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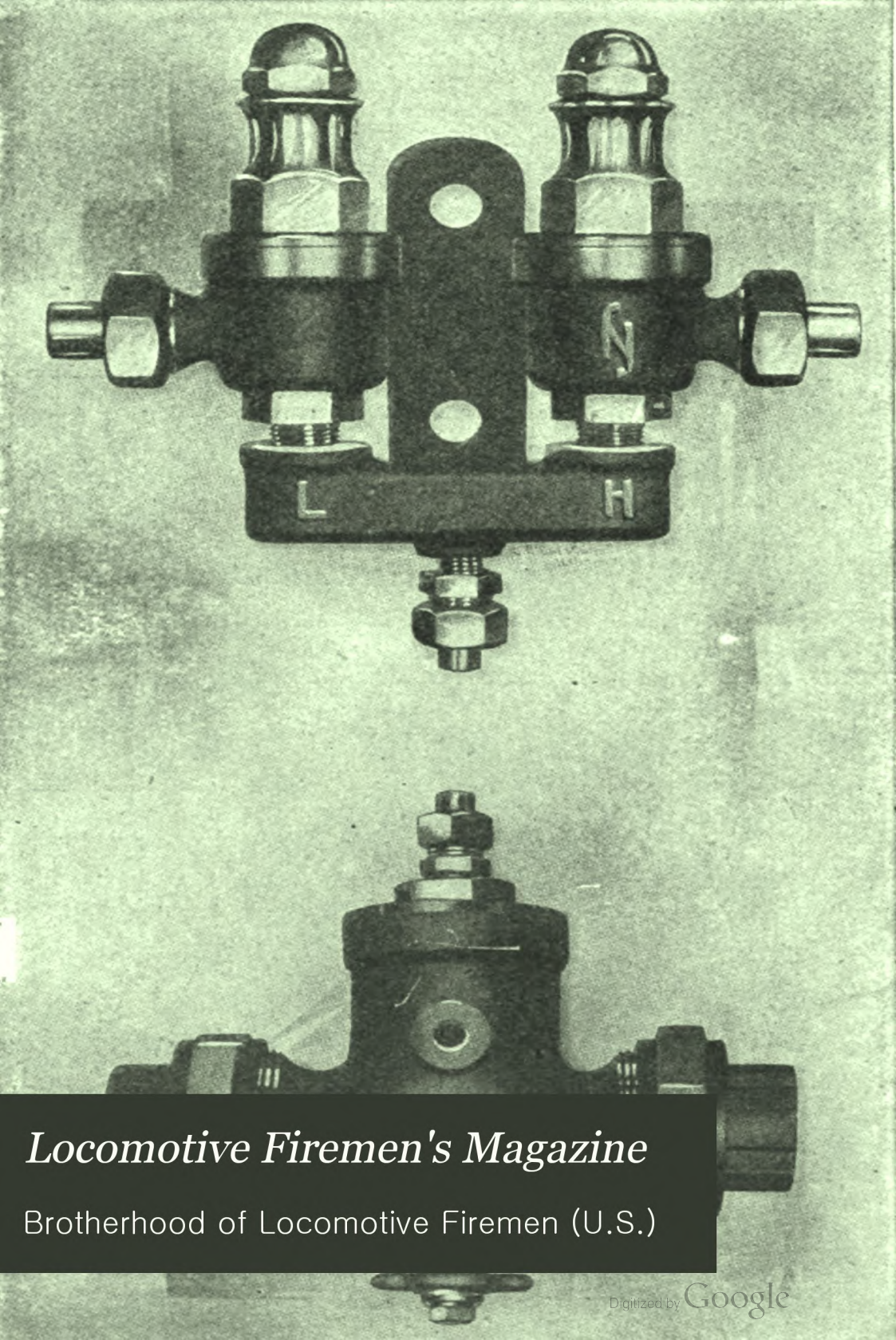

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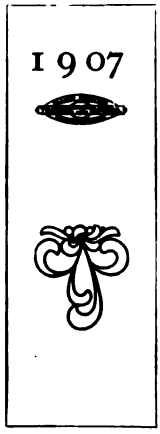
Volume XLIII—July-December

1907



Published by the
Brotherhood of Locomotive Firemen and Enginemen
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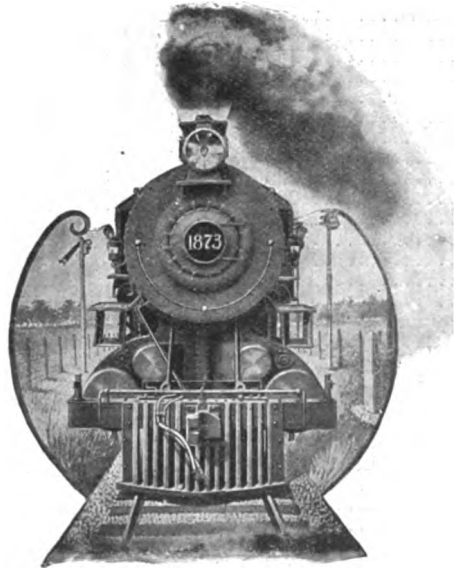

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JULY 1907

Grinnell Rist-Fit "Ventilated" Gloves

(PATENT PENDING)

Something every Railroad Man will Appreciate

Grinnell "Rist-Fit" Gloves are made especially for the use of Engineers, Firemen, Brakemen and Railroad Men in general.

They will not work down over the hand. Notice how the strap is placed across the wrist. By pulling this strap closely, a snug, tight fit is secured, which prevents dirt or cinders working down into the glove.

There is plenty of free wrist movement, and the cuff gauntlet stays where it should—up on the sleeve. These "Rist-Fit" Gloves are made with or without the ventilated back in all sizes.

The ventilated back allows free circulation of air, keeping the hands cool and comfortable. Patent pending on both the "Rist-Fit" and "Ventilated" features—found only on Grinnell Gloves.

Made of same material as our other famous Grinnell Reindeere Gloves, may be washed as often as desired and will dry out soft and pliable as new.

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Ask your dealer for "Grinnell" Gloves. If he does not sell them, send us his name and address and size of glove you wear, and we will have him take a stock, and will send a pair along for you free with first order to him, providing you are the first engineer (fireman) (Railroad man) to send in his name.

Morrison, McIntosh & Company, Makers
Grinnell, Iowa

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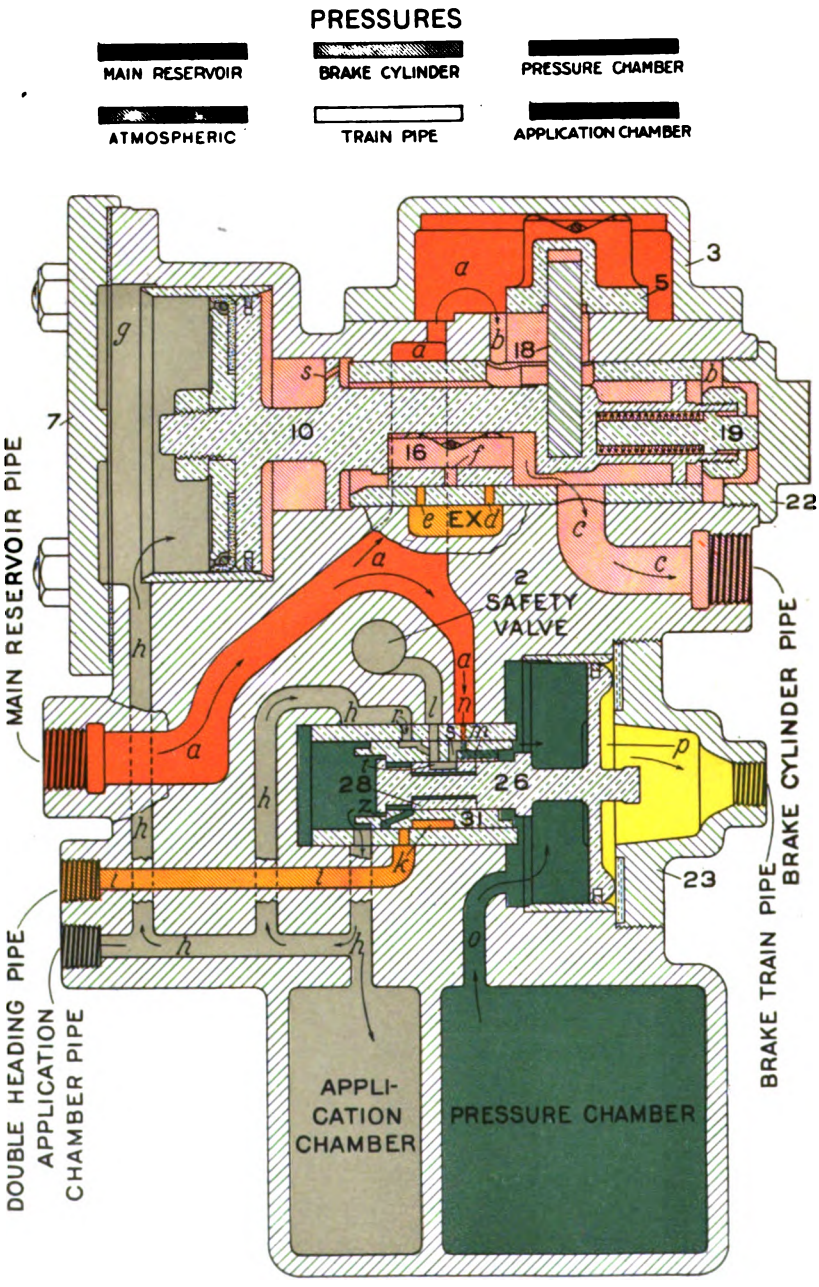

Locomotive Firemen and Enginemen's Magazine Educational Charts

WESTINGHOUSE AIR BRAKE SERIES

PLATE XXXIII—DISTRIBUTING VALVE, E T LOCOMOTIVE BRAKE EQUIPMENT

(Emergency Application Position, Automatic)

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BROTHERHOOD OF
Locomotive Firemen and Enginemen's Magazine.
TECHNICAL DEPARTMENT

JOHN F. McNAMEE
EDITOR AND MANAGER

SUBSCRIPTION PRICE
$1.50 PER YEAR

PUBLISHED MONTHLY BY THE BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN

Entered as Second-class Matter December 27, 1906, at the Post Office at Indianapolis, Ind., under the Act of Congress of March 3, 1879.

VOL 43 NO. 1 INDIANAPOLIS, IND. JULY 1907

Plate XXXIII—Distributing Valve of the ET Locomotive Brake Equipment (Emergency Application, Automatic).

Plate XXXIII of the Westinghouse Air Brake Series of the Locomotive Firemen and Enginemen's Magazine Educational Charts shows a diagrammatic sectional view of the distributing valve of the ET locomotive brake equipment in emergency application, automatic position.

Plate XXVIII (August, 1906) showed the distributing valve in release position. By again referring to it the action of the distributing valve in emergency position, shown by Plate XXXIII accompanying this article, will be easier understood.

With the handles of the automatic and the independent brake valves in running position the application chamber would be empty, application piston *10* would have moved application valve *5* to close the port from the main reservoir pressure to the brake cylinders, and would have moved exhaust valve *16* to its open position, thereby allowing the brake cylinder pressure to escape to the atmosphere. The increase to standard brake train pipe pressure would have forced equalizing piston *26* to recharging position, allowed the air to pass around the piston through the feed groove and into the pressure chamber until its pressure had become equal to that in the brake train pipe. Although graduating valve *28* and equalizing valve *31* had moved with equalizing piston *26* no results followed. The application chamber was connected with the double-heading pipe by equalizing valve *31*, but this pipe was closed by the double-cut-out cock, and the application chamber pressure had escaped through the application chamber pipe and the two brake valves to the atmosphere, as already stated.

We are now ready to consider emergency position of the distributing valve. The objects sought by this position are, first, to quickly give a higher brake cylinder pressure than can be obtained in a service application, this being justified when life or property is in danger, even though the risk of wheel sliding is somewhat greater; second, to gradually reduce this pressure as the speed reduces and the liability of wheel sliding is thereby increased; and, third, to finally maintain as high a brake cylinder pressure as would be obtained by a full service reduction, and this in spite of any such leak from the application chamber as would release a moderate service applica-

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tion, until the stop is completed. Also, in case the pressure chamber air had previously been reduced by an automatic application, followed by a release with the independent brake valve, to gradually raise the brake cylinder pressure to the full service amount obtained from a fully charged pressure chamber.

With the parts in the positions as just described and the brake train pipe, the pressure chamber and the equalizing reservoir of the automatic brake valve charged to 70 pounds, we will assume that the handle of the automatic brake valve is moved quickly to emergency position, that of the independent brake valve remaining in running position. The effect on the distributing valve is illustrated by accompanying Plate XXXIII. In emergency position of the automatic brake valve the rotary valve connects the equalizing reservoir with the application chamber through the application chamber pipe, thus allowing the 70 pounds in the equalizing reservoir to equalize into the application chamber. The large opening made by the automatic brake valve from the brake pipe to the atmosphere caused a sudden and heavy reduction in brake pipe pressure. The 70 pounds in the pressure chamber therefore forced equalizing piston *26* to the extreme right against its cylinder cap gasket, as shown. Equalizing piston *26* pulled graduating valve *28* and equalizing valve *31* with it to the positions occupied in the illustration.

Referring to the lower halves of these two valves, it will be seen that equalizing valve *31* has opened the port leading through passage *h* to the application chamber, thus allowing the 70 pounds in the pressure chamber to equalize into the application chamber. Now, referring to the upper halves of graduating valve *28* and equalizing valve *31*, it will be seen, first, that a very small port supplied by passage *a* and not heretofore used, is now connected by maintaining port *m* in equalizing valve *31* with the pressure chamber and is allowing main reservoir air to feed through the equalizing valve chamber and port *h* into the application chamber.

The sudden admission of the 70 pounds from each the equalizing reservoir and the pressure chamber into the application chamber will raise its pressure to about 60 pounds. The feed from the main reservoir into the application chamber through maintaining port *m* into the application chamber would raise its pressure higher were it not that the upper halves of equalizing valve *31* and graduating valve *28* have also connected the application chamber with the safety valve through passage *h*, the cavity in equalizing valve *31* and port *l*. As the safety valve is set at 53 pounds, it commences to discharge the application chamber pressure as soon as it exceeds this amount, but owing to the large volume suddenly admitted from the equalizing reservoir and the pressure chamber the pressure in the application chamber raises to about 60 pounds, as stated before. The cavity in equalizing valve *31*, which aids in connecting the safety valve to the application chamber, is also quite small at one point. This and the supply from the main reservoir through maintaining port *m* results in the application chamber pressure reducing gradually to near the adjustment of the safety valve and remaining at this amount so long as the valve maintains emergency position.

If 110 pounds brake train pipe pressure were being carried, as in high speed brake service, the application chamber pressure would have risen to 85 pounds and then gradually reduced to and remained at about 60 pounds, thereby duplicating the action of the high speed reducing valve, then used on the brake cylinders of other equipments.

It follows that as long as the distributing valve parts remain in emergency position the safety valve will continue to discharge air from the application chamber as fast as it enters from the main reservoir through maintaining port *m*.

As the application chamber is connected by another branch of passage *h*, with space *g* at the left of application piston *10*, this piston was forced to the right to the position shown, carrying application valve *5* and exhaust valve *16* with it, and, by graduating stem *19* striking cap nut *22*, compressed the graduating spring. Exhaust valve *16* has closed ports *e* and *d*, leading to the atmosphere, and application valve *5* is allowing main reservoir pressure to flow through *a*, *b*, and *c* to the brake cylinders on the engine and tender. Port *s* in the collar of application piston *10* gives brake cylinder pressure free access to the right side of the piston. Hence, as soon as the brake cylinder pressure has increased to an amount a trifle higher than the application chamber pressure on the left of application piston *10*, the brake cylinder pressure and the graduating spring will force the piston to the

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left until it comes in contact with exhaust valve *16*. The graduating spring can act no farther, application valve *5* will be closed and these parts will remain in this position (lap) until the reduction in application chamber pressure by the safety valve, as explained, allows the brake cylinder pressure to move exhaust valve *16* to release position, opening ports *e* and *d* to the atmosphere. Application valve *5* moves with the piston, but keeps its port closed.

The application chamber and brake cylinder pressures will reduce together. When the former stops falling and the brake cylinder pressure has reduced a little below it application piston *10* will move exhaust valve *16* until its ports are closed, but not enough to open application valve *5* being again on lap.

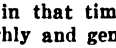
Except when these parts again move to application position for a moment at a time to restore brake cylinder pressure lost through leakage, the parts will remain on lap until the brakes are released.

Flue Sheets.

At the meeting of the International Master Boiler Makers' Association, Cleveland, Ohio, May 21, 1907, Mr. J. R. Cushing, of the Cleveland, Cincinnati, Chicago & St. Louis Railway, presented the following paper:

"I have been handling the Belpair boiler for fifteen years and in that time I have studied them thoroughly and generally found that after the first twelve months the flue holes in the top corners had become elongated 1-32 inch, necessitating reaming. Before two years the bridges would crack and have to be plugged, flue holes would have to be reamed again, making them 2 3-32 inches, and the flue sheet would be bulged in the center, making it necessary to apply a new flue sheet. The life of fireboxes in this design of boiler is from four to four and one-half years. I firmly believe the Belpair design of boiler is inferior to the radial stayed boiler of modern design, for in the Belpair there is too much flat surface for boilers carrying 200 and 225 pounds pressure.

"The criticism so often heard in regard to radial stayed boilers of cracking at top of flue sheet is, I believe, due to faulty construction only, and my reason for saying this is that I have paid particular attention to the upward movement of flue sheets and find that in three years the crown sheet will be bulged up ¾-inch in the center over flue sheet, while the short radius in the corner will be in its natural state, thus putting all the strain due to expansion at the top of sheet, causing it to crack just above short radius. To overcome this I would recommend that the flue sheet be given a 2-inch radius when being flanged instead of a 1-inch radius, which I find is the practice, and in a great many instances less. I applied a flue sheet to one of our large passenger engines carrying steam at 200 pounds with 1½-inch radius and after twenty months' service I applied side sheets to the same engine and there were no signs of fracture in the top of the flange of this sheet. The only noticeable change in this flue sheet was that it was 5-16-inch longer from bottom flue hole to top of flange in the center than when applied, making the crown sheet appear as if the engine had low water. I would also recommend the applying of Tate flexible bolts or some other bolt of similar design all over the crown sheet and down to the third row below parallel the seams of the firebox, thus giving free expansion room to the firebox when the engine is being fired. I think these two changes would not only increase the life of our fireboxes, but also the life of our flues, as it would stop the buckling of flue sheets which now causes so much trouble with leaky flues in bottom of sheet."



Contradictions in Locomotive Performance.

One of our prominent motive power officers, who has made a scientific study of locomotive performance, has characterized the steam locomotive as the most complicated and contradictory of man's inventions. He reaches this conclusion after a careful analysis of the most accurate measurements of locomotive performance which have ever been made, and shows how easy it is to make mistakes in drawing general conclusions relating especially to locomotive boiler performance.

The variation in boiler practice and boiler fittings and the constant uncertainty as to whether the best arrangement has been reached or whether it could be materially improved are often the result of contradictory results in measuring boiler performance. After using dead grates in front of the firebox for

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many years, it is now found that they are often the cause of leaky tubes, and it is better practice to keep a bright fire in front and not allow the tubes to cool while the engine is in service. The location of checks is connected with the general subject of the circulation of water in locomotive boilers, and as little is known on the subject there is naturally a variety of opinions as to the best place to introduce feedwater and there is no settled practice for check location. Some prominent roads place the check on the back head of the boiler and run the delivery pipe well forward; others have an attachment on the inside of the side check which deflects the current toward the bottom of the boiler. A photograph of a recent Pacific locomotive shows the check on the top of the boiler about three feet back of the front tube sheef and the water is delivered into the steam space at this point. Although copper is a much better conductor of heat than steel, it has been definitely shown that the copper firebox has no evaporation advantage over one made of steel, but it is probable that many foreign engineers still cherish the delusion that the copper firebox is the most economical. The transmission of heat through metal to water is not materially affected by the character of the metal, but depends more upon the circulation of the water on the metal.

When we consider the enormous capacity to which locomotive boilers can be forced, and that this is largely dependent upon the draft appliance in the front end, it is not surprising that slight changes or slight defects in this appliance will affect materially the boiler capacity, the economy of evaporation, or the engine performance. The draft appliance known as the self-leaning front end is regarded by some as the most improved form, as with that construction it is unnecessary to clean the smokebox between terminals. The St. Louis test showed that the advantage of a good balanced valve and a superior valve setting were neutralized by the two pounds extra back pressure produced by the arrangement of the diaphragm in the self-leaning front end. While this form of draft appliance is convenient, it is not the most economical. Attention is called to this particular instance in "Some Notes on the Tests at the St. Louis Exposition," by H. H. Vaughan, read at the April meeting of the Canadian Railway Club. He says that this is interesting on two accounts, as it shows the difficulty that is frequently experienced in intelligently explaining the contradictory results obtained from locomotive tests, and it is a useful object lesson as to the necessity of following all and not only a few of the many factors which together make for economy or waste on a locomotive. The spacing of tubes is another example of uncertain and irregular locomotive practice.

One of the most unsatisfactory details connected with locomotive testing is the analysis of smokebox gases. While a great deal of labor has been expended in the effort to get satisfactory results, they have usually been so contradictory that it has not been possible to draw any valuable conclusions from them and the most experienced experimenters now regard gas analyses of little value in locomotive testing. In the St. Louis tests the record of every run includes the analysis of smokebox gases and these should show the loss from imperfect combustion due to the formation of CO instead of CO_2. With the same rate of combustion this loss varied for different engines from ½ per cent. to 16 per cent., and is ascribed to the presence or absence of the brick arch, this causing a higher firebox temperature, which should decrease the percentage of CO. With a knowledge of the composition of the flue gases and their firebox and smokebox temperatures it should be possible to calculate the amount of heat transmitted to the tubes and thus determine the relative value of firebox and tube heating surface. Mr. Vaughan has spent a large amount of time in this effort, and he finds the results of practically no value. He also admits that his theory, announced at the Western Railway Club three years ago, which makes the value of tube heating surface proportional to the square root of the length of tube, was an attractive fallacy and leads to erroneous conclusions. The mistake was made in trying to extend the law to cover the form of heating surface whether in a number of short tubes or a lesser number of long ones, and to show that the latter were less efficient. The fact was overlooked that if the number of tubes is decreased the amount of gas and consequently of heat through each tube is correspondingly increased.

The relative value of long and short tubes, of firebox and tube heating surface, and the proper spacing of tube, are questions which remain unsettled, and it is evident that they are difficult of solution.

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The truth relating to them will never be obtained from the most learned opinions based upon ordinary practice nor by the most careful theoretical analyses of tests made on the ordinary locomotive boiler. These great questions relating to locomotive boiler performance and boiler design can only be solved by great effort and at comparatively great expense in conducting special experiments on boilers specially designed for testing purposes.—The Railway Age.

* * *

*The New York B-2 Locomotive Equipment.**

During the past few years the greatly increased length of freight trains, with the large number of air braked cars in such trains, have created conditions that the older types of brake valves have been unable to meet successfully. The difficulties in question and the methods of correcting them are as follows:

First. *The Failure of a Large Percentage of the Brakes in a Long Train to Apply.*—This is caused by a back flow of air from the auxiliary reservoirs to the brake pipe through the feed groove, and leakage from the brake cylinder to the atmosphere through the leakage groove. It is the result of the comparatively slow brake pipe reduction, which is due to the necessarily restricted size of the service exhaust ports in the brake valves, which for obvious reasons can not be enlarged to suit long trains.

This difficulty has been overcome by the introduction of the accelerator valve. This valve was designed to assist the brake valve in discharging brake pipe air when making service applications on long trains. Its action causes a more prompt and uniform application of the brakes than was possible with former types of brake valves. It operates only when a service application of the brakes is made with the brake valve and then only when the volume of brake pipe air is sufficient to warrant its use. The reductions, however, are no greater with the accelerator valve than with the former types of brake valves, as the automatic cut-off of the brake valve controls the flow of air that actuates the accelerator valve. This valve does exactly what its name would imply. It accelerates the discharge of brake pipe air.

*Courtesy of New York Air Brake Company.

Second. *Overcharging the Auxiliary Reservoirs at the Forward End of a Long Train While Releasing Brakes, Which Results in a Reapplication of Them When the Brake-Valve Handle Is Moved to Running Position.*—This difficulty is overcome by the use of the pressure controller. The controller is located in the return pipe, between the brake valve and main reservoir, and controls the brake pipe pressure. Release of the brakes is practically as prompt in running position as in full release, and as the control of pressure can not be changed by moving the handle from release to running position, there is no fall in pressure, which is always the case with former equipments where full equalization has not taken place. Thus the possibility of reapplication, due to the charging of the rear brakes when the auxiliary reservoirs on the forward end are overcharged, is eliminated.

Third. *The Danger of Long Trains Breaking in Two When the Train Brakes Are Released, Owing to the Slack Running Out and Creating Excessive Strains on the Draft Gear.*—This is corrected by holding the engine brakes applied when releasing the train brakes. It is accomplished through the agency of ports in the brake valve, which admit straight air to the engine brake cylinders when the brake valve is moved to full release position, or retaining the pressure that is in the brake cylinders at the time of the release of the automatic brakes. This is sufficient to hold a long train bunched as long as necessary, when the engine brakes can be released wholly or gradually, at will.

The equipment designed to perform this work is known as the New York B-2 Locomotive Equipment, and is arranged in three schedules to cover the general requirements. Schedule B-2 covers the single pressure system, B 2-HP the double pressure system, and B 2-HS the double pressure system with high speed attachment. As Schedule B 2-IIS contains all of the parts used in the schedules it will be described in this paper.

By referring to the piping diagram it will be seen that the general arrangement of this equipment is similar to that of the previous standard equipments.

The instructions for manipulating the B-2 brake valve are the same as for the former types, with the following exceptions:

To release the locomotive and train brakes simultaneously, move the handle

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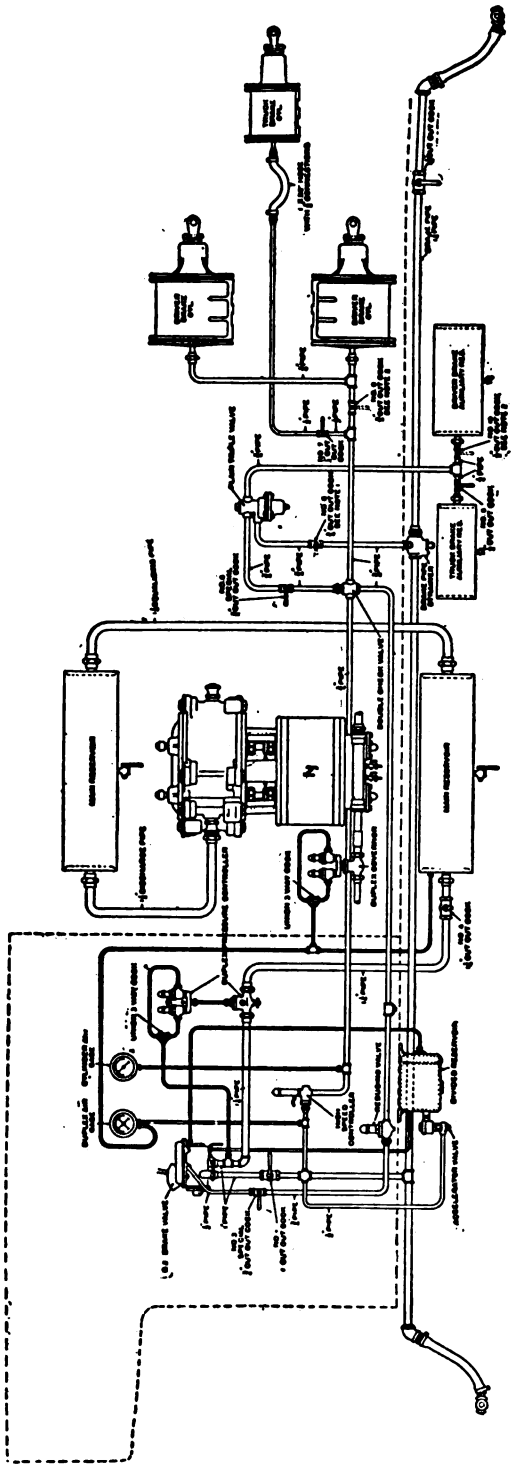

Piping Diagram, B-2 HS Equipment

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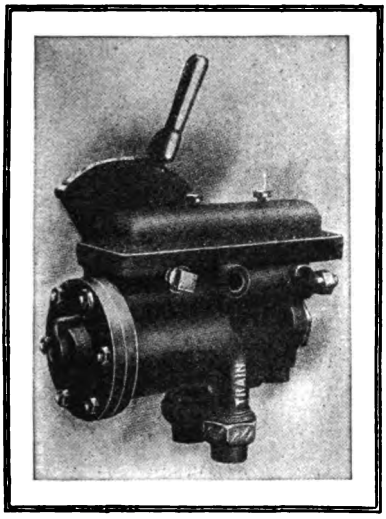

Fig. 1. B-2 Brake Valve

handle to full automatic release and straight air application position.

To release the locomotive brakes, move the handle to running and straight air release position.

To apply the locomotive brakes separately, move the handle to full automatic release and straight air application position.

To graduate off or entirely release the locomotive brakes without releasing the train brakes, use the lever safety valve to make the required reduction.

A point midway between full release and running positions laps the straight air ports. By using it, the straight air can be graduated on and off as desired.

The B-2 Brake Valve.

This brake valve, although similar in appearance to the 1902 model, is essentially different in interior construction in order to embody the features of the pressure controller, the accelerator valve and the applying and releasing of the engine brakes with straight air. Fig. 1 is a photographic view of this valve. Fig. 2 is a

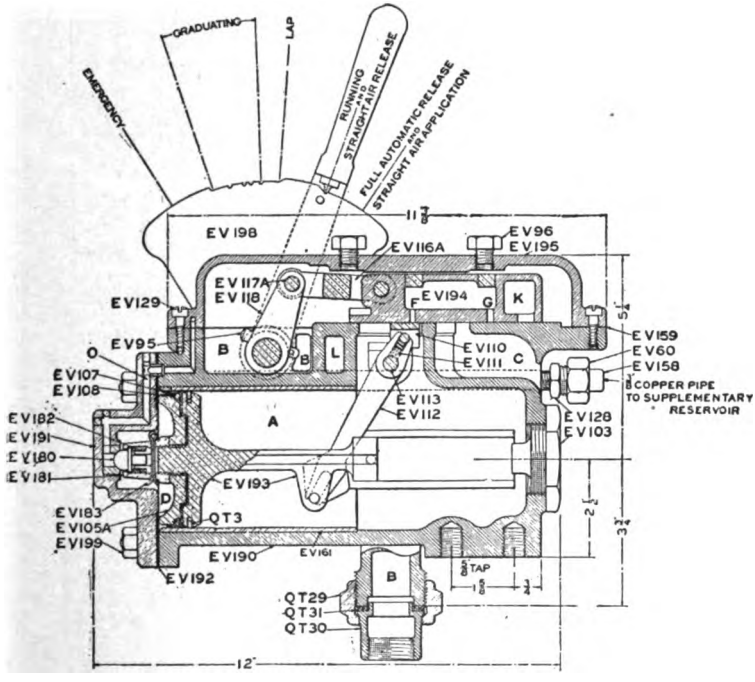

Fig. 2

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longitudinal side section, showing the main slide valve *E V 194*, and how the graduating valve *E V 110* is controlled by the piston *E V 193* and lever *E V 112*. This view also shows the different positions of the brake valve handle. Fig. 3 is a top view of the valve with the cover, slide valve and handle removed, showing the seat and connections to the straight air and divided reservoir pipes. Fig. 4 is a cross section through the valve (rear view). Fig. 5 is a cross section through the main slide valve *E V 194*. Fig. 6 shows the face of the main slide valve. The main reservoir pipe, brake pipe and the supplementary reservoir pipe are the same as with previous valves. The chamber *D* and supplementary reservoir are charged through port *W* instead of through the piston, therefore there is no port through the piston, or ball check. Vent valve *E V 180* is retained to close port *O* when the piston is in its normal position.

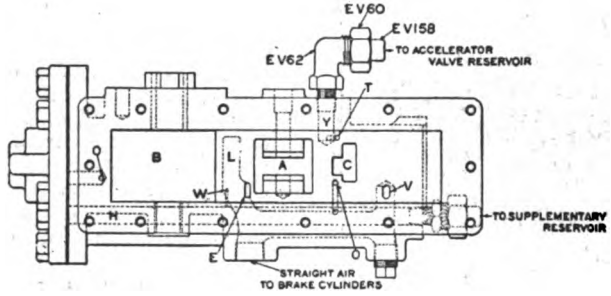

Fig. 3

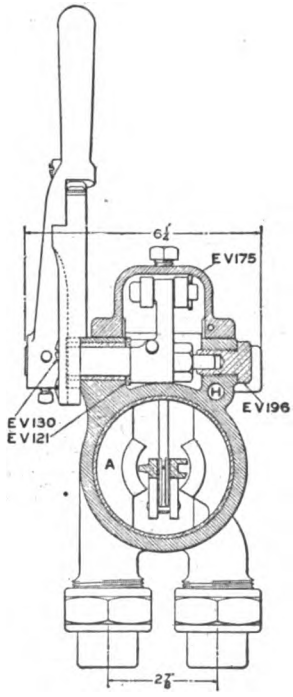

Fig. 4

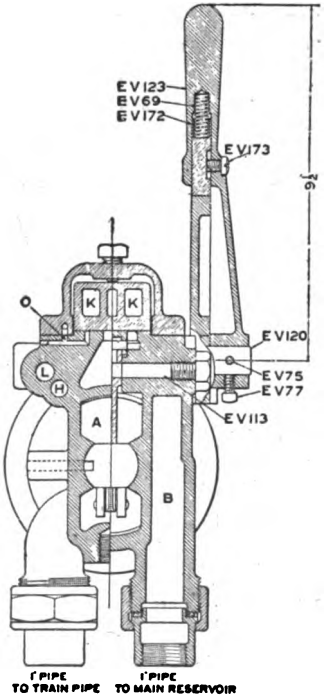

Fig. 5

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Full Automatic Release and Straight Air Application Position (*Fig.* 7).—Main reservoir air reduced in pressure at the controller valve to the standard brake

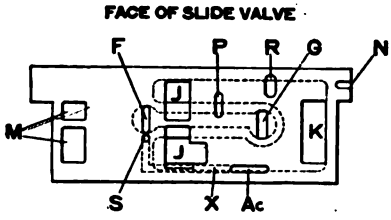

Fig. 6

pipe pressure, enters the valve at the main reservoir connection, comes up into cavity *B*, and is around the slide valve. turned to its normal position when it is closed by vent valve *E V 180*. Port *W* is open and air passes through it to passage *H* to charge the supplementary reservoir and chamber *D*. Port *T* leading to the accelerator reservoir registers with port *J* so that the pressure in this chamber can equalize with the atmosphere. Port *E*, in the seat, leading to the engine brakes, is now open so that air can pass through *E*, the reducing valve and the double check valve as shown in the piping diagram, until it is shut off by the reducing valve. As the air coming into the brake valve is reduced by the pressure controller to the standard brake pipe pressure, leaving the handle in full release position will not overcharge the brake pipe.

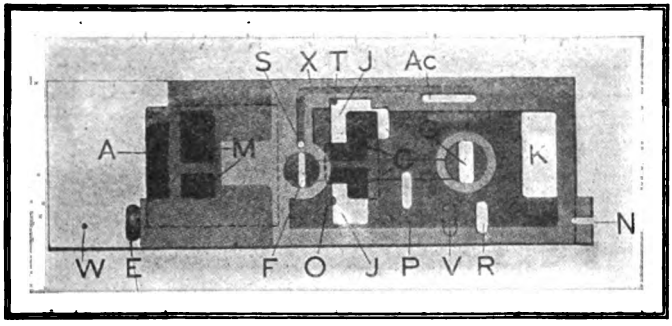

Fig. 7. Release Position

In this position air flows into chamber *A* (brake pipe) past the end of the slide valve and through ports *M*. Port *O*, in the seat and connected with chamber *D*, is open to port *J* and exhaust passage *C*, and allows air to escape from chamber *D* to the atmosphere till the piston is re-

Running and Straight Air Release Position (Fig. 8).—This position is used to release the train and engine brakes simultaneously or the straight air brake, if it only has been applied. Air passes to the brake pipe through the ports *M*. Port *E* is closed, and ports *R* and *V* register

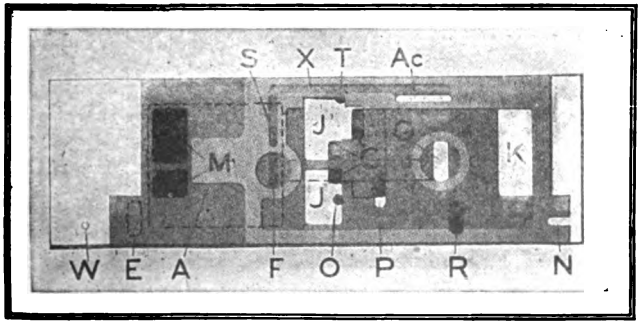

Fig. 8. Running Position

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with each other, the air from the straight air brake passing to the atmosphere through ports *J* and *C*. Ports *E* and *V* are connected by a cored passage (see Fig. 3). Ports *O*, *T* and *W* remain the same as in release position.

Lap Position (Fig. 9).—The handle should be placed in this position when a hose bursts, the train parts or a conductor's valve is opened, to save the main reservoir air. All ports are closed in this position excepting port *O*. This port is open in release, running and lap positions, for the purpose of holding the piston in its normal position. If by any means a reduction of the brake pipe pressure should take place when the valve is in these positions, the piston would only move far enough to unseat vent valve *E V 180*, when the pressure in chamber *D* would be reduced, and the brake pipe pressure would at once return the piston to its normal position, and the vent valve would close port *O*. Port *O* is connected to exhaust passage *C* in this position by groove *P* in the face of the slide valve.

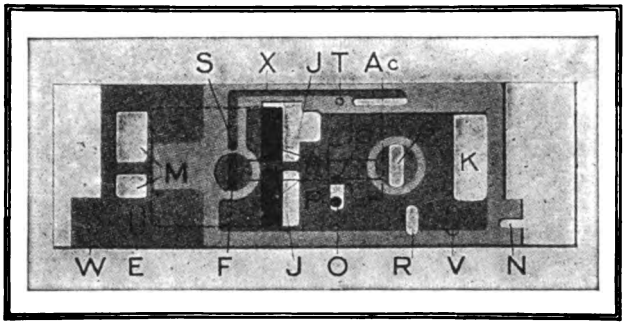

Fig. 9. Lap Position

Service Application Position (Figs. 10 and 11).—Service position is divided into five graduating positions or notches. When the slide valve is moved to the first graduating notch, the slide valve closes port *O*, port *F* is moved off the graduating valve *E V 110* and port *G* registers with the exhaust passage *C*, so that the brake pipe air can flow to the atmosphere and reduce its pressure. At the same time port *S* is opened, and brake pipe air can flow through *S*, passage *X* and the long port *Ac*, and thence through port *T* to the accelerator reservoir, and build up a pressure to operate the accelerator valve. As soon as the pressure in chamber *A* (brake pipe) begins to reduce, the pressure in chamber *D*, from which there is now no outlet, begins to expand until it equalizes with the pressure in chamber *A*. In doing so, it moves the piston forward. The piston carries with it the lower end of the graduating valve lever *E V 112*, which is so proportioned that the graduating valve on the other end of it just closes ports *F* and *S* when the pres-

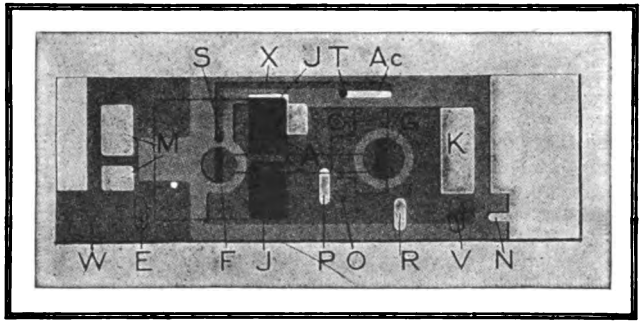

Fig. 10. First Graduating Position

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sures in chambers *D* and *A* are equalized. This stops the flow of air through ports *F* and *G* to the atmosphere, and *S* and *T* to the accelerator reservoir. This is called automatic lap, and it takes place in all the service application notches. When the brake pipe air that flows into the accelerator reservoir has built up a sufficient pressure to operate the accelerator valve, it also discharges brake pipe air; this

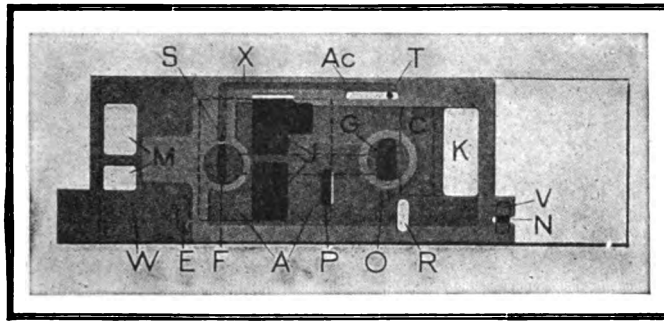

Fig. 11. Last Graduating Position

operation will be explained in connection with the accelerator valve. The operation of the brake valve is the same until the last graduating notch is reached. The slotted port *N*, in this position, is over port *V* and air from chamber *B* flows through the straight air pipe to the brake cylinders, and takes care of excessive piston travel and cylinder leakage, up to the adjustment of the reducing valve.

tion with exhaust passage *C*, so that the brake pipe air can flow to the atmosphere quickly, causing the brakes to apply in the shortest possible time. Port *V* is wide open in this position, so that air can flow from chamber *B* to the locomotive brake cylinders as freely as when the handle is in the release position. Should there be excessive piston travel or cylinder leakage, or should the automatic brake on the engine be cut out, for instance, to relieve the tires on a grade, it will insure the full power of the straight air brake, the same as in the full release position. All other ports are closed in this position.

Duplex Pressure Controller.

This valve, in reality, is a large capacity feed valve. It is placed in the pipe between the main reservoir and brake

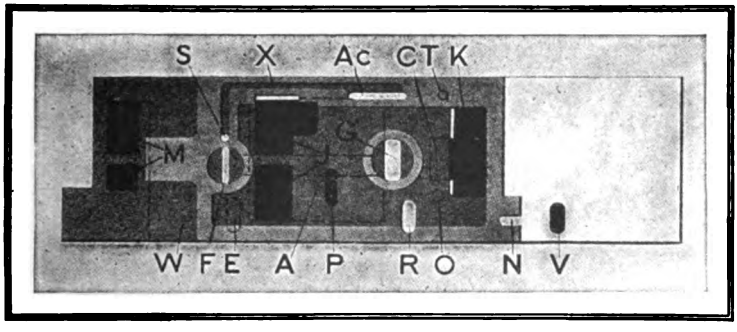

Fig. 12. Emergency Position

Emergency Application Position (Fig. 12).—This position should be used when a prompt and full application of the brakes is required. The handle is moved to its extreme travel when the large ports *J* and *K* bring chamber *A* in communica-

valve, and controls the brake pipe pressure. The regulating tops are connected to the pipe between the controller and brake valve, the pressure in which is the same as in chamber *B* of the brake valve, and never greater than the max-

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imum brake pipe pressure being used. By referring to the piping diagram its location and connections are readily seen. A union three-way cock (Fig. 15), from which pipes lead to the regulating tops, is used to cut in or out the high or low-pressure tops as required, the handle of the cock points to the top governing the brake pipe pressure. The letters *L* and *H* on the duplex bracket, into which the regulating tops are screwed, are for convenience in designating the low and high pressure tops of the controller.

The principle of operation of the duplex pressure controller is similar to that of a duplex pump governor, which is too well known to require much explanation. Main reservoir air enters the controller

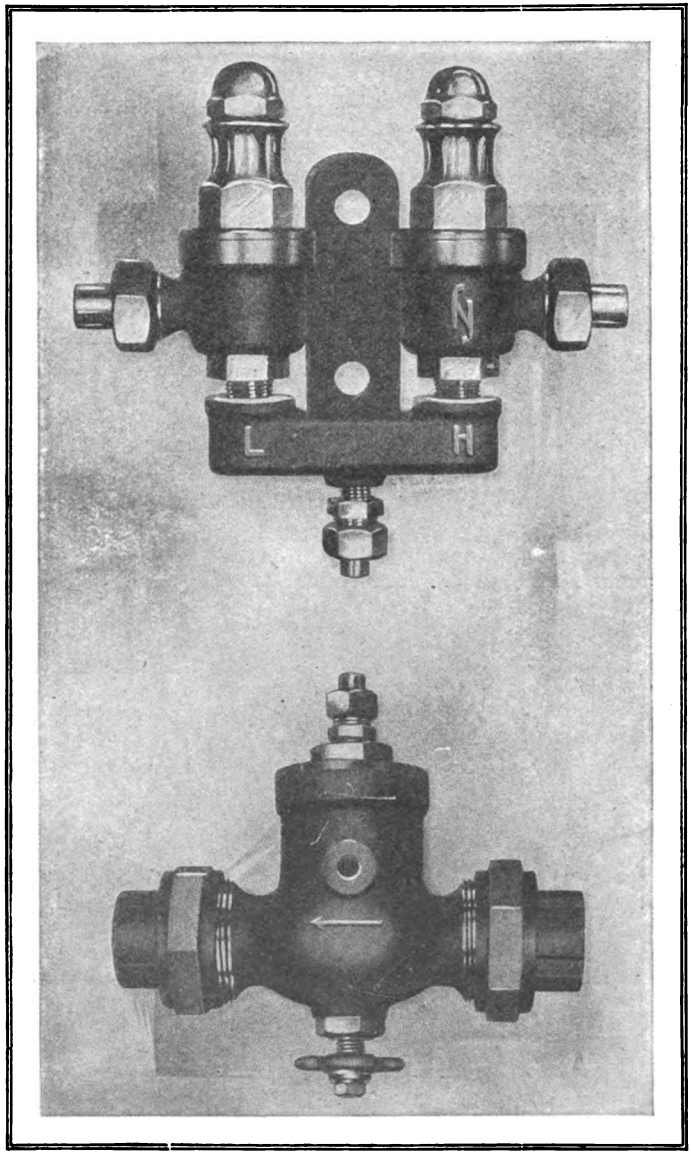

Fig. 13. Duplex Pressure Controller

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body at *M R* (Fig. 16) raises the valve *P G 95* from its seat and passes to the brake pipe. As soon as the air in the brake pipe reaches the pressure to which the controller is adjusted, it raises the

Excess pressure is now confined to the main reservoir. As only brake pipe pressure is now on top of the main slide valve, it handles much easier than with other types, being more nearly balanced.

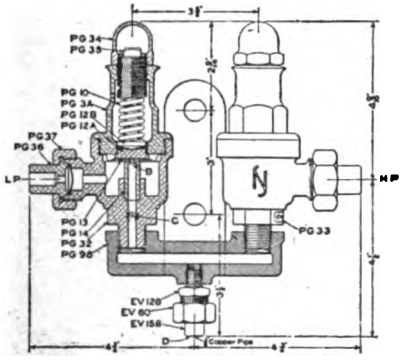

Fig. 14

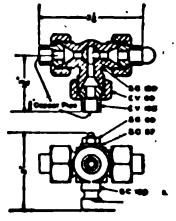

Fig 15

diaphragm and flows to the top of the piston *P G 4*, moving it down and closing valve *P G 95* so that the flow of air to the brake valve is stopped. A small vent port *C* allows air to pass out of the space above the piston and as soon as the

On the bottom of the controller body there is a hand wheel *P G 45* (Fig. 16). This wheel can be used in case of any defect that would cause a sluggish action of the controller. By screwing it up the valve *P G 95* is lifted from its seat, and

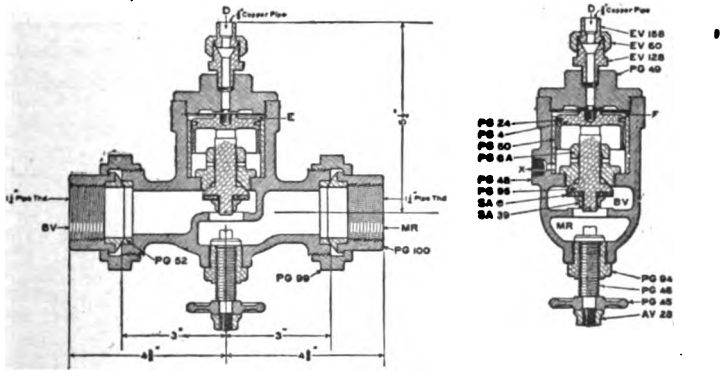

Fig. 16

diaphragm seats, the piston rises and allows main reservoir air to flow to the brake valve again. There is a vent port in each regulating top. One should be plugged and the other left open.

A similar arrangement of piping with the union three-way cock is used on the duplex pump governor, which, however, has the regulating tops connected to the main reservoir.

main reservoir air is free to flow to the brake pipe. Main reservoir and brake pipe pressures will be equal in this case, and care must be exercised until the controller can be cleaned or put in shape to resume its normal action. Occasional cleaning and inspection of the controller will reduce the liability of failure so that it may never be necessary to use the hand wheel.

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Accelerator Valve.

This valve is bolted to the divided reservoir, the large chamber of which is the accelerator reservoir and the small one the supplementary reservoir.

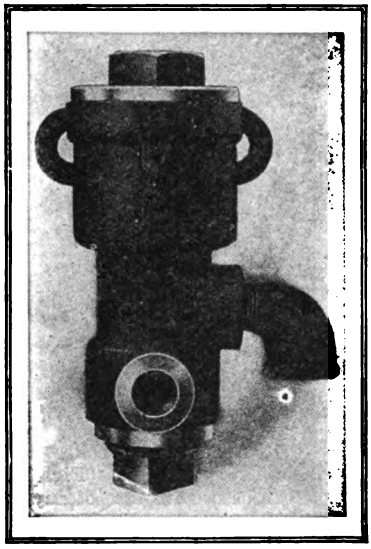

Fig. 17. Accelerator Valve.

The arrangement of piping to this valve is shown in the piping diagram. Fig. 17 is an outside view of the valve showing the brake pipe connection and exhaust elbow. Fig. 19 is a sectional view. The working parts are the piston *R V 65*, slide valve *R V 74*, and slide valve spring *E V 656*, valve stem *R V 67* with leather seat *R V 70* and spring *Q T 231*.

Brake pipe pressure is always present in chamber *O*, around the slide valve *R V 74*, and is prevented from escaping to chamber *B* by the leather seat *R V 70*, which is held to its seat by the spring *Q T 231*. There is a port, *a*, in the slide valve and a triangular port, *b*, in the slide valve bush, with its point upward. When the brake valve is placed in the service position port *S* in the slide valve is open to the brake pipe and the long port *Ac*, also in the slide valve, registers

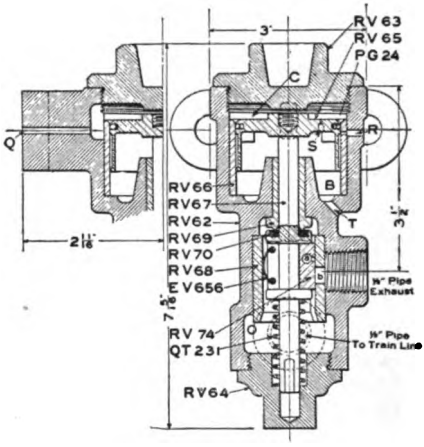

Fig. 19

with port *T* in the seat, allowing brake pipe air to pass through ports *S* and *T* to the accelerator reservoir and to the top of piston *R V 65*, which is always in

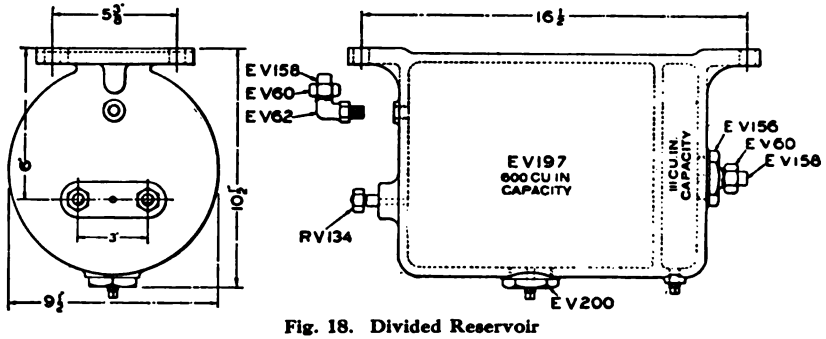

Fig. 18. Divided Reservoir

direct communication with the accelerator reservoir. When a pressure of from 15 to 17 pounds is accumulated in the reservoir, the piston, valve stem and slide valve are moved down, compressing spring *Q T 231*. Port *a* then registers with *b*, but as the small part of the port opens first the brake pipe air flows slowly to the at-

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mosphere, the discharge increasing as the port opens wider until the full travel of the piston and slide valve gives a full opening of the port. When the cut-off valve of the brake valve goes to automatic lap and closes port *S*, air stops flowing to the accelerator reservoir. The pressure on piston *R V 65* reduces through ports *R* and *T* in the body of the valve and through port *S* in the piston. As soon as the pressure above the piston has

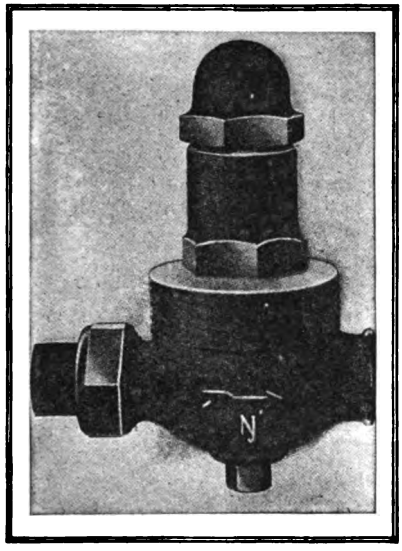

Fig. 20. Straight-Air Reducing Valve

been reduced sufficiently, the spring *Q T 231* pushes the slide valve and piston upwards, first closing port *R*, then ports *a* and *b*, lastly closing the leather seated valve *R V 70*, and stopping the flow of brake pipe air to the atmosphere. The piston closes port *R* before the slide valve closes port *b*, so that the air from the accelerator reservoir, flowing more slowly through the port *S* in the piston, gives the slide valve the slow closure desired.

This action of the accelerator valve will allow a much larger volume of air to pass from the brake pipe than could flow in the same time through the service ports *F* and *G* in the brake valve.

It takes about four seconds after the brake valve begins to discharge brake pipe air to build up enough pressure to operate the accelerator valve, and it closes in about the same length of time after the brake valve. This valve stays open longer with a long train than with a short one, because the volume of brake pipe air to be reduced is greater and the cut-off valve *E V 110* stays open longer. With a train of less than eight cars the cut-off valve closes port *S* in the slide valve before there is sufficient pressure in the reservoir to operate the accelerator valve.

Straight-Air Reducing Valve.

The purpose of this valve is to limit the pressure in the driver and truck brake cylinders to 40 pounds when using the straight air brake.

Fig. 20 is a photographic view of the reducing valve. Fig. 21 is a section showing the valves, port, etc.

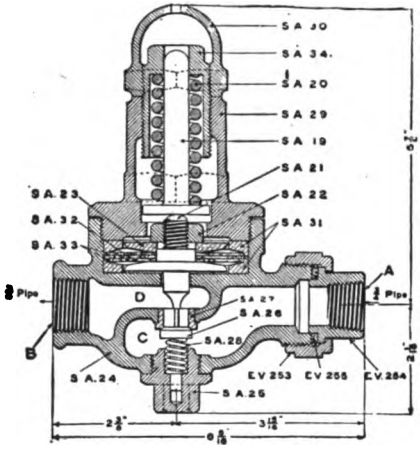

Fig. 21

Connection from the brake valve is made to the union fitting *A*, and by means of the passage *C*, pressure is free to pass to the feed valve *SA 26*.

Connection *B* leads to double check valve and brake cylinders.

The adjustment of the valve is accomplished by means of regulating nut *SA 34*, which regulates the tension of spring *SA 20* against the diaphragm *SA 32*. During the time the tension of the spring against the diaphragm is stronger than the force exerted against it by the brake cylinder pressure, valve *SA 26* will be held open, whereupon pressure from the main reservoir will be free to pass to the brake cylinders. As soon as the pressure against the diaphragm is strong enough to overcome the resistance of the spring the diaphragm will be moved upward, al-

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lowing the feed valve *SA 26* to be closed by the spring *SA 28*, shutting off communication from the supply to the brake cylinders.

High-Speed Controller With Lever Safety Valve.

This valve is operative when the locomotive equipment is set for high speed service.

Fig. 22 is an outside view showing the general arrangement. Fig. 23 is a section showing the operative parts.

The safety valve is for use at all times to graduate off brake cylinder pressure after an application of the train brakes when same is desired, and to regulate the pressure in the brake cylinders during high speed operations. It is set at 53 pounds and should so be adjusted in service.

The high speed valve to which the safety valve is fastened connects with the brake cylinder pipe at *BC* and with brake pipe at *BP*.

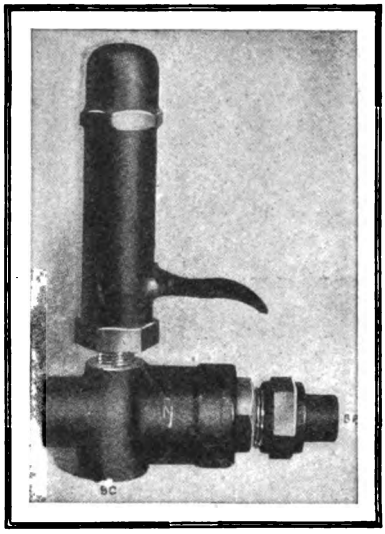

Fig. 22. High-Speed Controller

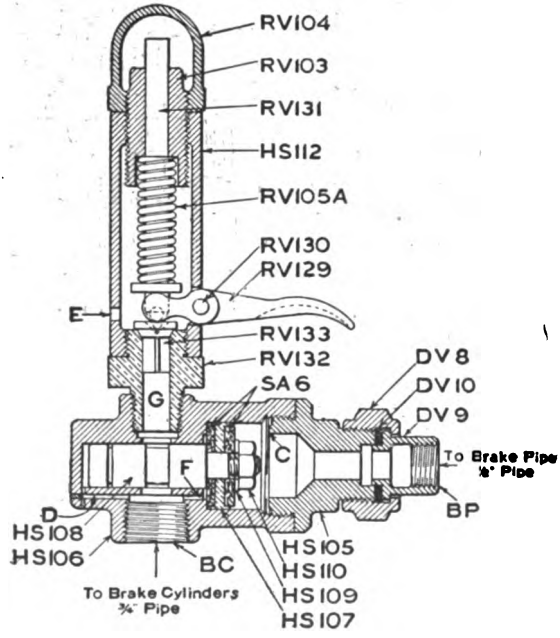

Fig. 23

The valve *HS 108* with piston *HS 107* operates when the brake pipe pressure is less than the pressure in brake cylinders. During all ordinary service applications the valve *HS 108* will remain in position shown. In an emergency application when brake pipe pressure is greatly reduced, the brake cylinder pressure will move the piston *HS 107* and valve its full traverse to the seat *C*. This move-

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ment will restrict passage *G*, leading to the safety valve and atmosphere, by the circular groove in the valve *HS 108* being moved forward, closing a portion of the passage. This will give a gradual blow down from the brake cylinders through passage *G* until shut off by the safety valve. The valve will remain in this position until the brakes are released.

Ports *F* and *D* allow the brake cylinder pressure around the piston *HS 107* and back of valve *HS 108*, so that the piston will be free to operate at a slight difference of pressure.

The piston *HS 107* is provided with leather seats, *SA 6*, which insures a seat at each end of its traverse.

* * *

*Block Signal Systems and Automatic Control of Railway Trains.**

Conclusions and Recommendations.

Under questions 7, 8 and 9, in its order of August 24, the commission sought to obtain information from railroad officials concerning the economy of the block system, the extent to which it had reduced the number or cost of collisions, and how far it had increased the capacity of their lines.

The answers to these questions have not been in all respects entirely satisfactory. Many railroad officials have freely expressed themselves in favor of the block system, and the manager of one of the most important systems of railroad in the country, on which automatic block signals of the latest type have been installed very extensively within the past few years, declares unequivocally that the investment which his company has made in this direction is one of the best that it has made in any department. A great many managers, however, appear reluctant to make positive statements with respect to the actual results attained from the operation of the block system on their lines.

It appears that the block system has been introduced from mixed motives. One road, for example, will incur the added expense of several hundred dollars per mile per year because it has been mulcted a considerable sum for damages in a collision of passenger trains; another will introduce the system because of numerous lesser collisions of freight trains, causing much loss and showing the likelihood of greater loss. Another will emphasize the feature of reputation, knowing that passengers will feel safer under a scientific system and this feeling will influence their patronage. If a competing line already has block signals this argument may be forced on a manager. Another manager, particularly sensitive to the reputation of his road, will be influenced by the effect on his subordinates and on his own peace of mind. They all breathe more freely after getting rid of the anxieties incident to the time interval and flagging system.

The salient facts shown in the statements which have been received from carriers are that

(1) Fifty of the principal railroads of the country have introduced and are using the block system on their important lines, though with considerable difference in details of apparatus and methods of operation.

(2) The telegraph block system is operated at moderate expense, with a great improvement in safety as compared with former methods of train control.

(3) Automatic block signals, almost universally looked upon in this country as the highest exemplification of the art, have been and are being developed with great energy and skill and liberal expenditures of money.

(4) Automatic signals are superseding the telegraph block system to some extent, and seem destined to do so increasingly in the future.

(5) Thirty roads of considerable length and importance have not yet adopted block signals of any kind.

(6) The block system has proved decidedly profitable even on lines where the signal equipment is not complete, this being accomplished by careful adherence to modifying rules making provisions against the deficiencies of the block system and by the continuance of the train dispatching regulations which were used before the block system was adopted.

It is proper to add that all of the railroads continue in force their rule requiring that when a train is unexpectedly detained a flagman shall go back with a red flag or lantern to stop any following train, though, as the accident records show, flagmen have repeatedly failed to stop trains that have wrongfully passed block signals.

*Report of the Interstate Commerce Commission on Block Signal Systems and Appliances for the Automatic Control of Railway Trains.—Continued from the June, 1907, Magazine.

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The main facts which have been elicited concerning the present policies of the railroads of the country in respect to block signaling are:

(1) The principal railroads use the block system on their lines of heaviest traffic, and most of them report that it is economical.

(2) Many of these roads use it also on lines of light traffic, and some are rapidly extending it.

(3) All railroad officers deem the system an improvement over any other method of guarding against collisions. In other words, they consider it a means of safety.

(4) Many say that it has reduced the number and cost of collisions.

Those who do not testify on this last point simply plead ignorance, saying that their records are imperfect. One reason why some of the roads do not keep records of the results of the block signal system is, no doubt, that they are convinced that as a means of safety it is an improvement over the old system without statistical proof. Another is that its benefits consist partly in an amelioration of unfavorable conditions which can not be definitely compared one period of time with another. It is probable that one reason why records are withheld on the plea of incompleteness or slight inaccuracies is that they show the prevalence of permissive blocking or other practices not generally approved.

The various conditions under which the different block signal methods are used may be observed by considering briefly the practice on typical roads, as follows:

The "controlled manual" system is used on the four-track lines of the New York Central and Hudson River and the New York, New Haven and Hartford. These are the principal examples of this system in the United States. It is, of course, equally adapted to two-track lines. The electric train staff, which is a type of controlled manual apparatus, is used on 100 miles of a single-track division of the Southern Pacific, and on short sections of other roads. The train staff is universally approved as a safety device, but its failure to secure more general recognition appears to be due to a general feeling that the controlled manual apparatus which is used on double-track lines is perfectly adapted to single-track work, and is superior to the staff in that trains need not be stopped or slackened for the purpose of delivering the staff.

The telegraph block system, the cheapest method in use, is found on four-track sections of the Pennsylvania Railroad (though according to the present policy of the road these signals will in the near future be supplanted by automatic signals); it is used on double-track lines by the Baltimore and Ohio, the Pennsylvania, the Chicago, Burlington and Quincy, the Chicago, Milwaukee and St. Paul, the Chicago and Northwestern, the Erie, the New York Central lines, the Philadelphia and Reading, and a number of roads of less importance than these. The telegraph block system is used extensively on single-track lines of the Atchison, Topeka and Santa Fe, the Bessemer and Lake Erie, the Chesapeake and Ohio, the Chicago and Alton, the Chicago Great Western, the Lehigh Valley, the Norfolk and Western, the Northern Pacific, the Southern, the St. Louis and San Francisco, and on the lines just mentioned as using it on double track.

The automatic block system is in use on the four-track lines of the Boston and Albany, the Boston and Maine, the Central of New Jersey, the Pennsylvania, the Philadelphia and Reading, and the Pittsburg and Lake Erie. It is in use on double-track lines of these roads and of the Baltimore and Ohio, the Chicago and Alton, the Chicago and Eastern Illinois, the Chicago and Northwestern, the Delaware, Lackawanna and Western, the Illinois Central, the Lehigh Valley, the New York Central lines, the New York, New Haven and Hartford, the New York, Ontario and Western, the Southern Pacific, the Union Pacific, and on short sections of fourteen other roads. It is used on single-track lines of the Chicago and Alton, the Cincinnati, New Orleans and Texas Pacific, the Delaware and Hudson, the Missouri Pacific, the Oregon Short Line, the Oregon Railroad and Navigation Company, the Southern Pacific and the Union Pacific, and on short sections of four other roads.

With regard to the telegraph block system, most of the roads using it show records of long continued immunity from collision, but the thirteen collisions which are referred to in this report, details concerning which are given in the appendix, with others occurring more recently and still fresh in the public mind, compel us to recognize that the system is not perfect.

The only reason specifically formulated by any railway manager for not intro-

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ducing the block system is financial inability, except in the case of lines on which the passenger business is extremely light. Looking at the policies of some roads as they are known, and at others in the only way in which they can be interpreted in the light of facts, it is quite clear that, generally speaking, the roads which have been dilatory in adopting the block system or in extending its use have simply pursued that temporizing policy which postpones appropriation of money until necessity will permit of no further postponement. An appropriation for the erection of block signals or for the expense of maintaining them is not viewed with favor, because railroads operating without such signals have, in many cases, made fair records for a long time. It is true that important railroads have carried thousands of passengers for many years, with no block system, without fatally injuring a single one of them in a collision. Such a record is justly regarded with pride, but a single collision ten years hence, which is an admitted possibility, would extinguish the pride and becloud the record of the past.

Many important roads have introduced the telegraph block system with the expenditure of very little money, simply by establishing a few new telegraph offices. There are also cases where a road, which has apparently held the view that the block system is impracticable by reason of its cost, has quickly changed its policy after the occurrence of a collision on its own line. It is true that roads which introduce the block system without increasing their telegraph facilities usually find themselves obliged, for a part of the time at least, to run freight trains under permissive blocking (which, strictly speaking, is not block signaling at all), but the action of such roads is significant because it marks decided progress. Their imperfect system protects passenger trains and it educates trainmen to the need of a space interval for all trains.

A number of prominent roads which have shown enterprise in safeguarding their more important lines by means of block signals are continuing the old methods on other lines. A disastrous collision in the State of Indiana in November affords a striking illustration of this fact. A few roads which enjoy ample prosperity have as yet done little or nothing in providing block signals.

The present investigation has been conducted for the purpose of setting forth the actual facts under present practices, affording the best guide as to what can or should be done to improve the safety of travel on the railroads of the United States. The conclusions reached confirm the views which have been heretofore expressed by the commission in its annual reports for the years 1903, 1904, and 1905. In its report for the year 1903 the commission presented the draft of a bill similar to the one introduced in the house by the Hon. John J. Esch, of Wisconsin, which provides for the introduction of the block-signal system and also for the exercise of supervisory power by the commission through the employment of suitable agents and inspectors.

Supervision is necessary, not only to insure that the specific requirements of the law are complied with, but also because of differences in methods of construction and operation and in the standards of perfection and safety on different roads where the block signal system is already in use. This point was not especially emphasized by the commission at the time the bill was laid before Congress, but the present investigation has more clearly emphasized the need of such supervision. The differences of practice, etc., are reflected in the results of operation. In reporting the faults of signals, the errors in operation, different companies make widely different showings. This is a vital matter, in which the function of the Government in securing publicity is a particularly useful one, and in which no authority other than the Government can act efficiently. To investigate accidents, as is done in England and to some extent by state commissions in this country, may be called an indirect method of securing information as to the efficiency with which safeguards to life and property are administered. To investigate signals and signal practice directly, without regard to accidents, would be a more direct method of promoting safety. Accidents should be investigated, for they increase so rapidly year after year that the record is looked upon as a reproach upon our American system of railroad management; but it is even more logical and reasonable to investigate signal practice, for, as regards the worst class of accidents, namely, collisions, investigation and regulation which look to prevention are chiefly of value. Investigation to this end is needed under four heads, namely:

(1) The telegraph block system on the larger roads (mainly double track)

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as regards the personnel and the routine, the use or nonuse of distant signals, and the practice of permissive block signaling.

(2) The telegraph block system on single track lines and minor roads as regards the personnel, the routine, distant signals and permissive signaling, and also as regards the use of time rules and dispatchers' orders to make up for incompleteness in the block signaling arrangements.

(3) The automatic block system should be investigated on all roads with respect to the efficiency of the apparatus and of the methods of inspection and care and the integrity of the records of signal operations in respect to their completeness.

(4) The automatic block system on single-track lines should be investigated with respect to the features named in the foregoing paragraph, and also as regards the use simultaneously with the block signals of dispatchers' orders and other measures designed to prevent collisions irrespective of the block-signal system.

If legislative enactment should not require the early introduction of the block system on all railroads, Government inquiry should be pursued with a view to determine the necessity for its installation on particular lines or parts of lines on which it is not now in use. The principal and, indeed, the only argument against the enactment of a compulsory block-signal law, is that a large number of railroads are now making fair progress in the extension of block signals without compulsion. Certainly the roads which come within this class can have no fault to find with such a mild measure of compulsion as that provided for in the bill proposed by the commission; while as to roads which have taken no action, some compulsion should be employed to require them to bring their service up to a proper standard within a reasonable time.

The question of the need of apparatus for automatic control of trains is a somewhat difficult one. Collisions occur occasionally under both the telegraph and automatic block systems, which an efficient automatic stopping apparatus might prevent. The locomotive engineman has most exacting duties. An individual runner may be far above the average in mental poise and moral character and yet may fail in vigilance or in judgment occasionally, and such failure may mean disaster. Again, the individual engineman may be efficient in a high degree, and yet the efficiency of a force of enginemen as a whole may be unsatisfactory. The engineer performs such an innumerable succession of important acts on every trip that, even with an infinitesimal percentage of failures, the forty or fifty thousand engineers of the United States may still be chargeable within the course of a year with a large aggregate of fatal and nonfatal injuries. Anything less than perfection is cause, at least, for investigation, if not for decided dissatisfaction.

Every great accident due to an engineman's fault is followed by a strong public demand for the introduction of automatic train-stopping devices. As previously shown in this report, such devices used to a limited extent, though not on interstate roads, seem to have given a fairly good account of themselves, but these records do not justify the commission in making any recommendations as to their use or nonuse without a more thorough and complete investigation.

The limited extent to which devices of this character have been used makes it practically impossible for the commission to obtain anything more than theoretical and technical knowledge concerning them. It is therefore apparent to the commission that Congress can not be furnished with much further information concerning these appliances, which would appear extremely valuable theoretically, without extensive tests conducted by officials of the Government and at Government expense. For this reason and because the resolution under which this inquiry has been made does not confer authority to make such tests, the commission, on January 3, 1907, addressed a communication to Congress recommending that supplemental legislation be enacted authorizing the commission or some other official body to supervise and conduct experimental tests of such safety devices as appear to be meritorious, and that an appropriation be made sufficient to secure the most competent experts and defray the other expenses incident to such a project. The commission can only repeat this recommendation, believing that such experimental tests would be of great value in determining the direction which legislation not now recommended should take in seeking to add to the safety of railway operations.

The recommendations of the commission for immediate or early legislation are summarized as follows:

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(1) That the use of the block system should be enforced on the passenger lines of the country in general, according to the provisions of a bill in substance like the one submitted to Congress by the commission in December, 1903, except that the time to be allowed for final compliance with its compulsory features should be made three or four years from the present.

(2) That with or without the passage of a law requiring the use of block signals there should be a law authorizing an official investigation of train accidents, and providing for the employment of competent men to perform the duties imposed by such an enactment.

(3) That investigation by official tests of automatic appliances for the control of railway trains should be authorized in accordance with the commission's recommendation of January 3, 1907, with an appropriation of sufficient amount to conduct such tests in a proper manner.

Recently a disastrous collision occurred in the District of Columbia (at Terra Cotta station on the Baltimore and Ohio Railroad, December 30, 1906) in which 43 passengers and other persons were killed. This collision occurred on a line equipped with block signals. It was the subject of much discussion in the press and elsewhere, and the circumstances attending it were such that the whole question of the management of railroad trains when running at high speed was brought prominently before the public, including the comparison of the block system with other methods. The commission therefore instituted an inquiry into the case, as well as into another collision which occurred in November on the Southern Railway, causing the death of Mr. Samuel Spencer, the president of that railway. These inquiries are not yet completed, but these accidents are referred to here simply for the purpose of observing that consideration of them has not been omitted. The investigations have proceeded far enough to show that the fault in these cases is not to be charged to the signal system in use, but to laxity in the methods of operating it. Collisions from the same or similar causes have occurred many times before, and these causes have had full consideration in the present report. As has been observed in the annual reports of the commission to Congress, the block-signal system remains superior to any other system, both theoretically and by the test of actual experience, after all due weight has been given to the records of failures in the running of trains under it. It is the intention of the commission to submit a further report covering these matters and other questions that have not been fully treated herein.

Answering specifically the questions (not hereinbefore answered) which are embodied in the senate resolution of January 29, 1907:

The length of time that would be required to put in operation the telegraph block system would depend on the facility with which telegraph operators could be trained to act as signalmen, and, in most cases, on the ability of manufacturers (railroad shops or independent concerns) to provide and erect the signals and apparatus. As these questions have to be decided in each case on the special conditions of that case, a general answer could not be made; but a period of from one to three years would undoubtedly be fair. For the installation of automatic signals a longer time should be allowed in the present state of manufacturing business with all shops overworked, a much longer time, because the apparatus is delicate and costly, requiring time and extensive facilities for manufacture. The commission has not recommended the specific requirement by law of any particular kind of signals, and it is not believed that the introduction of automatic signals should be made compulsory at the present time.

The record of the number of deaths by accident, which is called for by the last paragraph of the resolution, will be found in the appendix.

All experience has shown that, generally speaking, the number of deaths is reduced by the adoption of automatic block signals as compared with operation without block signals, but no ratio has been computed, for the reason that on nearly every railroad conditions are constantly changing, making comparisons uninstructive; and, obviously, it is impossible to estimate what would have been the number of fatal accidents on a block-signaled railroad if it had not been block signaled.

Employes in connection with the dispatching and moving of trains and the operation of block signals should also work under such conditions only as will promote in them the best mental, physical, and moral conditions attainable in the service. The rules of operation by

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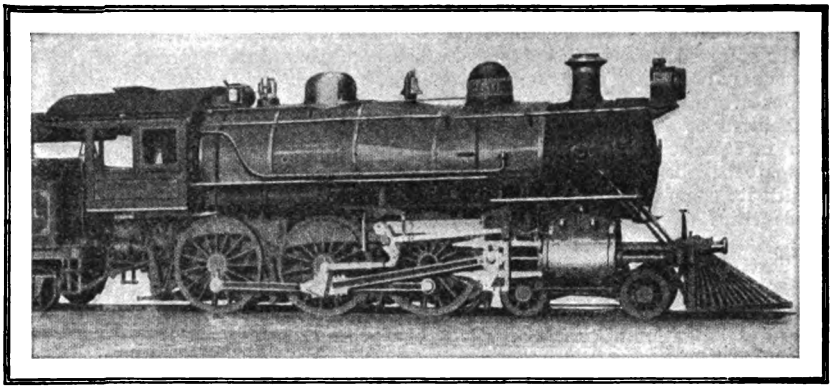
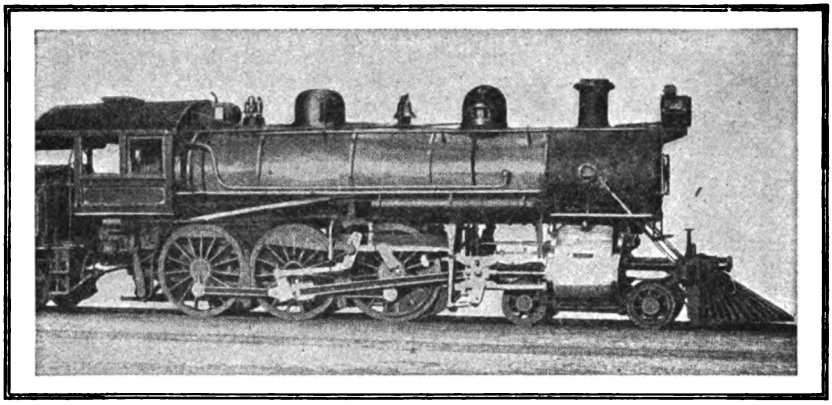
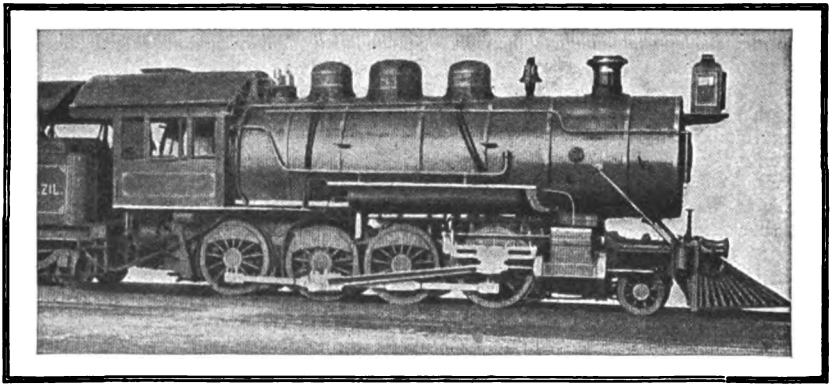


BALDWIN TEN-WHEEL LOCOMOTIVE FOR THE CENTRAL RAILROAD OF BRAZIL, EQUIPPED WITH VAUGHAN SUPERHEATERS



BALDWIN BALANCED COMPOUND TEN-WHEEL LOCOMOTIVE FOR THE CENTRAL RAILROAD OF BRAZIL



BALDWIN CONSOLIDATION TYPE LOCOMOTIVE FOR THE CENTRAL RAILROAD OF BRAZIL, EQUIPPED WITH BALDWIN SUPERHEATER

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which they are to be governed should be, as far as possible, uniform and absolutely explicit, and free from ambiguities and confusion. There can be no doubt that many of the recent great disasters are traceable to defective service due to non-observance of these essentials.

A comparison of the results (freedom from fatal accidents of automatic block signals with nonautomatic) can not be made with any degree of accuracy for the reasons just mentioned, and because the nonautomatic system is worked under varying conditions. In certain imperfect comparisons which have been made, the automatic system has appeared to be superior, but the nonautomatic was at a disadvantage, because it was worked without certain safeguards.

All of which is respectfully submitted.

MARTIN A. KNAPP,
JUDSON C. CLEMENTS,
CHARLES A. PROUTY,
F. M. COCKRELL,
FRANKLIN K. LANE,
JAMES S. HARLAN,

Washington, D. C., February 23, 1907.

♦ ♦ ♦

Locomotives for the Central Railroad of Brazil.

The Baldwin Locomotive Works has recently completed an order for ten locomotives for the Central Railroad of Brazil, which includes six locomotives of the consolidation type equipped with Baldwin superheaters, two ten-wheel balanced compound and two ten-wheel single expansion locomotives equipped with Vaughan superheaters. Illustrations of these locomotives are shown herewith. The opportunity for testing the merits of the different types of locomotives is afforded by the various modifications in design and equipment. The Vaughan superheater, with which the simple ten-wheel locomotives are equipped, is of a design which the Canadian Pacific Railway has used largely with satisfactory results. Both the simple and balanced compound ten-wheel locomotives are provided with the Walschaert valve gear, that on the simple locomotives being somewhat modified on account of the unusual location of the piston valves, they being 18 inches inside the cylinder center lines, which necessitated the employment of rock shafts, the same being bolted to the guide yoke. The gauge of the road being 5 feet 3 inches, it was possible to use a firebox 48¼ inches in width and set over the frames and between the wheels.

♦ ♦ ♦

The Mallet Compound as a Helper Engine.

About eight months ago the Great Northern Railway purchased five Mallet compound locomotives for helper service on the mountain divisions. While little was known at that time regarding this type of engine in this country, it was believed that it was particularly adapted to helper service. The results of the performance of the locomotives purchased by the Great Northern during the time they have been in service would indicate that they have fully justified expectations and made a record which would seem to warrant a more general adoption of the Mallet type to helper service.

The tests of engine 1800 on the Cascade division of the Great Northern, published on another page of this issue, clearly show the economy of the Mallet engines in comparison with those of the simple consolidation type formerly used in helper service. The average saving of over twelve tons of coal on one trip of thirty-two miles of heavy grade, represents the approximate economy of the Mallet engines and the increase in tonnage from 500 to 1,350 tons gives an idea of their performance as compared with that of the consolidation engines.

The enormous boiler capacity of the Mallet engines in addition to their great starting power and economy in the use of steam render them especially fit for helper service where they must be worked to the maximum for long continuous periods.—Railway Master Mechanic.

♦ ♦ ♦

Ventilation of Gallitzin Tunnel.

After the completion of the Gallitzin tunnel on the Pennsylvania Railroad it was found that great difficulty was experienced on account of the smoke and gases discharged by locomotives. These caused the atmosphere to become so bad that the trainmen sometimes became unconscious and it was necessary to provide relief. This was done by constructing at the east end a ventilating apparatus, consisting of a sheet-iron hood about 50 feet long, inclosing one track and having an inner surface coincident with the soffit of the tunnel arch and

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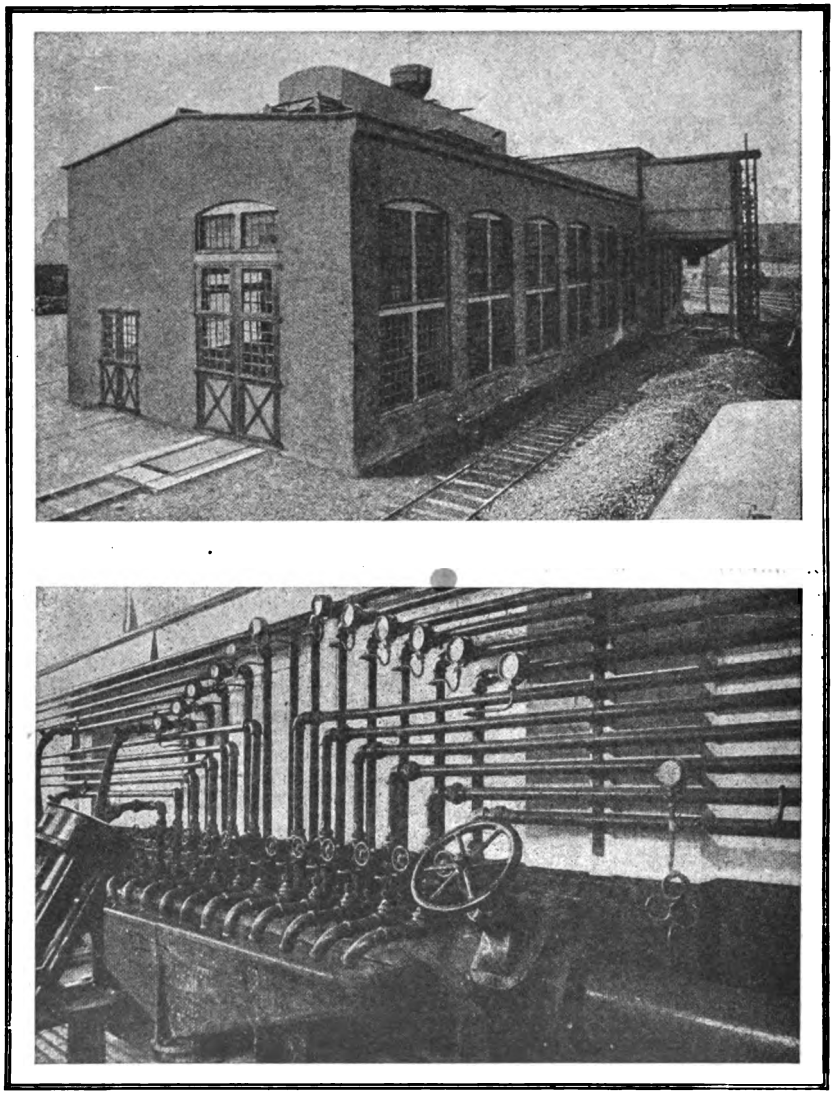
walls. The outer surface converged from the outer end of the hood to the portal of the tunnel so as to give it a wedge-shaped cross-section. A Sturtevant blower was installed at the end of the hood on each side and delivered air through it to tunnel portal, where a narrow opening in the inner surface of the hood permitted the blast to be forced into the tunnel nearly parallel with its axis.

Trains pass through this tunnel in one direction only, and as the grade is up from this end they are usually drawn by two locomotives in front and one pusher behind. As soon as the forward locomotive enters the tunnel the fan is started. The large volume of air which is forced into the narrow space between the train and the tunnel lining drives the smoke and gas in advance of the locomotive, so



PENNSYLVANIA RAILROAD TESTING PLANT, ALTOONA, PA.

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that its driver can keep the cab windows open and is supplied with an abundance of fresh, pure air. The second locomotive does not work in the tunnel, and the smoke from the pusher never reaches the front of the train. This arrangement is considered efficient and satisfactory.

The tunnel was designed and constructed under the direction of the engineering department of the Pennsylvania Railroad. C. S. Churchill was the patentee of the ventilating apparatus.—The Railway Age.

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Testing Plant of the Pennsylvania Railroad.

We show herewith illustrations of the locomotive testing plant of the Pennsylvania Railroad at Altoona, Pa., which is now in operation. The building, which is of brick and steel construction, was specially built for the purpose. In the installation of the plant at Altoona, the experience gained at the St. Louis Exposition is responsible for a few minor changes and improvements. Ample provision has been made for light and ventilation and the instruments have been conveniently located, while special facilities have been provided for handling and weighing the coal and ashes, and for the protection of the recording mechanism from disturbing conditions, etc. The American Engineer and Railroad Journal, from which the illustrations are reproduced, among other things, says:

"It will be remembered that one of the most troublesome features of the operation at St. Louis was the difficulty in obtaining a supply of water for the friction brakes at a constant pressure. In the present installation this difficulty has been entirely removed by the use of a two-stage centrifugal pump driven by a 75-horse-power electric motor, which is fitted with an automatic control and delivers water at a constant pressure of 75 pounds to the main header, from which the branch pipes for the individual brakes are led. The pump draws its supply from one of the large water tanks nearby, the temperature of which is sufficiently low for this purpose. The discharge from the brakes empties into an iron trough, which is shown in one of the illustrations. From this it runs by gravity into a tank located beneath the floor of the building, from which it is again forced back into the outside tank by another centrifugal pump driven by a 20-horse-power electric motor. This apparatus is capable of delivering a large volume of water at low pressure, which is needed for high speed tests, and it has a capacity of 900 gallons per minute. The automatic features for maintaining a constant pressure have proved to be a success and there has been no difficulty with sudden fluctuations of water pressure.

"The dynamometer has been placed somewhat farther away from the locomotive than was the case at St. Louis, thus allowing more room for the firing platform. It has also been enclosed in a small steel and concrete housing, which protects it from the dust and dirt occasioned by the handling of coal and ashes in the immediate vicinity.

"For handling the coal for the locomotive a very complete plant has been installed. The loaded coal cars are run in on the track alongside the building and dumped into a hopper below the track level. From this hopper the coal is carried by a bucket conveyor to two elevated reinforced concrete pockets, each of which has a capacity of fifty tons. These pockets are located over the larger of the two rooms directly back of the testing laboratory and each is provided with a bottom cut-off gate, of a type shown in one of the illustrations. The coal is discharged from the bins into wagons holding 1,000 pounds each, which are run over the weighing scales and then pushed along a passageway beneath the laboratory floor to a hydraulic elevator, which raises them to the firing platform, where the cars are dumped. The ashes are discharged from the locomotive into the bottom of the pit, from which they are shoveled into a wagon and after being weighed are raised in the hydraulic elevator to the level of the main floor and emptied into a chute leading to a conveyor, which delivers them to an ash bin on the outside track. From this they can be discharged into cars and hauled away.

"The water for boiler use is taken from a supply tank in the corner of the laboratory, which is filled from one of the large outside tanks, the water being passed through the weighing tanks, from which it is discharged into the supply tank. It also passes through a meter on its way to the injector, the reading of which is used as a check upon the weighing tanks. The overflow from the injectors is collected and returned to the supply tanks by a small motor driven centrifugal pump.

"The spark collecting apparatus has

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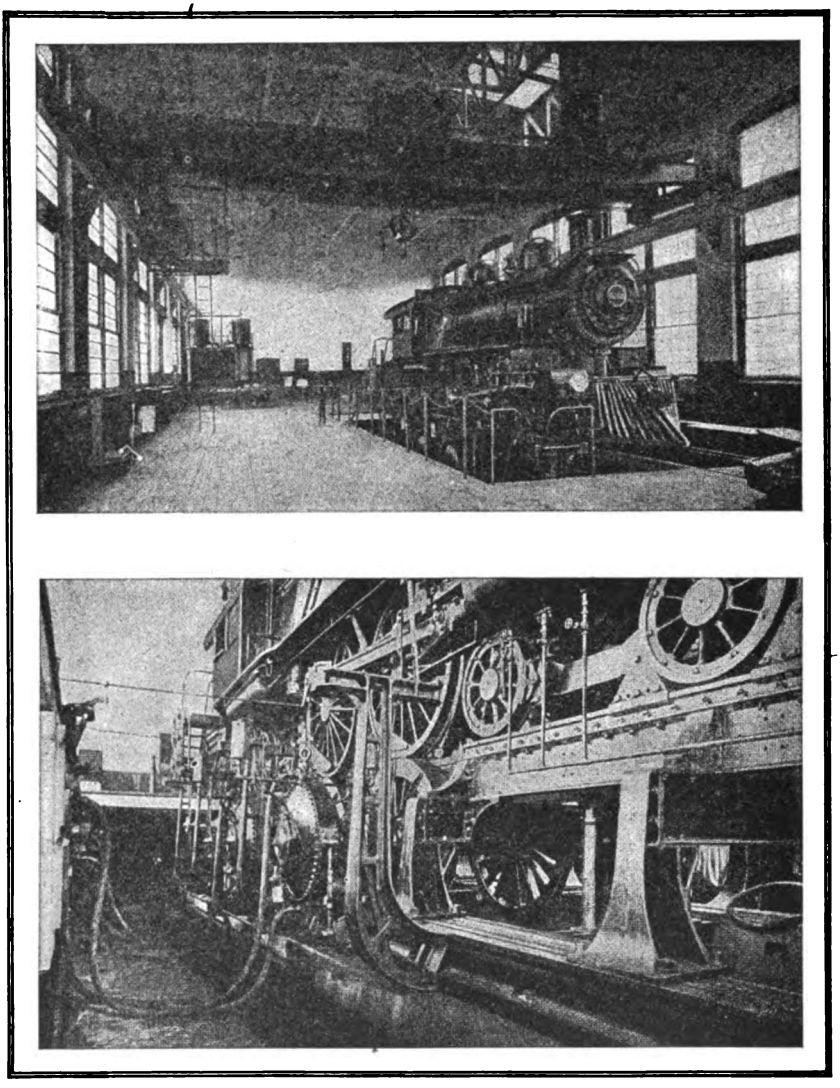
been greatly improved over the one originally used in St. Louis, and after much experimenting an arrangement has been devised which collects as large a proportion of the sparks as it is possible to get without seriously obstructing the draft. This entire apparatus is carried from a truck supported on run-ways above the roof of the building and is adjustable over a distance of 16 feet 6 inches. The opening in the roof is protected by a hood, which keeps it closed to the weather at all times.

"The smaller of the two rooms located back of the laboratory proper is arranged for the computers and here the tests are worked up as soon as completed.

"Some changes have been made in the foundations of the plant, which provides better drainage than it was possible to obtain at St. Louis. The system of piping has also been more carefully worked



PENNSYLVANIA RAILROAD TESTING PLANT, ALTOONA, PA.

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out and arranged, but in other respects the plant remains practically as originally built.

"Tests have been completed on a Pennsylvania simple Atlantic type locomotive, and it is stated that the plant is at present turned over to the United States government for use in connection with the testing of briquettes as locomotive fuel."

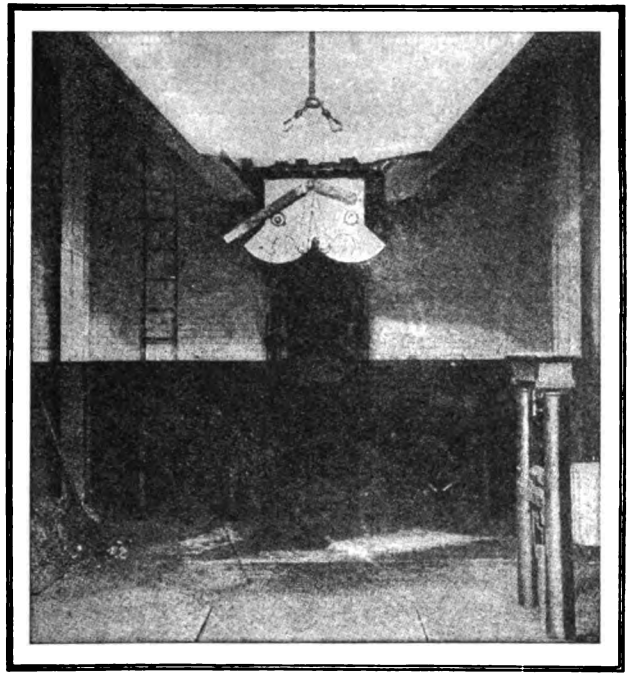
A.—It is essential that a man keep posted on the signals of his road so that this question can be properly answered.

Q. 3.—Have you made any improvement in the way you fire your engine, and are you obtaining better results in making steam economically and in firing with less black smoke than a year ago?

A.—The experience of last year should have been such that a man should be able to fire intelligently, thus getting all possible benefit from the burning of his fuel. He should be doing his work easier, burning less coal and making less black smoke than a year ago. A man does not stand still. He either progresses or goes backward, and in a year considerable progress should have been made.

Q. 4.—Give a general description of a locomotive boiler.

A.—A locomotive boiler consists of five principal parts: First, the firebox; second, the shell; third, the flue sheets and flues; fourth, the front end; and, fifth, the grates and shaking apparatus, and as an auxiliary to this, the ashpan.



PENNSYLVANIA RAILROAD TESTING PLANT, ALTOONA, PA.
COAL SUPPLY BIN

*Questions Likely to Be Asked in Examinations for Promotion, Together with Their Answers.**

SECOND YEAR.

Question 1.—Has anything interfered with your preparation for this examination during the time since the first series of questions were asked?

Answer.—There is no reason why sufficient knowledge to answer this second set of questions should not have been gotten during the year.

Q. 2.—Have any new signals or any changes in the old ones been introduced during the year?

*By a member.

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The firebox sheets are surrounded by water legs, through which the water circulates to keep the firebox sheets from burning out. At the front end of the firebox is the flue sheet; at the back of the firebox, the back sheet, which contains the firedoor opening; at the bottom the grates, and at the top the crown sheet. The shell of the boiler, of which the legs are a part, surrounds the firebox everywhere, except at the bottom, and this outer shell at the front of the firebox extends to the front end in the form of a barrel or a tube, in which are contained the flues. At the end of this barrel of the boiler is the front flue sheet, which also forms the front end of the flues. The smokebox connects with the boiler shell at this point and extends sufficiently beyond the front flue sheet to contain the steam pipes and draft appliances.

Q. 5.—What difference is there between the wide firebox and the narrow firebox, and what are the advantages of the wide firebox type of boiler?

A.—With the narrow firebox boiler the total width is such that the boiler can be set between the frames of the engine, whereas with the wide firebox the boiler is set not only over the frames, but in many cases projects over the wheels as well. The difference in the two types is that the size of the firebox is increased very greatly in the wide firebox boiler, the flues and barrel of the boiler being practically the same in both cases. The advantages claimed for the wide firebox are increased grate area and increased direct heating surface, the increased heating surface allowing the heat of the fire to be better utilized, the increased grate area allowing a large nozzle to be used, reducing the amount of back pressure in the cylinders, making a lighter draft on the fire and allowing a slower rate of combustion of the coal in the firebox, all three of which should produce considerable economy in the use of the fuel.

Q. 6.—What is a wagon-top boiler?

A.—A wagon-top boiler is a boiler which has an outer shell above the firebox of larger diameter than the barrel of the boiler. Sometimes this enlarged section is extended beyond the firebox and the dome placed on the enlarged section, in which case the boiler is known as an extended wagon-top boiler.

Q. 7.—Describe the different parts of a locomotive firebox.

A.—The locomotive firebox consists of a crown sheet, a flue sheet and a back sheet, in which is contained the firedoor and side sheets, which end at the bottom in the mudring. The side sheets are supported by staybolts, which extend through to the outer shell, and the space between the inner and outer shell is known as the water leg of the boiler. The crown sheet is supported by crown bars or radial stays, which are fastened to the outer shell of the boiler, and the crown sheet is further braced by stayrods, which are fastened to the shell of the boiler and also to the back boiler head. The back sheet and the front sheet below the flues, known as the throat sheet, are also supported by staybolts to the outer shell. The bottom of the firebox is open, and in it are fitted the grates on which the fire is carried.

Q. 8.—Why is it necessary to place two firedoors in some of the wide fireboxes?

A.—It has been found necessary to place two doors in some of the wide fireboxes in order to allow the fireman to place the coal in the back corners of these wide fireboxes. It also allows him to fire the engine with less exertion by doing away with the necessity of throwing the coal at such a great angle as would be required with only one firedoor.

Q. 9.—What strains is the firebox of a locomotive subjected to?

A.—A locomotive firebox is subjected to the strain of the steam pressure, the strain of the weight of the water in the boiler, and to the strains caused by unequal expansion and contraction of the metals of which it is composed.

Q. 10.—How are the side and end sheets of a firebox supported?

A.—By staybolts, which extend from the firebox sheets to the outer shell of the boiler.

Q. 11.—Why is a small hole drilled in the outer end of some of the staybolts?

A.—A staybolt which has a hole drilled in its outer end is known as a hollow staybolt, the object of the hole being to provide a means of determining when the staybolt becomes broken. As these bolts usually break near the outer shell, the steam escaping through this small hole indicates when these bolts become broken.

Q. 12.—How are the crown sheets of a firebox supported?

A.—There are two methods of supporting the crown sheets in general use. One is known as the crown bar method and the other the radial stay method. In the crown bar method, heavy iron bars are

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riveted together with sufficient space between for the crown bolts to pass through them. They are placed so that the curved ends of these bars rest on each side of the crown sheet, near its edge. The crown bolts passing between these bars extend through the crown sheet and are bolted tight, and the sets of the crown bars are placed close enough to form a solid brace for the crown sheet. The crown bars, in turn, are supported by sling stays, which extend from the crown bars to the outer shell of the boiler, and are there fastened securely. In the radial stay method, stay-bolts are passed through the outer shell on through the crown sheet itself so as to be as near radial to the curves of the two sheets as possible. These radial stays are placed close enough to provide sufficient strength to withstand the pressure the boiler is expected to carry.

Q. 13.—What disadvantages has the crown bar method?

A.—The crown bar method has the disadvantage of excessive weight and cost. It also prevents to a certain extent the free circulation of the water across the top of the crown sheet, and allows large quantities of scale to accumulate around the crown bolts and the ends of the bars.

Q. 14.—What advantages has the radial stay method?

A.—The radial stay method is cheaper and reduces to a considerable extent the dead weight of the boiler. Radial stays are easier to keep in repair and allow a better circulation of the water, and the crown sheet can be kept cleaner with this method of staying than with the crown bar method.

Q. 15.—How is the firebox secured to the outer shell at the bottom?

A.—By a mudring, which is a heavy piece of iron occupying the full width between the inner and outer plates. The bottom of the firebox and the bottom of the outer shell are securely riveted to this mudring, which really forms the bottom of the water space of the boiler.

Q. 16.—What is the ashpan and what is it used for?

A.—The ashpan is a receptacle placed below the bottom of the firebox, and usually fastened to the mudring, that provides a means of catching the ashes and live coals that drop through the grates and of protecting the grates from snow in the winter time. It is provided with a movable door at each end, which can be regulated to allow the proper admission of air to the fire, and also to provide for the removal of the ashes, etc., which accumulate in the pan. In some cases there is an opening between the mudring and the ashpan. This opening is covered by a netting, which allows an additional air supply to come directly to the grates.

Q. 17.—What would be the effect on the fire if the ashpan should become full of ashes and fire?

A.—If the ashpan is allowed to fill up with ashes and fire it first of all prevents the necessary supply of air from being furnished to the fire, and the fire will not burn properly; second, the fire accumulating in the ashpan will warp and burn out the ashpan sheets; and third, if the ashes and fire fill up to the grates, the grates will burn out. It is plain that the only thing that keeps the fire that is on the grates from burning them, is the large volume of cold air which is constantly passing through them. If this volume of cold air be stopped off by ashes and fire filling up the pan to the grates, the grates will, of course, be burnt out very quickly.

Q. 18.—What is the object of the steam dome with which boilers are usually provided?

A.—The steam usually contains a certain amount of moisture as it rises from the water, and consequently a steam dome is provided, which forms a small storage place for the steam to accumulate in before being used, allowing sufficient time in many instances for a large part of the water to become separated from the steam, thus providing drier steam for use in the cylinders. The throttle valve is always placed in the dome, when there is a dome provided on the boiler.

Q. 19.—In what condition should the boiler be to produce good results?

A.—The boiler should be clean and free from leakage, and must not contain any oil or vegetable matter which would be liable to cause foaming.

Q. 20.—What is meant by circulation in the boiler?

A.—The water in the boiler is always in motion, or, in other words, is always circulating, the explanation being that the hotter the water becomes the less it weighs. Cold water when entering a boiler goes direct to the bottom. As its temperature increases it rises until at its highest temperature it will be at the top of the boiler. The admission of cold water to a boiler and its rise in temperature, as it is being turned into steam, therefore accounts for and explains the

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circulation of the water which always takes place.

Q. 21.—What would be the effect if one of the legs of the boiler should become filled up with mud?

A.—Should one of the legs of the boiler become filled up with mud the water could not circulate through it. As long as there is water on one side of any of the firebox sheets this water will absorb the heat of the fire so rapidly that there will be no danger of burning the firebox sheets, but in case the water could not get to the firebox sheets on account of the mud in the boiler at that point, there is great danger of the sheet becoming very hot and consequently mud burned.

Q. 22.—What damage would be caused if sufficient water were not kept on the crown sheet?

A.—If there is not sufficient water on a crown sheet the intensely hot fire in the firebox will heat this sheet red hot and probably burn it badly, permanently injuring the sheet. If water is put into a boiler with the sheet in this condition there is danger of the sheet cracking and of the boiler being ruined, and possibly exploded.

Q. 23.—How can the amount of water on the crown sheet be ascertained?

A.—Gauge cocks are provided on all engines, and water glasses also on many of them. The bottom gauge cock is usually from 2½ to 5 inches above the highest point of the crown sheet, and the bottom of the water glass is usually an inch or so higher than the bottom cock. The top gauge cock is usually 10 or 12 inches above the bottom one and the top of the water glass an inch, or so, below the top gauge cock. The height of water in the glass indicates the water level of the boiler, and by opening the gauge cocks and noting if steam or water issues from them the water level can be approximately determined also.

Q. 24.—What would be the effect if a firebox sheet were overheated?

A.—If a firebox sheet becomes overheated there is great danger of its becoming cracked during the time it is cooling off, and even if it does not become cracked the strength of the sheet is materially reduced, due to the metal having been heated and possibly burned, and there is grave danger of the sheet being weakened to such an extent that it will give away under pressure.

Q. 25.—Why is the check on the boiler usually placed near the front end?

A.—The reason why the boiler check is usually placed as near the front end as possible is on account of the fact that it is desirable to have the cold feed water enter the boiler at the point where the temperature of the boiler is lowest, rather than close to the firebox sheets, where the temperature of the boiler is highest. For this reason the boiler checks are usually placed well ahead, thus doing away with the danger of unequal strains on the boiler, due to the cold water entering close to the hot sheets, as well as promoting good circulation in the boiler by not disturbing the natural circulating current that is formed by the heat.

Q. 26.—On what part of the locomotive boiler is the greatest pressure exerted?

A.—The actual pressure of steam and water is the same in every direction, so that, as far as pressure is concerned, it is the same at all points. However, the weight of the water in addition to the pressure causes the greatest force to be exerted near the mudring.

Q. 27.—How can the steam pressure in a boiler be ascertained?

A.—By reference to the gauge, which is placed on all boilers, and which is provided with a hand to indicate the pressure in the boiler in pounds per square inch.

Q. 28.—What means are taken to prevent excessive steam pressure from forming in the boilers?

A.—Excessive steam pressure is prevented by providing safety valves, which are set to lift at a designated pressure, and which are large enough when lifted to relieve the boiler of any excess of pressure above that which it is safe to carry.

Q. 29.—Do you consider it a waste of fuel when an engine is about to pop off if you open the firebox door to prevent it?

A.—Yes. All heat wasted through the pops or by opening the firebox door to keep an engine from popping is a loss of fuel. This can be prevented more economically by careful firing and boiler feeding, so as to avoid sudden rises of pressure, which will cause the engine to pop.

Q. 30.—How long should the smokebox of a locomotive be?

A.—Long enough to provide sufficient room for the steam pipes, the exhaust pipes and the different draft appliances.

Q. 31.—Why is steam exhausted through the front end and out the stack?

A.—The exhaust steam is carried

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through the nozzle in the front end and out the stack in order to produce a vacuum in the front end, which in turn will allow the atmospheric pressure to force its way through the ashpan and grates and through the fire and the flues to supply this vacuum, promoting the combustion of the fire and providing a means of carrying the gases and products of combustion from the firebox through the flues into the front end and out the stack.

Q. 32.—What effect has this action on the fire?

A.—The atmospheric pressure forces itself up through the ashpan, grates and fire, in order to supply this vacuum in the front end, thus producing an artificial draft on the fire and providing the oxygen necessary for the proper combustion of the fuel.

Q. 33.—What adjustable parts are contained in the front end by which the draft on the fire is regulated?

A.—The parts in the front end which can be changed to regulate the draft on the fire are the exhaust nozzle tip, the petticoat pipe and sleeve and the deflector plate, with its adjustable extension.

Q. 34.—What adjustment can be made with these three appliances and what is the effect of such an adjustment on the fire?

A.—The size of the exhaust nozzle tip can be increased or reduced. Speaking generally, the larger the nozzle the less the amount of vacuum produced in the smokebox, and, consequently, less draft is produced on the fire. If the size of the nozzle is reduced, it increases the vacuum in the front end and increases the draft on the fire. Any change in the size of the nozzle, however, causes a corresponding change in the back pressure of the cylinder, which is an important point to be considered in regulating the size of the nozzle. Sometimes bridges are placed across the nozzle tip to spread the exhaust and make it fill the stack nearer the base. There are many arguments for and against the use of a bridge, but in general, if the engine is properly designed, it should have plenty of draft with an open nozzle of reasonable size. The use of a bridge usually overcomes some defect in the front end arrangement. The petticoat pipe and sleeve is simply an uptake pipe, standing between the top of the nozzle and the base of the stack. By raising or lowering this petticoat pipe or the sleeve, a change can be produced in the amount of the draft, and to a certain extent on the even burning of the fire, where the deflector plate is high. If the distance between the tip of the nozzle and the bottom of the petticoat pipe is large compared to the opening between the top of the petticoat pipe and the bottom of the stack, the draft will be greater through the bottom flues and the fire will burn out faster at the front end of the firebox. If the reverse is the case, the fire will burn faster at the back end of the firebox, near the door. The adjustment of the deflector plate is the usual means of drafting the engine so that the fire will burn evenly all over the grates. If the deflector is low, it will cause a stronger draft through the lower flues than through the upper flues, and the fire will burn faster at the flue sheet than at the door, whereas if the deflector is high the reverse is the case. It should be the object in adjusting the draft appliances to produce a sufficient draft for the proper burning of the fire by the aid of the exhaust nozzle and the petticoat pipe. This should be done without creating unnecessary back pressure in the cylinder, and then the even burning of the fire should be regulated by the adjustment of the deflector plate.

Q. 35.—What should you judge to be the trouble if the exhaust steam and smoke issued from one side of the stack?

A.—The exhaust steam and smoke issuing from one side of the stack indicates that the exhaust stand is out of line with the stack, or the stack is out of line with the exhaust stand, or the petticoat pipe is out of line with the exhaust stand and stack. This should be remedied immediately, as it seriously interferes with the proper action of the exhaust.

Q. 36.—What would be the effect of having a large number of the flues stopped up?

A.—The effect of stopped up flues is to interfere with the even burning of the fire. It also increases the speed of the gases through the flues, which, of course, does not allow the heat to be given up properly to the water for making steam, and it also reduces the heating surface of the boiler materially, as a large proportion of the heating surface is in the flues.

Q. 37.—What would be the effect of having the front end stopped up with cinders?

A.—It would destroy the draft on the

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fire and prevent the engine from steaming properly.

Q. 38.—Is there danger of the sparks in the front end accumulating and damaging the smokebox sheets, and how can this be prevented?

A.—There is great danger of the sparks in the front end accumulating and burning the smokebox sheets if any air at all leaks into the front end. This can be prevented by having the joint of the smokebox door tight, and by making sure that the cinder hopper slide and the cinder doors on the side of the smokebox are tightly closed; also, to prevent any air leaking into the front end.

Q. 39.—What trouble will be caused if the steam-pipe joints are leaking in the smokebox?

A.—Leaky steam-pipe joints in the smokebox allow the steam which leaks by them to expand into the smokebox and to destroy a large proportion of the vacuum produced therein by the draft. To understand this it must be remembered that steam is an elastic body, and if allowed to escape from a high pressure to a low pressure it expands and occupies many times the space it was previously contained in. This steam expanding will supply the vacuum formed in the front end just the same as the atmospheric pressure would, the result being that every bit of steam expanding into the firebox from these leaks means just so much less draft on the fire, with the result that the engine will not steam.

Q. 40.—Explain what causes the pull on the firedoor?

A.—The vacuum produced in the front end will always be supplied as easily as possible, the usual means being by atmospheric pressure coming through the ashpan, grates, fire and flues, as already explained. There will always be a pull on the firedoor, however, because the vacuum exists in the firebox, as well as in the flues and the front end, and, as the vacuum represents a pressure less in amount than the atmospheric pressure, there will be a difference of pressure holding the firedoor shut, just the same as there is a difference of pressure which causes the movement of the triple piston of the airbrake when a reduction of trainpipe pressure is made.

Q. 41.—In your opinion, what is the best method of firing a locomotive?

A.—The problem of firing a locomotive is different for every engine, and a man must rely on his practical experience entirely in judging as to the thickness of the fire to be carried, the method of firing, etc. Speaking generally, however, the best rule is to carry a light fire, a level fire, and a bright fire; to fire light and often, having all the coal broken up in small pieces, spreading it well, covering the bright spots, and closing the door between each scoopful fired. The fuel should only be supplied as is necessary to produce sufficient steam for the way the engine is being worked. Care should be taken to burn down the fire in approaching stations and other points where necessary to shut off, and to open the blower a little if necessary when shut off, to avoid making black smoke, bearing in mind constantly that careful attention to the work in hand will produce economical results, with less labor on the fireman's part and with a reduction in the amount of black smoke made.

Q. 42.—What conditions will allow of holes being torn in the fire?

A.—If holes are torn in the fire, it indicates either that the engine is improperly drafted so that there is not an even pull on the fire, or else the firing has been done carelessly, so that banks have been formed in some places and light spots left in others, or else the fire is dirty in places where banks have formed, increasing the draft to such an extent where the fire is clean that holes are torn in it.

Q. 43.—What is an injector?

A.—An injector is a mechanical device for forcing water into a boiler against pressure. It is made up of a series of tubes and nozzles through which the steam passes, the action of the steam raising the water from the supply tank through a height as great as ten or twelve feet and forcing this water into a boiler against pressure. The pressure the injector will work against depends altogether on the size and construction of the tubes and on the initial steam pressure used, it being possible to force against a pressure of 200 or 300 pounds with an initial pressure of only 50 or 60 pounds.

Q. 44.—Is there more than one kind of injector in use?

A.—Yes; there are two general types of injectors; the lifting injector and the non-lifting injector.

Q. 45.—What is the difference between these two?

A.—A non-lifting injector must be placed below the lowest water level in the tank. A lifting injector may be

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placed a few feet above the water level and is so constructed that it will lift the water from the tank, as well as force it into the boiler.

Q. 46.—What are the principal parts of an injector?

A.—An injector has four outside connections, namely, the steam supply pipe, the water supply pipe, the delivery pipe to the boiler, and the overflow pipe. The principal parts inside the injector are the lifting steam nozzle and the lifting tube. forcing steam nozzle, the combining and condensing tube and the delivery tube; there are also the steam valve, the overflow valve, the water valve and the line check valve.

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Speed Indicators on Locomotives.

Certain recent accidents in this country and abroad point clearly to the necessity for the use of speed indicators on locomotives. Two fatal derailments which have occurred in England were due to the engineers running their trains around curves at speeds greatly in excess of the schedule; and the two most notable derailments of the past few months in this country also occurred on curves, and probably in each case they were due to the same cause. The use of speed recorders is quite general on European railroads, and we believe that on some systems they are in universal use, being considered as indispensable to the safe operation of the trains. Though occasional experiments have been made looking to the adoption of this device in the United States, we believe it is a fact that there is not a railroad on which it has been officially adopted. The present practice is to depend upon the judgment of the engineer, who is supposed, by virtue of his long experience, to be able to tell very closely at what rate of speed his engine is running at any particular time. No doubt, the more intelligent and observing of the engineers do acquire a sense of speed which is remarkably accurate; but it is evident that this will vary greatly with the temperament and intelligence, and that there must be some, and possibly not a few, engineers, who are incapable of making any accurate estimate of speed.

We are largely the creatures of custom and habit. Because we have so long done without speed indicators, we have settled down to the belief that they are unnecessary. And yet, a little sober thought should convince us that this device is, in its way, just as useful and almost as necessary as the steam pressure gage or the vacuum gage. Particularly is it needed on a road which is full of sharp curvature and crowded with crossings, turnouts, and sidings, at many of which a reduction of speed is called for. Even in the case of a train like the Empire State Express, there will probably be not less than half a dozen points on the 140-mile run to Albany, at which the engineer is called upon to slow down from the average running speed of, say, 65 miles an hour to speeds of from 40 miles down to as low as 15 or 20 miles an hour. With an accurate speed register before him the engineer could reduce to the exact speed called for on any particular stretch. The device would be specially useful in cases where the engineer was new to the division, and, therefore, more or less unfamiliar with the run.

Unquestionably, the introduction of speed indicators would be greatly facilitated if there were more of these devices on the market that were absolutely reliable. Too many of the present types are either uncertain in their action, or are so sensitive (that is to say, are subject to such violent oscillations above and below the true reading) that a prejudice has been raised against their use which may require some little time to overcome. Without disparaging the work that has been done already in this direction, it may be affirmed that this is one of the most promising fields to which inventors can direct their attention. The ideal indicator would be one which combined quick response to changes of speed and steadiness of pointer on the index with simplicity and durability of mechanism.—Scientific American.

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Pullman All-Steel Sleeping Car.

In past issues of the Magazine have been shown examples of steel construction in passenger cars for various railroad systems. The illustrations herewith show a new all-steel sleeping car, the "Jamestown," recently built by the Pullman Company, and which has been on exhibition at several points and will be exhibited at the Jamestown Exposition. The outside appearance of the car, except for the smooth finish and rectangular windows, is little different from the present standard sleeping car. Paneled steel and aluminum, brass and composite

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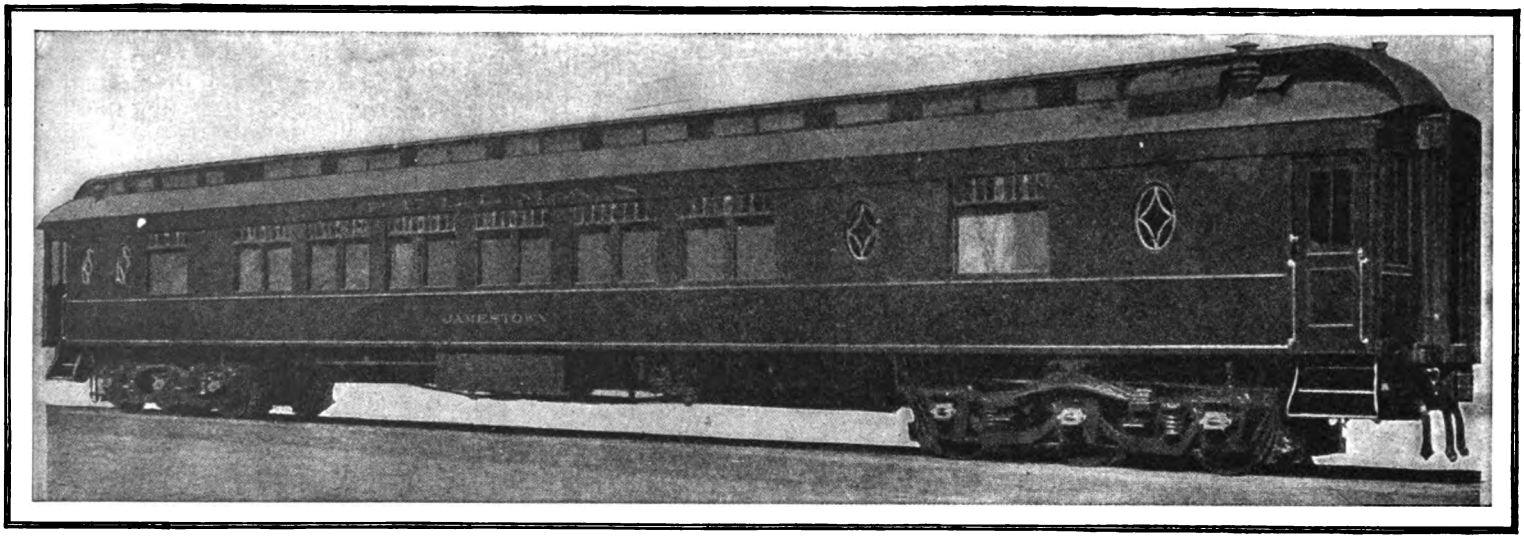

PULLMAN ALL-STEEL SLEEPING CAR "JAMESTOWN"

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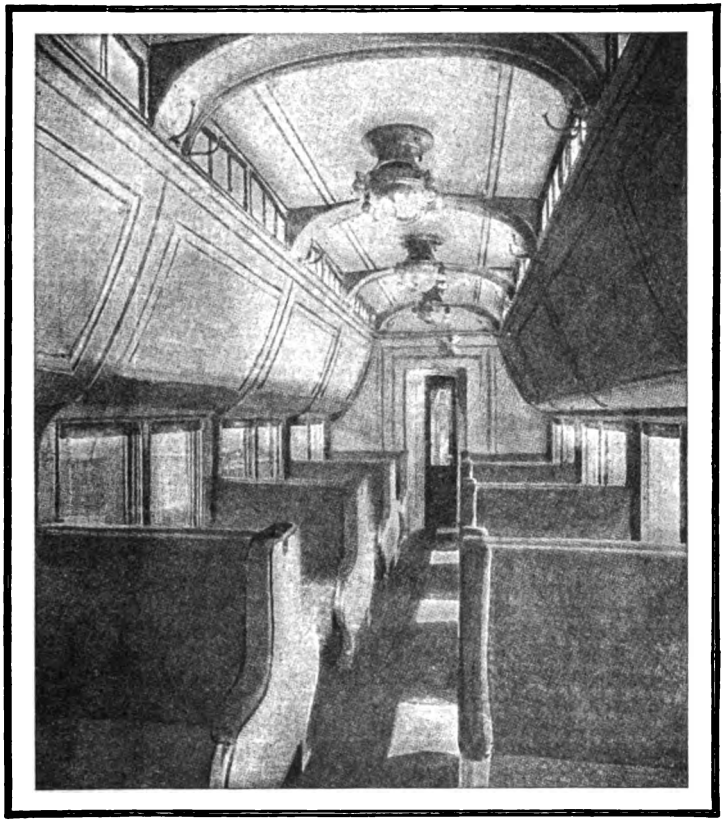
board are used in the inside finish. The framing is composite structural steel. The flooring is composed of steel plates ¼-inch thick, with corrugated galvanized iron above and 1 inch of hair felt between. On the galvanized iron is laid Monolith floor covering, and in the passageways, men's saloon and smoking room, in addition to the Monolith floor covering, is laid rubber tiling. For the purpose of deadening the noise, and to provide insulation, two thicknesses of asbestos board is placed between the sheathings in the sides and ends of the car.

The ceiling of the upper deck is finished with aluminum and that of the lower deck with composite board, while steel is used in the hallways, saloons and annex and ladies' toilet room. The seats and backs have steel frames, and the ends are of steel and brass; pressed steel is used for the upper berths and brass for the window frames. The interior of the car is nicely decorated. Combination electric and Pintsch gas mantle lamps are used for the ceiling lights and electric bracket lamps for the berths, the car being wired for the axle-light system. The car is said to be of as near all metal construction as it is now practicable to make it.



PULLMAN ALL-STEEL SLEEPING CAR "JAMESTOWN"
INTERIOR VIEW

*Western Railroad Activities.**

To Bridge the Colorado.—The Santa Fe has concluded to abandon its bridge across the Colorado River at the Needles, and build one farther down stream as part of a new route into California for fast passenger and freight service. The abandonment also means that the portion of the present main lines between Am-

*By J. Mayne Baltimore, special correspondent to the Locomotive Firemen and Enginemen's Magazine.

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boy, on the Mojave desert, California, and Ash Fork, Arizona, will also be abandoned for the fast service into and out of California, because of the heavy grades along it. The new bridge to span the Colorado will be located at Salome. From the latter place northwest across the Mojave desert to Amboy the work on the new line is rapidly progressing. This new route will be a great improvement to the southwestern part of the Santa Fe System—cutting off distance and eliminating the heavy grades.

New Union Station at Salt Lake.—The officials of the Oregon Railway and Navigation Company (Southern Pacific system) have determined to erect at Salt Lake City a large and handsome union passenger station, designed not alone on beautiful architectural lines, but well studied as to arrangement for the handling and comfort of patrons. The projected new structure will have an ideal location in the city, commanding a splendid view. The building will be 677 feet long by 70 feet in width, with a height of 100 feet for the central portion to the top of roof cresting. When completed, this new union depot will cost in the neighborhood of $450,000. Nearly two years will be required to complete the immense structure. It is to be constructed from plans made in the office of the assistant chief engineer of the Southern Pacific Company, J. N. Wallace, under the direction of D. J. Patterson, architect for the company. It will be one of the largest, handsomest and most expensive union depots west of Chicago.

Woman and Indian Railroad Presidents.—California can boast of having a woman railroad president, who has had personal superintendence of a railway for several years. Her name is Mrs. J. F. Kidder, and she has conducted the financial affairs of the road very successfully. The line has nearly fifty miles of trackage, and is located in Sierra county. Several years ago Mr. Kidder, who was the builder and principal owner of the line, died, leaving all his interests to his wife. The board of directors have thrice elected the lady to the presidency of the road, a position formerly held by Mr. Kidder. The widow has, in every respect, proved a worthy successor.

An Indian chieftain as a railroad president is certainly a rare thing in railway history, but that is what Pleasant Porter, chief of the Creeks, is. His railroad is what is known as the Indian Central Railway Company. It recently filed its charter at Guthrie, with a capitalization of $15,000,000. It contemplates the construction of 400 miles of railroad in Indian Territory and Oklahoma within the next two years. The road begins at Ponca City and runs southeast to Paris, Tex., with a branch line extending from the Red River northwest to Oklahoma City.

Weight Increase of Locomotives.—Superintendent of Motive Power N. J. Small, of the great Southern Pacific system, with headquarters at Sacramento, Cal., in very recently speaking of the great size of modern locomotives, coaches and cars, said that they constituted one feature of the railroad situation which is apt to pass unnoticed.

"Thirty years ago," said Superintendent Small, "what is now known as the Southern Pacific system had a standard locomotive called the 'C. P. Huntington.' Now it is on exhibition and is good for nothing else. Its total weight is only 29,000 pounds. In 1888 the weight of engines had grown to 72,500 pounds. Today they weigh as high as 208,000 pounds. The increase in traction power, in heating surface of boiler and in water capacity of tender has been augmented to a corresponding degree.

"In 1880 a passenger coach was usually 41 feet long, with a seating capacity of thirty-two. Today the standard coach is 67 feet long, and can comfortably seat seventy passengers.

"Twenty-five years ago freight cars were 27½ feet long, weighed 30,000 pounds, and had a cubic foot capacity of 1,400 feet. Today their usual length is 40 feet, with a weight of 100,000 pounds and 2,730 cubic feet capacity."

Rail Laying Now in Nevada.—Western Pacific tracklayers have crossed the Utah boundary line into Nevada and are laying track at the rate of a mile a day. Already the track has been laid over 150 miles west of Salt Lake City. The company has been enabled to obtain an extra lot of graders, and the work on the roadbed is being crowded eastward from Oroville, Cal., as well as west through Eastern Nevada. Mr. Gould is confident he will be able to run his first Western Pacific train between Salt Lake and San Francisco in September, 1908.

There are fifty-nine tunnels along the route, which limits the grade to one per cent., which means but 52.8 feet per mile. There are 100 miles of one per cent. grade between Oroville and the summit of Beck-

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with Pass. There are no bridges of any magnitude on the line, save the crossing of the American river east of Sacramento.

Fifteen Millions for Trolley Lines.—Richard Notaling, W. M. Rank, and their associates, have made a deal with a strong Baltimore syndicate by which a big electric railway system is to be built in Marin, Sonoma, Napa and Lake counties, with ferry connections with San Francisco. This deal includes the purchase of the Petaluma and Santa Rosa electric roads.

The proposed system will invade the territory of the Northwestern Pacific in Marin and Sonoma counties, and that of the Southern Pacific in Sonoma and Napa counties. The undertaking will involve an expenditure of between $10,000,000 and $15,000,000.

The proposed road will embrace an extension of the Petaluma line northward into the Healdburg and Cloverdale regions. Ultimately it will extend over into the Lake county country, thus forming a double line covering a great sweep of country between Lake and the Marin county bay shore. The Baltimore syndicate have large capital behind them, and will finance the project. Several leading members of this syndicate have recently been all over the grounds, and are very well pleased with the prospects.

Rush Work Under Way.—Rush work is now under way on the Malibu Rancho for the completion of the Hueneme, Malibu and Port Los Angeles Railway in four months. In 120 days the tracks must be laid between Santa Monica and Hueneme. Three hundred teams and a thousand men are now employed. There seems to be no doubt but that the Western Pacific thus proposes to make entry into Los Angeles by blasting a gateway through the overhanging rocks which bar it from the north. When this railroad is extended northward, as its builders evidently intend doing, it will affect the Southern Pacific by cutting the time between Los Angeles and Santa Barbara in half, and at the same time afford a more level, safe and picturesque route.

Western Pacific Trains.—According to a statement made by the chief engineer, the Western Pacific expects to have trains running between Oroville and Stockton, Cal., within the present year. The company is rushing the work of construction, and will soon have large crews of men working at Stockton and Oroville toward Sacramento. The trestle over the American River has been completed to a distance of about 1,500 feet and is being put together rapidly.

Mr. Harriman to Visit the Coast.—Early the coming summer President Harriman is expected to visit San Francisco. The Southern Pacific has many improvements and extensions mapped out in California, Oregon, Washington, Arizona, New Mexico, Nebraska and Wyoming, and Mr. Harriman desires personally to inspect them and consult with those in immediate charge.

Work of Double Tracking.—The work of double tracking the main line of the Southern Pacific between San Francisco and Omaha is in full progress; 175 miles of double track is now being laid in Nebraska and Wyoming, together with many side tracks which are eventually to form a double track. These sidings are to be put down in the Sierra Nevada and Siskiyon mountains in California.

Will Approve Hospital Plans.—While Mr. Harriman is on his Pacific Coast trip, he will finally approve of the new plans for the large hospital which the Southern Pacific Hospital Association is to soon build out near Golden Gate Park under the direction of Chief Surgeon F. K. Ainsworth. Local Southern Pacific officials think he has definitely made up his mind to purchase a site and build in San Francisco a big railroad office building. It is said reports on at least three pieces of property have been submitted to him during the past eight months. It is believed he will make a selection from these three.

No Extensive Electric Extensions.—Southern Pacific officials declare that it is doubtful if Mr. Harriman will decide upon any extensive electric road extensions in Southern California outside of those H. E. Huntington is building and in which he is jointly interested with the latter. He would like to buy out the Huntington interest, but the latter is not anxious to sell and is said to ask a price Harriman is not willing to pay.

Building a "Dyke Grade."—Assistant Chief Engineer McCartney of the Western Pacific says that the line of road in Nevada had been constructed to a place four miles from a deep cut, which had been named "The Dyke."

"Around this dyke," said Engineer McCartney, "a line will be built, because it is the purpose of the engineers to preserve this cut for use on the desert. The track

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on the Utah desert, 38 miles long, runs over soft mud, and had to be laid on heavy planking laid criss-cross in checker board style.

"As 500 feet of track was laid, a ballast train came along and dirt was shoveled in. This cut on the west side of the desert is of cement-gravel, and will be used in ballasting the track on the desert which is not as high as the proper grade, nor as wide as it should be. We are working about 5,500 men and the company would employ 15,000 if it were possible to get them."

To Extirpate Weeds.—A very successful gasoline weed burner has recently been devised by W. R. McKeen, Jr., superintendent of motive power of the Union Pacific. The heavy growth of weeds all along the lines have given officials a great deal of trouble recently. The most annoyance comes from the sunflowers which attain such a height and density as to necessitate the employment of big gangs of men armed with shovels and scythes to extirpate them.

Cars fitted with knives operated by machinery were used first, then a saturated solution of salt and water, and finally a gasoline weed burner was devised by Superintendent McKeen. The car runs slowly over the tracks, and fierce, devouring flame sweeps over the earth, burning and practically destroying the weeds. One such car machine does the work of 300 men, as it can easily cover from twenty to twenty-five miles a day.

Another Road in Nevada.—It is definitely stated that the Southern Pacific intends to begin the construction of a railroad line from Fallon, the terminal of the branch line from Hazen to Fairview. The statement is made officially that the work will be completed and the road in operation before the snow shall come again. The road from Fallon will make Fairview a much larger and more important camp and will do a great deal toward developing the mines. The mine owners in that part of Nevada some time ago sent a delegation to San Francisco to interview the Southern Pacific officials in regard to a railroad, and the company now reports that the much-desired road shall be built at once.

A Splendid New Depot.—The Southern Pacific is soon to erect at Los Angeles a large and costly depot. It will cost $750,000, and when completed will be the largest and most handsome railroad building in California. The plans have been prepared and are to be soon submitted to President Harriman for his final approval. These plans will retain the principal features of the Old Mission style of architecture and the Spanish Renaissance. The building will be 699 feet long and 110 feet wide. The interior will be beautifully decorated with historical scenes, the panels are to be works of art, and the floors a mosaic of colors.

The entrance to the central dome or main waiting room will be through three large semicircular arches, which will be 150 feet long by 80 wide. In the south wing a dining room and a cafe will be installed. The exterior walls are to be made of cement stucco and the ornamental work will be of cement stone. In the decorations soft colors will be used, browns, reds and greens. Between the tracks are to be umbrella sheds 450 feet long, 16 feet wide and 10 feet 6 inches in height.

A $600,000 Railroad Hospital.—Completed plans have just been prepared by the Southern Pacific Railway Company for the new and splendid hospital. When completed its total cost will approximate $600,000, and it will be the largest, most expensive and best equipped railroad hospital in the West. The new site has already been purchased out near Golden Gate Park, and preliminary work will soon be commenced.

The building will be in the form of the letter "H," and will consist of an east and west wing. Opposite the main building will be a structure 52x116 feet, four stories high. The frames of the two large buildings will be of reinforced concrete, with the exterior or screen wall of brick, having the exterior surface finished in marble and white stucco.

All partitions will be formed of steel studs with metal laths and plaster, and all finished floors will be in different patterns of unglazed ceramic title, the only wood work being the doors and windows. The building will be the high type of fire proof structure with the latest system of heating and artificial ventilation; a vacuum cleaning plant will be installed, and all food rooms will be cooled with the best brine system of refrigeration.

In all the building will have accommodations for 225 beds for patients, with the most up-to-date facilities for their care.

The arrangement of plans and ideas as to the systematic working of this large hospital was the work of Dr. F. K. Ainsworth, chief surgeon of the Southern Pa-

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cific. The plans were drawn up by Architect D. J. Patterson, under the general supervision of J. H. Wallace, assistant chief engineer of the Southern Pacific.

Great Loss by Floods.—The great floods in California of last March caused a decided decrease in Southern Pacific earnings for that month alone amounting to $560,000. The floods not only affected the lines in Southern California, but also north of San Francisco, and at many points on the line to Portland. Their effect is apparent in the gross earnings only less than the net. The gross increased by $1,930,000, but in February, a short month, the gain in gross was $2,514,000 or 30 per cent. The March ratio of gain in gross was but 21 per cent.

The Union Pacific naturally suffered from the same influences that interfered with profitable operation on the Southern Pacific, the two systems being so closely knit together in respect to traffic movement. The former system also suffered from floods on its own lines in Colorado, although not to anything like the same extent as the other. The Union Pacific's increase of $150,000 in net was a rather disappointing result from an increase of more than $1,000,000 in gross.

For Safety Appliances.—The Southern Pacific, Union Pacific and the various Oregon lines of the Harriman systems have recently completed the expenditure of the grand total of $11,835,520 upon safety appliances to guard against the dangers of travel by rail. Block signals, interlocking plants, crossing bells and gates on the Southern Pacific alone have cost $3,500,000, and safety devices on Southern Pacific trains have cost another $4,000,000. Block signals on the Union Pacific and Southern Pacific lines cost $5,460,000, and brakes and high-speed attachments on trains cost an additional $3,296,000. On the Union Pacific roadway safety devices have cost $2,000,000, and equipment appliances on Union Pacific trains to avert accidents have cost another $876,238. On the Oregon Short Line and the Oregon Railroad and Navigation Company $847,000 has been expended for roadway safety appliances and $650,000 for safety devices on the cars and locomotives.

A Million-Dollar Tunnel.—The Western Pacific will soon commence, in South San Francisco, the boring of a long tunnel, the total cost of which will approximate $1,000,000. It will be 30 feet wide and 27½ feet high. Over 18,000 yards of concrete work will be required in the tunnel's construction. Fully one year will be required to complete the work.

In addition, a long fill will be made to the water front involving $300,000. The Western Pacific estimates that the company will spend in San Francisco not less than $3,800,000 within the next 2½ years. Work on both tunnel and fill is to be commenced very soon.

The Dumbarton Cut-Off.—Active work on the Dumbarton cut-off has been commenced by the Southern Pacific, which is to provide for a new transcontinental rail route into San Francisco. Several hundred men and teams are grading out of Redwood City toward the bay, and many thousand piles for the bridge have already been received and are to be driven as soon as possible. The cut-off extends from Redwood City to Newark, thence through Centerville to Niles. This new line, in addition to its transcontinental value, will give a new short all-rail route from the San Joaquin Valley into San Francisco both in freight and passenger traffic.

The Western Pacific's Plan.—It is authoritatively stated that Mr. Gould's Western Pacific road has obtained a right of way for a line to Los Angeles so as to be able to meet Southern Pacific competition in that section as well as to San Francisco. The old Santa Fe right of way through Inglewood will be utilized. This line is now being operated as an electric road. It is under lease to the Los Angeles Pacific Company. It is stated that this lease can be easily lifted, and that Gould interests would have no difficulty in obtaining control of it to afford them a Los Angeles outlet. It is just what the W. P. needs to complete its system.

Direct Line to Yellowstone.—Mr. Harriman has completed a new and more direct line to the Yellowstone Park. Instead of running up on the Oregon Short Line, which is a part of the Harriman system, to a station called Monida, and then traveling directly eastward over a branch line to the edge of the park, a branch of the Oregon Short Line, 127 miles long, has been constructed during the past year, starting from Idaho Falls and extending northeastward to the edge of the park. This new diagonal short cut route has just gone into operation. It practically forms the hypothenuse of a right angle triangle and runs through Anthony.

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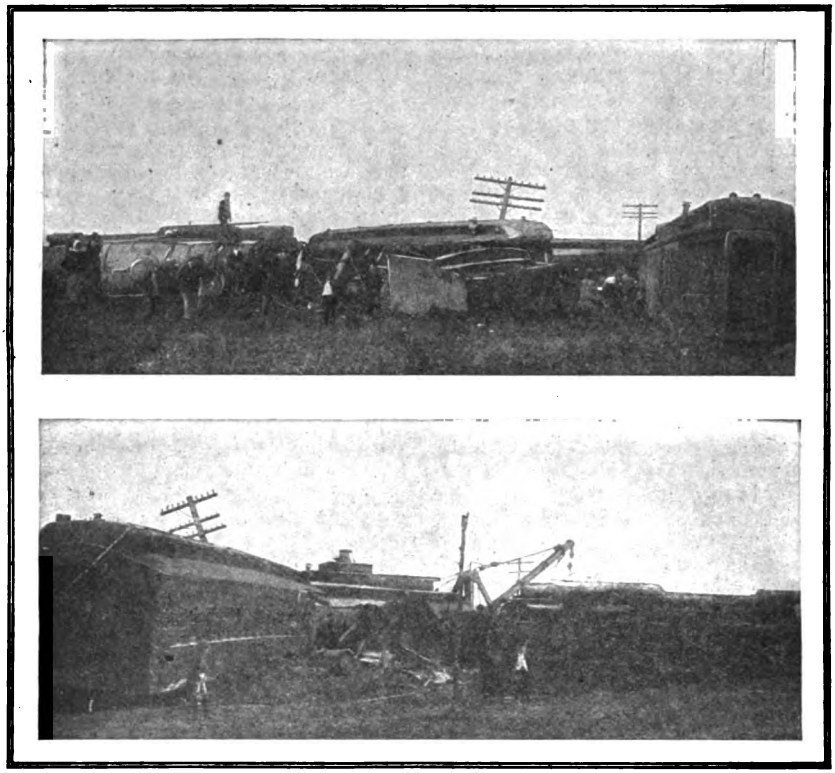
Wreck on the Rock Island.

Illustrations are shown herewith of the wreck of the Hot Springs Limited, train No. 6, on the Rock Island, which occurred at Hazen, Ark., March 15, 1907. The wreck is said to have been caused by some one tampering with a switch. Engineer T. J. Kilkoine, of Division 554, B. of L. E., and Fireman Mansford A. Currier, of Lodge 551, B. of L. F. and E., were killed and several passengers were injured.



WRECK OF THE HOT SPRINGS LIMITED, TRAIN No. 6, ON THE ROCK ISLAND, AT HAZEN, ARK., MARCH 15, 1907

Progressive Examinations.

"First, Second and Third Year Standard Examination Questions and Answers for Locomotive Firemen—Illustrated," is the title of a work recently compiled by Mr. W. G. Wallace, Past President of the Traveling Engineers' Association, who, for many years, has filled the position of superintendent of motive power, and well known to our readers as a writer of many years' standing to our Magazine, and a competent authority on all matters of a technical nature. This work consists of progressive examinations for the first, second and third years, which have been adopted as a standard by the Traveling Engineers' Association, the answers being furnished by Mr. Wallace.

In addition to the examination questions and answers, the work includes an appendix containing very valuable information on air brake equipment and practice, locomotive construction and fuel combustion. The work in its preface says that "firemen should learn the principle of each question, should understand why it is asked, instead of learning the answer without having a proper and clear understanding of it. By knowing the principle of the question it will be easy to demonstrate to the examiner a thorough

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mastery of the subject and a higher rating will follow.

"Written answers to questions may be perfectly correct, yet if answers given to the oral or verbal questions disclose a lack of knowledge of the subjects and show ignorance of the principles—or in other words, of the 'whys' and the 'wherefores'—examiners are justified in marking a failure.

"Oral questions are asked to determine whether or not firemen have the necessary understanding of the subject. Therefore, notwithstanding the answers which follow are designed to aid students in gaining a knowledge of the principles and a clear understanding of the questions, we can not too strongly urge the necessity of making a more thorough study of the principles of locomotive engineering. The explanations and instructions therein contained, together with the student's observation and practical experience, will render comparatively easy a complete mastery of the questions and answers which follow."

This work contains 343 pages, is neatly and serviceably bound in flexible Morocco leather and has red edges, size being 4¼ by 6¾. It sells for $1.50 per copy and can be secured from Frederick J. Drake & Co., publishers, Chicago.

*Car Inspection on Interurban Railways.**

When inspection, as regards the maintenance of electric railway equipment, is considered from an economical standpoint, the old adage that "a stitch in time saves nine" is expressly applicable. Inspection of electric cars should be similar to that of locomotives on steam lines, and not like the inspection of railroad cars or coaches, as each individual electric car has its own motive power in which a small defect may cause serious trouble and much expense and delay. Accidents such as the burning out of controllers and derailments, caused by broken flanges, etc., can generally be avoided with proper and thorough inspection at frequent intervals.

On many city lines cars are allowed to run several days without complete inspection. This is generally owing to the crowded condition of shops and pit rooms, as many of the older city lines are still using the same shops, or portions of them, that were used when horse cars were in service. These shops are centrally located in a majority of cases, and floor space and pit rooms can not be obtained owing to the excessive price of adjoining grounds. Consequently the cars can not all be run over the pit each night, but have to be divided for inspection alternately; and it is sometimes several nights or days before all the cars are inspected. To a large extent this explains why so many cars fail while in service, interrupting schedules and giving great dissatisfaction both to the management and the public.

We believe that the inspector should be jointly responsible with the foreman for the condition of the equipment and also for the manner in which repairs are made. He should be thoroughly familiar with the different types of equipment he is required to inspect, and it should be his duty to carefully inspect each car undeneath as soon as it arrives over the pit, and, if conditions warrant, to complete the inspection of controllers and car bodies afterward in order to allow room on the pit for the next car. After completing his inspection, he should make a report on a blank form furnished for this purpose. He should also know that the work has been done before the car is allowed to enter service, and should promptly report to his foreman any errors made in repairs.

Shop condition is another point to be considered. When building new shops, would it not be well to consider the fact that although central location may be sacrificed, considerable advantage would be gained by securing plenty of room for storage, repairs and inspection? Another important fact that is quite likely to be overlooked, is the advantage of complete inspection. The car would pass over the pit each night, and the inspector would be allowed time to go over them thoroughly. One or two pits could be located in places where cars would pass over them. If a car is found to be in good condition it could be taken to a place for storage, and if not it could be taken to a pit room for proper repairs. This would greatly facilitate both inspection and repairs, and also save much time in shifting to get defective cars where they can be repaired.

*Extracts from a paper by Lee M. Jacques, read before the Central Electric Railway Association, Dayton, Ohio, March 28, 1907.—Reproduced from the Railway and Engineering Review.

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Interurban shops and barns are generally located in small towns where land is not so expensive, but unless the shops are very modern, conditions are much the same as in the city, as the buildings in most cases are too small to accommodate the increase in equipment that the business now demands. In other words the present large equipment now used for interurban service has outgrown shop facilities. However, as these cars are less in number and not so closely scheduled, there is much better opportunity to give them necessary inspection. At the present time with the high speed that is required of these cars, their frequent and careful inspection is of the greatest importance, as there are many defects that would not only delay schedules, but might result in serious accident and loss of life. Inspection of interurban cars should be the same as with the smaller equipment, only of course more time would be required.

In addition to shop inspection each night, I would suggest that the motorman could be of great service if put through a practical shop course and taught where he would be likely to find the defects and the best manner in which to correct them. On most interurban lines the schedule allowed considerable time to lay over at the end of each trip, and if the motorman was required to inspect and to do light repairs, he would soon become quite proficient. He should provide himself with suitable overclothes and tools for this work, and he might be the saving of many delays and possibly serious accidents that would be caused by broken or sharp flanges, loose tires, etc., which can readily be detected in daylight. If motormen were placed on the same level and held responsible as locomotive engineers are in steam railroad service, and were given the proper training, there would be many less failures and interruption of schedules than there are now; and no doubt in certain cases accidents would be avoided. This should be the motorman's duty as well as handling the cars; however, his defect report to the shop men should in no way interfere with their inspection.

Many roads contend that it is not necessary for motormen to know too much about electrical equipment, and simply teach them to cut out motors, replace fuses and brushes, and make other minor repairs. There are some good arguments in favor of this, especially in city service where motormen are quite likely to attempt to make repairs of which they have little knowledge and thus to delay schedules and damage the equipment. But in interurban service, more time could be given to their training and more shop experience afforded, so that they would soon be able to detect many small defects that are now overlooked. At the end of the run, providing the schedules permitted a layover, as most of them do, motormen could make a thorough inspection of all parts of the car that can be easily reached. Many times a motor brush will stick in the brush holder or there will be broken brushes, loose brush holders, etc., which can easily be detected and which would cause many unnecessary interruptions by pulling the car in for knocking the circuit breaker or blowing fuses. The damage to commutators, brush holders, etc., should be considered, and in many cases repair bills would be greatly reduced. There are also many other light repairs, such as tightening loose bolts on the trucks or brake rigging, which can easily be accomplished. Frequently the loss of a cotter pin in certain parts of the brake rigging will cause the loss of a pin, and the result is the car has no brake. This is generally found out at a point where a stop is very essential, and the newspapers publish an account that the air brakes failed to work, giving full details of the accident.

* * *

Engine Breakdowns and Repairs.

"Locomotive Engine Break-Downs and How to Repair Them" is the title of a new book by Mr. W. G. Wallace, Past President of the Traveling Engineers' Association, who, for many years past, has filled the position of superintendent of motive power.

This work consists of nearly four hundred questions submitted by locomotive enginemen during a number of years past and answered through the columns of our Magazine by Mr. Wallace. These questions and answers cover almost every conceivable form of break-down that can happen in locomotive service. They include many difficult problems that are solved in a way to be easily understood, and are being explained in the simplest terms possible. In addition to the questions and answers, the work includes a department entitled "Tables" and "Useful Pointers" embracing information

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which is exceedingly valuable to all locomotive employes.

The book is also equipped with an index which permits of any subject treated in the questions and answers being turned to without the slightest trouble or delay. The questions answered in this book represent conditions occasioned by difficulties met with in everyday service by practical engineers and firemen, from which fact the very wide range they cover can be the better understood. The questions and answers are numbered and by reference to the index, which is alphabetically arranged, each can be readily found by its number through the system of cross indexing which has been employed wherever possible.

The preface of the work states that no expense has been spared in using diagrams and cuts to illustrate answers when a clearer understanding of the subject seemed possible by so doing.

Mr. Wallace is too well known to the engineers and firemen of the country to need any special introduction. For many years past he has written for the Magazine, having been an acknowledged and as a rule a final authority on all questions relating to break-downs.

The subjects treated in the departments known as "Tables" and "Useful Pointers" are Care of Flues, Adhesion and Traction of Locomotives, Distribution of Weight in Locomotives, Tractive Power, How to Figure what a Locomotive will Pull, Train Resistance or Locomotive Rating, Shortcuts in Arithmetic and Hydraulics. It contains, in addition to its regular illustrations, two large folding inserts, one showing a balanced-compound locomotive equipped with Walschaert valve gear and of the latest improvements, each part being numbered and the names of each being given in list form to correspond with number. The other insert shows cuts, names and numbers of all parts of the Pyle National Electric Headlight.

"Locomotive Engine Break-Downs" is 4¼x6¾ inches in size. It is printed in clear type, pleasing and restful to the eye, is bound in flexible Morocco leather, and has red edges. The work contains 285 pages and sells at $1.50 per copy. It can be secured by applying to Frederick J. Drake & Co., publishers, Chicago. It is one of the most valuable technical publications on the market today.

Echoes from the Firing Line

What Caused the Blow from Relief Valve?

I have had a little experience which was a hard problem for me, and it may be of benefit to some of the brothers in locating a similar defect should it ever occur on an engine they are running or firing. I have a very strong opinion of what the trouble was and what caused it, but wish to learn the opinions of others, and if it is not answered soon I will give my version.

I had an American type of locomotive weighing about forty-five tons, on which the relief valve on the left side would blow hot air all the time the engine would be drifting and it was impossible to put oil through that valve. It made no difference whether the engine was running ten miles per hour or sixty miles per hour, it would blow all the time when

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engine was shut off, while the relief valve on the right side of engine would take all the oil we would give it.

The engine was reported and upon taking up the left steam chest the valve was found to be all right. The left cylinder head was also taken off and the cylinder packing examined and found to be all right. The engine has a 9½-inch air pump and the exhaust is in the cylinder saddle, but it was found to be all right, as was the blower. The engine is equipped with a Detroit triple-feed lubricator.

MEMBER 294.

Peculiar Operation of the Air Brake.

A short time ago I was running an engine on which the air brakes had a peculiar way of working. I tried the brake valve in service position and placed it back to lap position. The train line hand of the air gauge remained at 60 pounds, as I had drawn off 10 pounds. In full release it equalized all right, and in running position the hands would remain at 70 and 90 pounds. I afterwards put the brake valve in emergency position and the brakes went on all right. The tank brake leaked off, but the driver brakes still remained on. I left the brake valve in emergency position and the pump continued to run until 70 and 90 pounds was reached again.

If any of the brothers can explain why the pump should raise the pressures to 70 and 90 pounds with the brake valve still in emergency position I wish they would do so, as I have never had the opportunity of seeing this occur with the air brake system before.

FRANK R. BROWN,
Member 100.

"The Oil Burner."

In reading o'er the "Echoes"
From the Firing Line today,
I notice sev'rl brothers
Have had quite a bit to say
About the "fun" they're having
With their "real estate" and "slack":
That 'bout half of every scoopful
Goes straight on out through the stack.
How they rake and shake and shovel
From the time they whistle out
'Till they reach the other term'nal,
They're all in or just about.

How we sympathize, dear brothers,
With you all in all your trouble;
We, too, have fired this "real estate,"
And know what it's like to double,
When you feel you've not a friend on earth,
E'en the engineer is "sore,"
And a vow you make that when once at home,
You'll an engine fire no more,
When a bath and a bed and a few hours' "spot,"
Would seem like a gift from God;
For in slumber deep you'd forget such things
As poor coal and the decapod.

But now we have no pans to hoe,
No grates to dump or shake;
And about the hardest job we have
Is to try to keep awake.
Now if the "Driver" drops her down
Till of notches he's bereft,
We sit and listen to her bark,
For we have notches left.
No shovels on our engines now,
They all burn oil at last,
And our troubles with the "real estate"
Are but mem'ries of the past.

THOMAS E. BAILEY,
Member 139.

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Technical Contributions

SOME IRREGULARITIES OF THE ET ENGINE AND TENDER BRAKE EQUIPMENT—II

BY WILL W. WOOD

Defects, and Errors in Operation.—The first pattern of independent brake valve was arranged with *running position* at the extreme left where the valve was expected to normally stand, and toward the right came, first, *release position*, then *lap*, and *application position* at the extreme right; and there was no spring used to automatically move the valve from release to running position. This style of straight-air valve was abandoned and generally called in and replaced by the later pattern now standard; in making the change there was some confusion resulted in operating the straight-air; a few of the older type are still in use, and as many enginemen do not know there was ever but the one, present type of independent brake valve, if you ever get hold of a valve that gives results as first described note if the large, upper spring chamber is not absent, and if so be governed by the handle positions as explained.

The first train line feed-valve (Type K) used in connection with the ET equipment, although the most perfect and sensitive pressure-reducing-valve so far known, was a failure in maintenance, a very small piece of scale or a condition of gumminess causing the "K" valve to close its feed to the train line completely, excepting the small amount of air that leaked through the piston, which was enough to keep up the supply for the light engine, but when coupled to a train the black gauge pointer would remain at zero with the engineer's valve in running position; another bad result was that the pressure supplied to the distributing valve for use in the driver and tender brake cylinders, the same as auxiliary reservoir pressure, was at that time taken from the 70-pound-pressure pipe fed by the "K" valve, so that its stoppage of supply of pressure rendered the independent brake valve inoperative; of more importance, still, in cases of such trouble where the "K" feed-valve can not be repaired, or cleaned, it would help matters but little to carry the engineer's valve in *release position*, for there would be no air pressure supplied to the 20-pound spring-chamber of the low-pressure governor top; as no governor can be adjusted to stop the pump at less than about 40 pounds of air pressure, however, about that amount could be obtained in the main reservoir and be supplied to the train line.

To overcome this trouble and get full braking pressure in the train line in release position of the engineer's valve, *complete* the cutting-out of the low-pressure governor top by disconnecting a union in the other pipe that runs to it—pipe *J*, Fig. 1—from the engineer's valve, slipping in a blind gasket and recoupling the union; then adjust the high-pressure top to 70 pounds, and close the little cut-out cock in governor pipe *H;* while excess pressure can not be carried in the main reservoir, under this arrangement, still if a 25-pound brakepipe reduction is made before attempting to release the train brakes there will not be a great deal of trouble experienced in getting them off on a fairly long train of air.

But there is a better way out of the trouble, when it is possible to do it, and as the feed-valve now in use might get—or have to be put—out of commission this method should be thought of: Disconnect both of the main reservoir supply pipes, *J* and *K*, at their unions to the governor tops and reconnect pipe *J* from the brake valve *to the high-pressure top;* plug, or otherwise close, pipe *K*, and set the high-pressure governor top at 70 pounds; by this means 70 pounds pressure will be carried in both train line and main reservoir while the engineer's valve is in release position, but when an application of the brakes is made, or the brake valve lapped, the pump will start up and furnish an ample sufficiency of excess pressure with which to release the brakes on a long train. If, however, the brake valve is left on lap or in an application position too long the pump throttle will

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have to be regulated, as there will then be no *sentinel* governor to finally stop the pump.

Two new transfer engines, fitted with the ET equipment, were sent to the terminal yards at the other end of the road, where nobody understood the device, and when the instructor drifted in there it was just in time to prevent the switch engineers from finally putting the upper heads of their air pump cylinders out of business, probably; whenever one of those new engines had been coupled to a train line empty of pressure, the engineer would leave his brake valve in running position and the pump would stop, instantly; it seems that they never thought of *moving the brake valve to release position*—just let it stand, and got out on the running board with a hammer and thumped the top head of the pump, where its vital organs were presumed to lie. After awhile the pump would start up, of course. There was no defect in the air equipment; with the engineer's valve in running position the train line really begins at the feed-valve, and upon coupling to a lengthy train not already charged the train line pressure at once falls to a little above nothing. The air force above the diaphragm of the 90-pound governor top is taken from this train line pressure, at a point between the feed-valve and engineer's valve; consequently, the quick, heavy fall of the supplied pressure leaves the adjustment of the low-pressure governor altogether too low, while the main reservoir pressure reducing but slowly through the feed-valve remains high enough to hold the steam shut off from the pump through the action of the low-pressure top, until finally when the main reservoir and train line pressures are within less than 20 pounds of each other the pump will start up. The remedy is in the correct—natural—handling of the engineer's valve; whenever the air is cut in from engine to train the brake valve should be placed in release position, to remain there until the two gauge pointers are within about 15 pounds of each other, only being careful to return the valve to running position before the black pointer has reached 70 pounds.

In the ET equipment there has always been a cut-out cock in the branch pipe, *X*, from train line to distributing valve, although there is none shown in the plate, which, when closed, would permit an application of the train brakes by the automatic brake valve without actuating the locomotive brakes, although the latter could still be operated by the independent brake valve; and there was never any cut-out cock in the pressure-supply pipe *L*. On the last two engines received by our road these conditions are reversed; the cut-out cock is absent from branch pipe *X*, and a cock is placed in pipe *L* through which the locomotive brake cylinders receive their *auxiliary* pressure. The engineers promptly kicked; they wanted the cut-out cock in the branch pipe, and they didn't want the other one—"somebody might close the cock in the supply pipe, and there wouldn't be any air to set the driver and tender brakes with at either automatic or straight-air application—must have been a mistake." But it wasn't; the change was demanded, and here's why:

The other day the engineer of another engine had reasons—or thought he had—for cutting out automatic operation of his distributing valve, so he closed the cock in branch pipe *X*, noticing at the time a very slight leak that he couldn't tighten at a joint of that pipe between the cut-out cock and distributing valve. He made several applications of the train brakes with his automatic brake valve, without incident, but when he made the first application of the engine brakes with the independent valve the brake cylinder gauge ran up to 52 pounds and the pop on the distributing valve began to blow; he pulled the handle of the independent valve back to lap and there was no change in the action, and in its running position the effect was the same, except that pressure began to blow from the "big hole" of the automatic brake valve; by placing the independent valve in release position the blow was changed to its exhaust port and the pointer of the cylinder gauge slowly fell, finally to zero, and the engine brakes released, but a light, steady blow continued from the independent valve, and as soon as the handle was released its spring drove it back to running position and the engine tender brake began reapplying. The engineer didn't know how to undo what he had done, so he closed the individual cut-out cocks to the driver and tender brakes and went on.

The cause of his trouble was this: When he closed the cock in the brake pipe connection at *X*, the leak between it and the distributing valve exhausted the pressure from the brake pipe side of the dummy triple piston, and if that leak had been greater (suppose the branch pipe

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had broken off; it may, some time) the dummy auxiliary pressure would have forced the "triple" into emergency position and the brake-sticking would have begun at once. As it was, the leak was so slight that it drained the dummy auxiliary, or pressure chamber—we will now use the adopted names—through the feed-groove without disturbing the dummy triple—*graduating valve;* but when a straight-air application was made—now consult Fig. 3, an ideally arranged sectional view of the distributing valve and its reservoirs—the pressure from the independent brake valve entering the distributing valve through the ports *h*, raised the slide-valve *31* from its seat and filled the pressure chamber, forcing the piston, *26*, into emergency position as shown in the plate. Piston *26* having passed the feed-groove, and there being no "graduating spring" as in ordinary triples, and

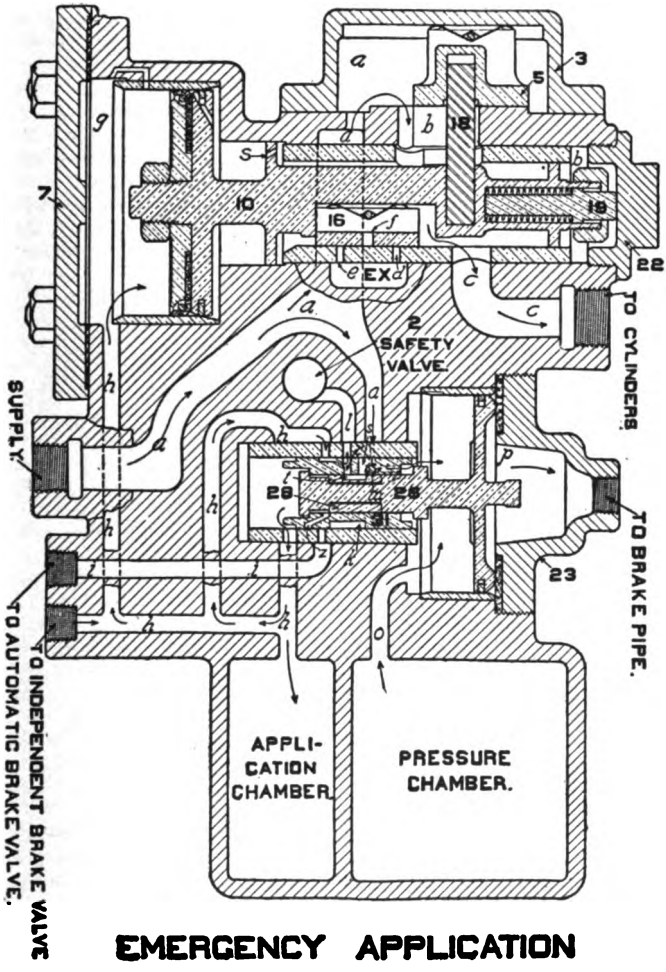

Fig. 3

brake pipe connections cut out by cock and leak, the piston would remain permanently in emergency position as represented, and in which position there is another supply of air to the pressure chamber; the dotted port *m* in the upper section of slide-valve *31* registers with port *n* in the upper seat (the arrow from *a*, past *s*, points to port *n*) permitting main reservoir pressure from passages *a*

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to enter and keep up an automatic and constant recharge of the pressure chamber, or dummy auxiliary reservoir, but the pop-valve prevents it going above 52 pounds; with dummy triple—graduating valve—in this position the contents of the pressure chamber equalize with the *application chamber* that we have referred to as dummy cylinder, and from the latter the pressure combines with that supplied through ports *h*, in chamber *g;* piston *10* having been forced to the right, the position shown, by the application of the independent brake valve, exhaust valve *16* is closed, and supply valve *5* open for the main reservoir pressure of chamber *a* to flow through to ports *c* and the brake cylinders of the engine and tender, producing an application. But when the engineer drew his independent brake-valve handle back from application to running position, application chamber pressure was discharged through ports *h* (Fig. 3), and pipes *B* and *B'* (Fig. 1), to the atmosphere at the automatic brake valve; but the permanent feed of m. r. pressure through port *m* supplied enough to chamber *g*, in spite of the blow at the engineer's valve, to keep supply valve *5* somewhat open and the brakes dragging; placing the independent valve in release position, however, gave a slightly faster exhaust of pressure from pipe *B*, and effected the release; cutting out the brake cylinders individually held them released.

Whenever for any reason the *automatic* operation of the distributing valve should be cut out, it is not advisable to try to use the *straight-air* brake on the engine and tender, as just illustrated, and to prevent its use the manufacturers have dispensed with the cut-out cock in the train line connection to distributing valve, but have supplied another cock placed in the main reservoir supply pipe that should be closed when it is not desirable for the distributing valve to set the brake from an application by the engineer's automatic brake valve.

In special cases where it is very desirable that the straight-air brake may be used, when the automatic or *triple-valve* feature of the distributing valve is cut out by the cock in the train pipe connection, temporarily bleed the pressure chamber by removing the plug from its under side, take off the lower head, *23*, and insert a block to keep the piston from moving to the emergency position and then replace the head and plug; it is best to block against the button on the center of the piston, for if a nut or something of that sort should be laid on the bottom of the chamber bushing, air pressure against the opposite side of the piston would tend to distort it and bend the piston stem. The independent brake may then be applied and released without trouble.

An engineer followed this advice one day after he had broken off the branch pipe between the cut-out cock and brake pipe, and found the cut-out cock leaked, slightly; he used the cut-out cock, however, to close the brake pipe connection as the leak didn't amount to much. Now, when he made regular service stops with his automatic brake valve there was, of course, no action of the engine and tender brakes, but finally he was compelled to make an emergency application and was surprised to note that *then they did set*, and that the brake cylinder gauge showed 52 pounds, and this *with the distributing valve having no connection with the brake pipe;* the reason is simple and there was nothing wrong.

When the engineer's automatic brake valve is placed in the emergency position a port in the rotary valve coming into register with ports in the seat completes a direct connection between pipes *M* and *B'*, whereby the volume of pressure contained in the brake valve equalizing reservoir is supplied to the application chamber of the distributing valve, entering through ports *h* (Fig. 3), and into chamber *g*, effecting an application of the brakes in the understood manner, the equalizing reservoir in this case taking the place of the pressure chamber—being larger, in fact—and equalizes with the application chamber at a higher pressure than is obtained at a full service application, although the pop-valve blows it down to the regular 52 pounds. It is the combination of this volume of air from the equalizing reservoir with that from the pressure chamber, that at emergency application runs the brake cylinder gauge up to 60 pounds, when all parts are working normally.

There are two little copper pipes that run from the distributing valve to the automatic brake valve that are of the greatest importance of any of the piping in the ET equipment, in regard to applying and releasing the locomotive brakes, and their leakage is to be absolutely avoided, or their stricture by being slightly crushed in at an unnoticed point; one — the main pipe of all—is lettered in Fig.

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1 as *B* and *B'*, and starting from the application chamber of the distributing valve as *B*, is routed *via* the independent brake valve, a port in that valve continuing the passage through it when in running position, to pipe section *B'* that connects with the automatic brake valve, and when the latter valve is also in running position the pipe has an opening to the atmosphere through ports in the rotary valve and seat connecting with the big emergency exhaust port; therefore, with both brake valves in running position the application chamber is directly open to the atmosphere, and pressure delivered to it can not set the brakes with any degree of force unless one or the other of the two engineer's valves is out of its running position.

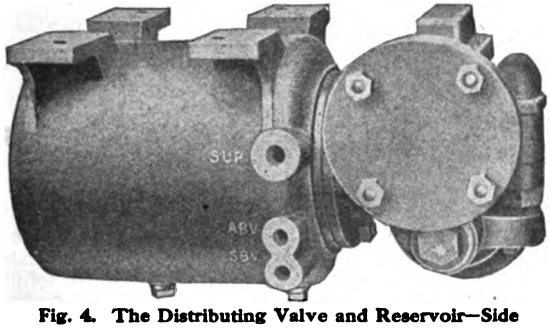

Fig. 4. The Distributing Valve and Reservoir—Side opposite to that shown in Fig. 2

For that reason, and not only to save his main reservoir air, when the engineer feels his brakes go on from an unknown cause, he should pull his automatic brake-valve handle to the lap position as quickly as possible, so as to close the release of air from the application chamber; if the brake pipe pressure should be reduced 25 pounds or more, or if an emergency application results, main reservoir pressure will be supplied to the pressure chamber and brake cylinders, but not rapidly enough to fully supply the loss with the brake valves in running position; when the first noise of escaping air is heard at the engineer's valve, remember that it is a forewarning of brake application that you will feel before the effect of the brakes is felt, and if you are quick enough you can save the high emergency force of the ET equipment, but if you lap the valve too late throw the independent valve into application position; it will apply the brakes all right, but with 45 pounds instead of the final 52 pounds.

Fig. 4 shows the side of the distributing valve opposite to that in Fig. 2, and here there are three pipe connections; the upper one marked "sup" is where the pipe that supplies main reservoir pressure is connected (pipe *L*, Fig. 1), and the lower openings are for those two little copper pipes; the bottom one (*SBV*) is for pipe *B*, in Fig. 1, that is routed through the independent brake valve, and the one just over it (*ABV*) is for the other one—pipe *A*, Fig. 1. The other day an inspector had these two copper pipes detached, and in putting them up again he reversed their positions at the distributing valve; the engineer was able to make straight-air applications and releases all right while the automatic brake valve was in running or release position, and to apply and release the engine and train brakes with the automatic valve, but when the latter valve was on lap after an application, he could not release the locomotive brakes by the independent valve, and the reasons for these odd actions will be obvious enough with a little study of the diagrams.

Undoubtedly the most important instructions on the ET equipment that can be given to an engineer are *for him individually* to test and keep tight those two little copper pipes, *A* and *B-V'*. If section *B* leaks, the engine brakes will begin to release as soon as they have been applied *by either brake valve;* a leak from section *B'* will cause the locomotive brakes to release after an application by the automatic brake valve, but will not affect an application by the straight-air brake valve, and if such leak exists while on the road the only way to make the engine brakes hold at a general application is to first lap the independent valve, and then after the general release and the automatic brake valve has been brought back to running position, return the in-

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dependent valve to its running position. A leak from the other little copper pipe, *A* ("double-heading pipe"), between the distributing valve and double cut-out cock, will not have any effect at an application by the automatic brake valve nor while it is on lap, but when the brakes have been applied by that valve and the handle has been returned to *release or holding positions*, instead of the engine brakes holding as they should, this leak will release them—a disastrous happening when an engineer wishes to release the car brakes of a long train while running at a moderate, or slow, speed, and is depending upon the holding of the driver and tender brakes to keep the train from stretching in two; a leak in that vicinity will also cause the engine brakes to release at a straight-air application after the independent brake valve has been lapped, if the automatic valve is, meanwhile, in running position. The other section of this double-heading pipe, *A*, extends from the double cut-out cock up to the automatic brake valve, and a leak in that remote section could not cause trouble (being normally out of reach of pressure, by the closed port in the double cut-out cock), except under one condition: if you are on the second engine in double-heading, with your double cut-out cock closed and the automatic brake valve on lap, it might be that the forward engineer—who is operating the brakes—would want to make a running release of the train brakes, and in such case it would be necessary for the brakes of both engines to be held on till it was certain that the brakes at the rear of the train had fully released; therefore as soon as the leading engineer has applied the brakes the second engineer should pull his automatic valve handle over the shoulder from lap to the *holding position*, and by that means, when the head engineer recharges the train line, prevent the brakes of the second engine from releasing and breaking the train in two; for, if a leak existed as suggested, it would have the effect precisely as a leaking retaining valve pipe. Make your tests of these two little copper pipes carefully and thoroughly, and in the way as suggested by the foregoing explanations, and save destruction of property.

A passenger engineer had trouble with his engine brakes releasing under conditions that proved a leak to exist in pipe *B'*, but neither the torch-flame nor soap-suds would reveal that leak; yet it was there—the evidence proved it wasn't anywhere else. It was a bad leak, too; now that doesn't mean that a whole lot of air blew out at it—*a very little leak* from the small application chamber or its connected pipes *means a big leak* from the brake cylinders' atmosphere exhaust. Now, the engineer's valve is tapped at two points for possible connection of pipe *B'*—one hole on the side—to which the pipe was connected in this case—and one underneath the brake valve body, the one not used being plugged—the lower one, of course, in this case; repeated tests having proved that the pipe *individually* was perfectly tight, I went further and found that the leak existed at the imperfectly tightened plug underneath the lower section of the brake valve—called the "pipe bracket."

Similarly, there are two taps in this lower section of the automatic brake valve for connecting the double-heading pipe, *A;* one is underneath, to take a vertical pipe as shown in Fig. 1, and the *bracket stud* that supports the engineer's valve is also drilled and threaded to take the upper section of the double-heading pipe when the cut-out cock and engineer's valve may be placed too close together to admit of pipe fitting between them; then, again, the double cut-out cock has an extra side tap that is used under the latter conditions. So, regardless of how the brake valve section of the double-heading pipe may be connected, pressure that may be contained therein has chance for leakage at *two* plugs—one in the brake valve and one in the cut-out cock—that remaining undiscovered can cause train parting just the same as if the main section of the double-heading pipe leaked, as explained.

These little pipes, *A* and *B*, Fig. 1, are liable to get broken off near the distributing valve; if both pipes break off plug pipe *B* toward the distributing valve and let pipe *A* remain open, and your locomotive brakes will work under the same conditions as with a plain automatic triple-valve; they will be applied and released in the regular manner by the automatic brake valve, but can not be operated by the independent valve either in applying nor releasing; neither will the engine brake stay set when the automatic brake valve is placed in release or holding positions. If pipe *A*, only should break off, plug it toward the distributing valve and conditions will remain normal and unchanged. If pipe *B*,

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only, should break off, *then disconnect pipe A also* and proceed as directed when both pipes are broken off.

There is one trouble that has happened on every engine we have with the ET equipment—easily overcome, if understood, but the men generally make erroneous reports on the case; for instance: A passenger engineer reported that with brake valve in running position, and train line and main reservoir pressures at the regular figures, either with or without a train, at regular intervals air would blow from the equalizing discharge valve, resulting in the beginning of an application of the driver and tender brakes, but they would release before causing much if any resistance. Of course he examined all connections to chamber *D*, etc., and could find no leakage. The fireman, however, was so rude as to declare that his engineer was away off on his estimates—that there was no discharge whatever from the equalizing valve—that the blow was from the "big hole"—the *direct application and exhaust port*. The opinion of all enginemen running ET equipment was similarly divided on the same question (incomplete investigation), but this fireman was right—he had held his hands over both holes.

Now, it's peculiar—none the less the fact, although I can not say just why—that the little "dummy triple-valve," or *equalizing* valve of the distributing valve, is much more sensitive to slight brake pipe reductions than any ordinary triple-valve; in the cases just referred to the feed-valve was sticky and slow to respond to variations of the train line pressure, with the result that when 70 pounds had charged-up the feed-valve would close and not reopen until leakage from the train line to atmosphere had reduced its pressure anywhere from 1 to 3 pounds, and this reduction, while not affecting any regular triple-valves, will usually actuate the one in the distributing valve that is nominally the "equalizing valve," causing pressure to be supplied to the application chamber; and although this pressure will be exhausted through pipes *B*, and *B'*, at the big hole of the engineer's valve, it will open the application valve, slightly, before it can escape, resulting in a partial brake application; of course, as soon as the feed-valve opens up and the train line pressure is restored, the blow and brake action cease. The fact that the blow from the brake valve and the application of the locomotive brakes take place simultaneously causes many enginemen who have not actually investigated the source of the blow, to imagine the *first* to be the cause of the *second*, and in that case "the blow must be brake pipe air"—therefore they report the *equalizing discharge valve*. To cover all such cases, until the men have been sufficiently instructed, I tell them to *report the feed-valve*, and *train pipe leaks*.

A freight engineer's trouble from similar cause was odd: Now, notice closely—the train line feed-valve on his engine was o. k. and worked sensitively, and he had not been up against this trouble before; it was a case of double-heading and his engine was placed second, with the head engineer handling the brakes; as soon as they got out on the road and the train line pressure was up to the regular 70, every little while the brakes on the second engine would apply; and they held with force for a while in this case, finally releasing through the "big hole" in the brake valve; so the engineer wired the independent valve in release position in order to open the application chamber to the atmosphere, and had no further trouble with his brakes dragging. But that was unnecessary, and prevented his brakes from applying when they should. It would have been easier to have carried his *automatic brake valve in running position* to have accomplished the same results that he desired, and to have left his independent valve also in its running position free for use, being careful to return the automatic valve to lap when from the escaping pressure he believed the other engineer was beginning a regular brake application. The cause of this trouble was the same as the one previously narrated, but the irregular-working feed-valve happened to be *on the head engine*, and there were, of course, leaks in the train line. The leading engine did not have the ET equipment, and if either engine had been pulling that train *singly* the trouble of sticking brakes would probably not have occurred.

A freight engineer reported that his train line pressure was irregular; he had examined, and cleaned and oiled the feed-valve, but the trouble got continuously worse, and the air brake inspector was unable to locate the cause; the black gauge pointer would rise clear up to the red one with the engineer's valve in running position. The cause here was again in the feed-valve and could occur on any engine with the B-4 feed-valve—

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with or without the ET equipment; but *just because it was the ET equipment* the cause was supposedly mysterious and the trouble was looked for elsewhere after the feed-valve's inner parts had been inspected and found good. I exchanged the feed-valve in the instruction car for the affected one and the engineer had no further annoyance in that line; in the car the cause showed plainly, but had been concealed by the general noise in the engine cab; the large cap-nut had become warped, causing a slight leak; the piston was one of those with packing rings (packing rings are done away with now in the feed-valve pistons), the ring was neatly ground to a fit, and the small leakage port that is drilled through pistons that have packing rings was so small that immediately after being cleaned it would get gummed shut again; when 70 pounds train line pressure closed the regulating valve the air leaked out through the cap nut faster than the piston leakage could supply it, with the result that the piston held the slide-valve off the feed port permanently. *The fourth cap nut was taken from stock before we found one that would screw up tightly and not leak.*

The "combined strainer and check-valve," and "special fitting," through which the signal line receives its supply of pressure from the same 45-pound reducing valve that delivers pressure to the indepedent brake valve, is quite heavy, comparatively, to be supported by the small, ⅜-inch pipe to which it is attached, and this pipe has a habit of breaking off occasionally. Such a breakage occurred the other day on a passenger engine while on the road, the pipe breaking just past the reducing valve; what should you do in such case? This engineer plugged the pipe toward the reducing valve; it wasn't necessary; if he had just unscrewed the regulating nut of the reducing valve until the spring was perfectly slack no pressure would have passed through the valve.

And he had trouble that he couldn't understand: Every time he applied his brakes with the automatic valve there would be a blow of air at the exhaust port of the independent brake valve and the locomotive brakes would at once release. He should have plugged that exhaust port under the independent brake valve, and also the end of that section of the broken pipe connecting with the independent brake valve; for, whenever an application of the brakes filled the application chamber with pressure it passed up through the little copper pipe *B*, to the independent valve, and coming underneath its rotary valve, *lifted it* and escaped through the exhaust port and the broken end of the pipe that he should have plugged.

After we had the ET equipment in service a short while, one passenger engineer, whose statements were generally accepted and who was running an engine with the new device, declared that it was a decided failure and a nuisance; he was making miserable stops; the trouble was in the engine brake but he didn't know what to report, and the inspectors at both ends of the division were also unable to locate the cause of his trouble. In fact, it almost resulted in official condemnation of the ET equipment. The evidence was that while the driver and tender brakes would apply and remain set all right by the independent valve if thrown full-on suddenly and permitted to stand in the application position, lapping that valve would permit the brake to release; worse, however, at any kind of an application by the automatic brake valve not more than 10 or 12 pounds' pressure could be obtained in the brake cylinders.

Upon this evidence I instructed that either the pressure chamber of the distributing valve contained much water, or the packing of piston *10*, Fig. 3, leaked badly. They found no water, and claimed the leather packing of the piston looked fine—and the trouble continued.

When the opportunity came I showed them that simply removing the front head, *7*, of the distributing valve, as they had done, would not reveal the condition of the packing leather on that piston, and the expanding ring and packing ring could not be inspected—the former may not expand, and the latter may be broken. I had the piston removed and it was then seen that while the leather was perfectly smooth all around, and not a *buckle* at any point in its edge—*well oiled on its bearing surfaces*—the leather had hardened to its permanent form and would not expand. I showed the young inspector how to soften it in warm water and then work oil into it with his fingers until pliable; then after the piston, packing ring, valves and chamber had been cleaned and greased lightly with *air brake graphite grease*, to wipe the packing leather and rub the graphite grease well

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into it and just before replacing fill under the edges of the follower plate and cupping of the leather with the grease; and after putting it up to be most particular to have a sound gasket under front head, No. 7, and it tightened well against leakage. The trouble was ended. There had been evidence of brake cylinder leakage, however, and their piston packing leathers were given the same treatment as above, and their pipe joints inspected.

Watch for that leakage past piston *10*; there's a mighty small graduating valve in the "dummy triple-valve," and it lets a very small feed of air to a very small "dummy cylinder"—application chamber and chamber *g*—so that a slight leak past the piston will get rid of the pressure given it pretty quickly; and it's hard to get an inspector to take out piston *10*, for the reason that he must first remove the *application-valve pin*, *18*, and that, again, calls for taking off the top cap, *3*, and application-valve, *5*; but that ought to be done pretty frequently anyhow, because the full main reservoir pressure is up there riding that valve all the time, and when it gets out of lubrication and works hard it increases the chances for the failure of the packing of piston *10*.

The duty of the engineer with ET equipment in double-heading, when he is not operating the brakes, is generally understood; but suppose his air pump has failed? If he has no main reservoir pressure the other engineer can not apply the brakes on the second engine. When it is desired, however, the Westinghouse Air Brake Company furnish a connection between the main brake pipe, or train line, and the main reservoir, consisting of the *combined strainer and check-valve* and *choke-plug* of the same style as those used in the supply pipe to the train air signal line, wtih a cut-out cock which is normally closed; when your pump is stopped and another engine is supplying the pressure it is only necessary to open this cock in order to have your main reservoir charged from the train line and your engine and tender brakes are ready to be operated automatically from the other engine and you can use your independent brake valve; of course your automatic brake valve should be carried in the lap position, and the cut-out cock beneath it closed. Where an engine is not equipped with this special charging device, if the pump fails and there is another engine to the train there is no use for leaving the distributing valve cut in to the train line; it will do no good and only wear the packing leathers unnecessarily; follow instructions as for double-heading, but also close the cut-out cock in the branch pipe from train line to distributing valve, and inform the other engineer that your locomotive brakes are inoperative.

If anything should go wrong with your train line feed-valve so that you could not keep the pressure steady at 70 pounds, remember that you can always change-off with the signal reducing valve, as they work exactly alike. After making the exchange tighten up the regulating spring of the reducing-valve until the black gauge pointer is at 70 pounds; and if the feed-valve will keep up any fair pressure at all the air signal will work —you may, or may not, be able to get enough pressure to make the straight-air brake hold; but your main air brake pressure on the engine and train will be carried all right. For that reason keep your signal reducing valve in first-class condition, *even in freight service where you are not using it*, as you don't know when you might want to "borrow" it.

Don't depend on the fact that increase of piston travel, and moderate brake cylinder leakage has no effect toward weakening the brake power of the engine with ET equipment; if you do, the pistons will strike the non-pressure heads some day when you would rather that the shoes would strike the wheels; and when brake cylinder, piston packing leathers are allowed to harden they can leak out pressure faster than the application valve can supply it—I have learned that from experience.

When anything about the foundation brake gear gets out of working order, or you have a slipped or loose driving-wheel tire, etc., remember there is an individual cut-out cock for each set of brakes, and by closing the right one you can cut out separately the driver brake, the tender brake, or the truck brake—or all of them. And remember that when one set of brakes won't work and the others do, maybe someone has accidentally, or otherwise, closed one of those cut-out cocks; we had an engine running several trips with the driver brake cut out, when the ET equipment was new here, and the inspectors being superstitiously impressed with the mysteries of the equipment concluded that the cause was in the distributing valve.

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*Setting a New Sector**

When it becomes necessary to replace the quadrant or sector on a locomotive it must not be imagined that an exact reproduction of the worn-out quadrant with new teeth would suffice. Organic changes are taking place in the locomotive all the time. Distances from point to point vary, partly by the deterioration of the wearing parts, and partly by the haphazard method in which running repairs are often done. A new quadrant will necessarily involve at least a new latch in the reverse lever and also other new attachments. The valve gearing may be adjusted with the reverse lever in temporary positions, the lever being held steadily in place by a set screw at the desired points. The length of the reach-rod should be such that when the link block is in the center of the link the reverse lever should be standing perpendicularly on the quadrant. It may be remarked that the locomotive should be placed on the dead center while finding the center of the reverse lever, as that is the only point at which the link hangs in an exactly vertical position. This central point in the quadrant is of importance and should be reached by experiment on both sides of the locomotive.

Some constructors make an allowance for the amount which the link drops in service, because, as will be readily perceived, lost motion accumulates by the wear of the bearings, the link gravitating lower on the link block as the wear increases. It is also to be observed that the expansion of the boiler when heated is much greater than the expansion of the reach-rod, and on locomotives where the quadrant is attached to the boiler this varying expansion has the effect of shortening the reach-rod and raising or lowering the link according to the position in which the links are placed in relation to the lifting shaft and reversing lever.

*From Railway and Locomotive Engineering.

The reach-rod being of the required length, and the center of the quadrant being fixed, the extreme points of the arc through which the lever travels are to be noted, and it must be observed that the clearance at each end of the link is sufficient to preclude the possibility of the ends of the link colliding with the link block. The vibration of the parts of the link motion incident to railroad service is much more than is generally supposed, and three-eighths at the bottom of the link and one-half inch at the top should at least be allowed for clearance.

Having the three points marked on the quadrant, the distances can then be measured and the number of notches decided on by an approximate calculation of the thickness of the latch and the intervening spaces between the notches. The bridges between the notches should measure at least one-sixteenth of an inch more than the space required for the latch. The surplus distance, if any, after dividing the notches equally, can be added to the bridge spaces. It will be found that the space from the center to the front and back extreme points of the quadrant may differ in length, causing a difference in calculating the number of notches.

Some quadrants are marked off with a smaller number of notches back of the center than in front, but there is no great reason why they could not be laid off with an almost equal degree of regularity. It is well that the center be distinctly marked in some way, either by having the center notch separated by a larger intervening space from the others than the remainder or otherwise, and it may also be observed that it is necessary that the quadrant and the entire mechanism of which it forms the guiding part should be carefully re-examined after the finished quadrant has been hardened and polished and bolted into place.

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HEADLIGHTS AND WATER GLASSES

BY W. L. FRENCH

There are headlights and headlights, or, in other words, two headlight reflectors that are apparently the same as far as the general condition of the reflectors themselves, the burners, the wicks, buttons and ventilators of the cages are concerned, and one will be found to give a better light than the other, but this is not strange when it is noted how often one hears one locomotive being quoted as being so much better than another of the same class and specifications.

Silver or aluminum is used to coat the interior or headlight reflectors, to reflect or throw back the rays of light given off by the flame. Silver is really the best as it is a white metal, is soft and polishes well, and being so white of itself absorbs but little light.

The best reflector possible should be used with an oil headlight, as the view of the engineer behind the light is none too good at the very best, it seeming to serve more to tell the other fellow he is coming, and where he is, and to guide him safely through the yards at low speed than to be of any real benefit as an accident preventer when out on the main line flying along at a high rate of speed.

With the electric headlight the engineer's view is greatly increased, but the one toward whom the electric headlight is approaching finds it impossible to judge the distance of the coming headlight with any degree of accuracy.

It is an axiom of geometry that the angle of incidence is equal to the angle of reflection, and applying this to a headlight it means that the rays of light cast by the flame of the headlight on the reflector will be cast back at the same angle. The idea then is to so design the reflector as to collect and focus the greatest possible number of rays of light on the track ahead of the locomotive.

The reflector is made cone-shaped with the point of the cone cut off and rounded. Some roads set the glass in the front of the cage sloping in at the bottom, with the idea that the light will be thrown the better on the track, but it is doubtful if such is the case. The headlight reflector should be in line with the track and square with the glass in the cage to give the best lighting result.

A wick that is not charred or corroded is necessary for a good light, and the burner also should be clean. Cotton flannel will make a good wick, when a regular felt one can not be obtained, if fastened to the wick thimble in the same manner as the felt one. A wick can be trimmed by heating a piece of flat-iron, removing the button and burner, and burning the wick off smooth with the tube by laying the hot iron flat on the top of the end of the wick, or it may be trimmed off with a very sharp knife blade.

A wick that has been used can be trimmed in a perfectly satisfactory manner by running one's finger around the top of the burner tube, being careful to move the finger always in the same direction; this will give an even surface to the top of the wick by removing all the charred wick. This method is quick and always available. Turning the wick up or down unnecessarily should be avoided, as it tends to make the wick ravel and become uneven. The flame should be blown out and not turned out. The burner strainer should be kept clean so that air can reach the flame freely, as that is needful for a good white light. The height of the button above the burner has much to do with affording a good light by spreading the flame properly, and it also has something to do with the headlight smoking. If the headlight smokes when plenty of air is admitted to the cage, and the top of it is not stopped up with soot and the meshes of the strainer are open, raise the button on its spindle or, if it will not move, get one with a longer spindle and note the effect. Two or three trials may be necessary to secure the desired result. The slide at the bottom of the burner must be kept open and plenty of air be allowed to pass through the burner, as this will keep the chimney from becoming overheated and cracking or melting. The slides in the side or bottom of the cage should be so regulated as to admit the proper supply of air. Lamp black wet with signal oil and rubbed on with clean soft waste free from wiry material should be used to clean the reflector. The lamp black should be rubbed on lengthwise of the reflector and not around it. Polish it with dry lamp black and clean waste. Metal polish of any kind should not be used, for it destroys the silver coating on the reflector.

Headlights on large engines are placed

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too high from the ground to give good lighting results. Placed on the smokebox door of a "battle-ship" the headlight would be none too near the ground, and in no more danger of injury from anything striking it than it would be on the top of a smoke arch of a standard engine.

To light a headlight when a wind is blowing, take an ordinary train order, roll it in the form of a tube and insert it in the top of the chimney, allowing the lower end of the order to rest on the wick inside the burner. Close the cage door, all but just room for the arm, light a match, and set the top of the order on fire. The blaze will run down the order and ignite the wick and one can close the door as soon as the order is lighted, as the light ash of the order will rise and float out of the chimney when the engine gets in motion. A headlight can be lighted in this manner in any kind of a wind.

The water glass has come to be regarded as a part of the necessary equipment of a locomotive, as it furnishes an accurate and easily observed notice of the water level in the boiler so long as it is kept in good working order, but the proper working of any device is, of course, dependent on that condition. The one thing to do to be sure that a water glass is in good order is to note if the water in the glass moves freely up and down: to do this the water should not be allowed to get up out of sight in the glass. More boilers have been burned on account of water being up out of sight in the glass and there being supposedly plenty of water in the boiler than from any other cause. If the water does not work freely in the glass, find the trouble and remedy it. It is when one thinks the water is all right, and it is not, that boilers are burned, for when the water is low and one knows it, proper precaution will always be taken to prevent any damage to firebox or boiler. A new water glass should be put in about every four weeks, as the action of the steam causes them to become thin at the top, and after that length of time where an engine is in active service a glass is liable to give away at any time. Putting in a new glass will prove to be a better safeguard to avoid injuring any one than are the screens over the glass or wings on the water glass lamp.

When a water glass breaks, shut off top and bottom water glass cocks and open blow-off cock to water glass. This will remove any water remaining in the bottom nut. Remove packing nuts and packing nut sleeves, and clean out the old gaskets and broken glass from water glass cocks. Take plug out of top of upper water glass cock, pass water glass down through top cock and put on a rubber gasket or two if needed, put sleeve on, and then upper and lower packing nut, and lower sleeve with one or two gaskets as desired. Force glass down to its place in lower water glass cock, crowd gaskets in place, and screw packing nuts up firmly with the hand. Compressing the cold gaskets up tight by using a wrench on the packing nuts kills the life of the rubber, for as soon as the steam and hot water reaches the gasket they become hot and try to expand, and sometimes the rubber forces itself under the end of the water glass and stops it up, requiring the work to be done over. Replace plug in top of upper water glass cock, open both water glass cocks a little and close water glass blow off. Then open water glass cocks as wide as wanted. Blow the water out of glass and note how rapidly it returns. This will indicate the working condition of the glass and removes any small piece of rubber or glass that might have been left in the water glass cocks. If a water glass is too long it can be cut easily in the following manner: Light a torch. Take a common parlor match, dampen the phosphorus and rub it in a circle on the inner side of the water glass, where it is desired to cut it. When a good ring of the phosphorus shows on the inside of the glass, hold it where marked in the flame of the torch, rolling the glass over in the fingers so that it will be exposed all around to the flame, and in a very few seconds it will crack off smoothly where marked. This is an easier way than to cut a glass with a file or a cutter, and it avoids the carrying of either of them, while a match is always available.

The fact that a water glass breaks soon after being put in is no indication that the glass was a poor one. The top and bottom water glass cocks may not have been in line, thus causing a side strain on the glass.

There is danger of injury to persons from flying glass when a water glass bursts, but putting in a new glass before the old one is worn to the bursting point is the better way.

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A water glass will often show that it is in poor condition by indications of wear about the top of the glass, and it also appearing to contain flaws. Automatic devices to shut off the water and steam when a glass breaks are plentiful, but not very satisfactory in actual service as corrosion spoils their efficiency.

Most guards used interfere with the view of the water in the glass, and also with cleaning it. Some roads use an extension on the top packing nut that comes down nearly one half the length of the glass, the idea being to safeguard the part most liable to breakage and also to cause the engineer to carry a water level that will not be too high for the working of dry steam. These extension nuts are used on large engines.

The fireman has a good opportunity to note the water level at all times and to so carry his fire as to avoid a waste of fuel. If he did not know the true water level, naturally he would play on the safe side and carry a fire that would allow the boiler to be filled up when steam was shut off. In addition the fireman is watching the water level as well as the engineer, and the chances of injury to the boiler by burning are greatly lessened, as the chances of two men overlooking the same thing at the same time are very few. In case it should be found that the water is not working freely in the glass the gauge cocks should at once be tried to determine the true water level, and it being found to be at a safe point blow out the water glass thoroughly. If that does not make it right, close top water glass cock, blow out the glass and open the top cock; proceed the same with the bottom one and then open them both and blow the glass out good. This will usually put the water to working freely in the glass; if it does not, the stoppage is pretty solid. A new glass can be put in, and if this does not remove the difficulty the engine will have to be run to the terminal, using the gauge cocks, and have the water glass boiler passages bored out after arrival.

Where the water is "bad," or much soda ash is used in the water, the water glass is of great benefit in fixing the true water level. By easing off the throttle the engineer can determine how much water he has at any time by allowing the foaming mass to settle. Where water is foaming the water glass should be blown out more frequently than with good water. The water glass should be located so as to be plainly visible to both the engineer and fireman, and if necessary to do this two water glasses should be used and a close watch should be kept on the water column at all times, and it is well for the fireman of today, who will be the engineer of the future, to make this an important part of his training.

A DANGEROUS AIR BRAKE PRACTICE

BY F. B. FARMER

The word practice, in regard to what follows, is used with the understanding that it means something unusual and not exceptional. This dangerous practice is holding a standing train on a grade with air brakes where the stop exceeds ten minutes and a locomotive in charge of the brakes remains attached to the train; or in ever cutting off the locomotive with the air brakes applied, no matter how short the stop is to be. Nor is the steep grade alone considered, for it is dangerous on any grade where the train will run if no brakes are applied. It is serious enough where one or more locomotives remain coupled to the train, and absolutely criminal where no locomotive is attached.

That this practice is followed by men who have not seen its dangers nor heard of it from others in whose statements they can rely, is not so hard to understand, for following it for some time without an accident is liable to breed contempt for the rules or instructions that prohibit it, particularly where compliance means, as it does, a little more work and time. But where, as has been seen, the practice is continued by men who were working on the same grade when, within a few months, it was directly responsible for a runaway which de-

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stroyed several lives and much property, some of the dead being their fellow-workers—where in the short interval between this accident and its farther observance another runaway occurred from the same cause and did no damage merely because there happened to be nothing in the way before an ascending grade and the hand brakes applied stopped the train, is more than the writer can understand or offer any reasonable explanation for. Yet it is a deplorable fact.

Neither were the conditions in either case as severe as they might have been as regards the train getting away, as in each it is fair to presume that some hand brakes were set when the air brakes leaked off sufficiently to let the train start, and in both a brakeman at once commenced and continued applying hand brakes as long as he dared remain aboard.

Some competent air brake men who have personally made hand brake tests with a single car, expressed to the writer their conviction that with the average freight train at a speed of ten miles per hour or more, down a grade of 100 feet per mile or over and no aid rendered by air brakes or a locomotive reversed—under these conditons and a train crew of three men commencing and continuing to apply hand brakes as rapidly as possible, that it is more than probable that the train speed would continue to increase until a wreck occurred or the grade became less steep. Runaway trains have been got under control, but the writer knows of no instance under such limitations as mentioned and does know of some where with one locomotive reversed, some aid from the air brakes and all that could be rendered by three men applying hand brakes, the speed increased until a wreck occurred.

Air brakes must leak off in time, how soon depending on maintenance. Leaving the air applied with hand brakes set is almost, if not equally as dangerous as having no hand brakes set, for no one can say how many will be required to hold a train until it is seen that with the number applied and the air brakes released the train does stand.

The statement that "nothing is proven until it is tried" applies here with particular force, and the only way to prove the hand brakes is to try them by releasing the air brakes. If the train starts the air brakes can stop it at once. More hand brakes should then be applied until with the air brakes released the train will stand. With a descending train there is yet left a sufficient element of danger to justify caution, as the retaining valves may hold enough to enable them and the hand brakes set to hold the train until the former leak off. But this danger is slight or entirely eliminated where the air brakes are released as soon as the train stops and kept so until the locomotive is cut off, the train being held by the locomotive reversed, the independent or the straight-air brake until the hand brakes are set, thus giving time for the retaining valves to leak down. They do this quicker with a train standing than with it running, but the triple valves must be kept in release.

The engineer and the conductor are the responsible and the most interested parties. It is well to be a "good fellow" to the extent of saving work for the brakemen when this is possible without danger, but it is no reason or excuse for an engineer failing to follow the correct method as outlined in the beginning of this article. If the brake pipe has been closed before the engineer appreciated that the engine was to be cut off or the train separated he should insist on it being opened again until he could release the brakes.

Railway officials are reasonable and thinking men and would certainly uphold any engineer and censure the trainmen where a delay arose from the insistence recommended, particularly when the danger was explained, if the official was not already aware of it. But the conductor is the most responsible man, as he is in charge of the train and should see that the method advised and covered by rule or instructions where roads take proper precautions, is invariably followed.

While it is not usually deemed prudent to exercise severe discipline for every infraction of rules, there are some, such as flagging and this one, where violation should invariably be so dealt with as to make it evident to all that no known case will be overlooked.

More or less close observance over some seventeen years enables the writer to state with certainty that a large percentage of runaways down grades, many of them resulting in some lives and much property being lost, is the direct result of the bad practice explained. Early in his experience as an engineer he underwent a nerve-racking half-hour until it was found that three cars, loaded with men, that had got away through being

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left with air and hand brakes set, had been stopped without accident. It is hoped that some, at least, who read this will profit by the experience of others. This bad practice may be followed for years before the runaway follows, but that it will eventually is "as sure as death and taxes."

ELECTRICITY—DYNAMOS

BY ELWOOD GRISSINGER

As shown in the preceding paper, the simplest dynamo consists of one coil of wire revolved in a two-pole field. This coil when rotated gives a current under a pressure varying from zero to a maximum and so on. To make the current direct, a two-part commutator was shown. For practical purposes, a dynamo generating a current which would vary through such a wide range would be of no use. The voltage must be uniform. In order to accomplish a result which would insure a uniform voltage or pressure, the number of commutator segments must be increased, which means that the number of coils of wire to be wound upon the armature must also be increased. There are usually as many parts to the commutator of direct current armatures as there are groups of coils in the armature circuit.

The earlier forms of direct current dynamos possessed but two field poles, but all of the modern dynamos have four poles or more. The greater number of field poles has made possible the reduction of speed of the machines and other advantages have been gained, such as better mechanical arrangement of the parts, higher efficiency and improved appearance. Eighteen hundred and 2,000 revolutions per minute used to be common speeds, whereas 400 and 500 were rare. At present speeds are run as low as seventy-five revolutions per minute for larger machines. The smaller sizes of dynamos are made for different speeds, going as low as is necessary for direct connection to modern engines. Steam turbine practice has now come to the fore. This has required the development of an entirely new line of dynamos, running at higher speeds than any heretofore designed, gaining in the unit cost of construction, economy of operation and decreased amount of floor space necessary for the installation of the equipment.

The simplest form of a dynamo shown in the preceding paper was also the oldest form in that a current could be generated by virtue of the permanent magnetism of the fields—for in this case the two poles were those of steel magnets which had been given their magnetism from some other source. The voltage of the machine, therefore, could not readily be changed, except by varying the speed. This type of dynamo is called a *magneto-electric machine.* In this form of a dynamo the magnetism of the fields is sure to diminish slowly by aging, and is also likely to be weakened by hard usage. However, the form survives and has its largest use in telephone work, automobile generators, motor boat igniters and for testing sets in electric light and power stations. Another serious disadvantage of such forms of dynamos is the fact that permanent magnets can never exhibit and retain anything near the magnetism that can be given soft iron and steel by separate excitation. On this account, magneto dynamos are much heavier for a given output and correspondingly bulky.

The next development of the dynamo is referred to as the *separately-excited* type. The magnetism is given to the field from an outside source, such as a primary battery, another dynamo, etc. This form of machine is illustrated in Fig. 1.

The two-pole field will be used in the illustration referred to and those which follow in this paper for convenience and simplicity. A commutator with a larger number of segments is also shown, which means, as already pointed out, that there are a correspondingly greater number of armature coils and these are all connected to the commutator segments. The field magnets terminating in the poles N and S are of the horseshoe form, equivalent to a bar magnet bent around upon itself. The lines of force or magnetism pass from the North to the South pole

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through the armature and thence through the field magnet core. *A A* are the brushes, which are shown bearing upon the commutator and connected to the outside circuit, which outside circuit may consist of the usual wiring to which may be connected lamps, motors or other

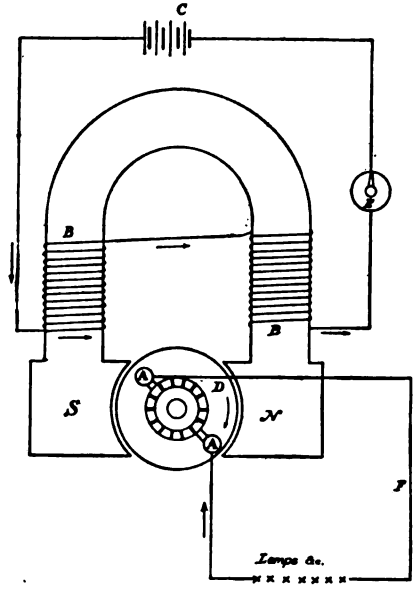

Fig. 1

translating devices. The direction of rotation is assumed to correspond to the direction of the hands of a watch, and the direction which the current will therefore take is as shown by the arrows.

B B represent the field coils in this case, through which an exciting current of electricity is caused to pass from the battery *C*. This exciting current may come from a primary battery, a storage battery or another dynamo, so long as it is a direct current sufficient in quantiy and pressure for the purpose. The passage of this exciting current through the field coils at once forms an electro-magnet, precisely as shown in a previous article covering that subject. The poles of this electro-magnet are N and S. This electro-magnet produces, therefore, a field force or magnetism which passes through the armature *D* from N to S. When, therefore, the armature *D* is caused to revolve, its conductors wound upon it (which are not shown) cut those lines of force as it is termed, and a current of electricity is induced in the armature and in the circuit, therefore, to which the brushes bearing upon the commutator are attached. Such electrical current will be developed at a certain pressure or electromotive force, which pressure will depend upon the speed at which the armature revolves, the strength of the magnetic field or the number of conductors or groups of the same that are wound upon the armature.

The number of active armature conductors is, of course, constant in any one machine, and, therefore, to vary the voltage of the machine it is necessary to vary one or both of the other factors. As it is usually impracticable to have a source of motive power of variable speed, recourse is had to the methods for varying the strength of the magnetic field, which means changing the strength of the magnetic field or, more plainly, increasing or decreasing the number of magnetic lines of force which pass through the armature. This is accomplished with every form of dynamo now built by inserting a *resistance box* in the field circuit. This is shown at *E*. A resistance box is made up of a number of coils of wire or equivalent resistance mediums, which coils are separated and insulated from one another. The later and more substantial forms of resistance mediums are made up of cast metal so as to be fireproof and practically indestructible. The coils or grids are connected within the resistance box in different ways but in general have an end coming to a button on top of the resistance box over which may slide a contact arm. This arm is moved by hand when it is desired to change the voltage of the dynamo. The movement of the blade or contact arm over the contacts on the outside of the resistance box cuts in or out more or less of the resistance forming the resistance box. This increases or decreases the amount of current which can flow in the circuit in which such resistance is connected. This variation in the amount of current which can be caused to flow through the coils wound about the field magnets *B B* will produce a corresponding variation in the strength of the magnetic field or the number of lines of force passing through the armature, resulting in a change in the electrical pressure developed by the dynamo. The common name for a resistance box is *rheostat*.

It was not long after the advent of the second form of a dynamo that it was found possible to make dynamos self-ex-

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citing. The simple and practical methods of accomplishing this result are two in number: (1) The entire current generated by the armature is caused to pass through coils wound upon the field poles, thereby producing a magnetic field in the familiar way. This forms a *series dynamo.* (2) Only part of the current generated by the armature need be carried through the field coils. These coils are not connected in series with the armature, but are in *shunt* relation to it. Such coils are called *shunt* coils and such a dynamo is called a *shunt wound dynamo.* The field coils in this case have a larger number of turns of wire carrying a small current, while in the case of a series dynamo there is a smaller number of turns of wire carrying a large current. The product of the number of turns of wire times the number of amperes of current flowing through the turns is called *ampere-turns,* and it is the ampere turns which govern the strength of the magnetic field. For a given strength of the latter, any increase in the number of turns of wire on a field pole or upon any other electro-magnet, means a corresponding decrease of current necessary to flow, and vice versa.

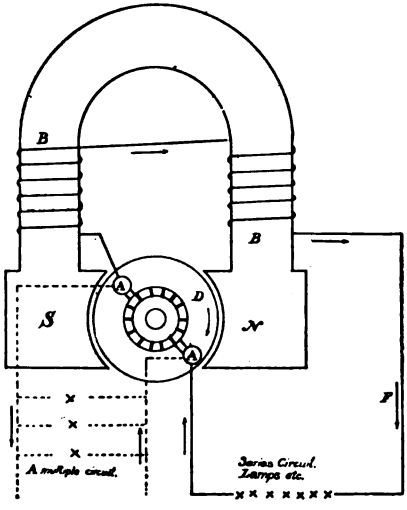

Fig. 2

Fig. 2 shows a series dynamo and the path the current takes, assuming the conditions to be the same as described for Fig. 1. N and S are the poles as before, *B, B* the field coils, *A, A* the brushes, *D* the armature and *F* the main circuit. This is the simplest of the self-exciting dynamos. At this point it may be asked how such a dynamo is self-exciting.

When any generator is built, a current from some external source is sent through the field winding for a few moments and then cut off. The effect has been to magnetize the fields with a separate current, and when the latter is cut off the iron in the field core will retain a certain small magnetization, called *residual magnetism.* It is, indeed, a very small percentage of magnetism that remains, and this is independent of the kind of iron. After the fields have been separately excited, the generator will ever afterwards "pick up" of itself when set in motion and gradually attain full magnetization of fields and consequently full potential.

The series dynamo, as shown, has but one circuit. They are not as sensitive to picking up their voltage as a shunt wound dynamo—usually requiring full speed and resistance less than usual in the field circuit. In contradistinction to the shunt dynamo, they also require that the external circuit be closed, because there being but one circuit, the dynamo will not be able to show any voltage unless that circuit is closed. Series wound machines have the great objection of a tendency to show a reversal of the polarity of their fields, because of a backward flow of current, which can occur in electro-plating or in the charging of storage batteries. If such a dynamo is operating arc lamps in series with one another, the addition of a lamp will add to the resistance of the circuit and correspondingly diminish the power of the machine. This can be neutralized to a certain extent by means of a rheostat. When a lamp is added to the circuit of the dynamo, cut out some of the resistance and so on. If the lamps were not in series with the armature, but in parallel with it, as shown by the dotted circuit, then for every additional lamp, the resistance of the circuit is decreased, and the current will increase around the field so that the rheostat would need to be cut in, inserting enough resistance to keep the voltage down. Such poor properties of regulation make the series dynamo an undesirable machine. When the same style of winding can be used for a motor, better things can be said.

The shunt wound dynamo is shown in Fig. 3. In this form it will be seen that there are two circuits, a shunt circuit

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and a main circuit. The former applies to the field only, while the latter is the circuit which passes to the lamps, motors, etc. It is endeavored to illustrate that the shunt winding on the field is made up of a large number of turns of small wire

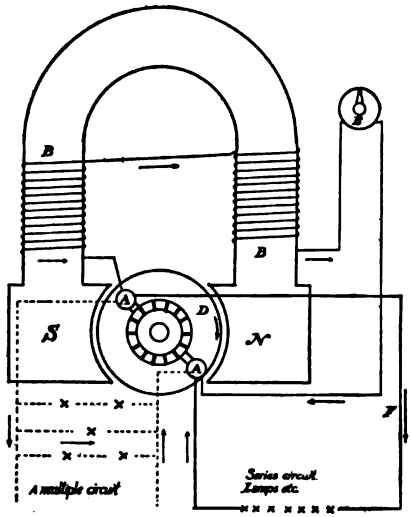

Fig. 3

as against the reverse condition shown in Fig. 2. The symbols in the cut have the same reference as before. Wherever there are two or more paths for the current to take, it will divide itself in proportion to the resistance of the different paths. In the case of the shunt dynamo, the shunt resistance is the same all the time. This is likewise true of the resistance of the entire shunt-circuit, unless the amount of resistance in use in the rheostat is changed. The resistance of the main or external circuit will vary, however, with the changes in the load. Every variation in such resistance will cause a change in the proportion of current flowing in the two circuits. We have seen how any change in the current strength circulating in the field coils changes the strength of the magnetic field and hence the voltage; consequently, we must resort to the rheostat for hand regulation in order to maintain a uniform voltage. In the shunt dynamo, if lamps or other devices using current are connected in multiple or parallel in the main circuit, the addition of a lamp will decrease the resistance of the main circuit. This will divert some of the current from the field winding, because of the change in the relative resistance. Therefore, the magnetism of the fields will drop a little in strength, since less current is flowing through the shunt field winding. If the lamps are operating in series, the resistance of the main circuit is increased for every lamp added, and because of this more current will flow through the shunt winding, thereby strengthening the magnetic field and increasing the voltage of the dynamo. To obtain regulation, the rheostat must be employed and operated by hand when necessary. A shunt dynamo will "pick up" its voltage with greater ease than a series machine, and is less liable to a reversal of polarity of its field poles.

Some separate circuit self-exciting dynamos have been devised, but as they have never been developed on a practical basis, it is unnecessary to illustrate them here.

In each of the forms of dynamo shown it is noted that they are not automatic in their regulation. Such regulation as can be had must be by hand through the medium of a rheostat. Certain combinations of field windings have been devised, however, which give first class automatic regulation.

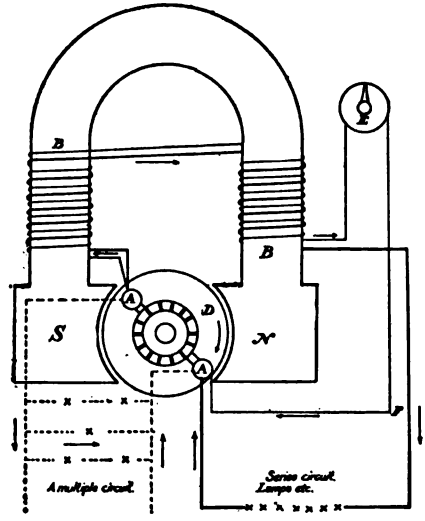

Fig. 4

In general, we may say that a dynamo is made to supply current with steadiness to lamps for lighting. With the exception of street lighting, lamps are always connected into the circuits in parallel.

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Street lamps, with but few exceptions, are connected through one another in series. In the former method of multiple running, a dynamo must develop and maintain a constant pressure. In the series system of lighting, a variable pressure is brought about by a varying number of lamps, but there must be a constant current. In other words, if a system of street lighting employed 50 lights, each requiring 50 volts and 9½ amperes of current, then if they were run in series the voltage of the generator would have to be 50 lamps times 50 volts, or 2,500 volts, and the current generated by the dynamo 9½ amperes (as each lamp requires only such current strength). If, however, the lamps were connected in multiple, the voltage of the machine would need to be but 50 (not counting for line losses, etc.), while the ampereage would have to be 475. The product of the number of lamps, strength of current and voltage of the generator will, it is noted, be the same in each case, requiring the same amount of horse-power, with one exception. Assuming the area of distribution to be the same, the line copper will need to be much heavier in the case of the fifty volt generator and the line losses will be more than when the lamps are run in series and a twenty-five hundred volt generator is employed. With heavier external losses, the output of the dynamo will need to be increased, and consequently more horse-power developed to accomplish the same result.

Fig. 4 shows the arrangement of field coils and circuits of a compound-wound dynamo, which is the modern form of a direct current dynamo affording automatic regulation for circuits requiring constant pressure.

THE AIR BRAKE ASSOCIATION CONVENTION

BY F. B. FARMER

The fourteenth annual convention of the Air Brake Association was held in Columbus, Ohio, on May 14, 15, 16 and 17, 1907, President Garabrant, Genl. A. B. I., P. R. R., presiding. As indicating the excellence of papers presented and the interest in the discussions, four days were required, where three were heretofore sufficient. The report of the secretary showed a very satisfactory condition, the membership being 817 and the cash balance, May 1st, being $1,708.32. Receipts for the year were $4,155.58 and disbursements $4,287.32.

The convention was honored by the presence at the opening of Governor Harris, Mayor Badger and Sheriff Carb, all of whom addressed the meeting and gave the members a most cordial welcome. The latter recalled that he had the honor and pleasure in 1894, when mayor of Columbus, of addressing the first convention of this association in the same city. The Great Southern Hotel was convention headquarters and also provided the assembly hall.

Following the brief but pertinent opening address by President Garabrant, in which he urged the importance of the association confining its recommendations to practical features, and receiving the reports of Secretary Nellis and Treasurer Best, a paper by Mr. T. L. Burton (Westinghouse Air Brake Company) on the following subject, was read:

"Air Brake Control on Heavy Grades of Trains Composed Exclusively of Fully Loaded 100,000 Pounds Capacity Cars."

The paper was thoroughly practical, inasmuch as it described how on a grade of from 173 feet to 190 feet per mile, averaging 175 feet, and five and one-half miles long, a train of 20 100,000-pounds capacity cars, overloaded, was controlled by the air brakes alone, where heretofore the use of both hand and air brakes had been accompanied by a few runaways. This, too, in spite of a faster speed than usual and with an ample reserve of braking power, as shown by a test stop having been made in 430 feet on the most difficult part of the grade by a 12-pound reduction, speed being about 15 miles per hour.

The improvement effected was due to the use of the type K or quick service, uniform release and recharge triple valves, 15-30 pound retaining valves (30-

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pound position used), a good average condition of train brakes, taking advantage of curves for recharging and avoiding high maximum speeds and long holds between recharges. The following data covering train, grade, trip and a comparison of results with those heretofore obtained, is copied from the paper:

"The trial train was handled down the grade under the supervision of the writer, and under the personal observation of a number of the motive power and transportation officials of the railroad, as well as some visitors from connecting lines. The make-up of the train, condition of brakes, and method of handling same were as follows: The locomotive was equipped with the Westinghouse Air Brake Company's standard automatic brake, two 9½-inch pumps, plain triple valves on locomotive and tender, duplex pump governor, main reservoir of 73,000 cubic-inch capacity, combined automatic and straight-air brake, and schedules SWA and SWB. The feed valve was adjusted to 90 pounds brake pipe pressure with the brake valve handle at running position, main reservoir pressure then being 110 pounds, and 130 pounds pressure with the brake valve handle on lap, or application position. The straight-air brake reducing valve and safety valves were adjusted to standard pressure of 45 and 53 pounds, respectively.

The steam pressure carried on the boiler was 155 pounds, and the weight of the locomotive and tender was as follows:

Drivers	136,500	lbs.
Trucks	14,400	"
Tender, estimated loaded	243,000	"
Total weight of locomotive and tender	393,900	"

The car data is as follows:

Cars in train	20	
Kind of cars, 100,000 capacity, steel, coal.		
Light weight, per car, minimum	41,400	
Light weight, per car, maximum	42,112	
Average light weight, per car	41,855	
Total light weight of train.	837,110	
Average loaded weight per car	142,900	lbs.
Total loaded weight of train, 1,429 tons, or	2,858,000	"

The brake equipment was as follows:

Detached auxiliary reservoirs and cylinders, 10-inch, and K-2 triple valves.

Standard 15-30-lb. retaining valves, used in the 30-lb. position.

The braking power, based on 60 lbs. cylinder pressure, was as follows:

Braking power per car	35,820 lbs.
Braking power per train	716,560 "
Braking power on empty cars, average	85.6%
Braking power on loaded cars, average	25.0%

In making the terminal test, before starting from the summit, all brakes were examined and found to be in an operative conditon. The piston travel had been adjusted in accordance with the rules of the company for this heavy service, but two or three brakes leaked off through defective retaining valve pipes.

The train was successfully handled down the severe grade as indicated below, with five-pound brake pipe applications. The grade and speed of the train are as follows:

Maximum grade..190 ft. per mile, or 3.6%
Minimum grade..173 ft. per mile, or 3.3%
Average grade...175 ft. per mile, or 3.4%
Length of grade..... 5.5 miles
Running time of train on grade 25.0 min.
Ave. speed of train on grade..13.2 MPH.

As stated elsewhere in the paper, the gross weight of the train, exclusive of engine and tender, was 1,420 tons, which was not only the heaviest train that ever went down the mountain, but was by far the heaviest tonnage per car, or per brake, that had previously been considered practicable to handle with safety.

The following is an interesting comparison of the tonnage and speed of the train, equipped with "K" triple valves, with that of trains equipped with old valves and used in conjunction with hand brakes:

Tonnage handled with standard brake (assisted by hand brakes)	1,120
Tonnage handled with "K" valves (no hand brakes)	1,429
Increased tonnage handled with "K" valves	309
Increased tonnage percentage of	26.6%
Tonnage handled per brake under old method	40
Tonnage handled per brake with "K" triple valves	71.45

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Increased tonnage handled per brake with "K" triple valves.....	45
Increased tonnage handled per brake with "K" valves, percentage of..	78.75%
Time consumed on grade with standard valve, assisted by hand brakes..	40 min.
Time consumed on grade with "K" valve (no hand brakes)	25 min.
Maximum average speed allowed with old brake.	8.25 MPH.
Average speed maintained with "K" valves.....	13.20
Increased speed with "K" valves, over old practice	4.95 MPH.
Increased speed with "K" valves, over old practice, percentage of	61.0%

Although the light brake pipe total reductions and short time the triple valve were held in application position resulted in little aid being rendered by the driver and tender brakes, thus increasing the work of the car brakes, the author stated that the wheel temperature at the foot of the grade showed "a marked absence of cold or excessively hot wheels, indicating that each brake was doing its share of work, notwithstanding that several brakes leaked off through the retaining pipe. The uniform temperature of wheels at the foot of the grade demonstrated that the retarded feature of the triple valves on the cars with defective retainer pipes performed, in part, the function of retaining valves."

The results of the tests are summed up as follows:

"The results of the tests were so thoroughly satisfactory to the railroad officials present at the test, and were considered such a decided improvement over the old method of using hand brakes in conjunction with the air brakes, that immediate steps were taken to control the speed of the trains on the grade in the future with the air brakes exclusively. The author of this paper is therefore of the opinion that where cars are equipped with the improved quick service, uniform release and recharge triple valve and "three position" retaining valves, no difficulty should be experienced in successfully handling 100,000 pounds capacity cars, fully loaded, down approximately 200-foot grades, providing the brakes are properly maintained and the braking power is, at least, 80 per cent. to 85 per cent. of the light weight of the car."

That they might be discussed together, a paper was read by Mr. W. H. Spencer, Genl. A. B. I., C. R. R. of N. J. It described briefly a test of the same triple valve with a loaded train of 46 coal cars of 80,000 pounds capacity each, down a grade 10.7 miles long, averaging 58½ feet per mile, at a speed of 26¾ miles per hour. The schedule speed is 15 miles per hour. The locomotive had an 11-inch pump and a main reservoir capacity of 59,600 cubic inches. The results were equally satisfactory. As this test was made the last of April the time was not sufficient to enable advance copies of the paper to be printed, but it will appear in the proceedings.

Discussion.

Mr. Burton (W. A. B. Co.) called attention to the fact that 50-ton capacity cars braked at 85 per cent. are braking very close to lower capacity cars braked at 70 per cent. when both are loaded, this being due to the capacity of the former being higher in proportion to its empty weight (on which the braking power is based) than with the latter.

Mr. J. R. Alexander (Genl. Rd. For., P. R. R.) expressed the belief that to control all coal trains with air brakes alone would require raising the braking power on a very large number from 70 to 85 per cent., that this would often mean a larger brake cylinder and stronger brake beams, entailing a heavy expense. Also, that test trains usually had the brakes in good order which is more than can be said of the average train in general service, and that 10 per cent. of the railways are apparently expected to care for their brakes and those of the other 90 per cent. instead of each road doing its share of the work. He noted that both papers indicated a desire to increase the speeds down grades and said he believed the speeds should be kept down so as to avoid losing the safety resulting from improved equipment and better maintenance.

Mr. P. J. Langan (Genl. A. B. I., D. L. & W.) agreed that brake conditions in tests were generally better than usual, but had observed that the K triple valves applied much quicker than the older type, which insures better results with equal maintenance. He also urged against increasing speeds down grades.

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Mr. F. W. Ainsworth (Genl. A. B. I., D. & R. G.) had made tests of the K triple valve down very steep grades and obtained similar results to those described by Mr. Burton, having taken down an increased tonnage with greater safety than with the older valve. He attributed the betterment to the retarded releases giving more time to recharge and to the quick service affording a very prompt reapplication at the moment needed.

Mr. Otto Best (Genl. A. B. I., N. C. & St. L.) told of a runaway train of thirty-one loaded cars he had observed some time ago down one of their steep grades. The train was finally stopped without damage. All cars were air-braked and 85 lbs. pressure was carried, but the fault lay in fifteen of the brakes being defective. They then put an inspector at the top of the grade and required that the brakes be in fairly good order before trains are allowed to start. This necessary work can usually be done without delaying the trains.

Mr. W. P. Borland (Inspr., Interstate Commerce Com.) said he believed safe handling down steep grades is largely dependent on good maintenance, but questioned whether or not some hand brake assistance would sometimes be needed.

Mr. Alexander (P. R. R.) said any mechanism will fail to do its duty some day, due to failure to maintain or operate it properly, that it is slow work applying hand brakes and therefore thinks it best to have some applied: In other words, to use enough hand and to fairly well control the speed and employ the air brakes for the additional braking power needed for this purpose and stopping.

Mr. Jas. Anthony (Genl. A. B. I., C. P. Ry., Western Lines) said that in their ore service down a 3½ per cent. grade the cars are braked at 90 per cent., 15-lb. retaining valves are employed and hand brakes are used only on cars having retaining valves that do not hold.

Mr. D. H. Breese (U. P. Ry.), answering Mr. Borland as to who is responsible for keeping the train under control, said that the trainmen are as well as the engineer, and that they don't use hand brakes to aid the air brakes except where actually needed.

F. B. Farmer (W. A. B. Co.) urged the importance of low speed, good brake maintenance and operation and any really improved devices—that all are of value and should be given careful attention to obtain the maximum and proper degree of safety down steep grades. He felt that if reasonable efforts were made to obtain and maintain a good air brake efficiency that the law would be interpreted as broadly regarding the exceptional use of hand brakes as it has been concerning the percentage of cars that must have the air brakes in use.

Mr. Burton (W. A. B. Co.) explained that the higher than average speed used in the two tests were not intended to indicate what should be done regularly; that the usual speed regulations down grades should still govern in spite of the improvements and that the faster speed in the tests were to show the large degree of safety that had been obtained.

Mr. E. L. Gibbs (Inspr. Interstate Commerce Commission) asked whether anyone would recommend that in general freight service all trains be held down a 100-ft. grade with air brakes alone and was advised by Mr. Burton that this was done on the C. R. R. of N. J.

Mr. W. V. Turner (Mechl. Engr., W. A. B. Co.) stated that the K triple valve is not intended to overcome poor maintenance, but instead to first remedy the slow service application with long train, thereby giving a more prompt response throughout the train, increasing the effectiveness by cutting off all loss through leakage grooves and producing less shocks because of more uniform and simultaneous action; second, to avoid delays and break-in-twos by enabling release of brakes on long trains to be made with safety at low speeds; and, third, to effect a uniform recharge, so rear brakes will release and recharge more promptly than they have and so head brakes will not tend to reapply after release.

He stated that the big improvement it had effected in steep grade braking was not what was originally sought for in the development of the K triple valve, but was, nevertheless, a logical result of its operation. As showing the saving in air effected by it with long trains, he cited where in comparative tests it had made the same stop with 62 cubic feet of air where 252 cubic feet were required with the older triple valve. Stated differently, an 11-inch pump required but 1 minute and 4 seconds to fully restore the pressure after the stop with the K triples, and 4 minutes and 5 seconds after the stop with the older triples. He also referred briefly to some recent tests on the Soldiers' Summit grade of the D. & R. G. Ry., one of the steepest in any main

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line service, and which demonstrated that increased tonnage could be taken down with greater safety than with the former tonnage with the older valves.

Mr. J. P. Kelly (W. A. B. Co.) described conditions on a 12-mile grade of from 71 to 90 feet per mile where the general manager decided to handle the freight trains by air brakes only. Brakes were first put in a fair average condition and instructions were then issued to use air brakes only with trains containing 60 per cent. or more. Trains averaged about 50 cars and the results had proven very satisfactory.

He emphasized the importance of maintenance, especially for grade work—not everything perfect, but in good to fair condition. He said repairs should be made at terminals, not on the road, but that a satisfactory terminal test should not eliminate another test at the summit of a grade, before descending.

He is against dividing the responsibility between the hand and the air brakes for several reasons, one being that hand brakes, if used to render any material assistance, increased wheel breakage from overheating, liable to be followed by wrecks.

Mr. Geo. R. Parker (Genl. A. B. I., G. N. Ry.) described tests he made some time ago with ore trains down two of their 2.2 per cent. grades, one ten miles long and the other fifteen. Where formerly 1,100 tons had been taken down with hand and air brakes, with many cracked wheels resulting from overheating, they commenced by taking this same tonnage down safely with air brakes alone, and without repairing any brakes. Later the tonnage was increased to 1,800 per train and next to 2,400 tons. The train brakes were not especially prepared for the tests. The cars were braked at 90 per cent., 90 lbs. brake pipe pressure was carried and main reservoir capacity was 50,000 cubic inches. The New York No. 2 duplex pump was used in the lighter tonnage tests and the No. 5 with the heavier; and with the latter the total reductions did not exceed 12 lbs. per application.

He also advised that the most difficult train to control was one of old cars, due to their brakes being in poorer condition; that the engineers prefer to hold the trains with air brakes only; but that the responsibility for their being held safely rested equally with the trainmen and the engineer.

Answering an inquiry he advised that the heavier trains were composed of loaded, 50-ton capacity, steel ore cars, some being loaded beyond capacity, and that the time regularly consumed in pumping up, testing and making light repairs before such trains descended the grades rarely exceeded 30 minutes.

Mr. Geo. Frederick (A. B. I., P. B. & W. Ry.) expressed the belief that the possibility of safe handling with air brakes alone is limited by the density of traffic as well as by other conditions mentioned, and that where trains follow each other closely the need for a good reserve of braking power, meaning ability to make an unexpected stop in a short distance, is more important.

Mr. Turner (W. A. B. Co.) while agreeing that, owing to unsatisfactory maintenance, railways are far from getting all possible out of the present brakes, contended that, even at their best, the older types do not fully meet present conditions.

Mr. P. J. Langan (D., L. & W.) answering an inquiry as to how trainmen can be held responsible in view of the law, said that they require that their trains be held by air brakes, but that owing to scarcity of skilled labor and time to make needed repairs, there must necessarily be some trains where air brakes alone would be inadequate, that such were really emergency conditions and that trainmen must be in positions to render prompt assistance when needed.

Answering an inquiry, he added that engineers are instructed to make a 10 or 12-lb. reduction at low speed on passing the summit and that if this does not control the speed they are to at once call for hand-brake aid and hold the air brakes applied until it is rendered.

Mr. C. B. Conger (Int. Correspondence Schools) farther demonstrated the responsibility of trainmen by calling attention to it being their duty to see that the brake pipe is coupled and open to the rear end of the train and, where it is had, to know by the caboose gauge not only that it is open, but also that an adequate pressure is had.

Mr. F. B. Farmer (W. A. B. Co.) called attention to ruling grades for main line or general service rarely ever exceeding 2.2 per cent. and that successful tests on steeper grades indicated what should be possible on the former. As showing a good method of anticipating the need of hand brakes before starting down a grade, he stated that a certain

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western road requires a test at the summit of their 2.2 per cent. grades, as well as the regular tests at terminals, and that the indications of whether or not hand brake assistance will be needed is judged by dividing the number of good order brakes into the train tonnage. If the result is fifty tons or more per good brake some hand brake aid is advised. This lesser amount than taken down with air brakes alone in tests described is owing to the summit tests by trainmen not indicating all of the poor brakes, due to these men being less skilled in inspecting, and also to the tonnage per good brake being accurately determined in special tests by the comparative wheel temperatures after descending the grades.

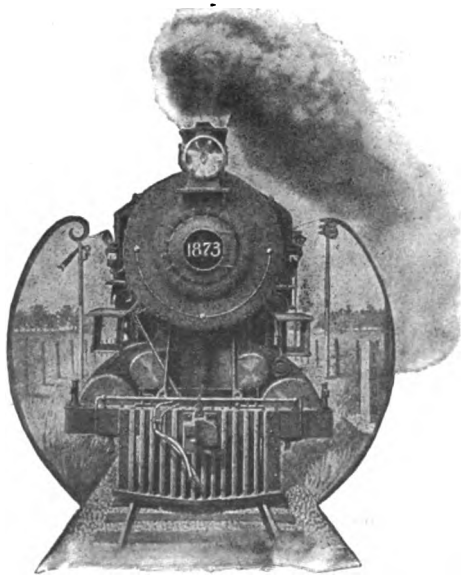
He also expressed the belief that there are a few engineers who, through a desire to run fast, or because of lack of ability, are prone to ask for hand brake aid with practically all freight trains they handle down steep grades, particularly if no official is aboard.

He believes that the condition of freight brakes has not improved, that it is not satisfactory considering the needs, but considers it the logical result of the heavy strain the unprecedented prosperity has put on the railways and that as soon as they are able to the latter will gradually improve the condition of air brakes.

Mr. W. M. Sleet (Genl. A. B. I., C. & O. Ry.) stated that at one time they used both hand and air brakes to control freight trains down their 60-foot grade, that many cracked wheels resulted and that the latter had been eliminated by requiring the trains to be held by air brakes only. Trains are put in shape to make this possible before they are allowed to pass the summit, there being no time limit. Also, a rule requires that the conductor report by wire whenever hand brake aid is required and all such cases are investigated. He stated that owing to the condition of air brakes they have at times to use both air and hand brakes down their steeper grades.

This closed the discussion and a vote of thanks was extended to Messrs. Burton, Langan and Spencer for the valuable data they had submitted.

(To be continued).



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MOVEMENT OF TRAINS

BY H. A. DALBY

Forms F and K.

We have three questions this month which have a direct bearing on certain parts of the Standard Code which are quite obscure in the old version, but are cleared up by the revision of 1906. We consider it of the highest importance that every dispatcher, every man in train service and every one concerned in the movement of trains make himself clear on this matter if he is not so already. Probably many men will be compelled to work under the old code for some time to come, and as it is admitted by all that it is very imperfect it is essential that its imperfections be thoroughly understood.

The trouble has its source in the fact that in many places the old code uses the word "train" where "schedule" is meant. Form K is entitled "Annulling a Regular Train." It should be for annulling a schedule. The explanation says that "the train annulled loses both right and class," when it should say that a schedule which has been annulled can not be restored. Then, under Form F there is one example for an order which it says is "for annulling a section," and when that form of order is used it frequently raises the question whether the order means that there is no section of that number or only that the engine named will not run as that section. Then the train that was displaying the signals does not know whether to take them down or not. Some think it should not do so, because all the order does is to take the schedule away from that engine. Others say that the order did what the book of rules calls for; it annulled the section, and then they go over to Form K (which has nothing to do with the case) and say that the train annulled loses both right and class and can not be restored. Now, Form F should not use the word "annulled" for the simple reason that nothing is annulled. The engine can not be annulled, the code gives no form of order which actually annuls a section (although it does say so) and it gives no intimation of annulling the schedule. The simple fact is that the title "for annulling a section" is all wrong and should be expressed in some other way. The new Code corrects all these defects as has been brought out in the three questions to which reference is made.

It is not strange that confusion of ideas should result when there is so much that is misleading and so many places where the wording of the rules and the forms of orders fail to express the intended meaning. Neither is it in the nature of unfavorable criticism of those who formed the original Standard Code, for it may be said that experience had not then pointed out the varying situations which the rules should be called upon to provide for. But their insufficiency has been clearly demonstrated by the hard places we have encountered and the difficulties we have been "up against" in using them. The revision, therefore, is very acceptable and fills a long felt need.

It is to be hoped that the new code, with its many improvements, not only in the particulars we have mentioned, but many more, may speedily be adopted on American railroads, for it is very much needed. To those who are still required to work under the old code we offer the advice that they become familiar with the revision, not only for the reason of its probable adoption in the near future, but for the light that it sheds on the uncertain parts of the old code. Of course, the changes in the new code are not authority for rulings on the code which you may be using, but they will help to a better understanding of what your rules should be. We also advise, as always, that for points that are not clear application should be made to the superintendent or other officer so that a thorough understanding may be obtained.

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Employes' Magazines.

We welcome to our desk each month the recently established "Santa Fe Employes' Magazine," a bright, newsy periodical of 64 pages, issued every month, bearing on its opening page the inscription, "A monthly publication devoted to the interests of, and for free distribution among, the Santa Fe's army of fifty-five thousand; to others at $1 per annum." It is, of course, of special interest to employes of that system, but it is exceed-

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ingly attractive and filled with good reading for railroad men wherever located.

The idea is not entirely new, similar publications being issued by some other roads, but the plan seems most commendable and might well be imitated by other large systems. The possibilities of these publications are large and much good may be accomplished in various ways by their distribution among the employes. The magazine, with its illustrations of familiar scenes, its articles on topics which come close to home, and its budget of news about what is going on all over the line soon becomes a welcome guest and in time we look for it as for an old friend.

The uses to which it may be put are numerous. It should be the medium by which officers of every grade may communicate with those under them. Instruction, assistance in the performance of duty and timely advice may reach the men through its columns which would be impossible to communicate through book of rules or circular letter. Employes may be kept posted as to the general condition of business in the territory covered by the system, the prospects for the summer's crop or the movement of stock in the fall. Reports of progress in the construction of new lines and the opening of new territory can be used to advantage by agents for the information of the patrons of the road. New motive power or improvements in the air brake or other mechanical appliances may be announced, explained and illustrated. If new signals are to be erected or new rules contemplated they may be explained and so that those who are to use them may become familiar with them.

It could contain a question box in which might be dropped any and all inquiries pertaining to the operation of trains or the handling of the company's business. These questions could be separated according to the department of the service to which they refer and a competent officer should answer each in a careful and satisfactory manner. It should of course be understood that answers to such inquiries are positive information and may be used by the employe as a definite ruling on the matter. The success or failure of new machinery, new plans, new systems of all kinds may be gathered from points along the line and made of benefit to all concerned. There is no telling how much valuable information may be obtained in this way.

The personal department is of no small consequence. The columns devoted to the personnel of the various departments serve to make one acquainted with those with whom he works. On a large system it is impossible for one to have a knowledge of those on distant parts of the line. The monthly publication makes them pleasantly acquainted with each other.

The idea seems excellent and should be encouraged. Railroad men should have opportunity to mingle with others whose work is the same or similar. They cannot do it in person, the nature of their work making it impossible. The next best thing is the medium afforded by the system magazine. It is a good thing. Push it along.

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Questions and Answers

Locomotive Running and Repairs.

Answers by F. P. Roesch.

510. Blocking by Steam.—"I would like to have a clear definition of the term 'blocking by steam,' also when blocking by steam is considered necessary."—*E. J. N.*

Answer.—Blocking by steam means to hold the piston at either end of the cylinder by steam pressure, instead of the usual block in the guides. When an engine becomes so disabled as to necessitate taking down the main rod, the piston can be forced to either extreme end of the cylinder, and the valve moved (after the valve stem has been disconnected, of course) so as to open the steam port to admit steam into the other end of the cylinder and so prevent the piston from moving. For instance, if the piston has been pushed to the extreme front end of the cylinder move the valve forward for outside admission, back for inside admission valve; this will uncover the back steam port and the pressure of steam against the piston will hold it securely.

Blocking by steam can only be effected when the main rod and valve stem are disconnected. It is a quick way to block an engine after a breakdown if you are in a hurry to clear the main line and have no blocking for guides available. It is also a perfectly safe way to block an engine provided steam is worked continuously; if, however, steam is worked only at intervals, that is, if steam is shut off occasionally and the engine is allowed to drift or roll, a small block should be fastened in the guides to prevent the piston from moving when steam is shut off. as if the piston shifted a little when the steam was shut off it would be liable to knock out a cylinder head when the throttle was opened again.

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511. Broken Eccentric Strap.—"If you broke an eccentric strap or rod on an engine where the eccentrics are on the axle ahead of the main axle, could you come in on one side? If not, why not?"—*G. H. P.*

Answer.—As long as the side rods connecting the main wheels to the wheels on the axle of which the eccentrics are mounted remain intact, you can come in on one side all right. If the side rods were down, you could not come in under steam at all.

512. Broken Link Hanger.—"When you break a lifting arm, link hanger or anything that would cause you to block up the link, why not block over the two link blocks instead of one?"—*G. H. P.*

Answer.—If but one link hanger was broken it would not be necessary, as the other link hanger would support the other link. If both link hangers were broken it would be necessary to block over both link blocks, as in this case you would have nothing to support either link. If the reach rod, tumbling shaft arm or reverse lever was broken you would block over one link block only, as both links would still be attached to the tumbling shaft by means of the hangers, and blocking up on one block would raise both links the same.

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513. Broken Driving Box.—"What would you do with a broken driving box?"—*G. H. P.*

Answer.—This would depend altogether on the nature of the break. Driving boxes usually break just at the end of the crown brass; in this case if both sides of the box were broken the cellar would fall away from the journal, causing the box to run hot. If you could not wire the cellar up to the journal, or fasten a bunch of saturated waste under it in such a manner as to lubricate it sufficiently to bring the engine in, it would be best to take most of the weight off the box by running the wheel up on a wedge and then blocking up between the frame and spring saddle or frame and equalizers, as the case may be, and apply plenty of oil from the top. If the box broke in such a manner as to allow the brass to fall into the cellar, you should first remove the brass and cellar, then run the wheel up on a thick block, and while the wheel is raised pry the broken parts into place and block up between the pedestal brace and bottom of box, then run the wheel off the block. If now the box doesn't stand far enough above the journal to allow you to insert the brass, run the next wheel up on a block; this will raise the broken box so you can slip in the brass. After placing the brass in position, run the other wheel off the block and block up between the top of the broken box and frame, insert the cellar which you had removed and go on.

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514. Rise of Water in Water Glass.—"Why does the water in the water glass rise so quickly as the upper globe valve leading thereto is closed? Why does it rise more quickly when the water is low? The argument is: 'The steam in the water above the glass condenses, making room for the rising water.' If this were not the case the pressure in the glass would be excessive as the water rises out of sight. Does the steam condense?"—*W. O. Y.*

Answer.—Your argument is correct. When looking at a water glass you can not see the steam, as it is a colorless gas or vapor. You simply see the water; the steam nevertheless is there and holds the water to its true level so long as both top and bottom cocks are open. This steam, however, has a temperature above 212 degrees Fahrenheit, according to the pressure, and as the glass is surrounded by or exposed to the air, whose temperature is much lower, condensation is continually taking place, but as long as the upper valve is open fresh steam is being supplied as fast as condensation occurs. Now, if the upper valve is closed no steam will be admitted to keep up the supply. Consequently when the steam is condensed a vacuum is formed in that part of the glass formerly filled with steam, and the pressure in the boiler, acting on the water, forces it up. The longer the glass, or, in other words, the higher the column of steam, the greater will be the vacuum and consequently the more rapid will be the rise of the water.

It is this flow of steam rushing down to take the place of the steam that is constantly being condensed that causes the more rapid erosion of the upper part of the glass, which you may have noticed when renewing a broken one.

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515. Crosby Improved Steam Gauge.—"Please explain how the Crosby steam gauges work that have two hands, one short and one long one, and the short one stands about 30 or 40 pounds back of the long one. It also has a figure, usually 200, above the other figures sunken below the dial?"—*H. M.*

Answer.—This is called the Crosby improved steam gauge, in which the action is the same as on a gauge with but a single hand, the pressure being registered by means of the usual Bourden spring tube, whose expansion and contraction actuates the hands. The dial is changed, however, as noted by our correspondent, to show two sets of figures, the single figure, which in the case mentioned as 200, shows the pressure the boiler is supposed to carry, or, in other words, the pressure at which the pops or safety valves will release or open. The dial is really a double dial, there being a small dial pivoted to and back of the large dial, the latter dial having an opening cut at the upper side just large enough to show one of the figures of the smaller dial. This small dial has all the figures, 10, 20, 30, 40, 50, etc., on its face, but only the set of figures opposite the opening in the larger dial show. Therefore, if the engine is to carry 150 pounds of steam the small dial is turned so the figures 150 will show through the opening of the large dial; if 175 pounds is desired, the small dial is turned so these figures will show, and so on.

The gauge therefore serves a two-fold purpose, viz., a pressure gauge and a reminder of the popping point. The long hand simply shows when the pressure is nearing the popping point, while the short hand registers the pressure on the boiler at any and all times, the same as any ordinary steam gauge.

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516. Valve Travel in Mid Gear.—"On an engine using the eccentric and link motion, drifting with reverse lever in center of quadrant, how much travel will the valve have? What will govern this travel, if any? It is understood there is no lost motion."—*R. J. H.*

Answer.—With rocker arms of equal length, the valve travel in mid gear will be twice the lap of the valve plus twice the mid gear lead. As the lead increases as the reverse lever is hooked up toward the center of the quadrant, the travel of the valve in mid gear is naturally governed by the manner in which the eccentrics are adjusted in relation to lead, that is, if the eccentrics are set so that the engine will have 1-16 lead in full gear, the valve will travel farther than if set without, or negative lead. Eccentrics are usually set so as to give ¼-inch opening in a 6-inch cut-off; if the lever were now hooked up on the center notch this would probably be increased to ⅜ or ½-inch. Therefore, if the valve had 1 inch outside lap, and the lead increased to ½-inch with lever in center of quadrant, the valve would travel 1 inch + 1 inch + ½ inch + ½inch = 3 inches in mid gear.

Errata.—In the answer to Question 498, Strange Action of Water in Water Gauge Glass, published in the June issue of the Magazine, an error appears in the fifteenth line, wherein it says: "When

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the engine is *not* at rest there is comparatively little circulation of water in the boiler," etc. This should read: "When the engine *is* at rest," etc., omitting the word *not*.

The Westinghouse Air Brake.

Answers by F. B. Farmer.

317. Undesired Quick Action or "Dynamiter."—"Will you kindly answer through the Magazine the following questions: (1) If, in applying brakes, you had made a 5-pound reduction and the train line exhaust should suddenly close and black hand should drop to about 55 pounds, what defect would it indicate? (2) How would you handle a train with a defect of this kind?"—*J. O. C.*

Answer.—The action described indicates that some triple valve in the train has applied quick action and which would cause all of the others to do the same. In quick action triple valves discharge brake pipe air. With the Westinghouse it goes into the brake cylinders and with the New York to the atmosphere. This suddenly dropped the brake pipe pressure under the equalizing piston of the brake valve, much below what that over the piston (equalizing reservoir pressure and to which the black hand of the gauge is connected) had been reduced to. This caused the piston to seat suddenly and stop the service exhaust. The yet higher pressure above the piston then leaked past the latter into the brake pipe until the two were equalized, this causing the reduction to 55 pounds, as noted.

The reason for a triple valve applying quick action from a service reduction is that the auxiliary reservoir pressure does not reduce as fast as the brake pipe pressure is being drawn down and when the difference between the two is sufficient the main triple valve piston moves to quick action position. There are several causes for this.

With passenger trains a possible one is an H1 (formerly F-36) freight triple valve, for use with 8-inch cylinders, put on a 10-inch cylinder where a P1 (formerly F-27) valve should be. The H1 triple valve ports are too small to reduce the auxiliary reservoir pressure fast enough unless the train is quite long or the reductions are small and well separated.

The other causes may be classed under too much friction to be overcome to move the triple valve piston to service application position, so that when it does move it travels so rapidly as to go direct to emergency position. This will result from grit or a very gummy condition and will be made worse by a too strong slide valve spring.

The right thing to do is to locate, cut out and report the defective triple valve. It can usually be located by making a light reduction that will not cause quick action, ascertaining what brake or brakes have not applied and then, while watching such, making a farther reduction and cutting out the one that is seen to be at fault.

Train Rules and Train Practice.

Answers by H. A. Dalby.

228. Does It Annul the Section?—"Please give your opinion of the following order according to Canadian Pacific rules: 'Order No. 2.—Engines 501 and 1479 will run as 2d and 3d 74 from A to D and display green.' At B Order No. 3 was received at follows: 'Engines 501 and 1479 are annulled as 2d and 3d 74 at B. Engines 1479 and 501 will run as 2d and 3d 74 from B to D and display green.' Does this order annul the whole sections of 74 or only annual the engines on those particular sections? I see no other form in the Standard Code for annulling a section, and if it is so annulled it could not again be run under its original number."—*C. B. L.*

Answer.—Order No. 3 does not annul 2d and 3d sections in the sense that no other train can run as those sections. It annuls the two engines *as* those sections and immediately gives instructions for them to continue on the same schedule, merely reversing their positions.

The questioner has encountered the difficulty in the former Standard Code which has long been the occasion of misunderstanding and which is corrected under Form F in the revised code. The matter has been freely discussed in the Magazine and it may be summed up in this way: The word "annul," as used in Form F in the old Standard Code is entirely wrong. It says "For Annulling a Section," but the order given under that heading does not, in reality, annul anything. The order says the engine is annulled, but an engine is a thing that can not be annulled. The only things that can be annulled are a schedule and a train order. The annullment of a train order has nothing to do with the case so that the only thing that we can consider in this connection is the annulment of a schedule. It

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is very plain that Form F does not do this. What it does is to take an engine off the schedule it has been using. It does not affect the schedule in the least. The new Standard Code expresses the idea in proper language: "Engine 85 is withdrawn as 2d No. 1 at H." The language of the old code is incorrect and misleading. The new form of the order means the same as the old, but expresses it correctly.

Our correspondent suggests the question as to how a section may be annulled. Presumably he means to provide for a case where signals have been displayed over the road and it is decided not to run any train in answer to those signals. In the Canadian Pacific rules and in the old Standard Code there is no form of order provided for this. In the new code Form K has been modified so that it is entitled, "Annulling a Schedule or a Section," and the second order under this form is, "2d No. 5 of February 29th is annulled E to G." Under an order of this kind there can be no 2d section of No. 1 between the points named on the date mentioned.

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229. Forms for Annulling a Section.—"In Mr. Collingwood's book he says Form K is the logical form to use for annulling a section. May we not say that it is the only form in the Standard Code that can be used for that purpose and give authority to opposing inferior trains to run against the section annulled? But it is a fact that Form F gives a form for annulling a section and it looks as if Form K is for annulling a schedule. Is it proper to use form K to annul a section?" —*G. O. F.*

Answer.—This question is similar to Question 228. The questioner is up against the same difficulty and our answer to that question will apply to this.

When the old Standard Code was formed there were many situations which were not anticipated and for which the rules did not provide. Evidently they did not think at that time of making a distinction between taking a particular engine off a section (leaving it so that another engine could run the section of the same number) and annulling the section altogether. When we came to put the rules into practice we found that the order forms were not sufficient and that some of them might be understood in more than one way.

Now, to answer this correspondent's question, in reference to the statement that Form K is the logical form to use for annulling a section (so that no train can run as that section) our opinion is that in the old Standard Code, Form K says nothing about sections, and has nothing to do with sections. Everything indicates that it is intended to annul a schedule. There is nothing in the old form of the code to authorize the annulment of a section in the sense that the section can not again be run. The only form is this: "Engine 85 is annulled as 2d No. 1 from Chatham" and that can not be understood to mean that there can not be any 2d No. 1 from Chatham. It only means that Engine 85 will not run as 2d No. 1. That is one of the defects of the old Standard Code. It provides no way for entirely annulling a section.

But the new Standard Code corrects this by making Form K annul a schedule or a section and the form for annulling a section is this: "2d No. 5 of February 29th is annulled E to G." Then when it is desired to merely take an engine off a schedule and still leave it so that another engine may run the same section it gives an example under Form F as follows: "Engine 85 is withdrawn as 2d No. 1 at H.' The word "withdrawn" is much better than "annulled," as it is in the old code.

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230. Authority to Take Down Signals.—"The following order was issued: 'Engines 1480 and 501 will run as 1st and 2d 74 from A to D.' Then this was received: 'Engine unknown is annulled as 2d 74 at C.' Is this a proper order or is this sufficient authority to take green signals down?"—*C. B. L.*

Answer.—As to the use of the word "unknown" it would certainly seem improper. A man receiving such an order would be justified in asking for an explanation, and we know of no reason why the engine number could not or should not be given. If the wire was in trouble and communication with the dispatcher impossible it might be accepted and acted upon, providing there were no possibility of misunderstanding, but it is an order that we should not take any chances on. It is not correct form in this place. As to whether the order authorizes the first section to take down signals, this is another question which finds no definite answer in the old Standard Code, but which is corrected in the new. In the former the order does not indicate whether the signals are to be taken down or not. It does not say that there is to be no second section from C, but only that the engine

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named will not run as 2d section. Any other engine may, without violation of the rules, run as second section. But in case it is desired that the first section take down signals there is no form in the old code to authorize it. This question should be settled by the officers of the individual road.

The new code corrects the omission by the following, which is a part of Form F: "To discontinue the display of signals the following example will be used: '2d No. 1 takes down signals at D.' Under this example 2d No. 1 will take down signals as directed and a following section must not proceed beyond the point named."

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231. About Rule 90.—"I would like to have an understanding in regard to the second paragraph of Rule 90, which reads: 'When the expected train of the same class is not found at the schedule meeting or passing point the superior train must approach all sidings prepared to stop until the expected train is met or passed.' I understand the reference to the meeting point, but I can not see how the inferior train can go by the passing point unless the superior train is late and in that case they would have to have orders and the orders would notify the superior train where to expect the other."—*G. O. F.*

Answer.—In the first place, it is a fact worthy of note that the part of Rule 90 that pertains to trains in the same direction is not in the new Standard Code. This would seem to indicate that the requirement is not of so much value as was supposed by those who originally made the rule.

As a matter of fact, it is but seldom that the requirement is ever called into use. The cases where a train is scheduled to wait on a siding for one of the same class to pass are very rare, if, indeed, there are any such. If there should be such a case there is a misuse of the word "superior" in the rule, for we do not see how the train that is scheduled to pass the other can be considered superior in any sense. They are both of the same class and the rules do not make any superiority between trains of the same class in the same direction. The mere fact that one is scheduled to pass the other at a certain station does not make it superior either by right, class or direction, and those are the only three ways in which one train can be superior to another. There is nothing in the rules to require the train on the siding to stay there indefinitely if the other does not appear and there is nothing that requires it to get out of the way of the other before reaching the station where it is scheduled to take the siding. The trains are of the same class and have equal privileges so far as any rules are concerned. We do not see the necessity for any orders if the train is to be kept moving ahead of the other and if it should leave the siding where the other is scheduled to pass it would simply continue to run ahead the same as any other train. Our opinion is that each train is simply governed by schedule time and, aside from that, proceeds with reference to the other just as other trains of the same class would do.

Railway Club Proceedings

*Train Signals.**

Mr. President and Members of the Iowa Railway Club:

In presenting this subject to you I am well aware that it will appear like an interference, or rather an innovation upon established rules, but such is not the case, as I view it. This is a matter I have thought of very often and for a considerable time. I will say, therefore, in bringing this paper before you that I do so for your consideration.

I am not in favor of displacing or rearranging any of the signals or their color or their place which are now in use as train signals, as they are now displayed, or may be displayed in order to designate the rights of a following train. It has occurred to me that an additional signal, however, might be displayed on the rear of a train that was carrying signals, which would designate or show that this

*Paper by Mr. W. F. Gould.

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train was carrying the same signals upon the engine, and I think by so doing that the opportunities for observing these signals upon the rear of the train, if properly placed, would be of an advantage, that the line of vision would be superior, or that they could be more plainly seen under certain conditions than those upon the engine, and there is another thought which comes to my mind in this matter, and to which I desire to call your attention, and that is the responsibility of knowing that these signals are at all times properly displayed.

Under the present rules the conductor and engine man must know that they are so displayed when a train is required to carry signals, but many conditions arise in which the vision of the men on opposing trains may be taxed to their utmost to know that such signals are carried. Of course the engineer who is carrying signals is required to notify by whistle trains he may meet or pass that such signals are carried, but we all know that conditions arise in which even this may be overlooked, and at a distance of sixty-five or seventy cars' length from the point where the engine whistle is sounded, with the wind and other atmospheric conditions existing, it is difficult to hear the whistle. I refer now to freight trains lying upon the side track meeting a fast passenger train. Then there is another condition. We all know how difficult it is to see a signal carried under an electric headlight, and at a speed of forty miles per hour or more the line of the point of vision is very short, and in case of a snow storm it is very difficult to see the color of the signal carried after night, or the signal lamp may become extinguished.

But these are only a few of the many points which any train man has to contend with in regard to signals upon opposing trains, therefore I think, as a measure of precaution, and, I might add, as a double check upon the signals carried, that a set of signals carried as before stated, upon the rear end of the train, which would indicate that the same signals were carried upon the engine, would insure a degree of protection which would be advantageous; and in this line of thought it is the fact that the conductor and flagman should be held responsible for the proper display of those signals upon the rear of the train, either flags by day or lights by night, under exactly the same rules as the signals are displayed on the engine; then there would be more men practically responsible for the proper display of signals upon that train. Now, as to the position of the signals, that is a point which someone might suggest, but I believe that upon a freight train the flag signals should show near the top of the cupola of the caboose, so that a man in looking at the stencils designating the section of the train would be very apt to see the flag signals as well. Upon the rear end of a passenger train, however, the lower red light as carried now could be used as a signal light, with an additional light beside it in order to designate in either case that these signals were not markers; therefore, in placing them they should be far enough away from the markers which are carried at the present time. I would also suggest that in the daytime additional flags should be carried upon the rear end of the train as well as upon the engine to designate that a section of that train was following. Hoping that these sugestions may be construed so as to bear some fruit relative to additional safety, I am,

Yours truly,

W. F. GOULD.

PRESIDENT WENTWORTH.—Gentlemen, this is one of the most pertinent subjects that can be discussed before any club, and one of the most difficult subjects perhaps that the operating department has to contend with at the present time. We all know in a very recent period of time of several accidents that have occurred owing to a failure to properly observe the signals, and I believe it has been true that in each case the party at fault has had an excuse which really looked like a valid one. Anything that can be done to make this branch of the service better is in order. We have a good many from the train service here tonight who no doubt have had a great deal of experience, and I know they have some very valuable ideas on the subject. The club would be very glad to hear from Mr. Bentley.

MR. BENTLEY.—Mr. President and Gentlemen: I can only say that I would very much approve of Mr. Gould's additional signals. As he says, take an electric headlight and it is almost impossible to see the signals. I have made experiment to determine whether it is possible to see a signal with an electric light as distinctly as you could with an oil lamp, and I have come to the conclusion that at times, when the electric light is not

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properly focused so that it will throw one beautiful translucent shaft of light straight ahead, it is almost impossible to see a signal carried on an engine. Take the reflector, and if your light is so focussed that it is a little bit out from the center it will become dispersed right in front of the engine and throw a light so an engine could almost reach you before they saw the light. Mr. Gould's suggestion of lamps on the end of the train would give the train crew a better chance to see the signals. I would approve of that myself; I think it is a grand idea. It would amount to but very little expense, and certainly would oftentimes prevent men from saying they didn't see the signal or didn't hear the whistle.

PRESIDENT WENTWORTH.—Mr. Vermillion, you have been handling the other end of the train for a long time; we would like to hear from you.

MR. VERMILLION.—Mr. President and Gentlemen: I don't agree with what Mr. Gould said on that proposition. I don't think it is a good idea. If a train crew on a side track can't see the front end of a train they can't see the rear end, and there isn't one train crew in fifty that will look at the rear end of a passenger train after it goes by them; they are always looking at the head end. Take these passenger trains running through side tracks at forty and fifty miles an hour through the smoke and other conditions of the atmosphere and you can't see the rear end of a passenger train after it has gone by a hundred feet for the smoke and dirt, and how would a train crew discern these signals? When a train is approaching you, then you get a clear view. There is no smoke or anything else unless the atmosphere is rather foggy or cloudy, to obstruct your view. On the rear end everything is there—smoke, dust and dirt and everything else. In most cases where passenger trains or freight trains have carried signals and the crew on the siding has not seen them and pulled out they have been asleep, and if they have been asleep they won't see the hind end of the train any more than the front end. In my opinion there is only one solution of this signal problem, and that is for the train carrying the signals when they approach a station, if they see a train standing there, they must whistle the signals and get an answer that the signals have been understood, otherwise you will have collisions when you are carrying signals for a following train. If they don't answer your whistle, stop and ascertain why. Then report the matter to your superintendent, if they are delayed any, and let him rectify it.

PRESIDENT WENTWORTH.—I am sure the club would like to hear from Mr. W. G. Wagner on this subject.

MR. W. G. WAGNER.—I think that Mr. Gould's idea is a very good one. I believe that the book of rules of all the railroads instructs their train crew to stop if they see their signals are not answered, and there is no reason why that should not be followed just as well if a train has these additional signals as if it did not. I remember quite frequently of seeing trains go through on the main line without stopping, when really you could not see the front end, and sometimes could hardly see the rear end for the dust. I think it would be a very good idea to have signals carried at both ends of the train and the additional precaution of whistle signals being answered.

MR. GIVEN.—I have just a thought to suggest on this subject, and it comes from somebody else. It comes from a man that I wish was here, a subordinate in the ranks that I overheard talking on this question down in the caboose. He said, why don't you put signals on the last train instead of the first? If you have got nine sections, let eight of them go through without any signal, and when the ninth comes along, put a signal on that. That thought came to me from a man who has occupied the responsible position of a brakeman about fourteen months. I wish he was here; I don't know whether he could talk for himself, but I would try to talk for him.

PRESIDENT WENTWORTH.—Mr. Leach, what is your idea on this signal proposition?

MR. LEACH.—Mr. Chairman and Gentlemen: Speaking about the reflection of the headlight changing, I can't see where it could change, as it is put there stationary and solid. I think on the front end is the proper place to carry signals, and as far as carrying signals for sections, I think on the first end of the train is where the signal ought to be carried. I don't think the rear end of a passenger train or a freight train is the proper place to carry these signals.

PRESIDENT WENTWORTH.—On the proposition that Mr. Vermillion has ad-

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vanced here, take a fast train running through the yards and meeting a train on the side track, if you whistle your signals when you are running, say fifty miles an hour, isn't it possible, on account of the very short time that you would be even with or close to the engine on the side track, that the answering signal might escape you, owing to the roar of your own train? It seems to me you would be very apt to miss it unless you devoted very strict attention to it. There is more or less difficulty in catching these replies, is there not, in whistling these signals? It would seem to me that there might be.

MR. BENTLEY.—I would like to ask Mr. Leach if he has ever run an electric headlight.

MR. LEACH.—I never ran behind an electric headlight, all the old-fashioned lamp light, so I could not give you any explanation on that point.

MR. BENTLEY.—The focus of an electric light is constantly varying. They have endeavored to overcome that difficulty to a great extent. I ran at one time the first electric light put on the Rock Island system. We had a carbon below and one on top, and two springs, like that, to hold the lower carbon. It wasn't fifteen minutes before this burned away, and the result was the carbon went through in this position. The moment that varies the sixteenth of an inch it will dark down, and under those conditions you can't see the signal on an engine by a light in that condition. The moment it goes below the center it illuminates the lower part of the reflector. An electric light is very fluctuating, up and down. With an oil lamp I don't suppose you have much difficulty ascertaining signals carried on an engine. We made a test with my engine, and the farthest any of us could see the light carried on it as I approached them was about 350 to 400 feet, and I had the light focussed so that it threw one beautiful ray from the center. If the light is not properly focussed it will spread out immediately in front of the engine and illuminate the fences and everything right close to the machine, and you can't see any light upon it.

MR. GOULD.—There is a rule in the time card, I believe, that says, in case of doubt, take the safe side. In bringing this matter before you I had this thought in view that this is only as a precaution, and, if possible, to make the signals more possible in the first place, and in the second place to make more men responsible for the proper display of these signals, and therefore give the public a little more protection, if possible.

MR. VERMILLION.—In this important question what we want is not a little more safety, but positive safety, absolute safety, and, as I said before, there is only one absolute solution of the problem, and that is to ascertain that your man knows the signals. More safety don't answer the proposition; you want something that is absolute, and that is to positively know that the man knows you have got signals.

PRESIDENT WENTWORTH.—Does any other member desire to discuss the question?

MR. J. A. WAGNER.—I have been thinking of the suggestion made by Mr. Given. I think this is a live question, and the Iowa Railway Club has had some live discussions on live topics that the other clubs have studied over considerably. I would like to have the club invite the originator of the idea spoken of by Mr. Given to attend the next meeting and outline his thoughts on the matter. I had never thought of the idea until Mr. Given spoke of it, but it seems to me that there is a good deal in it, and, for one, I would like to hear the originator's ideas on it. I think the railroads have surrounded the employes with almost too many rules, and this method would be, it seems to me, from what little I have thought of it, a way of reducing the number of rules of precaution, and would be a very simple way for safety in running the different sections of a train. I am afraid if you attempt to put the additional signals on the rear end of the train that the crews on the side track will say, if I don't see the front end I will get another chance at the rear end. This is one objection I see to the signals on both ends of a train. I just at present look with a great deal of favor on the thought that Mr. Given advanced, and would like to hear from the gentleman who was the originator of the idea.

MR. GIVEN.—I happened to stray over to the caboose which was lying over on the side track and they were talking about these recent accidents, and I heard this man make the remark and I asked him what made him think of it, and expressed himself that he thought they

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would be more liable to watch for a chance to go than they would be for a chance to stay. Since I have thought it over and have been a brakeman myself, I am somewhat in doubt as to whether if I brought him here he would freely talk. Thinking the subject over, it seems to me there is a whole lot in it. On a busy road where they are carrying lots of signals, if there is four sections of a train and you are lying on a side track waiting for a chance to get out, there is one thing that is going to let you out, and you must see that thing. The other way you must see a lot of things and then see nothing to get out. That would be what I think the brakeman thought. I am talking now the brakeman's mind, not my own. That impressed me as a good idea. I know that if we discuss the thing until tomorrow morning that the conductors would be on one side and the engineers on the other, and, owing to my varied railroad experience I would be bobbing back and forth all night. I will say this, that I will make it a point to look up this brakeman, and in the meantime I think it would be a good idea for others to look up the subject and somebody prepare a paper on the question, and if they could do so let us have the paper in advance a little and put it in the hands of this man and that will help him to shape something up. Men of that class are not free to come up here and talk, but probably if he had the paper beforehand and saw what people were going to say, he has evidently got more in that head of his and he could probably add something to it.

PRESIDENT WENTWORTH.—If you will give the secretary the name of the gentleman we will send him a formal invitation.

MR. J. A. WAGNER.—I would like to hear from Mr. Ben Cook. He is an old train man and I would like to have him tell us what he thinks about these signals.

MR. COOK.—I have not been in the train service for a number of years and at the present time am unable to say very much in regard to that matter. I have been in the switching service for a number of years and of course, have dropped out of the train service, I have kind of lost track of it. We have been talking here mostly about passenger trains, but the freight train is as important in one sense of the word regarding misunderstanding of signals as the passenger train. Suppose a man didn't see the signal on the rear end of a freight train and they were broke in two and he was going out against that rear end. If he can't see the signals on the rear end he can't see them on the head end, and if he can't see them on the head end, he is not going to look for them on the rear end. It undoubtedly would be an additional safety, but of course we would have to have rules covering the matter of signals on the rear end. We have not been taught anything of the kind, but a man in actual railroad experience learns what he is taught. . . . Suppose there is a train of fifty cars and I am at the rear end of the train and I see that engine go past with the signals and I say, yes that man is carrying signals. I go back into my caboose and sit down and wait there, on a blind siding, perhaps, and cannot get any telegraphic communication. I have seen the engine go past but I haven't seen the caboose. If I didn't see the rear end I might just as well not see the head end, so it would be an additional safety to a man going out against that. On passenger trains it would not be so apt to occur because when they break in two as a natural consequence it sets the air and the rear end stops the head end. But on a freight train where they haven't all air, they might leave the hind end ten miles and never know it was gone and a man might go right out against that. How often has it occurred on a road that a signal on the rear end of the caboose, if the train broke in two, the fellow on the side track would have stood out there on the platform until he saw the hind end of the train go by.

MR. GIVEN.—I will make the suggestion that that discussion would lead into the train dispatching question very quickly, and I really think that the best man to go after that subject is a train dispatcher.

PRESIDENT WENTWORTH.—I wish each gentleman present would make it a special duty to consider this proposition and come, at the next meeting, to discuss it more freely and enter more fully into the discussion of the idea that will be presented by some train dispatcher and some train conductor, if possible to get one, and Mr. Given and his brakeman.—December 14, 1906, meeting, Iowa Railway Club.

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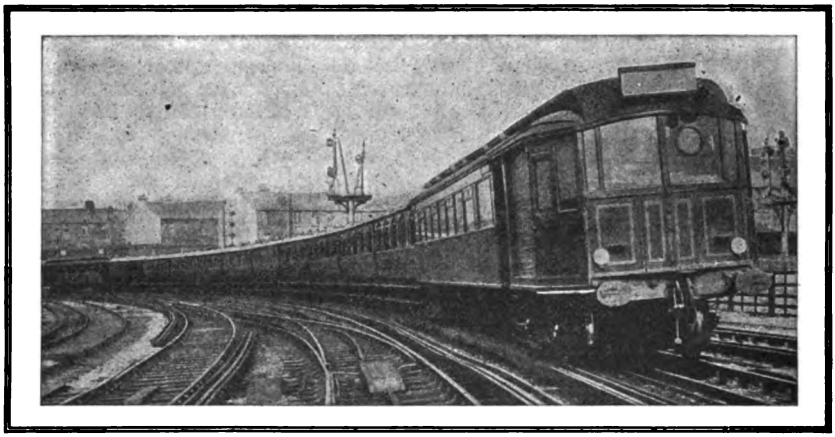
Special Electric Train on the Lancashire and Yorkshire Railway

During the year of 1906 the sphere of electric traction was extended on the Lancashire and Yorkshire Railway to include Aintree, thus adding to the mileage worked electrically by some five or six miles of road. This extension is expected ultimately to prove of considerable benefit, for Aintree, situated to the north-west of Liverpool, is not only a growing residential suburb of that city, but is also of importance as the scene of the "Grand National." At such times as race meetings the railway company has, of course, to cope with a considerable amount of special and extra traffic, and on the occasion of the Spring Race Meeting, held on March 21 to 23, last, such special trains from Liverpool were for the first time all worked by electric power. The specials were six in number, and were probably the longest and heaviest electric trains ever run in this country, taking the place of steam trains of similar capacity. A distinct advantage in the handling of such traffic is obtained with electric trains, for while with steam trains it was necessary at the end of each journey to do shunting operations in order that a fresh locomotive may be attached to the train for the return journey, such work is obviated with the electric trains.

Four of the special trains used on the occasion to which we have referred consisted of ten ordinary six-wheeled trailer carriages, over the roofs of which cables had been run to connect standard electric motor-cars, placed one at each end. Of one of these trains we give an illustration above. The motor-cars are 60 feet long, and are each equipped with four 150-horse-power motors. By trains made up in this way the company were enabled to utilize a considerable amount of ordinary stock. The other two trains were made up of stock having a similar capacity, but using ordinary electric trailer carriages. The horse-power of each train nominally can be taken to be 1,200, both sets of trains being approximately 460 feet long, each capable of seating over 500 passengers, and weighing about 230 tons.—Engineering, London, Eng.



SPECIAL ELECTRIC TRAIN ON THE LANCASHIRE & YORKSHIRE RAILWAY

(From Engineering, London, Eng.)

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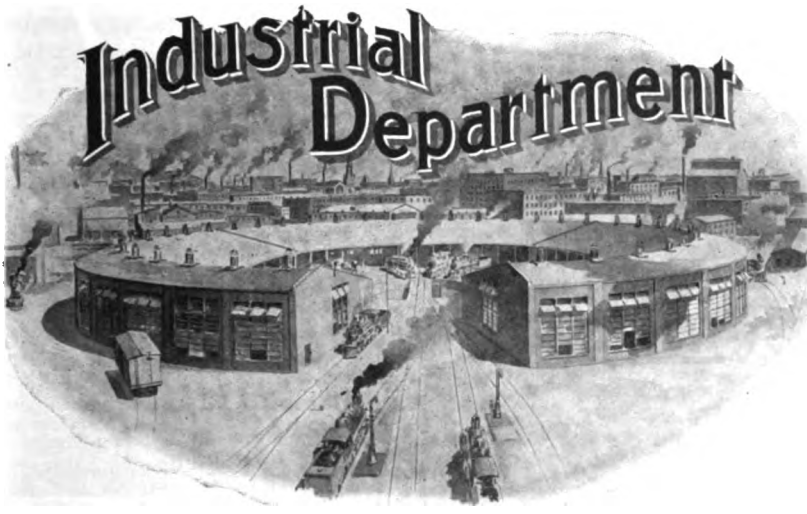

DISCUSSION OF CURRENT TOPICS

The Haywood Trial.

As this issue of the Magazine goes to press, the trial of William D. Haywood at Boise, Idaho, on the charge of complicity in the murder of ex-Governor Steunenberg, is still in progress, and while it may be some weeks yet before a verdict is reached, it is already evident that the testimony upon which the prosecution depends to corroborate the evidence of demon Orchard—with whom, by his own aeknowledgment, the commission of cold-blooded murders, robbery of various kinds and the destruction of property was a sort of business occupation—is of such a light and insubstantial character that under the ordinary conditions surrounding the everyday murder trial it would be of no real consequence as a convicting factor.

While the state has endeavored to show that Orchard was acting in co-operation with and under the directions of the officials of the Western Federation of Miners in the perpetration of his crimes, the fact has developed that while a member of that body, and professing to be in sympathy with its real aims and objects, he was, as a matter of fact, a spy in the pay of the Mine Owners' Association, and other interests operating against the Miners' Federation. About all that the evidence thus far introduced to corroborate Orchard's testimony has had a tendency to prove is that he really committed the crimes of which he has accused himself, and when we consider the inhuman excesses to which the Mine Owners' Association and their hireling thugs (the militia included) indulged in their efforts to exterminate the Western Federation, and their outrageous violation of the laws of God and man in their attempt to carry out their diabolical purposes, it does not require much reasoning to reach a conclusion as to who really hired Orchard to commit these crimes with the object of eventually fastening them on the miners' organization. When we consider, further, the unrestrained influence—the absolute power—which the Mine Owners' Association and combined monied interests in general have exercised in the selection of public officials (judges included), and in directing the actions of law-making bodies in Idaho and Colorado, it would not occasion us the slightest surprise if it were eventually established that the present trial is part of a gigantic, deeply laid, diabolical conspiracy to discredit the Western Federation of Miners before the world, and through the assassination of its officers by process of law, bring about its ultimate disruption.

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That such an object is, however, beyond their power to attain, regardless of how their preliminary plans will work out, has, during the past year, been clearly demonstrated by the Federation itself, for instead of losing membership or showing a disposition to weaken in the face of the present action against its chief officials, or to waver under the fire of a hostile subsidized press, it has evinced a grim determination to meet the conspirators that are endeavoring to enslave the wage-earner and fight with them the battle of emancipation to the bitter end. Instead of losing membership since these trials began, the Western Federation of Miners has increased materially in numbers, the report of Acting Secretary James Kerwin for the fiscal year ending March 31 showing that a total of fifty-one new locals have been organized and fifteen thousand new members admitted by initiation during the fiscal year ending March 31, 1907, the organization now having a total membership of forty thousand.

Trades Unionism—Sound Principles.

While discoursing recently upon the necessities of the present age, which are creatures of our impetuous commercialism, Prof. Jacob N. Hollander, of the Johns Hopkins University, took advantage of the occasion to express himself relative to the great principles upon which trades unionism is based, as follows:

"Trades unionism is a natural and proper institution in modern industry. But let it be clearly and explicitly understood that it is trades unionism and not necessarily trades unionists that are thus vindicated. Trades unionism is, in short, what trades unionism does. As an economic institution it is to be appraised by its possibilities and its tendencies, not by its occasional manifestations. Trades unionism may be wise and sound, and yet trades unionists may do wrong or foolish things. The same is true of religion and of democracy. In every case we cherish the system and blame those who violate its principles.

"Now and then, flushed with success or drunk with power, industrial liberty degenerates into industrial license, and the trades union becomes in the hands of corrupt or self-seeking leaders an instrument of brutal coercion that carries with it the seed of its own speedy destruction. More often foolish rather than vicious tendencies prevail. In short, as long as the trades union attempts to do those things for which alone it exists—the protection, education and improvement of industrial classes—and to do them by methods in consonance with social order and economic reason, it should be appreciated and supported as a wise and beneficent institution, even though its actual achievement falls far short of its program and be even marred by unfortunate and unwise incidents."

A Certain Class of Casualty Companies to Be Investigated.

The committee on building trades of the American Federation of Labor convention, held in Minneapolis last year, reported to the convention that there exists almost total disregard for, and evasion of, the laws of states and the ordinances and by-laws of cities relative to the protection of human life, particularly that part of our citizenship engaged upon the construction works and buildings in various parts of our country, and recommended that the convention instruct its executive council to collect from every available source contemporary experiences, violations of law and present general conditions known to the international, national, state, territorial, central and local bodies of the American Federation of Labor, also that it be required of the executive council of the Federation to lay before its legal advisers all matters obtained in accordance with the foregoing recommendation, requesting them to prepare a statutory form, which form shall be forwarded to state, central and local organizations, to the end that earnest, simultaneous endeavor be put forth to make the statutory form part of the code in every state, territory, possession or dependency of the United States. It also recommended that the legality of a certain class of so-called casualty companies be ascertained, as experience has shown that these companies are engaged in operations which tend toward the defeat of the ends of justice and the proper protection of human life. The report of the committee was adopted, and recommendations concurred in, and pursuant therewith Samuel Gompers, president of the American Federation of Labor, has issued a circular letter to labor organizations

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throughout the country, requesting them to furnish, as far as in their power, the desired information. It is nearly time that something should be done in the matter of regulating such casualty companies. They live on the misfortunes of working men. Their business consists of insuring employers against loss through damage suits. When an employe of one of their patrons is injured and sues his employer for damages, the casualty company assumes the employer's side of the case and insures him against loss regardless of how it may be decided. Inasmuch as they make a business of fighting the cases of injured working men, they have become experts in that line of work and are familiar with all the methods usually adopted to prevent the rendering of a verdict for the plaintiff.

It is to be hoped that the American Federation of Labor may succeed in having such institutions at least regulated if not entirely "put out of business."

The Battle Nearly Won.

In its crusade for the establishment of an eight-hour day in the printing trade, the typographical union has won a victory that is now almost complete. In a few isolated cases job printers and publishers are still holding out against the mandates of progress and are maintaining "open shops," and the old nine-hour day, as well as other working conditions that are below the union standard. Our brothers of the typographical union are determined, however, to continue their fight until every printer on the continent who is worthy of the name is enjoying the latest improved conditions, which, through its indefatigable energy and magnificently conducted campaign, it has succeeded in having almost universally established, and on which fact we extend to that branch of the great army of organized labor our most heartfelt congratulations.

The typographical union is leaving nothing undone to make the public in general, and wage-earners in particular, familiar with the names and identity of such institutions as are still holding out against the eight-hour day, notwithstanding that almost nine-tenths of the employing printers of the United States have adopted it. Their determination in this matter is evidenced by the following correspondence, which is self-explanatory:

"May 13, 1907.

"Locomotive Firemen and Enginemen's Magazine, Indianapolis, Ind.:

"Dear Sirs—Mr. Humphrey O'Sullivan of the O'Sullivan Rubber Company of Lowell, Mass., has withdrawn the advertising of his company from all unfair publications, and in reply to his notice refusing to place ads in the Saturday Evening Post and the Ladies' Home Journal, he received the following from the Curtis Publishing Company:

"'Boston, March 14, 1907.

"'Mr. Humphrey O'Sullivan, The O'Sullivan Rubber Company, Lowell, Mass.:

"'Dear Sir—Since writing you a few days ago I have inquired from our home office in regard to our precise attitude toward our printers, which is as follows:

"'We do run an "open shop," but we have no "non-union" men in it. They are all "union" men. There is not a concern in the United States that printers would rather work for than the Curtis Publishing Company, for they are treated better and get better pay than anywhere else. Furthermore, as long as we could, in justice to ourselves, we gave each man a vacation at full pay, which is something unheard of in printing shops, and we only discontinued this temporarily when we found we had to work nights as well as days to get our editions out with our present limited facilities.

"'The proof of the pudding is in the eating,' and the fact that we keep our printers through all conditions that surround the trade is strong proof that the Ladies' Home Journal and the Saturday Evening Post should never be placed on what you call your 'unfair list.' Are such conditions as these conducive to the leaving out of all the O'Sullivan Rubber Heel advertising from these two strongest publications in America, when you claim to be using the largest appropriation that you have ever put out in leading magazines? If so, it seems to me that the unfairness is entirely with you and to yourself.

"'Yours very truly,

"'THE CURTIS PUBLISHING COMPANY.

"'ARTHUR B. HITCHCOCK,

"'Manager New England Offices.'

"The statement contained in the above letter, so far as it relates to the printers, is absolutely false. The Curtis Publishing Company, publishers of the Saturday

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Evening Post and the Ladies' Home Journal, does not employ any union printers, and its composing room is not an 'open shop,' as none but non-union men work therein. The above publications are unfair. Union men do not buy or read them, nor do they patronize people who advertise in them.

(Signed) "J. W. HAYS,
"Representing the I. T. U. in Philadelphia."

♦ ♦ ♦

New Kansas State Federation.

The organization of the Kansas State Federation of Labor by the American Federation of Labor is a step in the right direction. The movement has been endorsed by the labor unions in all of the leading cities in Kansas, also by the district officers of the United Mine Workers of America, who have sixty-five local unions in that state.

The first convention of the Kansas State Federation will be held August 12, 13 and 14 of this year at Topeka, Kan. The work of organizing is in the hands of General Organizer Henry M. Walker, of the A. F. of L.

It is unnecessary to say that organized labor in Kansas will soon experience decidedly beneficial results as a consequence of the organization of the State Federation. It is due to the work of the State Federation under the A. F. of L. in the new state of Oklahoma that the following provisions and safeguards in the interests of the toiling masses were placed in the constitution of that State:

1. The initiative and referendum.
2. Compulsory education for our children.
3. Prohibiting the employment of children under the age of 15 years in factories and mines.
4. A fellow-servant law—damages for injuries resulting in death shall never be abrogated—and the amount recoverable shall not be subject to statutory limitations.
5. Eight hours shall constitute a day's work in all cases of employment by and on behalf of the state, or any county or municipality, and in the mines.
6. The state militia shall be subordinate to the civil authority and shall be called out only by the legislature.
7. The legislature is empowered to establish a state printing plant and to provide for the election or appointment of a state printer.
8. A mine inspector is provided for who has had eight years' experience as a practical miner in order to hold office.
9. A labor commissioner is provided for.
10. A commissioner of charities to look after the poor and needy is provided for.

To the new State Federation of Kansas the Magazine extends its congratulations and earnest wishes for success.

♦ ♦ ♦

Splendid Achievements of the Joint Labor Legislative Board of Texas.

The following from the report of the Joint Labor Legislative Board of Texas, appearing in the Texas Railway Journal, is fully in keeping with the past achievements and magnificent record of labor's representatives before the lawmaking body of the Lone Star State. Our Brotherhood is ably and efficiently represented on the Joint Board by Bro. Jos. S. Myers, who has been chosen as its statistician:

To Organized Labor in Texas:

In pursuance with the authority conferred by the respective organizations represented, the Joint Labor Legislative Board of Texas was organized for the Thirtieth Legislature at a meeting in Houston, Texas, April 14, 1906, with the following officers and members:

WALTON PETEET,
Texas Federation of Labor, Chairman.
C. F. GOODRIDGE,
O. R. C., Vice Chairman.
H. G. WAGNER,
B. of R. T., Secretary.
C. D. JOHNSON,
B. of L. E., Treasurer.
JOS. S. MYERS,
B. of L. F. and E., Statistician.

Another meeting of the board was held at Temple, April 29, 1906, for the purpose of outlining our work and preparing a synopsis of the legislation desired by labor to be submitted to candidates for the legislature prior to the primary election. This synopsis was embodied in the form of questions to candidates.

A large supply of these questions was printed and copies furnished to each organization represented by the joint board to be by them presented to candidates for signature. It is gratifying to note the increased interest taken by our members in this feature of the work, and to

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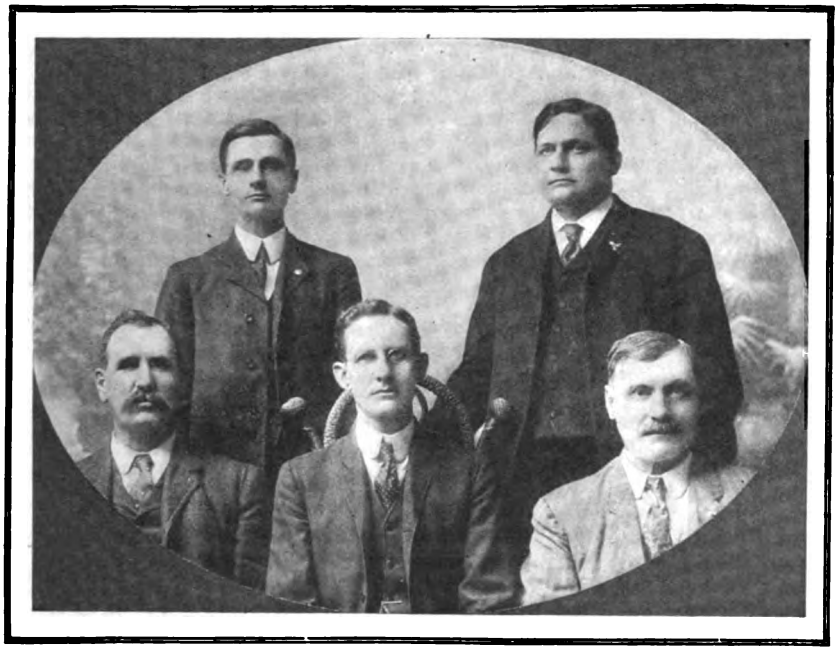
this is due in large measure our success in securing legislation this year, as we have only one instance to record of a legislator repudiating his pledge—the case of Senator Kellie of the Beaumont district, who in writing promised his constituents before election to vote for the mine bill, and when he got to the senate did all in his power to defeat this bill. The importance of questioning candidates before nomination can not be too strongly emphasized. Labor is entitled to know how candidates for the legislature stand on labor questions and this information can not be gained in any other way than by asking direct questions. The day when labor can be satisfied with glittering generalities is past. We earnestly invite your attention to our recommendations on this subject further along in this report.

In our last report we said: "It is gratifying to be able to report that as time passes the legislative needs of labor and the motives which prompt us to seek remedial legislation are becoming better understood, and that the number of our friends in the legislature is steadily increasing. Texas is still an agricultural state and a majority of the members of the legislature come in contact with and obtain personal information about the aims and purposes of organized labor for the first time through the work of the joint board. This gives it great educational and future value. Some of our very best friends and future champions come from districts in which there are no union men at all."



Joseph S. Myers, B. L. F. and E., Statistician
H. G. Wagner, B. R. T., Secretary
C. F. Goodridge, O. R. C., Vice Chairman
Walton Peteet, A. F. L., Chairman
C. D. Johnson, B. L. E., Treasurer

TEXAS JOINT LABOR LEGISLATIVE BOARD

It is a pleasure to us to be able to report two years after the foregoing was written that the cause of labor has made a steady advance and that today we are recognized as a substantial factor in legislation in Texas. By a wise and consistent policy of concerning ourselves only in matters that affect us and of keeping free from all entangling alliances with special interests that would use us for advancing selfish ends,

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we have not only maintained but increased the respect of the legislature and the public. As the friends of labor in the legislature increase and the standing and influence of the joint board improves, the effort to draw us into personal and political alliances that would ultimately discredit and destroy us also increases, and it is only by the exercise of sound judgment and a wise discretion that we have been able to steer a straight course.

The Thirtieth legislature passed more laws beneficial to labor than any previous legislature in the history of Texas. A brief summary of these laws follows. Laws enacted:

Mine inspection law.

Full train crew law.

Electric headlight law.

Anti-blacklist law.

Employes contract law.

Sixteen-hour law for railroad employes.

Eight-hour law for railroad telegraphers.

Barbers' license and inspection law.

Constitutional amendment for the creation of a bureau of labor.

Extension of benefits of uniform textbooks to cities above 10,000 population, which were exempt under previous law.

Amendment to anti-free pass law exempting railroad employes.

A law limiting the granting of injunctions.

For the first time in the history of the Joint Board we are not called upon to report anything under the head of "Measures Hostile to Labor," for none such were introduced this session. When we call to mind the many efforts made by our enemies in other states to get an advantage over labor through legislation, we have cause for feeling good over the absence of such efforts in Texas. In this connection, however, it may not be out of place to note that early during the session we came into possession of information that a firm of Galveston lawyers was attempting to raise a fund from the employing plumbers of the state, to be used in lobbying through the legislature a bill to destroy the plumbers union in Texas. We made such timely use of this information that the "lobby fund" was not raised and the hostile bill was never presented to the legislature.

A complete and authentic copy of each of the labor laws passed at this session, together with a brief legislative history of each will be found on other pages of this report, as well as a record of the vote of each member of the legislature on the same. A notable feature of the session has been the small number of roll calls on labor bills, most of them having passed by viva-voce vote—which renders it impossible for us to record the names of the few who voted against them. This is due entirely to the fact that our bills were so fair and just that the opposition could not muster sufficient strength to seriously hamper their passage.

Responding to a long expressed demand of the people for a law against free passes the legislature passed a very stringent and comprehensive law on the subject, which is reproduced in full on another page of this report. As originally drawn, most of the bills on this subject forbade railroad employes using free passes. The board gave this matter their attention and finally secured an amendment which exempts such employes —the right to ride free having always been reckoned as a part of the wages of such employes.

The legislature also passed an anti-lobby bill, aimed at correcting abuses against which the people have long complained. While the members of your Joint Legislative Board are commonly called "lobbyists," it was not at us or our kind that this bill was aimed. In effect the new law makes it a crime to seek to influence a member of the legislature by any other means than through "appeals to his reason," and as we never seek to influence them in any other way, the new law will not affect us. For the information of our members, however, we print a copy of the law on another page of this report.

Largely due to the efforts of organized labor, the uniform text-book law, passed by this legislature has been made to apply to all the state. Heretofore cities and towns of 10,000 population and upward have been exempted from the text-book law. If uniform text-books are good for the people who live in the country and in small towns and cities, they should be equally good for those who live in the larger cities. Thus viewing the matter, we sought to have its benefits extended to all the people, and trust that the laboring men in the larger cities will profit by it through cheaper books, and less frequent changes.

We also sought to have the law ex-

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press a preference for books printed in Texas, thus tending to build up the printing industry in the state, which would mean more employment for labor and an added volume of business. This amendment was adopted by the house but was stricken out by the free conference committee.

It should be a matter of pride to the union men of Texas that our Joint Labor Legislative Board is regarded as a model by our brothers in other states and is being extensively copied and patterned after. Texas has been the first state in the Union in which all branches of labor have united on a legislative program and where representatives of union labor and union farmers have actively co-operated in aiding each other.

Under our present poll tax law those who live in cities and towns which levy a city poll tax are required to pay both or $2.75 in order to vote, while the residents in the country districts only have to pay the state and county tax of $1.75. This is a rank discrimination against those who live in cities, and Representatives McGregor and MacInerney introduced a bill to make the payment of a city poll tax unnecessary in order to vote. It was a just measure and we gave it our support, but it failed to pass.

The bill by Representative Love of Williamson county, forbidding district judges to grant injunctions applying to disputes outside their districts, while in no sense a "labor measure" is of great interest to labor, which has always opposed government by injunction. Under the new law it will be impossible for some corporation to break a strike by going across the state somewhere and finding an "injunction judge" who will issue an injunction applying to a dispute outside his own district.

Adhering to the well-settled policy of the board for many years of devoting our energies first to the passage of our preferred measures and after them to such other as would benefit labor, we gave our support to the following bills which did not pass and which will necessarily go over to the next session: An experience bill by Senator Harbison for railroad employes; a bill by Representatives MacInerney and Cobbs for the protection of dock workers in handling defectively baled cotton; a bill by Representative Wilson for the protection of employes against discrimination by bonding companies; and a bill by Representative McCallum and Senator Senter amending the mechanics' lien law.

Organized labor everywhere stands for government by the people, and we note with pleasure the growth of public sentiment in favor of the initiative, referendum and recall—a system of making laws and controlling public officials which has for many years been endorsed by every labor organization in the country and by all farmers' unions. A constitutional amendment embodying the initiative and referendum was introduced by Senator Senter and Representative Cable, and it will not be many years before this will be sumbitted to a vote of the people. This legislature embodied the initiative, referendum and recall in both the Dallas and Fort Worth city charters. We advise our members to study these questions and be prepared for the issue over them which is certain to come.

Representative Hamilton introduced for us a bill creating a bureau of labor, but after giving the matter careful consideration we did not press this bill, but joined with the farmers in support of a constitutional amendment by Senators Brachfield and Looney creating a department of agriculture and a bureau of labor. This amendment passed and will be submitted to a vote of the people at a special election to be held on the second Tuesday of August this year. It is vitally important that every union man in the state go to the polls on that date and vote for this amendment, for the value to us of a bureau of labor can not well be overestimated. At the same time a vote will be taken on establishing a state printing office.

While the legislative board was in session in Houston information was given to the board through C. D. Johnson, a member of the board, that the General Managers' Association of Texas was desirous of meeting the legislative board at some future date for the purpose of considering the sixteen-hour law, hoping thereby to arrive at some settlement satisfactory to all concerned, and avoid the necessity of seeking further legislation on this subject. Complying with this information the legislative board was instructed to meet at some future date with the General Managers' Association, and complying with said instructions the board met at Waco, on August 2, 1906, the same day the General Managers' Association was scheduled to meet. The board met several of the managers in

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the morning before they convened, informing them that the board was in Waco and ready to meet with them, and advising them where we could be found. The board waited patiently until 2 p. m. and having heard nothing, a special messenger was sent asking if it was their intention to meet with us. The following is a copy of the letter in reply to our communication:

Waco, Texas, August 2, 1906.

Dear Sir—Your communication of even date just received and this is to advise that the meeting of the General Managers' Association adjourned before lunch and all of the managers have left the city, or at least my office, and are beyond my recall.

Concerning the "sixteen-hour" law, would say that as all of the roads live up to this law as completely as practicable, it did not occur to the various managers that there was any necessity for a conference between your board and the General Managers' Association.

Very truly yours,

(Signed) C. HAMILTON, President.

Mr. H. G. Wagner, Secretary Joint Legislative Labor Board of Texas, Hotel Metropole, Waco, Texas.

Under the circumstances there was no other course to pursue but to propose a measure at Austin, and have same enacted into a law, which was accordingly done, but we will say in connection therewith that several of the general managers have personally expressed their regret to members of the board for their failure to meet us at Waco.

We desire to express our appreciation of the uniform courtesy and consideration shown us by all the officers and employes of the legislature. We desire especially to thank Lieutenant-Governor Davidson and Speaker Love, the presiding officers of the two houses, for the fairness and consideration shown to us and our cause. Thanks are also due to Bob Barker, chief clerk of the house; Frank M. Kemp, assistant chief clerk; Mark Logan and W. T. Potter, reading clerk and assistant reading clerk; O. P. Basford, and Captain Sullivan, doorkeeper; Sebe Newman, sergeant-at-arms, and to our old friend and board member, Bro. Ed B. Willis, assistant sergeant-at-arms; R. C. Chambers, clerk to the speaker; Laten Stansberry, Tilden Childs, O. C. Funderburk, Mr. Holsey, clerk to sergeant-at-arms; and Mrs. S. R. Boyd and Miss Lelia Doyle, postmistress and assistant postmistress, respectively; also to Chief Clerk Smith of the senate; W. Z. Haynes, calendar clerk; J. H. Wagner, stenographer; Jeff Roberts, notary clerk; and many others.

We are also under special obligations to our old friend Chris B. Callan of San Antonio, who was a member of the three previous legislatures.

The list of our friends among the members of the house and senate is too long to be given here, but on another page we present the record of each, and trust that our members will carefully study the same and make known to their own senator and representative their appreciation of their actions.

In this connection we can not impress upon our members too strongly the justice as well as importance of paying attention to the records of your representatives in the legislature. You should not only vote for but actively work for the re-election of those who have proven their friendship for labor. This is not only to our own interest but is a matter of justice to those who have fearlessly stood by us. Many members of the legislature seek other offices after leaving the legislature, and when they have shown themselves our friends they should receive our support.

It is a pleasure for us to testify to the continued cordial and friendly relations that exist between our board and the officers and representatives of the farmers' unions. They have rendered us valuable assistance, and not a member of the farmers' union in the legislature (and there were quite a large number) who was not at all times our friend. We desire here to thank President E. A. Calvin; Legislative Representative F. W. Davis, and J. D. Montgomery, an influential member, for much valuable aid and assistance.

In conclusion we desire to earnestly recommend to our respective organizations and members:

1. Closer unity and co-operation in the matter of questioning candidates. This work should be done by a joint committee representing all branches of labor in each county and district, and when questions have been answered concerted action should be taken to make the answers of each candidate known to every union workingman in the county or district. In no other way

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can we unite our forces to elect good men to the legislature.

2. An active participation in primary elections. It is here that public officers are chosen and it is here that we must vote and use our influence.

3. That more joint and open meetings of all branches of labor be held for discussion of our legislative work. No matter what union or brotherhood we are a member of we have a common cause with the members of every other labor organization in matters of legislation. To this end we recommend that provision be made by each organization represented on the joint board to have its members attend as many of the local joint meetings as possible to discuss and explain our legislative program.

4. That each organization represented on the joint board send a fraternal representative to every state meeting or convention of every other organization represented and of the farmers' union, with a view to bringing about even closer unity and co-operation.

It is known to the members of this board that certain corporate interests in Texas are exceedingly anxious to bring about a dissolution of the joint board and that some unavailing efforts have been made in this direction, but we will not insult the intelligence of our members by any further warning against these insidious efforts at disruption, or by trying to point out the value to labor of the continued maintenance of the joint board. "By their fruit ye shall know them."

Anti-Blacklist Law.

An act to define and prohibit discrimination against persons seeking employment, and to prescribe penalties for the breach of said act.

Section 1. Be it enacted by the Legislature of the State of Texas: Either or any of the following acts shall constitute a discrimination against persons seeking employment:

(1) Where any corporation or receiver of same doing business in this state, or any agent or officer of any such corporation or receiver, shall blacklist, prevent, or attempt to prevent, by word, writing, sign, list or other means, directly or indirectly any discharged employe, or any employe who may have voluntarily left said corporation's service, from obtaining employment with any other person, company or corporation, except by truthfully stating in writing on request of such former employe, the reason why such employe was discharged or his relationship to such ceased.

(2) Where any corporation or receiver of same, doing business in this state, or any officer or agent of such corporation or receiver, shall by any means, directly or indirectly communicate to any other person or corporation any information in regard to a person who may seek employment of such person or corporation, and fails to give such person in regard to whom the communication may be made, within ten days after demand therefor, a complete copy of such communication, if in writing and a true statement of such communication if by sign or other means, and the names and addresses of all persons or corporations, to whom said communication shall have been made.

(3) Where any corporation or receiver of same, doing business in this state, or any agent or employe of such corporation, or receiver shall have discharged an employe, and such discharged employe demands a statement in writing of the cause of his discharge, and such corporation, receiver, agent or employe thereof fails to furnish a true statement of same to such discharged employe within ten days after such demand, provided, that such demand by the employe for said statement shall be in writing.

(4) Where any corporation or receiver of same, doing business in this state, or any agent or officer of same, shall have received any request, notice or communication, either in writing or by sign, word, list or otherwise from any person, company or corporation preventing or attempting or calculated to prevent the employment of a person seeking employment, and shall fail to furnish to such person seeking employment within ten days after a demand in writing therefor, a true statement of such request, notice or communication, and if in writing, a copy of same, and if a sign, the interpretation thereof, and the names and addresses of the persons, company or corporation furnishing the same.

(5) Where any corporation or receiver of same, doing business in this state, or any officer or agent of such corporation or receiver discharging such employe shall have failed to give a discharged employe a true statement of the

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causes of his discharge within ten days after a demand in writing therefor, and shall thereafter furnish any other person or corporation any statement or communication in regard to such discharge unless at the request of such discharged employe.

(6) Where any corporation or receiver of same, doing business in this state, or any officer or agent of such corporation or receiver shall discriminate against any person seeking employment on account of his having participated in a strike against another corporation.

(7) Where any corporation or receiver of same doing business in this state, or any officer or agent of such corporation or receiver, shall give any information or communication in regard to a person seeking employment having participated in any strike, unless such person seeking employment violated the law during his participation in said strike, or in connection therewith, and unless such information is given in compliance with subdivision one of section one of this act.

Sec. 2. Any and all discriminations against persons seeking employment as herein defined, are hereby prohibited and are declared to be illegal.

Sec. 3. Every foreign corporation violating any of the provisions of this act is hereby denied the right, and is prohibited from doing any business within this state, and it shall be the duty of the attorney-general to enforce this provision by injunction or other proceeding in the district court of Travis county, in the name of the state of Texas.

Sec. 4. Each and every person, company or corporation, who shall in any manner violate any of the provisions of this act shall for each and every offense committed forfeit and pay the sum of $1,000 (one thousand dollars) which may be recovered in the name of the State of Texas, in any county where the offense was committed or where the offender resides or in Travis county, and it shall be the duty of the attorney-general, or the district or county attorney under the direction of the attorney-general to prosecute for the recovery of the same, and the fees of the prosecuting attorney for representing the state in proceedings under this act shall be over and above the fees allowed him under the general fee bill.

Sec. 5. In addition to the penalties and forfeitures herein provided for, every person violating any of the provisions of this act shall be guilty of a misdemeanor, and upon conviction shall be punished by confinement in the county jail for not less than one month nor more than one year.

Sec. 6. In prosecutions for the violation of any of the provisions of this act, evidence that any person has acted as the agent of a corporation in the transaction of its business in this state shall be received as prima facie proof that his act in the name, behalf or interest of the corporation of which he was acting as the agent, was the act of the corporation.

Sec. 7. Upon application of the attorney-general, or of any district or county attorney, made to any justice of the peace in this state, and stating that he has reason to believe that a witness who is to be found in the county of which such justice of the peace is an officer, knows of a violation of the provisions of this act, it shall be the duty of the justice of the peace to whom such application is made, to have summoned and to have examined such witness in relation to violations of any of the provisions of this act, said witness to be summoned as provided for in criminal cases. The said witness shall be duly sworn and the justice of the peace shall cause the statements of the witness to be reduced to writing and signed and sworn to before him, and such sworn statement shall be delivered to the attorney-general, district or county attorney upon whose application the witness was summoned. Should the witness summoned, as aforesaid, fail to appear or to make statement of the facts within his knowledge under oath, or to sign the same after it has been reduced to writing, he shall be guilty of contempt of court and may be fined not exceeding one hundred dollars, and may be attached and imprisoned in the county jail until he shall make a full statement of all the facts within his knowledge with reference to the matter inquired about. Any person so summoned and examined shall not be liable to prosecution for any violation of the provisions of this act about which he may testify fully and without reserve.

Sec. 8. Said written cause of discharge, if true, when so made by such agent, company or corporation, shall never be used as the cause for an action for libel, either civil or criminal, against

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the agent, company or corporation so furnishing same.

Sec. 9. The importance of this measure, and the near approach of the close of this session creates an emergency and an imperative public necessity that the constitutional rule requiring bills to be read on three several days be suspended, and that this act take effect and be in force from and after its passage, and it is so enacted.

Anti-Lobby Law.

An act to define and prohibit and punish lobbying.

Section 1. Be it enacted by the Legislature of the State of Texas: That if any person having any direct interest, or the president or any other officer of a corporation having any direct interest in any measure pending before, or thereafter to be introduced in either branch of the legislature of this state, in any manner, privately attempt to influence the action of any member of the legislature of this state during his term of office concerning such measure, except by appealing to his reason, he shall be deemed guilty of lobbying.

Sec. 2. That if any paid or employed agent, representative or attorney of any person, association or corporation, shall at any place in this state, after the election and during the term of office of any member of the legislature of this state, privately solicit the vote, or privately endeavor to exercise any influence or offer anything of value or any other inducements whatsoever, to any such member of the legislature, to influence his action concerning any measure then pending or thereafter to be introduced in either branch of the legislature of this state, he shall be deemed guilty of lobbying.

Sec. 3. The provisions of this act shall not be held to apply to the governor or a member of the legislature of this state, nor to prohibit any person, either in person, or by his agent or attorney, or any corporation by representatives, agents or attorneys from exercising the right of petition to the legislature, or from collecting facts, preparing petitions, procuring evidence and submitting the same, together with arguments, to either branch of the legislature, when in session, or any committee thereof, in the interest of any measure in which he or it may be interested, but in such case the agency and the interest in the measure of the person so appearing shall be fully disclosed.

Sec. 4. That lobbying as hereinbefore defined, shall be unlawful, and the same is hereby prohibited; and any person who shall be convicted of lobbying shall upon conviction be punished by a fine of not less than two hundred nor more than two thousand dollars, and in addition may, at the discretion of the jury, be imprisoned in the penitentiary for a term not less than six months nor more than two years; and any violation of this act may be prosecuted in the county where the offense is committed, or in Travis county.

Sec. 5. To prevent lobbying and to promote the orderly dispatch of business it is hereby made unlawful for any person employed in any manner to represent the interest in legislation of any person, association or corporation to go upon the floor of either house of the legislature reserved for members thereof, while in session, except upon invitation of such house; and any person violating the provisions of this section of this act shall be punished by a fine not to exceed one hundred dollars.

Sec. 6. The fact that there is no law in this state defining or punishing lobbying in this state creates an emergency and a public necessity exists requiring that this act take effect and be in force from and after its passage, and it is so enacted.

* * *

Child Labor.

The boy telegraph operator at little railroad stations, whose blunder causes frightful wrecks, is more sinned against than sinning. The boy nature is such that it should never be relied upon when human life is at stake. Boys will be boys. No matter how bright and keen and willing and capable a boy may be, he is nevertheless peculiarly subject to fits of forgetfulness. His fancy roves to deeds of adventure and ambition. Suddenly brought back to realities, the boy is confused. And the train rushes by. It is all right to trust boys so long as their mistakes do not involve human life. And the railway managers should be brought to realize that "taking chances" is only permissible so long as the disastrous consequences do not affect others than those who take the chance. You can take a chance in your own business. If it fails, it is your own loss. If the bright boy

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you employ makes a mistake, it is your loss. But when taking chances—when trusting the boy—involves two trains full of human life and a mistake will kill and maim and make widows and orphans and sever families and rob parents of their children, it is different. It is criminal. And the time has come when this thing must cease. It must be abolished by law. Otherwise America will stand convicted before the world as a people that put the dollar above human life:—Denver Post.

*Labor Interests in the Courts.**

Instruction of Employes.—While a railroad company is bound to promulgate rules for the government of its employes and to enforce their obedience, it is not absolutely required to adopt and promulgate a code of rules for the education of beginners prior to inducting them into its service.—Louisville & N. R. Co. v. Vincent, 95 S. W. (Tenn.) 179.

Excessive Damages.—An award of $2,500 damages for the loss of two fingers of the right hand of a man twenty-three years of age, who was engaged in work requiring the use of his hands, was not excessive.—Choctaw, O. & G. Ry. Co. v. Craig, 95 S. W. (Ark.) 168.

Punitive Damages.—Where the evidence shows that an engineer on a locomotive was injured by the explosion of the lubricator because the glass was insufficient to sustain the steam pressure, and the glass was of the highest quality and had been in general use for a long time, a verdict for punitive damages is unwarranted.—Wysong v. Seaboard Air Line Ry., 54 S. E. (S. C.) 214.

Defective Bridge.—James McGuire, an employe of the Lehigh Valley Railroad Company, was thrown into the Lehigh River and drowned by the collapse of one span of the railroad bridge. In an action by his children against the company for damages because of the death of their father, there was a judgment for plaintiffs, from which the defendant appealed to the Supreme Court of Pennsylvania. This judgment has been reversed by the latter court on the ground that the issues in the case should never have been submitted to the jury. In part the court said:

"Plaintiff was at the time of the accident engaged with others in placing heavily loaded freight cars upon the bridge for the purpose of holding it in position, and preventing it from being washed away by an extraordinary flood then prevailing. The decedent was unmarried, and lived with his parents, and they have brought this suit, alleging negligence upon the part of the defendant company in the construction of the pier which gave way before the flood. The pier in question was built in accordance with the plans and specifications furnished by the engineers of the company. The skill and competency of the engineers are not questioned.

"The pier had a base of solid concrete, about fourteen feet thick, and upon this the stonework was erected. The manner in which the work was done is thus described by the chief engineer, under whose supervision the bridge was designed and erected: 'In the construction of the foundation of the piers for which Mr. Hendler had the contract, the method used was to first dredge out the soft material forming the material at the bottom of the pool back of the dam. It consisted of mud and muck, sawdust, and different material of that kind, soft material. That was dredged out. That was dredged out until the dredge bucket scraped the hard bottom. We then sounded that bottom with iron rods, and passed upon it as being sufficiently firm to support a bridge of that character. The bottom would be best described as boulders and compact gravel, a hard mass. Then the contractor built the cofferdam or caisson, consisting of a wooden box eighteen feet wide, about fifty-eight or sixty feet long, and about thirty feet high. That was built in the water, and, as it grew in height, sunk down. There was no top or bottom to it, simply four sides. When that reached the bottom, the bottom was still further excavated inside this box after it had come down to the bottom, and cleaned out with an orange-peel bucket we subsequently furnished to Mr. Hendler for that purpose, until the bottom was well cleaned off, and then sounded over with rods to make sure it was hard, and then the concrete put immediately thereafter. The concrete base filled this box on all sides, that is, it was eighteen feet wide, about fifty-eight or sixty feet long, and it was,

*Prepared for the Locomotive Firemen and Enginemen's Magazine by Geo. H. Murdoch, Jr., St. Louis, Mo.

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at pier 2, in question, fourteen feet high.' The engineer further explained the process of riprapping, and what was done in that respect, at this pier. After describing the size of the large stones used, he said, 'We put that riprapping around the pier on all sides; upstream, downstream, both sides varying in height vertical along the outside of the wooden caisson from ten to twelve feet high, and running out from the caisson horizontally that way about from eight to ten feet. The total yardage deposit of a new riprap stone brought there for the purpose by Hendler and deposited around that pier No. 2 was, as per the payment we made to him for that purpose, 371 cubic yards.' In addition to this, about one hundred yards of old material was placed around this pier, beside the new stone. The engineer testified that in his judgment the amount was entirely sufficient, and that, if he had not thought so, he would have ordered more, as the matter was entirely in his hands, and under his control.

"Now, as against this testimony of a skilled and competent engineer, the record shows that the contractor who built the pier, under the direction of the engineers, was of the opinion that more riprap work should have been placed around the pier. And because of this difference of opinion between the engineers and the contractor, the trial judge allowed the case to go to the jury to determine who was right, and permitted the jury to say that the company was negligent in relying upon the judgment of its engineer, rather than upon that of its contractor. If the fact had been the other way, and the company had followed the suggestion of the less-skilled adviser, there would have been room for criticism. But, having obtained the services of skilled engineers, against whose capacity there is not the slightest imputation, it would be unreasonable to allow a jury to say that the company was negligent in resting upon the judgment of these competent men. It is not enough for the plaintiffs to show that in some particulars the contractor who did the work differed in opinion with those who made the plans and specifications under which he worked. This was a question of the sufficiency and character of a structure which could only be determined by the exercise of professional skill, and great practical knowledge. It was a problem in engineering, and from its very nature it was something which a jury is not competent to decide. A railroad company is bound to exercise the highest degree of care in the construction of its bridges for the use of its trains. But the standard of duty is not to be fixed in this respect by the caprice of a jury of uninformed men.

"The trial judge correctly said that the defendant company was only bound to construct and maintain a reasonably safe bridge, and one reasonably suited for the purpose for which it was intended. But he was inconsistent in leaving the question to the jury, for there was no evidence to show any failure to discharge this duty. It was no ordinary occasion which wrecked this bridge; it was a most extraordinary flood, complicated further by giving away of the dam below, which induced a strong sidewise current, which overturned the pier sidewise. The authorities upon this aspect of the case are thus summed up: 'A railroad company is not bound to furnish absolutely safe machinery to an employe, but only such as is reasonably suitable for the purpose for which it is intended, and to exercise ordinary care to see that it is kept in such a condition. Applied to the case of an injury in consequence of a defect in a railroad bridge, the rule is said to be that a railroad company which uses ordinary care to see that a bridge on its right-of-way is so constructed as to be reasonably safe, and subsequently employs competent and careful inspectors who use ordinary care in inspecting it, to see that it is kept in a reasonably safe condition, is not liable to an employe for an injury received on such bridge.' And where competent engineers pass upon the sufficiency of a structure, and decide that it is safe, the employer will not be answerable as for negligence in case of an honest mistake of judgment made by such men. To hold otherwise would be to make the employer insure the infallibility of the judgment of its employes.

"We find nothing in the evidence in this case to show that the defendant company did anything more or less than to commit the designing and construction of the bridge into the hands of competent and skilled engineers. And having done so, it did not, either through its engineers or other officers, accept the suggestion of the contractor with regard to the amount of riprapping needed around the pier. There being in this conduct nothing sufficient to sustain a charge of negligence, it is not necessary to discuss

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the question of the assumption of the risk by the employe.—64 A. (Pa.), 825.

Fellow-Servant Doctrine Applied.—John H. Ricker, a fireman on train 30, southbound, on a branch of the Central Railroad Company of New Jersey, was injured in a collision with train No. 31, northbound, one mile south of Hoffman station. He brought an action against the railroad company for damages on account of the injuries sustained and a verdict was rendered in his favor in the trial court, which was reviewed by the Court of Errors and Appeals of New Jersey and affirmed. Two questions were presented on the appeal. (1) Was the negligence of the train dispatcher the negligence of the company, so as to preclude the application of the rule that denies recovery for injuries caused by the negligence of a fellow-servant? (2) If so, was there evidence of negligence sufficient to justify the submission of the case to the jury?

The opinion rendered is a learned discussion of who are fellow-servants, especially as applied between a train dispatcher and a fireman, and is as follows:

"The general principle well established in the cases is that the master is bound to take reasonable care that the place where the workmen are engaged shall be kept safe, and if the master selects an agent to perform this duty for him, and the agent fails to exercise reasonable care and skill in its performance, the master is responsible for the fault. The master is held liable in a proper case because the negligence is regarded by the law as his negligence. Where the negligence consists merely in the failure of the agent to perform a duty properly intrusted to him by the master, the master can not be held liable by virtue of the rule respondeat superior, for the application of that rule is prevented by the well-established exception which exempts the master from liability to a servant for injuries resulting from the negligence of a fellow-servant. In applying the general principles to the fact of a particular case, it often becomes difficult to determine whether the negligence in question is to be regarded as the negligence of the master or of the servant alone, and various tests to determine this question have been suggested. In this State we have rejected the theory which holds the master liable merely because the negligent servant is in charge of a separate department or is superior in rank to the one injured. In Baltimore & Ohio R. R. Co. v. Baugh, 149 U. S. 368, 13 Sup. Ct. 914, 37 L. Ed. 772, it was said that the question turns rather on the character of the act than on the relation of the employes to each other. This test had already been adopted in our Supreme Court, where Justice Van Syckel said that the neglect to perform those duties which devolve upon the company should be regarded as the neglect of the company itself, and was adopted by this court in Smith v. Erie R. R. Co., 67 N. J. Law 636, 52 At. 634, 59 L. R. A. 302. In Steamship Co. v. Ingebregsten, Justice Dixon said, with reference to the inspection and repair of apparatus, that a rational distinction would seem to be that when the employe's duty to inspect and repair is incidental to his duty to use the apparatus in the common employment, then he is not intrusted with the master's duty to his fellow-servant, and the master is not responsible to his fellow-servant for his fault, but that, if the master has cast a duty of inspection or repair upon an employe who is not engaged in using the apparatus in a common employment with his fellow-servant, then that employe in that duty represents the master, and the master is chargeable with his default. Both of these tests—the character of the act, and its incidental feature—are useful tests, but there is nothing in the cases cited to indicate that there may not be other tests, also. The question to be determined is whether, under all the circumstances of the particular case, the servant is to be regarded as the alter ego of the master. It may be that the master has intrusted him with such control over the general conduct of the business that he must be regarded as standing in the master's shoes. This is especially likely to be the case with a corporation, which can act only through agents, as was suggested in Smith v. Oxford Iron Co., 42 N. J. Law 467, 36 Am. Rep. 535, and in O'Brien v. American Dredging Co., 53 N. J. Law 291, 21 At. 324. In such cases the liability of the master depends upon whether he has intrusted the servant with such control as is properly the business of the master.

"We think the facts in the present case necessitate an inference that the train dispatcher was the alter ego of the defendant. It will hardly be denied that the duty of a railroad company to take

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care that the place in which its employes are to work shall be reasonably safe required the company to prepare a schedule or time-table for the running of its trains. Such a schedule is absolutely essential in order that the system adopted by the company for the conduct of its business may be reasonably safe. When that schedule breaks down, it may be under such circumstances that a new schedule to meet the emergency can be made by the train hands themselves, as, for instance, when a train is delayed and the engineer makes up time by running faster than his ordinary schedule. But when the railroad is a single track and it becomes necessary for the company to require information to be given to a central authority, who is empowered to direct the movements of all trains, his orders for that purpose amount to a new emergency schedule. We agree with the Court of Appeals in New York that the preparation of that schedule is a positive duty of the master. The work is not merely incidental, as was the duty of the brakeman to signal the oncoming train in Miller v. Central R. R. Co., 69 N. J. Law 413, 55 At. 245. What chiefly distinguishes the train dispatcher's work in the present case is that by the company's rule it was made his duty to issue telegraphic orders for the movements of trains in the name of the superintendent, and to see that they were transmitted and recorded in the manner prescribed. This duty in the present case required him to issue orders to three different trains miles apart, and might sometimes require orders to many trains scattered along the company's whole line. Such work as that pertains to the master, the natural directing head. The train dispatcher is not merely a superior servant, like the foreman of a gang of workmen. It is to be conceded, as we think it must be, that the duty to prepare a time-table is the company's duty. The duty is not discharged by preparing a time-table once for all, accompanied by rules regulating variations therefrom. The duty to exercise reasonable care is continuous, and the need of a time-table to direct the movement of trains is constant. Upon the question whether this duty is a positive one resting on the master, we can see no distinction between this case and the case of Smith v. Erie R. R., 67 N. J. Law 636, 52 At. 634, 59 L. R. A. 302. It is quite as much the master's duty to keep the time-table up to date as to keep the roadbed in repair. Both are equally essential to the servant's safety. The courts of fourteen of our sister states and the federal courts, including courts which rest the liability of the master upon the same ground as our own cases, have reached the same result. The cases have been recently diligently collected by Mr. Justice Chase of New Hampshire, in Wallace v. Boston & Maine R. R., 72 N. H. 504, 57 At. 913. It would serve no useful purpose to repeat the citations. To them may be added the recent case of Santa Fe Pacific Railroad Co. v. Holmes, 202 U. S. 438, 26 Sup. Ct. 676, 50 L. Ed. 1094. The courts of Maryland and Mississippi seem to stand alone in the other view, and their reasoning does not commend itself to us. We do not rest our view upon the fact that the train dispatcher is superior in rank to the fireman of a locomotive. We can conceive of cases where the company would not be responsible for his negligence. Perhaps Reiser v. Pennsylvania Co., 152 Pa. 38, 25 At. 175, 34 Am. St. Rep. 620, may be regarded as such a case. There it was held that the knowledge of the train dispatcher that a station agent and telegraph operator, whose negligence caused the accident, was incompetent, did not make the company liable. We rest the defendant's liability in this case upon the character of the work of the train dispatcher in regulating the movement of trains.

"In order to determine whether there was sufficient evidence to justify a submission of the case to the jury, a rather full statement of the facts proved is necessary. Three trains are involved. No. 30 and No. 52 were southbound trains, and by the rules of the company had the right of way. No. 31 was a northbound train. According to the time-table No. 52 should have reached the terminus at High Bridge at 9:40 a. m., ten minutes before the departure of No. 31, and No. 30 and No. 31 should have met at Hoffman's, 3.9 miles north of High Bridge. On the morning of the collision No. 52 was detained and considerably behind time. At 9:43 a. m., three minutes after No. 52 was due at High Bridge, the train dispatcher issued an order directing 52 and 31 to meet at Hoffman's. This order reached the telegraph operator at Galifon, one and one-half miles north of Hoffman's, and he put out a signal to stop the southbound train. In the meantime, No. 30 had passed No. 52, which was on

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a switch at Vernoy, a little more than a mile north of Califon. By the rules of the company a train overtaking another train of the same or superior class, disabled so that it can not move, will run around it, assuming the rights and taking the orders of the disabled train to the next telegraph office which is open, where it will report to the superintendent. The next telegraph office after No. 30 had passed No. 52 was Califon. At that point train No. 30 offered to stop, but the station agent and telegraph operator signaled to go ahead, and gave the train conductor a clearance card, which reads as follows: 'I have no orders for your train. Signal is out for 52.' It was then about 10:20 a. m. No. 30 was due at Califon at 10:01, and being a southbound train had the right of way. At 9:43 the conductor of No. 31, then waiting at High Bridge, received the order directing him to meet No. 52 at Hoffman's. At that time, according to the time-table, No. 30 should have been fifteen minutes north of Vernoy. The conductor of No. 31 asked the train dispatcher if No. 30 was ahead of No. 52 and was assured that it was not. When No. 31 was ready to leave High Bridge, the conductor saw the order board red, which meant there were orders for him, and he started to the office to see what the trouble was, but as he got in sight of the office the yardmaster and the train dispatcher both gave him the regular hand signal, the regular day signal, to go ahead, and he started with his train at 10:15 or 10:16. The road was a single track, and the result was a head-on collision one mile south of Califon at 10:28. The train dispatcher had been inquiring about 52 of the telegraph operator at Califon for half or three-quarters of an hour prior to the arrival of No. 30 at Califon, but is not shown to have made any inquiry as to No. 30. Under these circumstances we think it was a question for the jury whether the train dispatcher was negligent in allowing the time from 9:43 to 10:15 to elapse without any further orders, although he must be presumed to know from the time-table that No. 30 was due at Hoffman's at 10:10, five minutes before he ordered No. 31 out of High Bridge, and might have passed No. 52, which was then at least fifty minutes behind time, for it was due at Califon at 9:25. It is true the witnesses testified that No. 30 had no right to pass No. 52 at Vernoy, but they also said it frequently did pass. No. 30 was due at Califon at 10:01. We think it was a question for the jury whether the care necessary in directing the movements of trains upon a single-track road did not require new orders. The order of 9:43 a. m. was adapted to the conditions existing at the time, but not to the condition thirty-two minutes later. At the time No. 31 was ordered out of High Bridge it did not have full schedule time to make the meeting point at Hoffman's and could not leave without special orders. The fact that a special order was necessary would naturally suggest to the train dispatcher that the operator at Califon be notified that such order had been given to No. 31. To make a special order accomplish its purpose, it seems reasonable that it should be communicated to all trains likely to be affected, and not to one alone. Such was the course adopted with the order of 9:43 a. m. If the same course had been adopted with the order given No. 31 at 10:15 the accident might have been averted, for four or five minutes elapsed before No. 30 left Califon, a time long enough to enable notice to be sent to the operator at Califon. We think it was also a fair question whether the train dispatcher was not negligent in ordering No. 31 to leave High Bridge at a time when No. 30, by the time-table, ought to have passed Hoffman's without making inquiry as to the whereabouts of No. 30, especially as No. 30 had the right of way. It may be said that the operator at Califon ought to have known that the order as to No. 52 was applicable to No. 30, since the latter had passed No. 52, and ought to have reported No. 30's arrival before giving the clearance card. We incline to think he ought to have done so. It may also be said that the conductor of No. 30, before acting upon the clearance card, should have waited for the operator at Califon to report his arrival and receive further orders, although it is to be said in his defense that he may well have thought that such a report had been made, for his train could be seen for 300 or 400 yards before it reached Califon and was running so slowly that the operator had time to make the clearance card after he saw the train coming. But even if the operator at Califon and the conductor of No. 30 were negligent, the question would still remain whether, under all the circumstances of the case, the train dispatcher exercised reasonable care in de-

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pending upon their accepting an order issued for No. 52 thirty-two minutes before, as an order still obligatory on No. 30. Ought it not to have occurred to him that they might possibly think, as they probably did think, that the order to No. 52 did not apply to No. 30, and that No. 31 would be held at High Bridge until No. 30 reached that point, especially as the train dispatcher up to 10:15 is not shown to have made any inquiry as to No. 30, although her regular time for leaving Califon had passed? If the accident was caused by the negligence of the operator at Califon and of the conductor of train No. 30 co-operating with the negligence of the train dispatcher, the defendant is nevertheless liable."

64 A. 1068.

* * *

A Strike Within a Strike.

A rather peculiar condition of affairs has been brought to light as a result of the strike of the street car employes of Portland, Ore. It appears that when the union men in that city struck, the company, with the assistance of strike-breakers, managed to open traffic, and later induced the scabs to organize in conjunction with its (the company's) officials. This was done, and the former, as soon as they had gained sufficient headway numerically, ousted the latter from the organization. They then made a demand upon the company for an increase in wages of three cents per hour, which is considerably more than that sought by the union men—and threatened to strike, if necessary, to enforce said demands. This placed the company in a position where it either had to surrender to its scab employes or else call in the legitimate union employes. Of course the latter was entirely out of the question, and rather than acknowledge the union they adopted the former course, thinking possibly that under the circumstances that was the better plan.

This, however, does not seem to have ended the matter, as the organization consisting of their refractory scab employes is now endeavoring to join the legitimate union in a body. Whether or not they can do this remains to be determined, but of one thing there is no doubt, and that is that the Portland Street Railway Company has learned a substantial lesson to the effect that fair and equitable treatment of employes is by far the cheapest in the long run.

*Jesus Christ—Union Carpenter.**

I was asked in a public meeting recently if I thought that Jesus would become a member of the Carpenters' Union were He on earth today. Just what Christ would do in regard to organized labor in the twentieth century, no man dare prophecy. Any other man's opinion on this subject is as good as mine. But I do believe that Jesus was a member of the Carpenters' Guild of His day, which was the nearest approach to the forms of organized labor in this generation. It is also quite likely that were He to come again as a carpenter, with all that that implies—a workingman's trials as well as a workingman's sympathies—He would identify Himself with that organization which is doing most to better the conditions of all workingmen. And if He were to manifest the same spirit toward those who oppressed the poor and the helpless that He did when He was on earth in bodily form, He would probably become known as a "labor agitator."

Those who assert that Jesus would in no case identify Himself with any organization that practiced slugging or that was unfair in any particular—of which things these persons insist organized labor is guilty—forget, or do not know, that He became a member of the very organization of His day, which was guilty of everything that is today charged against organized labor. When he addressed the leaders of the scribes and Pharisees, He not only reminded them that their fathers had scourged and persecuted the prophets, that they had killed and crucified those who had been sent to them, but that they, themselves, were guilty of the most damnable sins—hypocrisy, graft, persecution. And these very leaders afterward crucified Him for His persistent declaration that He was the Son of God, and that He had been sent to save the people. Jesus Christ was a member of that ancient organization, because—in spite of the fact that it was largely controlled by men of this type—it had within it the elements of true piety and faithfulness toward God and toward men. It must, in all fairness, be said today with reference to organized labor, that it, too, contains the elements which make for a higher type of manhood and womanhood, even though there are within its ranks some men who dishonor the cause. These must soon be eliminated, so that the

* By the Rev. Charles Stelzle.

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movement which represents the best interests of the working people may no longer be handicapped by unfaithful leaders.

To this end, why would it not be well to invite into membership the man who may truly be claimed as "Labor's Champion"—Jesus Christ? Let organized labor take its stand behind Him. Permit Him to speak for you. You need never again quote the political economist. Quote Christ. Never has any man more bitterly denounced the oppressor. Invite Him to sit upon your platform. Take Him into your councils. If you will, you are sure to win, for Christ is sure to win. I have a very strong conviction that if the workingmen of the world were to claim Christ as their exponent, their Leader, with all that goes with this claim, no power an earth could withstand their onward march. Does this seem visionary? But hasn't the Church done this very thing? The true Church rests absolutely and specifically upon the person of Jesus Christ. All of its progress is due to this fact. Its sacrifice, as well as its victories, were founded upon its faith in Christ. He is claimed today by the Church as a living, personal power. Labor, too, may have Him—in the broadest, fullest sense. And when it again lays claim upon Christ, its victory is assured.

* * *

Initiative and Referendum Movement Meeting with Success.

Machine Rule Is Doomed.

March 14 the House of Representatives in Maine unanimously passed a bill submitting to the people of the state a constitutional amendment for the initiative and referendum. During the same month a vote in the Delaware House of Representatives for an initiative and referendum system for the city of Wilmington was unanimous. In Oklahoma the vote in the constitutional convention for the initiative and referendum was practically unanimous. It would seem that there is no withstanding the arguments. Therefore, every state in the Union is sure to install this direct-vote system, and it is only a question of time when it will be established nationally. Already twenty states have adopted the system, or the movement is far along, while nationally 109 members of the next House are pledged—seventy-four Democrats and thirty-five Republicans. Is it at all unlikely that next year's campaign will result in a majority vote in both of the national houses and the approval of the President?

Machine rule is doomed. Only yesterday it defiantly ruled us, today it is practically an outcast. In the long run Truth always wins. The people's cause is secure.

When the time for each particular reform is ripe it sweeps the country like a prairie fire. It was so with the movement for the secret ballot; today it is the movement for direct-voting on public questions and direct nominations.—National Federation for People's Rule.

The Voice of the People.

An editorial in the Wall Street Journal of March 18th says: "If progress in favor of the initiative and referendum in representative government advances in the next few years as it has in the last few it will not be long before the people will send their representatives to the state legislatures and to Congress with a definite program of convictions to enact into laws for the subsequent decision of the voters. It is true that the referendum idea may be carried to foolish extremes, but within due limits it has great value.

"There are undoubted signs that machine rule must give place to more or less direct control by popular vote. More than twenty states have taken action upon these methods of legislative reform. In a few of the newer states they are already in operation, but there, as elsewhere, they forecast a more complete control by the people in determining what laws shall be presented for consideration, and that only such laws shall go into effect as have been accepted by the direct vote of the people.

"The restoration of the rule of the majority in politics coincides with what is taking place in the financial world. The two tendencies seem to be part of a parallel awakening to power. With increasing publicity questions of policy can no longer be confined to a star-chamber session of a few interested people, but must be open to the consideration of all who are directly concerned. The initiative and the referendum in financial management have possibilities in the direction of broadening the confidence and strengthening the credit of business which the

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older system of boards of directors has never realized.—National Federation for People's Rule.

The need for a change from the machine-rule system of government is stated in the following words by the San Francisco Star: "The legislature adjourned on Tuesday and we humbly and heartily thank God for the riddance. The majority in both houses were simply the unliveried lackeys of the railroad, and Mr. Harriman's sub-bosses walked among these creatures with the mien and words of undisputed masters. It was the most greedy, shameless and disgraceful collection of corporate hirelings that ever assembled to make laws for a great commonwealth."—National Federation for People's Rule.

Political Reforms in Iowa.

This year Iowa is making a record for political reforms. The legislature has framed and adopted a new and improved system of municipal government for cities, has devised a new form of direct legislation for the State, which system has received more than a majority vote in the house, and the legislature will doubtless provide for popular election of United States senators.

The improved system of municipal government is for cities of more than 25,000 population, and it is optional with the people to install it. An initiative petition by 25 per cent. of the voters can bring before their fellow-citizens the question of adopting the system. It is understood that Des Moines will soon make the change.

The system provides for a board of five members, consisting of a mayor and four aldermen, with a veto power in the voters, who possess also the power of direct legislation, and the right of recall. These five officials are to receive fair salaries and devote their entire time and energies to their work and will be nominated and elected by direct vote.

Thus expert business ability is to be combined with the people's rule. The actual workings of the system will be watched with great interest. It is claimed that it will solve the problem of securing honest and effective municipal government, provided complete home rule is established.

Iowa's other new system is an improved form of advisory initiative. It is proposed that where a bill in the legislature or a resolution for the submission of a constitutional amendment fails to pass, the voters can put it to an advisory vote of their fellow-citizens at the primary election, or 55 of the 158 members of the legislature can order that the vote be taken. Such a system, it is claimed, would terminate most of the evils of the lobby. The bill, though introduced in the house by a Democrat, has received a vote of 44, as against 34, lacking only 11 of the required two-thirds vote for the submission of a constitutional amendment.

By taking the advisory vote of the people at the time the nominations are made, the question will be kept separate from the issues at the regular election, and it will be easy to pledge the candidates to obey instructions from their constituents when given by referendum vote. Furthermore, legislative hearings will have been had and the details worked out.

People's Rule in Wilmington, Del.

The city of Wilmington, Del., is the first eastern city to possess the initiative and referendum system. This year's legislature installed it and the initiative is being used. A petition, signed by more than the required 10 per cent. of the voters, has been filed in the mayor's office, requesting the submission of the following questions at the June 1st election:

"Shall the mayor and council recommend the same system of assessing property as is now in vogue in the city of New York and elsewhere, whereby separate assessments are made of property and the improvements thereon, instead of the entire property, as at present?

"Shall the mayor and council recommend that the city shall publish a minute and comprehensive statement from time to time of all moneys received and expended by it?

"Shall the mayor and council recommend that assessors and collectors be bonded by regularly authorized bonding companies?

"Shall the mayor and council recommend that street railways be required to repair and maintain such portions of the streets as is now required by law, and also repair and maintain their cars in a manner to best cater to the convenience and comfort of the public?"

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A Welcome Visitor.

We welcome to our exchange table the initial number of "Labor Review," a new worker in the vineyard of trades union journalism. The "Review" is published in the interest of organized labor in general and is owned and controlled by the various labor bodies in and around Minneapolis, Minn.

This new advocate of the rights of the workingman comes to us appropriately addressed in magazine form, and we understand it is to be published weekly. The managing editor is John P. Kennedy, a well-known journalist and a recognized "wheel horse" in the ranks of organized wage earners. He is a member of the International Typographical Union, and under his guidance we hope to see the new periodical pursue a progressive and uncompromising course in advancing and protecting the interests of the toiler. As it promises to stand first, last and all the time for a "square deal" we bespeak for it a successful career.

Why Eight Hours?

Because of the present long-hour day many are unemployed, and the man on the street fixes the wages paid to the man at work.

Labor-saving machinery has increased the producing capacity of workmen, who in justice should be afforded more leisure.

The eight-hour day would increase the longevity of the workers.

It would give greater opportunity for social and educational development.

It would raise the standard of living, upon which prosperity depends.

It would help the taxpayer by putting the tramp to work.

It would promote an independent spirit which is lacking in overworked people.

It would build up trades unions and concentrated efforts in the law of success in the militant world of industry.

It would open up the road to every desirable social reform.

It would give men a chance to get acquainted with their families.

It would promote temperance by removing the desire for stimulants which comes from long hours of labor.

It would make better citizens by giving the citizen more time to understand his duties.—Ex.

Montana-Idaho Tunnel.

The following forceful argument, appearing in a recent issue of "Progress," brings forth the fact that while the distance from one given point to another may not be so great, yet the advantages enjoyed may differ widely, and it is reproduced for the benefit of our readers:

"The Chicago, Milwaukee & St. Paul Railway is digging a big tunnel which will connect the States of Idaho and Montana, and a rather unusual situation has arisen. They are working on the tunnel from both ends in order to facilitate its completion. Montana has an eight-hour law, Idaho has not, and as a consequence the men working in the Montana end of the tunnel receive $3.50 per day and work only eight-hour shifts, while those in the Idaho end receive but $3.00 per day and work ten-hour shifts. The reason: In Montana the workers are better organized than they are in Idaho."

Too Much Work Destroys Health.

A famous Chicago physician says we work too much. He says that if a medical commission were appointed to draw up a schedule of working time it would probably turn out something like the following:

For school children, two hours in school and one hour's lesson at home.

For outdoor workers, six hours daily.

For clerks, factory workers, etc., six hours daily.

For writers, professional men and other brain workers, five hours daily.

The weeks to consist of five days.

Holidays, two weeks at least four times a year.

If rules like these were adopted we might not be so rich as a nation, but we should enjoy better health, greater happiness and longer life.—Exchange.

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Contributed

A Voice from Nebraska.

It has come to the time that union men have to wake up. I have been a member of old 17, Chadron, Neb., for seven years, and while I have not done any railroading for five years, I still pay my dues. I am also a member of the Western Federation of Miners. While I never see anything from our local, still I keep posted through the columns of our Magazine.

In the trial of Wm. D. Haywood, one of the officers of the Western Federation of Miners, who was kidnapped from Colorado, and which is now being held at Boise, Idaho, the criminal or lunatic named Orchard, that the State of Idaho is using as a witness in its attempt to convict honest and upright men, has even gone so far as to swear that the miners have taken up extra assessments to compensate such fiends as himself for the perpetration of the awful crimes he claims to have committed, such as killing men, blowing up mines, etc. I have certainly never paid any such assessments and our books can be found at headquarters in Denver, in Kirwin's office, open for inspection on request. Brother Editor, I, for one, would like to see or be shown where any of our treasury has been used for such a purpose, and the whole federation of miners can corroborate what I say; but it seems that a lunatic or criminal is considered a more desirable citizen in the eyes of the Government, and that the State and United States authorities rely more on such a man's word than they do on the oath and honor of 40,000 miners.

The officials of the miners' union have the sympathy of all the labor organizations of the entire North American continent, but I fear that will not save them, as the mine owners' association and moneyed interests of that part of the country have without any doubt or question planned to do away with the Western Federation of Miners, and if there is any way they can accomplish that end they are going to do it. Recently I heard a millionaire remark that a dollar a day and board was enough for a miner. Just think of it! A man going down 2,400 feet in the bowels of the earth to toil, and not knowing, when he starts in the morning, that he will ever return alive. The mine owners are anxious for the miners to board at the company boarding houses so that they themselves can reap monthly dividends out of the industry of starving workingmen. Under our constitution a man is supposed to have the privilege of boarding where he desires, but it seems that if myself or any of my fellow-workmen say a word in defense of our constitutional rights we are thrown into jail, or what we term "bull pens," and left to lay there until they feel like giving us a trial. I, myself, am talking from experience, as I have been through the mill in this western country. I have been in mining camps where I could not work unless I signed a card to the effect that I never belonged to any labor organization. I have left Leadville, Colo., without any breakfast because I belonged to a labor organization, but if I had been a scab I would have been taken to the best hotel and rooming house and could have secured any job I desired in or around the mines, from a shovel to a first motion hoisting engine.

MEMBER.

* * *

European Labor News.

Progress of Trade Unionism in Germany.

In 1906 the German trade unions exceeded their second million of members, a fact to be valued all the higher by the organized workmen because the leaders of the political labor movement in this country predicted a few years ago that the trade unions would never attain any importance worth while speaking of; it was then considered impossible that so large a proportion of the industrial population could be united in the trade organizations, and that they would be financially so strong as to be able to endure severe struggles like those which the last years witnessed.

For a long period the unions had low contributions and very few friendly benefits; except in times of extraordinary business prosperity they had not the least influence upon wages and working conditions. Employers did not heed them and refused to treat with other people than their own employes. All this changed

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by and by; especially the unions affiliated to the General Federation of German Trade Unions (General Commission der Gewerknhaften Deutschlands) have not only grown tremendously in membership, they have also grown essentially in solidity. They have gradually raised their contributions, increased their benefits, particularly in the direction of out-of-work pay, and they have become a force in the land. In a number of trades employers still refuse to recognize them or to deal with their representatives. But in one trade after the other the employers have to climb down from their high pedestal and to meet trade unions step by step.

After the economic depression of 1901-1902, the revival of trade naturally led to a good many labor difficulties, as is always the case at such a time; but it has also been accompanied by a movement in the direction of friendly negotiation and joint trade agreement between capital and labor which has, so far, met with remarkable success. While formerly the workmen had to carry on struggles for weeks to obtain their most modest demands; while, but a few years ago, the employers brusquely declined all dealings with an organization of work-people; today the same employers are recognizing in many cases the organizations as equal factors in the adjustment of wages. A report issued by the government estimates that now between 3,000 and 4,000 wage agreements of one kind and another are in existence.

At the close of the last year the membership of the unions affiliated to the General Federation of German Trade Unions was 1,750,000, or three times greater than in 1899, and they now embrace more than three-quarters of the organized workers of the country. The Christian Trade Unions, having 350,000 members, made almost equal relative progress; and the "Hirsch-Duncker" Trade Societies, though of less importance numerically (120,000 members), continue to hold their own. Certain trades are more strongly organized than others, and the tendency to combine is, as would be expected, strongest in the case of skilled labor. The largest trade unions in Germany are those of the building trades, which number a fifth of the members of all unions; and it is noticeable that it is these trades which have been the most successful in concluding collective wage agreements. The metal and engineering trades come second with a membership nearly equal to that of the building trades.

Trade Unions and the Political Labor Movement.

The masses of the workmen in Germany who are organized in trade unions have learned to understand that their economic struggles are not only directed to every day things, but must also be led from a political perspective; it was their fundamental idea which brought about an intimate connection between the trade unions affiliated to the General Federation and the Socialist Labor Party, although the unions never declared themselves socialist bodies, because the leading trade unionists cling to the principle that their first duty is to organize the workers irrespective of their political or religious opinions, and that they therefore must keep open the unions to every worker who is willing to do his duties as a bona fide trade unionist. In this sense they claim for the unions the designation of neutral bodies, where neutrality is not to signify political indifference, but freedom in their action from outside dictation. Until recently some prominent socialists looked at the trade union movement as subordinate to the political movement; but at the congress of the socialist party held in 1906 in the city of Mannheim, the fact was recognized that the trade unions are the equal of the political party, that the party should not undertake any action involving the trade unions without having previously consulted the responsible officials of the latter, and that the party would act unwisely if it put the trade unions under obligations which would make them appear as mere trade branches of the political party.

H. FEHLINGER.

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Miscellany

*A Day of Service.**

The following contains a lesson that is well worth heeding.

It was the Fourth of July—that day so dear to the hearts of old and young alike—but especially to the latter for the continuous round of fun and enjoyment which it brings, such as no other in the whole round of the year contains. What, with the picnics, and firecrackers, and band concerts and public fireworks, which usually characterize the day, is it to be wondered at that the Nation's birthday is so welcome with the youth of the land! And it is well that it should be so, for in a very little time they will be the patriots, to whose loyalty she must look for her continuance and prosperity. All hail to the Fourth of July.

And on this particular occasion, a group of lads were arguing earnestly with one another as to how best they could spend the remainder of their day. Already they had enjoyed themselves not a little in ways known only to boys of a similar age; but now they were longing for something else. What should it be? Of all the many forms of amusement known to them, which should be taken up next?

Each had his own idea to advance, one favoring one thing, and another another. But finally it was agreed among them that the afternoon should be devoted to an excursion to the river, where the railroad crosses it on the high trestle. On the way they could fire the remainder of their firecrackers and torpedoes, while at the bridge they were sure of a good time fishing, and could easily get home again in ample time for the fireworks on the common. And so it was arranged that they should go to the river.

As may well be imagined, the boys had a glorious time of it on their way through the woods to the river; playing Indians and trailing each other through the undergrowth; imagining themselves scouts in search of a hidden foe, or hunters out after buffalo. Then, too, one of their number played the part of our mighty hunter, President Roosevelt, while the rest were to act as the game of which he was in search, and keep out of his way if they could.

Almost before they realized it the party were at the river bank, and at the end of their ramble. But here their fun was not at an end, by any means, for now followed fishing, and wading in the water, and sailing miniature boats down the rapid stream. Crackers and torpedoes were kept banging and snapping at regular intervals, too, while now and then a giant cracker set the echoes ringing with its loud report.

Thus the remainder of the day was happily and pleasantly spent, and as the sun began to lower in the west the sport was reluctantly abandoned and the return trip begun. Not in a long time had the boys had so much fun, they all admitted as they separated at the edge of the town, agreeing to unite again after supper, to attend the evening exhibition of fireworks on the part of the town.

"We certainly did have a splendid time today," reflected one of their number, George Scoville, as he continued on alone to the little gate which led from the street to his home, "and the day would have been all that it possibly could to me if I could have done something that really amounted to something, in the course of it. But, after all, what does romping and fun amount to, if you never do anything of any value! Surely, that's the best fun! How I wish I could be of service, in some way, today, before this glorious day is over!" Little did he realize how soon his wish was to be granted.

After supper, George set out down the road again to rejoin his friends for the pleasures of the evening, and as he went he noticed, away on the horizon, what he was sure was a thin column of smoke, rising into the sky. "It comes from down by the river! Just where the bridge is, too!" He mused with momentarily increasing anxiety as he beheld it. "Can it be possible that some of our firecrackers have set fire to the woods, or worse still, to the railroad bridge? If anything should happen to it, what would become of the ten o'clock express, which is scheduled to dash over it in the darkness of the night!"

"Whether it is a fire at the river or not, I will go and give the alarm. I shall miss the fireworks, to be sure, but duty should come before pleasure, always; and this is my duty, and I will do it!"

With these thoughts passing through

*By R. B. Buckham, Salem, Mass.

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his mind, the youth hastened along the road to the pasture bars, and took the lonely path through the woods. It was dark, and solemn and sombre, picking his way through the dim shadows, and many a time his courage was tried to the utmost, but he kept manfully on, nevertheless, resolved not to turn back now, under any circumstances.

At last the welcome sight of the river lay before him, and he could hear its waters ripple, as they hurried ceaselessly on.

There was a farmhouse near the river, and to this George now hastened. Fortunately the owner was at home, reading beside the evening lamp. The lad knocked at the door, and quickly made known his errand. "Come, quick, there is a fire out here in the woods, I think. Come and help me put it out."

The two hastened to the vicinity of the bridge, arriving none too soon. Already the flames which had caught in the dry leaves along the river bank had crept up and were licking the bases of the bridge piers. "A little more and they would have been beyond us," exclaimed the farmer, as the last of the leaping tongues was subdued and beaten out. "It was a narrow escape, I can tell you."

George had a long and lonesome walk home through the woods, after the work of extinguishing the spreading fire had been accomplished, but it was with a light and happy heart, nevertheless, that he picked his way along, for he realized that though he had missed a part of his Fourth of July fun, yet he had done his duty to the best of his ability, and had been of service to his fellow-men that day; and after all, no one can ask a greater pleasure and privilege than this, no matter what the day.

Some Famous Men.

If anything were wanting to prove that genius is not the stock in trade of the privileged classes the following facts would disprove it:

Goethe was the son of a tailor.

Burns was a peasant's son.

Canova was a stone cutter's boy.

Paganini's father was a factory laborer.

Wagner's father was a clerk in a police court.

Shakspeare's father was a wood merchant.

Sir Isaac Newton's father was a poor farmer.

Hans Christian Andersen's father was a cobbler.

Benjamin Franklin was the son of a tallow chandler.

Horace Greeley was the son of a Vermont farmer.

Almost all the lights of history came from the ranks of the toiler, and these instances are only a few of the innumerable ones that might be cited, and are selected at random.—Progress.

The Battle Against Consumption.

Interest in the fight against consumption is constantly on the increase. Health authorities, organized labor, and public-spirited citizens have for some time been co-operating in an effort to stamp out the awful "white plague." During recent years legislative bodies have been making special appropriations for use in carrying on the work and have in other ways sought to encourage it. Special committees consisting in part of able physicians have been formed in about every municipality for the purpose of acquainting the masses of the people with the real nature of the disease and familiarizing them with the best methods to adopt with a view to its prevention and—where possible—cure.

Among the most active of such bodies is "The Committee on the Prevention of Tuberculosis, of New York City," as is evidenced by a letter just received from its secretary, from which the following is an extract:

"For three years and more the trade unions have been coming in on the fight against consumption, and now this year in New York City we find them joining forces with us stronger than ever and in a way which is bound to have considerable effect on this great problem of the *prevention* of this terrible but preventable disease. In place of ignorance and indifference, at the present rate we shall soon have a public which knows that consumption can be prevented, that it can be cured and that it is foolish and worse to put off an honest and real attempt to get well; that "sure cures" for consumption are merely methods of obtaining money under false pretenses, that consumption is caused by a germ, and that it is courting death to allow a consumptive who will not take care of his

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germ-ladened sputum to spit on the floor of one's shop or home. These things we are getting before the unions of this city by means of short talks, many of them illustrated with stereopticon views. Take, for instance, our record in this respect for the first week in April; we were given the privilege of the floor at the meeting of nineteen unions. . . .

"This means that the sacrifice of over 10,000 lives to this preventable disease which we see going on in New York City every year is to be stopped, that the trade unions of this city are going to hold up the hands of the public authorities in their attempt to stamp out consumption, and that there will be in the future a more vigorous and determined demand for thorough-going factory, tenement house and Board of Health regulations.

"But we can not be satisfied with what is being done. After all and in spite of the numbers who have given us a hearing a good many unions are still on the other side and have still not responded to our request for permission to address them. We want to have extended to us the privilege of the floor by every single union in this city. We will furnish a speaker in any language desired entirely at our own expense. It is to the unions' own interest to learn of this preventable disease that at present is causing them far more loss in members' lives and union funds than any other one cause. . . .

(Signed) PAUL KENNADAY,
Secretary."

On one point in the foregoing letter too much stress can not be laid, viz., that so-called "sure-cure" medicines for consumption are merely methods of obtaining money under false pretenses. Many unfortunate victims of the disease are ruthlessly robbed in purchasing patent medicines which, although possessing no merit whatever as consumption remedies, are broadly heralded by those interested in their sale as a certain cure for the malady.

The three chief factors in the treatment of consumption are pure, fresh air night and day, plenty of nourishing food and open air exercise. Without these nature can do little in combating the disease.

The great efficacy of organized labor in producing results, to the accomplishment of which united effort is essential, is fully recognized and appreciated by the public authorities and others interested in the success of the present crusade against this great enemy of mankind—tuberculosis.

While labor organizations by virtue of their very nature operate primarily to advance the general well-being of their members through the protection and promotion of their economic interests, they can not too fully realize and appreciate the great good they can accomplish by exerting directly their powerful influence to the attainment of that happiness which comes from the priceless boon of good health.

The ravages of consumption in the ranks of wage-earners is appalling. When this dread evil has been stamped out or reduced to the greatest possible minimum, a most prolific source of misery, sorrow and suffering to the masses will have been eradicated. It is to be hoped that the interest in this most commendable work will grow until every labor organization throughout the length and breadth of the land will be vigorously doing its part with a view to the accomplishment of that great end.

* * *

*The People and the Railroads.**

VI.

Great Issue Before the Country Summed Up —New Tracks, New Terminals, Vast Expenditures Necessary—Must be Done in Partnership with the People.

Details of the transportation situation in the country and in the Northwest have been given, containing facts and figures from official sources, that make the truth clear to every unprejudiced mind. A brief summary of these and a consideration of the remedy to be applied to existing troubles must appeal to persons of fairness and intelligence everywhere. For the problem is a problem for the people as well as for the railroads; their interests stand or fall together. Only by the hearty co-operation of both forces can the right solution be worked out.

It has been seen that, during a period of unexampled prosperity, when every business in the country was growing as never before, all contributing more work for the common carrier, railroad building steadily declined. Roughly stated,

*By Howard Elliott, President Northern Pacific Railway.—Continued from June, 1907, Magazine.

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the volume of railroad business increased one hundred and ten per cent., in the last ten years, while trackage increased twenty per cent. You can not do fifty horse-power work with a ten horse-power machine. The difference must be made good.

This excessive demand upon transportation facilities has been concentrated, in the Northwest, into five years instead of ten; has become acute and phenomenal in the last two. Hence, all over the country delays in transmission of goods, car shortages, complaints. Not only tracks, but terminals are inadequate. Railroad yards in all the great cities are choked with cars awaiting transfer. The average mileage of each freight car is about twenty-five miles per day, the average speed from twelve to fifteen miles per hour. The freight equipment of the country is, by reason of this double congestion, rendering only a fraction of its potential service.

Confronted by an emergency, the railroads of the Northwest have met it with energy, boldness and liberality. They have incerased motive power and car capacity to the limit of production in locomotive and car shops. They have utilized every pound of steam and every cubic foot of car space. They are spending from ten to twenty million dollars a year on new equipment. They are so operating their lines that the people of the Northwest get more service, more freight carried for each unit of equipment and each mile of road than do other sections where conditions are more favorable. All that men and money and technical skill and experience can do is being done to satisfy the needs of business.

This is not enough. It is clear that extraordinary efforts must be made, plans of greater daring and more magnificent scope be executed, if business is not to suffer destruction from the comparative inadequacy of facilities. The whole country must have more tracks and enlarged terminals; and the Northwest, while actually suffering no more than other sections, needs its share.

The enlargement of terminals is enormously expensive. Existing grounds, as a rule, were obtained when land was cheap. Sometimes they can not be extended at any cost. Large capital is always required. The Great Northern and the Northern Pacific have expended over five million dollars for terminals at Seattle. As much must be spent in the near future at St. Paul and Minneapolis to take care of passenger traffic alone. Large expenditures must be made at Tacoma for the same purpose. But there is greater need of more space for freight business; and that at every center and in every flourishing city on these lines. Time must be saved and money poured out freely. The cost of necessary terminals alone must be expressed in tens of millions.

One other factor in railroading deserves special mention at this time. Tracks and motive power must both lie idle unless there is an adequate supply of fuel with which to make steam. The coal shortage all over the west from Los Angeles to Vancouver and from Salt Lake to Butte, Spokane and Portland, is very critical and none of the railroads has any margin today. If railroads are to run, the fuel supply must be enlarged. Montana produced 1,483,728 tons of coal in 1900; her product for 1905 is estimated at not more than 1,500,000 tons. Washington produced 2,209,012 tons in 1900, and only 2,818,042 tons in 1905, a trifling increase for five years. Compare these figures with the statistics of industrial growth and railroad expansion, and the vital nature of the fuel question at once appears.

The railroads can and will move fuel for the people of the States, but they can not provide it. They can not move their increased volume of business unless they get more coal themselves. The Federal Government has declared that they should not themselves engage in the coal business. It is indispensable, then, that capital outside of railroads should engage in furnishing, for people and railroads alike, a proper fuel supply. It should be made easy for coal to come in from British Columbia to the Northwest, where the supply is short, and new mines should be opened in Montana and Washington. This is an essential item in transportation and in all industrial problems, and it is one which the railroads, without outside assistance, are powerless to deal with as the circumstances demand today.

For work that will fall properly and directly upon the railroads, in addition to tracks and terminals that must be made if traffic is to be moved, what is required? The Great Northern, the Northern Pacific and the Burlington companies together operate about one-eleventh of the railroad mileage of the country. It would on a fair computation, be neces-

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sary for them to raise and spend in the Northwest a total of $500,000,000 in new work. That is what, in money terms, is involved in the elimination of present causes of complaint, in a due provision for the future. It is a demand that would stagger the Government of the United States. Even if spread over five years it would call for $100,000,000 a year. It involves labor problems and problems in obtaining of material and a thousand others that would tax executive energy if the money were ready on call. Confidence on the part of capital, labor, both skilled and unskilled, in great quantities and for a prolonged period of time, and patience on the part of the public while difficulties are being overcome must combine to reach the happy end.

The railroads are going forward, facing this labor of Hercules undismayed. The Great Northern proposes to spend $60,000,000 in improvements such as have been outlined at once. The Northern Pacific will spend as much or more. These systems must be double tracked, grades cut down, curvatures lessened, terminals enlarged. As it always has stood, so the Northwest will continue to stand, in the face of a new era, at the front in the fields of railroad construction and operation. Its transportation agencies will, if permitted, grapple with and master the conditions that are now threatening to smother industry; to stop the circulation of its blood and paralyze all its wholesome functions. What else is required?

No such enterprise as this, covering an empire 2,000 miles long, dealing with the fortunes of several million people, affecting industries most jealous and diverse, calling for a credit of hundreds of millions with investors, can be achieved successfully except with the hearty sympathy and support of the people. It is, after all, their work. They are partners in it. They share the benefits, as witness this very prosperity which the building of railroads has so powerfully promoted. Nothing great and enduring was ever accomplished in this world by a house divided against itself. And never was there a time when fairness, intelligent appreciation of conditions and a willing support on the part of the people were so necessary or promised to them so large a return as now.

The people should tolerate no injustice where it has been proved to exist. They should insist upon just and equal treatment. They should not cherish unreasoning hostility against a partner in the firm; for by no possible action can the partnership between the people and the railroads be dissolved. The roads may be harassed in the performance of their great task by unjust and unreasoning attacks; they may be hampered or even forced to discontinue their work of improvement; they may very easily, and this is most important of all, through the weakening of faith in all railroad investments, because the business is always under fierce fire, find credit so impaired among investors that the huge sums to be spent for the people's interests can not be obtained. The American people are surely too fair, too sane, have too much appreciation of their own highest interests for that. For they, after all, would be the chief sufferers.

Though it deals in big figures and with partially unfamiliar terms, the whole situation is essentially simple. The cause of a malady creeping over business is discovered, the remedy is at hand. It can be applied successfully only by a close co-operation; by a mutual tolerance, understanding, good faith and instinct of helpfulness that shall put an end to the hostile attitude and forbid the endless iteration of malcontents whose work, at best, can only be destructive. The big task before the American people, before the people of the Northwest, can be performed only by the laying aside of old differences, the celebration of a new compact of amity, the hearty pull together of the two partners and allies—the people themselves and the railroads. In what spirit and with what action shall this emergency be met?

* * *

1,000,000 Miles in a Railway Mail Car.

Probably the most remarkable record in the mail service of the United States is that of a veteran mail clerk of the Grand Trunk in Maine, C. I. Kimball, who for thirty-five years has not missed a regular trip, having traveled in that time over 1,000,000 miles. Under the rules of the Railway Mail Service mail clerks are allowed one week's lay-off in each three, thus making thirty-four weeks of service a year. Mr. Kimball's round trip is from Portland to Island Pond and return—300 miles—making the total number of miles he has covered in his mail

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car, when multiplied bv thirty-five years of service, exactly 1,071,000.

Mr. Kimball states that when he first entered the mail service there were three of them, and that they were running a car seven feet wide and ten feet long. He also states that they had no letter cases to distribute letters in, and that their instructions at the time were not to open any packages of letters made up for a distribution office. They used no slips for packages, and no labels for the pouches, having wooden tags about six inches long that they used for the sacks. Instead of using pouches for the letters, in making up through mail, they often used boxes from two to three feet long, just wide and deep enough to stand letters up edgewise. The first increase in the size of their car was its enlargement to 20 feet long and 6 feet wide. Their car now is 40 feet long and they hang 61 pouches where they formerly had 6. They have 380 pigeon holes or letter catches where before they had none, and make fourteen connections with other runs.

Delights of Literature.

A lady asked her gardener if he had read the book she had given him at Christmas. "I never reads," said the gardener in pure Kentish. She began to point out the beauties of literature. "It's like this," said the gardener, leaning on his spade. "You reads a bit, and then you thinks a bit, and then you gets a ter'ble 'eadache."—London Chronicle.

Diplomacy.

James C. Dahlman, the mayor of Omaha, was talking about bores. "I used to be pestered to death with a bore," he said. "My doorkeeper was a good-natured, obliging chap, and he could never find it in his heart to turn the bore away. Just as sure I was in the bore was certain to be admitted. One day, after an hour's martyrdom at the man's hands, I determined to end that persecution. So I called my doorkeeper and said to him mysteriously: 'Jim, do you know what keeps Smith coming here so regularly?' 'No, sir,' said Jim, 'I can't say as I do.' 'Well, Jim,' said I, 'I don't mind telling you in confidence that he's after your job.' From that day," Mayor Dahlman concluded, "I saw no more of the bore." —Ex.

No Monster So Dangerous.

Hannis Taylor, former minister to Spain, in an address delivered to Johns Hopkins University described the modern enormous fortunes and the "philanthropies" resulting from them, saying: "I know of no monster so dangerous to the life of a republic as one who can in a moment throw bewildering millions in one direction or the other, especially when those millions grow out of abnormal conditions that should not exist. The omnipotent dispenser may throw his millions in a good direction today, but it is sure to be in a bad one tomorrow. But most and worst of all, he is an image breaker, he is an iconoclast who shatters the ideals upon which the nation's life was founded. There was a time when our young men thought it worth while to strive to be like Marshall, Webster, Emerson and Washington Irving. But how long will those illusions last under the teachings of the new gospel which proclaims that nothing is really worth while except the brute force wielded by masses of money. If this thing goes on we can soon close all departments of our universities except those that apply the principles of physical science to the production of material wealth or its equivalent."—The Commoner.

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THE TACTICS OF DESPERATION

A new method of promulgating falsehood has been adopted by the B. of L. E. Over the signature of its Grand Chief, circulars have recently been issued which are being sent to the officers of our lodges in large quantities accompanied by the following letter:

GRAND OFFICE
BROTHERHOOD OF LOCOMOTIVE ENGINEERS, EXECUTIVE DEPARTMENT.

CLEVELAND, Ohio, June, 6, 1907.

To all Officers and Members of the Lodges of the Brotherhood of Locomotive Firemen:

Dear Sirs and Brothers—We herewith enclose you two (2) copies of the action of the Brotherhood of Locomotive Engineers and the Brotherhood of Locomotive Firemen in regard to the concerted movement on Western roads.

Also twenty-four (24) copies of correct statement of the trouble between the Brotherhood of Locomotive Firemen and the Brotherhood of Locomotive Engineers on the Southern Pacific system.

Will you please place these in the hands of the members of your lodge.

Yours fraternally,
W. S. STONE,
Grand Chief Engineer.

There is nothing that such tactics demonstrate so clearly as they do the desperation of the crowd that is fast leading the B. of L. E. to destruction. The time and space at our disposal will not permit of our giving detailed attention to said circulars at this time. Suffice it to say that the false character of statements made therein can be very easily and clearly proven. The letter which the Grand Chief of the B. of L. E. has sent out to the officers and members of our subordinate lodges. addressed, as it is, to officers and members of lodges of the "Brotherhood of Locomotive Firemen" and thus constituting a definite and formal refusal on the part of the B. of L. E. to recognize or concede to us the right to use the legally adopted and universally accepted and acknowledged name of our organization is in itself a direct insult to our Brotherhood, as well as to each and every officer thereof to whom it is directed, and it should be resented as such. These people might as well admit now, as they will be forced to later on, that our organization is a Brotherhood of engineers as well as firemen, and that every day it is being more firmly established as such. Their pusillanimous denial to us of the name which we have adopted for our organization will have no more effect in retarding the inevitable progress of the B. of L. F. and E. or the successful carrying out of its great mission than would an adverse breeze have in obstructing the movement of a modern battleship. The following circular, recently issued by the Grand Master—the statements in which are clear facts, without the slightest shadow of an attempted exaggeration—speaks for itself as to what our Brotherhood is accomplishing:

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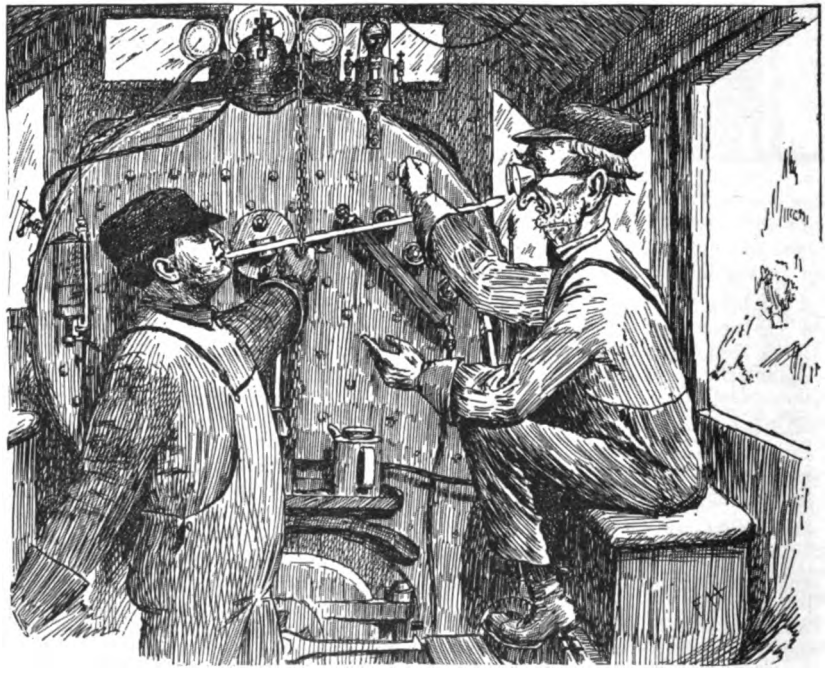
To the Officers and Members of Subordinate Lodges:

Sirs and Brothers—The month of May has been a most memorable one in the history of the organization, and it is with a feeling of extreme gratification I address you and advise you of the prosperous condition of our Brotherhood. One thousand nine hundred and ninety-six applicants were admitted to membership during the month of May, which is the largest number ever admitted during any month. It is therefore apparent that those connected with the organization, both officially and otherwise, are doing all that is possible and in their power in the way of missionary work, which in the future development and progress of the organization will redound to their credit. I hope that during the month of June the number of admissions will exceed the number admitted in May, and the indications at this writing are that such will be the case.

The condition of the organization generally was never better than it is at the present time. Every Grand Officer, including the Grand Secretary and Treasurer, the Editor and Manager of the Magazine and the Grand Medical Examiner, are now in the field.

We ask you not to heed the appeals that are being made to you to withdraw on account of inducements offered in other fields. We assure you that your retention of membership and faithful adherence to the laws of the organization guarantees you the support and assistance which you are justly entitled to and which has been promised you.

In conclusion I appeal to you to leave nothing undone to enroll in your lodge the name of every eligible fireman and at the same time to use your good influ-



THEY WOULD FAIN DIVIDE US

B. of L. E. Engineer.—Don't you know you firemen hadn't oughter have engineer members on your grievance boards and holdin' offices in your lodges?

Fireman.—Never mind, Dad, we're all over twenty-one and can run our own affairs. There is nothing like self-reliance, and then, you know, I expect to be an engineer myself some day.

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ences to retain all those who now hold membership.

I hope at the close of this month to make a report of initiations that will be pleasing and appreciated by all.

With best wishes, I am,

Fraternally yours,

J. J. HANNAHAN,

Grand Master.

On the first day of June our membership was 63,400. If the good work is kept up there is no question but that we will go into the Columbus convention with at least 70,000 men. On many railroad systems between 30 and 40 per cent. of the engineers are members of our Brotherhood, while on others we have from 40 to 45 per cent. On one great system 47 per cent. of the engineers are members of the B. of L. F. and E., there being only 4 per cent. lacking to give our organization the right to seek representation for men on the right side of the cab in all matters pertaining to their employment, as well as in the adjustment of personal grievances. Again let our firemen members be warned against the schemes of the B. of L. E. people to create dissension in our ranks by making them dissatisfied, because engineer members are elected to offices in our lodges or to membership on our Protective Boards. Brothers, remember that in unity there is strength, and that strife amongst ourselves only gives aid to those who are seeking the destruction of our Brotherhood. Our engineer membership is constantly on the increase, and every brother should endeavor, as the Grand Master urges in his circular, not only to leave nothing undone to enroll on his list of lodge membership the name of every eligible fireman and hostler, but at the same time to exert his every influence with a view to retaining in our ranks all who already hold membership therein.

Canadian Grand Union Meeting—Official Notice.

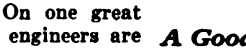
The committee of arrangements for the Canadian Grand Union Meeting, to be held at Hamilton, Ontario, August 5th, 6th, 7th, 8th and 9th next, extends a most cordial invitation to all members of the Brotherhood and of the Ladies Society to attend. The committee begs to assure them, one and all, that everything possible will be done by them with a view to making their visit to Hamilton one of the most pleasant occasions of their lives. Business sessions have been arranged for so that ample time will be afforded for the full enjoyment of the entertainments.

It is to be hoped that our brothers and sisters and their friends will avail themselves of this opportunity to enjoy a most pleasant outing, as the guests of the city of Hamilton. All particulars as to hotel rates and transportation appear in this issue of the Magazine.

COMMITTEE OF ARRANGEMENTS.

JOHN MCILWAIN, Chairman.

CHAS. V. HAYES, Sec.-Treas.



A Good Way To Build Up Membership.

Probably about as effective a plan as could be adopted by a local lodge with a view to the complete organization of those within its jurisdiction eligible to membership in our Brotherhood, was recently put into operation by Pittston Lodge 436, of Pittston, Pa. The Brothers of that lodge, realizing that it was time that about twenty-six non-Brotherhood firemen and hostlers within their reach should be "where they belong," concluded to let them know just what the Brotherhood is, and what its objects are, and that they should be told about it, not singly, but all at once. So with a view to carrying out that purpose, the lodge decided to give a smoker, which all of the twenty-six firemen and hostlers were invited to attend, and did attend, there being, in addition thereto, a very large number of Brotherhood men present. Bro. James Austin presided at the meeting and Bro. Louis Smith, an alderman of the city, past master and present collector of the lodge, spoke at length upon the history of the organization, detailing its growth and achievements, and dwelling upon the great advantages which membership possesses for the individual engineer, fireman and hostler. He explained the mottoes of the Brotherhood and showed how they had been carried into effect by the organization. Bro. Smith was followed by Bros. Chas. McCarty and W. E. Snyder, who delivered very interesting addresses, after which stereopticon pictures were shown by Bro. Smith, an illustrated song entitled "Bunker Hill" being sung by Bro. James McDonald, which was followed by songs and

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recitations by Bros. P. J. Cain, C. C. Buckley and Nicholas McNally. That there are now very few men remaining outside the ranks of No. 436, who are working within its jurisdiction and eligible to membership, goes without saying. This incident may appear as a "local" event, but the character of the work done is of such great importance as to be of general interest to the organization, and the matter is thus mentioned in the hope that where the opportunity offers, other lodges in which the idea has not been advanced may possibly put it into effect so that as men who are morally fit for admission to our ranks become old enough in railroad service to join us, there will be an effective influence constantly operating to obviate unnecessary delay in their so doing. Accounts of events of this kind conducted by our lodges will be always welcome to the columns of the Magazine as matter of "general interest" to the membership at large, as such work is of the most vital importance to our Brotherhood.

♦ ♦ ♦

The Coming Canadian Grand Union Meeting.

The general committee of arrangements having in charge the Canadian Grand Union Meeting, to be held at Hamilton, Ontario, August 5th, 6th, 7th, 8th and 9th next, is leaving nothing undone to make that event a magnificent success. Neither time, effort nor expense is being spared to insure that for all who participate in its pleasures it will be an occasion long to be remembered.

Hamilton stands prominently amongst the most beautiful and attractive cities of the North American continent. It lies nestling at the foot of the escarpment over which plunges the Falls of Niagara, being situated 42 miles to the west of the falls. A magnificent view of the city can be had from the mountainous elevations which surround it, and which are reached by inclined plane railways. The city was first surveyed in 1791 by Augustus Jones, a deputy provincial land surveyor, the land being then allotted to thirty-one families. In 1846 the population was 6,832 and on June 9th of the same year it was incorporated as a city. It has, since then, as a result of its superior natural advantages, developed into one of the greatest centers of industry and commerce in the entire Dominion. Hamilton is located on the bank of Burlington Bay. It has a canal outlet to Lake Ontario, and a fine natural harbor. The canal floats the greatest boats on the lakes and is crossed by what is claimed to be the largest single span swing bridge in the world. This bridge operates perfectly, notwithstanding that its length is

HOTEL WALDORF, HEADQUARTERS FOR CANADIAN GRAND UNION MEETING, HAMILTON, ONTARIO

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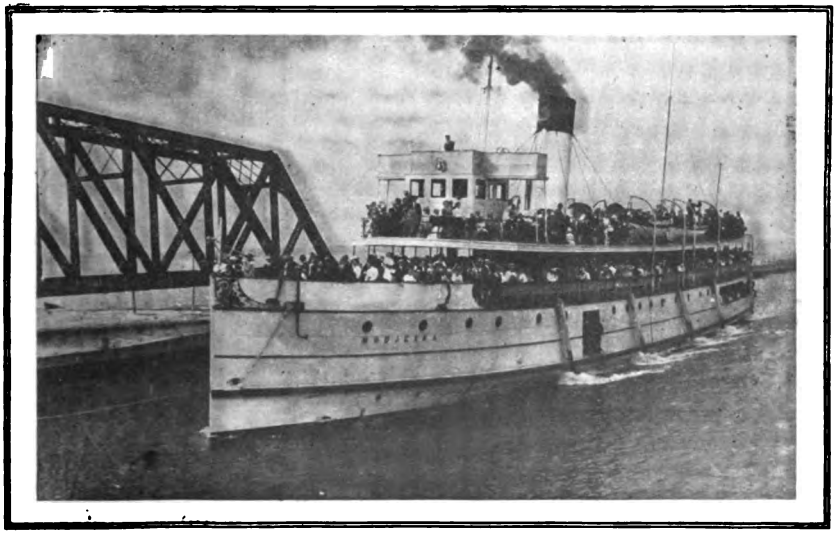
AT THE CORNER OF KING AND JAMES STREETS, HAMILTON, ONTARIO

400 feet, and weight over one hundred thousand tons. All of the light and railway power and most of the factories in Hamilton are operated by electric current generated at De Cew falls, thirty-five miles distant, to which is attributable its possession of the title of the "Electric City of Canada." Hamilton is a thriving, progressive, enterprising and fast growing municipality. Its population of nearly a hundred thousand is being continually augmented by the constant addition of new commercial establishments and manufacturing and other industrial concerns which, attracted by its many advantages, find it profitable to locate within or close to its boundary lines. The number and quality of its religious, educational and charitable institutions, its up-to-date city improvements and public utilities, the character of its architecture, its excellent municipal government



STEAMER MODJESKA PASSING THROUGH THE PIERS, HAMILTON BEACH, ONTARIO

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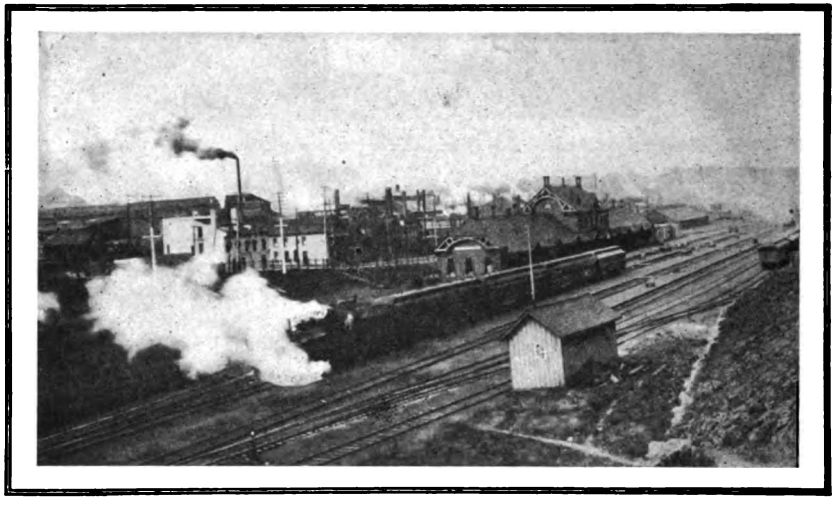
and clean and efficient public officials all proclaim the high moral and intellectual standards which characterize its citizenship, as well as their possession to a high degree of that sturdy vigor, broadmindedness and hospitality with which the term Canadian is so inseparably identified. An extensive system of electric railways radiates from Hamilton connecting it with all points of consequence for hundreds of miles in various directions. It is the central market for the finest fruit growing country in the Dominion, a million dollars' worth or more of fruit being shipped from this point annually. Numerous parks and points of interest are to be found in and around Hamilton, and it is claimed generally that as entrancing and varied landscape effect is to be seen in the immediate vicinity as is furnished by the blue hills of Switzerland. Hamilton is one of the cities on the North American continent that has successfully solved the great question of sewage disposal, having a perfect system of sewers and two sewage disposal works, into which its sewers empty, the liquid being separated from the solid matter by a process of chemical precipitation and flowing on out to the bay as clear as filtered water. Its perfect sewage system has much to do with the high standard of health and cleanliness which is one of its predominant characteristics.

Hamilton has three hundred or more manufacturing plants, in the construction of which, particularly those more recently established, the practical application of modern sanitary methods, and the comfort of the men who work in them has been kept prominently in view.

The transportation facilities of Hamilton can be the better understood when it is known that that city has four electric radial lines, six steamboat lines and seven steam railroads, the latter being the Grand Trunk (the Southern, Northern and Northwestern Railways converge at this point), the Canadian Pacific, the Toronto, Hamilton & Buffalo, the Michigan Central, the Lehigh Valley, the Wabash and the New York Central.



GRAND TRUNK RAILWAY DEPOT, HAMILTON, ONTARIO

Arrangements as to hotel rates are as follows:

Waldorf, $2 and upwards.
Royal, $2 and upwards.
Hanrahan, $1.50 to $2.
New Terminal, $1.50 and upwards.
Cecil, $1.50 to $2.
Mountain View, $1.50 to $2.
Stroud's, $1.50.
Strand's, $1.50.
Simcoe, $1.50.
Wellington House, $1.25 to $1.50.
Franklin, $1 to $1.50.
White Star, $1.
Arlington, $1.
Vineyard, $1 and upwards.
Commercial, $1 to $1.50.
Dominion, $1 to $1.50.
City Hotel, $1.
Armory, $1.

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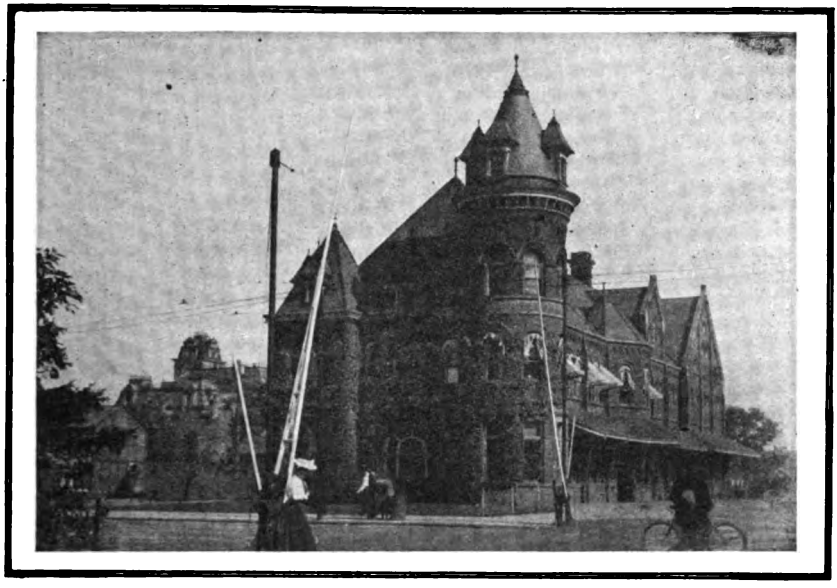
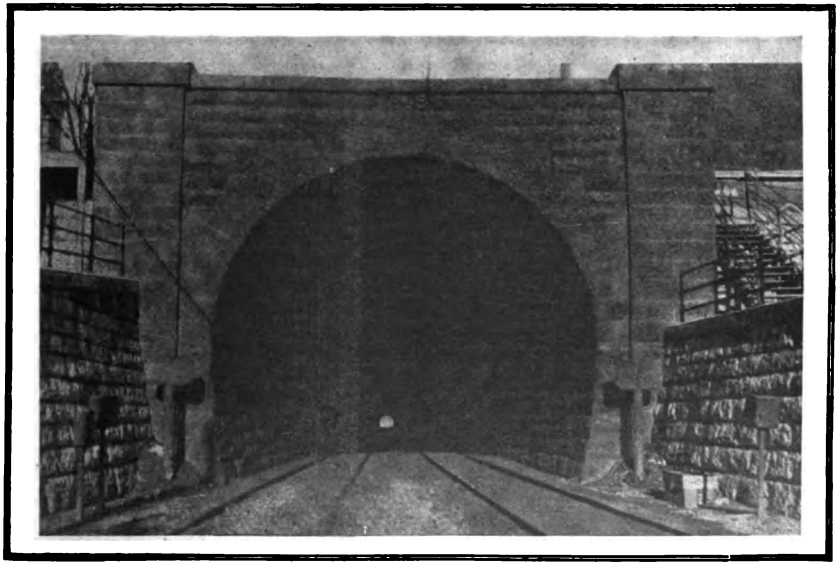


T., H. & B. RY. DEPOT, HAMILTON, ONTARIO

There will be ample accommodations for everyone. A series of entertainments has been arranged for, including a grand ball and trip to Niagara. Arrangements for exchange transportation have been made with the following railways: Toronto, Hamilton & Buffalo, Grand Trunk, Michigan Central, Inter-Colonial, Canadian Northern and Canadian Pacific.

All brothers throughout the United States and Canada who can attend should at once make application for transpor-



RAILWAY TUNNEL, HAMILTON, ONTARIO

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tation to the officials of the various roads upon which they are employed, so as to avoid as far as possible delay in securing same.

The committee of arrangements extends a special invitation to the members of the Ladies Society and their friends and relatives. Any brother or member of the Ladies Society desiring hotel accommodations in advance should correspond with Bro. Chas. V. Hayes, secretary of the committee of arrangements, 111 Pearl street, North Ontario, Canada.

It is to be hoped that our membership in general will avail themselves of the opportunity which our Hamilton brothers have created for them to have a most thoroughly enjoyable outing and show their appreciation of the efforts those brothers are putting forth for their happiness and enjoyment, by making the Hamilton union meeting, in point of attendance, the greatest ever known in the history of our Brotherhood. This is an occasion that will afford a great opportunity for discussion of business topics of the deepest interest to our organization. Business sessions and entertainments have been so arranged that neither will conflict with the other, attendance at and enjoyment of both being carefully provided for.

* * *

Sparks.

We have it! What? Why, the "Catechism of the Electric Headlight," the best book on the market from which you can secure the necessary information to enable you to pass that part of your mechanical examination with a view to promotion. Write for it today. Price 50 cents. Address orders to John F. McNamee, Editor and Manager, 806-807 Traction Terminal Building, Indianapolis, Ind.

Attention is directed to the ample accommodations the city of Hamilton, Ontario, furnishes for all who can attend the Canadian Grand Union Meeting, to be held there August 5th, 6th, 7th, 8th and 9th, as is evidenced by the long list of hotels and very reasonable rates appearing elsewhere in this issue of the Magazine.

Brothers, when you are promoted, keep out of the B. of L. E. When a so-called labor organization finds it necessary in order to perpetuate its existence to resort to the enactment of such insulting and antagonistic laws as are to be found in the B. of L. E. constitution against a sister organization that has always been friendly to it, it is conclusive evidence that the usefulness of such an organization is about at an end.

The Canadian Grand Union Meeting to be held at Hamilton, Ontario, August 5th, 6th, 7th, 8th and 9th next, furnishes a splendid opportunity for a most pleasant summer outing. A visit to the city of Hamilton would of itself be a most enjoyable treat, but when one is there as the guest of our big-hearted Canadian brothers, the pleasure of such an incident must be enjoyed to be realized. Transportation arrangements, etc., appear elsewhere in this issue.

Do you desire to be thoroughly posted on the modern headlight? If you do, it will be to your interest to secure a copy of the latest and best book on that subject, which is the "Catechism of the Electric Headlight." Price 50 cents. Address John F. McNamee, Editor and Manager, 806-807 Traction Terminal Building, Indianapolis, Ind.

Brothers, the B. of L. E. wants you to join their ranks to help them bear the burden of their costly insurance.

The well-known firm of Frederick J. Drake & Company, Chicago, U. S. A., are offering to send free to our subscribers their complete illustrated catalogue of Home Study publications. This house is a responsible concern, and publishes the latest books on the mechanical arts published in the world. They make a specialty of furnishing books which are strictly practical and written in a manner that can be easily understood. They are just the books for the young man or the practical mechanic, for everyday reference and home study. It will pay our subscribers to send for it.

All brothers who can possibly do so should attend the Canadian Grand Union Meeting, to be held at Hamilton, Ontario, August 5th, 6th, 7th, 8th and 9th, and in order to avoid any possible disappointment, application for leave of absence and transportation should be made at once. All particulars appear elsewhere in this issue.

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The "Catechism of the Electric Headlight" contains 296 questions and answers on this modern and up-to-date light, together with an insert sheet showing illustrations of the lamp. It is just what you need to assist you in acquiring the necessary knowledge to maintain and operate this wonderful aid to safe railroading, and will enable you to successfully pass that part of your mechanical examination with a view to promotion. Price 50 cents. Address John F. McNamee, Editor and Manager, 806-807 Traction Terminal Building, Indianapolis, Ind.

Look out for the wily tactics of the B. of L. E., whereby they try to create dissension in our ranks between our engineer and firemen members. They would like to divide us. Don't let them fool you.

A grand day at Niagara Falls, which is only 40 miles distant from Hamilton, Ontario, is one of the treats in store for those who can attend the Canadian Grand Union Meeting, to be held at that point August 5th, 6th, 7th, 8th and 9th. See all particulars as to arrangements, etc., elsewhere in this issue.

The B. of L. E. arrogantly and insolently went ahead with the enactment of its offensive and antagonistic laws against our Brotherhood with absolute disregard as to our rights, feelings or interests in the premises.

If you desire to engage hotel accommodations in advance for the Canadian Grand Union Meeting to be held at Hamilton, Ontario, August 5th, 6th, 7th, 8th and 9th, correspond with Bro. Chas. V. Hayes, 111 Pearl street, North Ontario, Canada.

The advertisement of Hamilton Carhartt, manufacturer of the "Carhartt" overalls, appears in double-page space in our issue this month. Mr. Carhartt, like all wide-awake and progressive manufacturers, operates his factory on a strictly eight-hour basis. We are now living in the age of "Modern Machinery Methods." The modern equipped factory, such as is the Carhartt factory, can turn out a vastly greater output for each operative employed, in an eight-hour day, than was formerly possible in twelve or fourteen hours. This means greater wage-earning powers, fewer unemployed workers, wider markets for the manufacturers, and a more decided era of peace, prosperity and contentment throughout the industrial world than has ever before existed.

Wonder if the crowd that is running the B. of L. E. imagine that they are operating on the "open shop" principle when they try to enter into conspiracies with the railroad officials with a view to securing from the latter a monopoly on the representation of men running engines on the North American continent?

If you are looking for promotion you could not do better than to invest 50 cents in a copy of the "Catechism of the Electric Headlight," the latest and best book on that subject now on the market. Price 50 cents. Address John F. McNamee, Editor and Manager, 806-807 Traction Terminal Building, Indianapolis, Ind.

The committee of arrangements having in charge the Canadian Grand Union Meeting to be held at Hamilton, Ontario, August 5th, 6th, 7th, 8th and 9th, extend a special invitation to the members of the Ladies Society and their friends to be present on that occasion. Particulars appear elsewhere in this issue.

No one could desire peace, harmony and co-operation with all other labor organizations more than does the B. of L. F. and E., but there can be neither peace, harmony nor co-operation between our Brotherhood and the B. of L. E. as long as that organization retains in its constitution the insulting and obnoxious laws against our Order at present to be found therein.

Nothing has been left undone by the committee of arrangements having in charge the Canadian Grand Union Meeting of August 5th, 6th, 7th, 8th and 9th next to make it a magnificent success, and it is to be hoped that every brother and member of the Ladies Society who can possibly do so will, by attending, show their appreciation of the efforts being put forth by the committee to provide in every possible way for their enjoyment.

Every B. of L. F. and E. man should wear our Brotherhood's official lapel button.

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The B. of R. T. and O. R. C. work co-operatively. They have Joint General Chairmen's Associations, and taken together they constitute a powerfully effective agency for the protection of the interests of the members of both orders. If the O. R. C. were to enact laws relative to the B. of R. T., such as the B. of L. E. has at present in its constitution regarding our Brotherhood, what would happen?

Many matters of vital importance to the Brotherhood will be discussed at the Candian Grand Union Meeting to be held at Hamilton, Ontario, on August 5th, 6th, 7th, 8th and 9th next, and every brother who can possibly attend, should, without delay, endeavor to arrange to be present on that occasion. See particulars elsewhere in this issue.

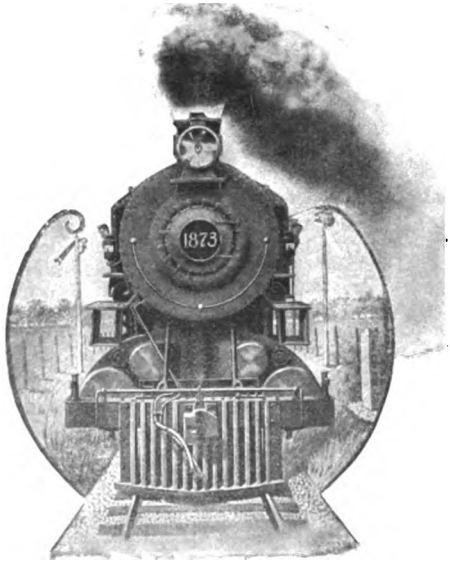
Brothers, when purchasing an emblem of the Order to wear, remember that the Brotherhood has adopted a very handsome official button which can be secured for the sum of one dollar.

We still have on hand a few bound volumes of the Magazine for 1906, a copy of which will be sent prepaid upon receipt of $2.50. Address John F. McNamee, Editor and Manager, 806-807 Traction Terminal Building, Indianapolis, Ind.

Elsewhere in this issue is published a list of the roads with which exchange transportation arrangements have been made for the Canadian Grand Union Meeting, to be held at Hamilton, Ontario, August 5th, 6th, 7th, 8th and 9th. Application for leave of absence and transportation should be made at once.

As an evidence of pride in your membership, wear the official emblem of the Brotherhood. It can be secured on application to Bro. W. S. Carter, Grand Secretary and Treasurer, Peoria, Ill.

If you want to enjoy a most delightful summer outing where hospitality and good fellowship reign supreme, attend the Hamilton Union Meeting. Particulars published elsewhere in this issue.



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BROTHERHOOD BULLETINS

FOR THE INFORMATION OF ALL LODGES AND MEMBERS.
CONDUCTED BY THE GRAND SECRETARY AND TREASURER

Suspension of Lodges Account J. P. B. Assessments.

On June 10, 1907, the following matter was published in an official circular, which circular was mailed to the secretaries of all lodges:

By referring to lines 34 to 37 of Section 225 of the Constitution, it will be noted that the statement is specifically made that "any lodge failing to collect and forward the same (J. P. B. assessment) to the Grand Secretary and Treasurer shall stand suspended according to the laws governing the non-payment of dues and assessments."

The fact that a Joint Protective Board assessment is sometimes levied upon but a few of the members of a lodge caused the question to arise as to the expediency of enforcing this part of the Constitution, and the matter was referred to the Grand Master for an official ruling. After giving the matter consideration and consulting with the members of the Grand Executive Board, who were members of the Committee on Constitution and By-Laws at our last convention, he has become convinced that there was no mistake made by the Committee on Constitution and By-Laws in thus expressing its intentions. Even though the enforcement of that section might carry with it the suspension of the members of a lodge who were not liable for the particular assessment in question, the object of the law is to compel the lodge either to pay the amount of the assessment or report to the Grand Secretary and Treasurer the expulsion of all members who are liable for the Joint Protective Board assessment, and who refuse or fail to pay same when due.

When a Joint Protective Board assessment has been levied upon a lodge, and notice of same is sent to the secretary in the regular manner, and a call is served upon the treasurer of the lodge for the return of the assessment, the treasurer should remit for all members liable for said assessment, or the secretary should report the expulsion of all members who refuse or fail to pay the same when due. If secretaries of subordinate lodges will report the expulsion of all members who fail to pay Joint Protective Board assessments in the same manner that they report the expulsion of those who fail to pay their quarterly dues, no further difficulty of this kind will be encountered.

Inasmuch as there has been some question as to the proper application of the law in this matter, it has been decided by the Grand Master that all lodges who are now delinquent for Joint Protective Board assessments shall be notified that they must remit the amount due on or before the first day of July, 1907, or else they will be suspended upon that date.

It is, of course, understood that Joint Protective Board assessments are levied in advance of the last day of collection, and wherever it is possible to do so, sixty days' notice will be given secretaries of lodges, so that lodges will not have only sixty days in which to collect the assessment, but thirty days additional in which to pay in order to avoid expulsion.

This does not mean, however, that lodges should not remit their Joint Protective Board assessments promptly after the last day of payment of same, for Joint Protective Boards are usually in need of the money, and if the money is collected it should be immediately forwarded after the last day of payment.

Bonding of Financial Officers.

Notwithstanding the action of the last Convention, it would seem that lodges and Joint Protective Boards have no desire to bond their financial officers. On May 1, 1907, an official circular was sent to all lodges and boards explaining the entire matter, and in "Brotherhood Bulletins" in the June Magazine the matter was again explained at length, and all lodges and boards that desire their financial officers bonded were urged to attend to the matter during the month of June. Not to exceed a dozen lodges had expressed any desire in the matter up to June 12.

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The only interest the Grand Lodge has in the matter is occasioned by the fact that the Grand Lodge has lost nearly enough money during the past year, because of "shortages" in the accounts of certain financial officers of lodges, to pay for a $500 bond for every lodge in the Brotherhood. The Constitution provides for the transfer of all members who have paid their dues and assessments, when a lodge becomes defunct, to other lodges, therefore when a lodge loses its charter because of a "shortage" the Grand Lodge suffers the loss.

If reports that reach the Grand Lodge are true, the aggregate losses by lodges during the past year because of such "shortages" would more than pay the expense of ample bonds for all financial officers of all lodges and boards.

It is no greater reflection on a lodge officer to be required to be bonded than for a Grand Lodge officer to be bonded, and no officer should be excused. If you are interested in this question refer to page 849 of the June Magazine.

How to Admit a New Member Properly.

The following are sections of the Constitution with which all members should be thoroughly familiar:

QUALIFICATIONS OF APPLICANTS FOR MEMBERSHIP.

Section 162. An applicant for membership shall have served at least nine months as a locomotive fireman, and shall be actually employed as a locomotive engineman at the time he makes his application. He shall be white born, of good moral character, sober and industrious, sound in body and limb, his eyesight shall be normal, not less than eighteen years of age, and able to read and write the English language, provided that no applicant over forty-five years of age shall be allowed to participate in the Beneficiary Department. He shall join the lodge nearest his residence on the system upon which he is employed, unless the Grand Master grants him dispensation to join elsewhere. Locomotive engine hostlers who have served as such one year, and who have not served six months as a locomotive fireman, shall be eligible to membership, provided they are otherwise qualified under the provisions of this section. Provided that on all railroads where other means than steam is used as the motive power, the men directing, using or controlling such power in the operation of the railroad, and who have been so engaged for a period of nine months, and who are in actual service, shall be eligible to membership, if they possess all the other qualifications required by the Constitution, although they may not have served as a locomotive fireman.

APPLICATIONS FOR MEMBERSHIP.

Sec. 62. All applications for membership shall be made in writing and signed by the applicant. In his application for membership (Form S 3) the applicant shall state his age, occupation and residence, and in consideration of a lodge taking preliminary steps with a view of ultimately conferring membership upon him, he shall agree and subscribe to such other proper conditions, which may be necessary to insert in such application for membership, for the protection of the Brotherhood. Before the application for membership is presented to the lodge it must bear the signatures of at least two members of the Brotherhood in good standing. The application for membership must be accompanied by a fee of ($1.25) one dollar and twenty-five cents. Such application for membership shall be read at a meeting of the lodge, entered upon the minutes and referred to a committee of three, whose duty it shall be to examine into the qualifications of the applicant and file a report in writing of their investigation, in the prescribed form (Form S 3) with the lodge, at the first meeting or as soon thereafter as practicable: Provided, however, If the committee is satisfied that the applicant possesses all the necessary qualifications for membership, they may make their report upon the date of their appointment. Whether the report shall be favorable or unfavorable, the lodge shall proceed to ballot, and if not more than two black balls appear, the applicant shall be declared elected; if three or more black balls are cast, he shall be declared rejected.

APPLICATION FOR BENEFICIARY CERTIFICATE.

Sec. 61. A candidate for admission shall at the time of applying for admission for membership, make application for a beneficiary certificate (Form S 19), in substance as follows:

I, ... desiring to make application for membership in ..... Lodge No..... of the Brotherhood of Locomotive Firemen and Enginemen,

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hereby agree to comply with all the laws, usages and regulations of the order now in force or that may be hereafter enacted, as the condition upon which I am to be entitled to participate in the Beneficiary Department to the amount of..... dollars, and receive the other rights, privileges and benefits of the order. I warrant and agree that the answers made by me to the questions propounded by the Medical Examiner, which are attached to this application, as well as all other answers to questions propounded herein and over my signature are true in every particular. I hereby direct that the amount of the said beneficiary certificate in the event of my death, shall be paid to..... ....., whose relationship to me is that of....., provided that I shall not hereafter revoke such designation of beneficiary and name another beneficiary, in the manner prescribed by the laws of the Brotherhood. It is further hereby agreed that upon myself or beneficiary making claim for the money specified in said certificate or the Constitution, it shall be a condition precedent to payment that the certificate be delivered before the time when payment is tendered and a receipt given for the same by the duly authorized person examining the claim, and by the secretary of the Subordinate Lodge in case of death, of a prescribed form by the Grand Secretary and Treasurer.

INITIATION OF APPLICANTS.

Sec. 63. When an applicant has been duly elected to become a member of the lodge, he may be, as soon as practicable, initiated: Provided, That the applicant shall have filed with the secretary of the lodge an application for beneficiary certificate of the form prescribed by the officers of the Grand Lodge, and such application for beneficiary certificate shall be in the lodge room in the possession of the secretary of the lodge, or in the hands of the acting secretary, at the time the applicant is initiated: Provided, also, That an applicant, upon initiation, shall become a non-beneficiary member, and shall not become a beneficiary member until his application for beneficiary certificate is approved by the Grand Medical Examiner, as provided herein. No applicant or beneficiary, or beneficiaries, shall be entitled to participate in the beneficiary department or in any other fund of the Brotherhood; neither shall the Brotherhood incur any liability to pay him or his beneficiary any sum of money whatever by reason of his becoming a member until the Grand Medical Examiner shall have examined and approved his application for beneficiary certificate; and in the event that the Grand Medical Examiner, who shall be the sole judge thereof, does not approve, but, on the contrary, disapproves his application for beneficiary certificate, then such member shall be classed as a non-beneficiary member and entitled to the rights, privileges and benefits of the Brotherhood except those of participating in the beneficiary department. Such non-beneficiary member shall be subject to all the laws, rules and regulations of the Brotherhood except those governing the beneficiary department. He shall not, however, represent his lodge at any convention of the Brotherhood.

APPLICANT MUST BE ADMITTED WITHIN SIXTY DAYS.

Sec. 64. An applicant who has not been admitted by initiation or special dispensation within sixty days after the date of the medical examination, required in his application for beneficiary certificate, shall forfeit his application fee and his right of admission into the lodge, and his application for beneficiary certificate shall become null and void: Provided, That, in case of sickness of the applicant or some unavoidable occurrence, the lodge may, by consent of the Grand Master, grant an extension of time, but when such extension of time is granted, a new application for beneficiary certificate must be filed by the applicant under the same rules and requirements as before.

APPLICATION FOR BENEFICIARY CERTIFICATE—HOW DISPOSED OF.

Sec. 65. Immediately upon the initiation of an applicant the secretary shall forward the application for beneficiary certificate to the Grand Secretary and Treasurer, who, after recording the membership, shall refer it to the Grand Medical Examiner, who shall, as soon as practicable, examine it to ascertain the physical condition of the applicant and whether the application complies with the Constitution, rules and regulations of the Brotherhood. He shall, as soon as practicable, either approve or disapprove it and return it to the Grand Secretary and

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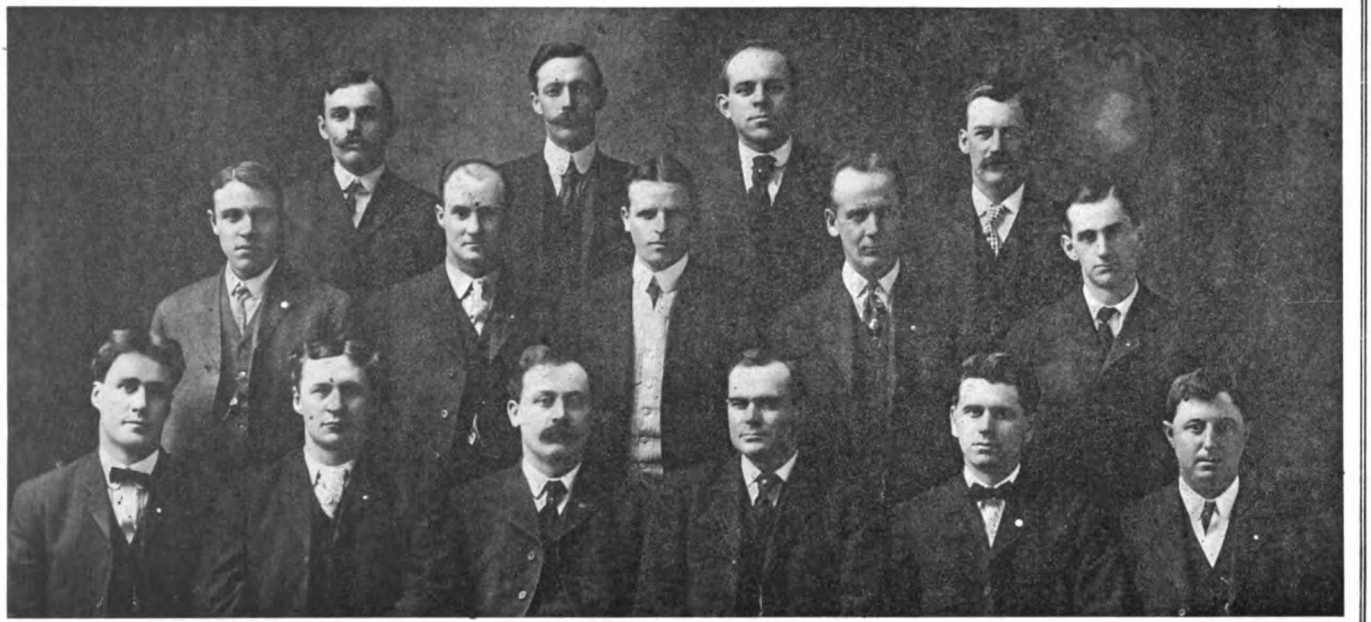

F. G. Cleveland, 35 W. S. Kearns, 519 E. M. Folsee, 407 Ed. Persons, 639

W. L. Stevens, 128 W. T. Wiechert, 191, Trustee A. A. Anders, 710 J. D. Canner, 133, Trustee J. Mills, 192

J. E. Lavell, 320 S. M. Sampson, 194, Vice Chmn. H. B. Smith, 519, Chairman D. Wood, 704, Sec.-Treas. T. P. Gorman, 443, Trustee R. R. Montgomery, 292,

JOINT PROTECTIVE BOARD, NORTHERN PACIFIC SYSTEM

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Treasurer. The Grand Secretary and Treasurer shall, under the seal of the Grand Lodge, issue either a beneficiary or non-beneficiary certificate, in accordance with the approval or disapproval of the Grand Medical Examiner, and forward the same to the secretary of the lodge, who shall deliver it to the member. Applications for beneficiary certificates must be in the hands of the Grand Secretary and Treasurer within thirty days after the date of initiation of an applicant, as shown on the title page of the application on the beneficiary certificate, or it becomes null and void, and a new application for beneficiary certificate must be furnished.

CERTIFICATES.

Sec. 66. The beneficiary certificate shall state name and number of the lodge of the applicant, the name and relationship of the beneficiary, the amount of insurance and the conditions upon which said certificate is issued.

The non-beneficiary certificate shall state the name and number of the lodge of the applicant and the terms and conditions upon which said certificate is issued.

The form of the certificate shall be determined by the Grand Master, Grand Secretary and General Counsel, and must be made to conform to the Constitution of the Brotherhood and the laws of the land.

Forum

The General Chairmen's Association.

On Monday, March 25, 1901, upon an invitation extended by Bro. Boone, chairman of the Joint Protective Board of the Chicago & Northwestern Railway, there convened in the city of Chicago thirteen general chairmen, representing as many different systems of railway and organized what has since been known as the General Chairmen's Association. Since that time the Association has met annually for the transaction of such business as was necessary and for the discussion of certain features pertaining to those duties devolving upon general chairmen, occasionally broadening out and taking into consideration the Protective Department as a whole as provided for in the Constitution of our Brotherhood.

For some reason or other the rank and file of the Brotherhood does not seem to be as familiar as it is desirable they should be with the necessity of such an organization, or the benefits to be derived from having the several chairmen come together in executive session where the various phases of their work could be openly discussed by those thoroughly conversant with the best methods to pursue. Perhaps it is this ignorance of the real objects of the association on the part of the membership in general that has given rise to many theories as to why it was necessary for the general chairmen to meet annually as an exclusive body, in a different city than that in which the organization's headquarters are located. A separate body, as it were, yet dealing with questions that had a direct bearing upon a very important department of the Brotherhood, and goodness only knows what else. Anyway, there seemed to be excellent foundation for the belief that soon become prevalent, viz.: that the General Chairmen's Association was a political body, founded for the sole purpose of furthering the interests of some who were seeking a Grand Lodge office; that it was a political ring, where slates were framed and a united effort made to dominate and sway accordingly the delegates assembled bi-annually for the purpose of legislating and electing officers for our Brotherhood. These rumors have been running rife for a number of years without any effort on the part of those connected with the association to correct the impressions resulting from such erroneous ideas, other than to keep in touch with the general chairmen over the country, depending on them to rightly inform their respective constituencies as to what benefit would be theirs by such an affiliation. This did not have the desired effect, because many of the chairmen were never in attendance and even those who came were not as interested as they should have been; at least, not interested enough to make an extra effort along this particular line.

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These are the impressions of many of the men on our system, and I will venture to state that they express the sentiment of a vast majority of the members of the Brotherhood.

It is the intention of the writer to tell in such a way, if possible, the real objects and aims of the association, as will make it clear to the membership at large that they have a direct interest in these meetings of general chairmen, that they are justified in having a full representation present, and that they should exert every effort to see that the chairmen of their respective systems are in attendance, even to the extent of contributing a portion to the expense incident to such gatherings.

In the first place the General Chairmen's Association has no political significance whatever. It is purely an educational body, where the different phases of grievance work are brought up for general discussion; where each general chairman is at liberty to advance his own individual opinion as to the best method to pursue, or to ask for any information that he desires. The fact that at each meeting there are several in attendance who have had years of experience in this particular work goes to show that the argument advanced is intellectual in its bearing, and has a tendency to instill into the minds of the listeners thoughts that, when carried home, will be of incalculable value to his constituents and himself in his future work. Our Magazine gives much space to the reports of the Master Mechanics' Association, the proceedings of the Railway Clubs and to the Air Brake and the Traveling Engineers' Associations. We find that in reading these reports several of the members are assigned subjects and come with prepared papers that open the way for an informal discussion in which many ideas are advanced that had never occurred to the writer. And when you take the paper itself, and the discussion resulting therefrom, into consideration you can come to but one conclusion; that each one goes away with a great deal more information than was his when he came. So it is with the General Chairmen's Association.

Then there is another phase to be taken into consideration; the concerted action on the part of the chairmen along certain lines that will necessarily grow out of these gatherings. In these days of manufacturers' associations, citizens' alliances and general managers' associations it becomes necessary that the employes, for their protection, merge their interests and meet these organizations of the employing powers on their own ground with a united, unbroken front.

The General Chairmen's Association is in fact a bureau of information, for any chairman can apply to the secretary for information regarding the rates of pay, working conditions and rules of such roads as he desires and the same will be cheerfully furnished in a condensed form that will be of material assistance when negotiating for a new schedule or changes in a few of the articles already governing the working conditions of the men that he represents.

The Protective Department of the Brotherhood is one in which every member is vitally interested; in order to get the best results, it must be represented by men who have the qualifications for handling successfully the business that makes such a department necessary. The handling of grievances is a very peculiar work; work that necessitates the exercise of caution, tact and judgment. Experience, too, is a good thing, but then experience comes only with the passing of time, and many of our general chairmen change so often that they have not the opportunity to get that experience that comes with years of service. Yet by affiliating with other men engaged in the same kind of work they can accumulate a fund of general information that will aid them in solving many of the knotty problems with which they have to contend; their version of a particular subject or feature of work will give them ideas that they never before possessed; their discussion of papers read will cause them to think along entirely different lines and to encompass a range of thought that would never have been theirs but for their presence at such a meeting. It is a schooling for them that will redound in many ways to the interests of the men they represent. It should be the object of each individual fireman to have his chairman qualify himself in the best possible way so that his own interests will be protected in the most able manner.

At the next meeting of the association there will be read a number of papers that will have a direct bearing upon the work that falls to the lot of the general chairman, and these papers will form the foundation for an informal discussion that will be very interesting and instruc-

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tive to those present. In order that the membership at large may become thoroughly conversant with the fact that there is such an organization of chairmen it is our object to have a series of articles appear in the magazine from time to time setting forth the advantages that the individual member will derive from having his chairman meet with others engaged in like work.

The association has been laboring at a disadvantage ever since its organization, in that it has never been officially recognized by the Grand Lodge, but this difficulty has been finally overcome, for on the 25th of May our worthy Grand Master, Bro. Hannahan, duly approved the revised version of the constitution and by-laws. We are at the beginning of a new era, which is launched under more favorable circumstances than the Association has ever before experienced, and we are confidently looking forward to the most prosperous year in our history. We want the general chairmen all over the country to feel that in the General Chairmen's Association they have an organization that is particularly interested in their work, and that any information that they may wish in regard to schedules of the different roads will be furnished upon application if the same can be obtained. And that this work may be carried on with the greatest possible dispatch it is the desire of the secretary-treasurer of the Association that each Joint Board furnish him with a copy of the schedule under which they work at their earliest convenience.

Of the membership at large we request the most earnest consideration of this very important adjunct to the Protective Department of the Brotherhood, knowing full well that if you give this subject the earnest thought that it deserves you will soon come to the realization that much good will result from these annual meetings of the general chairmen.

WALTER D. MOORE.

Wrecks Two Homes.

The subject of this article, Montague T. Heenan, familiarly known as "Monty" or "Matt," was a member of this lodge, No. 666, B. of L. F. and E., New York city, and has proven himself a discredit to our Order, as he eloped with another man's wife and children and deserted his own wife and child. In order that he may not impose upon good Brotherhood men throughout the country his picture is published herewith. His description is as follows: Height, 5 feet 10 inches; weight, 165 pounds; hair, short, black and kinky; eyes, very dark; smooth face; has high cheek bones; wears a 5½ shoe; age, about 28 years. When greatly amused, as by a good

MONTAGUE T. HEENAN

story, he laughs with a great ha! ha! and if sitting at such time he throws back his head and slaps his knee. He is quite witty, flashily dressed, and sporty. He has a traveling card, or did have, good until March 31, 1907, and a receipt good until the same date.

It will be very much appreciated if anyone knowing his present address, or possessing any information that will assist in locating him, will kindly communicate with Geo. L. Jones, 778 E. 136th St., New York City.

GEO. L. JONES,
Secretary.

LEWIS S. GORDON,
Master.

Will Stand by the Old Ship.

The good old B. of L. F. and E. Magazine is no doubt the finest book in existence. I highly appreciate mine and am always glad to see it come, as I read it from cover to cover without stopping, and then put it away for future reference. I have them from March, 1899, to May, 1907, and no man's money could buy them unless I could duplicate them, and in good condition. I hope, Brother Editor, that you will keep on with the good work. I am doing everything that I can for the lodge here, Ohio River Lodge 294. I was transferred to this lodge from Bluestone Lodge 446, and in

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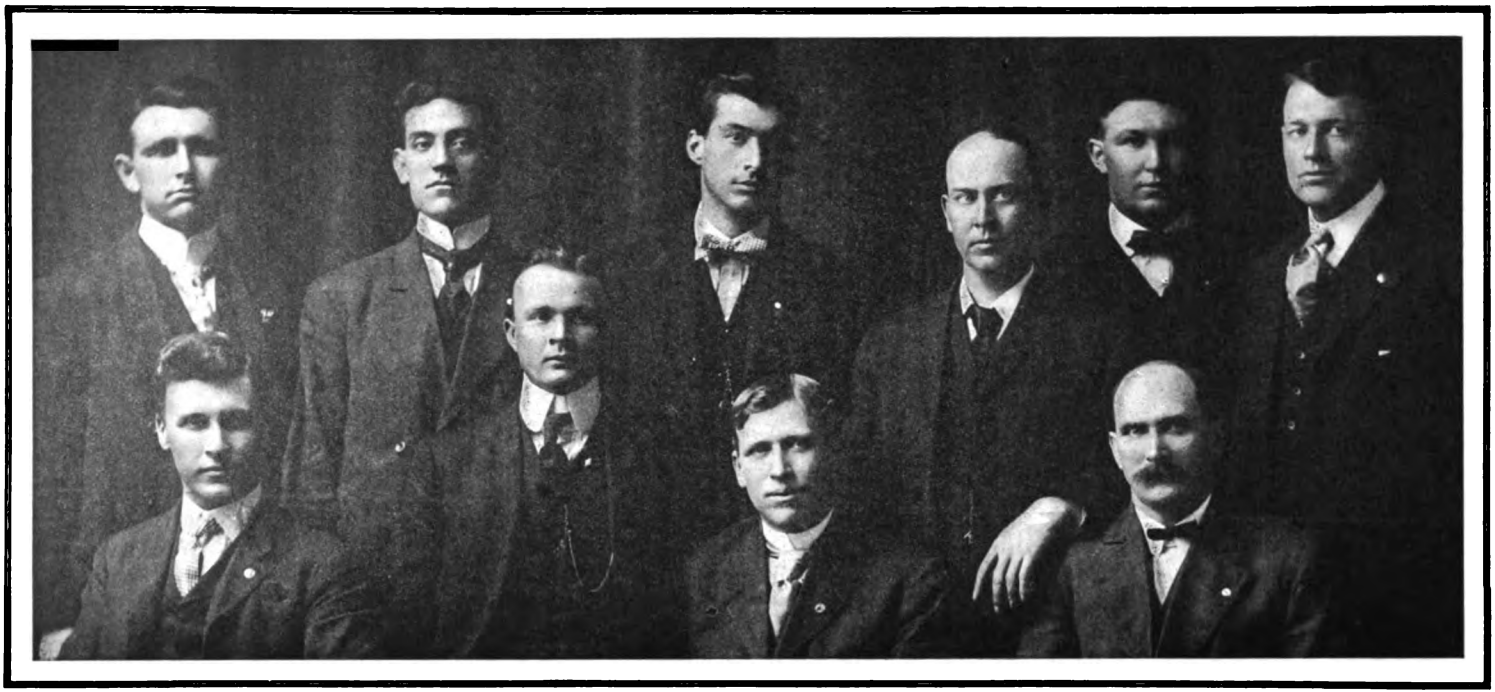

B. S. Price, 87 — H. C. Myers, 313, Vice Chmn. — C. C. Calloway, 438 — J. O. King, 394 — W. G. DeLaughary, 87 — D. W. Smith, 123, Sec.-Treas.

C. W. Tozier, 33 — F. W. Huxoll, 26 — C. V. McLaughlin, 86, Chairman — S. Morgan, 88

JOINT PROTECTIVE BOARD, UNION PACIFIC SYSTEM

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both lodges I have always been on the look out for new members and shall continue to stand by the old ship as long as it is in existence. I don't believe in robbing Peter to pay Paul. I am here with the goods and am going to stay, and I wish the Magazine and our Brother Editor much success.

MEMBER LODGE 294.

* * *

A Plan That Can Not Fail If Adopted and Lived Up To.

I think that there is somewhat more writing about the actions and position of the B. of L. E. than is necessary. Don't write so much, brothers, but ACT. I have given this matter a great deal of thought, and while I have not just as yet reached a conclusion as to which is the best plan, would say that the one that looks most feasible to me is to form clubs and make by-laws obligating each member from joining the B. of L. E. If this is followed out effectively, that organization will soon die out. In ten years it would be a thing of the past. If the members of each subordinate lodge will adopt this plan, the B. of L. E., being thus cut off from its source of membership supply, would soon have to shut up shop. If any brother can think of any more feasible plan I hope he will not fail to get it into motion, for inasmuch as strife between the engineers and firemen is sure to prove detrimental to the interests of both, and as the B. of L. E. is determined to maintain a position towards our Brotherhood which makes such strife inevitable, there is only one course to pursue with a view to the protection of the men on both sides of the engine, and that is to unite them in one order.

L. N. COUGHENOUR,
Member Lodge 21.

* * *

*Our Constitution.**

Section 18, "Election—Officers and Boards," would be made to read in part: Election of General Officers and Boards shall be by printed ballot, each ballot to contain the names of proposed officers and office for which each is a candidate, the ballot to be prepared by Executive Board, authenticated by Grand Lodge seal and Grand Master and Grand Secretary and Treasurer's signatures. It would be necessary, however, to have member voting said ballot to sign his name as in a local lodge election, and in addition to this the secretary of the local lodge of which the member voting is a member affix the local lodge seal. Each local lodge at the time set for holding these elections to count the ballots as is done in elections of officers of subordinate lodges, the master and secretary to affix their signatures and local lodge seal to a tally sheet giving the exact count for all officers voted for and forward to the Executive Board by registered mail, together with ballots cast by said local lodge, and at a set date in the presence of the Grand Lodge Officers canvass the returns of said general elections, the candidate receiving the highest number of votes to be declared elected. I see no reason why the system of a majority of all votes cast should be practiced by the B. of L. F. and E. This is not a general custom in election of officers in State elections. Let the membership vote their choice. If their choice is defeated, it is no fault of the member having another choice. I will again say here, as I have said before in these articles, the greatest weapon used by our enemies is that the manner of voting of our Order does not represent the majority of the membership's opinion. I am not writing with the view of getting anybody out of office, but that each and every member may have a vote in all matters pertaining to the welfare of the Brotherhood. One might agree that the "old way was good enough." Is this not an age of advancement? And if a change in one thing would better our conditions and strengthen our membership, why would this not help? Confidence is the mainspring of an organization. To hold old members they must have confidence to secure new ones. Prospective members must have confidence of return for money spent. You convince the membership and the prospective membership that they may have a direct vote in the enactments of the Order, and you will increase confidence and membership wonderfully.

And I say here, without fear of successful contradiction (outside of some personal or individual benefit), that no one will attempt to challenge a referendum system in our Order. What argument have you against it, my brother? Do you care to be deprived of your legal right of representation? Do you place your "at home financial affairs" in the

*Continued from June, 1907, Magazine.

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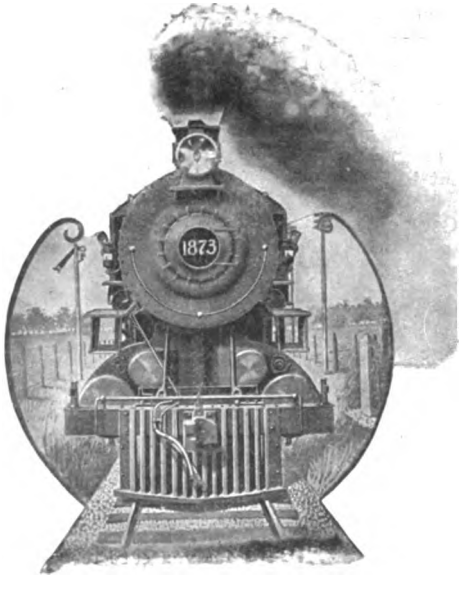
hands of others? Do you vote in your home, State or county elections by proxy? And further, do you not honestly believe if the laws of the land were referred to you for your rejection or acceptance that many of them would be better than they are today? Could you not, while around your fireside, with no allurements of hurry and flurry, and no lobbying for some pet individual's benefit, "study out" for yourself what would benefit you most? And is it not a fact that that which would benefit you would benefit all who represented your class and circumstances? This is not a pet theory of mine, but conditions that must be met. We must have a cheaper manner of conventions and representations, and yet have an efficient representation. Without this representation we lose confidence, and the loss of confidence is a loss to the Brotherhood's membership in general.

Can you, my brother, go into your lodge room this day and look that membership square in the face, and say to one hundred or more sturdy brothers who gain their sustenance of life by the sweat of their brow—men toiling, in the performance of the hardest kind of manual labor that can be assigned to man, risking their lives in their daily toil—"I can vote to your interest better than you can." You are human; I am human. The human flesh is subject to error. You might be mistaken in what was best. Is it not a fact that this vast membership would make the one and same mistake. Did you ever talk to your delegate upon his return from a convention? Did you ever hear him say: "I did not have time to study the question. Had I, I would have voted differently." The referendum will give every one a chance and time to study these important questions, and your remorse over a mistake will all be yours, and sixty or seventy thousand men will not be affected by your shortsightedness.

CHAS. J. ADAMS.

(To be Continued.)



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Correspondence

LODGE 709—(*George O. Apgar, Bonne Terre, Mo.*) May 5, 1907, was the time set for the boys to meet Bro. Asa Dillon, our Fifth Vice Grand Master, who was to come here for the purpose of organizing a lodge at this point. We met him, and also Brother Durocher of Lodge 6, and went to the A. O. U. W. hall, where arrangements had been made for the meeting. At the hall Brother Dillon took charge, assisted by Brother Durocher, and as most of the boys were already members of the Order at different points the meeting was soon under way, and as there were two candidates in waiting they were duly initiated. At this point we adjourned till we could partake of refreshments. This occupied about one hour and then we settled down to work. Then came nominations of officers, followed by election and installation, remarks and instructions from Brother Dillon. This was Brother Dillon's first attempt at instituting a lodge and it was certainly a success, and all who were there will uphold me in saying that it would be impossible to have known it was his first attempt if he had not told us. The membership wish him success wherever he goes. The name of our lodge is Riverside, and the number is 709. Twenty charter members are claimed by this lodge.

* * *

LODGE 464—(*Member, Brandon, Man.*) Having been a member of our good old Order for three years, and never having seen a letter from any brother of Lodge 464 during all that time, and for fear that some of our members in distant parts of this vast continent, under our Order's jurisdiction, should get the idea that we are at a standstill or even worse, with trembling hand I write to assure our membership that we are very wide-awake and hustling. More than that, our efforts are being attended with success, for we are steadily prospering, both numerically and financially. Some good work has been done amongst the eligibles during the last three months, a class of twenty having been lined up and duly instructed, and more still in sight. My advice is "keep up the good work, boys!" With a large and ever-increasing field to work in, owing to the vast expansion and ever-increasing business in the transportation world of this great western country, there is no reason why the watchword of Lodge 464 and all western Canadian lodges should not continue to be "Progress" for some time to come. Well, boys, I think I must let well enough alone and quit at this.

* * *

LODGE 407—(*Member, Seattle, Wash.*) In reading my Magazine I have failed to notice any item from our good old lodge, and would like to let the readers know that we are wide awake and on the move, and that our officers are men full of energy and ability, and a determination of character which admits of no failure. We are constantly making from one to two additions to our role of membership, and on Wednesdav evening, May 22d, we were obliged to hold a special meeting to initiate five candidates. There was a large attendance, so our readers may know the candidates got all that was coming to them. The goat kicked so high that it broke the chandelier, but of course this made the sport all the merrier. At our next meeting one of our old members who has been in the B. of L. E. for the past two years is coming back home to the good old Order, and I think there are three others that have a big notion of following his example. We now have a lodge of 118 members who are getting all the work they want. The engines and the coal are not the best, but the fine climate and up-to-date city we have to live in makes up for that, and in the course of two years we expect to have one of the largest lodges on the coast, as the Milwaukee and Union Pacific are now under construction and will have their terminals here, which we think will greatly enlarge our membership. The present members are not altogether in the service, but are engaged at different kinds of work about the city. We have several working for Uncle Sam, some in the cigar business. One of our officers has had dealings of late in the line of Peruvian parrots. We also have several of the boys working in a refrigerator plant learning engineering. Our lodge is in good financial condition and members in good health.

Our Ladies Society, which was organized about two years ago, is doing well.

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It has several times given us the pleasure of a social and a banquet, and gave a nice dancing party. The ladies are doing their best to get families acquainted, which is a hard task in a large city.

LODGE 715—(*W. C. Neely, Florence, S. C.*) We were organized on May 9th last, with fourteen charter members. Brother Shea organized us. Of course he was strange to us when he arrived in our midst, as the most of us had never seen a Grand Officer. Bro. Walter McCall was chosen as master, and Bro. George I. Graham, secretary and treasurer, and I must say that we could not get more efficient officers. We are all proud of our little lodge and our buttons. Brother Wells was chosen as vice master, Brother Kestler as collector, and Brother McDonald as chaplain. Brother Neely was appointed outer guard, Brother Mims, inner guard and Brother Crooks conductor, and the appointment of these men to fill the respective positions for which they were chosen could not have been improved on. I was told by some of the boys that if I got this lodge up I would get discharged, but I kept at it for two months and now we are a coming little lodge. We are getting 50 per cent. of engineer's pay, and are trying to run out the "Burr Heads." We would like to have all the men firing out of here white men. Of course we have poor coal, but do the best we can with it.

LODGE 563—(*James J. Burns, Merrick, Mass.*) I have been watching for some word in our valuable Magazine from this lodge, and failing to see anything of the kind concluded to take upon myself the responsibility of sending in a few lines for publication. Our lodge is still in the field and growing rapidly. We have a membership of nearly 125. Several of our boys have been promoted to the right side. Our officers are very able and efficient and are always working for the betterment of the Order. They are: Bros. Jas. Murphy, master; N. St. Dennis, secretary: W. Fisk, collector; J. Taylor, treasurer; and J. McCarthy, chairman.

We have a very good schedule here on the B. & A., thanks to the untiring efforts of Bro. J. C. McCarthy. He met with the best of success as a committeeman, and has won the esteem and respect of all the officials.

The afternoon and evening of May 19th last will long be remembered by the boys who attended the meeting. The meeting was called for two o'clock. Sixteen candidates were initiated into the mysteries of the Order. The new members showed a very keen appreciation of the B. of L. F. and E. after the goat got through with them. We then adjourned until eight in the evening and all enjoyed the splendid repast of which they partook. We are still looking for new members. I will now close to take a sweat over the mountains to Albany. Would like to hear something from our sister lodge, No. 200, in the near future.

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Official

Addresses Wanted.

Persons requiring the address or any information concerning another will please communicate with the Secretary of the lodge located nearest the residence of the person making such request. Upon receipt of a communication from the Secretary of such lodge requesting that a notice be published in the Magazine inquiring for such address or other information same will be complied with. However, the Magazine can not undertake the office of a collecting agency and must decline to lend itself to such purpose. The following requests have reached this office since the last issue. Information should be sent to the persons specified in the notice:

Jean Stafford.—Has not been heard from for about one and one-half years. At that time was firing a switch engine in Terre Haute. He ran away with a girl of that city and it is presumed has married her. It now develops that he has another wife and the police department of Terre Haute are very desirous of locating the missing girl, as her mother is in great distress. Anyone in possession of any information regarding the couple will please correspond with the Chief of Police, Terre Haute, Ind.

Sidney J. Lancaster.—Was formerly a member of Lodge No. 6 B. of L. F. and E., and afterwards transferred to Lodge 489 B. of L. F. and E. When last heard from he was in Salt Lake City, Utah. For some reason left for parts unknown. Is probably somewhere in the West now. Anyone knowing his present address, or able to give such information as will lead to his whereabouts, will please correspond with W. H. Cary, secretary of Lodge 489, B. of L. F. and E., 113 East Sixth street, Pittsburg, Kan.

Andrew O'Day.—When last heard from he was in Springfield, Ill. Is 6 feet tall, weighs 200 pounds, is of light complexion, hair slightly tinged with gray, about 46 years of age, is troubled with rheumatism. His sister is very desirous of receiving information regarding him. Anyone knowing his whereabouts, or anything regarding him, will please correspond with H. D. Clark, secretary Lodge 352, B. of L. F. and E., 25 England street, St. Albans, Vt.

Lost Traveling Cards, Etc.

This office has been notified of the loss of the following traveling cards, receipts, etc., and the request is made that all members be on the lookout for them. Should they be discovered in the possession of persons not entitled to them they should be retained and forwarded to the owner or to the Secretary of the lodge which issued same:

Bill book containing lodge receipts from quarter ending June 30, 1902, to the present quarter ending June 30, 1907, also traveling card good until June 30, 1907; meal ticket with name of John Burkley, proprietor, Benwood, West Virginia, belonging to Ralph A. Parlette, member of Lodge 318, B. of L. F and E., was either lost or stolen in the vicinity of Glenwood, Pittsburg, Pa., on or about April 28, 1907. Anyone finding same will please return to R. A. Parlette, 218 Winston street, Glenwood, Pittsburg, Pa., or to W. M. Leonard, secretary Lodge 318, B. of L. F. and E., 20 Natchez street, Glenwood, Pittsburg, Pa.

Traveling card (14028) good for quarter ending June 30, 1907, also receipt for quarter ending June 30, 1907, and about $9.00 in cash, belonging to C. N. Hulvey, member of Lodge 477, B. of L. F. and E., was recently lost or stolen on an Iron Mountain train between DeSoto and Poplar Bluff. If found, please return to C. N. Hulvey, 227 West Main street, Galesburg, Ill.

Traveling card for quarter ending March 31, 1907, belonging to Robt. E. Hahn, member of Lodge 512, B. of L. F. and E., was lost about May 8, 1907. The card was punched as follows: Color of hair, brown; color of eyes, gray; stature, tall. The card was in a celluloid case. If found please return to Robt. E. Hahn, 104 North Grant street, Dayton, Ohio.

* * *

Acknowledgments.

Bro. Wm. B. Sweet, long a member of Lodge 3, B. of L. F. and E., Jersey City, N. J., desires to thank the officers and members of the B. of L. F. & E., one and all, for the money donated to him at the recent convention held in Milwaukee, Wis., and for kindnesses and courtesies shown him, and expresses the hope that

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no other brother may be afflicted with such misfortune as has befallen him.

Mrs. Geo. H. Needler, Newton, Kan., wishes to extend her sincere thanks to the B. of L. F. and E. for the prompt payment of claim; also to the members of Lodge 340 for the many kindnesses extended to her in her deep sorrow.

Mrs. Hannaha Erickson, Moline, Ill., desires to extend her heartfelt thanks and appreciation to the members of Lodge 39, B. of L. F. and E. for all kindnesses and sympathy bestowed upon her at the time of the sad bereavement she suffered in the loss of her husband, Bro. H. Erickson; also for the beautiful floral designs, etc., at the funeral.

Mrs. Mary Eccles, Buffalo, N. Y., widow of our late brother, Chas. Eccles, extends to all members of the Brotherhood, and especially to J. G. Hubbard, Lodge 614, and L. S. 142, her heartfelt thanks and appreciation of the many comforting acts and kindnesses shown to her during the dark hours of her sorrow, and also for the prompt payment of Bro. Eccles' death claim.

Bro. Peter Kill, of Lodge 494, Dead Moose Lake, Sask., desires to express his thanks and gratitude to the Brotherhood for the allowance of his disability claim by the Tenth Biennial Convention held at Milwaukee, Wis., in September last.

Mrs. Mary E. Taylor, of Chicago, Ill., wishes to thank the B. of L. F. and E. for the prompt payment of the claim of her late husband, Bro. Alfred E. Taylor, member of Lodge 188. She also wishes to express her profound gratitude for the sympathy and tender kindness shown by the officers and members of Lodge 188, and L. S. 288 for the beautiful floral tributes.

Mrs. A. C. Linson, of Teague, Texas, wishes to express her most sincere thanks to the B. of L. F. and E. for the prompt settlement of the $1,500 insurance of her late son, Bro. Edgar J. Linson. She also wishes to thank the officers and members of Lodge 156 for the many kindnesses shown her at the time of her sad bereavement. Her heartfelt wish is that the B. of L. F. and E. may ever prosper.

Mrs. Gertrude P. Moorhouse, Otay, Cal., widow of Bro. Thos. Moorhouse, of Lodge 386, B. of L. F. and E., wishes to express her sincere gratitude to the Brotherhood for the prompt payment of Brother Moorhouse's claim. She also wishes to thank the members of Lodge 386 for their many kindnesses to her.

Bro. Almon H. L. Sprague, of Lodge 130, B. of L. F. and E., wishes to thank the Brotherhood for the kindness they have shown him during his sickness and helplessness, and for the prompt payment of his disability claim. He also wishes to thank the members of Lodge 173 in particular for the many kindnesses extended to him during his recent illness.

Bro. J. H. Weaver, of Lodge 162, B. of L. F. and E., wishes to express his gratitude to the members of Lodge 162 and the Brotherhood at large for their efforts in his behalf, and the prompt payment of his disability claim.

* * *

The Home Account.

The following donations were received at the Home for Aged and Disabled Railway Employes for the month of May, 1907:

B. of L. F. and E. Lodges 86, $3; 324, $7	$10 00
O. R. C. Divisions	39 55
B. of R. T. Lodges	112 50
B. of L. E. Divisions	89 00
L. A. C. Divisions	5 00
G. I. A. Division	5 00
James Costello, 270, O. R. C.	1 00
Alfred S. Lunt, 456, B. of R. T.	1 00
Proceeds of a ball given by Nos. 433, B. of L. E.; 390, O. R. C.: 397, B. of L. F. and E., and 564, B. of R. T., Hoisington, Kan.	25 00
Proceeds of a ball given by Div. 379, B. of L. E., Ashland, Wis.	31 00
Collection taken up by the delegates of the O. R. C. Grand Div., Memphis, Tenn.	206 93
Total	$525 98

Miscellaneous.—Box of books from Brother Bedson, Lodge 731, B. of R. T.

Respectfully submitted,

JOHN O'KEEFE,

Secretary and Treasurer R. R. M. H.

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Beneficiary Statement

OFFICE OF GRAND SECRETARY AND TREASURER,
PEORIA, ILL., June 1, 1907.

To SUBORDINATE LODGES:

The following is a statement of receipts in the Beneficiary Department for the month of May, 1907:

RECEIPTS.

Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.
1	460 75	73	280 75	145	206 75	217	176 75	289	103 25	361	113 25	433	130 25	505	.....	577	.....	649	39 75
2	53 25	74	141 75	146	306 75	218	238 00	290	170 00	362	85 50	434	252 25	506	145 50	578	285 25	650	42 25
3	.....	75	480 75	147	213 50	219	301 50	291	96 75	363	372 00	135	333 00	507	129 75	579	51 25	651	110 25
4	279 75	76	24 00	148	235 75	220	616 00	292	44 25	364	131 50	436	237 75	508	281 50	580	11 25	652	100 00
5	332 25	77	408 50	149	483 00	221	132 00	293	136 50	365	58 50	437	41 25	509	80 25	581	.....	653	154 50
6	435 00	78	164 25	150	343 00	222	135 75	294	145 75	366	180 75	438	163 00	510	199 75	582	91 50	654	67 75
7	217 00	79	66 75	151	103 50	223	264 75	295	304 00	367	170 25	439	121 50	511	233 75	583	96 00	655	71 50
8	511 75	80	174 50	152	262 25	224	82 75	296	286 50	368	108 75	440	202 00	512	114 00	584	.....	656	120 00
9	330 75	81	124 50	153	156 75	225	99 00	297	248 25	369	172 00	441	193 00	513	105 75	585	.....	657	158 00
10	914 25	82	....	154	142 75	226	280 75	298	184 25	370	49 50	442	132 75	514	114 75	586	87 75	658	100 50
11	292 25	83	322 75	155	84 00	227	.....	299	120 75	371	.....	443	195 25	515	168 50	587	202 25	659	153 25
12	234 00	84	131 25	156	265 50	228	405 75	300	216 00	372	125 00	444	388 25	516	173 25	588	57 75	660	107 25
13	307 00	85	292 75	157	79 50	229	301 00	301	127 00	373	182 50	445	248 25	517	.....	589	57 75	661	17 00
14	498 50	86	247 25	158	95 50	230	589 00	302	454 00	374	238 50	446	272 50	518	42 00	590	182 00	662	61 00
15	102 75	87	190 75	159	.....	231	415 50	303	99 75	375	80 25	147	95 25	519	201 00	591	226 75	663	139 25
16	473 25	88	216 75	160	188 25	232	198 75	304	253 50	376	.....	448	643 25	520	43 50	592	.....	664	197 00
17	211 00	89	43 50	161	55 50	233	201 75	305	123 00	377	203 25	449	679 00	521	176 75	593	64 75	665	105 25
18	173 25	90	91 75	162	463 00	234	.....	306	253 00	378	...	450	294 75	522	251 00	594	152 25	666	228 75
19	.....	91	294 50	163	196 00	235	239 25	307	190 00	379	355 00	451	156 00	523	93 00	595	63 00	667	82 75
20	44 25	92	155 25	164	94 25	236	451 50	308	70 25	380	63 75	452	145 00	524	25 00	596	131 25	668	136 50
21	257 00	93	166 25	165	71 50	237	383 50	309	325 75	381	357 75	453	56 25	525	152 50	597	.....	669	87 00
22	102 75	94	374 50	166	280 00	238	297 00	310	267 50	382	149 25	454	174 00	526	30 75	598	102 25	670	213 25
23	100 50	95	61 00	167	145 00	239	70 75	311	104 25	383	201 25	455	.....	527	124 50	599	99 00	671	81 25
24	361 00	96	208 00	168	230 25	240	347 75	312	199 50	384	180 75	456	151 75	528	191 50	600	.....	672	97 50
25	293 00	97	380 50	169	406 25	241	320 50	313	141 00	385	81 75	457	178 75	529	124 00	601	257 25	673	778 00
26	225 75	98	238 75	170	201 00	242	802 00	314	185 75	386	54 75	458	62 25	530	85 50	602	173 25	674	36 00
27	252 75	99	600 00	171	145 50	243	117 00	315	185 25	387	77 25	459	76 50	531	115 25	603	108 25	675	132 75
28	181 75	100	122 25	172	89 25	244	201 75	316	220 75	388	198 75	460	90 00	532	106 50	604	61 25	676	50 25
29	112 00	101	456 00	173	313 50	245	155 00	317	91 75	389	119 75	461	122 25	533	116 25	605	.....	677	103 75
30	193 75	102	140 50	174	679 25	246	247 00	318	344 00	390	145 25	462	212 00	534	.....	606	30 25	678	74 50
32	120 00	103	3 00	175	382 75	247	361 75	319	161 75	391	184 00	463	172 75	535	384 25	607	84 50	679	93 50
33	178 75	104	159 00	176	187 50	248	318 75	320	68 25	392	180 00	464	.....	536	129 75	608	.....	680	117 00
33	142 50	105	113 00	177	192 25	249	157 00	321	113 00	393	225 25	465	255 50	537	89 75	609	63 00	681	142 75
34	187 75	106	75 00	178	212 50	250	176 50	322	96 25	394	24 75	466	139 75	538	180 00	610	48 75	682	116 25
35	147 75	107	242 50	179	117 75	251	333 75	323	42 00	395	146 25	467	102 75	539	215 00	611	84 25	683	133 25
36	141 25	108	199 00	180	9 00	252	394 50	324	285 75	396	228 50	468	31 50	540	267 00	612	89 50	684	78 75
37	200 50	109	231 75	181	62 75	253	465 75	325	99 75	397	78 50	469	123 75	541	178 25	613	44 25	685	68 50
38	131 25	110	149 25	182	623 75	254	110 75	326	200 00	398	130 25	470	232 75	542	403 00	614	.....	686	36 00
39	137 75	111	204 75	183	256 75	255	.....	327	366 25	399	102 00	471	32 25	543	273 00	615	102 00	687	167 75
40	359 75	112	68 25	184	75 75	256	85 75	328	195 75	400	194 50	472	389 00	544	127 50	616	62 25	688	60 25
41	.....	113	.....	185	107 25	257	111 00	329	141 00	401	280 75	473	71 25	545	99 00	617	141 50	689	127 25
42	53 25	114	57 00	186	76 75	258	29 75	330	284 50	402	161 25	474	132 00	546	39 75	618	.....	690	66 50
43	.....	115	124 00	187	123 25	259	87 25	331	166 00	403	52 50	475	147 50	547	86 25	619	120 00	691	22 50
44	263 75	116	97 50	188	455 25	260	238 75	332	119 25	404	94 50	476	84 50	548	81 50	620	110 00	692	38 75
45	544 75	117	109 50	189	251 00	261	74 25	333	283 00	405	210 00	477	400 50	549	.....	621	74 75	693	21 00
46	47 25	118	57 75	190	56 25	262	285 75	334	241 75	406	72 00	478	.....	550	63 75	622	202 50	694	104 50
47	309 50	119	.....	191	306 50	263	172 50	335	52 50	407	217 00	479	85 75	551	.....	623	220 25	695	.....
48	391 00	120	225 50	192	321 25	264	115 25	336	99 00	408	213 50	480	12 75	552	.....	624	.....	696	47 50
49	.....	121	321 50	193	114 25	265	436 25	337	381 75	409	223 25	481	.....	553	254 50	625	90 00	697	50 25
50	87 75	122	73 75	194	459 25	266	304 50	338	149 50	410	168 75	482	145 50	554	101 25	626	100 50	698	118 50
51	180 25	123	327 50	195	111 25	267	112 75	339	97 50	411	296 25	483	61 00	555	98 25	627	79 50	699	85 00
52	350 00	124	151 50	196	115 00	268	43 50	340	145 75	412	196 00	484	167 25	556	63 00	628	54 25	700	42 00
53	125 25	125	56 25	197	93 75	269	.....	341	207 25	413	44 25	485	890 00	557	259 25	629	34 50	701	.....
54	434 00	126	164 50	198	398 75	270	267 25	342	265 00	414	166 75	486	195 00	558	226 50	630	141 25	702	.....
55	60 75	127	211 25	199	167 00	271	108 25	343	.....	415	153 75	487	30 00	559	109 75	631	96 75	703	62 25
56	.....	128	262 00	200	97 50	272	60 00	344	184 75	416	209 00	488	72 00	560	77 25	632	47 50	704	127 50
57	663 25	129	.....	201	359 00	273	208 25	345	177 75	417	75 00	489	170 25	561	184 50	633	147 75	705	55 50
58	191 50	130	474 25	202	224 25	274	130 75	346	31 50	418	243 00	490	267 50	562	369 75	634	219 75	706	21 00
59	.....	131	40 00	203	345 25	275	353 25	347	112 00	419	123 00	491	63 75	563	203 25	635	133 50	707	50 75
60	326 25	132	123 00	204	247 00	276	219 50	348	207 75	420	72 75	492	257 50	564	191 25	636	49 50	708	60 75
61	134 25	133	362 00	205	108 75	277	126 75	349	360 00	421	78 75	493	54 00	565	48 25	637	97 50	709	.....
62	108 00	134	119 25	206	103 00	278	30 75	350	102 50	422	74 25	494	125 00	566	.....	638	115 00	710	8 25
63	415 50	135	179 50	207	305 75	279	94 50	351	43 50	423	53 50	495	.....	567	162 50	639	52 00	712	3 00
64	256 25	136	54 75	208	82 50	280	119 75	352	.....	424	.....	496	154 50	568	168 25	640	54 00	713	.....
65	197 25	137	124 75	209	209 75	281	196 00	353	.....	425	102 25	497	119 25	569	182 75	641	119 75	..	.....
66	134 25	138	368 00	210	148 50	282	33 75	354	249 00	426	603 00	498	123 75	570	85 75	642	110 25	...	.....
67	145 50	139	331 00	211	257 50	283	106 50	355	.....	427	.....	499	45 75	571	189 50	643	.....	...	.....
68	121 75	140	412 75	212	174 25	284	730 50	356	224 75	428	104 00	500	102 00	572	.....	644	89 75	...	.....
69	77 25	141	679 75	213	216 75	285	434 25	357	157 50	429	134 25	501	220 25	573	182 25	645	74 75	...	.....
70	197 50	142	230 25	214	480 00	286	161 50	358	159 25	430	149 25	502	245 25	574	165 00	646	291 00	...	.....
71	304 25	143	.....	215	392 25	287	1202 25	359	.....	431	79 50	503	174 00	575	77 25	647	100 25	...	.....
72	320 25	144	41 25	216	134 25	288	108 25	360	112 50	432	228 75	504	57 75	576	66 75	648	39 75	...	.....

Received during month of May $119,724.50

Respectfully submitted,

W. S. CARTER, G. S. and T.

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Statement of Death and Disability Claims

PAID BY THE GRAND SECRETARY AND TREASURER, FROM APRIL 30 TO MAY 31, 1907.

Claim No.	NAMES.	Lodge No.	Death or Disability.	Date.	Cause.	Am't. of Ins.	When Paid.
129	Ingvald Strommen...	639	Death	Jan. 22, 1907	Typhoid fever.....	$1,000	May 2, 1907
1613	Robert Fuller.....	429	"	Mar. 28, 1906	Falling from engine.....	1,500	" 4, "
21	George A. Goodyer..	585	"	Dec. 24, "	Typhoid fever.....	1,500	" 4, "
42	Albert C. Williams...	652	"	Jan. 18, 1907	Collision.....	1,500	" 6, "
1925	George Shrieve, Sr...	405	Disability	May 1, "	Brights disease.....	750	" 10, "
2058	William S. Hughes...	247	Death	Oct. 7, 1906	Derailing of engine	1,500	" 10, "
57	Charles H. Pendleton	91	Disability	Apr. 19, 1907	Consumption of lungs..	500	" 10, "
72	Alfred Wade.....	631	Death	Dec. 30, 1906	Derailing of engine	1,500	" 10, "
137	Almon H. L. Sprague.	130	Disability	Apr. 16, 1907	Consumption of lungs..	1,500	" 10, "
305	C. O. Sims.....	48	"	May 1, "	Locomotor ataxia.....	1,500	" 10, "
2124	J. Howard Munford..	173	Death,....	Nov. 10, 1906	Run over by train	1,500	" 13, "
171	Luther A. Hill.....	171	"	Feb. 26, 1907	Collision.....	1,500	" 13, "
185	Thomas Fitch.....	193	"	Jan. 25, "	Abscess of liver.....	1,500	" 15, "
186	Levi G. Stoner.....	252	"	Mar. 6, "	Boiler explosion	1,500	" 15, "
187	W. W. Peterson.....	689	Disability	Feb. 12, "	Amputation of hands...	1,000	" 15, "
188	Olaf H. Bergstrom...	519	Death	Mar. 1, "	Collision	1,500	" 15, "
189	Alfred Taylor.....	188	"	" 13, "	Heart disease	1,500	" 15, "
190	James L. Miller.....	221	"	Feb. 18, "	Run over by train	1,500	" 15, "
191	Joseph W. Tibbetts..	4	Disability	" 3, "	Amputation of foot.....	2,000	" 15, "
193	William J. O'Malley.	319	Death	Mar. 14, "	Typhoid fever.....	1,500	" 15, "
194	Manford Currier.....	551	"	" 15, "	Derailing of engine	1,000	" 15, "
196	Frank T. Cornwell...	229	"	" 14, "	Apoplexy	1,500	" 15, "
197	Frank C. Edwards....	30	Disability	" 4, "	Amputation of foot.....	500	" 15, "
198	John B. Lasley.....	256	Death.....	Feb. 13 "	Run over by cars	1,500	" 15, "
201	Philip S. Ebert.....	323	"	" 12, "	Crushed under engine..	1,500	" 15, "
202	Henry A. Heberling..	293	Disability	Apr. 11, "	Locomotor ataxia.....	1,500	" 15, "
203	R. S. Russell.....	372	"	Feb. 3, "	Amputation of hand	1,500	" 15, "
204	Harry Stevens	225	Death.....	" 5, "	Typhoid fever.....	1,500	" 15, "
205	C. W. McDaniel.....	580	" ...	Mar. 18, "	Derailing of engine	1,500	" 15, "
206	Roy Cummings.....	463	"	" 13, "	Abscess of kidney.....	1,500	" 15, "
207	Ogal Hazelton.....	361	"	" 18, "	Derailing of engine	1,500	" 15, "
208	Paul P. Stewart.....	75	Disability	Apr. 16, "	Paralysis.....	2,000	" 15, "
209	Henry Knight.....	452	Death.....	Mar. 25, "	Convulsions.....	1,000	" 15, "
210	J. L. Mays.....	148	"	" 14, "	Derailing of engine	1,500	" 15, "
212	Harry F. Hoban.....	314	"	" 18, "	Falling from car.....	1,000	" 15, "
213	Fred A. Demson.....	88	"	" 12, "	Striking cattle guard	1,500	" 15, "
214	A. A. Mehsikomer....	320	"	" 27, "	Derailing of engine	500	" 15, "
216	John J. Madden.....	354	"	" 6, "	Run over by train	1,500	" 15, "
217	Thomas H. Brown....	435	"	" 21, "	Collision.....	1,500	" 15, "
218	Charles E. Persons...	163	"	" 12, "	Derailing of engine	1,500	" 15, "
219	John C. McVeigh.....	296	"	" 14, "	Collision.....	1,000	" 15, "
220	Clifton Nachand.....	457	"	" 17, "	Consumption of lungs..	1,500	" 15, "
223	John W. Overton.....	602	"	" 29, "	Derailing of engine	1,500	" 15, "
224	Chas. J. Mabry.....	369	"	" 18, "	Falling bet. eng.& tend'r	2,000	" 15, "
225	Colonel P. Culp.....	644	Disability	Dec. 6, 1906	Amputation of hand....	1,500	" 15, "
226	Joseph W. Fisher.....	3	Death	Mar. 11, 1907	Boiler explosion.....	1,500	" 15, "
227	Edward O. Wyatt.....	194	"	" 6, "	Derailing of engine	1,000	" 15, "
229	Ira Mitchell.....	537	Disability	" 19, "	Amputation of foot... ..	1,500	" 15, "
231	Henry P. Kent.....	37	Death	Apr. 4, "	Collision.....	1,500	" 15, "
232	Andrew McElligott...	667	"	Mar. 16, "	Derailing of engine	1,500	" 15, "
234	W. A. Matthews	332	Disability	" 20, "	Amputation of foot... ..	1,500	" 15, "
235	E. A. Post.....	149	Death	Apr. 3, "	Cancer.....	1,500	" 15, "
236	Silas R. Moon.....	11	Disability	" 15, "	Brights disease	1,500	" 15, "
238	Daniel Cannon.....	251	Death	Mar. 20, "	Burns	1,500	" 15, "
239	C. McDougall.....	117	"	" 31, "	Consumption of lungs..	1,500	" 15, "
240	Myron F. Caldwell....	8	"	Apr. 1, "	Collision.....	1,500	" 15, "
241	Louis H. Wonderly...	203	"	Mar. 30, "	Typhoid fever.....	1,500	" 15, "
242	Edgar J. Linson.....	156	"	" 19, "	Consumption of lungs..	1,500	" 15, "
244	Daniel J. Callahan...	87	"	Apr. 2, "	Apoplexy.....	500	" 15, "
246	Thomas G. Puckett...	446	"	" 8, "	Derailing of engine	1,500	" 15, "
248	William E. Olmsted..	312	"	Mar. 19, "	Derailing of engine	1,500	" 15, "
251	Olie Everson	211	"	Apr. 10, "	Apoplexy.....	1,500	" 15, "
253	R. E. Compson.....	99	"	" 9, "	Diabetes	1,500	" 15, "
254	Robert C. Buehner...	295	"	Mar. 25, "	Boiler explosion	1,500	" 15, "
256	Frank Miller	434	"	Apr. 6, "	Consumption of lungs..	1,500	" 18, "
232	Charles Linderman ..	215	"	Mar. 28, "	Burns.....	1,500	" 22, "
252	George McFatridge...	348	"	Apr. 10, "	Derailing of engine	1,500	" 22, "
247	Eugene L. Hodgins...	514	"	Apr. 3, "	Struck by engine.....	1,000	" 23, "
165	Henry A. Grant.....	190	"	Feb. 27, "	Collision.....	1,000	" 23, "
84	John Maloney.....	505	Disability	May 5, "	Paralysis, locom. ataxia	1,500	" 24, "

Death Claims Paid.		Disability Claims Paid.	
44—A	$66,000	9—A	$13,500
8—B	8,000	1—Special A.....	750
2—C.....	1,000	1—B.....	1,000
1—D	2,000	2—C.....	1,000
		2—D	4,000
55	$77,000	15	$20,250

70 death and disability claims paid, aggregating $97,250.00.

Pending Claims May 31, 1907.

104 death claims aggregating.....	$147,500
23 disability claims aggregating	31,500
Total of 127 claims aggregating	$179 000

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Statement of Death and Disability Claims

FILED WITH THE GRAND SECRETARY AND TREASURER DURING THE MONTH ENDING JUNE 15, 1907.

Claim No.	NAMES.	Lodge No.	Date of Filing.	Death or Disability.	Alleged Cause of Death or Disability.	Am't of Ins.
383	Taylor, Carl F.	40	May 16, 1907	Disability	Amputation of foot	$1,500
384	Hoar, Edmund F	563	" 17, "	Death	Consumption	1,500
385	Bills, James F	25	" 17, "	Disability	Loss of one eye	1,500
386	Hartman, John	21	" 18, "	Death	Cancer	500
387	Irish, Judd E.	419	" 18, "	"	Heart disease	1,500
388	Wood, Benton G.	352	" 20, "	"	Cancer	1,500
389	Benjamin, Edwin D.	326	" 20, "	"	Typhoid fever	1,500
340	Holmes, Ivan W	179	" 20, "	Disability	Paralysis	1,000
341	Roberts, Preston G.	665	" 21, "	Death	Consumption	1,500
342	Crouse, Elmer	396	" 22, "	"	Spinal meningitis	1,500
343	Scherer, William P	241	" 23, "	Disability	Paralysis	500
344	Whetsel, Oscar W.	109	" 25, "	Death	Run over by car	1,500
345	McIsaac, James	198	" 25, "	"	Derailing of engine	1,500
346	Flaherty, John J.	383	" 25, "	"	Derailing of engine	1,500
347	Epperson, Norman S.	435	" 28, "	"	Collision	1,500
348	Ridge, Harry O	505	" 28, "	Disability	Bright's disease of the kidneys	1,500
349	Forsyth, William	3	" 28, "	"	Paralysis	1,500
350	Donivan, Joseph A.	97	" 29, "	Death	Bright's disease	1,500
351	Lahey, Henry	16	" 29, "	"	Bright's disease	1,500
352	Veandry, Edward J.	387	" 31, "	"	Derailing of engine	1,000
353	Simpson, Henderson M.	695	" 31, "	Disability	Amputation of both feet	2,000
354	Plumsted, Martin E.	23	" 31, "	Death	Heart disease	2,000
355	Halle, Arthur F.	145	" 31, "	"	Falling from engine	1,500
356	Marshall, Harry H.	576	" 31, "	"	Collision	1,000
357	Benton, Jesse O.	617	" 31, "	"	Derailing of engine	1,000
358	Benedict, Emett H.	43	June 1, "	"	Falling between engine and car	500
359	Williams, Robert L.	8	" 1, "	"	Striking a mail crane	500
360	Horecker, Samuel J.	241	" 3, "	"	Boiler explosion	1,500
361	Alexander, Wilburt C.	544	" 3, "	Disability	Locomotor ataxia	1,500
362	Flescher, E. W.	33	" 4, "	"	Paralysis	1,500
363	Downey, John D.	324	" 4, "	Death	Collision	1,500
364	Cates, James P.	238	" 4, "	"	Crushed by falling building	1,500
365	Corey, Edward	196	" 5, "	"	Derailing of engine	500
366	Prentice, Louis N. B.	192	" 5, "	"	Gunshot wound	1,500
367	Truell, Ermel J.	276	" 6, "	"	Typhoid fever	1,500
368	Sample, William G.	252	" 6, "	"	Gastritis	1,500
369	Hartsell, George W	298	" 6, "	"	Blood poisoning	500
370	Bergquist, Oscar E.	348	" 7, "	"	Crushed between engine and car	1,500
371	Lenfesty, Henry J.	407	" 8, "	Disability	Totally blind	1,500
372	McKenna, Michael J.	151	" 10, "	Death	Consumption	1,500
373	Sims, Anthony	13	" 10, "	Disability	Locomotor ataxia	1,500
374	Wilklow, Cecil E	430	" 10, "	Death	Consumption	1,500
375	Dysart, James E.	280	" 10, "	Disability	Amputation of hand	1,000
376	Osbourn, William T	225	" 10, "	Death	Struck by car	1,000
377	Cahail, Clyde	501	" 10, "	"	Derailing of engine	1,000
378	Higgins, John M.	499	" 11, "	Disability	Insanity	1,500
379	Quinn, Fred J.	533	" 11, "	Death	Derailing of engine	1,000
380	Moline, Vernard W.	696	" 11, "	Disability	Sundry ailments	500
381	Kuhns, George O.	26	" 12, "	Death	Cancer	1,500
382	Mansfield, George E.	284	" 12, "	"	Peritonitis	1,500
383	Warne, William J	568	" 12, "	Disability	Paralysis	1,000
384	Foley, Frank	227	" 12, "	"		1,500
385	Fitzgerald, Wm. P.	499	" 13, "	Death	Abscess of kidneys	1,500
386	Mitchell, Benjamin L.	387	" 13, "	"		500
387	Pepper, John E	489	" 13, "	"	Derailing of engine	1,500
388	Cicero, McGehee	163	" 14, "	Disability	Partial blindness	1,500
389	Hill, Akin B.	551	" 14, "	"	Amputation of foot	1,500
390	Sullivan, Patrick J.	94	" 14, "	Death	Collision	1,500
391	Martin, Russell H.	219	" 14, "	"	Crushed between engine and car	1,500
392	Blatt, J. H	27	" 15, "	"	Heart disease	1,500
393	Kirton, James R.	80	" 15, "	"	Run over by car	1,500

Respectfully submitted,
W. S. CARTER,
G. S. and T.

Statement of Donation Claims

PAID BY THE GRAND SECRETARY AND TREASURER, FROM APRIL 30 TO MAY 31, 1907.

Claim No.	Name.	Lodge No.	Death or Disability.	Cause.	Am't of B. C.	Am't Allo'd.	When Paid.
1871	Francis P. Smith	75	Disability	Paralysis	$1,500	$750	May 6, 1907

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Beneficiary Assessment Notice No. 5.

SERIES H.

GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., July 1, 1907.

To the Treasurers of Subordinate Lodges:

Sirs and Brothers:—You are hereby notified that assessments for death and disability claims are hereby levied as follows: For each beneficiary member whose name appears on the rolls of membership on July 1, 1907 (also for all beneficiary members transferred after July 1), carrying a Beneficiary Certificate of THREE THOUSAND ($3,000) DOLLARS, you are required to forward the sum of SIX DOLLARS ($6.00). For those carrying a Certificate of TWO THOUSAND ($2,000) DOLLARS, you are required to forward the sum of FOUR DOLLARS ($4.00). For those carrying a Certificate of FIFTEEN HUNDRED ($1,500) DOLLARS, you are required to forward the sum of TWO DOLLARS AND TWENTY-FIVE ($2.25) CENTS. For those carrying a Certificate of ONE THOUSAND ($1,000) DOLLARS, you are required to forward the sum of ONE DOLLAR AND FIFTY ($1.50) CENTS, and for each member carrying a Certificate of FIVE HUNDRED ($500) DOLLARS, you are required to forward the sum of SEVENTY-FIVE ($0.75) CENTS. Said remittances to reach the Grand Lodge not later than July 20, 1907, as provided in Section 82 of the Constitution.

Yours fraternally,

J. J. HANNAHAN, G. M.

W. S. CARTER, G. S. and T.

SPECIAL NOTICE.—All remittances must be made by BANK DRAFT, MONEY ORDER, OR EXPRESS ORDER. Beneficiary members initiated after July 1st are not liable for this assessment.

Grand Dues Notice No. 2.

For the Six Months Ending December 31, 1907.

GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., July 1, 1907.

To the Treasurers of Subordinate Lodges:

Dear Sirs and Brothers:—You are hereby notified that you are required to forward to the Grand Lodge the sum of one dollar and twenty-five cents ($1.25) for semiannual Grand Dues for the six months ending December 31, 1907, for each beneficiary, non-beneficiary and honorary member whose name appears on the rolls of membership July 1, 1907. Said remittances to be forwarded so as to reach the Grand Lodge not later than July 20, 1907.

In making returns for the above Grand Dues, you will use the same set of statements upon which you make your returns for Beneficiary Assessment No. 5.

Yours fraternally,

J. J. HANNAHAN, G. M.

W. S. CARTER, G. S. and T.

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Notice.

All communications intended for publication in the Ladies Department of the Magazine should in all cases be addressed to the Editress, Mrs. Agnes G. Strong, 527 Green street, Boone, Iowa.

* * *

Cheer Up.

Look up! look up, ye moody folks,
Who will not turn your eyes
To find the bright and bluest spots
Which linger in the skies!
Why do you hunt for shadows, when
The shine is what you need?
That "the bright side is the right side"
Is very true, indeed!

Why, when you see the roses fair,
Look for the thorns they hide;
As tho' the thorns were all they gave
And they had naught beside?
Why mar your pleasures with the fear
Lest pain should lurk behind?
And blame your foes which, after all
You try so hard to find?

Cheer up; cheer up, ye moody ones!
Look for the "bit of blue,"
And when you find it, you will feel
The warm sun shining through.
And if the shadows come, why, then,
Just wait awhile; you'll find
That clouds can't last forever
When the sun lies just behind.
—Mary D. Brine, in the Business Woman's Magazine.

To the New Officers:

Now, just a few words on lodge work. It is the duty of all officers after accepting the honor and responsibility of their office, to fill the same to the very best of their ability. They should be promptly at their post, and not expect the worthy President to drum them up every meeting night, as I know is often the case. They all promised, as did the worthy President, that they would faithfully and impartially perform all the duties belonging to the office for which they were elected, or appointed, and do all in their power to promote the welfare and prosperity of the Order. It is just as much their duty to attend to their office as that the worthy President should attend to hers. Every member promises at the installation ceremonies to uphold the worthy President in the performance of her duties, and I am ashamed sometimes to see the manner in which some members fulfill this promise. I can not wonder at some Presidents losing heart, when instead of a help, many of the members prove by their coldness and indifference but a drag and a hindrance. On the other hand, what a comfort to the worthy President is the general utility member; those whom I have often seen and admired, ever present and ready to fill in the gaps, sometimes three or four of them the same afternoon, never saying, "Oh, I don't want to; ask someone else," but with the cheerful "I'll do the best I can," take the position as-

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signed them at once. Many of these sisters have the work almost entirely committed, so as to be ready to help out at any time, in any place, and what a blessing such a sister is, only the worried President of a small, or sometimes even of a large lodge, knows. "Truly, they shall have their reward."

* * *

Big Ten.

Below is given the membership of the ten largest lodges of the L. S. to B. of L. F. and E., reported June 1, 1907:

1. No. 142, Empire, Buffalo, N. Y.—120.
2. No. 70, Holly, Buffalo, N. Y.—105.
3. No. 3, Hazel, Peoria, Ill.—103.
4. No. 60, Pride, Harrisburg, Pa.—92.
5. No. 125, Charity, Jackson, Mich.—78.
6. No. 51, Grayson, Denison, Tex.—76.
7. No. 151, Missouri, St. Louis, Mo.—74.
8. No. 10, Helpmate, Elkhart, Ind.—73.
9. No. 58, Sisters of 99, Rochester, N. Y.—73.
10. No. 146, Virginia, Chicago, Ill.—72.

* * *

Instructors Appointed.

The Grand President has appointed the following sisters, who shall, when authorized by her, visit and organize lodges on the several specified railroad systems:

Mrs. Agnes G. Strong, 527 Greene street, Boone, Iowa; Chicago & Northwestern R. R.

Mrs. Martha Cary, 113 East Sixth street, Pittsburg, Kan.; Kansas City Southern R. R.

Mrs. Martha Cameron, 5 Halton street, Toronto, Canada; Canadian Pacific R. R.

Mrs. Rose M. Farren, 759 W street, Fresno, Cal., Pacific system; Southern Pacific R. R.

Mrs. Edna Mae Adams, North Eighth street, Breckinridge, Minn.; Great Northern R. R.

Mrs. Ada Ragless, 520 Main street, Elkhart, Ind.; New York Central and Michigan Central R. Rs.

Mrs. Roseltha McGregor, 26 Cordis street, Charlestown, Mass.; Boston & Maine R. R.

Mrs. Elizabeth Truax, No. 2 Manning Boulevard, New Albany, N. Y.; R. R. systems—New York Central; Hudson River R. R.; Lake Shore & Michigan Central and Mohawk & Malone R. R.

Mrs. Gertrude Henry, Minturn, Colo.; Denver & Rio Grande, also Colorado Midland R. R.

* * *

New Lodges.

Golden Glow Lodge, No. 210, Abbotsford, Wis., organized May 2, 1907, with thirteen charter members, by Sister Mae Henderson of Lodge No. 49, Minneapolis, Minn.

Sago Lilly Lodge, No. 224, Glenn's Ferry, Idaho, organized May 3, 1907, with seven charter members, by Sister May Peake of Lodge No. 139, Pocatello, Idaho.

Oregon Rose Lodge, No. 228, Roseburg, Ore., organized April 27, 1907, with twelve charter members, by Sister Rose M. Farren of Lodge No. 98, Fresno, Cal.

* * *

Letter from No. 15.

Dear Sister Editress—I expect you think Forest Flower No. 15 slow. We will admit that we are slow in correspondence, but that is all.

In last month's issue of the Ladies Department we were asked to state what we did for charity. Well, at one of our joint meetings not long ago we heard of a brother and sister that were pressed financially because of sickness. We decided to help them, and in just two weeks we realized $120.75 as the fruits of our labor. Many instances I could note if space would permit.

May 23 we expect to celebrate our twelfth anniversary. We intend holding a rally meeting and expect every member to respond to roll call.

Then we are going to have a "May Party" at Booth's dancing academy, which I know will be a success.

Our worthy president, Sister Jennie Creagh, brought in six applications for membership at our last meeting, and we still have a number of prospective members.

In looking over the last issue of the Magazine I was very much disappointed to find nothing from our new sister lodge at Conneaut, Ohio, for I expected Success Lodge 42 to introduce herself as a member of the L. S. to B. of L. F. and E. family.

Sister Mary Tousley, now our past president, and myself, had the extreme

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pleasure of organizing this lodge last September, and we should be glad to hear from our sisters through the columns of the Ladies Department.

Our president, Sister Creagh, and one of our past presidents, Sister Jennie Hicks, just returned from Ashtabula, where they organized a new sister lodge with twenty names enrolled on its charter. It is called Mizpah Lodge No. 55. We wish this new lodge success in all that it undertakes and were pleased with the kindness and courtesies extended to our sisters.

MRS. MARY NEGUS,
Cleveland, Ohio.

Welcome, East Toledo Sisters No. 229.

Dear Sister Editress—I have just organized a new Society for our Grand President. They are known as East Toledo Sisters Lodge 229, and a nicer lot of ladies would be hard to find. They all seemed so anxious to understand our work thoroughly and were willing to do everything that was requested of them. With such willing workers they are already assured of success. I received the kindest treatment the two afternoons that I spent with them, and so I am naturally very proud of them and wish at this time to introduce them to the readers of the Magazine. I am sure they will receive a hearty welcome from all.

Yours in Friendship and Charity,
MRS. MATILDA LYBERG,
Toledo, Ohio.

Another New Sister Lodge.

It has been my pleasure to organize another lodge of the Ladies Society of the B. of L. F. and E. in the beautiful city of Lexington, Ky., in the heart of the "Old Kentucky" commonwealth, where the meadow grass is blue and where the hospitality is proverbial, and the men as gallant as the knights of old.

It is difficult for me to express the kind treatment and sisterly and brotherly love manifested on all sides. From all indications Crescent Lodge 226, B. of L. F. and E., has a bright future. It was organized on April 6, 1907, with twenty-two names on its charter. The officers selected are of the very best material. The brothers of Big Sandy Lodge 393, B. of L. F. and E., all seem to be interested in the welfare of their auxiliary, and if the ladies do their part the success of Crescent Lodge 226 is a foregone conclusion.

The banquet given by the members of Big Sandy Lodge to the new lodge was something long to be remembered.

During my stay at Lexington I was entertained at the home of Sister Della Eberle, and find it difficult to express my appreciation of the sisterly treatment accorded me. I certainly enjoyed to the fullest extent the visits of the sisters and brothers during my stay at the home of Sister Eberle.

Too much praise can not be given to Brothers Stull, Cravens, Eberle, Hays, Cline, Sanders, Kash, Robertson, Scott, Fugua, Stump and John Crane for the part they have taken in the organization of Crescent Lodge 226, B. of L. F. and E.

ROSE T. SLABY,
Louisville, Ky.

From No. 80.

It is with much pleasure that I once more take my pen in hand to write a few lines to the dear old Magazine.

Since last I had a talk with the sisters and friends many changes have come into our lives; some of them very happy ones and some of them very sad ones indeed.

In my childhood home, in far-away, sunny Tennessee, a true friend and dearly beloved relative has gone to an unbroken rest. A chair in the old home is vacant, and in the loyal hearts of its inmates there is an aching void which even the soothing hand of time can never ease. However, we realize more and more as years go by that our duty is always to the living, and that the truest happiness comes from giving pleasure to others.

The little cottage, 206 Ringo street, our home for so many years, and under whose roof so many happy (and some sad) days were spent, is ours no longer. In other words, "we've moved;" to those who have gone through with this trying ordeal 'tis useless to say anything. They know.

But to those who have never moved I would suggest that they insure both their property and their lives before beginning. However, considering that we were novices in the act, we were fortunate, since, excepting a few scratches on my time-worn desk, a broken limb on the dining table—necessitating that important mem-

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ber of the household goods to stand on crutches—a few broken dishes and a portion of the German heater being gone entirely, we sustained no loss during the humiliating process.

Last February when the glorious winter sunshine caused the strawberry vines to blossom, and the little birds, happy "harbingers of spring," to flit among the branches of the trees, singing their little songs, which—could we only interpret bird language—must have meant: "Why are there no green leaves here among the bushes in which to hide our nests? The wind is in the south, and happy children play all day in the yards on the grass." Sone one with more wisdom than optimism said: "Nature has a surprise in store for us. There will be a cold spring —maybe snow in April." A few days ago, when the wind blew straight from the east, and a cold rain made a fire not only a pleasant accession to one's surroundings, but an actual necessity, we were inclined to agree with him. But today, April 29, is as near a perfect spring day as one could wish, and the beautiful hills and valleys of "Capitol View," with their pretty trees and new houses dotting the landscape, make a bright picture in the spring sunshine, which, I can only say, is indescribable.

Not long ago we had the pleasure of a talk with the worthy and competent president of Leola Lodge (Argenta), and she informed me that they have initiations nearly every meeting. Well, sisters, in dear old No. 80 we don't, do we? Spring is open now and while there is much to do in every home we sincerely hope the sisters will find time to attend their lodge meetings.

With best wishes to the L. S., and many thanks to our competent Editress for the excellent work she does for us, we remain, yours in F. and C.

ORA BOON,
Little Rock, Ark.

* * *

Joint Meeting of 113, L. S., and 230, B. of L. F. and E.

May 7th, Fort Orange Lodge, No. 113, Ladies Society of the B. of L. F. and E., held a joint meeting with the Albany City Lodge, No. 230. There were present delegations from Whitehall, Rutland, Rensselaer, Pride of Capital City, Green Island, and last but not least, our beloved Grand President, Georgia M. Sargent of Washington, D. C., who was enthusiastic in her praise of our floor work. The visitors were met at the Union Station by a large delegation from the Fort Orange Lodge and escorted to McElveney Dancing Academy, where a very interesting meeting was held. Sister Sargent spoke in her usual happy manner and mixed pertinent truths with pleasant humor, which had the effect of showing us our duty and at the same time putting us in the frame of mind to accept her counsel in the spirit in which it was given.

After the meeting the visitors were escorted to Odell's restaurant, where a bountiful repast was served. There was a good attendance at the evening meeting, although it had started in to rain in the afternoon. After the business of the lodge was gone through with the visitors were welcomed by the singing of a song of welcome, the composition of Sister Flora Cornell, sung to the air of "Marching Through Georgia." It was just the thing for the occasion and was considered so good by those who heard it that I here enclose the words and trust that you may find room for them with this article:

Sisters, we're assembled here a welcome to extend,
To every man and woman who to the Brotherhood's a friend.
May Friendship and Charity continue to the end.

Worthy, rap the gavel now, the lodge to order call,
Then we'll try and find a place for the sisters from Whitehall.
Joining hands with Rutland, we'll welcome one and all,
And all go marching onward.

Welcome, Pride of Capital City and Christmas from Island Green,
They are our nearest neighbors, though very seldom seen.
Our old standby, I assure you, is No. 118,
And we all go marching onward.

To every one assembled on this 7th day of May,
A hearty greeting we extend, for it is our eighth birthday.
Success has crowned our efforts, congratulations come our way,
For we still go marching onward.

Later Sister Cornell recited a humorous poem, entitled, "Uncle Josh's First Visit to New York." The manner in

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which this was rendered would do credit to a first-class elocutionist and we were proud of our Sister.

Several of the brothers from the visiting lodge spoke very interestingly on various subjects. Among them was Brother Hayes of Whitehall Lodge, who was most interesting in his remarks. Brother Wener of Lodge No. 230 felt a little timid among so many ladies, at least he said he did. Brother Albert Hunt, Master of No. 230, did himself proud. Sister Hunt (his wife), who is a new member, sang a solo very acceptably. After the meeting was closed refreshments were served in abundance and dancing was indulged in by those who cared for the pastime.

I cannot close without a word for our worthy President and her officers, who did their work splendidly. For dignity, we have never had Sister Haynes' superior in the chair. Our lodge is in a very flourishing condition and there are very few drones in it, and for a lodge of its size, we are very harmonious.

Our worthy Grand President, Sister Georgia M. Sargent, was the guest of our Past President, Sister Elizabeth Truax of No. 1 New York Central avenue. Sister Sargent spent the week in reviewing the lodges in nearby cities and visiting the members, and we all enjoyed it very much.

Sisters, I hope some day we will hold our convention in Washington. There are many reasons why we should and not one why we should not. Near there is the home of the father of our country, near there sleeps our dead of the Civil War. The climate is ideal at most any time of the year. Let us think it over and perhaps three years hence we may go there.

Yours in Friendship and Charity,
KATHERINE C. HOUT,
Magazine Correspondent.

❁ ❁ ❁

Mizpah Lodge, No. 55.

Having just been appointed Magazine correspondent, I take pleasure in sending a few lines to the Ladies Department of the Magazine. I am glad to announce that Mizpah Lodge, No. 55, has been organized again with twenty charter members and several more to be initiated later.

Said lodge was organized Thursday, April 25, 1907, by Jennie Dicks and Jennie Creagh of Cleveland, Ohio.

At 5 o'clock a fine supper was served and at 8 o'clock we all went to Morrison's Hall, where a dance was given by the brothers of Lodge No. 248, B. of L. F. and E.

We meet in the brothers' hall the second and fourth Wednesdays of each month and we anticipate a joint meeting the third Monday evening of each month.

This being our first note to the Magazine, and our lodge so new, I have not much to write about, but hope to tell you more in the near future.

MRS. KATHRYN MCCOOL.
Ashtabula, Ohio.

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The Kansas State Meeting.

The twelfth annual state meeting of the L. S. of Kansas, opened in the I. O. O. F. hall, Pittsburg, Kan., May 13th, at 2:30 o'clock. The hall was carefully decorated for the occasion with bunting, in our lodge colors, festooned in various ways. The officers' platform was banked with palms and red carnations.

The meeting was called to order by the president of No. 141. Then the secret work was exemplified. We adjourned at 5 p. m. in order to prepare for a joint meeting with the brothers of No. 489 at 8 p. m. After the joint meeting closed we were given a literary program, arranged by Sister Nevins of No. 141. Each number on the program is deserving of special mention, but space forbids. After the program an elaborate luncheon was served. And it was a late hour when good-night was said, and all felt that they had spent a most enjoyable evening.

Tuesday morning, May 14th, meeting was called to order by the president of No. 141 at 9:30 a. m., and because of the small delegation the first morning the welcoming address was postponed until this morning, when it was given by Sister Addie Van Pelt, president of No. 141. She also presented the visiting presidents and members. She gave an address that touched on many phases of L. S. work, as well as a hearty welcome. Mrs. Mae Lawton of No. 141 responded for the union meeting in a modest and pretty little speech.

Sister Lawton was elected permanent chairman of the meeting and Sister Martha Cary was elected to fill Sister Lynn Flynn's place as State Secretary.

Then the different committees were appointed and the meeting was adjourned until 2 p. m.

The afternoon meeting was called at the hour appointed and two candidates

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were initiated, using the lodge colors and robes used by No. 141 in their work. We then adjourned until 8 o'clock, when refreshments were served by the sisters of No. 141 and were much enjoyed by all.

May 15th the meeting was called to order by our chairman. The reports of the different committees were read and discussed. Some very interesting subjects were brought before the meeting, one of the most important being that of our union meeting.

Meeting then adjourned until 2 p. m. and was then promptly opened on time. The election of State Chairman and State Secretary was then the first order of business. Sister Mae Lawton was elected State Chairman and Anna Slanker of No. 29, Topeka, Kan., was elected as State Secretary.

The place for our next union meeting has not yet been decided upon.

The fraternal and social features of the Pittsburg union meeting will remain in the memory of those present.

ANNA M. SLANKER,
State Secretary.

Our Locomotive Firemen.

There are praises for the sailor and the "man behind the gun,"
And likewise the engineer for the laurels he has won;
But I'll tell you of another who exerts both limb and soul,
'Tis the jolly, smiling fireman, who shovels in the coal;
Just watch this hearty fellow as his engine climbs a hill,
How he works and sweats and watches while his engineer sits still.
He may be on the lefthand side, but everyone should know
That without these able fellows no railroad train can go.
Perchance as o'er the road he flies he'll pass the little spot
Where lives his wife and children, who have never yet forgot
To watch for papa as his engine speeds along the route;
With what loving heart he strains his ear to hear their farewell shout;
Or maybe 'tis a sweetheart, some dainty, loving miss,
Who watches for her fireman and her finger tips will kiss.
But no matter for a moment what the side attractions be,
Next minute hard at shoveling coal that fireman you will see.
God bless the brave old sailor and the "man behind the gun,"
God bless the fearless engineer for the laurels he has won,
But don't forget the fireman when you say your nightly prayer,
May God bless him, too, with all the rest, for he well deserves his share.

—Mrs. Henry B. Jones, Washington, Ind.

Another New Sister.

In the picturesque little village of Newport, nestling among the green hills of Vermont on the shores of the most beautiful lake in all New England, from which we derive our name "Memphremagog Sisters," we erected an altar April 17th, and then we gathered together to do honor to the fraternity of which we are now a part, the Brotherhood of Locomotive Firemen and Enginemen.

Sister McGregor, assisted by Mrs. Reynolds, both of Charlestown, Mass., organized the lodge during the afternoon and evening.

Mrs. McGregor not only gave us thorough instructions as to our work and duty, but she added a charming personality, which will long be remembered by all.

We were organized with thirty-six names on our charter roll.

At the close of the afternoon session the doors of the banquet hall were thrown open and we were greeted not only by a dainty repast in honor of the Ladies Society by the B. of L. F. and E. boys, but also by the smiling faces of our new brothers, who eagerly claimed us as their sisters.

After the banquet we retired again to the hall and were entertained by speeches from our brothers.

We hope to hear often from our new sister lodges, to whom for the first time we extend the hand of "Friendship."

LODGE No. 154.
Newport, Vt.

Glacier Lodge, No. 150.

Glacier Lodge, No. 150, was organized April 12, 1907, at Whitefish, Mont., by Mrs. Nellie Dawley of Hillyard, Wash., with a charter membership of twelve. The interest which is manifest by every member of this new lodge will make it

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one of the best. We have a very enthusiastic body of workers and are going to work with heart and hand for the good and welfare of this grand order.

Each and every one of us extend our hearty thanks to Sister Dawley for the kind and pleasant courtesies shown us while she was with us organizing this lodge.

We also thank the brothers of Stillwater Lodge for the splendid aid they have given to us.

Fraternally yours,

ELEANOR PROWSE.

Whitefish, Mont.

Sago Lilly Lodge, No. 224.

We organized our lodge Friday, May 3d, at 2:30, with seven charter members, at Glenns Ferry, Idaho. Sister May Peake of La Belle Lodge, No. 139, of Pocatello, Idaho, with her good workers and the able assistance of Sister Christine Perkins, who was initiated at the Grand Lodge meeting in Milwaukee, Wis., last September.

We all rode the "goat" in a hurry and had no time to get nervous.

Sister Christine Perkins was elected our president, and I am sure she is well qualified and will make an ideal president.

In the evening the new lodge tendered a reception in honor of Sister Peake and invited all of the brothers. Dainty refreshments were served and a thoroughly good time was had by all present.

We expect to keep our "goat" busy for a time, for we have several prospective candidates in view, and then we expect our brothers to help us swell our membership list, for they are very kind and so willing to help us make our new lodge a success.

With best wishes for all sister lodges, I am,

Yours in Friendship and Charity,

EFFIE QUINN,
Secretary of No. 224,

Glenns Ferry, Idaho.

Golden Glow, No. 210.

It is with pleasure that I introduce to the readers of the Magazine a new sister lodge, and it is called Golden Glow No. 210.

No. 210 was organized Thursday afternoon, May 2, 1907, at Abbotsford, Wis., with eighteen names on its charter roll.

These sisters have worked hard and faithfully to get the new lodge started, have met with some disappointments, but now start out with renewed energy, and I feel that with such willing workers they can't help but meet with success.

Much credit is due the good brothers of Chippewa Valley, No. 425, for their kind assistance and financial aid in having paid all of the expenses of organizing this new lodge.

The officers elected are Mrs. Mary Nohr, president; Edith Tennent, P. P.; Nettie Ireland, V.-P.; Mary Brinnell, Chap.; Effie M. Bellingo, Sec.; Mrs. C. G. Severance, Coll.; Mrs. K. Phaneuf, Treas.; Monda Kingsland, Cond.; Calla Sinsolk, Warden; Sophie Kulkanck and Belva Bunnell, Guards.

Golden Glow Lodge will be a bright spot in this part of the state. I understand that Ashland is now trying to secure a charter membership, and I hope to be able to introduce them to you in the next issue of the Magazine.

Yours in Friendship and Charity,

Mrs. MAE HENDERSON.

Minneapolis, Minn.

A Pleasant Visit.

Prospect Lodge, No. 162, and Helpmate Lodge, No. 10, were royally entertained by the brothers of Grand River Lodge, Grand Rapids, Mich., April 3d. Words fail to express how kindly we were treated. About forty-five members responded to the invitation. The L. S. kindly furnished us a private car and the trip will long be remembered by those who were fortunate enough to attend. On arriving in the city we were taken to the hotel for supper; then we repaired to the finely furnished hall, where a fine program, consisting of recitations, vocal and instrumental music was rendered. Some fine talent was displayed by the little children. The brothers served a fine two-course luncheon at 11 p. m. and to say they served it in style is putting it mildly. Great credit is due Brother Daily for the success of this feature of the evening.

Grand River Lodge has no Ladies Society and this was the chief purpose of the gathering—to get the ladies interested, and I hope the brothers' efforts will be rewarded and that they will soon have a L. S. in their city. After luncheon the

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time was spent in giving short addresses for the good of the Order, short talks on why they should organize a society, etc. We were then taken to the different homes to spend the remainder of the night. Special mention should be made of Brother Wilder and wife, as they entertained so many over night and for breakfast. I regret that I could not learn more of the names, but all showed the spirit of true hospitality, and the members of No. 162 and No. 10 take this manner of thanking them. We hope soon to have the pleasure of entertaining them in our beautiful city on the old St. Joe.

The home run was a most enjoyable one. We reached Elkhart the evening of the 4th, tired, but exceedingly glad we went, and loud in our praises of our Michigan brothers. Much credit is due Brother Cornelius of No. 162 for his efforts in arranging the details of the trip.

MARY MCLAUGHLIN.

Elkhart, Ind.

Willing Helpers Celebrate Their Tenth Anniversary.

Willing Helpers, No. 76, of Louisville, Ky., celebrated their tenth anniversary on May 15, 1907, with a dance.

The hall was beautifully decorated for the occasion with palms and ferns and delicious refreshments were served.

Willing Helpers are indebted to the brothers of Pride Lodge, No. 502, who furnished everything on that evening for the ladies and their friends' enjoyment. Brothers Noonan, Heller and Kraft certainly surpassed themselves as waiters.

We extend to the brothers our most heartfelt thanks and trust we may enjoy many more such delightful occasions. The following history of No. 76 was written by Brother Oris Reynolds, the secretary of No. 502, and was so good that I thought I had better pass it on and thought it might do some one else some good.

"Just ten years ago tonight there was launched upon the world that organization known as Ladies Auxiliary No. 76, the band of 'Willing Helpers.' The anniversary of that very important event we are assembled here tonight to commemorate.

Since its organization only three ladies have been elected president: Mrs. Jos. Mulloy, Mrs. Annie Green and the present incumbent, Mrs. Rose Slaby, which only proves the rule that it is better to give your officers a chance than to be changing every year.

Since the existnece of No. 76 they have planted in Portland a young shoot of which they have great hopes. The daughter lodge is called 'Queen of the Falls, No. 178,' and great hopes are entertained for her prosperity.

The right worthy President, Mrs. Slaby, has officiated also at the installation of several new lodges in central Kentucky since her reign in office, so you can see she has not been idle by any means.

The many sick or injured brothers and sisters who have been ministered to or visited in their hour of sickness or trouble space alone prevents our naming. They are manifold, to say the least, and will speak for themselves whenever and wherever you meet them along life's journey. What they have done and modestly refrain from boasting about would fill a book, but what they are going to do would fill two. Their desires are like their good works, very numerous.

First, they want an application for membership signed by each lady eligible to membership in their society, and that includes, well, almost all the ladies connected with railroad men's families. Don't forget that, boys, and use your influence on your wives and sisters and mothers.

Second, they want to eclipse this year the good work done last year and let each new year multiply their good deeds and good works done for the poor, sick or afflicted in any way."

And now for a word to the would-be-wise who are always asking "What is it like?" "Who belongs?" "What do they do?" It's not my place to tell this, so, like the boy who wanted to know how sweet the honey really was, the answer was, "Just stick your finger in and taste it." And to you, my dear uninitiated sister, my answer is "Just try it and see. Join them and see not only how much good you can do them, but how much real *good good* they can do you."

PRESIDENT OF WILLING HELPERS LODGE, No. 76,
Louisville, Ky.

Letters from Friends.

FROM L. S. 141—(*Bird H. Reed, Pittsburg, Kan.*) Being appointed correspondent for Connecting Link Lodge 141, I have delayed in writing to you of the

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good things we are doing. But "procrastination is the thief of time," and I will try and be more prompt in the future.

No. 141 is in a flourishing condition; the members attend meetings fairly well, and occasionally a new member is added to our number.

We have had several social gatherings. On December 31, 1906, the sisters planned a "watch party," under the championship of Sister Nevins. A most delightful evening was spent. A short program, followed by an elaborate banquet, then dancing till the New Year was heralded in. Some seventy-five of the brothers and sisters participated in this delightful event.

On March 11, the anniversary of the birth of 141, was observed jointly with the brothers in a royal manner, and that, too, was an occasion long to be remembered.

Two of our most energetic members are leaving us, lessening our willing workers, but God's speed be with them is our earnest wish.

Sister Anna Post has gone to Colorado Springs to recuperate in health. Her sister, Miss Nellie, preceded her over a month ago. She just recently joined our ranks before her departure for the west.

A most pleasant surprise was planned on Sister Post by Sister Cary, who never lays the gauntlet down. But, ever ready with might and main for the success and pleasure of 141, Sister Reed, in a few appropriate remarks, presented Sister Post with a slight token of our regard and esteem in behalf of the sisters. Sister Post was greatly affected by the manifestations of good will, and responded very gracefully.

Sister Laina Beyson, who soon leaves for Fort Smith, Ark. (where the other half is employed on the Frisco), invited the sisters in to celebrate her birthday. An elaborate spread was prepared, to which all did ample justice. Sister Moon, on behalf of the sisters, in a few well-chosen words, presented our sister a remembrance of the occasion and to show our appreciation of her who so soon leaves us for other parts. Sister Beyson thanked the sisters for the beautiful token, saying that she would "value and treasure it with much pleasure." The sisters all join in wishing her many happy days of health and happiness, and may success meet her on every turn in her new home.

At a recent meeting Lodge 141 was asked to take the Union State meeting, which is held annually in Kansas in May. At our last Union State meeting, which was held in Kansas City in May, 1906, with No. 91, it was voted to hold the next meeting in Osawatomie. Osawatomie finds, for various reasons, that they are unable to have it and communicated with our State president, Mae Lawton, their reasons.

So we have decided to have the Union State meeting meet with us, and only just one month to work in. But our members have the vim and all are hard and willing workers, so I do not fear, but know that this union meeting will be a success, and all will have a good time who attend.

McKeen's Pride surrendered their charter and we were fortunate in securing three of their members—Sisters Lawton, Damerell and Westfall. We welcome these sisters and are indeed happy to have them numbered with Connecting Link Lodge 141.

If my lengthy paper escapes the waste-paper basket you will hear from us again. With best wishes for brighter prospects for the coming year.

* * *

FROM L. S. 33—(*A Member, Paducah, Ky.*) Dear sisters, here we come again. Hope you won't get tired of us, but as there is always "somethin' doin'" we just have to write and tell you about it. We are getting along splendidly and never miss having a regular meeting, notwithstanding that sometimes the attendance is necessarily small.

Two of our most efficient members have moved recently, Sisters DeLoach and Crafton having gone to Memphis, Tenn. We are indeed sorry to lose them, but are glad that they still retain their membership with us. They were obliged to do this, as there is no lodge of our Order in the "Bluff City."

We never fail to have our joint meetings, and such splendid good times we do have. Any sister or brother sojourning in our city on the second Tuesday night in the month, just make a special effort to come to our hall on the corner of Broadway and Twelfth street, and you will always find the latch-string on the outside, and on the inside you will receive a hearty welcome.

On April 15 we gave a dance, which was a success in every respect.

Our treasurer, Sister Muenster, went to Texas to visit with her parents and was absent from the city about two

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months, and when she returned to Paducah we planned and carried out successfully a pretty surprise party on her and Mr. Muenster. The surprise was indeed complete. We carried with us refreshments, consisting of fruit and cake, and spent a most enjoyable evening with music, social amusements and pleasant conversation, and when we departed at a late hour all felt that it had been good to be there.

With best wishes for all sister lodges and for the noble Brotherhood, in whose interest we labor, and the lion's share of love for our dear, patient Editress, I am, yours in F. and C.

FROM L. S. 179—(*Mrs. P. Baker, Moose Jaw, Sask., Canada.*) It has been a long time since the readers of the Ladies Department have read anything about 179, and no doubt many have given us up for dead. I am glad to say that is not so, but that we are working on in our quiet way, occasionally adding a new member to our list, and holding some pleasant socials. It is with profound sorrow that I write you of the death of our Sister C. Nicholson, who departed this life March 25, 1907, after a very brief illness. She was a loving and faithful wife and sister, one whose company was always a pleasure, never greeting you but with a smile and a kind word. She was a charter member of Wellington's Companion No. 17, but took a transfer card and organized our lodge, Star of the West 179, of which she was also a charter member and past president. The funeral was largely attended and the floral tributes were many and beautiful, it being the wish of our deceased sister that the L. S. take charge of the funeral, assisted by the Ladies of the B. of R. T., of which she was also a member. After a short service at the home the remains were taken to the Moose Jaw cemetery, members of both Ladies' Societies acting as pall-bearers.

We are at present making a personal canvass of the wives and sisters of our brothers and hope to have many new names as a result. Our brothers are certainly doing all that they can to help us out, for many of them are bringing young wives into Moose Jaw, and we hope before long to be able to call them all sisters.

On March 15 last we had our first joint meeting with members of Buffalo Range Lodge 521, B. of L. F. and E., which was largely attended by both lodges. After the business was concluded a fine musical program was given, after which all retired to Leslie Palfrey's, where refreshments awaited us, and to which all did ample justice. The remainder of the evening was spent in entertaining amusements and music, and when we departed at a late hour all felt that it had been a most enjoyable evening.

FROM L. S. 195—(*Mrs. Meta Clark, Spokane, Wash.*) For some time we have sent nothing to the Ladies Department, but events have lately transpired that are worth speaking about. Our lodge is in a very flourishing condition in every way and we have great reasons to be proud of it.

The 12th day of April was our second anniversary, and it was decided we would give a ball, which should become hereafter an annual event. We gave the ball and it was very successful, all members entering heartily into the arrangements of the affair, and I must say right here that we thank the brothers for their hearty co-operation in helping to make it a success. But gloom was thrown over the spirits of the workers, for death had entered into our midst, and our band was broken, for the All-Wise Father had seen fit to place the seal of silence upon the lips of one whose going from among us has left a lonely home and a sorrowing family. Mary C. Keller, after a sickness of a few weeks, died suddenly just at the close of the day, April 11, 1907. Sister Keller was a charter member of Spokane Lodge 195, and at the time of its organization was chosen past president. She was the mother of our sisters, Stella and Leona, also two sons, who are employes on the road. They were a very united family and it will be long ere home will seem the same again—because mother is gone. She left many friends, not least among them being the members of the auxiliary to which she belonged. This is the first death our lodge has had, and though we shall sadly miss her, we know that what has been our loss will be her gain, and our heartfelt sympathy is with the dear ones left behind.

On Tuesday morning, April 10, 1907, the husband of our Sister Gertie Williamson was instantly killed with electricity. It was very sad. There were but the two

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of them, and one can hardly imagine the loneliness of the wife, for her home must ever be filled with the presence of the one who has gone to the place from which no traveler returns, for there is no forgetting. Sister Williamson is blessed, indeed, in having so many friends and relatives to be beside her in her dark hour of trial, and the members of Spokane Lodge also, who feel grief for her grief and sorrow for her sorrow. But we know:

"Somewhere the sun is shining,
Somewhere the song birds dwell;
Hush, then, thy sad repining,
God lives, and all is well."

* * *

FROM L. S. 77—(*Mrs. Fannie Meredith, Peru, Ind.*) After a short time, I will again endeavor to inform the sisters of the progress of Pride of No. 405, Lodge 77.

The quarter just ended was one of profit and pleasure to us, as we not only added four new names to our roll call, but gave a number of socials as well, each one netting us a goodly sum for our treasury.

Peru Lodge 405 very delightfully entertained the ladies after their usual business meeting on March 28. It was their first attempt of the kind, and, notwithstanding a certain "shyness" on their part, we had a delightful time. Refreshments, consisting of ice cream and cake, were served by the brothers. We wish the brothers would ask us just real often to meet with them, for we certainly did enjoy this occasion.

I am very sorry to chronicle the death of the only daughter of Sister Bennett. It grieved us because we could not do more for our sister at such a time, but, as the disease was black diphtheria, we could only manifest our sympathy to her through the medium of "flowers."

One of our sisters—in fact, one of our charter members—has taken unto herself a husband. She has the heartiest congratulations of Lodge 77.

We have received an invitation from Lodge 81 to be present at a meeting on the 29th of April to help them initiate a class of candidates.

Wishing all sister lodges success, I am, yours in F. and C.

* * *

FROM L. S. 32—(*Mrs. Kitty Donley, Kansas City, Mo.*) As Magazine correspondent from Three Star Lodge 32, I feel that it is about time that I should make myself known. I am very glad that I am able to report our lodge as in a flourishing condition.

We had two applications at our last meeting and have several more in view.

They have reorganized their lodge in Sedalia, Mo., and we were called upon to issue transfer cards to four of our members, so we felt as if we should like to make up for this loss of membership in getting as many new ones as we were obliged to transfer. So some of the sisters went to work and made an extra effort and we will soon have more than we lost, and while we were very sorry to lose our members, we are so glad to have a sister lodge again at Sedalia.

I take great pleasure in reporting a rousing joint meeting of Big Four Lodge 337 and our Lodge 32, on April 9, 1907, at which about one hundred and twenty-five members and friends were present. Among the number was Brother Steve Jackson, wife and daughter, who made her "debut" into society on this evening, and we think we had the honor of entertaining the youngest lady known to our lodge, she being only three weeks old. I can assure you she was the most popular lady present. We also had the pleasure of meeting several brothers from 330, and sisters from 90, and hope they will all come again. The evening was spent in music and social amusements, and a good time was had, after which a delightful two-course luncheon was served, to which all did ample justice, and went home feeling that it "was indeed good to be there." We thank the brothers for their kind invitation and hope for many more such enjoyable meetings. With best wishes for all, I am, yours in F. and C.

* * *

FROM L. S. 8—(*Mrs. Grace Iler, Garrett, Ind.*) Lodge No. 8 is getting along nicely. The meetings are well attended and much interest is being taken. Some of our sisters are very careless about attending regular meetings of our lodge. Remember your obligation, sisters, and come out and take an active interest in everything that pertains to the good and welfare of our Order.

Our "goat" has been kept quite busy of late, but we are going to give him a good exercising at our next meeting, as we have a candidate to initiate.

The stork has visited us again and left

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at the home of Brother and Sister Brennen a baby girl, which we hope may some day be an L. S. woman.

The brothers of 203 gave a banquet to the auxiliary and their families last Wednesday evening, April 3. The hall was well filled with the brothers and sisters and their friends, and all expressed themselves as highly pleased with the splendid entertainment and the delicious refreshments which were given them. The refreshments were served by the brothers of 203, and too much can not be said in favor of the boys. They are certainly a jolly "bunch" of brothers and we had a time long to be remembered. They have the sisters of No. 8 placed in the shade when it comes to giving entertainments and in getting "good things to eat." A flashlight picture was taken of the entire group, which makes a fine souvenir of a very happy occasion. We were pleased to have with us on this occasion Sister Scott, president of Lodge 44, and hope she will come again soon.

Our brothers have had to drape their charter in mourning for a dear brother, Louis Wonderly, who died March 30, 1907.

Sisters, try to secure new members. Surely there are many that are eligible to membership and perhaps are just waiting for an invitation to join us. Let our motto be, "At Least One New Member This Year."

* * *

FROM L. S. 78—(*Laura Christal, Raton, N. M.*) As L. S. 78 has not been heard from for some little time, I trust that a few words from us might be appreciated. Our silence does not mean lost interest, nor does it mean that we have not been busy. At our very last meeting we had the pleasure of guiding two candidates through the mysteries of our Order, and after the lodge session closed we adjourned to the banquet room, where we were greeted by some of the brothers and a bounteous repast was spread, and a thoroughly good time enjoyed. We look forward to another such occasion at our next regular meeting, for we have two more applications for our next meeting, and we have splendid prospects for at least several more soon.

Our little lodge affairs glide along smoothly, without friction, each member doing her part cheerfully and willingly.

It is unnecessary to say all visiting sisters are heartily welcome to our meetings when in this city.

Wishing all of our sister lodges success and a prosperous new year.

* * *

FROM L. S. 48—(*Mrs. J. S. Teter, Brookfield, Mo.*) Having just finished reading the Ladies Department of the Magazine, and especially the "Letters from Friends," which I am so much interested in, and feel that a great many are interested in them also, I will try and write a few words, which I hope will be of interest. Our lodge meets the second and fourth Wednesdays of each month. We have thoroughly enjoyed our meetings this winter, for while our membership is not so large, our sisters are every one faithful and are ready to do everything necessary to advance the interest of our Order.

At our two last regular meetings we had candidates to initiate, and at our last meeting we had a little luncheon served by Sisters Ruple, Wallace and Faye.

We held a delightful surprise on our president, Sister Mary Hanks, on April Fool night. About twenty-five guests were present and a splendid time experienced.

Since I wrote my last letter great sorrow has come to one of our sisters, Mrs. Clarence Donovan, by a wreck in which her husband was killed. The wreck occurred February 28, near New Cambria, Mo. Both the engineer and fireman were killed and the head brakeman, Mr. Lambert, lost one of his lower limbs. The widows of both have the heartfelt sympathy of all in this their great bereavement.

* * *

Death Report.

Bertha Vernier, Lodge 10; died May 16, 1907; cause, arsenical poisoning; suicide. Insurance, $200.

Lillie Maeklin, Lodge 50; died April 18, 1907; cause, pulmonary tuberculosis. Insurance, $200.

Beatrice Stone, Lodge 100; died April 14, 1907; cause, peritonitis due to an injury received. Insurance, $200.

Mary M. Ford, Lodge 37; died April 23, 1907; cause, valvular heart disease. Insurance, $200.

Sarah J. Davis, Lodge 68; died May 1, 1907; cause, cerebral hemorrhage. Insurance, $200.

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Locomotive Firemen and Enginemens Magazine

Published at INDIANAPOLIS, IND.
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Brotherhood of LOCOMOTIVE FIREMEN AND ENGINEMEN

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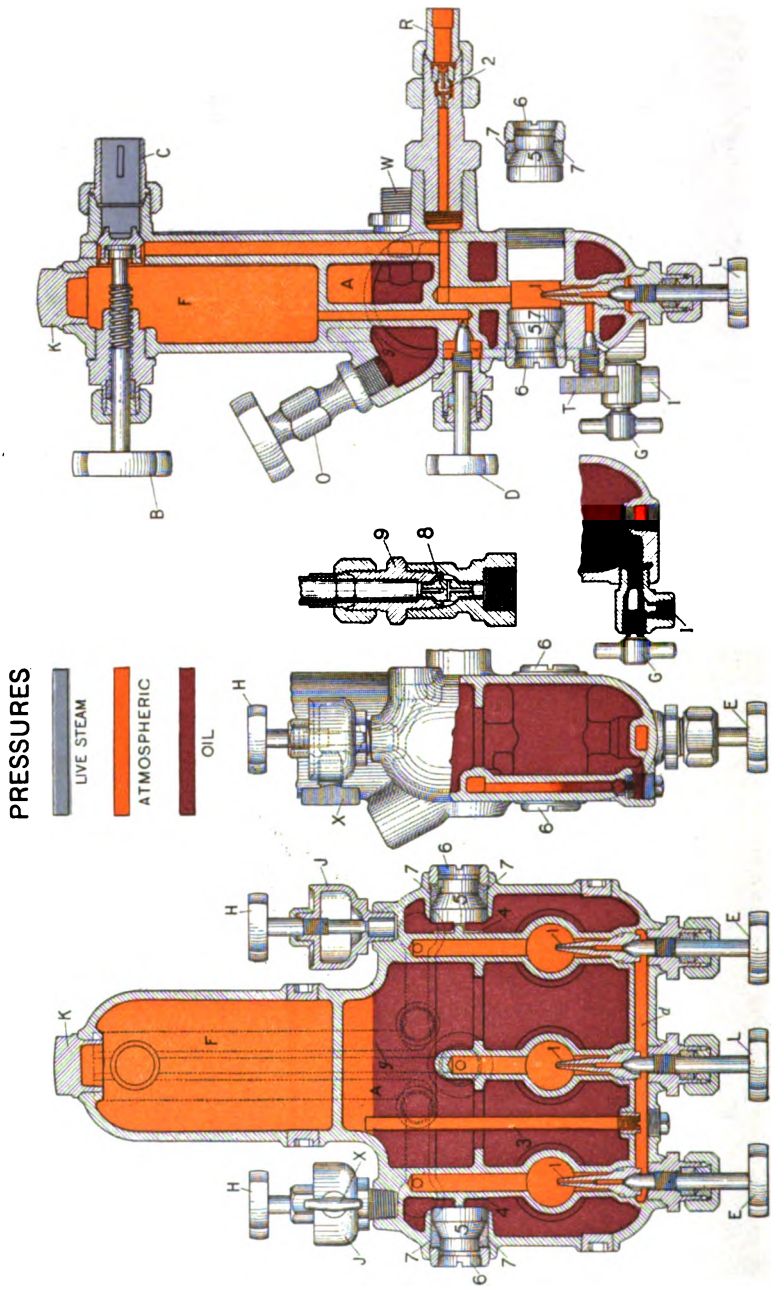

Locomotive Firemen and Enginemen's Magazine Educational Charts

LOCOMOTIVE APPLIANCE SERIES

PLATE XI.—DETROIT No. 21 TRIPLE FEED LOCOMOTIVE LUBRICATOR (Filled With Oil)

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BROTHERHOOD OF
Locomotive Firemen and Enginemen's Magazine.
TECHNICAL DEPARTMENT
JOHN F. McNAMEE
EDITOR AND MANAGER
SUBSCRIPTION PRICE
$1.50 PER YEAR

PUBLISHED MONTHLY BY THE BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN

Entered as Second class Matter December 27, 1906, at the Post Office at Indianapolis, Ind., under the Act of Congress of March 3, 1879

VOL 43 NO. 2 INDIANAPOLIS, IND. AUGUST 1907

Plate XI—Detroit No. 91 Triple Feed Locomotive Lubricator (Filled With Oil).

Plate XI of the Locomotive Appliance Series of the Locomotive Firemen and Enginemen's Magazine Educational Charts shows sectional views of the Detroit No. 21 Lubricator filled with oil, but the reader will carefully note that the body of the lubricator is not absolutely full, for the reason that in filling the lubricator the level of the oil cannot rise above the point *g* of the filler hole without overflowing. The space above this point is an expansion chamber, and is one of the most important features in this type of lubricator. This chamber was incorporated in the lubricator for the purpose of providing a space for the expansion of the oil when heated, thus relieving the body of the lubricator from the abnormal pressure exerted by expansion when filled with cold oil. This space, or expansion chamber, at the same time prevents the oil from expanding back up through the water passage into the condenser, as it did in the old type of lubricators—especially those that had the filler hole so located that the body could be filled absolutely full of oil.

By referring to Plate XI, it will be noticed that atmospheric pressure occupies the oil tube *3*, oil feed chamber *d* and the expansion chamber, as well as the condenser *F* and the sight feed chambers. If we should now turn on the steam pressure, or start the air pump, condensation would quickly gather in the condenser and sight feed chambers. At the same time, the steam circulating through the equalizing tubes would quickly heat the lubricator and oil to a temperature of about 60 degrees less than that of the corresponding steam pressure, and the oil would expand very rapidly, nearly filling the space occupied by the atmosphere. It is also true that the atmosphere has expanded and occupies space that will be considered later.

In this instance (in a No. 21 lubricator, such as we are considering) the oil would have a space in which to expand equivalent to one-third pint of oil, and, if the water valve *D* was not immediately opened after steam was turned on, the expansion of the oil could do no harm.

The best authorities on oil agree that when taken at 32 degrees and heated to a temperature of say 200 pounds of steam, gauge pressure (387.6 degrees), the oil will expand not less than one-fifth of its volume or bulk; but as valve

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oil of that temperature could not be put in a lubricator, some of this expansive force is spent or overcome by heating the oil to say 150 degrees before putting it into the lubricator.

If the reader wishes to carry out a little experiment he can do so by going to the oil room and procuring a one-pint U. S. measure, get the exact weight of it, then fill the measure with oil at about 70 degrees. He will find that the oil will weigh approximately 15 ounces. Now suppose that this pint of oil is placed on a stove and heated to a temperature of 150 degrees. He will find that in reaching this temperature the oil will have expanded and overflowed, yet the measure is absolutely full. Should he carefully wipe off the outside of the measure and re-weigh the oil, it will be found to weigh but about 14 ounces, a loss of one ounce. The same thing is true in filling a No. 21 Lubricator with cold oil. Its capacity is 42 ounces, but if hot oil be used (150 degrees temperature) 39 ounces, nearly will fill it, a difference in weight of three ounces. It will thus be seen that the expansion of 42 ounces of valve oil from 32 degrees to 387.6 degrees temperature will not be less than eight ounces, but if the oil is heated to about 150 degrees temperature before filling the lubricator its expansion will not exceed five ounces.

The natural inquiry is: "What becomes of the expanded oil if the lubricator has no expansion chamber?" The answer is simply this: When the water valve is open the expanding oil finds a natural relief through the water passage into the condenser, where it rises and floats on the water and is drawn down into the equalizing tubes by the current of the steam and carried to the air pump and cylinders.

The next question is: "How long will the oil continue to pass up through the water passage into the condenser?" It will flow until expansion has reached the limit, possibly ten minutes or more after steam pressure has been turned on the lubricator, and will continue to do so until the water has raised the oil above the lowest point of the water tube, when a natural water seal will be formed. Right at this point the writer wishes to call the attention of the reader to a most important fact, and that is that in the construction of the No. 21 Lubricator no brass water tube is used, but instead a hole is drilled through the walls of the lubricator body, and through which the water is delivered at the lowest possible point in the oil reservoir. It is believed that the reader will now have a much better understanding of the conditions that appear mysterious to so many enginemen.

* * *

The Effect of Long Divisions on Engine Failures.

In the last few years the operating divisions on a number of the large railroads have been materially lengthened, in some cases over 100 per cent. This change has undoubtedly resulted in a reduction of operating expenses and a greater road efficiency of both locomotives and cars. Although the long division has been a success from an operating standpoint, the questionable features introduced in regard to locomotive operation and maintenance render the change from the shorter division of more or less uncertain value.

Since the advent of the long division, the reports indicate that engine failures have increased and that greater difficulty has been experienced in keeping locomotives in proper shape. Investigation would seem to show that these conditions are caused directly by the long division. A locomotive in good shape will take a full tonnage train over a long division without difficulty provided everything is favorable. Too often, however, the conditions are not favorable for a continuous trip and delays occur which increase the hours on the road to such an extent that the engine crew is physically unable to do its work in the best manner. The fire gets dirty and in such shape as to start the flues leaking, and the long waits on side tracks aggravate this trouble. Hot driving boxes are not properly attended to and many things are left undone which would be looked after under ordinary conditions. Practically all of the trouble comes on the last few miles of the division, showing that good results are not obtained from locomotives when the men in charge of them are worked beyond the limit of ordinary endurance.

A delay on the road represents dead time, as the locomotive is out of service for that period, so the greater the delay, the greater the demand for the locomotive to turn back from the terminal. This often results in turning back locomotives which are not in shape to go, with the

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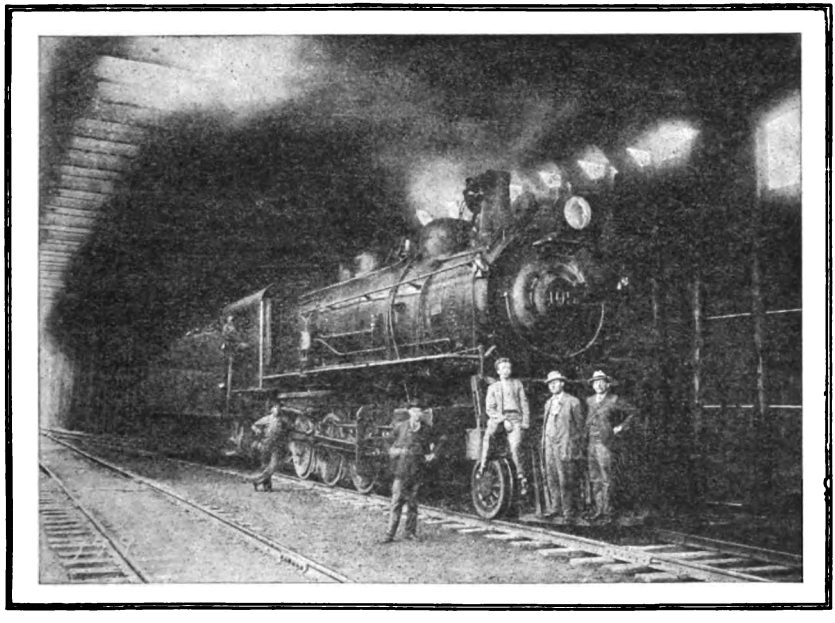
consequent result that the trouble is aggravated on the return trip and a series of engine failures result. The long division is not an unqualified success when it causes locomotives to spend too much time on sidetracks and not enough time in the roundhouse.—Railway Master Mechanic.

Allfree-Hubbell Locomotive, D., N.-W. & P. Ry.

A correspondent has sent us two illustrations of engine 105 of the Denver, Northwestern & Pacific Railway, which is of the Allfree-Hubbell type, and which said to be the highest point reached by any standard gauge railroad in the world. The parties shown standing on the pilot and in front of the locomotive are some New York tourists who were viewing the magnificent scenery to be observed along the route. On the day this photograph was taken engine 105 hauled five heavily loaded passenger cars to this summit, the final ascent being over a little more than a 4 per cent. grade (211 feet to the mile), and made the time of the regular passenger train, as this excursion was run on a special time card predicated on the schedule of train No. 1, and which consists of three



ALLFREE-HUBBELL TYPE LOCOMOTIVE 105 ON THE D., N.-W. AND P. RY., AT AN ALTITUDE OF 11,660 FEET ABOVE SEA LEVEL—HIGHEST POINT REACHED BY ANY STANDARD GAUGE RAILROAD IN THE WORLD

are shown herewith. This locomotive has been in service about fifteen months. It is of the 2-8-0 class, having cylinders 22 inches by 28 inches, driving wheels 55 inches in diameter over tires, and carries 210 pounds gauge pressure. The weight on drivers is 190,000 pounds, weight on truck 24,000 pounds, and the total weight of engine and tender loaded is 365,500 pounds.

One of the photographs was taken when the locomotive was at an altitude of 11,600 feet above sea level, which is cars. However, engine 105 handled the five cars on the regular schedule without difficulty. The other photograph was taken at an elevation of 10,800 feet above sea level, and shows the locomotive returning light.

It is a noticeable fact that locomotives of the Allfree-Hubbell type easily develop more power than sister engines on all the lines where this type of engines are used, and this appears to be due entirely to the fact that under the design of cylinders and valves used on

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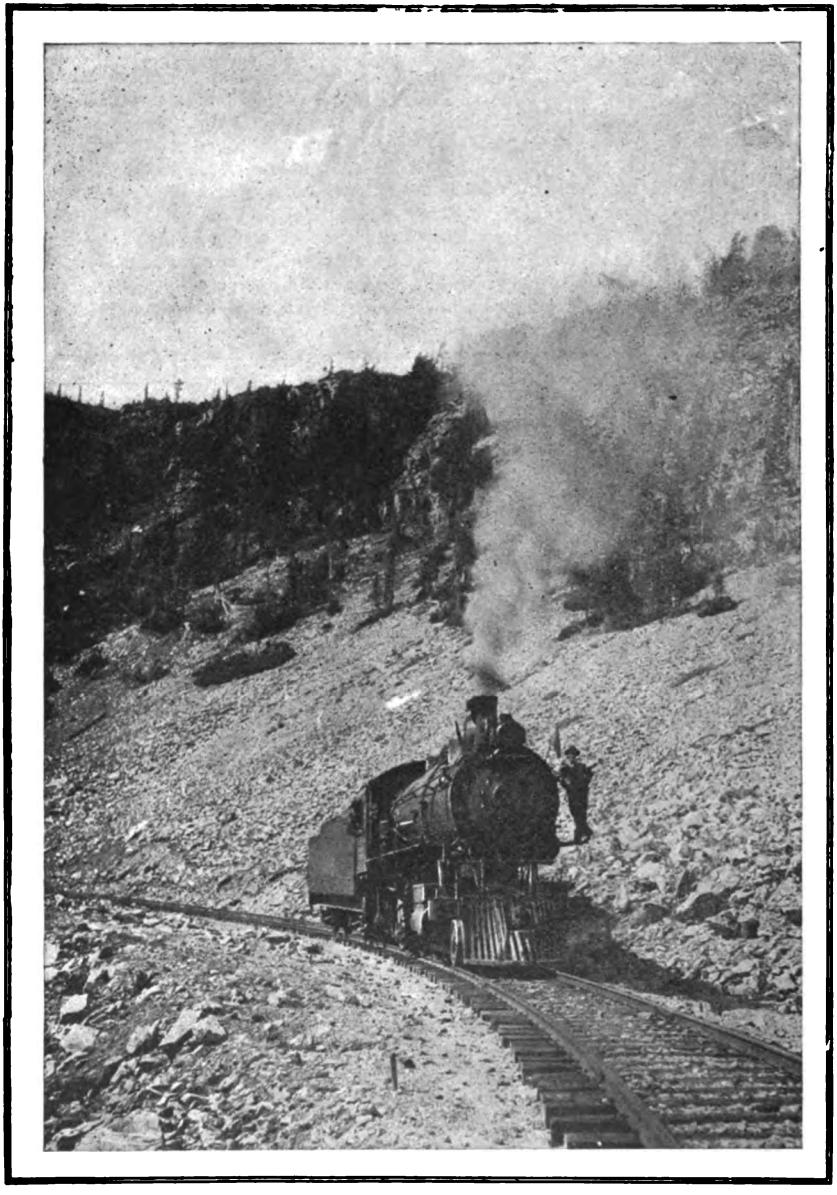

ALLFREE-HUBBELL TYPE LOCOMOTIVE 105 ON THE D., N.-W. AND P. RY., 10,800 FEET ABOVE SEA LEVEL—RETURNING LIGHT AFTER TAKING TRAIN TO THE SUMMIT

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this type of locomotive the steam is held in the cylinder longer during each stroke of the piston before exhaust takes place, and necessarily this gains considerable in power. In addition to this, under the special design of cylinders and valves in this type of engine, the final closure of the exhaust port on each stroke is delayed until the piston has completed fully 90 per cent. of the stroke, thereby greatly reducing back pressure and compression, which also results in additional power.

Our correspondent states that during August, 1906, he was in Colorado, and at the summit, 11,600 feet above sea level, he literally made a snowball with one hand and picked flowers with the other. People of this part of the country who have not visited Colorado and the section traversed by the Denver, Northwestern & Pacific Railway, should not let the opportunity to do so escape them, for the views to be had along the line of this railway are well worth the journey to see.

School of Railway Engineering and Administration—University of Illinois.

Recognizing the necessity for specialized training of those who in future are to assume the responsibilities of railway engineering and administration, and in order that such men may be prepared to take up such duties and become proficient in the engineering, financial, traffic and operating departments of both steam and electric railways, the University of Illinois has established a School of Railway Engineering and Administration. Bulletin No. 8 of the University of Illinois gives a detailed description of the courses as outlined, and contains illustrations showing the different groups of buildings of the University, interior views of the laboratories, power plant, metal shops, wood shops, etc., as well as views of the railway test cars used by the University on steam and electric railways. The following, which is reproduced from the Bulletin, will give a good general idea of the school:

In the employ of the railroads of the country there are approximately twelve thousand persons who are classed as officials. Of this number a considerable proportion occupy positions whose powers and duties require the possession of more than average ability, and such positions must always prove attractive to ambitious men.

Ever since such graduates have been available the railways have recruited many of the men for their engineering departments among the graduates of technical schools; and the success of these men has amply justified the procedure here as in other fields of industry. The rapid growth of railway organizations, with the attendant increase of responsibility resting upon those in their service, has made more necessary a proper preliminary training for all branches of this work; and each year has seen an increase in the number of men selected for this service from our engineering schools.

Within recent years there has developed a tendency—now quite marked in some railways—occasionally to select men for higher executive positions from the departments of maintenance of way and of motive power instead of taking them, as heretofore, almost exclusively from the traffic and operating departments. This tendency not only renders more urgent the necessity of special training, but, on the other hand, makes more attractive the service in the engineering departments.

There are many reasons why similar specialized preliminary training should prove equally desirable for those who expect to enter the non-technical departments of railways, where, in the administrative positions, responsibilities are frequently greater; and it is probable that here, as in the engineering departments, efficiency and the chances of ultimate success would be furthered by such training. It is only recently, however, that there has been available in this country any except the most elementary and limited education in preparation for commercial work, and where courses of commerce have been established in our universities they have been usually arranged without reference to railway work.

All these considerations point toward the desirability of special recognition of the needs of railways and of prospective railway employes in our educational institutions. Accordingly, there has recently been established at this University a School of Railway Engineering and Administration whose function it is to co-ordinate the various facilities of the University so as to provide specialized training for all branches of railway service and to otherwise further this work.

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In developing this plan there has been created in the College of Engineering a new Department of Railway Engineering, and the Department of Economics of the College of Literature and Arts has added to its business courses one in railway administration.

It is the purpose of this school to provide courses of training which shall prepare men to become efficient workers in the financial, traffic and operating departments as well as in the engineering departments of both steam and electric railways.

Description of Courses.

At present there are offered the four following courses:

1. Course in railway civil engineering.
2. Course in railway electrical engineering.
3. Course in railway mechanical engineering.
4. Course in railway administration.

The main object of these courses is to provide a thorough training in theory and general principles amply illustrated and fixed by practice. It is recognized that this preliminary training can be completed only in actual practice, and that its chief service must be to develop the ability to economically acquire information and to accurately apply it.

In railway work, as in other fields, one is seldom selected for an administrative position solely because of his technical or professional attainments. His promotion depends rather upon his ability to grasp and properly evaluate all phases—financial, technical and economic—of the problems presented for his solution. The effort is therefore made to emphasize this point of view and to stimulate interest in these directions, not only by the method of presenting the technical work, but by the incorporation of other than purely technical subjects in these courses. Toward this end there is included, for example, among other general subjects in the engineering courses, such work as economics, and in the course in administration there is enough of technical engineering work to give an understanding of the problems arising in the engineering departments.

The courses in railway civil engineering and railway mechanical engineering are intended primarily for those who expect to enter the service of steam roads in the departments of maintenance of way and of motive power; while the course in railway electrical engineering is arranged for those who will find employment in electric railways or in the service of steam roads with electrified lines. Each course occupies four years. The course in railway civil engineering differs from the regular civil engineering course only after the first semester of the third year, and the courses in railway electrical engineering and railway mechanical engineering differ from the regular electrical and mechanical engineering courses respectively in the fourth year only.

The course in railway administration aims to prepare men for service in all departments of railway work, other than the engineering and the legal. For these lines of work, of course, technically trained engineers and lawyers are required.

The course is four years in length, and is framed so as to give wide knowledge and training in the specific matters which relate to the organization and operation of all departments of railway administration, while at the same time giving the student a liberal education. Such subjects as English composition, mathematics and foreign language, which are early introduced in the course, do, indeed, have some specific value in training for railway service; but they are primarily studied for their liberalizing influence on the student.

Accordingly, the work of the first year is general, consisting principally of English, foreign languages and mathematics. The students have also a choice of such subjects as commercial geography and economic history.

In the second year the student begins to take up those subjects which have special reference to the work of his course. He studies the general principles of economics in the first half year, and proceeds to a general course in railroad administration in the second.

In his senior year each student is expected to make an intense study of one or two departments of railroad service in which he is particularly interested, so that he will become thoroughly familiar with the principles and details of present methods.

Detailed outlines of the four courses follow.

Buildings and Equipment.

The following buildings are devoted to the purposes of the College of Engineering:

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Engineering Hall—Containing, besides class rooms, draughting rooms and offices, the Physics Laboratory.

The Electrical Laboratory and University Power Plant.

The Laboratory of Applied Mechanics —Materials Testing Laboratory and Hydraulic Laboratory.

The Mechanical Engineering Laboratory—Containing also Cement and Road Materials Laboratories.

The Metal Shops.

The Wood Shop and Foundry.

The equipment of the College of Engineering in buildings and apparatus now represents an investment of about five hundred thousand dollars. Adequate facilities exist for carrying on the work in the Department of Economics. The special equipment for the work in railway engineering and administration is mentioned below, and more detailed descriptions are given in the University Register. Students in the railway courses have available all the facilities of the other departments of the University.

Railway Civil Engineering.

For the work of the course in railway civil engineering, there is available all the equipment of the Department of Civil Engineering. This, in addition to the cement and the road materials laboratories, comprises a complete collection of the usual field instruments. The proximity of three steam railways and of one electric road provide opportunities for field work and for demonstrations from practice.

Railway Electrical Engineering.

In addition to the well equipped electrical engineering department laboratories in which railway engineering students do their preliminary laboratory work, the railway department owns a two hundred horsepower electric test car. This car, of the interurban type, was designed especially for experimental work and was built in 1905. It is equipped with four 50-horsepower direct current motors and with the Westinghouse multiple control system. The car is supplied with recording voltmeters, ammeters and wattmeters, and with auxiliary measuring and recording devices by means of which there is automatically made a graphical record of voltage, current, power, speed, acceleration, time and curvature. The possession of this car renders possible a great variety of experimental work.

By the courtesy of the Illinois Traction System, whose lines are at present operated between the cities of Danville, Urbana, Champaign, Decatur, Bloomington, Springfield and St. Louis, the department is enabled to operate this car on their lines and obtains by their cooperation in other respects exceptional opportunities for giving instruction, and for investigating the technical problems of electric traction.

Railway Mechanical Engineering.

Three railroads enter Urbana and Champaign, the Illinois Central, the Wabash and the Cleveland, Cincinnati, Chicago and St. Louis Railways; the division shops of the last also being situated here. With the three railroads mentioned the department enjoys most cordial relations, and it can depend upon continuing to receive from them the same assistance and co-operation that have hitherto been extended.

Opportunities for shop and road tests have been freely given and throughout the year numerous locomotives and train resistance tests are made both for instructional purposes and for the information of the railroads. To facilitate this work there was designed and built in 1900 a dynamometer car which is owned jointly by the University and the Illinois Central Railroad. This car is equipped with all the apparatus necessary for carrying on train resistance experiments as well as with auxiliary apparatus used during locomotive tests. During the seven years in which it has been in service this car has been operated over the entire Illinois Central System, in the establishment of tonnage ratings, as well as on the lines of the New Jersey Central, the Baltimore and Ohio, the Cleveland, Cincinnati, Chicago and St. Louis, and the New York Central Railways. On this last road it was used in the preliminary train resistance tests made to provide information for the electrification of the New York City terminal, in which connection it was also used for competitive tests between steam locomotives and electric motor cars at the works of the General Electric Company at Schenectady, New York. In all this work the car has been operated by students of the Railway Engineering Department.

The department owns also a complete New York airbrake equipment for engine, tender and five cars. In addition to the special apparatus here mentioned,

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the students of the railway course have open to them the advantages of the mechanical engineering laboratory in which they are given their preliminary instruction in experimental work.

Railway Administration.

For the study of railway administration there is on hand an excellent collection of books and pamphlets on railroad matters, both theoretical and practical. Moreover, the list of railroad journals, technical, legal and administrative, taken by the library is very complete. These are supplemented with the financial and other reports of railroads and government publications relating to railroads.

The department also has at the disposal of students for practice various calculating machines, including one of the electrical tabulating machines used in the preparation of the last census, which are coming more and more into use in handling the freight accounts of great railroad systems.

* * *

Loose Wheels for Locomotives and Cars.

Mr. Thomas E. Lambert, of Butte, Montana, has invented and patented a loose wheel and axle for locomotives and cars which appears to have many good points in its favor. When it is considered with what ease the automobile, the bicycle or the carriage having loose wheels on the axles adapt themselves to various degrees of curvature, the advantages of this principle, if successfully applied to railroad equipment, can be the better understood. This is well illustrated by the diagram shown herewith. In the construction of this loose wheel and axle the axle is not held rigid, as is the case with the ordinary vehicle, but is free to revolve with the wheel, thereby overcoming the tendency of the wheel or axle to wear in spots. The following from a circular issued by Mr. Lambert will give a good general idea of the construction of this loose wheel and axle, and the troubles and expense which same is designed to overcome:

Upon the advent of railroads about the year 1825, the invention was made of fixing car wheels rigidly on their axles (the present system of forcing the wheels on under a heavy pressure being questionable, as probably many of them are at a bursting point after the operation), and to this cause may be traced directly all the evils encountered since that time: Wearing of the wheels and rails, broken flanges, axles, trucks and drawbars, spreading of the rails, derailment, and in fact, general wear and tear through the entire system. There is also an enormous waste of energy in drawing the cars, as shown by the effect on the locomotives.

As an instance of the friction produced through the contact of the wheels against the rails, an article from the Mining and Scientific Press, October 27, 1906, page 512, says: "Inexperienced truckers often try to stop cars by pulling back on them, instead of throwing a side pressure on them, so as to make friction between the rail and flanges. This is far more effective and much less trouble."

The necessities of the increasing traffic on the railroads require cars of a capacity of 200,000 pounds and larger locomotives; notably on the Erie Railroad, which has ordered three locomotives of 410,000 pounds, to haul 2,000 ton trains without pushers where the grades are steep and the line full of curves, and which will be able to haul 175 cars on level track. Now the amount of friction generated on such trains must be enormous and the resistance over 50 per cent. on the curves. The car next the engine must have quite a strain on it.

Regarding the Speed of Trains on the Best Railroads.

Two of the most conspicuous accidents of modern times, noted as being similar in several respects, both express trains running somewhere between thirty and seventy miles an hour, and derailed on curves, happened in England, one at Salisbury, on the London & Southwestern, on July 1, 1906, and the other on the Great Northern, at Grantham, September 19, 1906. All of the witnesses in both cases being killed, the cause of the accidents is left to the inspector to explain.

The report of Major J. W. Pringle, inspector of the British Board of Trade, on the Salisbury disaster, states that the speed at the time of the derailment was very high, perhaps as high as seventy-two miles an hour, and that the high speed caused the engine to topple over, and remarked that "There is no other known case in the United Kingdom where overturning has been caused by high speeds;"

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and also that fifteen miles an hour was the highest speed allowable at that part of the track.

On the Stockton and Darlington Railroad, the first English road, which was opened September 27, 1825, and from which the Great Northern originated, a relative of mine, Mr. William Younghusband, who was the chief mechanical engineer, had built, thirty-five years ago, in the company's works, North Road, Darlington, locomotives which would run seventy-five miles an hour. The Rocket, built by Stephenson, attained a speed of fifty-three miles many years before that time.

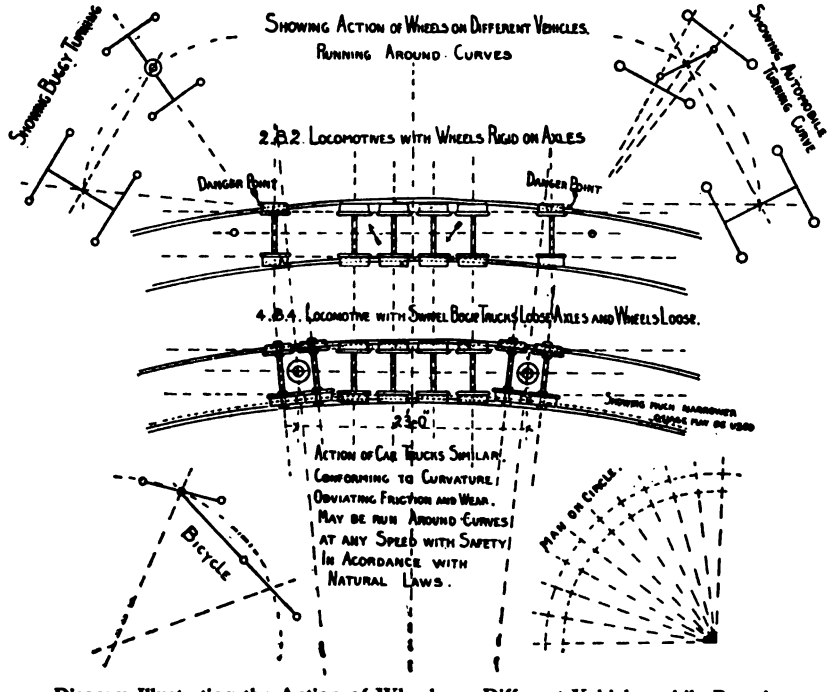

Diagram Illustrating the Action of Wheels on Different Vehicles while Running Around Curves

Yet, with all the supposed improvements, it is not safe to run at such high speeds now.

The aforesaid accidents are not alone, for there have happened thousands, and are occurring every day from the same cause (wheels rigid on the axles), and which have cost the railroads millions upon millions of money trying to overcome, without effect, but by the use of the heavy locomotives and heavily loaded cars, and high speeds, the disadvantages of the device will soon be proved conclusively.

If the engines on those two express trains had been fitted with the bogie axles, free to revolve in their bearings, and the wheels free to revolve on the axle, the accidents would not have happened. The whole weight of the engine and train depended on one front wheel, and it was pressed with such force against the rail by the inside wheel, fast on the same axle, that it climbed over the rail; then the engine toppled over.

Elevation of the outside rail on curves, although suitable for some trains at high speed, has a contrary effect on slow, heavy trains, and is of little benefit, unless the trains be made of the same weight and speed.

Extra coning of the wheels, with the heavy locomotives and heavily loaded cars, only puts a heavier outward pressure on the rails to the detriment of the track, causing expensive repairs, which is a subject of much concern with some railroads already.

No doubt it will be hard to convince some, of these facts, who have got ac-

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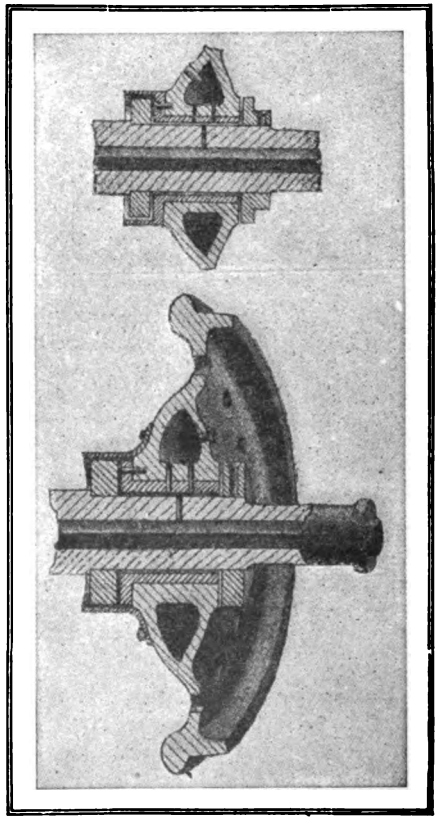
customed to things after so many years, and are impressed with bigoted ideas against improvements or changes. Still, there are others, gifted with intelligence to understand, who reap the benefit.

For instance, the Westinghouse air brake. The inventor was called a fool for bothering with a thing like that; it would never do any good. The automobile, after many years of neglect and use as a toy, is now forging to the front and will in a few years be the only means of transit on the highways. Electricity is now becoming such a factor that it will before long change the whole system of railroading. See the improvements in marine engineering. Who at one time had any use for the turbine? Now they are being adopted on every class of vessel afloat; yet it is only an improvement on the old-fashioned windmill.

Not only has the theoretical advantage of loose wheels been long known, for they have been used since the earliest ages in history, but their practical advantages are manifold and proven, and in every case where strength, efficiency, durability, are studied, they are used and found to be the most economical. And if the railroads wish to cut down their heavy expenses and prevent accidents, they must discard the present device and adopt the old and natural style of wheels loose on the axle, and by making that change, will save at least 25 per cent., even after paying a little more for the loose wheels and axles in the first place. Cheapness is not always economical.

The accompanying engraving illustrates a very simple and inexpensive loose wheel construction I have invented and obtained patent for. The axle is free to revolve in its bearings and the wheels free to revolve on the axle. By their use perfect freedom of motion is obtained. The lateral motion required by the use of wheels rigid on the axles, which in conjunction with the probable difference in diameter of the wheels causes the swaying of the cars, which in turn necessarily causes a great amount of friction, especially on curves, is obviated, as either wheel is free to accommodate itself to any of these inequalities. The object of having both wheels loose is that there is an even wear of both wheels and their bearings; if one only was loose, it would have double the amount of wear, and the axle would be worn out in half the time. The axle, by being free to revolve also, wears evenly, and lasts longer, for when fixed it would wear only on the bottom side, and wear the wheel sooner. The wheels do not revolve on the axle when running; the axle bearings being smaller, it revolves in the axle boxes with the wheels, excepting on curves, or where there may be difference in the diameter of the wheels. Then the wheels revolve on the axle to equalize the difference of travel.



The T. E. Lambert Axle and Wheel

Another distinguishing feature of this design—it will make the adjustment of the brake power better, and a more even wear of the wheels; for, if there is any skidding, the wheels of the lighter cars will skid the most, where there would be less wear. The axle and wheel is designed for use with bearings either on the inside or outside of the wheels, and to be used as bogie wheels for locomotives, mine cars, or any others with inside bearings.

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The principle of my design is approved by many eminent railroad engineers. The wheels can be made as cheap as any ordinary wheel, as by the design it would be stronger with less weight. By using steel tires the hub would last for years. The bushing is made of good cast iron, at small cost, and is readily replaced with a new one when worn, thus renewing the life of the wheel. The wheels have a broad bearing on the axle, and with the loose collar taking up wear, and spacing between the hub and axle box taking up the lateral motion, the wear on the bearings is reduced to a minimum and the bushing will outwear the tires of the wheel. There will be no strain on the wheels, not having to undergo the heavy strain put on the fast wheels. By allowing the hubs to run close to the shoulder of the bearing in the axle box a great amount of strain will be taken off the neck of the bearing.

Regarding the axle, it would be better and stronger if made hollow, as by the process of manufacture, either by rolling or forging, the grain of the material would be more even, and the skin on the inside would be as strong as the outside; whereas in the solid axle the grain is coarser at the center and practically detrimental. The fast collars on the axle, made of cast steel, are shrunk on, and bear against shoulders on the axle, and new ones are readily substituted when worn, thus renewing the life of the axle. For the locomotive bogie axles they should be hollow, as being shorter, and with larger bearings, 1½-inch hole, and screwed at each end for a 2-inch cap screw to fasten on the collar, and dowel pins in the collar to prevent turning. When hollow axles are used, the space is to be used as a chamber for some lubricant, of such consistency that it would not flow unless the axle got heated, as it would be, by friction should the supply of the other parts become exhausted. The oil chambers in the wheels being filled either from the inside or outside, the bearings are by these means almost perfectly lubricated.

There are no more parts than possible to make a good, substantial, efficient, durable and economical axle and wheels.

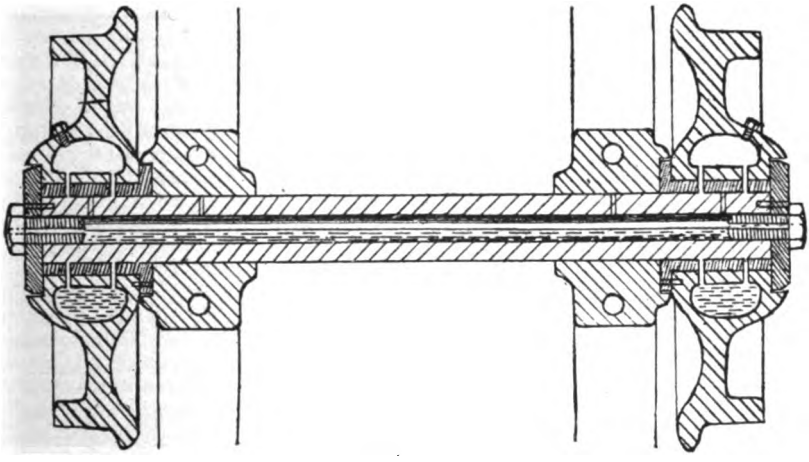
As the axle and wheels are held between the axle boxes, there is no possibility of any part getting loose.

The first cost of these axles and wheels will be a little more, but when put in use there will be a saving of at least 25 per cent. in the operating department of the railroads.

As the wheels and axle are the most vital part of the system, they can not be made too good, for when they fail everything is wrecked.

Their use will be better appreciated on heavy cars and at fast speeds when once in use, and many deplorable wrecks avoided.

For further particulars apply to Thomas E. Lambert, Butte, Montana.



Sectional View of the T. E. Lambert Loose Wheel and Axle

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The Rotary Snow Plow.

The American Locomotive Company has issued a very interesting pamphlet illustrative and descriptive of the rotary snow plow as built by that company for removing snow of any character and depth, quickly, easily and with no danger to equipment or men. The pamphlet gives a number of examples of its successful use on lines subjected to heavy snow blockades, which under the old plan of using snow plows of the wedge type it was impossible to keep open. A description of the rotary plow and rules for its operation are given. The pamphlet is well illustrated with full page halftones, showing the rotary plow in operation, on heavy grades, in deep snow, and cutting through drifts. At the end of the pamphlet is given a list of the railroad lines using the rotary snow plow.

* * *

*Locomotive Lubrication.**

Your committee having the subject in hand divided it into four heads, as follows:

(1) With reference to high steam pressures and superheated steam.

At the 1906 convention, your committee reported that for locomotives with steam pressures as high as 225 pounds, or those using superheated steam, the temperature of which is as high as 600 degrees F., the ordinary valve oil had been found by experience to be quite suitable, and the problem is one of delivering the oil in proper quantities to the places needing it; your committee believes the latter is possible with the modern sight-feed lubricators now in use.

(2) How far may we economize in lubrication, both internal and external?

(a) Internal lubrication: Internal lubrication should not be stinted, in order that an engine may perform its work properly and without undue wear or heating. Dry valves and dry cylinders mean rapid wear of the surfaces of contact in the steam chest and cylinders, also excessive trouble with the valve motion parts.

Too much economy in the use of oil for internal lubrication is apt to result in hot or slipped eccentrics, broken eccentrics, eccentric straps, links, transmission bars, rockers, valve stems, and connection pins, and aside from the increased machine friction, the performance of the engine is affected. Hard-running valves cause a derangement in steam distribution, and worn packing in valve chambers or at rods causes a loss due to leakage.

With the slide-valve locomotive there is not so much danger of these troubles, as the jar of the reverse lever attracts attention to the fact that oil is needed and the engineman will see that the valves are properly lubricated.

With piston-valve locomotives the internal lubrication may be much below the required amount without any indication from the reverse lever, and the cause of the trouble may have been operating a long time before being discovered; in other words, the engineer on a slide-valve engine, even on a small allowance of oil, is more apt to keep the valves supplied with enough oil to prevent hard service to the machine, while with piston-valve engines he is not so able to tell that the valves need oil, and no one knows that the parts have been running too dry until trouble comes through heated bearings and worn or broken parts.

With this in mind, your committee feels that for internal lubrication, 70 miles per pint for large freight locomotives and 80 miles per pint for large passenger locomotives seems to be the amount needed to lubricate properly. The amount to each class depends upon the speed at which the locomotive is running; in bad water districts the oil allowance should be increased about 25 per cent.

(b) External lubrication: The use of grease on crank pins and driving axles seems to offer the best solution of how to decrease the cost of external lubrication and at the same time secure the best results, and the committee report of last year gave some experiences with 203 locomotives, that grease, as a lubricant, gave results about as follows:

Reduces engine failures due to heated journals and pins.

Reduces cost of lubrication.

Reduces cost of labor incident to inspection, cleaning and renewal of lubrication packing.

Reduces delays incident to oiling.

Reduces cut journals incident to oil lubrication.

Possibly produces a slight increase in machine friction.

*Report presented at the annual convention of the American Railway Master Mechanics' Association at Atlantic City, N. J., June, 1907, by a committee consisting of D. R. MacBain, R. D. Smith, R. F. Kilpatrick, C. Kyle, W. O. Thompson.—Reproduced from the Daily Railway Age.

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In reference to the cost of external lubrication as compared with that of, say, four years ago, your committee believes that the cost per square inch lubricated, or per pound carried, is less with the use of hard grease than when oil was in general use.

(3) Consideration of standard fittings for locomotives.

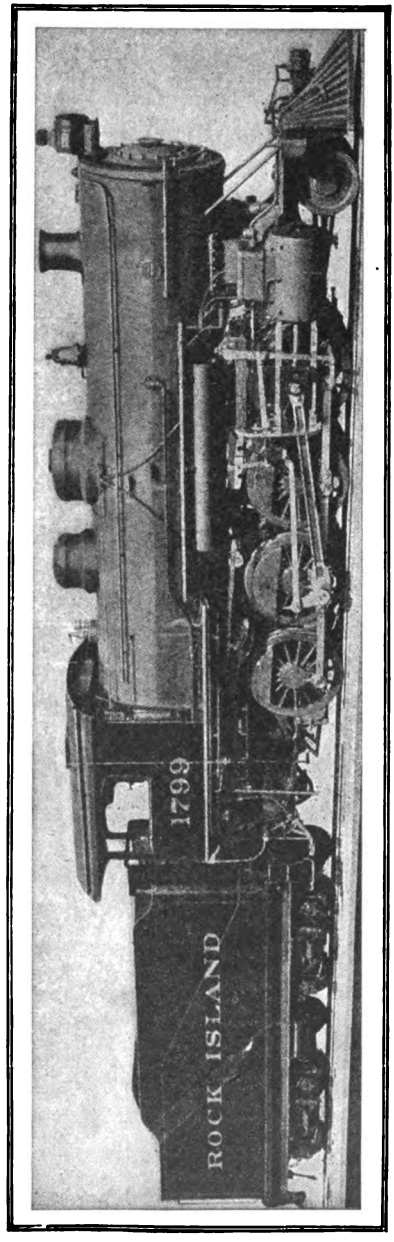
The 1906 convention referred your committee's recommendations, as shown in the 1906 Proceedings, page 379, Figure 1, page 380, Figures 2, 3, 4 and 5, and page 381, Figure 6, to letter ballot, and they are now standards of the association.

(4) The consideration of sight-feed lubricators versus pumps for internal lubrication.

Your committee is of the opinion that a well-designed sight-feed lubricator, that has pipe connections suitably arranged so as to deliver the oil in the most direct way to the parts needing it, will under present conditions do the work properly. On superheated locomotives it is, we believe, generally conceded that there should be one pipe from the lubricator leading direct to the cylinders and attached to separate plugs near the center, so that the oil fed from the lubricator, for the cylinder, may be properly distributed. The question of location of plugs in the steam chest is one point on which we find considerable difference of opinion; one member of your committee, who has had considerable experience with superheated steam, favors putting the steam chest plugs at the end of the valve chest in preference to attaching the oil pipe to the center of the chest and letting the oil be carried by the steam to the parts where needed; and your committee as a whole believes that the question of locating steam chest connections is one that can be left open, and, therefore, does not care to make any recommendations.

Consolidation Type Locomotive for the C., R. I. & P. Ry.

Herewith is illustrated a heavy consolidation type locomotive recently completed by the Baldwin Locomotive Works for the Chicago, Rock Island & Pacific Railway. The valve motion is of the Walschaerts type, and the boiler is provided with the Baldwin superheater, the arrangement of which is shown in one of the illustrations. The steam before reaching the cylinders is circulated through the hottest part of the device by being first passed through the forward tubes. A minimum resistance is offered to the flow of the gases by suitable arrangement of the deflecting plates.



BALDWIN CONSOLIDATION TYPE LOCOMOTIVE FOR THE C., R. I. & P. RY.

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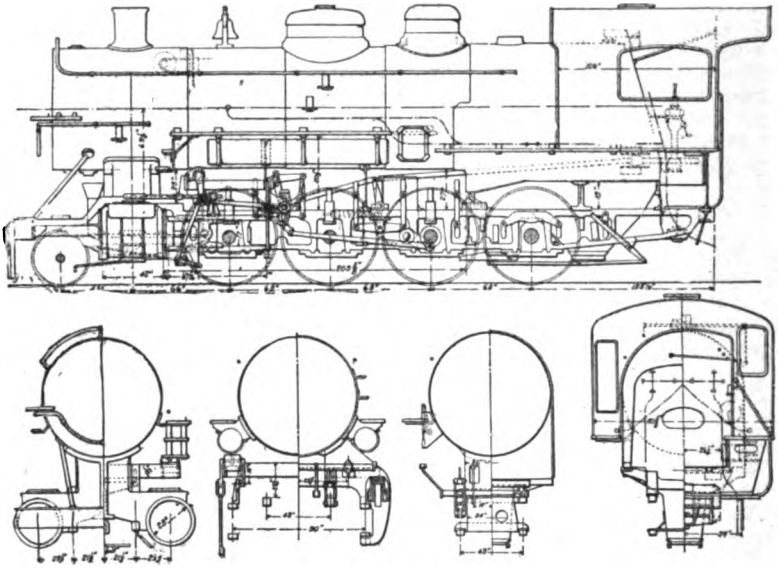
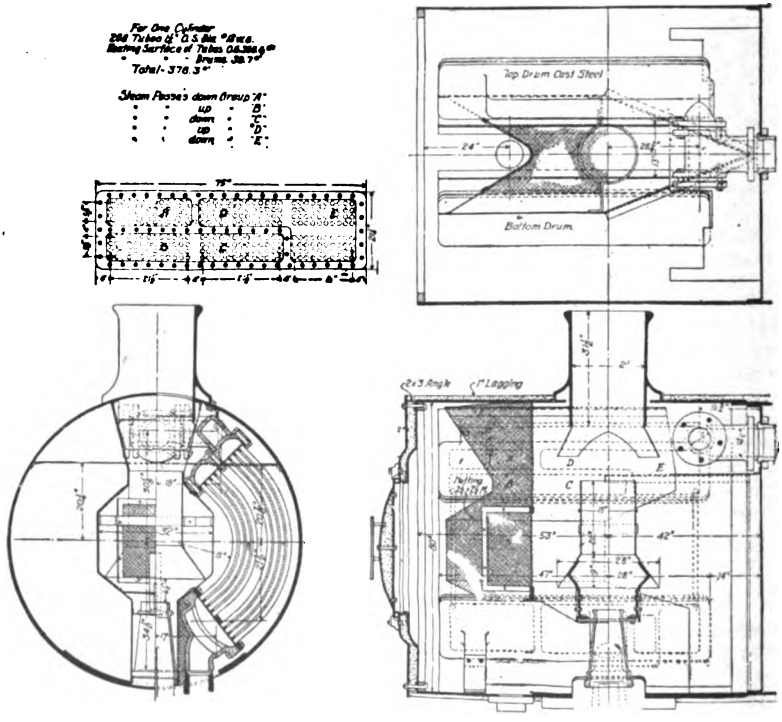


Baldwin Consolidation Type Locomotive for the C., R. I. & P. Ry.—Side and End Elevations



Baldwin Consolidation Type Locomotive for the C., R. I. & P. Ry.—New Arrangement of Baldwin Superheater

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The McCarroll reversing mechanism, which consists of a rotary air engine, in connection with suitable gearing, operates the reach rod in reversing the engine. There are two reverse shafts, one being located between the second and third pair of driving wheels and the other supported by bearings bolted to the guide yoke. The center lines of the steam chests are 3 1-2 inches inside the cylinder lines, which necessitates the employment of rock shafts, the rock shafts being carried by bearings which are bolted to a suitable support. The required rigidity for the support is secured by lugs cast in one piece with the top frame and braced to the guide bearer. The principal dimensions are as follows: Cylinders, 28x32 inches; boiler pressure, 163 pounds; diameter, 80 inches; tube heating surface, 3,658 square feet; firebox heating surface, 179 square feet; grate area, 60.2 square feet; tubes, 446; diameter, 2 inches; length, 15 feet 9 inches; diameter of drivers, 63 inches; weight on drivers, 209,950 pounds; total weight, 236,850 pounds; rigid wheel base, 17 feet; tractive effort, 51,920 pounds.

*A Practical Discussion of the Walschaert Valve Gear.**

The Walschaert valve gear has been introduced gradually into American locomotive practice during the last few years and its performance as compared with that of the Stephenson link is still the subject of investigation, as the relative merits are not yet fully established. The theoretical advantages of the gear are well established and have been thoroughly discussed, but of the actual service given on the road and the practical value of the design in regard to hauling tonnage, break downs, repairs, lubrication, etc., little has been said, although these factors will determine whether this type of valve gear is to be continued as a feature of locomotive practice in this country.

The judgment of those who are directly concerned with the operation and repair of locomotive equipment is of practical value in determining the relative merits of designs and appliances, and with this in view the opinion of a number of prominent road foremen of engines relative to the Walschaert locomotive valve gear are given as indicating the practical advantages and disadvantages of the gear and the service obtained from it in actual service.

The first communication is as follows: "The Stephenson valve gear is well known to all of us and needs no description. As long as the locomotives were of the American, or eight-wheel type, on which all parts of the valve motion could be properly proportioned and was easily accessible for oil, inspection and repairs, we did not desire anything better. With that class of engines there was no difficulty in getting underneath to inspect them; set screws could be reached and tightened, as well as all nuts and bolts that were liable to get loose; oil holes cleaned out, packing examined in eccentric straps and on top of link blocks; every part of the valve gear could also easily be reached when oiling engine, and there was very little danger of any part being missed. With the heavy locomotives of the present day, with three and four pairs of driving wheels placed together closely, our valve motion is not the simple affair it was with eight-wheel engines. Eccentric blades either have to be made very long and curved, or very short with curved transmission bar to transmit the motion to rocker arm, or use some other arrangement that increases the number of wearing parts, which soon causes the valves to be out of square. On account of the larger diameter of eccentrics, they as well as the straps must be heavier and with a wider bearing surface to withstand the pressure necessary to move the heavy valves and link motion. As the eccentrics receive considerable up and down motion caused by uneven track, and side motion caused by side play between driving boxes and hubs, which movements are not to be communicated to the links, they are subjected to a twisting strain that without warning may cause them to heat, and a strap to break. The links and other parts are also made so heavy that failures are quite frequent from hangers or pins breaking. The eccentrics take up so much of the space between the driving boxes and they are placed so close together that it is almost impossible to see if any of the nuts holding the two halves of back-up eccentric together are loose until after the eccentric opens up, grips and breaks the straps, and we all know what a pleasant duty it is to pack a driving box cellar behind an eccentric. The valve gear can not be thoroughly inspected unless engine

*From the Railway Master Mechanic.

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is over a pit, and it takes something of an acrobat to oil those with large wheels. On account of giving this motion a thorough inspection, it does not receive the attention it formerly received.

The main advantage the Walschaert valve gear has over the Stephenson gear is its accessibility; every part of it is in plain view of the engineer when inspecting or oiling the engine. This is not all, however. There are no eccentrics or straps to heat, slip or break; no eccentric blades to slip or loose, no heavy links and transmission bars suspended from hangers which are liable to break. The valves if square and motion is properly put up when engine is put into service, remain so, and do not need the frequent adjustment that those having the Stephenson link motion do. While they can not handle any heavier tonnage on a slow pull, they seem to handle their train easier when under headway. This, I think, is due to the construction of the valve gear, the valve receiving its motion from two points, one from the return crank, the other from the combination lever attached to the crosshead. The latter gives it the movement required by the lap and lead. If the valve had neither lap nor lead the crank would give it all the motion required, both forward and backward. There being only one instead of two, as would be required for the Stephenson motion, the crank is set at nearly all right angles to the main crank pin, where it is moving the fastest when it is opening the steam ports for the admission of steam, and should give a quicker port opening than the Stephenson gear, where the eccentric is moved ahead from this point the distance required to overcome the lap and lead of valve. The link is pivoted on solid trunnions attached to the guide yoke, which while allowing it to move freely, does not allow it to spring out of line, as is the case with the shifting link. While I do not believe that the Walschaert valve gear will enable a locomotive to haul any heavier trains, I believe it will enable her to take her train over the road easier, and in somewhat less time, and I consider its advantages are simplicity and solidity, accessibility for inspection, oiling and repairs; freedom from breakage of distortion, as there is nothing to get out of order if the motion is properly proportioned when placed on the engine; barring accidents, the motion should run from the time an engine comes out of the shop until she is returned for repairs, without any adjusting of the gear, unless a new pin is required on account of excessive wear at some point. In regard to repairs, we have had very few repairs to make, and they are caused by the connecting pins not being properly fitted by the builders, allowing the wear to come on the wrong part of pins and connections. This has been remedied, and I do not look for further trouble in that line. While we have not had any experience with the Walschaert valve gear on fast passenger engines, from our experience with heavy freight engines I believe this gear is as well adapted for that service as for freight service, and I would like to see all large engines with this gear."

The opinion of another road foreman is expressed as follows: "What advantage has the Walschaert gear over the other engines with the Stephenson gear, and what difference in the cost of repairs have you noticed? First, is accessibility to get at to oil, inspect and repair; Second, the absence of wear to the whole valve gear; third, the constant lead; fourth, the engineers and the round-house folks' side of it; on account of the convenience of the location, more accurate information can be had as to when the engine can be ready for service, as inspectors or engineers can look over on ash pit or outside tracks and note any defects, whereas with other gear we must wait until engine gets to a pit or take a chance on having to cancel an order that may have been O. K'd for the engine if she is given in before inspector has gone underneath.

In several months' service we had to make very little repairs to valve gear; in one instance valves were out and it was found eccentric rod was slightly bent. This was taken down and straightened and overcame the trouble. The absence of wear and difference in cost, on account of doing away with the heavy straps and cams on the eccentrics; various troubles are overcome, among which we may mention heating, causing breakage and serious and expensive delays. On some classes of engines it is not possible to see all the eccentric trap bolts, and I have known bad delays on account of strap bolt losing out or breaking. Again, on large engines with Stephenson gear, the parts are so heavy that lost motion naturally accumulates very fast in the link gear owing to the connections being light in comparison to the weight of the motion and where there is much liability for

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dirt and ashes to get to oil holes, these parts wear unusually fast. This is not the case with the Walschaert gear, as there are few oil holes, and what there are, are provided with cavities for waste packing; also the pins and bushings are hardened and are of very liberal dimensions, so that the indications are now that the valve gear will wear as long as the engine will stay out for general overhauling, except such light repairs as can be made between trips. The valve rods being short, we have no trouble with the valve steam packing blowing; this can be appreciated by those having labored with defects of this kind. These troubles encountered in the way of lost motion and wear, reduce the efficiency of the engine considerably; that is, equipped with the Stephenson gear is a drain on the coal pile, as engine can not be worked to an economical advantage and will require more oil for the above reasons. The constant lead is an advantage of the Walschaert gear, for it is possible to ascertain what is the best amount to give them at ordinary cut-off, and to maintain it. With the Stephenson gear the amount necessary to furnish desired cushion in full stroke, will increase to such an extent as to cause back pressure, when working in cut-off, besides making the engine ride hard. To offset this, engine will be worked lower down on the quadrant than is economical otherwise. This also holds good where valves are not square, and it is next to impossible to keep them square in cut-off on heavy power, so therefore the engineer squares them with lever and wiredraws the steam account having to work such a light throttle. The Walschaert gear overcomes all of this. The lever can be worked at the most advantageous point to cut-off and engine handles easily if reach rod and counter balance spring are properly looked after. The engineers like the Walschaert gear for this reason, and for their convenience to oil and inspect, and for absence of hot eccentrics and the frequent breakage. With regular engines there is not so much time lost by engines held for repairs. The engines are so much cleaner to work around and oil; while the eccentrics will not be run more than 30 miles on an average for an oiling, the Walschaert gear will be run twice that distance if necessary. On the Stephenson gear, even if grease cups are used, the engineer will not feel confident that plugs are properly screwed down without trying them himself, and the same thing applies to inspection of keys and bolts which will require him to go under the engine. I have no figures at hand to show difference of maintenance of valve gear of the two types, and my information is based only on a few months' experience of the Walschaert gear, and may be somewhat biased on account of the nice performance they have given. Where Stephenson link motion engines are new they also do good work with only a few failures, but when these engines were put on fast passenger trains, there were several failures from hot eccentrics, and a few on account of broken eccentrics, whereas with the Walschaert gear this is eliminated. The fact that so many railroads in this country are ordering this gear on new engines is fair proof of its efficiency, and I have no doubt but that it is the valve motion of the future."

Practical experience with the Walschaert gear as expressed by the road foreman quoted, shows that the performance of the gear in service is highly satisfactory in every respect. As the Walschaert gear represents an investment in some cases of approximately $1,000 more than the Stephenson link motion, a relatively higher performance should be expected consistent with the extra cost, but practical experience with the gear, up to the present time, indicates that the points of superiority claimed are fully justified by the results of service.

* * *

*Completion of the Bay Shore Cut-Off Route.**

The famous Bay Shore Cut-Off of the Southern Pacific that furnishes a shorter and better grade route into South San Francisco has at last been completed. With the exception of laying the rails, the road would be ready to throw open to regular traffic.

President Harriman confidently expected to have this stretch of road open to traffic by the first of July; but unavoidable delay in securing the necessary steel has prevented him from doing so. However, it is hoped that tracklaying will be commenced before long.

The Bay Shore Cut-Off is, without doubt, the heaviest and most expensive piece of railway work ever accomplished

*By J. Mayne Baltimore, special correspondent to the Locomotive Firemen and Enginemen's Magazine

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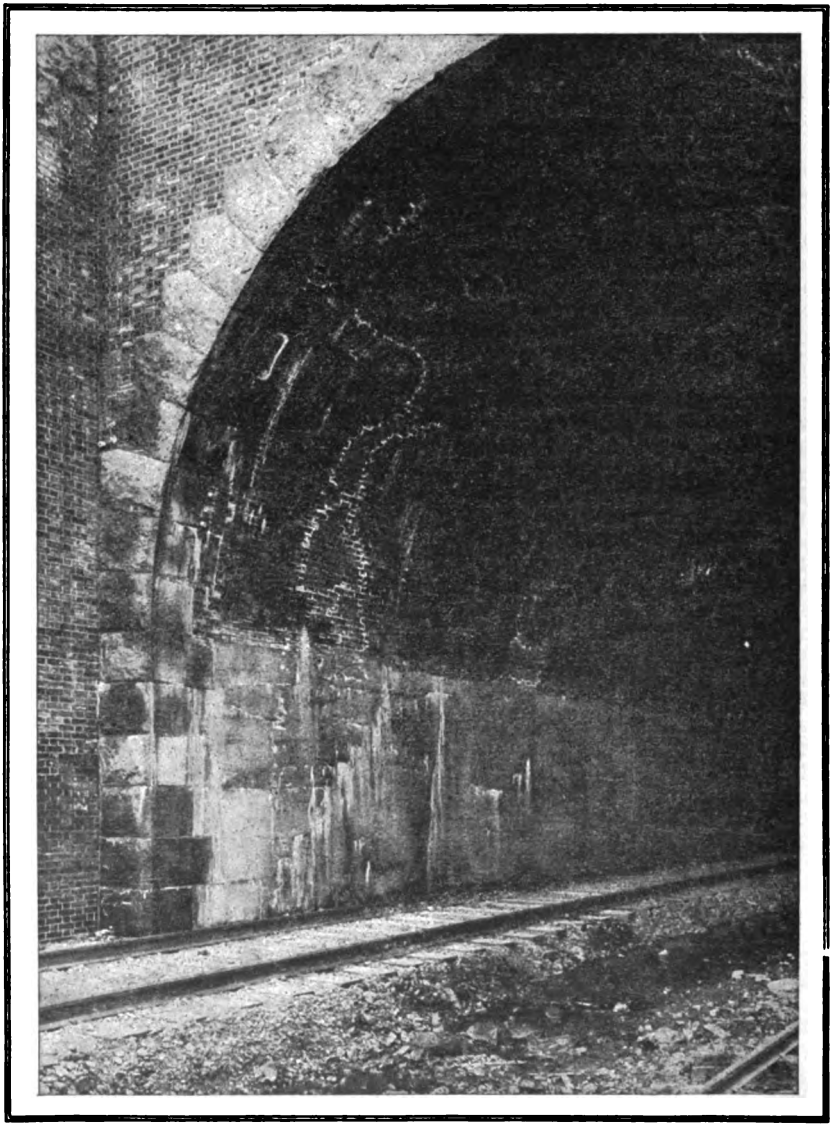
west of the Rocky Mountains, that is, for the distance. Its total length does not exceed nine miles—yet the total cost will exceed $7,000,000. Tunnels, immense cuts and enormous fills have been made all along the route—from Baden to the company's depot in San Francisco.

This gigantic undertaking was commenced more than three years ago and was pushed almost day and night until a very short time ago. The last tunnel work was completed last November, but much other necessary work remained to be done. At present writing, nothing remains now but the track-laying.

Throughout the Cut-Off will be double track, including all of the five tunnels. By all odds, the boring of the tunnels constituted the heaviest and most expensive work, though the cuts and fills were a



ENTRANCE TO TUNNEL No. 3—BAY SHORE CUT-OFF

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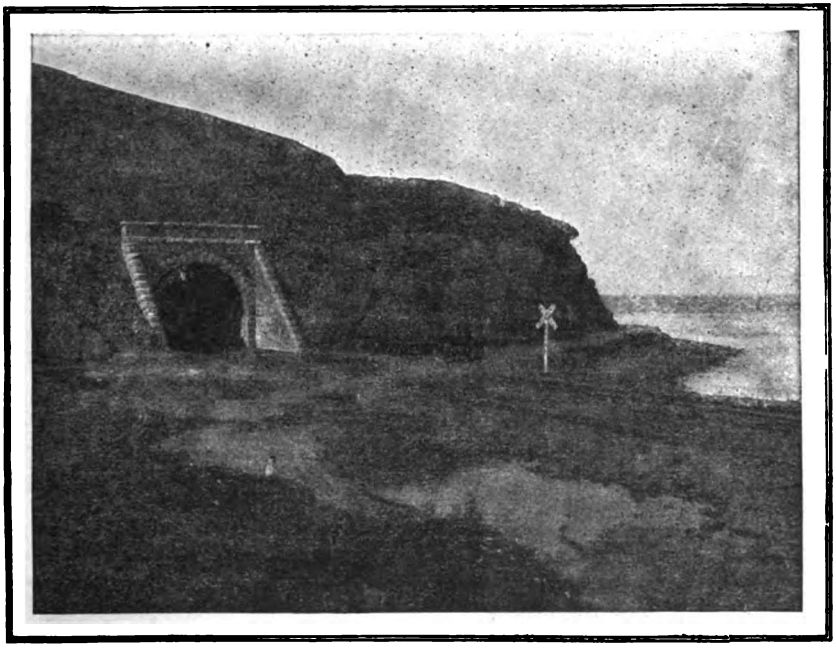
very important feature of the operations. Of course, the tunnels are the most picturesque and spectacular feature of this stretch of road.

As before stated, there are five tunnels. Tunnels 1 and 2 are through the Potrero Hills; No. 3 is through Hunter's Point Hill, No. 4—the longest tunnel—goes under the high ridge opposite Candlestick Point, No. 5 is through Sierra Point. No. 1 is 1,817.3 feet long, extending through massive serpentine with clay seams; No. 2, 1,086.4 feet long, is also through massive serpentine with clay seams: No. 3, 2,364 feet long, is in part through wet sand with seams of clay and in part very hard silicated formation; No. 4, which is 3,547 feet long, is mainly through very wet ground with quick sand and clay layers, and in part through medium shale; No. 5, 1,133.8 feet long, is through hard sandstone. The total length of the five tunnels is 9,948.5 feet, being 1.884 miles of double track tunneling.

The average daily progress in each end of each tunnel was a little over four feet, or eight feet a day total progress. No power drills were required excepting in the hard rock in No. 3. The tunnel side walls and invert arc are of concrete, and the tunnel arc of brick, with three sections, according to material passed through.

The packing between side walls and arch ring and natural material in some cases is broken rock, and in other cases concrete. The tunnel excavation of maximum section, including an assumption of six inches all around the masonry, was approximately 32.2 cubic yards per lineal foot. All of these tunnels, with the exception of No. 5, were taken out with a center core.



ENTRANCE TO TUNNEL No. 4, THE LONGEST—BAY SHORE CUT-OFF

Without cessation the tunnel work progressed, the only delay being the changing of the shifts of men. These five tunnels —nearly two miles in total length—do not cover more than six miles of the cut-off route. Operations on the cuts were confined to day work exclusively; the same with the filling work.

Singular to say, no serious damage was done to either the tunnel or cut work by the fearful earthquake which visited California on April 18, 1906. Though there was a regular panic among all of the men engaged in the tunnels, yet no one met with any serious injuries. Not a brick

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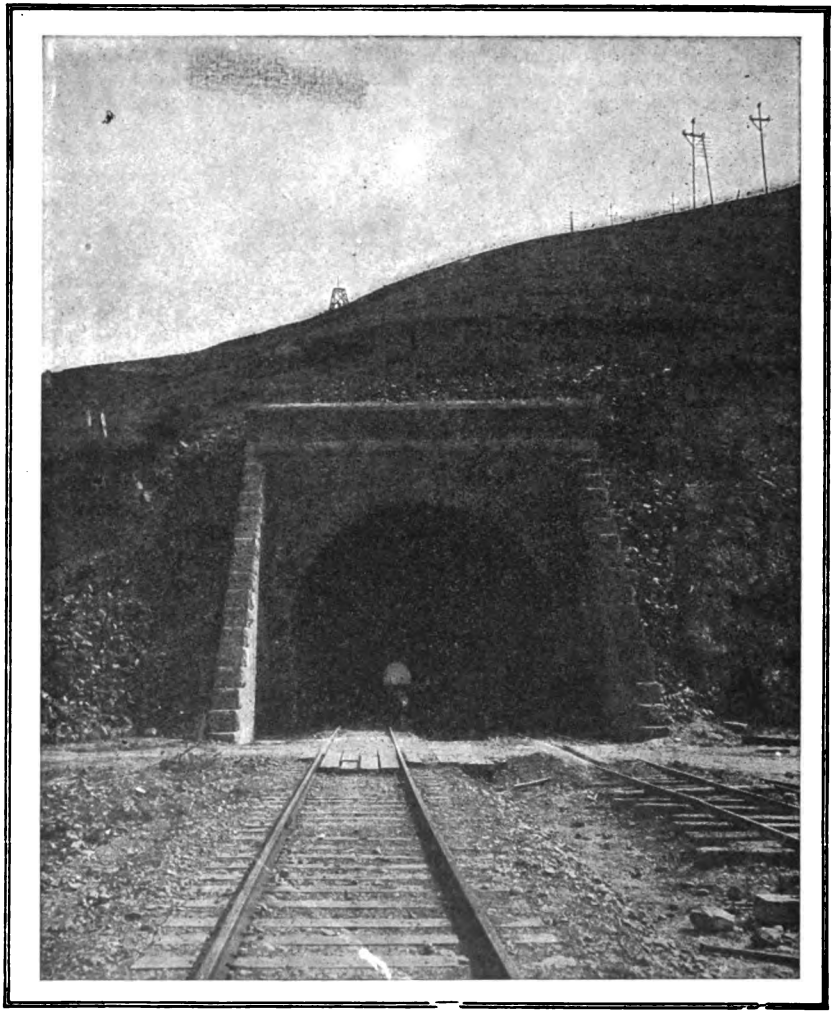
or a piece of concrete was thrown down, and today not a crack or seam is to be seen in the interior of any of the five tunnels, or at any of the ten portals.

A number of very heavy side cuts were made along the line. But the heaviest cut—open—was the giant one at what

material was used in making enormous fills across two arms of the bay. One of these fills was for a distance of 5,700 feet—with a depth ranging from 30 to 60 feet.

Immense quantities of material were used in constructing this line—especially



ENTRANCE TO TUNNEL No. 5—BAY SHORE CUT-OFF

is known as Visitacion Point. In fact, this is one of the heaviest cuts on the continent, being more than 1200 feet long, 300 feet wide at the top, 60 feet at the bottom, and 150 feet high at the highest point. About 800,000 cubic yards of excavation was necessary. All of this

the tunnels. Over 20,000,000 of bricks were used, besides vast quantities of cement and other materials. The building of this important cut-off has long been the purpose of the Southern Pacific. The old route down the Peninsula is quite long and roundabout, and leads over some

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heavy grades. Besides shortening the road several miles this new route will eliminate all of the grades.

With the other new cut-off by way of Dumbarton Point—now in course of construction—a direct route will be obtained straight through to San Francisco by way of the south. In many ways the Bay Shore Cut-Off is a most important piece of work, and will more than compensate for the great labor and the enormous expense incurred in building it.

To be used in connection with this cut-off another very heavy and expensive operation is now in progress. It is the building of giant terminal works, freight yards and switching yards at what is known as Visitacion Valley. This point is located about midway between Baden and San Francisco.

Most of this valley was originally covered by the waters of the Bay, but this expanse is being transformed into firm ground. Over 140 acres will be reclaimed and on this made land are to be built the new immense freight terminals, yards, etc. This work has been in progress for some time and will be pushed forward to an early completion. This great improvement will also cost the Harriman System a very large sum of money.

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*Questions Likely to Be Asked in Examinations for Promotion, Together with Their Answers.**

SECOND YEAR.

Question 47.—Upon what principle does the locomotive injector work?

Answer.—In general, the working of an injector may be described as follows: Steam of a certain pressure is allowed to flow through a nozzle which gives to the steam a high velocity. This steam, on leaving the nozzle, passes across a space which is in connection with the feed water supply, and passing across this space enters a second nozzle known as a combining and condensing tube. The passage of the steam at high velocity across this space carries with it any air the space may contain, much as a train passing along at high speed carries with it any dust and papers which lie in its path. In other words, this passage of steam across this space creates a vacuum above the feed water and the water rises to fill this vacuum, coming in contact, in this manner, with the jet of steam and condensing it. The steam being arrested in its passage imparts its velocity to the water and the water and condensed steam flow together through the combining and condensing tube and through a delivery tube against the check valve. The combining tube is shaped like a fire-hose nozzle, so that any stream leaving it does so at a high velocity, and this jet of water striking the check valve at a high velocity has sufficient force to raise the check and force its way into the boiler. The pressure against which an injector will work depends entirely on the initial pressure of the steam and the construction of the tubes in the injector.

Q. 48.—How would you start an injector?

A.—To start a lifting injector with a lever handle, first move the handle to the priming position with the steam valve, water valve and overflow valve open. When water appears at the overflow pull the handle clear out, and if the injector is in proper condition it will go to work. With the screw handle, there is a separate handle for raising water. This should be placed in the open position until the water appears at the overflow, then the screw handle should be turned clear out and the lifting handle closed again.

With the nonlifting injector, the water valve, which is kept closed while the injector is not working, should be opened and then the steam valve should be opened. When the injector is shut off the water valve must be closed as well as the steam valve, except in cases where the overflow valve is placed above the level of the water in the tank.

Q. 49.—What are some of the common causes of a lifting injector failing to work?

A.—If a lifting injector does not work properly the trouble may be under one of three heads. First, the injector may not prime. Second, the injector may prime, but will not force the water into the boiler; and third, the injector may prime and may force some of the water into the boiler but will waste water at the overflow and may break occasionally. Under the first head when an injector fails to prime, it may be that the tank valve is closed, or the tank is dry, or there is a kink in the hose, or the strainer is stopped up, or the water valve of the injector is closed. Remedy: Blow steam back to clear the obstruction and examine the

*By a member

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tank valve, the water valve and the hose connections. The supply of water to the injector may be all right, but there may be a leakage of air in the suction pipe. The principle on which the water is lifted to the injector is that of atmospheric pressure forcing the water up to supply the vacuum in the suction pipe. If, instead of the water supplying this vacuum, there is an air leak, the air will supply the vacuum and the water will not be raised. If the air leak is small or is below the water level the injector may prime. However, if there is a free supply of water to the injector and no air-leaks in the suction pipe, the injector still may not prime if the water in the suction pipe is hot. To explain this, it must be understood that ordinarily water will boil in a teakettle or, in other words, at atmospheric pressure, at 212 degrees. If water is put under pressure, say of 200 pounds, the temperature at which it will boil is raised to 388 degrees. The opposite is the case where the water boils in a partial vacuum, when the boiling point is reduced to 160 or 170 degrees with the ordinary vacuum produced in the suction pipe of the injector. If the steam valve or check valve of an injector is leaking so that the water in the suction pipe becomes heated to a temperature of 160 or 170 degrees, when the handle of the injector is placed in the priming position and a vacuum is formed in the suction pipe, the hot water at this reduced pressure immediately commences to vaporize or boil. A teacup full of water will form 1,800 teacups full of steam under these conditions, and the great volume of steam thus formed supplies the vacuum, with the result that the water does not rise. However, if the injector is left in the priming position until all of the hot water is boiled away, then the injector will prime. Other defects on this first case which are seldom met with are steam valve disconnected shut, lifting tube in the double tube injectors out of place, overflow valves closed, or check valve at boiler leaking so badly that it prevents the proper action of the lifting valve. Under the second case, where the injector primes all right but will not force, the trouble may be due to the fact that while the water supply is sufficient for the priming of the injector it is not sufficient for the forcing volume, due to the tank valve being partially closed, the strainer being partially stopped up, or there being an obstruction in the suction pipe, or it may be that the air can not get into the tank fast enough, due to the man-hole cover fitting too tight or being frozen closed so that atmospheric pressure can not get on top of the water in the tank so as to force it up the suction pipe to supply the vacuum in the injector. The trouble may be that the combining and condensing tube, the forcing steam nozzle or the delivery tube are out of line, or that there is an obstruction in one of these tubes. It may be that the line check (or boiler check) is stuck shut, or that the tubes of the injector are stoped up or are not of the proper size for the work expected. The third case, where the water is not all taken up by the injector, is usually due to the improper mixture of steam and water. If the water which spills at the overflow is hot it indicates too much steam or too little water is being supplied to the injector, and the water supply should be increased or steam supply cut down. If the water appears cold at the overflow the opposite is the case. While many other injector troubles may be mentioned, the above cover the principal points met with in practice.

Q. 50.—What would be the probable cause if your second injector failed to work? What treatment should the injector receive to overcome such failure?

A.—The second injector generally fails because it is not used often enough to keep it in proper working order.

To obviate this failure the second injector should be used part of the time during each trip made with the engine.

Q. 51.—What should be done if a boiler check valve sticks open?

A.—If a boiler check valve sticks open, the check valve casing should be tapped with a wooden mallet or soft hammer. If this fails to seat the valve, a couple of buckets of cold water dashed over the casing may seat it. The overflow and water valve of the injector should be closed to prevent the water wasting or blowing back into the tank.

Q. 52.—What points of advantage does the combination boiler check possess over the ordinary form of check valve?

A.—A combination boiler check has one great advantage over the common form of check, due to the fact that in case the check sticks open, the escape of the pressure from the boiler can be prevented by closing the hand valve of the combination check.

Q. 53.—How can the difference between

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a leaky check valve and a leaky steam valve be ascertained?

A.—Close the main steam valve; if the leak stops it indicates the steam valve leaking; if it continues, it indicates the check valve leaking.

Q. 54.—What should be done in either case?

A.—In case the steam valve or check valve leaks the water valve should be closed as soon as the injector is shut off to prevent the heating of the water in the suction pipe. In case the water becomes hot the overflow valve should be closed and steam driven back into the tank. The steam valve should then be closed and the overflow valve opened and the handle put in priming position, so that the cold water going back into the suction pipe will cause injector to prime.

Q. 55.—If the combining tube is obstructed what may be done?

A.—The injector must be taken apart and the obstruction cleaned out.

Q. 56.—How can a leak in the suction pipe be located?

A.—Close the tank valve and the overflow valve and turn a little steam back into the suction pipe. Care should be taken to not use enough pressure to burst the pipe.

Q. 57.—In case a hose or strainer is obstructed, what can be done?

A.—Close the overflow valve and blow steam back through the strainer. If this does not clear out the dirt, the hose must be taken down and the strainer cleaned by hand.

Q. 58.—What can be done in case the feed water in the tank is too hot?

A.—In case the feed water in the tank becomes so hot that the injectors will not work, even when the main steam valve is throttled down, the only remedy is to run for water, as the injectors can not be made to work with this hot water.

Q. 59.—Will an injector work if all the steam is not condensed by the water?

A.—No.

Q. 60.—With a siphon connection how is water prevented from flowing out of the tank when the hose are taken down?

A.—The pet cocks at the top of the siphons must be opened.

Q. 61.—How can the water in the delivery pipe be prevented from freezing?

A.—There should always be a drain at the lowest point in the delivery pipe, usually underneath the check valve, so that there will be no water in the pipe to freeze when the injector is not working.

Q. 62.—How would you prevent a waste pipe from freezing?

A.—On the injector that is being used as a heater, there is no danger of the wastepipe freezing unless there is a leakage at the overflow. In case there is a slight leak which might let this pipe freeze up, the overflow valve should be unseated enough to keep a sufficient current of steam passing through the wastepipe to prevent its freezing. With the injector that is being used to supply the boiler it may be necessary at times to cut down the water supply so fine that a little stream of hot water will flow from the wastepipe continually, thus keeping it open. However, with an injector that takes up all its water, a little care in manipulation will do away with the danger of this pipe freezing.

Q. 63.—How can the suction pipe and the injector hose be protected from freezing?

A.—When not using the injector the overflow valve should be closed and the steam throttled down low at the main valve. The steam valve should then be opened wide and the water valve left open. This will send steam back through the suction pipe and hose and prevent their freezing. Only enough steam should be used to make certain that these connections will not freeze, as there is danger of getting the water in the tank so hot that the injectors will not work.

Q. 64.—How is the lever monitor injector changed into a heater?

A.—The answer to the question above also answers this question.

Q. 55.—How is the screw monitor injector changed into a heater?

A.—This question is also answered by the answer to Question 56.

Q. 66.—What weather conditions would warrant converting an injector into a heater?

A.—The injector should be converted into a heater whenever there is danger of the water in the suction pipe or tank freezing.

Q. 67.—If the water in the gauge glass is not moving up and down when the locomotive is in motion, is its indication safe to go by?

A.—No. If the water glass is working properly the water will be continually moving up and down in the glass.

Q. 68.—When an engine foams is more water used than when it is working properly?

A.—Yes, because quite a little water is

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carried into the cylinders along with the steam.

Q. 69.—Explain the operation of the sight-feed lubricator.

A.—In a sight-feed lubricator, part of the steam passing through the condensing chamber is condensed there, a water valve allows this condensed steam to flow down to the bottom of the oil reservoir, and as oil is lighter than water, what oil is in the oil reservoir will float to the top of this water. The oil pipes at the bottom of the sight-feed arms extend into the top of the oil reservoior, and the oil passes down through them to the regulating valves. From the condensing chamber the equalizing tubes lead into the top of the sight-feed arms, so that the pressure on the top of the water in the glasses is exactly equal to the pressure acting on the oil at the bottom of the glass, with the exception that the weight of the water in the condensing chamber is just sufficient to cause the difference of pressure which makes the oil flow, drop by drop, through the regulating valves, where it rises through the water in the feed glasses and is carried by the current of steam passing through the equalizing tubes through the choke plugs and into the tallow pipe, where it runs by gravity down to the steam chest.

Q. 70.—How does a triple or quadruple sight-feed lubricator differ from one of the single feed kind?

A.—On a triple there are three, and on a quadruple four separate sight-feeds, in place of the one found on a single lubricator.

Q. 71. How would you shut off a lubricator before filling it?

A.—First shut off the regulating valves, then the water valve and then the steam valve, then the drain valve may be opened, the filling cock opened, and after the water has drained out the drain should be closed and the lubricator filled.

Q. 72.—In tightening the filling plug of a lubricator what precautions should be taken?

A.—Be careful, if using a big monkey-wrench, not to tighten it so that you will twist the plug off.

Q. 73.—Should a lubricator be filled with cold oil?

A.—Letting alone the fact that cold valve oil runs very slowly, it is bad practice to fill a lubricator with it, because when this oil is heated it expands and there is liability of its bursting the lubricator. Most of the recent makes of lubricators have air chambers provided for this contingency.

Q. 74.—When should a lubricator be started in preparing to go out on a trip?

A.—A sufficient time before starting to allow the oil to get to the valves before any switching or work is done with the engine. The feed to the air pump should be started when the pump is started.

Q. 75.—Should the feed-valves or the water valve be closed while waiting on siding, etc.?

A.—The feed-valves should always be the ones that are closed.

Q. 76.—How should the valves be opened on a lubricator?

A.—First open the steam valve and allow sufficient time for the condensing chamber to become filled with water, then open the water valve and then the feeds.

Q. 77.—Does a draft from the cab window affect the working of the lubricator?

A.—It does in some cases where the equalizing tubes are outside of the condensing chamber, in which case the cold air striking these tubes condenses part of the steam passing through them and reduces the pressure on top of the water in the feed glasses, causing the lubricator to feed too fast.

Q. 78.—What else might cause the irregularity of feed?

A.—If the choke plugs become stopped up or are worn too much, the feed will be irregular.

Q. 79.—If a lubricator feeds faster when the engine is shut off than it does when working steam, where is the trouble?

A.—The trouble is that the choke plugs are too large or that the steam valve to the lubricator is not wide open, so that the full boiler pressure is not maintained on the top of the water in the sight feed glasses.

Q. 80.—If the sight feeds get stopped up, how can they be cleaned out?

A.—If a sight feed is stopped up, the other feeds should be closed, the water valve should be closed and the drain opened for a moment. This will allow steam to blow back through this stopped up feed and will usually clean it out. If not, the lubricator must be taken apart and the feed cleaned out by hand.

Q. 81.—How can stopped up choke plugs be cleaned out?

A.—To clean a choke plug the regulating valves should be closed, also the

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steam valve. With these valves closed, if the drain is open for a moment while the throttle is wide open, pressure will be blown back into the lubricator through the chokes. This usually cleans out the obstruction; if not, the parts must be taken out and cleaned by hand.

Q. 82.—Is it necessary to keep the sight feed glasses clean?

A.—Yes, otherwise it is hard to determine how the oil is feeding.

Q. 83.—What is the use of equalizing pipes?

A.—The equalizing pipes furnish a passage through which steam pressure is maintained above the water in the feed glasses. The steam passing through these equalizing pipes also passes through the choke plugs and through the tallow pipes into the steam chest, thus assisting the oil in its downward passage from the lubricator to the steam chest. Although when the steam chest pressure is practically equal to the pressure in the equalizing pipes, the oil must then flow down through the tallow pipes by the aid of the force of gravity alone.

Q. 84.—If an equalizing pipe were broken off or became very loose, what would you do?

A.—This pipe would have to be plugged where it entered the condensing chamber and where it entered the feed arm. This would put that one feed out of service, but would not interfere with the working of the other feeds.

Q. 85.—How can you tell if the equalizing tubes are stopped up?

A.—If an equalizing tube was stopped up the oil would spurt in a stream through the glass when the regulating valve was opened, as all of the pressure would be removed from the top of the water in the glass.

Q. 86.—Why is it when an engine is working slow with full throttle that the valves become dry, and the lever jumps, even though the lubricator is feeding regularly?

A.—When the throttle is wide open and the engine is working slow, the steam-chest pressure is practically equal to the boiler pressure; this being the case oil will pass up through the glass all right, but there will be no current of steam passing through the chokes to start the oil down to the steam chest. The oil will, therefore, be held up and the valves become dry. Cases of cross-feeding have been known but are of unusual occurrence.

Q. 87.—What should be done under these circumstances?

A.—The throttle should be closed for a moment, thus giving a chance for the oil to pass down to the valves.

Q. 88.—How many drops will feed through a lubricator from a pint of valve oil?

A.—With ordinary feeding there are about 5,800 to 6,000 drops to the pint.

Q. 89.—Assuming that each valve is given five drops per minute, and the air pump one drop per minute, how long will a pint of valve oil last?

A.—This would be eleven drops per minute, and eleven goes into 5,800 527 times, or eight hours and forty-seven minutes.

Q. 90.—If an engine runs twenty miles an hour, how many miles can be made to a pint of oil with the feed as shown in the last question?

A.—About 175 miles. Multiply the number of hours by twenty.

Q. 91.—How many drops per minute should ordinarily be used?

A.—For average conditions, about six drops per minute should be used for the valves and one drop per minute for the air pump.

Q. 92.—About how much oil should be used to feed a 9½-inch air pump?

A.—About one drop per minute for average conditions.

Q. 93.—When a lubricator refuses to feed properly, how should the oiling be done?

A.—By using the auxiliary oiler, with which most makes of lubricators are supplied, and which work on the principle of the old hand oilers.

On some makes of lubricators the auxiliary oil cups must be filled and not opened until the engine is drifting and the vacuum in the steam chest is sufficient to draw the oil down through the pipe when the valve is opened.

Other makes of lubricators are supplied with attachments whereby a valve above the sight-feed glass can be opened and oil supplied tel the valves directly, by passing through the sight-feed glasses.

* * *

The Growth of Railroad Equipment.

The large and almost constantly increasing size of locomotives and cars of the great railroad systems of North America has been frequently commented on by those most directly interested, the

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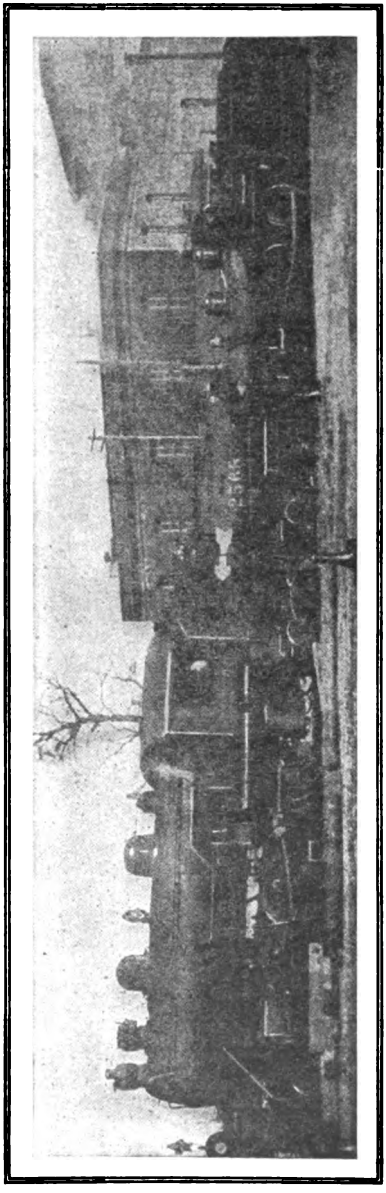
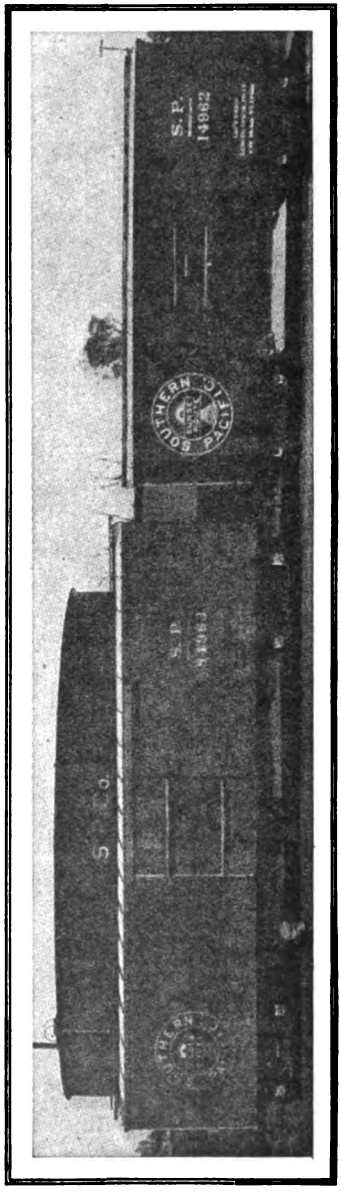
railroad employes, but to the general public it has perhaps not been so noticeable. The illustrations herewith show most forcibly the tendency of the times, and it would seem that the limit had been reached.



A GOOD ILLUSTRATION OF THE GROWTH OF THE LOCOMOTIVE SINCE 1888



EVOLUTION OF THE FREIGHT CAR FROM 1882 TO 1906

The little locomotive, C. P. Huntington, now retired from service, was no doubt the pride of the road thirty years ago. Its weight was 29,000 pounds, and it had a tractive effort of 3,506 pounds. It now occupies a place of honor as an exhibit in the shops of the company at Sacramento, Cal.

The illustration of the locomotives 1500 and 2568 shows the development of

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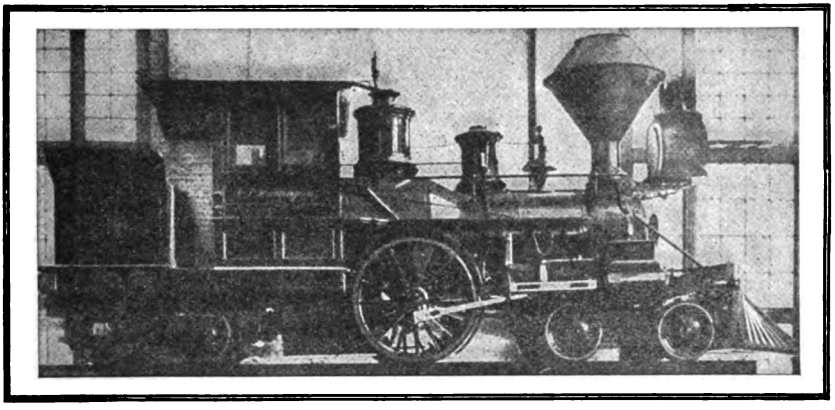
motive power since the year 1888 to the present time. The total weight of engine 1500 is 72,500 pounds, and its tractive effort 11,600 pounds, while the total weight of engine 2568 is 208,000 pounds and its tractive effort is 43,305 pounds.

Increased size and weight has not been confined to motive power, as will be seen by a comparison of the passenger and freight cars shown herewith. The smaller passenger car was built in 1880, while the larger one was built in 1905. In the case of the latter, its capacity and weight has been greatly increased, made necessary by the larger volume of travel and higher speed. A space of twenty-four years has made a wonderful change also in the size and capacity of freight cars, the smaller one of 1882 having but about one-third the capacity of that of 1906.

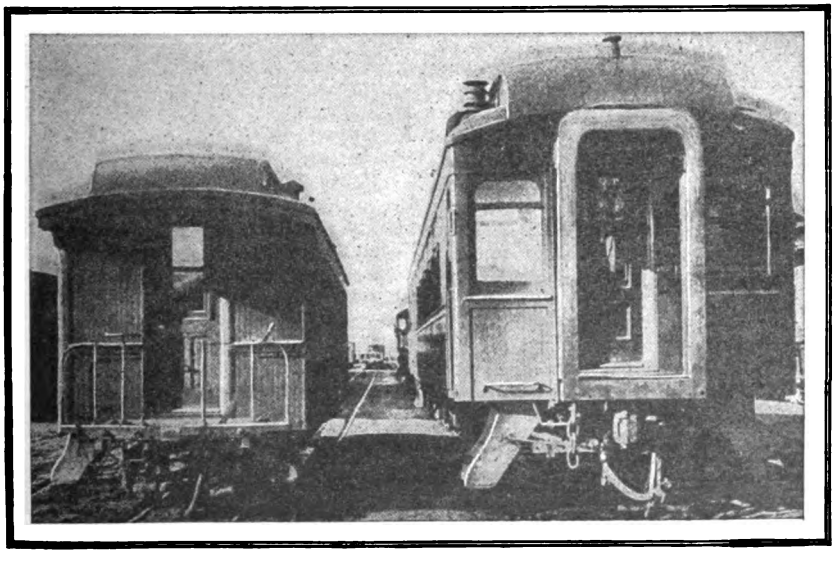


LOCOMOTIVE C. P. HUNTINGTON, PRESERVED AS AN EXHIBIT

* * *

Psychology and Signals.

One source of useless agitation against railway management is the eagerness of some of the popular scientists to "butt in" on certain railway problems. We re-



PASSENGER CAR OF 1880 AND ITS SUCCESSOR IN 1905

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cently called attention to an exhibition of this in connection with the investigation of a railway wreck. Of course the practical, or expert, or progressive railway man, whichever one chooses to call him, recognizes the great extent to which modern railway construction and operation depend upon scientific knowledge, and how questions are all the time shaping themselves more and more along scientific lines. Notably is this the case with the engineering and mechanical department work, but not a little in other directions also. But with certain classes of questions, like those pertaining to traffic arrangements, the fixing of rates and many operating questions, the hard-headed official of long experience is not willing to admit that the solutions are reducible to scientific basis.

The man who goes in and creates, organizes, operates and maintains a plant or business is usually not so much given to classifying, generalizing and drawing conclusions as are some of the outsiders who are watching the thing. This is not an intimation that successful railway men do not "plan out ahead," conduct experiments, make observations and strive for system—they really do more of this than the outsider who criticises; indeed, they do practically everything which serves to bring out the facts; but with the man who does things the classifying and generalizing and the conclusions are largely matters of afterthought; they come after the result. Here is where the outside critic sees his opportunity. He has the advantage of waiting until the other fellow gets through. If called upon to assist in advance of the experience, some of these advisers might not be so full of suggestions or so ready and certain with criticisms.

Now in respect to block signaling, we have had some experience in this country, and many cunning inventions have been worked out; but still, speaking for the country as a whole, and in view of adaptation to our variety of operating conditions, standards for installation, rules for operation and of practice generally, are in much of an unsettled state. As for indications we must admit that uniformity is wanting. The men in charge of the block signaling layouts should therefore have their ears open to helpful suggestions, and we think they have.

For about ten years past there has been a good deal of discussion concerning block signals and interlocking, in this country, first, principally by the signal engineers, whose standing is now much better than it formerly was, for general officers are now beginning to take a hand and, generally speaking, the signal engineers must be relied upon for the scientific part and the administration of the details. Coming now to the point, the questions which have been thrown upon the threshing floor in these past years have frequently raised points of scientific importance. We have heard "moral agencies," "the psychological moment" (whatever that term may mean), and other psychological things referred to in connection with signaling practice; and, withal, we should think that the mind and its phenomena should have much to do with the proper use and observance of signals. Until the present, however, no man, so far as we know, has made bold to bring his psychological studies to a direct issue with signaling practice. We now have an instance, and, although he does not cover practice as broadly as he might have done, the reader has an opportunity to reflect upon the ideas of an outsider who looks at our block signal systems from the standpoint of a psychologist.

We have been requested to read and discuss an article in Century Magazine for May, entitled "The Psychological Need of Revising the Signals," by George M. Stratton, professor of experimental psychology and director of the psychological laboratory in Johns Hopkins University. We understand that this article has been quite widely advertised among railway men. The professor finds that the use of two kinds of signals—semaphores by day and lights by night—is confusing and all wrong in principle, not to consider the confusion in lights of different colors. In his opinion "absolute simplicity" is needed. "The signal should pierce the mind, should thrust its meaning home, in the most direct and unerring way;" and the "alternation every night and morning between two wholly different kinds of signals would be unfortunate, even if each set were of itself entirely good."

He next explains that a white light seen through smoke looks reddish, and as a result engineers become distrustful of colored lights in general and take liberties with genuine red lights. No account is taken of practice where white signal lights are not used. Moreover, some men are color blind, and others are weak in their color sense, and many there

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be of the latter class who can pass the color test and succeed in getting where they must "nightly grope their way amid signals." Furthermore, color cannot be distinguished when seen through the corner of the eye, and "even in the quiet of the psychological laboratory" red and green are deceiving unless looked at squarely; and a quick glance at an object is not trustworthy, for the attention may "make a full sweep to the goal but the eye lag far behind." And again, eyes grown accustomed to darkness do not readily detect colors; the "owl-sight of the human eye is blind to the hue of things; the eye adapted to the dark can see the light, but see no color in it." The use of blades in daylight and lights at night, and a variety of colored lights at that, is therefore only confusion compounded, and results only in "needless labor to the memory."

The professor has ridden in the cab of an express locomotive during its "frantic course by night" and seen the engineman "as by a miracle" pick out his clear signal amid a "swarm" of other lights, and seen him, also, with an "almost mysterious confidence rush past countless red and green lights, knowing that they were not for him"—as one "dashes recklessly" through such a "maze of colored lights, he can no longer wonder that signals are occasionally misread or unobserved. He can only marvel that a night express ever reaches its goal in safety."

Unlike some who discuss practical questions from an academic standpoint, the professor does not leave his readers to grope in darkness for a remedy. In place of colored lights at night he proposes to revive the ancient idea of the illuminated semaphores, or "fiery arm," as he calls it, using preferably white light. He thinks the mechanical difficulties would not be great. If he was obliged to use oil he would place a row of half a dozen counterpoised oil lamps along the face of the semaphore blade. But he fears the use of oil would result in too much temptation to economize in weight and oil capacity, so that insufficient brilliancy would be provided. Gas lights, fed from pressure tanks, would be better, and these could burn for months untended. The most satisfactory means of illumination would be incandescent electric lights, which can now be had in a large and rapidly increasing area, and will soon be available throughout nearly the whole land. Sudden interruptions of the current would not be serious objections on roads where electricity is the motive power, for should the signal lights go out the power would at the same time be cut off from the trains and they would be brought to a standstill. Apparently the professor is not an automatic stop man, but he would have it arranged to "violently coerce" the attention of the enginemen, and the passengers as well, by causing the "explosion of several torpedoes or bombs of generous size," should a stop signal be unheeded and an engine run past it.

Thus, in short, we are told how that our troubles with block signaling are mainly a psychological problem. Having reviewed the ideas of the professor, briefly, but fairly, as we think, we prefer to omit criticism, leaving that entirely to the mind of the reader.—The Railway and Engineering Review.

*Locomotive Piston Valves.**

The locomotive is indebted to the marine branch of steam engineers for more than one great improvement. Next in importance to the principle of compounding, in the opinion of many, is the use of the piston valve, or "piston slide valve" as we have been taught to say. In this description the former term will be used.

The Piston Valve in Marine Practice.—Although its advantages of simplicity and perfect balance were early recognized, its adaptation in marine practice does not seem to have come about through the recognition of any inherent merit, but in the words of an ex-marine engine designer, it was only used "as a subterfuge for a slide valve, when such a valve would be so large as to be unwieldy and difficult to balance."

Historical.—While this article is not intended to be historical, a brief account of the earlier applications of the piston valve to the locomotive would seem essential. Probably its first application to locomotive work was made by Mr. T. B. Henney, then superintendent of motive power of the New York & New England Railroad, who tried some experiments with piston valves . . . . as applied to simple engines, but without any marked success, because of the use of too small a

*By Hal. R. Stafford, American Locomotive Company, Schenectady, N. Y., in American Engineer and Railroad Journal.

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valve. About this time also the Vauclain compound locomotive having a piston valve appeared. As it performed the function of distributing steam to two cylinders. the reason for its application in this case is obvious, since the use of a slide valve would have been almost a mechanical impossibility.

For its earliest successful application to simple engines, we are mainly indebted to Mr. John Player, and the Brooks Locomotive Works, of which he was then mechanical engineer, although mention must be made of its application to a single engine on the Norfolk and Western soon after this, by Mr. G. R. Henderson. Most of the early investigation and exploitation of the piston valve engine, however, was the work of the Brooks Works, which for a long time was almost alone in the field.

The application of piston valves by this company dates from 1889, although these first engines were really slide valve engines, with a cage containing the valve fitted into a peculiarly shaped steam chest. This arrangement shows much ingenuity, since the whole cage and valve were arranged to lift inside the chest, to give relief in the same manner as the slide valve. It was not until several years later that the Brooks Works commenced building bona-fide piston valve engines, which became increasingly popular.

Those concerns interested in cross-compounds soon adopted the piston valve for the high-pressure cylinder, because of the difficulty experienced in balancing the large slide valve necessary against the high pressure used. These valves were of the outside admission type, because the low-pressure slide valve was necessarily so, and it was desirable to maintain the valve gears the same for both sides. Until the direct motion was introduced, many simple engines were built with outside admission, which were more or less unsuccessful.

Packing.—With the exception of the piston valves built at the Brooks Works, all early valves on simple or two-cylinder compound locomotives were of solid one-piece construction, with closed ends—that is, there was no communication between the opposite ends through the valve body—while for packing the ordinary piston snap ring of rectangular section sufficed (Fig. 1). This ring did not give a sharp admission or cut-off, which was early recognized by the Brooks people, since their first packing was of the form

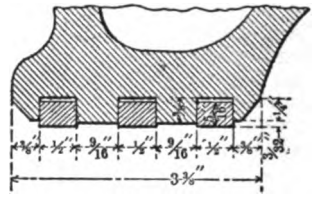

Fig. 1

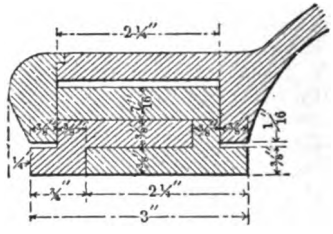

Fig. 2

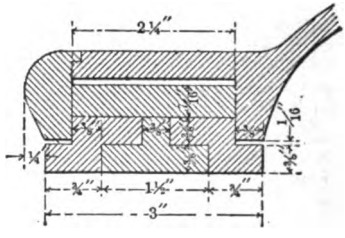

Fig. 3

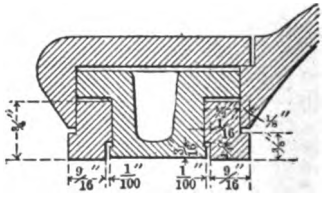

Fig. 4

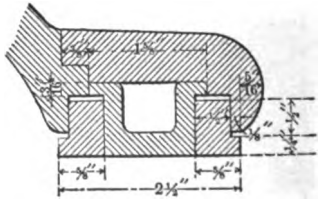

Fig. 5

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shown in Fig. 2, giving a ring projection over the end of the valve.

The next modification was Fig. 3. This form of packing ring proved very successful with the low steam pressures then in use, being practically steam tight and probably much better in this respect than many modern types; but as pressures increased above 180 pounds, friction became excessive, since the whole face of the valve was composed of expansive packing rings set out by steam pressure. It was superseded by the L-shaped ring, Fig. 5, which offers much less surface for the pressure to act upon, the L-ring composing the middle of the face being a solid non-expansive ring. This ring is practically standard throughout the country today.

When the L-shaped ring first came into use, it was feared that it would break because of its light section and cause damage by the pieces falling into the ports. To prevent this the form of ring shown in Fig. 4 was designed and is still used to a great extent. But strange to say, although breakage of valve packing rings is of too common occurrence, nothing more serious happens than is caused by the loss of the ring itself. Cases have been known of valves removed which were entirely innocent of packing rings, no portion of the ring being found in the cylinder or valve chest, and no other damage being done.

Early locomotive piston valve bodies, except those built at the Brooks Works, were made in one piece, the rings being "snapped" into place as in the ordinary solid head piston. But it has been found that, no matter how carefully these rings are turned to the bore of the bushing, this practice stretches them and causes a poor fit. This is the principal reason for the adoption of the built up valve (Fig. 6) which enables the rings to be slipped into place without distortion, and allows a deeper and heavier section to be used than would otherwise be possible. It will be noted that the Brooks Locomotive Works used this built up valve from the beginning (Fig. 2).

The best fitting packing rings are turned to the old piston ring rule—the rings are turned from 1-16" to 3-32" larger than the bore, according to the size of the valve, then from ⅛" to 3-16" cut out, the ring clamped together in a jig, and turned to nominal size. This gives a ring which will bear all around the bushing and wear equally.

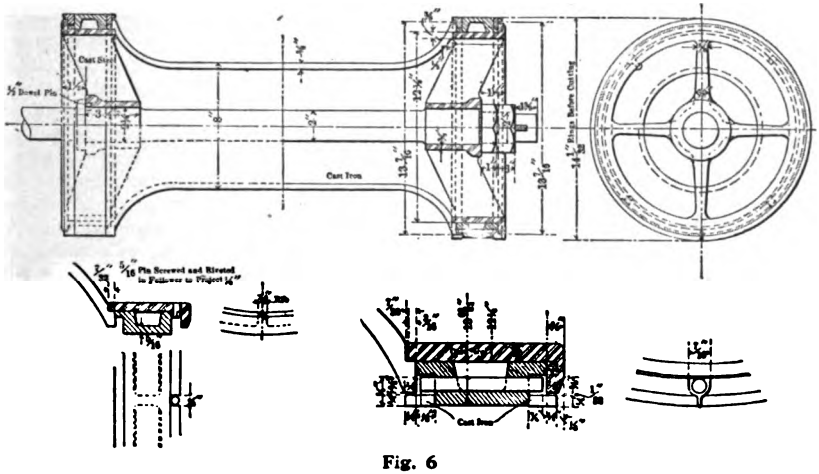

Fig. 6

Advantages and Disadvantages of Piston Valves.—We have thus brought the piston valve down to present day usage, which is well represented by Fig. 6. Some of its advantages are perfect balance, that is, when properly constructed, with just enough area of ring acted upon by pressure to make it properly steam tight, without unnecessary friction; a simpler, lighter, and cheaper cylinder casting; a wearing face separate from the cylinder casting which can be cheaply renewed; ports in cylinders readily made very straight and direct; and its adaptability to any design of valve gear, since it can be placed above the cylinder, between the frame rails, or in any other position with equal facility. Its general tightness to steam is conceded by engineers on both sides of the water to be about equal to a

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good slide valve. . . . Again, it practically does away with one set of metallic packing, as almost any form of hemp packing is sufficient to hold exhaust pressure, assuming the valve to be of the inside admission type.

On the other hand, it is accused of many shortcomings, most of which can be overcome, and some of which have already been eliminated in special designs in use today.

Many motive power men are of the opinion that an engine equipped with piston valves cannot develop the speed of a slide valve engine, both being otherwise of the same design. The fact that some of our very fastest trains are pulled by piston valve engines would seem to refute this argument; but as many of the older engines had valves entirely too small, these opinions may have been based on such poorly designed engines. Such an opinion might have been formed by comparison with outside admission piston valve engines. This is also unfair, as the outside admission piston valve has a proverbially poor exhaust. Inside admission has become the rule, and special care is at present taken to shape the steam chest covers to direct, and to offer the least possible resistance to the exhaust.

As regards the size of piston valve required, we have many opinions; but it is an established fact that the circumference of the valve, less the space occupied by the bridges, must considerably exceed the length of the slide valve port for a similar bore of cylinder. This is accounted for by the resistance offered by the bridges, and by the fact that the portion of port diametrically opposite the cylinder cannot be so effective as that nearest it. The port should be so proportioned that the area around the outside of the bushing at any point is equal to the combined area of all the openings above this point.

The following table gives recommended diameters of valves for different bores, it being assumed that the sizes given are large enough for the longest stroke commonly used with this bore. The table also shows the net length of the port (with bridges deducted) for each diameter, and the corresponding length of slide valve port in common use.

Diameter of Cylinder.	Diameter of Piston Valve.	Net Length of Piston Valve Port.	Length of Slide Valve Port.
17	10	25	16
18	11	26⅛	16
19	11	26⅛	18
20	12	30⅛	18
21	12	30⅛	18
22	12	30⅛	20
23	14	34	20

Another objection to the piston valve is the fancied increase of cylinder clearance. This, while it may be that clearance is larger in many cases than on a similar slide valve cylinder, is by no means necessary. It can usually be kept between 6 and 8 per cent., except on very short stroke engines, and this is low enough with ordinary valve gear, since the 2½ per cent. of the Allfree-Hubbell system is only made possible by the use of additional exhaust valves to relieve compression. The Allfree-Hubbell valve itself is really an inside admission piston valve, of rectangular shape.

In starting a train, with the gear in long cut off, inside admission valves have a tendency to jump at the moment exhaust takes place. This is very noticeable when there is excessive lost motion in the valve gear. It is caused by the action of the exhaust on the end of the valve, and is worse with a valve follower having a considerable overhang, with a long bevel as in Fig. 4 than for one like Fig. 6. Valves with a large diameter of body, forming a free communication between the opposite ends, to equalize the exhaust pressure and allow part of it to pass to the other exhaust port, rarely exhibit this fault.

The L-ring of the proportions generally used (Fig. 6) is open to another objection—the collapse of the exhaust ring just prior to release, due to the fact that in this position the lip of the ring has long exhaust pressure under it, while it has the pressure in the port on its face. This lip is usually ¼" wide, as on Fig. 6, and it has been found that with this proportion of ring, collapse takes place when the exhaust ring laps the port about ⅛". This suggests the remedy—reduce the lip to ⅛", thickening the body of the ring by that amount. Fig. 5, the standard valve of the Chicago, Burlington & Quincy Railroad, shows such a form (the Clark ring). However, the importance of this evil (the collapse of the exhaust ring) has been somewhat exaggerated. It cannot be detected on the indicator card, since the point of exhaust opening itself is rarely distinct except at very low speed, and the only effect is to round off this corner a little more. It cannot be detected in the sound of the exhaust even with valves having a long lipped ring. Its only effect on steam distribution is to

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cause a slightly earlier pre-release. The worst feature is in the increased wear on this ring and its joint faces, caused by this movement.

The greatest disadvantage under which the piston valve labors is its inability to relieve excess pressure in the cylinder port by lifting, after the manner of the slide valve. This renders some sort of cylinder head relief valve imperative. For this purpose the ordinary spring pop valve is generally used, and although many objections are raised to this device, it has not been proved that pop valves of ample size, properly designed and taken care of, will not eliminate cylinder head breakage, except in cases of deliberate attempt to use cylinders and pistons as hydraulic rams. Various types of by-pass valves are also used with success, in which the pressure in the chest is made to serve in place of the spring, in a manner analogous to the slide valve. The Vogt by-pass valve is typical of this class . . . This valve is open to the criticism of considerably increasing the cylinder clearance, if the passages are made large enough to be effective.

Bushings.—Piston valve bushings ordinarily have from seven to nine bridges, one at the bottom being wider than the others, because of the joint in the packing rings at this point. These bridges, as has been said, obstruct the flow of steam to and from the cylinder by dividing it into small streams, the sharp edges of the ports having more or less of a retarding effect. Authorities differ greatly as to the importance of this evil, but all admit that the fewer bridges the better. If we could do away with packing rings, we could do away with bridges; this brings us to the consideration of the plug valve, which has been used on the Continent in locomotive work, and in an adjustable form by the Brooks Locomotive Works some years ago.

To use a solid, incompressible valve, of perfectly circular section and incapable of accommodating itself to the irregularities of the bushing, requires considerable modification in the bushing itself. In the first place it must be able to expand and contract independently of the cylinder casting; at the same time it must be held in true central position, with the steam edges of the ports always in the same relation to each other and to the cylinder itself. Moreover, at least two steam tight joints must be made on this bushing with the cylinder port walls. The valve must be of such section that it will not expand more quickly than the bushing when it suddenly comes in contact with the entering steam, and should cool at least as quickly when steam is shut off.

These conditions, together with a perfect fit between the valve and bushing, are said to have been met by the Schmidt valve, used in connection with the Schmidt superheater. This system employs for the purpose a double bushing, between the inner and outer shells of which steam has free access, joints with the port walls being made with copper gaskets. The valve is of small diameter, with a double exhaust feature. The system has been tried in this country without much success.

The form used by the Brooks Works was more successful, but has also gone out of use. In this type a single wide ring was used, with water grooves, which was cut in one place, and bolted together by means of lugs on the inside, liners between the lugs providing for accurate adjustment to the size of bushing.

The nearest thing to the plug valve in successful service is the American "Semi-Plug" valve. . . . It is believed that this valve could be successfully used in a bushing without bridges; and aside from this fact the design is undoubtedly most successful from a point of view of maintenance. The American "Semi-Plug" valve is the only working illustration in American practice of the collapsible valve.

As a type of the modern valve, showing the lightest possible construction, combined with great strength, attention is called to Fig. 7, which is the valve used both on the high and low pressure cylinders of the Cole balanced compound. In this the body or spool consists of seamless steel tubing, with light cast steel ends riveted on.

Fig. 8 shows a double-ported valve for the low-pressure cylinder of a Mellin cross-compound, for passenger service. This gives the large port-opening necessary for high speed work, with very large cylinders. The prototype of this valve has long been in successful service in the engines of the battleship Texas.

Lubrication.—That the piston valve is much easier to lubricate than the slide valve is undeniable, since a cut bushing is almost unknown, while the scored valve seat is always with us. It is also true that while the piston valve is used with perfect success, with highly superheated steam, it has been found almost impossible to properly lubricate a slide valve under these conditions.

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There are two methods of applying oil to the inside admission piston valve, each of which has its advocates; the first being its introduction to the center of the chest, or steam passage in the saddle, while the second involves the use of branch pipes which deliver the oil at the passage. The exhaust ring, as has been pointed out, is more or less unreliable, and as a result the oil is blown past it and lost both to the valve and the cylinder. The oil studs should be so spaced, when this method is used, that the valve will just wipe off the drop at the shortest stroke.

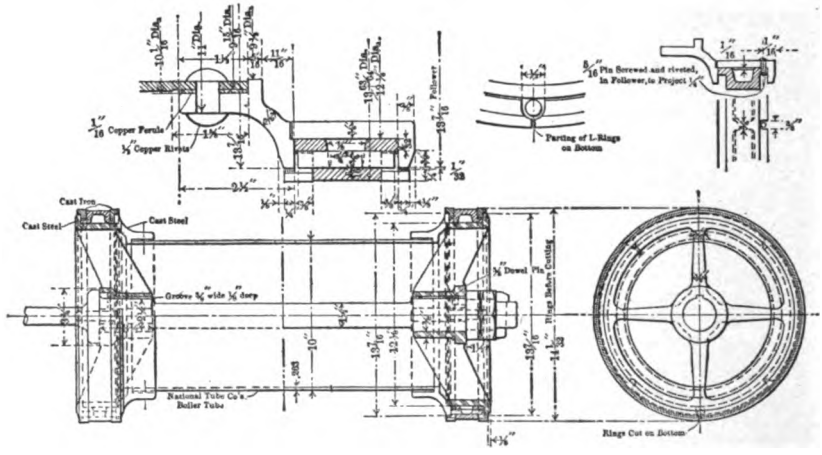

Fig. 7. Piston Valve used on the Cole Balanced Compound Locomotive

top of the valve itself, through a hole in each bushing. This is much more certain and economical, provided the oil holes are not spaced so widely apart that the steam ring passes over them, thereby making it dependent upon the exhaust ring to keep the oil out of the exhaust

The piston valve is daily coming into more general use, as its errors are corrected and prejudice overcome. On some of our trunk lines it has practically superseded the slide valve, and it seems idle to longer deny it at least equal rank with its older competitor.

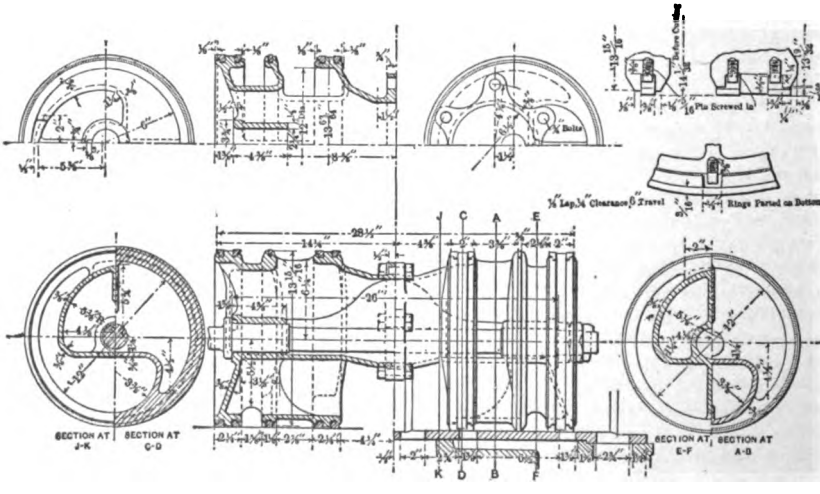

Fig. 8. Double-Ported Valve for Low Pressure Cylinder of a Mellin Cross Compound

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*Western Railroad Activities.**

Automatic Railway Switch Device.—Mark Daniels, a young civil engineer and mechanic, of Berkley, Cal., has very recently devised an effective automatic railway switch that promises to greatly minimize the danger of train wrecks. The invention, though quite simple, proves very effective. By means of an electrical attachment and connection with the semaphores, the latter will show automatically whenever there is the slightest split between the main rail and the switch. The engineer on an approaching train will thus know if the switch is only partially open.

Recently, several very serious railway casualties have occurred in California, all mainly due to partly or slightly open switches, of which fact the engineers were ignorant. With Daniel's device, the semaphore will unerringly indicate if the switch is neither perfectly closed, or wide open, and thus greatly lessen the liability of disasters.

The Daniels switch device has already been adopted on all the coast lines of the Southern Pacific in California.

Western Pacific Crowding Work.—The Western Pacific now has over 8,000 men employed on construction work between Oakland, Cal., and a point 50 miles west of the Utah-Nevada State line in Nevada, and is expending through the San Francisco banks for labor and supplies not less than $1,500,000 a month. Efforts are being made to secure 4,000 more men in order to push the work of completing the new overland line as rapidly as possible.

Work on all the 59 tunnels the road is to have is progressing very favorably. These tunnels aggregate 52,593 feet—within a fraction of ten miles. The longest single tunnel will be 7,294 feet, and is being bored through the divide between the north and middle fork of the Feather River in California.

The Western Pacific officials express confidence that the entire line will be completed by September, 1908. Of the track to be laid between San Francisco and Salt Lake City there will be 380 miles in California, 427 in Nevada and 122 in Utah—a total of 929 miles.

Bids have already been invited for work aggregating $2,000,000 for the company's trans-bay terminal, including a depot on the Oakland water front. Contracts for this immense work will soon be awarded.

Tunnel Reopened.—After being closed for several months the Santa Fe's Franklin tunnel has been recently reopened. This tunnel is a mile long and extends under the undulating hills southward of Hercules and Port Costa, Contra Costa County, Cal. The tremendous rains of the past winter caused cave-ins and other complications in the long-short-cut, and for some time the engineers were badly puzzled with the problem of restoring the long hole to usefulness. But at length the Franklin tunnel has been securely walled and lined with concrete and now defies seepage waters.

Will Abandon The Suisun Run.—Plans of the Southern Pacific Company to abandon the Suisun-Benicia Run and send its trains through Jamison Canyon via White Sulphur Springs to San Francisco, and from South Vallejo to the Contra Costa Shore, have just been made public. The reason for the change is that the extensive sinks and tide marshes near Suisun have proved an immense drain on the company's finances in the past in the way of perpetual repairs; that, after all the work done, the present roadbed is in a dangerous condition, and the engineers estimate that at least $2,000,000 will be required to make the roadbed permanently solid and safe.

New Santa Cruz Broad Gauge.—The new broad gauge line from Santa Cruz to Boulder Creek has recently been thrown open to public traffic. This railway will do away with the transfer of 50 or 60 cars of lumber and other material a day coming from the timber sections of Boulder Creek. Few persons realize the vast timber resources that exist in the Santa Cruz Mountains, and this new line extends far toward the heart of this great forest belt.

Bridge Tender Gets His Pension.—About three years ago Mr. Harriman established the Southern Pacific pension system, and the very *first* man to be placed on the list was David Close, a bridge tender in Oregon where the road spans the Clockarnas River. For nearly 25 years Mr. Close had watched this bridge. He had not lost a single day in all that time. He had never failed to trudge across the bridge before and after each train had crossed—each time making a close inspection to see that every-

*By J. Mayne Baltimore, special correspondent to the Locomotive Firemen and Enginemen's Magazine.

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thing was secure and that no sparks from the engines had caught. For many years the bridge was an old wooden structure, but five years ago the company replaced the bridge with a modern steel one which required no watchman. However, the veteran was a fixture on that section of the road. He retained his little home on the bank of the stream and patroled the track for a few miles in each direction on a track velocipede. One unlucky day he fell under a train and had a leg cut off. The railway company then retired the grizzled old fellow, granted him a pension, and purchased him an artificial limb. Since then the faithful veteran has lived in his lonely little house at the end of the bridge. Old "Uncle Dave" is a great favorite with all the conductors, engineers and firemen on the road.

Surveying Line for Coast.—At present the Southern Pacific is making preliminary surveys along the coasts of Humboldt and Del Norte Counties, Cal. This is a part of the plan to have another trunk line between San Francisco and Portland, Oregon, via Santa Rosa, Eureka, Crescent City, Marshfield on Coos Bay in Oregon, and thence by way of Drain. The surveyors are now working in a very difficult country, along the heads on the south coast of Del Norte County, and the work is progressing slowly and with great difficulty.

Will Run Trains to Seattle.—Southern Pacific officials state that when President Harriman completes his extension from Portland to Seattle, it is his intention to run passenger trains without changing between San Francisco and Seattle, in order, as far as possible, to offset the proposed improvement of the Pacific Coast Steamship Company's service between the same points. This extension is to be 180 miles long, and will run through Tacoma and Vancouver on its way to Seattle. In both Seattle and Tacoma, Mr. Harriman intends building extensive freight yards and passenger stations at a cost of $500,000 or more. Work on the new road, which will be known as the Oregon and Washington line, is being rushed to completion.

To Build Line Over The Sierras.—That the Southern Pacific will soon build a double track railroad from Reno to Roseville, Nevada, over the Sierra Nevada Mountains, has been confirmed by Superintendent Palmer, of the Western Division. The new line, which parallels the old one, will be constructed to handle the rapidly increasing traffic with more speed and safety. Work, according to Superintendent Palmer, will be commenced very soon. He also stated that he did not think the work on the Sierra tunnel would start for some time.

The railroad officials also state that the Southern Pacific is going to allow the Riverside Railroad to retain its right of way secured on Southern Pacific ground, which was very recently done when the former road laid 2,000 feet of rails under cover of darkness, but a lease is now being negotiated with the street car enterprise.

Harriman Lines Building Side Door Coaches.—For use on some of his western lines, President Harriman is having built at the Southern Pacific's great car shops at Sacramento, a number of new passenger coaches which will have side doors instead of end doors. Mr. Harriman believes that coaches thus constructed will be much stronger and more enduring than the style now used, and that in case of wreck there will be little danger of the coaches telescoping each other. These coaches will have a small passage way by which passengers may go from one coach to another, but it will be so arranged that it will not weaken the end walls of the car. Another feature of these coaches is the use of round instead of square windows. New patent ventilators now being used by the Union Pacific on its motor cars will be placed on these new coaches, and the cars will present an appearance so little in common with the ordinary coach that they will at first hardly be recognized as a passenger vehicle. Some of these new style coaches will be placed in commission before a great while.

Millions to be Spent for Cars.—Both the Santa Fe and Southern Pacific officials, who have made a close study of the subject, state that all the roads in this country are this year spending nearly a billion dollars for new cars, locomotives and additional track facilities. They state it is estimated that if the manufacturers are equal to the test, between 340,000 and 350,000 freight cars, fully 5,000 passenger coaches and 6,000 locomotives will be added to the railway equipment. It is expected that the "banner year" of 1905, when more freight and passenger cars and locomotives were turned out than during any other year in railroad history, will be surpassed.

The capacity of the manufacturing

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plants has increased since then and it is known that on January 1st last 170,000 freight car orders had been already placed.

Of course this means that the shops of the country would have been kept busy until September 1st, even though not another car had been ordered. Since that time it is estimated fully 100,000 freight car orders have been placed, and, judging from the first three months of the year, orders will reach 350,000. The record of 1905 was 341,315 freight cars. Last year the railroads purchased 310,000 freight cars, 3,400 passenger cars and 5,650 locomotives.

It is estimated that the railroads will pay fully $92,000,000 for steel rails during 1907. Should this prove true, the steel mills will have to turn out about 3,300,000 tons of that product. Last year the total output was about 3,250,000 tons. It is claimed that the Western roads alone will use fully 1,600,000 tons of rails and that nearly 1,000,000 tons of this will be rolled in the Eastern mills.

Difficult to Secure Labor.—Western Pacific officials state that it is difficult to secure workmen on the lines of that company now being constructed in California. One thousand more men are now needed on the new line between Oroville and the Nevada State boundary line. More men are also required near Sterling and Chico, where 250 miles of road are to be constructed; also at Spring Garden, where a big tunnel is being bored. New railway camps are being established all the time and more laborers are in constant demand. The demand is very active but the supply scarce.

Plans for Western Pacific.—Plans for the Western Pacific Railroad ferry depot on the Oakland water front are nearly completed. There will be two slips at the Oakland mole, one for the passenger boats and one for the freight carriers. These slips will be about 500 feet long, with a water depth of about 15 feet at the end. It is estimated that the work will require about 1,300,000 feet of lumber, and about 3,500 piles, and will cost, including the depot, about $500,000.

The boats will be similar to those of the Key route, and will have a seating capacity of about 1,500 passengers. They will each cost about $220,000.

Regarding the freight proposition it will be the plan to have an immense car flat run between San Francisco and the Oakland mole at stated intervals, to be towed across the Bay by a tug. The depot proper will not be constructed until the work is well under way.

Railway to Mount Diablo's Summit.—A project is now afoot to construct a scenic railroad up to the summit of Mount Diablo in California. This peak stands about 40 miles east of San Francisco and its summit is nearly 6,000 feet above the sea level. The enterprise will be backed by capitalists of Contra Costa. The road will be either a zigzag electric one, or else a cable line running directly up the incline, like the one at Mount Lowe near Pasadena, Cal. Just which system will be adopted has not yet been determined. This will largely depend upon the recommendation of the engineers. Surveys are to commence soon. It is estimated that the road can be built and equipped for less than $2,000,000 and can easily be financed.

Mount Diablo is a very attractive locality and the view from its summit is picturesque and inspiring—extending hundreds of miles and including San Francisco and the Golden Gate. Alameda county has been invited to join in the project. It is claimed that the project will be a very profitable investment.

Installs New Refrigerating Cars.—To take the place of regular Armour cold storage railroad cars, the Southern Pacific Railroad Company has lately received 1,000 of the new 7,500 refrigerator cars lately ordered built in the east. These new cars, together with 7,000 owned by the Santa Fe, are expected to be sufficient for several years to handle all deciduous fruit and vegetable shipments to the East. As shipments increase more new cars will be ordered.

Immense Double Track Operations.—On the Southern Pacific main line between San Francisco and Omaha via Ogden, a great amount of double tracking is being done, which, when completed, will reduce the time from the Pacific to the Atlantic fully twelve hours.

To the 175 miles of double track in operation between Omaha and Green River, Wyo., will be added nearly 200 miles of second track now under construction. The vast undertaking known as the Lane Cut-Off, between South Omaha and Lane, Neb., although 11 miles in length, is the largest feature of the Union Pacific improvement programme now under way. This line necessitates 2,000,000 cubic yards of roadbed excavation and calls for fills of from 300,000

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to 1,400,000 cubic yards. These cuts are of huge proportions. The largest is over a mile long, with an extreme depth of 87 feet. Already two-thirds of the grading is finished and the entire undertaking will be completed by the close of 1907. This cut-off saves nearly 9 miles over the old main line by way of South Omaha and Gilmore. The Union Pacific is also doing double track work. By the close of the present year that company will have a continuous double track line in operation from Council Bluffs to Kearney, a distance of nearly 200 miles.

Important Santa Fe Lines.—The Santa Fe, acting possibly in connection with the Southern Pacific, will soon commence the construction of a railway line straight through from Parkes, Arizona, to San Diego, Cal., crossing the mountains through Palm Valley Pass. Parkes is located on the Colorado River about 200 miles north of Yuma.

The Santa Fe has just completed the construction of a road over 110 miles long from Wickenburg to Parkes, and is now about to bridge the Colorado at the latter point.

It is the expressed purpose of the company to continue the road on from Parkes to Ludlow, a distance of about 115 miles, thus completing a line which will shorten the distance between Los Angeles and the Southern part of Arizona, New Mexico and Texas by many miles. The extension is also to be used to shorten the distance from San Diego to Chicago.

A New Railway to be Built in Hawaii.—Mauna Loa, Hawaii's active volcano, is soon to be girdled by a railroad. The preliminary steps for putting the steam horse along the slopes of the mountain have been undertaken by B. F. Dillingham, of Honolulu, who built the railroad on the Island of Oahu.

The Hawaii Railway is to serve a number of rich sugar plantations in the Hamakua and other northern districts of the island. It will run a distance of 45 miles northward from the town of Hilo. The cost will be about $1,800,000, and the road will be standard gauge. At the present time, the sugar from the plantations is shipped from the shore by means of trolley wires to the island steamers.

This new road will eventually, it is planned, circle the island and in consequence go around Mauna Loa—skirting the lower levels of the active volcano. Traffic would at intervals be interrupted by the flow of lava that occurs on the southwestern side of the mountain. The lava could be easily blasted out after it had cooled.

To Build The Alaskan Road.—E. C. Hawkins, chief engineer of the Oregon and Washington Railroad, which the Harriman System is now building to Puget Sound, has just resigned and will join the Guggenheim and Morgan interests, constructing 590 miles of railway from Katalla to the Copper River country, and to Fairbanks and Eagle, Alaska.

Mr. Hawkins was the chief engineer for the White Pass and Yukon steam road, built after the Klondike discoveries. He is regarded as one of the best engineers in the west. He was also in personal charge of the Harriman work while the entire line between Portland and Seattle was located, and is the man who solved the problem of how to get into Tacoma by locating a tunnel route.

Rapid Progress Being Made.—Very soon the rails of the Western Pacific Railroad will be laid into Western Nevada territory. More than 2,500 men are now being employed on the line out from Salt Lake City and the end of the tracks is now only about 100 miles from Elko. Half of that distance has been graded and it will require but a short time to lay the rails. A crew has also prepared surveys east of Elko for the laying gangs, and still more rapid progress is promised by the officials in charge after the gap into Elko is covered. It will be several months before the completed portion of the road will be opened for traffic.

Speaking generally of the work, J. G. Jamison, division engineer of the Western Pacific, says:

"I can report good work along the line on the California route. The Western Pacific is working more men today than during any other time since ground was formally broken. There are now over 8,000 men employed along the proposed road from Salt Lake City to the end of the route in California."

* * *

Pacific Type Express Passenger Locomotive for the Pennsylvania Railroad.

What is said to be the heaviest and most powerful passenger locomotive in operation at the present time is the Pacific type locomotive which has recently been completed by the American Lo-

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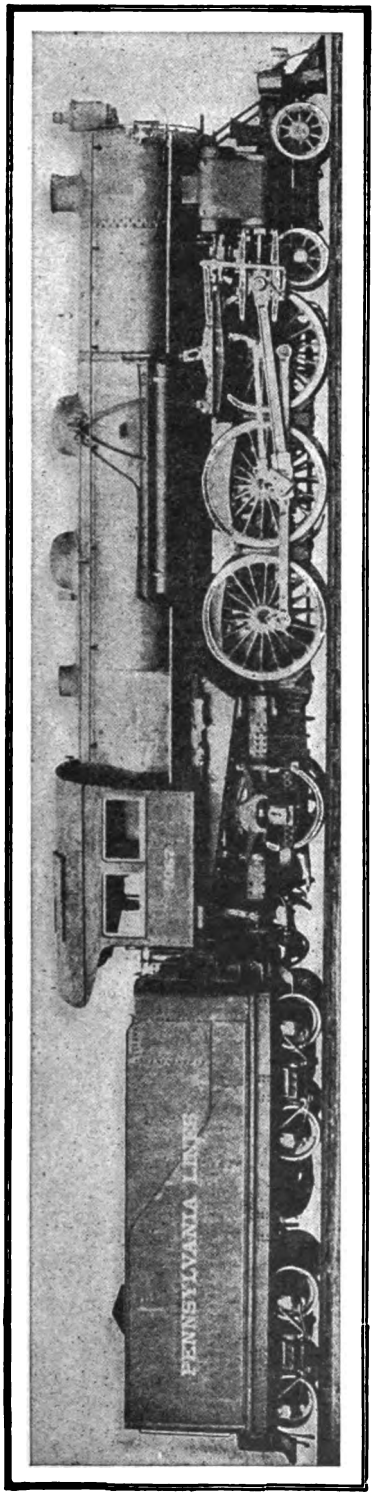
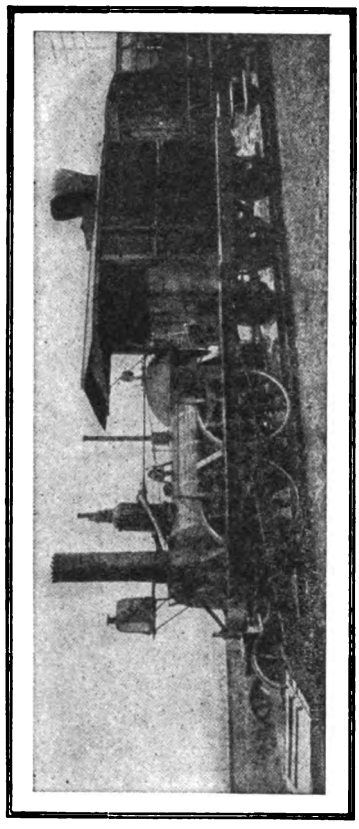


PACIFIC TYPE EXPRESS PASSENGER LOCOMOTIVE FOR THE PENNSYLVANIA RAILROAD



OLD TIME LOCOMOTIVE USED ON THE PENNSYLVANIA RAILROAD

comotive Company for the Pennsylvania Railroad, and which has been placed in service by that company. The tractive power developed by this locomotive is given as fifteen and one-half tons, or 22 per cent. higher than that of the Atlantic type. Owing to increasing passenger traffic making necessary the increase in size of trains from eight cars to that of ten or twelve cars, it was deemed advisable to adopt the Pacific type in order to keep the weight on each pair of driving wheels below 60,000 pounds and gain the required capacity. The locomotive is provided with piston valves which are operated by the Walschaert gear. This locomotive has been carefully designed, and if it fulfills the requirements of a particular division of the road it may be expected to be followed by others of the same type.

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One Cause of Derailments.

The proper location of the side bearings—that is, the distance from center to center—together with the amount of ver-

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tical clearance between them, undoubtedly has much to do with the safe movement of cars or locomotive tenders of different types and dimensions when moving over track of varying physical conditions, and particularly so when rounding curves at different rates of speed. Some inquiries recently made of leading mechanical department officers show that the distance between side bearings of the cars of these companies varies from 42½ inches to 65 inches, while on some locomotive tenders the distance is as great as 88 inches. The amount of clearance between side bearings varies from one-eighth inch to about one-half inch on each side. From twelve important railroads and one private car line the following dimensions are reported as the practice followed on their respective lines: 42½ inches, 48 inches, 51 inches, 56 inches, 57 inches, 59 inches, 60 inches, 62 inches, 63 inches and 65 inches, and for tenders, 88 inches. On some roads the practice or standard is the same for all kinds of cars and locomotive tenders, no distinction being made between gondola or hopper cars used in ore or coal traffic, and furniture and refrigerator cars, or tenders.

The views held by the ablest mechanical officers in the country are in many cases directly opposite, and while it would appear that there are more cars at present with the side bearings 60 inches between centers than of any other dimension, yet there are many only 48 inches between centers, and the officers who have adopted this small dimension as the best practice to follow support their position with a record of extensive experiments with side bearings at different locations which seemed to justify their conclusions and practice.

Certain known conditions of track superstructure must exist, of course, in order to insure the safe movement of trains both on tangents and curves. Likewise the equipment must be designed and built with a view to its safe movement, it being quite as essential that the cars and locomotives should be free from defective design, construction or physical condition as the superstructure which supports them. Of the numerous dimensions for locating side bearings observed by different roads, some certainly are not as well adapted to the safe movement of cars at different speeds as others, and it, therefore, appears to be a question that not only justifies, but seems to require, immediate attention; in fact, it seems of sufficient importance to warrant some process of analysis that involves determining by exhaustive experiments such a combination of dimensions, types, location, clearance, etc., as is best adapted to different types of cars and engine tenders at different rates of speed on a superstructure of known conditions. Derailments of refrigerator, carriage and furniture cars on curves, because of their high center of gravity under load, are good subjects on which to base investigation and inquiry and with which to conduct experiments in an effort to arrive at some uniformity of standard.

Recent articles in the technical journals have brought into prominence the fact that there are among engineering and maintenance of way officers distinct differences of opinion in reference to superelevation and other track conditions that exert more or less influence on the safe movement of trains. That track elevation on curves is based on correct principles no one with the slightest knowledge of the laws of moving bodies will question. There may be, and doubtless are, some differences of opinion as to just the desirable amount. Track that is designed for the safe movement of trains at a speed of thirty or forty miles an hour around curves of 10 to 16 degrees, has such elevation of the outer rail as is necessary to counteract the centrifugal force at that speed. An entirely different proposition is presented when these same trains traverse the curve at eight or ten miles an hour. The car which would safely and easily round the curve at the higher rate of speed would at the lower rate of speed, in the absence of centrifugal force, bear heavily on the inside side bearing and the rear wheel of the truck would hug closely the inside rail. The distance of the side bearing from the center plate is the measure of, or governs the proportion of, the total weight of the car resting upon the inside bearing under these conditions. The closer the bearings are located to the center plate, the greater this weight; the greater the distance, the less the weight. It is also true that the greater the amount of weight supported, the greater the friction or the resistance to the swiveling of the truck. If the sum of the forces opposing the swiveling of the truck exceeds the pressure of the flange on the leading outside wheel against the railhead, then the wheel climbs the rail and a derailment follows.

It is therefore evident that under fixed

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or known conditions of track and equipment, considering the distance between the side bearing and the center plate and the center plate and the outside leading wheel as lever arms, the matter is susceptible of mathematical demonstration, both as to the cause of the derailment and the proper remedy therefor. But operating conditions are so varied that any result thus obtained theoretically, based on a given set of conditions, would, of course, require modification to meet different conditions; therefore it would seem that the "happy medium" which would prove the best of all conditions could best be found through a series of practical experiments under proper engineering supervision. The subject is of sufficient importance to warrant the expenditure of considerable money to the end that the best known types of center plates and side bearings be determined, together with their proper location and the amount of clearance for different kinds and types of cars, locomotive tenders and trucks; special care being taken, for example, to differentiate between trucks with springs located centrally over the arch bars and those having short truck bolsters with springs located inside of the truck frames; also to observe the difference in the action of steel car frames as compared with wooden frames. The former, on account of their greater rigidity, do not yield to undulating track and curve elevations as do cars of wooden construction, and this may be a factor to be taken into consideration in an experimental study of the problem.

Interstate Commerce Commission reports show that during the past year 381 persons were killed and 4,362 injured by derailments in the United States, a total of 4,743 who met with accident from this one cause. In addition to these there are doubtless many hundreds of derailments which are never reported, such, for instance, as cars in freight trains getting off of the track and being derailed without serious delay or injury. All such derailments, together with those which have had more serious consequences, evidence the need of some combined effective effort to minimize their number.

This is a problem which can not be solved by any one person or any one department, but it is too important to be ignored as it evidently is now by many companies. It is worthy of careful study, theoretical and experimental, by a committee of competent men representing the mechanical, operating and maintenance of way departments, which should determine some standards for future guidance.—The Railroad Gazette.

The Consideration of Locomotive Designs.

"In a news item in our last issue," says the Railway and Engineering Review, "mention is made of the Pennsylvania Railroad having assigned a competent engineer to the task of making an exhaustive study of the lengths of times in service exhibited by locomotives between shoppings. At first, such a study might be considered to produce results of no very great value. A little consideration, however, will bring to mind the fact that such a study offers many possibilities. At present, the records of any line will give a perfunctory idea of the average mileages between shoppings locomotives of the general classes will exhibit. Aside from wrecks and like extraordinary damages, it is the usual practice to shop locomotives chiefly from inspection of the monthly condition reports. On most lines there is a more or less classification and study of the daily engine failure reports. But as to the comparative efficiency of the various types and classes of locomotives as regards their ability to stay in service, on any line with which we are familiar, there is little real specific knowledge. The study in question will reveal not only this, but the good and the weak points of each particular design. Since it will undoubtedly continue on into the individual repair statements and ascertain the character of the repairs for which the shoppings were given, the inquiry will undoubtedly bring out into needed light the relations of many particulars of design to which the necessary consideration has not heretofore been given. This alone would on any line be well worth the time and expense of such a study, for it will tend more to accomplish what the mechanical engineer's daily summary and monthly analysis of engine failure reports aims at but does not very successfully obtain, viz., the bringing out of the defects of design. In the new locomotive designs brought out to comply with the demands for increased power during the past decade the ability to stay in service has been necessarily lost sight

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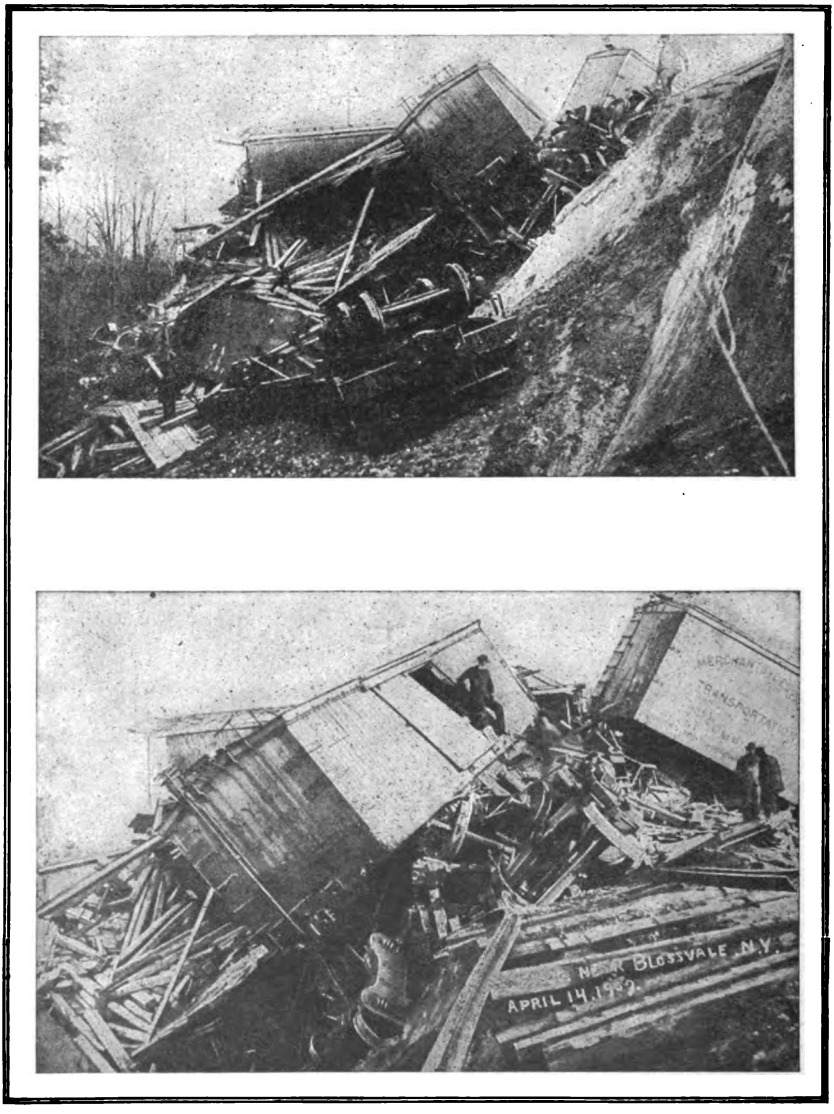
of to an undue degree. Hence it is well that we should at this time take up the careful consideration of our new designs from this standpoint. And certainly no better means of deriving the data for such consideration could be imagined than this plan of commencing with the actual mileage exhibited and the reasons therefor."

Wreck on the R. W. & O. Division of the New York Central.

The illustrations herewith are of a freight wreck which happened on the night of April 14, 1907, on the R. W. & O. Division of the New York Central. Our correspondent states that on the night in question train No. 23 of the



WRECK ON THE R. W. & O. DIVISION OF THE NEW YORK CENTRAL, NEAR BLOSSVALE, N. Y., APRIL 14, 1907

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Rome and Richland branch, running as a double-header, with engines 1726 and 1863, and consisting of sixty cars, some loaded with coal and other freight, when at a point about two and one-half miles south of Blossvale, N. Y., the bank on the lower side of the track slid away, causing the two engines and fifteen cars to plunge down the bank, which was about sixty feet high, carrying both engine crews with them. Fireman E. J. Hartford, who was firing engine 1863 for Bro. I. F. Losch, of Lodge 638, B. of L. F. and E., was killed, while the remainder of the crews were slightly cut and bruised. The leading engine, No. 1726, is shown at the extreme left of the picture at the foot of the embankment with her driving wheels up, while the second engine, No. 1863, lies on her side with the stack and upper part of the boiler showing, the rest of the engine being covered with wreckage. Both Engineer W. A. Daring, of Division 227, B. of L. E., and his fireman, L. B. Joyce, of the leading engine, No. 1726, were thrown to a point below their engine not shown in the picture, receiving severe cuts and bruises, but were not seriously hurt, and Engineer I. F. Losch, of engine 1863, escaped without injury. A box car, together with ties, had to be moved before the body of Fireman Hartford could be recovered, which required several hours' work on the part of two large wrecking cranes. Firemen Joyce and Hartford had been firing only a short time, and were not yet members of our Brotherhood.

*Switch-Closing Devices and Switch Protection on Main Tracks.**

Railway accidents in which the condition of the track structure plays a contributing part are not rare, although less numerous than those in which defects in operating conditions and discipline are the primary cause.

During the past few weeks accidents due to defective track have been brought into unusual prominence by a series of derailments on important railways. These particular accidents have directed attention principally to the desirability of a general improvement in the construction and maintenance of track on heavy main lines in order to bring it into (and keep it in) proper relation with the character of the traffic which is imposed upon it. This is undoubtedly a matter that calls for very careful consideration at this time, but there are certain features of the track, however, which are weak points in themselves, irrespective of traffic conditions.

One of these features is the main track switch, as ordinarily applied at sidings and yard entrances. The old stub switch has practically disappeared from main track service, the construction of the split switch has been improved and strengthened materially, and some roads have taken important steps in reducing the number of facing switches on double-track lines. The great majority of main-line railway mileage is single track, so that facing switches must necessarily exist, but it is in regard to safety in operation rather than as a track appliance that the ordinary switch is a weak point.

The development in the use of block signals and interlocking plants during recent years has been very extensive. But in spite of this, on railways of both light and heavy traffic, trains of all classes are daily run against facing switches fitted simply with a common hand-lever switchstand locked with a common padlock, and having no warning device beyond a lamp and target on the switchstand. During 1906 there were reported fifty-five accidents where a train ran through an open switch and collided with a train on the siding, or was derailed on the turnout; in these accidents sixty-five persons were killed and 303 injured. There were undoubtedly many more accidents which were not sufficiently important to be reported. The disaster due to an open switch of the class above noted in the face of the "18-hour flyer" on the Lake Shore & Michigan Southern Ry., near Cleveland, Ohio, in 1905, was a sharp reminder of the risks run and chances taken daily even by high-class trains on high-class railways. The open or misplaced switch, however, causes accidents to trains of all kinds on railways of all classes, with light as well as with heavy traffic. The loss of life and property in a single accident of this kind, with a passenger or freight train running even at moderate speed, may easily be great enough to warrant considerable expenditures for the double purpose of preventing the switch being left open and of warning the engineman of an open or obstructed switch.

*From Engineering News.

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This state of affairs has led inventors to the design of switch-closing devices operated by main-track trains approaching the turnout, and intended to automatically close switches which may have been left standing open in the face of such a train. Such devices have recently been experimented with on two or three railways, although certainly not with any view to their adoption, and indeed they introduce new dangers in themselves. It may be said most emphatically that however perfect such devices may be mechanically, their use is based upon an erroneous idea, for which, however, the railways are largely responsible from their very general failure to equip main-line switches with the protective apparatus which should be provided. The purpose of the switch-closing apparatus mentioned is to prevent accident in the event of the failure of a brakeman or switchman to set a switch for the main track after opening it to allow a train to enter the siding. The idea that trains (whether of low or high speed) may be properly or safely run against facing switches under the protection afforded by automatic switch-closing devices of this kind is certainly not consistent with good railway practice. But in view of the fact already noted, that many trains each day run against facing switches which have not even this protection, it is not difficult to realize that many an inventor or railway employe sees a great field open for an automatic switch-closing device by which a train may protect itself.

There is, however, another class of switch-closing device which is not inconsistent with the principles of railway operation and which has a certain legitimate field of application as auxiliary to other apparatus. The devices of this class provide for the automatic closing of the switch by the train which has entered the siding, and some of them have been tried experimentally. In purpose and principle they differ materially from those of the class first mentioned. The principle is the closing of a switch behind a train, so as to keep the switch normally set closed for the main track and to prevent it from being left open carelessly. In the previous case, however, the switch may be left open, but in the emergency of a main-line train approaching it in this position as a facing switch, it would be automatically closed in the face of the train by means of a device operated by the train itself. The one is a safety device to prevent the dangerous condition of an open switch in a main track. The other permits this dangerous condition to exist, but provides an emergency device to remove it when danger is imminent. Apart from the fact that the latter is inconsistent with proper principles of railway operation, as already stated, the difference between the safety device and the emergency device is obvious.

Safety switch devices to prevent switches from being left open were tried many years ago, but were either unreliable or in other ways unsatisfactory. The earliest form was the drop-lever switch-stand, having a weighted lever to return the switch rails to the closed or main-track position as soon as released. The brakeman, however, soon learned to save his time and muscle by propping up the lever with a stick, and of course not infrequently forgot to remove the stick. Another device was a cabin or "dog-house" enclosing the switchstand, so arranged that a man could not open the switch without going into the house and could not then get out as long as the lever was in position for an open switch. This was tried many years ago both in this country and abroad.

The devices which have already been given an experimental trial on two or three different railways, as mentioned in our opening remarks, belong to the "emergency" class devices, which provide for closing the switch by the approaching main-line train instead of by the retreating train on the sidetrack. In most of the devices of this sort, the mechanism is entirely too complicated or in other ways impracticable to be considered for actual use, and many of them embody the serious objection of having a spring connection to the switchrod, while modern practice is decidedly in favor of a rigid connection between switch, switchrod and switchstand. This objection is eliminated in some cases by utilizing the spring connection only at the instant of automatically closing the switch, the connection with the switchstand being rigid at all other times, whether in opening or closing. If the track device struck by the engine operates the switch directly, through the medium of rods, etc., the apparatus would be liable to injury when operated by trains running at high speed, but if this track device simply trips the operating spring this objection need not apply. Of course provision is made for trains taking the siding, as by waiting to

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open the switch until the engine has passed the trip, the train normally coming almost to a stop to enable the brakeman to run ahead and open the switch. It is a comparatively easy matter to design an automatic switch-closing device which will be as simple and reliable as a spring-rail frog, but as already stated, there are fundamental objections to the use of devices of this kind.

With these devices excluded, we have to consider the general question of the protection of trains at turnouts. The use of the common switchstand operated by the trainmen and unprovided with any safeguard should not be permitted at main-track switches; and the more important the traffic the more important becomes the application of this principle. All main-track turnouts on lines with important traffic, but not having block signals, should be equipped with interlocking switch and signal plant (including distant signals), and controlled by an operator in a tower instead of being operated by the train men. Where the traffic does not appear to warrant this expense, the switch should be provided with a distant signal, automatically operated by mechanical or electrical connections from the switch or switchstand, so as to give an engineman warning of an open switch at a sufficient distance to enable him to bring his train to a stop or at least reduce speed before reaching the point of danger. It is true that there is a large number of accidents due to the failure of enginemen to see or obey signals, and it has been suggested that a switch-closing device might be used as an additional safeguard. An auxiliary device to automatically apply the brakes on a train passing a "stop" signal would be, however, much more consistent with operating principles than a device to close the switch, especially as the "stop" signal might be displayed to protect a train that had not cleared the switch. In such case, the switch-closing device would not prevent collisions.

In connection with this question of switch protection it is important to note that the committee on track, of the American Railway Engineering and Maintenance of Way Association, in its report presented at the annual meeting in Chicago, March 19-21, recommends that where trains run at over thirty miles an hour, main-track turnouts should be equipped with distant signals and facing-point locks. Their recommendation was not adopted, for the reason that while it applied to switches on track not having block signals or interlocking, it involved apparatus similar to that employed at interlocking plants. It was considered that this might be misleading, and the matter was therefore referred back to the committee for further consideration, with instructions to confer with the committee on signaling and interlocking. The general principles for switch protection were not questioned, and the recommendation as presented was as follows:

For railways where speed exceeds thirty miles per hour, main-track turnouts should be equipped with semaphore type of switchstands with distant signal, reinforced switch points, facing-point lock, and reinforced spring-rail frog; also, upon sidings where cars are allowed to stand and upon passing sidings with a derail to operate in connection with main-track switchstand.

The type of switchstand for facing-point switches as recommended is intended to correspond with the practice of interlocking signals; upper arm governing main track routes and lower arm governing sidetrack routes, and is for switches where interlocking has not been established. At points where the speed of trains is greater than forty-five miles per hour, the committee thinks it impracticable to operate wire-connected or pipe-connected distant signals, and would prefer at such points distant signals of the electric type.

Main track switchstands should have the following parallel throw: There should be two levers, one to operate the facing-point lock and the second to operate the switch. These two levers to be so arranged that it will be impossible to get clear signal for the main track unless the switch is locked for the main track.

Where the automatic block signal system is in use, of course, a train approaching an open switch would be warned by one or more signals,, but this system is in use on only a very small percentage of the vast mileage of main-line railways. There are, however, numerous devices for automatically operating mechanical or electrical distant signals from the switchstand, some of which have been described in our columns. Several railways are using protective appliances of this kind, as was shown in an abstract of a paper in our issue of September 21, 1905, but unfortunately neither these appliances, switch interlocking plants, nor

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block signal systems are in use to anything like an extent commensurate with the requirements for the safe handling of traffic under modern conditions of railway service.

While accidents due to misplaced switches are far too numerous, it may safely be said that the use of automatic switch-closing devices operated by approaching trains is not the proper remedy, for reasons above given. There does, however, seem to be a certain field for a device which will automatically close a switch behind the inferior train taking the side track, instead of in the face of a train approaching on the main track.

In conclusion it may be said that this matter has nothing to do with the question of high speed, except that the severity of accidents will of course be in some proportion to the speed. The question is that of the protection of the regular traffic, whether passenger or freight, and not simply that of protecting fast trains. The most effective remedy for the existing troubles is to adopt the block-signal system and to take the handling of the switches out of the hands of the trainmen. For lines where these steps can not be taken, there is a remedy in the use of automatic distant signals at switches, with switch-locking apparatus, and perhaps also with an auxiliary in the form of a device to keep the switch set for the main track except when in actual use to admit a train to the side track.

* * *

Wreck on the Buffalo, Rochester & Pittsburg Railway.

A disastrous freight wreck, said to have been caused by failure of air brakes to operate on a steep grade, happened at Silver Lake Junction, on the Buffalo, Rochester & Pittsburg Railway, on the morning of January 12, 1907, resulting in the death of Conductor John F. O'Brien, of train No. 28, and the demolition of the locomotives and forty-eight cars of trains 28 and 29.

From the Rochester Democrat and Chronicle of January 13, 1907, we learn that:

"While descending the steep grade coming in to Silver Lake Junction, No. 28, which was bound for Rochester, reached a high speed, the rails being slippery, and Engineer Egger applied the air brakes. They failed to work. It is said that Conductor O'Brien was riding on the engine and immediately started back over the train, setting the hand brakes as rapidly as possible. The engineer sounded the whistle for brakes repeatedly and the whole train crew bent every energy toward getting the train under control, as only a mile ahead they knew the other freight train was waiting for them. Their efforts were fruitless, as the wheels slid along the slippery track and the speed of the train was not perceptibly diminished.

"The train crew and engineer saw that it would be impossible to stop or control the train before the meeting point was reached, and the whistle was sounded continuously to warn the crew of the waiting train of the peril. At this time train No. 29 was just pulling into Silver Lake Junction, assisted by a pushing engine. It was only a little more than moving, on account of the steep grade and the fact that the engineer and conductor knew they were to meet No. 28 at the junction. They heard the blasts of the whistle of the runaway train, but before No. 29 could be brought to a standstill and backed on the siding, the train of heavy coal cars crashed into it at high speed.

"The crews of both trains knew what was coming and all but Conductor O'Brien sought safety in jumping. O'Brien stuck to the work of setting the brakes. When the trains met the heavy cars piled up to a height of forty feet. The mass of wreckage buried the tracks and siding, blocking all trains for hours.

"The trains had hardly come to a complete stop when it was found that Conductor O'Brien was missing, and it was feared that he had been buried under the coal and heavy wreckage.

"Wrecking trains were dispatched to the scene of the collision from Rochester and Bradford, and after many hours of hard work the body of O'Brien was taken from the debris. It was found near the center of the train, buried under tons of coal and heavy car timbers. Death probably was instantaneous.

"Otto Egger, engineer of the runaway train, jumped when he saw the freight train coming into Silver Lake Junction. He escaped with a wrenched leg and several cuts and bruises, and was able to go to his home in a carriage. He is not seriously injured. James Morrow, of

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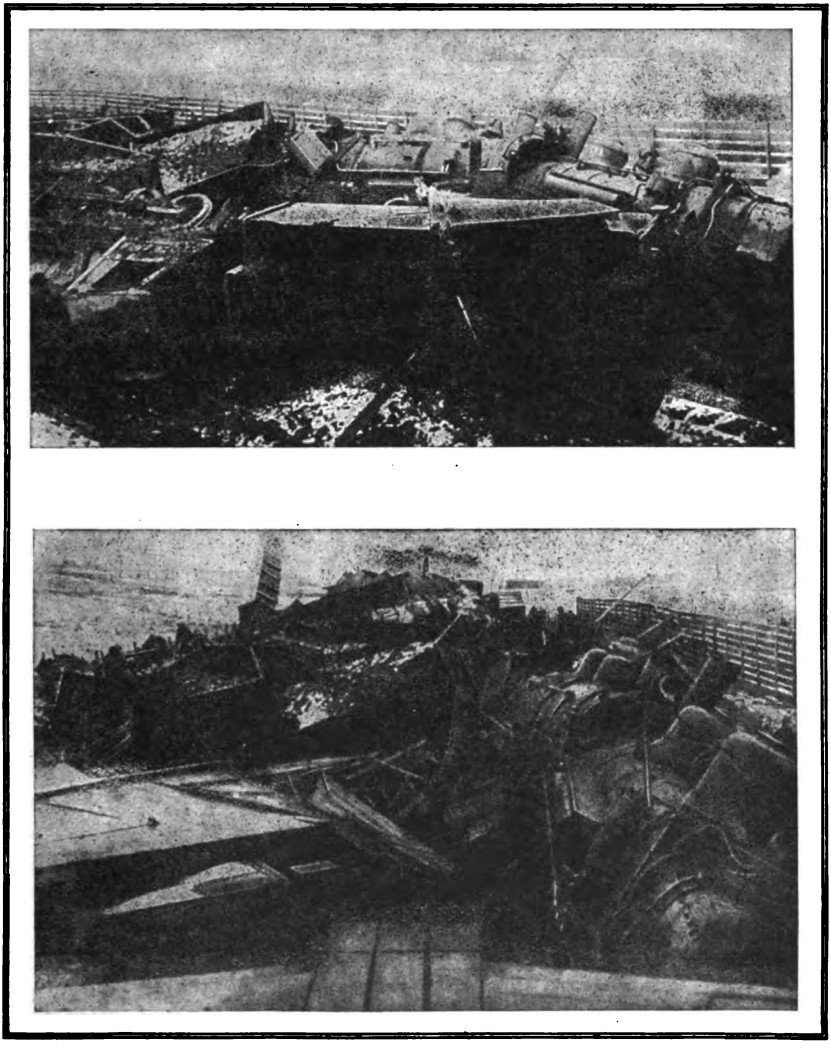
Mt. Jewett, Pa., and Engineer William E. O'Brien also received slight bruises. But for the notice of the approach of the runaway train sounded by the whistle, it is likely that every man of both crews would have been killed.

"Both Egger and O'Brien are credited with being careful railroad men, it is said, and but for the failure of the air brakes to work the accident would not have occurred. This, with the fact that the accident occurred on a heavy



WRECK ON THE BUFFALO, ROCHESTER & PITTSBURG RAILWAY AT SILVER LAKE JUNCTION, JANUARY 12, 1907

"The heavy engines grappled for a moment in a death grip. Then the force of the heavy cars behind the northbound train was exerted and Egger's engine plowed its way into train No. 29. . . . grade, made the application of the hand brakes, after the train had reached a point within a mile of the meeting point, without avail in preventing the collision. . . ."

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Locomotive Performance Data Developed at Purdue.

It seems curious in the light of recent experimental information that has been obtained regarding the action of the several parts of the locomotive, that the world should have waited for it so long. It is not so very long ago that the use even of the indicator upon the locomotive was rare or unknown, and our only means of testing, if it could be called testing, was to ride upon the engine and observe general results. This was followed by road tests that involved so many variables that the real object of the work was sometimes buried beneath a mass of uncertainties. So when it was proposed by Purdue University to build a laboratory plant upon which a full-sized locomotive could be tested under constant conditions it was received with the warmest acclaim by the railroad world and the greatest interest was at once manifested in the probability of obtaining valuable results. Whether the promoters of the scheme had a clear idea of what was to be the outcome, we are not informed, but if they had they must have been endowed with a most remarkable foresight.

The Purdue testing plant has given rise to others, and the results of the investigations that have been made have been so prolific of good that this method of testing has now come to be recognized as the only one upon which reliance can be placed, and the records of Purdue and St. Louis form the most valuable contributions to the literature of the locomotive extant. When it is remembered that in 1890, before the opening of the Purdue laboratory, we had no definite idea of how the draft of a locomotive was produced and that every engine driver was a law unto himself as to the adjustment of the smokebox details; that the action of the fire was almost unknown; the influence of tube length a mystery; the quality of steam supplied to the engine a pure guess, and the economical efficiency of the machine, as a whole, a matter upon which there was a general agreement to the wrong, namely, that it was extravagant in the use of coal and steam, we can see that much was to be learned, much more than was realized at the time.

Seventeen years of constant, painstaking effort has borne fruit a hundredfold, and we have learned so much that we are realizing more and more every day how much there still remains to be done. We have learned that there is a scientific method of adjusting diaphragm and petticoat pipe and stack and netting and front end proportions in order to secure maximum efficiency with a minimum of back pressure, and if this one thing were all that we had to show, it would fully repay for all the trouble and expense. To remove the smokebox from the realm of guesswork and settle definitely the relation of steam jet to entrained air, and size and diameter of stack was a great achievement and deserves all the praise that has been given it.

Then come the clear cut, definite statements that have been made regarding the value of high steam pressures. In the early eighties, when 125 pounds was the standard, it was felt that more would be better and tentative efforts were made that soon raised that standard to 140 pounds. Then as facilities for boiler construction were increased, the pressures advanced by leaps and bounds until now many engines have been built designed for 200 pounds, for use with simple expansion, but here the warning hand from Purdue has been raised and we are given an unmistakable demonstration, admitting of no criticism, that we are too high and that 185 pounds is the point at which steam pressure in a single-expansion engine reaches its point of maximum efficiency.

And how about the quality and consumption of that steam? We guessed that it was damp and that much water was entrained into the cylinders, and guessed wrongly, for we are now told definitely that though "the locomotive is often credited with carrying over a great deal of water to the cylinders, the tests show that this does not happen under constant conditions of running." Then comes the greatest surprise of all, in the fact that the engine is not only not wasteful but is exceedingly economical in the use of steam and that it is quite capable of developing a horse-power on less than 25 pounds per hour, and that good average practice ranges in the neighborhood of 30 pounds. This is probably at least 25 per cent. lower than the average motive power man would have guessed before this scientific research was placed on record.

We learned many years ago that the boiler was the limiting factor in locomotive performance. Wheels of large diam-

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eter and cylinders of large capacity availed us nothing for the production of high speeds or great power unless we could get the steam with which to operate them. So we increased the sizes of our boilers and added to our heating surface and raised our pressure until we reached the limits of human endurance for the fireman, and also the clearance limit of permanent structures. Then the testing plant at Purdue came to the front and brought out certain points on boiler performance well worthy of attention. We were shown the intimate relationship existing between all of the elements of the boiler and the fuel, and how a change in any one affects the economical operation of the whole. As the draft rises so does the firebox and smokebox temperature, and with this the amount of fuel burned per hour; facts more or less well known, but we did not know just what this relationship was until these reports were published. We can now see how the rate of evaporation falls off as the intensity of the combustion increases, and we are thus able to form an approximate estimate of the values to be obtained from forcing, and their probable cost.

We have been taught, too, a really scientific method of handling the indicator and interpreting its records, and we are shown how a bad adjustment of piping may tell a falsehood under a guise of truth that is worse than misleading, and how many of the conclusions that have been drawn from indicator cards that looked all right may be misleading and not warranted by the actual conditions that exist within the cylinder. The conclusions reached from a study of the indicator work done in connection with the plant are that piping tends to retard the pencil action and that it should, therefore, be short and direct, and that this piping effect increases with the speed of the engine and inversely with the point of cut-off.

A great deal of valuable information has also been obtained regarding the proportions of valves and the effect of lap, lead, travel and inside clearance. In the days when the valve-setter shrouded his work in mystery lead was usually fixed by the arbitrary decision of some one in charge based upon an opinion that had more or less, usually less, of a foundation to rest upon; and inside clearance never existed except where some careless workman had planed out the D of the valve too much. As for the increasing lead that occurs with the shortening of the cut off with the Stephenson gear, there were two opposing camps, with diametrically opposite opinions; one holding that the increase was good and an advantage, and the other the reverse; each having very good reasons for its belief. Hence the careful analysis of these matters that we now have is welcome as a fair referee's decision of a disputed point. It appears that a reduction of lead effects a reduction in the back-pressure losses, but it also reduces the positive work under the steam and expansion lines; and, judging from the cards alone, it would appear to be a fair question whether any advantage had been gained by reducing the lead; but it must be remembered that a reduction in the size of a card does not necessarily constitute an argument against reduced lead. The advisability of the change is rather to be judged by the amount of steam consumed per unit of power. And then it is shown definitely and "conclusively, that the reduction in lead effects a reduction in the amount of steam consumed." This has led to a strengthening of the position of the Walschaert gear with its constant lead as a valuable improvement to the American locomotive.

As for inside clearance, the blowing-through effect, that was formerly feared, has been shown to be "insignificant as far as its effect upon the form of the card is concerned, even though the amount of clearance is as much as ⅜-inch," while the reduction of compression and the freer passage that is given for the exhaust steam to escape to the atmosphere, lowers the back pressure, increases the area of the card and with it the mean effective pressure. This, however, does not mean that there is a saving in steam consumption, for it appears, as would be expected, that "inside clearance results in loss of efficiency at low speeds, but as the speed is increased, the difference in steam consumption for different amounts of inside clearance diminishes" until at high speeds of "fifty miles an hour or thereabouts, we have the same steam consumption for all cases. For speeds above fifty miles an hour, the least steam consumption attends the use of the greatest amount of inside clearance, while the steam consumption for the valve having no inside clearance increases rapidly, with increase of speed beyond this limit." All this has been checked off and corroborated by engines in high speed service, upon which

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it has been found to be necessary to use a liberal amount of inside clearance in order to obtain the required speed and tractive power.

So it runs, through a wide gamut, in the performance of the locomotive, and we find that the sum of our knowledge has been vastly increased since the first days of the Purdue plant, and the generalizations that have been drawn regarding the action and interaction of the several parts are having their influence along the whole line of American practice. It is quite true that the specific conditions that may have exercised great influence on the engine used for the greater portion of this work, may not exist in others of different types and weights, but this will not necessarily vitiate the results.. So that the broad generalizations that have been put forth regarding boiler, cylinder and engine performances, with the resultant drawbar pull and the losses that occur between the indicated and the actual work of the locomotive can be accepted as very nearly accurate.—The Railroad Gazette.

Engine Failures and Man Failures.

It sometimes happens that what is termed an engine failure results from a lack of knowledge, or of ingenuity on the part of an engineer, and by his not being able to meet an emergency when it arises. Every precaution should be taken by the roundhouse force to maintain the engine in proper condition, and the engineer should be educated to realize the responsibility of his position and to develop ability to fight failures under reasonable conditions, and bring the train to the terminal on time or with as little delay as possible.

For instance, a broken lubricator sight feed glass should not cause a failure if the auxiliary oilers are in condition to be used. A case which occurred in connection with a broken link hanger shows the value of ingenuity in preventing engine failures. By blocking the link on the broken side at such a cut-off as to insure time being made and by using the good side at any cut-off to enable the engine to start the train or to make time over the hard portion of the road, an engineer brought in a train with comparatively little delay under conditions which would cause some men to tie up a division.

There are many instances where the high grade engineer prevents failures and is hardly recognized properly by either the mechanical or operating departments. The master mechanic or traveling engineer who can so interest his men as to make them equal to emergencies will be able to reduce engine failures and to increase his value to the company. The service obtained by reason of interest taken by engineers and shop forces, and which is not included in the schedule under any rule of compensation, is the service that makes efficiency in transportation.—Railway Master Mechanic.

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Technical Contributions

SQUARING VALVES WITH THE WALSCHAERTS VALVE GEAR

BY WILL W. WOOD

A correspondent asks the following questions:

First.—How can an engine with the Walschaerts valve gear be squared up in the cut-off when she takes steam, say at six inches at one end of the cylinder and at eight inches at the other end, and different at each side of the engine?

Second.—How can an engine with Walschaerts valve gear be squared up in the cut-off if she takes steam the same at both ends of the stroke, on both sides of the engine, but one side cuts off both ends at, say six inches, and the other side cuts off at both ends at eight inches?

Third.—How can an engine with Walschaerts valve gear be squared up in the cut-off, at all, anyhow?

The third, and last, question is paramount, and a detailed answer to it will cover the other two. In transferring attention from the common link motion to the Walschaerts valve gear, one should leave to the former type many of the cares incidental to its maintenance, and—if an engineman—forget many of the expressions used in allusion to the link motion, especially that one of "squaring the valves."

It should be understood, first of all, that the Walschaerts gear contains no provision for adjusting the position of the valve, and is set up so rigidly at erection that if the valve works squarely when the engine comes from the shop, there are but three things that can cause any irregularity of valve action: one being distortion of the engine frame, or a general working out of line of the parts that carry and support the valve gear; another cause is lost motion due to wearing away of motion pins and the bushings in which they work; and, of course, the only way to square the valves when they are out from those causes is to square up the whole engine, or supply new motion pins and bushings. But the very use of the Walschaerts gear provides the room for extra frame bracing exactly where it is needed most, and the strains from strenuous service have the least effect on the frames of engines equipped with this valve gear; it is not found that the supporting pieces, brackets, etc., that carry the Walschaerts gear work loose or get out of line. And as for slack in the motion work, the steel motion pins and their case-hardened bushings show so little wear between shoppings as to seldom need renewal when the engine is overhauled.

The third point of possible lost motion is, however, a probable one—the unpreventable wear in the driving-boxes—and this will produce irregularities in the motion derived from the eccentric. It is believed by many that there should be an easy way provided to lengthen or shorten the eccentric rod, in order to correct any errors in the motion of the valve due to wear in the driving-boxes, after the wedges have been set up, but if no such provision exists the only remedy is the back shop.

The idea is that the Walschaerts valve gear should be designed and erected correctly in the first place, and there can be no need, nor reason, for subsequently altering the action of the valve, but that as the true position of the main axle may vary from wear in the driving-boxes the length of the eccentric rod should be corrected to suit.

It may be, and is highly probable, that all of the irregular action mentioned by the correspondent in his first two questions could be corrected by changing the lengths of the eccentric rods, and it would be advisable to test them for errors.

Have the lost motion in the driving-boxes taken up as close as practicable. On the side to be tested first—the right hand side, preferably—place the engine with the crank-pins on the dead center—say the forward center—with the position fixed accurately; and it may be properly in order, here, to explain the method of setting an engine on the exact center: Secure a *tram*, or make a temporary one by taking a stick two or

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three feet long and driving a couple of sharp pointed nails through it, one near each end. Move the engine forward until the main pin is nearly on the center, and when the crosshead is within about one-half inch or so from the end of its stroke stop it there; now make a punch mark on some rigid part near the wheel—say on the wheel cover; set the tram with one of its points resting on the punch mark, and with the other point scratch a short arc line on the side of the tire. Without having moved the engine, now scratch a vertical line on the guide-bar and crosshead in such a manner that if the engine should be moved you could reset the crosshead in the exact position in which it was when the mark was made, by simply bringing the lines on guide and crosshead into straight conjunction again. Then move the engine ahead *until the crank-pin passes the dead center*, and as the crosshead begins moving backward watch closely and stop it when the scratch marks on crosshead and guide are again in register, as explained. Once more take the tram and place one point in the punch mark on the wheel cover and scratch another short arc line on the side of the tire, as before; but although the crosshead was in the one location both times the tire was scratched, the marks on the tire will be some distance apart, and it is for you now to find with dividers the exact center between the two scratched arc lines; having done so, mark the point with a punch. The driving wheel must now be revolved backward to get the crank on the dead center, and having placed one point of the tram in the punch mark on the wheel cover, when the other point finds the middle mark on the tire—the one last made—the engine is then precisely on the center, on this side. When it becomes necessary to center the engine on the other side it can be done the same way, and the back centers may be found in similar manner.

With the main pin on the exact center on the side to be tested, have the reverse lever moved from the go-ahead corner notch up toward the center of the quadrant; while the link-block is rising, if the valve-stem is pushed forward, slightly, a cause for the error in the valve's action is indicated right there, and the eccentric rod should be *lengthened*, gradually, until the reverse lever can be thrown from one extreme end of the quadrant to the other—with the main pin on the exact center—without causing any movement of the valve-stem. On the other hand, if the valve-stem should be drawn backward by the rise of the link-block, the eccentric rod needs to be *shortened*, somewhat, until the full travel of the link-block from bottom to top of the link slot will not affect the position of the valve. Each side should be tested—and, if possible, adjusted—in the same way.

However, after the length of the eccentric rod has been so altered that with main pin on the dead center no movement of the reverse lever can change the valve's position, if it should be that then the valve is not "square," there probably is a general distortion of the parts that carry the link and reversing shaft. Sometimes, slightly altering the position of the link fulcrum by shimming between the link bracket and its bearer, or closing up, instead, will adjust matters; or, after the "set" of the link has been corrected by altering the length of the eccentric rod, errors in the valve action may be overcome by slightly lengthening or shortening the valve-stem.

A study of the general construction of the Walschaerts valve gear will satisfy anyone that on a substantially built locomotive, with the gear properly designed and erected—and there is no doubt that every engine emerges from the builders' hands with valves as square as he wants them to be—the wear in service can have no effect on the set of the valves, except from the wear in the drivng-boxes; and that if after adjusting the eccentric rods in the recommended manner the valves are still out of square, the proper remedy —and about the only one—is to *square the whole engine* in the back shop.

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THE AIR BRAKE ASSOCIATION CONVENTION

BY F. B. FARMER

(Continued from July Number.)

Owing to the large amount of work before the convention it was voted at the opening on the second day, May 15th, to hold two sessions.

Brake Shoe Friction With Brake Hanger at Various Angles.

Mr. Jno. S. Barner kindly read a brief paper on the above subject, covering some tests he had made with a 30-inch cast iron wheel and a shoe 2¼ inches by 8 inches of ordinary brake shoe metal. The object of the tests was to show how very materially the brake shoe friction or holding power is changed by the angle of the brake beam hanger, with exactly the same pressure applied to the brake shoe. In these tests the shoe pressure used was 50 pounds and the shoe was located at the horizontal center line of the wheel, or equivalent to 15 inches above the rail on a standard freight car.

At each angle the tests covered two conditions: One with the wheel turning and the other with as much power applied to turn it as possible and yet have the shoe friction hold it. A comparison of the results shows the far greater liability of the wheels being slid in starting a car with a brake applied than if it is moving before the application is made. At hanger angles of 10, 20 and 30 degrees from the vertical, covering those in general practice, the increases were 16, 21 and 30 per cent. respectively, while at 50 degrees the increase was 52 per cent. The tabulated results of the tests are as follows:

This paper, while a valuable contribution, resulted in little discussion, as there had been almost no data heretofore available on this subject. One member recalled some tests made under the auspices of the University of Indiana, which, while not on brake beam hanger angularity, affected wheel sliding in a similar way. These tests were to determine the increase in brake shoe pressure resulting from one brake beam rising suddenly to the limit the lost motion or slack at each end of the hangers permitted, as is often noted just as a car is coming to rest. As brake beams are hung so as to bring the shoes more or less below the horizontal center line of the wheel, one beam rising increases the distance between it and the other beam of the same trucks. By the use of an accurate measuring device it was found that the increase in brake shoe pressure was always considerable when the beam rose. It was more with the hand brake than with the air brake. By the use of the latter and considerable slack in the hanger connections a brake rod was broken with only a moderate braking power applied.

This indicated another of the contributory causes of wheel sliding when cars are started with brakes applied, especially hand brakes.

Regarding the effect of rust on the brake shoe friction, another member stated that these tests apparently explained a difference in length of some stops in a brake test. With all else the same the first stop made one morning was shorter

	Wheel Moving.		Wheel Stationary.	
	Down	Up	Down	Up
Brake hanger in vertical position, pull in pounds on scale	17	17	18	18
" " at angle of 10 degrees	15½	18	17½	21
" " " " " 20 "	14	19	16	23
" " " " " 30 "	12½	20	15	26
" " " " " 40 "	11	21	14	30
" " " " " 50 "	9	23½	11	36
" " " " " 60 "	7	Lock	8	Lock
" " " " " 70 "	5	Lock	6½	Lock
" " " " " 80 "	1¾	Lock	3	Lock

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than those made on the previous evening. During the night it had rained, causing the wheels to rust.

Maximum Allowance of Brake Pipe Leakage.

(By M. L. Laylin)

"Although the matter of brake pipe leakage and its resultant effects have been so thoroughly discussed as to leave very little more to be said, still the necessity of overcoming this defect becomes more apparent each year, owing to new conditions entering into the makeup of the trains and the exacting requirements of the law.

"The use of large pumps and large main reservoir has helped to maintain the pressure and release brakes on long trains, but has had a bad effect from the fact that as long as pressure can be kept up, the leakage is not looked after closely, and when brakes are applied we get the bad result of having them continue to set harder.

"This will become more noticeable as the introduction of the 'K' triple becomes more general, as with the triple the same leakage will cause brakes to become fully applied in one-half the time that it does with the triples heretofore used, thus largely taking the full control of the brakes away from the engineman, he merely deciding the time and point at which the application shall take place. This action of the brakes makes it necessary to apply and release often, which is bad practice.

"Another result that is commonly lost sight of in considering leakage is the fact that where there is any large amount, the hot air coming from the pump does not have time to cool and deposit its moisture in the main reservoir, but goes into the brake pipes hot and carries its moisture with it, and in freezing weather upon coming in contact with cold pipes, couplings, or triples, there cools and the moisture is turned to frost, which soon collects in a large enough amount to cause a freeze-up with its disastrous results.

"On the road with which I am connected, we endeavored to establish a maximum number of pounds brake pipe leakage allowed, with more than which no train could depart from a terminal. Under the conditions existing at the present time, we found we could not make this standard lower than eight pounds.

"With this amount, upon a train of fifty air-braked cars, an eleven-inch pump in fair condition will have to make eighty strokes per minute to maintain seventy pounds brake-pipe pressure, thus reducing the efficiency of the pump to about one-half when charging or recharging the brake pipe.

"From the foregoing it behooves every one connected with the handling or maintaining of the air brakes to unite in some concerted action to overcome, or at least, reduce to a minimum the brake pipe leakage. I believe the Air Brake Association to be in a position to take some action toward this end.

"For any one road to undertake to bring their standard down to what is desired, is at present a futile undertaking, for the reason that the trains upon almost any road are made up of cars from the various roads throughout the country. Therefore, if all the roads would unite upon some standard and fully respect the same, it would be feasible to bring the leakage down to four pounds per minute at some future time. This could be done by making a standard at eight pounds for 1908, six pounds for 1909, and four pounds thereafter.

"Under the present interchange rules there is no recompense for repairing leaks or adjusting piston travel, and it naturally results in these two important defects being badly neglected. In the rush to obtain all possible information and familiarize ourselves with the many and excellent improvements that are being brought forward, let us not neglect to give to our present equipments that care which is necessary to insure safe and economical operation."

This paper raised a very interesting discussion and developed some interesting facts regarding the effect on brake pipe leakage of slack between cars, stiff hose in very cold weather, defective and non-standard hose couplings, poor material in hose coupling gaskets and those not of standard size. It also developed that, contrary to the expectations of some, the "K" triple will not increase the difficulty of braking with leaky trains, as compared with older triple valves.

Mr. C. B. Conger (Int. Corres. Schools) called attention to the fact that serious brake pipe leakage takes the control of the train from the engineer in so far as doing good braking is concerned; also, that this is a detrimental feature that can not be overcome by greater pump capacity.

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Mr. Otto Best (Gen'l A. B. I., N. C. & St. L. Ry.) attributed much of the brake pipe leakage to the increase in the bad practice of pulling hose apart, stated that they require their trainmen to separate all hose by hand, and urged the importance of stopping leaks before trains leave the terminals, and of firmly securing the pipes with good clamps.

Mr. P. J. Langan (Gen'l A. B. I., D. L. & W. Ry.) said that 8 pounds leakage per minute is just double the most that should be permitted with a train of 50 cars leaving a terminal, particularly so as tests had shown that with the same train and no changes in it, the leakage was three times as great by the time it had reached the next terminal.

Mr. W. G. Wallace (Supt. M. P., D. T. & I. Ry.) stated that it costs much more to supply leakage than to repair it. Also, that he could not see how an engineer can be held responsible for poor braking where the leakage alone would rapidly apply the brakes on the brake valve handle being moved to lap. He expressed the belief that if this position of the brake valve handle or closing the tender angle cock caused the brakes to apply, the train should be held until the excessive leakage is stopped; and that if this were done invariably the resultant overtime would soon result in the much needed betterment.

Mr. W. V. Turner (M. E., W. A. B. Co.) showed the importance of making a light brake application before noting the brake pipe leakage (then leaving on lap), by stating that if with 50 brakes, triple valves in release position, 70 pounds pressure and lap position of the brake valve the brake pipe leakage were 3 pounds per minute, this would be increased to 8 pounds per minute by a light application and return to lap before noting the leakage.

He said, also, that the impression that the difficulty from brake pipe leakage would be increased with "K" triples is in error; in fact, that under the conditions mentioned it would take them longer to graduate to full application than it would the old style or "H" triples.

As showing the need of each terminal point doing its share in repairing leakage, he cited an experience in his railway service where a decision to stop all excessive leakage at the summit of a steep grade resulted in one month in changing 4,300 hose coupling gaskets on 12,000 cars. This naturally caused considerable train delays, but which was later prevented without increased leakage by requiring other points to do their share of the work. He urged that this should apply to all roads as well as all terminals of any certain road.

Mr. W. J. Hatch (Gen'l A. B. I., C. P. Ry.) stated that they have six months of very cold weather each year and that during the most severe spells it is difficult to get their average train of 30 cars so that the pump can supply the leakage, not to mention reducing it to 4 pounds per minute. He mentioned cases where trains were held twelve hours on account of excessive leakage. He explained that their trouble is due to the air hose stiffening from the cold (above), and that the Master Car Builders' specifications are seriously deficient in that they do not require a flexibility test under such low temperatures as are common in winters on all northern roads.

Mr. Geo. B. Culver (N. Y. C. & H. R. R. R.) expressed the opinion that the hose causes less leakage in cold weather than does the coupling gasket, but another member from the north called attention to the entire agreement with statement by Mr. Hatch, as the stiff hose causes the leakage at the coupling gaskets.

Mr. T. W. Dow (Gen'l A. B. I., Erie R. R.) said there is much hose coupling leakage caused by non-standard gaskets furnished by various rubber companies, and that the saving in first cost results later in a far greater loss and bad service. He also agreed with Mr. Best as to the bad effects of pulling hose couplings apart.

Mr. T. L. Burton (W. A. B. Co.) stated that tests of some coal trains of 50 to 80 cars, not picked or prepared and with leakage of 6 pounds per minute, showed that about 90 per cent. of the work of the pump consisted in supplying brake pipe leakage.

Mr. Geo. Fredericks (P. B. & W. Ry.) expressed the belief that angle cock leakage was also worthy of consideration, stating that he had found 40 per cent. of the angle cocks were leaky, some cases being quite severe, and urged the back-up hose as a cure, as it could easily be maintained.

Mr. W. C. Hunter (Mgr., N. B. C. & Ry. Co.) endorsed Mr. Wallace's proposal of holding trains until excessive leakage is remedied, as the best proposed, but urged that even this will not cure

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one of the most prolific causes of leakage and which is the excessive and unnecessary amount of slack between many cars. He stated that tests made by a committee of which he was a member, developed that this lost motion varied from 3 to 9 inches, and that the total for a train of 47 cars amounted to 18 feet. This slack, and the hose stiffened by zero weather, causes the most severe brake pipe leakage, and he felt that the M. C. B. Association should be urged to take steps to reduce cases of excessive slack.

Mr. L. M. Carlton (M. M., C. & N. W. Ry.) expressed the conviction that yard test plants and supplying air to all repair and freight shed tracks would prove a great aid in reducing brake pipe leakage. He compared waiting for arrival at the top of the steep grade before repairing leakage, to waiting until the foot of a grade is reached before determining whether or not the locomotive could take the train up.

Mr. Jas. A. Hodge (N. C. & St. L. Ry.) cited an instance where frequent complaint of serious leakage was eliminated by installing a yard plant and supplying two inspectors.

Mr. Geo. R. Parker (Gen'l A. B. I., G. N. Ry.) told of an incident during a North Dakota blizzard where a passenger train of seven cars pulled by two freight locomotives, stalled twice in a drift owing to brakes applying from the leakage at hose couplings when the slack was drawn out. They finally cut out the brakes and got through the drift. He considered Mr. Wallace's plan impracticable, as it would too often tie up the railways.

Mr. Lake (C. P. Ry.) endorsed the statements regarding excessive leakage from stiff hose in cold weather. As indicating that at least part of such hose trouble arises from moisture penetrating the outer layer of ducking during rainy weather and freezing later, he said he had removed and dried hose made stiff by cold and afterwards returned them to service with good results.

Mr. W. V. Turner (M. E., W. A. B. Co.), referring to the amount and effect of train slack, as mentioned by Mr. Hunter, said that in a test train of 50 cars this slack amounted to 48½ feet. Regarding the apparent reluctance of railways to put on enough inspectors to remedy the causes of excessive leakage, he suggested that the expense of the inspectors is more evident than the greater one resulting from wasted steam, etc., due to leakage.

Mr. C. B. Conger (Int. Corres. Schools) stated that the steam used by one 9½-inch pump running at full speed would pull about 18 tons on the level, thereby showing how reduced leakage would easily pay for the cost involved.

As bearing on the subject of brake pipe leakage, Mr. Conger then read a paper he had prepared at the late request of Secretary Nellis. While time had been too short to permit of printing advance copies, it will appear in the proceedings of the convention, and is entitled:

The Hose Coupling.

Mr. Conger recommended that the present hose coupling be improved so that such can be pulled apart without damage to hose or pipes. He does not agree with those who believe it best to wait until the present coupling is displaced by the automatic type. He said he had been told that one road estimated that pulling couplings apart destroyed about one hose per car per month, not to mention damage to pipes. He conceded that the present hand coupler pulled apart fairly well when of standard dimensions, but claimed such were often destroyed by hammering the couplings and using wedges between them.

He also urged the need of good coupling gaskets, and stated that the modern type of dummy coupler aids very materially, where used, in keeping the gasket in place.

Mr. W. J. Hatch (Gen'l A. B. I., C. P. Ry.) stated that they keep their hose couplings well standardized by gauging all on cars passing over repair tracks. He added that at such times when the weather permits, they also test the hose with soap suds to detect leakage.

Mr. H. A. Wahlert (Gen'l A. B. I., T. P. Ry.) stated that the two brake companies do not make their couplings to the same standard; that in consequence the faces of the two couplings are not parallel when coupled; and that the gasket groove of one has a curved inside face, which gives it a desirable diaphragm action when two new ones meet, thereby preventing distortion, while that of the other company is without this feature.

He also stated that many coupling gaskets now being supplied by various rubber manufacturers are not to standard dimensions, and that another frequently-observed fault is such a poor quality that

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they will crack when bent enough to enter the coupling groove. He said that out of 20,140 cars that passed one terminal in 53 days, 1,020 coupling gaskets had to be replaced, and that 33 per cent. of those removed had been whittled to enter them because they were too large. He added that at this point 90 per cent. of the cars were foreign. He stated that a lot of 2,500 gaskets from one manufacturer were so poor that one out of every five or six would break when being put in place.

Mr. Wahlert exhibited coupling gaskets of eighteen different makes, all of which had been whittled, demonstrating clearly the faults he had described, and the importance to all railways interchanging cars of insisting on good material and standard dimensions in coupling gaskets in their own service and also in that of the other roads.

Another member stated that on the road he was employed by they get about thirty-five good gaskets out of every hundred, the others being too hard, nonstandard in thickness, or having the monogram on a surface that should make an air-tight joint.

Mr. C. D. Getchell (B. & A. Ry.), referring to brake pipe leakage due to the partial separation of hose couplings when the slack is pulled out of trains, said they have changed the location of the angle cock by bringing it 3 inches farther out, so as to provide more hose slack, and that it effected a considerable improvement last winter and did not result in more angle cocks being broken off.

(To be Continued.)

INJECTORS

BY W. L. FRENCH

If the locomotive engineer of today was required to go back to the water pump as a means of supplying the boiler of his locomotive with water, he would rightly think that it was a long step backwards, and yet it is not quite half a century since Henri Gifford was granted letters of patent on the injector now so universally used to supply feed water to boilers.

From a theory this French engineer had worked out a practical instrument, the principle of action of which remains the same and the main working parts of which are practically the same.

To the man entering railway service in the last few years the pump seems to have been an instrument of the long ago, yet a third of a century would mark its more general application to locomotives, and then it was customary to place an injector on one side and pump on the other, and often the injector was allowed to lie idle, the runner preferring the pump. One of the great troubles with the first injectors on locomotives was their becoming hot and refusing to prime, or the feed water becoming too warm, and many a pail of cold water has been poured over the early injectors to cool them when the men trying to operate them were about as warm as the injector.

Injectors may be classed as the single jet injector, double jet injector, and automatic injector. They may be of either the lifting or non-lifting type.

Single jet injectors are those using a single set of combining and delivery tubes.

The double jet injector contains two sets of nozzles, one set receiving the feed water and passing it on to the second set, where it receives the force that puts it into the boiler.

The automatic injector renews the supply of water to the boiler where the flow of feed water from the tank has been interrupted without the injector being shut off.

A non-lifting injector is one that is located below the bottom of the water level in the tank, so that the supply of feed water flows to it.

The lifting injector is placed above the tank and the water is forced to it by the air pressure in the tank; when the overflow is opened the steam forces the air out of the injector and overflow pipe and the air pressure in the tank forces the water up into the injector. The higher the atmospheric pressure the better the injector will work. Air leaks to injectors should not be allowed.

The important parts contained within

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the body of the injector are the combining tube, suction tube, delivery tube, overflow outlet and steam nozzle. The combining tube is the one in which the steam and water combines, and from which fact it receives its name. It extends from the delivery tube to the steam nozzle. The steam nozzle guides the motion of the admitted steam jet.

The delivery tube is the one in which the combined steam and water receives its greatest velocity before it passes to the branch pipe on its way to the boiler. In the branch pipe it loses a portion of its velocity. Owing to the velocity of the water through this tube it becomes rough and wears out sooner than the other tubes of the injector. It may be reamed out smooth, and used much longer by doing this, without renewing. This reaming or boring out of the tube can only be done to a limited extent, for if the tube is enlarged too much the injector will not work with high steam pressure, the water not receiving velocity enough to overcome the boiler pressure. The suction tube extends from the upper overflow to the lower end of steam nozzle, and aids in starting the injector.

The overflow is an opening from the injector into an overflow or waste pipe when injector is being started. When the overflow is opened a small amount of steam escapes through the combining tube and overflow chamber and out of waste pipe to the atmosphere, and this creates a vacuum above the water in the feed pipe, allowing the air pressure in the tank to force the water up into the injector; if it is a non-lifting injector the water of course will flow down to it. The water enters the large end of the combining tube around the steam tube, and, steam being turned on, as the water and steam combines the jet of steam becomes smaller until it can enter the small end of the delivery tube, where the force of the jet being concentrated on a small opening it gains its greatest velocity, and is able to raise the check and enter the boiler against boiler pressure. The weight of an object multiplied by its velocity in feet per second will give its momentum. The steam and water combine their weight and velocity and thus gain the momentum or force needed for the injector to work.

The maximum capacity of an injector is the greatest volume of water passing through the delivery tube in a steady flow with any steam pressure. The minimum capacity is the least water passing through the delivery tube without loss at the overflow. The range of an injector is the difference between the maximum and minimum capacities of the injector.

It is necessary that the water be cool enough at all times to condense the steam, and the time for this condensation is very short, just while they are passing through the combining tube, so that there must be enough difference between the temperature of the two bodies for the steam to condense quickly. If not, the volume of steam will be too great to enter the delivery tube. Where the feed water is too warm the injector will not take up all the water, that is, a certain amount is wasted at the overflow pipe opening, or if too hot the injector will not start to work at all. If there was more time for the combining of the water and steam no doubt injectors would work with feed water at a higher temperature than they will at present.

Feed water that contains lime or sand wears rapidly on the combining tube. Water heavily charged with lime corrodes the interior of an injector quickly and puts it in a condition in a short time that it will not work.

In locomotive service the difference in the water supply on a single division of a road may be great, making a hard condition to overcome, as often the water that can be obtained must be used, as there is no choice on account of the limited supply at certain points. This has led to the establishment of plants for treating or softening water at certain points by the use of chemicals, with marked benefit to both injectors and boilers.

A non-lifting injector will not corrode in bad water as quickly as a lifting injector, for it is less subject to the action of the steam. If the throttle on the boiler head or steam fountain to a lifting injector was closed when the injector was not in use the injector would not require an acid bath so often. This is particularly true of the one not in active use. The steam seems to form the scale on the tubes and interior parts of the injector the same as it does on the interior of a tea kettle.

There are two prime defects to an injector: one, failure of the injector to lift the water; the other failure to force it all into the boiler. There are several things that would cause one of these conditions aside from wornout tubes.

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If the boiler check does not raise enough, or the branch pipe does not have sufficient area to care for the water delivered to it, part of the water might enter the boiler and part of it be thrown out through the overflow pipe onto the ground. A boiler check might become corroded or the space about it become filled with "mud" and cause it to get in this condition. Branch and feed pipes, as well as tank hose, goose necks and tank valve openings, should be large enough to furnish or care for all the water used by or delivered by the injector. Putting on injectors of large size capable of delivering a large amount of water to the boiler will not give good results if capacity of connecting source of supply and delivery are not increased in the same proportion.

Overflow pipes should not be too small, and they should be so made that there will not be any short bends in them to retard the flow of the water when injector is priming. As a rule an injector does not get out of order quickly or easily when one considers the amount of work one of them does, and if given proper care will give good service for a long time, and nothing is more important about a locomotive than good injectors that can be relied on to work properly whenever needed.

In case the throttle of an injector leaks, dry steam only will show out of the overflow pipe. The fact that it is the throttle that leaks can also be determined by shutting off the source of supply at the steam fountain. If the boiler check leaks, steam and water will both escape from the overflow pipe, but the same is true if the injector primer leaks. By closing the stop cock to the boiler check it can be easily shown whether it is the boiler check or the primer that leaks. If boiler check is not provided with a stop-cock open the front pipe valve to the check, and if steam and water comes out of the front pipe it is a good indication that it is the check that leaks. A leaky primer will not prevent injector working if it can be made to prime. If check or throttle leaks so that a vacuum can not be formed injector will not work, for feed water will not raise to it.

Sometimes an injector with a leaky throttle or check can be made to prime by opening the throttle a turn quickly and at once shutting it off. This blows the hot water out of the supply pipe and gives a chance for a vacuum to be formed, and the feed water rising, the injector will prime and can be put to work.

When a restarting injector breaks, owing to low water, rough track or any other temporary cause of interference with the source of water supply, the steam from the throttle is carried away from the feed pipe and the water coming back to the injector it again goes to work.

Any foreign substance in the tank that gets down about tank valves or into tank hose will interfere with the working of the injector, or perhaps cause it to fail altogether. Close the heater plug down so that steam will not blow out of overflow pipe and open injector throttle; this will usually blow the obstruction away so that one can get along until terminal is reached, when the foreign material can be removed from the tank. In case it does not remove it, take down tank hose, remove strainer, and open tank valve and wash hose out. This can be done at the first stop if the other injector is working good, as it is always desirable to avoid delays. Air leaks in pipes between injector and tank will cause injector to fail to work ordinarily. With a full or nearly full tank of water it may be got to work, but even then it will likely break at any moment. Closing the tank valve and the overflow and blowing some steam back into the pipes will locate the leaks. Too much steam must not be blown back or hose will be blown off or bursted.

If the combining tube gets stopped up, shut steam off from injector. Remove injector throttle, and with a wire remove obstruction from tube. This defect is not of ordinary occurrence. If small valve on end of steam throttle comes off stem, shut steam from injector, remove throttle and put valve back on spindle. This is a short job ordinarily. To prevent overflow pipe freezing in the winter when using a heater, leave joint to heater valve open a little so that a small amount of steam will escape out of overflow pipe, or open primer occasionally. The former is the best method, as one is apt to forget the primer too long. There is always a loss of heat in working an injector, and its throttle should only be opened sufficiently to supply enough steam to keep injector working properly.

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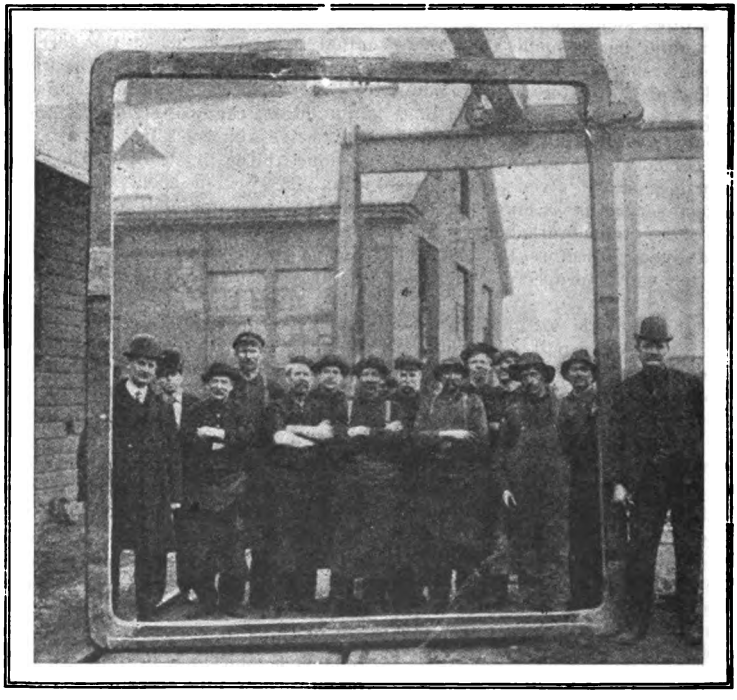
Firebox Ring for Mallet Compound Locomotive

As illustrating the large dimensions of the fireboxes of the three Mallet compound locomotives now being built by the Schenectady works of the American Locomotive Company for the Erie Railroad, we show herewith a view of one of the firebox rings, back of which stands a group of shop men. The dimensions of these fireboxes are: Length, 126 inches; width, 114 inches. They have a grate area of 100 square feet. The rest of the boiler being in proportion to those of the firebox, its large size can be easily imagined.

When the Mallet articulated compound locomotive for the Baltimore & Ohio Railroad was built and exhibited at the St. Louis Exposition, it was then the largest, heaviest and most powerful locomotive ever built, but the locomotives of this type now being built for the Erie Railroad greatly exceed it in both power and weight, and the successful operation of the Baltimore & Ohio locomotive in mountain grade service is expected to be more than equaled by these new locomotives for the Erie.



FIREBOX RING FOR BOILER OF MALLET COMPOUND LOCOMOTIVE, ERIE RAILROAD

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ELECTRICITY—DYNAMOS AND THEIR CARE

BY ELWOOD GRISSINGER

The drawing reproduced as a part of this article, Fig. 1, is a diagrammatic representation of the field coils, armature and circuits of a compound wound dynamo. This form of a dynamo will give automatic regulation of voltage. In the figure, N and S are the two field poles

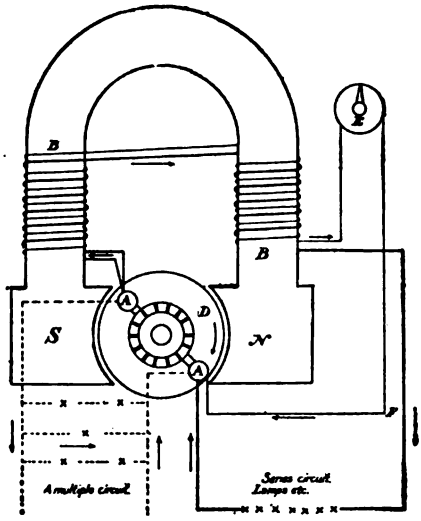

Fig. 1

upon which are wound the series and the shunt coils *B*, known as the field coils. "*A*" are the brushes for collecting the current from the commutator, "*D*" is the armature and "*E*" a rheostat placed in series circuit with the shunt field coils, by means of which the strength of magnetization of the field produced by the shunt coils can be changed. A series circuit is shown by heavy lines and a multiple circuit by dotted lines.

In the series circuit, such as street lights, any irregularity in one lamp would be evidenced in the others on the same line. In the multiple-circuit system each lamp is an independent element, yet each lamp is virtually in series with the armature and the series field coils. The readers of this paper will find, however, that in practice multiple circuits are run from compound wound dynamos.

The compound wound dynamo is virtually a combination of the series and the shunt forms of machines. Part of the main current passes through the shunt coils and rheostat, while all of the current generated passes through the series coils. The operation combines the features of the two machines mentioned. The shunt coils are made up of a large number of turns of fine wire, and the number of amperes flowing is almost constant after the machine has once acquired full voltage. The series coils have but few turns of heavy wire, which wire must be of sufficient size to carry the full current generated by the machine at any and all times.

To explain briefly the action of the compound wound dynamo, it might be well to refer to a part of the preceding paper, where it is to be noted that, with a multiple external circuit, the addition of a lamp across the external mains will reduce the resistance of the external circuit. Since an electrical current will divide itself proportionately to the resistance of the paths provided, more current will flow through the circuit whose resistance has been reduced. This would take some current from the shunt coils, whose resistance remains constant. But the lamp which has been added is in series with the armature and the series field coils. The current passing through the lamp will therefore pass through the series field coils, but not through the shunt coils. It might be said that what has been diverted from the shunt coils has been added to the series coils.

A loss of current flowing in the shunt coils would cause a drop in the voltage at the terminals of the dynamo. Inasmuch as the series field coils have, however, had an increase in the strength of the current flowing in that circuit, they have strengthened the field by just that much, and instead of the voltage falling, it remains practically constant.

As a matter of fact, all compound wound dynamos are made to over-compound; that is, if the voltage at no load is, say, 500, then when running at full load the voltage of the machine may be over-compounded to say 550. This is brought about by the series field coils alone. Over-compounding is desirable for the reason that the resistance or

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losses in the external circuits may increase, and when they do, an increase in voltage or line pressure is necessary in order to compensate for such loss and give normal voltage at the point or points where the current is being used.

The percentage of compounding of such a dynamo considers the internal losses of the machine itself. As in the case of line losses increasing with an increase of load, so in the armature and coils of the dynamo. These losses vary throughout the range of load and in the case of well designed machines, the losses follow well defined curves.

The rotation of an armature of a dynamo in its magnetic field, when such an armature is carrying an electrical current for supplying the demands of an external circuit, tends to demagnetize the field in which it rotates. The armature when carrying a current is a magnet in itself and creates a cross-magnetizing effect. The series field coil windings assist in overcoming this armature cross-magnetization, also called *armature reaction*. There are several other similar actions manifest in the operation of a dynamo. They are more or less technical and can well be omitted. In the design of a dynamo, however, all such points are of importance, especially so when close regulation is necessary.

The greater number of street railway motors of this country are operated by a direct current of appoximately 550 volts pressure. Such current, with but an isolated exception or two, is furnished by compound wound dynamos, which may be either belt-driven or direct-connected to an engine or other prime mover.

In the setting up of a dynamo, care must be exercised in selecting a space that will remain dry at all times. The machine should be given a good length of belt, if belt driven, in order to insure smooth running. Belt driven dynamos are always provided with an adjustable base, whereby the belt tension can be altered from time to time. A belt always runs much better and gives less trouble if there is a heavy sag in it. The under side of the belt should be the taut side. Sometimes this can not be arranged. A dynamo should run without any vibration, as there are no reciprocating parts. If it is a machine of small capacity, it can be fastened to the floor, but large machines require a good foundation. The frame of the machine, except in street railway practice, should be insulated from the foundation. This is important in all cases.

Many readers are, no doubt, familiar with the fact that a spark can be drawn oftentimes from a belt running at high speed. Sometimes on large belts carrying great power, the sparks are to be seen passing from belt to pulley and vice versa. These sparks are the result of the presence of static electricity—scarcely any current, but a high voltage. If permitted to continue, and no precautions are taken for prevention, the insulation of an armature or a field coil is almost sure to be damaged sooner or later and serious results follow. "An ounce of prevention is worth a pound of cure" is an old saying. There is no place where this is more appreciable than in the dynamo room. Static electricity can be kept away from a dynamo in a very simple manner. Place any kind of a bare electrical conductor at right angles and close to the belt. Connect it to a gas or a water pipe, or anything else that leads to the ground. The static charge will gather upon the terminal of that conductor and be carried to the ground.

It is equally important to keep the machine clean in all respects—also dry. Moisture will do no harm; at the same time a wet dynamo is to be prevented. Oil about a dynamo has only one place, in the bearings; and since such are self-oiling upon all of the modern machines, there is no reason why oil should be seen around a dynamo. If a bearing throws oil, it must be remedied, because oil will deteriorate insulation on an armature or a field coil. In self-oiling machines the oil chambers should be kept well filled and the oil changed entirely about once a month—new oil put in and the original oil after having been removed should be filtered for use again.

The commutator of a direct current dynamo is usually "the bone of contention." The best commutators are made of forged copper, the insulating material used between the segments being white mica, carefully selected, so as to give the same hardness as the commutator segments between which it is placed, thereby insuring uniform wear upon the surface. Carbon brushes are used exclusively on the best makes of direct current generators. The carbon of the brushes should be reasonably hard, close grained and free from impurities. After a dynamo has been in use for some time, the commutator should wear to a deep brown gloss

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and run with very little noise. If a lubricant of any kind is used upon a commutator, it should be in very small quantities and not often applied. If the brushes are properly fitted and the commutator begins to wear as it should, lubrication other than what the carbon affords is seldom necessary. Of course, with dynamos whose commutators have an abnormal peripheral speed, conditions will change. With such machines sparking at the commutator is very likely to occur unless the commutator is very carefully made, running absolutely true and the very best carbon brushes are used.

Sparking at the brushes of a dynamo is always injurious. It may be due to any one of a great many causes. An examination may show that the brushes do not make a good contact with the commutator. They may not move easily and quickly in the carbon holder. The pressure of the carbon brush upon the surface of the commutator should be just enough to insure that it will always be in contact with the commutator as the segments of the latter pass beneath it. The carbon must move freely up and down in the holder provided for it, so as to accommodate itself readily and rapidly to any inequalities of the commutator surface. It is a rare thing to find a commutator so true in running that there will be no up or down movement of the carbon brushes in contact with it. It is readily seen that if there were a portion of the commutator a little higher than another part, when the carbon left it for the next segment, if it did not do so regularly and remain in electrical contact, the commutation would be momentarily interrupted at that point and a spark would result. Another frequent source of trouble comes from a dirty commutator—one upon which there has been placed too much of some form of lubricant, which has become sticky, collected dust, and caused the commutator to become covered with minute non-conducting particles. The remedy is to clean the commutator, which can be done by sandpaper in the hand, or placing some of the same upon a small block of wood which has been cut to conform to the shape of the commutator.

If a dynamo has been started properly when new and the brushes never allowed to show injurious sparking, the chances are that no trouble will ever be experienced with that commutator. On the other hand, if sparking has ensued every day or so, it will soon be found that the commutator segments are being worn away in spots, making the surface irregular, when sand-papering, adjustment of the brushes, lubrication, etc., no longer avail toward keeping the machine in good operative condition. It then becomes necessary to remove the armature from the machine, where such is possible, place it in a lathe and turn off enough of the commutator surface to make it smooth and true. After using a sharp tool for this work and removing the necessary cuts, apply sandpaper freely so as to acquire the smoothest possible surface. In placing an armature in a lathe, care must be exercised to the end that the armature is well centered, else the commutator will be out of true when the work is finished. In the case of larger machines, the turning can be effected without removing the armature from the machine. In this case the brushes are lifted and such removed as are in the way for work at the commutator. A turning tool can be obtained from the manufacturer of the generator which can be fastened to the frame of the machine. Then by running the engine or other source of power at a reduced speed, the commutator can be turned up as well as if done upon a lathe.

Too much stress can not be laid upon the care which the brushes and commutator of a generator should have. They must be kept perfectly clean and the brushes given a perfect freedom of motion with light but firm pressure upon the commutator. As long as the commutator runs quietly, smoothly and with a good gloss, avoid lubricants of any kind. It is always of value to keep any machine clean in every respect, and this is particularly so of the dynamo. Great care should be exercised that the windings of a dynamo never become wet or receive mechanical injuries from external causes.

After a dynamo has once been set in operation and doing regular service, accidents may happen unbeknown, and heavy flashing occur at the commutator, regularly or periodically. This flashing is a serious condition and may often extend all the way around a commutator. It is possible that it may be due to an open circuit in the armature winding. If an open circuit is present the flash will appear green in color and seem as though it extended all the way around. An open circuit in the armature winding will be shown by the scarring of the commutator at two points diametrically opposite in

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some windings and forty-five degrees apart in others. The scarring referred to has been caused by the sparking. If allowed to continue the bars at which the scarring has begun will wear down rapidly and the insulation between be partially destroyed. The spots on the commutator locate the coil which is open. The temporary method of remedying the defect is to place a "jumper" around the bad coil. To do this, connect the adjacent commutator segments which have been scarred. The connecting can be done with copper wire or the commutator segments may even be soldered together. This procedure will cut out the defective coil and the machine will run as though the defective coil were not in the armature. As soon as a new coil can be put in it should be done. It is unnecessary to put more than one "jumper" on an armature showing but one open circuit.

Another cause of a steady flare is a weak magnetice field. This may come from a field coil having become grounded and some of its turns of wire short-circuited, thereby lessening the number of ampere turns of such field coil. To satisfy one's self regarding the field coils it is necessary to revert to Ohm's law, shown in an earlier paper, and with the aid of the formula for resistance calculate the resistance of each field coil. To do this it is necessary to place a low reading ammeter in the shunt field circuit, measuring the current strength, and then with a voltmeter measure successively the voltage on the outside of each field coil. With the known current flowing and the voltage across each coil, the resistance of the coil is readily calculated at once. If there is a material discrepancy in the resistance of any one of the field coils compared with others, showing a much lower reading, that coil is undoubtedly out of line, should be marked, removed at the first opportunity and repaired. When machines are erected after having been dismantled, a field coil might be placed wrong, producing a north pole where it should have been a south and vice versa. Many machines will evidence such an error by a failure to give full or normal voltage, while others which may have a wide margin in field magnetization may show full voltage, but the moment full load is placed upon the machine heavy flashing will occur. Under such circumstances it will be found necessary to shut down and remedy the defect before attempting to proceed further.

A troublesome occurrence in many railway stations is so-called "bucking" of a generator. This is virtually a short-circuiting of the armature. A heavy flash extends from one brush to another, a loud report, and, unless the protective device operates efficiently, off goes a belt, the engine slows down or something gives way. Such an occurrence is usually due to a heavy and sudden overload on the machine. It may also be due to the brushes not having the best position with reference to the field poles. Some machines will stand very hard usage without "bucking," while others will buck with the slightest provocation. "Bucking" is always severe. The commutator is blackened and the brush holders are blistered with the flash. The remedy is to be sure that the brushes are set properly, keeping the circuit breaker (protective device) clean and in such a condition that it will open up under such service as would tend to make the machine buck.

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THE WEAK POINT IN THE SIGNAL SYSTEM

BY WILL W. WOOD

Interlocking safety railway crossings, the block system of governing the movement of trains, station or telegraph office stops, train order delivery, flagging—all depend upon visible signals, automatically or manually controlled; yet in spite of the important fact that none of those elements of train operation can be conceived without the inclusion of some device that will convey to the engineman positive assurance of safety as well as of danger, the standard American method of signaling, as the chief factor for safety, is incomplete and unsatisfactory.

Red means danger! Stop! Very well, so far as it goes; but is that color always present when the situation is dangerous? What is the railroad man taught in regard to his observance of signals? Simply this: If you see a red flag, or other red signal, stop at once and ascertain its meaning; but *if you do not see any red signals—keep going.* Might as well mean that; it is what an engineer does unless there is some extra or unusual evidence of possible danger besides the mere fact that there is no red signal in sight; and therefore trains receive only one-half the protection that should be required.

It isn't any more for safety that an engineer should stop when he sees a red flag than it is that he should invariably stop when approaching a point where he knows a red signal may be in reverse, and hidden, *and no safety signal is displayed.*

The answer at once is, that all of those reversible signals indicate safety as well as danger, and there are orders issued by nearly all roads that when an engineer sees that a switchlight is not burning he shall take it as a token of danger, stop and investigate, and report the circumstance. But how many engineers follow such instructions? Why, if they did, trains would never get over the road on time. The railroad officials know that, and it is a question whether they really expect observance of the rule.

It seems strange that with all the past years so full of experience along these lines, and with the numberless accidents as the result of a lack of danger warnings, for object lessons, railroad men and officials do not understand that at points needing the protection of signals safety is best conserved, not so much by the display of a red flag or lamp when a stop is demanded or danger involved beyond that point, as by requiring by inviolate rules that *the absence of a safety signal* shall mean all that a red signal implies.

"Well," you say, "the reverse of the red signal *is* a safety signal, and if engineers do not obey orders already supposed to be in force, and do not stop when a switch light or other plural-colored signal is not displayed or burning, they are risking their own lives; how much further can we go?"

As far as that argument is concerned, it is the assertion of the majority of railroad men that a large per cent. of orders issued by a railroad company are made to be violated in the usual course of things, and are only a club held over the men to be used at the disposition of the officials. Anyway, the order referred to is not generally enforced nor often observed, except in some particular cases where other matters are involved. But, of greatest importance, *what is the safety color?*

Accounting for the majority of switch and general main line signals, *there is none.*

In railroad yards, where trains are not usually expected to run at speeds beyond reasonable control, *green* is the color of switch-lights, etc., denoting line clear; but out on the great highway there is just the red light to announce *danger*—if the lamp happens to be burning. But suppose the signal was turned to indicate danger, and the red glass was broken and gone! With the wind blowing, and from the right direction, the light would probably be extinguished and would then—by its absence—mean danger; but we are not theorizing; we are discussing actual conditions, and the darkened lamp *is not* considered dangerous because constant familiarity with it has bred a lack of fear or of dependence upon it. And suppose the light does not go out with the red glass broken; running sixty miles an hour we are approaching danger—an open switch, containing cars; and we view that "white" light *of safety* with all confidence, until—and then many lights go out.

Not long since a big Pacific type engine pulling one of our most important pas-

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senger trains was approaching the crossing of another road. There is no train of equal importance on that road due at this station anywhere near the time for our train and the operator invariably has the points and signals set in favor of our train, which was a few minutes late, and was trying to avoid losing any more time. The engineer claims that he got the distant signal for clear—"white"—all right, and passed it, but immediately thereafter the home signal and derailing switch must have been thrown in opposition. The light in the nome signal, however, was not burning. On the end of the coal chute near the crossing some employe had set a "white" lantern, and as the train approached on a curve the light of the lantern was about on the tangent from the engineer's eye to the home signal, so the engineer, seeing this misplaced "safety" signal was deceived; he let her go, and took the derail at a pretty fair rate of speed. The engine and tender, and baggage, mail and express cars went over and down a 25-foot embankment. The engineer and fireman jumped and luckily escaped injury. A signal that means absolutely *safety* is too *dangerous* (note the paradox) to be carried around and exhibited here, there and anywhere, and this was such a case in point just related. Which would be the more prejudicial to safety—to permit a signal that means *danger* to be carried and placed anywhere along a railway line, or to allow a signal that indicates *absolute safety* to be displayed at any place that the bearer may attend, even where danger may exist?

A "white" light for safety on the reverse of a signal, red for danger, is not as safe as a single exhibition of red that should be displayed for danger and concealed otherwise, where the intent is understood, as an absence of expected light should compel a stop and investigation.

But, answer this question—there will be no hesitation in anyone's answer: If a signal could show but one color, which would you prefer to trust—red for danger, and turned and concealed for safety; or, say green for safety, turned, concealed or extinguished for danger?

As a matter of fact there is no need for more than one color of light in order to distinguish between safety and danger, if that color is one that is not commonly seen, *and if it shall mean safety.* The alternate color of red *for danger*, then, is the secondary consideration; use it, of course, *to emphasize* the danger that may be beyond it, but give to the man who is responsible for the lives of all of those people behind him a sight of real color that positively means safety when the line is safe, or clear. It seems to me that the color—or absence of color—of common illumination should not be used for a signal that would have any meaning or special significance whatever. Green, preferably, or some other distinctive color, should be used to signify safety conditions, as the reverse of red for danger. And the same discipline that is applied for the offense of failing to regard a red signal should be enforced for passing any point known to be protected by signals *when the color denoting safety, or clear, is not displayed.*

There is not an experienced railroad man in this country, probably, who can not tell of accidents—and many of them most serious ones—caused directly or indirectly by this system of half-defined *danger-safety* signals. In our own personal journeys through life our minds are not set at rest so much by the absence of prophesies and portents of trouble, as they are by the more satisfying *green signals* of "line clear;" for the absence of any warning of danger doesn't remove any possible catastrophe, or mean that there is none to anticipate, but *the safety signal*—if you can accept it—*does.*

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MOVEMENT OF TRAINS

BY H. A. DALBY

Questions About Rule 4.

This rule continues to raise questions as to how trains shall be governed at a change of time-table. We have received an inquiry describing a number of situations and asking for information in each case. We were compelled to answer that if the old form of Rule 4 were still in use there are liable to be complications in which no rule will govern and the only source of instruction should be the superintendent or other officer in charge of train movements. But if the revised version of the Code has been adopted each question can be answered and can be understood by every one.

According to the new form of Rule 4 there are two principles which must always be kept in mind. First, a train leaving its initial station carries its date (the date on which it was due to start) throughout its entire run. If a change of time-table takes place it still holds the date it started with and is entitled to use the schedule of that date on the new time-table, providing, of course, that the schedules of the old and new time-table correspond in the particulars specified in the rule, viz., number, class, day of leaving, direction and initial and terminal stations. If they do not so correspond the train can not proceed after the new time-table takes effect. Second, only one train can leave an initial station on a particular schedule on one calendar day. Of course we do not mean that two sections are prohibited, but if a train starts out as No. 1 of the 15th, for instance, and fulfills that schedule, no other train can start on the schedule of that number and date, even if a change of time-table should take place which would seem to authorize it. If these two principles are well understood and kept in mind they will be a guide not only to the train on the road whose schedule is affected, but also to all other trains which may be running against a schedule which may be changed in some particular. Keep your dates in mind and you should have no trouble.

There is one question, however, in the list to which we refer, that may require some further explanation. The example given was this: No. 1 of the 15th leaves A at 11 p. m., and at 2 a. m. the 16th a new time-table takes effect, showing No. 1 due to leave A at 1 a. m. Now, the train on the road is the train of the 15th and the only schedule it could assume would be the schedule of that date. Its own schedule, therefore, according to the new time-table, was due (or supposed to have been due) to leave A at 1 a. m. the 15th, twenty-five hours before, so of course that schedule is now dead. Therefore the train on the road has no schedule on which it can proceed. The schedule of the 15th is dead and the next question is, what train, if any, can use the schedule of the 16th? The new time-table took effect at 2 a. m. the 16th, and it shows No. 1 of the 16th as having been due to leave A at 1 a. m., one hour before the change took place. It would seem most natural that No. 1 of the 16th should be considered due as soon as the new time-table takes effect, but a peculiarity of the revised form of Rule 4 is that in this case there can be no train of that number on the 16th. This is on account of that part of the rule which reads as follows: "Each time-table, from the moment it takes effect, supersedes the preceding time-table, and its schedules take effect on any division (or sub-division) at the leaving time at their initial stations on such division (or sub-division)." This means that schedule No. 1 can not take effect on the new time-table until its leaving time at its initial station, which will be 1 a. m. the 17th, or twenty-three hours after the change. In other words, when a new time-table takes effect there are but two ways in which life can be put into a schedule; either it must become due at its initial station or a train must be on the road or authorized to be on the road which can assume the schedule and continue to its terminal. In the case before us neither of these conditions will apply on the morning of the 16th, so the schedule of that date is omitted entirely.

The above is the authorized understanding of the rule as set forth by the makers and is the result of the words relative to the schedules of the new time-table taking effect. A form of the rule omitting these words and which would have avoided the situation just described, was recommended at that time, but was

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not accepted. It would seem that such a form would have been more easily understood in a case of this kind and would have provided for the movement of the train for that day.

Two Schedules on One Day?—Another correspondent asks this question: Suppose No. 1 is due to leave A at 9 a. m. and arrive at Z at 1 p. m. A new time-table takes effect at 2 p. m. on which No. 1 is due to leave A at 4 p. m. We understand that if the train has not started from A when the new time-table comes into effect, it may leave on the new time-table at 4 p. m. We also understand that if first No. 1 should run on time on the day of change and the second section should not be started by 2 p. m., it could leave at 4 p. m. on the new time-table. Now, in either of these cases are there not two schedules in effect on the same day, one on the old and one on the new time-table? If an inferior train has not met No. 1 by 2 p. m. he will then run along regardless of them until he gets on their time on the new time-table and then he will clear them again. It looks as if he was clearing two trains of the same number the same day and Rule 4 says: "Not more than one schedule of the same number and day shall be in effect."

We would assure this questioner that he is right in his understanding of the way the trains should be governed in all the cases he mentions, but that it can not be considered in any sense a duplication of the schedule. The provisions of Rule 4 are not violated in the least. There are not two schedules; there is but one. When the new time-table takes effect schedule No. 1 is alive and its life is transferred to the schedule of the same number and date on the new time-table, which makes it due to leave its initial station at 4 p. m.

What troubles the writer of the question is the fact that when the new time-table takes effect No. 1 is not due at any point for two hours, and he is misled into thinking that the schedule has lived its life for that day. A schedule is like a train order, in that it is good until it is fulfilled, annulled or expires by reason of becoming twelve hours late, but this schedule has not been disposed of in any of these ways. The new time-table simply puts its time two hours in the future and during these two hours it is not due at any station. It is just the same as a train having dead time at a station: when the dead time has expired the inferior train must look out for it.

There is another possible situation which, while it may appear similar to the above, yet it is not and should not be confused with it. Suppose No. 1 runs from A to D, leaving at 1 a. m. and arriving at 3 a. m. A new time-table takes effect at 4 p. m. showing No. 1 due to leave at 5 p. m. and due to arrive at 7 p. m. In this case it would be impossible for No. 1 to run on the new time-table, for the reason that the schedule of the old time-table for that day would either have been fulfilled or have become twelve hours late before the new time-table took effect. A question such as was asked might possibly suggest a case of this kind, but the rule clearly states that only one schedule of a particular number can be in effect during one calendar day. In the latter case the schedule has gone out of existence for the day when the change takes place, while in the former case it may still be in effect and its life may be transferred to the schedule of the same number and date on the new time-table.

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Questions and Answers

Locomotive Running and Repairs.

Answers by F. P. Roesch.

517. Valve Setting on Hamilton Corliss Engine.—"Please give a descriptive illustration of setting valves on a Hamilton Corliss engine, and what lead should a 1,000 H. P. Corliss engine have, pulling a very uneven load, steam pressure 120 pounds, 80 revolutions per minute? Also give lead for 250 H. P. engine, 90 revolutions per minute, with variable load."—*O. G. S.*

Answer.—As our readers are no doubt aware, the Corliss valve gear is applied principally to stationary engines, there being but few recorded instances where it has been applied to locomotives, these being only so far as the writer can learn in France, although the Young valve and gear as applied to several locomotives in the United States might be termed a modification of the Corliss.

There are many different types of Corliss engines, of which the Hamilton Corliss, mentioned by our correspondent, is one of the most efficient and popular.

In the Corliss engine four valves are used for each cylinder, two for steam and two for exhaust. These are set at right angles to the cylinder and are usually of the semi-rotary type, the upper valves being the steam valves and the lower ones the exhaust valves.

The most important feature of this type of engine, however, is the valve gear, which is so designed as to admit steam at or near the beginning of the stroke, and hold the valve open so as to maintain the same pressure in the cylinder to the desired point of cut-off. This point reached, the steam is cut off quickly so as to obtain the full benefit of the expansion. At the completion of the stroke the exhaust valves are opened quick and wide enough to permit a perfectly free exhaust, almost devoid of back pressure. By this means the full power of the steam is utilized.

The setting of the valves is not a difficult matter when the customary marks have been placed on wrist plate, rocker, valves, etc., to enable one to locate their relative positions. These marks will be found on all Hamilton engines. When the back bonnets of the valves are removed there will be found a mark on the end of each valve coinciding with the working edge and the edge of the port. On the hub of the wrist plate will be found a mark coinciding with the center line, and also two lines which show the extreme ends of the travel.

In setting the valves, first set the wrist plate in its central position so the center lines will coincide and fasten it there by means of a paper washer. Now set the steam valves so they will have a small amount of lap; the amount is governed by individual preference or experience, and can vary from 1-32-inch to 9-16-inch. This is obtained by lengthening or shortening the rods by means of the adjusting nuts. Now place the exhaust valves so the working edges will just open the exhaust ports the amount desired. This is also largely a matter of preference, some men preferring exhaust lead, others exhaust lap. Now loosen the wrist plate by removing the paper washer, so plate will be free to swing. Now set the rocker arm plumb and connect the eccentric rod to it, then turn the eccentric round on the shaft and note if the rocker arm travels an equal distance on each side of the plumb line. If this travel is not equal, lengthen or shorten the connecting rod until it comes right. Now connect the hook rod to its pin on the wrist plate, and again rotate the eccentric on the shaft and note the extreme points of travel of the wrist plate. If all parts have been adjusted properly the marks indicating the extreme travel lines of the wrist plate should coincide. In case they do not, the hook rod must be adjusted to equalize the motion of the wrist plate by either lengthening or shortening it.

We now have our motion adjusted, but not with reference to the crank. The next step will therefore be to place the crank on either of the dead centers, and turn the eccentric loosely on the shaft in the direction in which the engine is to run, until the steam valve nearest the piston shows the desired amount of lead. Now fasten the eccentric in place on the shaft. Then turn the shaft in the direction in which the engine is to be run until the crank is on the opposite dead center, and notice if the lead at this end of the cylinder is the same as at the opposite end. If not, shorten or lengthen as required the connecting rod between wrist plate and eccentric. If too much

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out, however, you have probably made a mistake when you first set the valves in reference to the wrist plate.

The only thing that now remains to be done is to adjust the cam rods. To do this, disconnect the hook rod from the pin, secure the governor balls in the highest position, lengthen or shorten the cam rods so as to bring the detachment apparatus into action, swing the wrist plate back and forth and make such adjustment of the rods as to permit the steam valves to be released when the steam port has been opened about one-eighth-inch. This latter adjustment is for the purpose of keeping the engine under the control of the governor, in case the load is suddenly thrown off. After this adjustment the governor balls are to be returned to their lowest position. The releasing gear is so constructed as to close the steam valves automatically in case the governor belt is broken.

To set the cut-off even, proceed as follows: Block up the governor to where it stands when engine is carrying the normal load, and mark on the guides the extreme travel of the crosshead. Now, with the governor so blocked up, move the engine slowly, either by hand or steam, until the valve is tripped, and note the exact distance traveled by the crosshead up to this point. Turn the engine to the center, hook up the valve and repeat the process on the other stroke. If the distance traveled by the crosshead is not the same in both cases, lengthen one point of cut-off and shorten the other until the crosshead travels exactly the same on both strokes up to the point where the valves are unhooked.

The dash-pot rod should be adjusted in length so the steam valve arm, resting thereon, when the dash-pot plunger is home, or at the bottom of the pot, is in such a position that the latch is sure to hook over the latch stud and the stud lies midway between the latch die and the closing shoulder. This will insure the positive engagement of the latch, and also prevent the shoulder from jamming down on the latch stud. If the dash-pot rod is too short the latch will not hook on.

By following the above directions a very close adjustment of the valves can be made; to obtain a perfect adjustment, however, we would advocate the use of an indicator.

On the two engines mentioned in the question above, the 1,000 H. P. engine should have 1-32-inch lead, and the 250 H. P. engine 1-16-inch lead.

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518. Lame Engine.—"What will cause an engine to be more lame in full gear than when hooked up?"—*A. J. D.*

Answer.—As a rule engines sound more lame when hooked up than when in full gear, owing to the difference in the volume of steam admitted to the cylinder. For example: Say we have an engine of 30 inches stroke. If the valves were set correctly the steam would be cut off in each end of the cylinder after the piston had traveled, say 27 inches, with lever in full gear. If we now slip one of the blades so as to change the point of cut-off in one end of the cylinder, say 3 inches, then the valve would cut the steam off at the end of a 30-inch travel in one end of the cylinder and at 24 inches in the other end; owing to the volume of steam exhausted this difference would not be noticed very much. If now, however, the lever be hooked up into what would ordinarily be a 6-inch cut-off, the valve would cut the steam off at 9 inches in one end and 3 inches in the other end, which, of course, would be quite noticeable. (The above figures are, of course, not mathematically correct, but are simply used as a basis of illustration.) If now we have an engine as cited in the question, which sounds more lame in full gear than when hooked up, it would probably be due to the fact that both blades are slipped on one side, the back-up blade being slipped in the opposite direction from the go-ahead, so that as the lever is hooked up toward the center and the movement of the valve being thrown partly under the control of the backing eccentric (we are assuming that the engine is being moved in the forward motion, or ahead), then the back-up eccentric and blade would have a tendency to overcome the inequality of the go-ahead, and so cause the engine to show or sound out less than when in full gear.

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519. Engine Pounding in Full Gear.—"Why will an engine pound worse when working in full gear then when hooked back near the center?"—*A. J. D.*

Answer.—This is due, first, to the difference in the volume of steam admitted, and, second, to the fact that the lost motion is not taken up by the steam cushion produced by the earlier exhaust closure and increased lead which obtains as the lever is hooked up.

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The Westinghouse Air Brake.

Answers by F. B. Farmer.

318. ET Brakes Do Not Apply.—"We have some ET engine and tender brake equipments that have been on engines about one year in use on the Kansas City Southern Railway. We have pooled engines. Why is it that the brakes on engines sometimes do not set when train brakes are set with the automatic brake valve? Have known two cases where engineman could not get engine brakes to set during entire trip, and on another trip the engine brakes began to work with the automatic brake valve when part way over the road. They would set at any time with independent brake valve."—*D. J. M.*

Answer.—Failure of the locomotive brakes to apply with an automatic application where they would with an independent application indicates (1) that the equalizing piston of the distributing valve was prevented from moving by frost; (2) that by reason of stoppage of the feed port or leakage from the pressure chamber the pressure chamber was not fully charged; or (3) that the distributing valve was of the earlier type with which the pressure chamber was supplied from the feed valve pipe and the handle of the automatic brake valve was carried in release position.

Weather just below freezing and insufficient cooling of the air before it passed out of the main reservoir would explain the first suggestion. It might also explain the second if the distributing valve was of the earlier or No. 4 type, having the feed port through the equalizing slide valve and its seat. If dirt got under the equalizing valve and caused a slight leakage from the pressure chamber, it would cause it with any type, just as similar leakage in a triple valve may result in that brake failing to work.

The third suggestion means that the brake pipe pressure would be increased by release position to about 95 pounds, while the pressure chamber could not charge above 70 pounds, the feed valve adjustment. Consequently it would take over a 25-pound reduction to get the brake pipe pressure below that in the pressure chamber, which latter is necessary to obtain an automatic application.

Another possibility is that the independent brake valve was of the early type, having no spring to return the handle from release to running position, or of the later type and the spring was broken or the valve worked very hard, and in either case was left in release position. This position would leave the application chamber open to the atmosphere, which would prevent an automatic application, but in applying independently the port in question would be closed. The equalizing parts of the distributing valve are not brought into use in an independent application, and even if the equalizing slide valve were unseated it would not affect the independent application.

Train Rules and Train Practice.

Answers by H. A. Dalby.

232. Annulling a "Run Late Order."—"No 402 received Order No. 1 at Mayville as follows: 'No. 3 will run one hour late Breckinridge to Mayville.' When 402 arrived at Hunter they received Order No 2, which read as follows: 'No. 3 will run one hour and thirty minutes late Breckinridge to Mayville.' When they arrived at Casselton they received Order No. 3: 'Order No. 2 is annulled.' What are we to do in regard to Order No. 1? Take it for granted that it is still in effect or that No. 3 is on time?"—*C. J. W.*

Answer.—Every order is in effect until it is fulfilled, superseded or annulled. Order No. 1 has not been disposed of in any of these ways, therefore it is still in effect. We believe this is the only way the question can be answered by the rules.

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233. Single and Double Track.—"This division is part single and part double track. Going west the stations are A to C, single track; C to D, double track. No. 28 is east bound, and on single track it is superior by direction to No. 15. We were on No. 15 and at A got Order No. 71 to meet No. 28 at B, which is on single track. At B we got Order No. 73, reading as follows: 'Order No. 71 is annulled. No. 15 has right over No. 28 from B to C. No. 15 will run east bound track, C to D, and has right over all trains.' When No. 15 arrives at C, No. 28 has not arrived. Can No. 15 proceed on the orders they have?"—*M. S. W.*

Answer.—We can see no reason why No. 15 can not proceed to D, regardless of all trains, according to the terms of Order No. 73, as all the orders seem to be in the regularly authorized forms.

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Coalite

A new fuel has recently been placed on the market, which has been given the name of "Coalite," and which has been invented by Mr. Thomas Parker, M. Inst. C. E. This fuel will burn in almost any kind of grate, however inefficient, without emitting smoky gases, and at the same time give a higher sensible heat efficiency than the best Welsh steam coal.

Coalite is obtained by the distillation of bitumionus coal of any size or quality, and the process consists in carbonizing such coals for a period of eight hours in flat rectangular retorts, 10 feet in length, which are placed vertically in a gas-fired furnace, the temperature of which is kept at 800 degrees F., a temperature which just shows a dull red glow when shaded from strong light. These retorts being filled, the swelling of the coal on heating causes a considerable pressure, and results in the formation of a product of good density, while the low temperature prevents the whole of the volatile matter from being expelled, and yields a substance which, although it has a superficial resemblance to coke, differs, widely from it in many important points. Each retort takes 15 cwt. of coal at a charge, and yields approximately 11 cwt. of coalite, but this varies with the composition of the coal used, so that, although in most cases the yield is 70 per cent. of the coal taken, it may be slightly higher or lower.

The temperature at which coalite is formed is nothing comparable with the white heat to which ordinary gas retorts are subjected, with the result that the constituents of which illuminating gas is composed remain behind in coalite to an extraordinary extent. The presence of so great a proportion of the gaseous elements of coal also secures the easy ignition of the fuel and its burning with a gentle flame; while the removal of the superfluous volatile elements deprives it absolutely of the power of emitting smoke at any time during its combustion.

Professor Vivian B. Lewes, in a report on coalite, states as follows: "Analysis shows it to be coal from which the smoke-forming constituents have been separated, leaving enough hydrogen-producing matter to insure easy ignition and free burning, so that the heat of combustion, instead of having to do the work of decomposing and volatizing the hydro-carbons and the water produced by the combustion (as is the case with bituminous coal), is largely generated as sensible heat." In a later part of his report, Professor Lewes states that these preliminary colatilizations so reduce the heating value of a coal fire, that by the time it has burnt clear only a little over 50 per cent. of the total calorific value of the original fuel remains. "This means," continues the report, "that, taking coal with a heating value of 14,000 B. T. units, not more than 7,500 B. T. units can be rendered available as sensible heat as against 13,000 available in coalite." In the manufacture of coalite, while the main object of the process is to produce that fuel, by-products are recovered which are of great value, including gas, sulphate of ammonia, benzol, and other hydro-carbons, a feature of the subject which we hope to deal with in a future article.—London Standard.

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Railway Club Proceedings

*"Maintenance of Way."**

Mr. President and Members of the St. Louis Railway Club:

I consider it an honor as well as a pleasure, to have the privilege of delivering an address to such a body of representative railroad men; and yet it is not without much diffidence that I speak on a subject which is so well known to all of you.

In years past, when the markets of Western Europe could be supplied from our western coast, and when our great Mississippi Valley was as yet undeveloped, the few lines which then crossed our country were subjected to light traffic, and, with a very inferior permanent way, successfully carried it. With the development of transportation facilities of Eastern Europe, and the large commercial growth of the United States, a greater market for our products was opened up and better facilities were required in order to supply it.

It was soon evident that economical ransportation must be considered. The cutting of rates was an additional factor demanding a curtailing of expenditures. Curious as it may seem the subject of motive power and rolling stock received consideration first; and then when it was forced upon us, and not until then, did we consider the maintenance of way.

The cost of maintenance of way and structures of all roads for the year 1905 was almost exactly 20 per cent. of the total cost of operation. Of this 20 per cent. over one-half was for labor, most of which was expended on the permanent way. As the operating expenses of English roads average about 55 per cent. of their earnings, while those of our country average about 67 per cent., it is evident that a considerable saving is possible. As the conducting of transportation, and general expenses have all been given much study, and as a result their value as a percentage of the total operating expenses is on a continual decrease, it remains for economy to be exercised in the maintenance of way and equipment. These two items are of about an equal value; but as the equipment has been brought to a high standard of excellence, we must look to the economies of maintenance of way for any great saving.

It is the object of this paper to briefly consider those subjects which constitute as a whole the permanent way, and to discuss them from an economical standpoint, pointing out their defects and, if possible, a remedy for the same.

The requisities of a good permanent way are: good men, good tools, and good material, enumerated in the order of their importance. That good men are a necessity is now being recognized by those in authority. (Taylor's 5.) Technical graduates are now being trained to become proficient in the practical side of the work. They occupy the positions once held by the promoted section hand; and while their practical knowledge may not be as great as such, yet their liberal education enables them to grasp new ideas more readily, and their efficiency is greater. It is an acknowledged fact that the largest requisitions and biggest section gangs are not necessary adjuncts to the best alignment and smoothest riding. A good foreman who sees the economy of quality of work, rather than quantity is a thing of joy, and his work a thing of beauty—unfortunately, the latter is not forever.

Good tools and plenty of them are a necessary adjunct to the efficiency of the gang and the facility with which they can work. For example, it is poor economy to have men wearing themselves out with heavy tamping bars when lighter ones would have done, or to have them carrying tools from place to place on a push car, when a hand car should have been furnished them.

It is self-evident that good material is necessary in order that the best results may be obtained. That good material can be so abused that poor results obtain, is also a known fact. This point will be further brought out in the following discussion.

The causes which tend to deteriorate the permanent way are: Poor drainage, rolling stock and motive power, and the physical qualities of the ballast, ties, and rails, and their accessories. These will now be considered, but not in the sequence named above, as they are so closely interrelated that a discussion of any

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particular one will of necessity include one or more of the others.

Although the item of labor is 50 per cent. of the total cost of maintenance, being $144,161,701 for the year 1905, it will not be discussed at any length, inasmuch as the discussion of the items enumerated above will imply a necessary increase or decrease. It might be said that the average cost per mile appears to be greater in the mountainous than in the flatter regions, and greater in the northern half than in the southern half of this country. The explanation of this seems to be that curves predominate in the mountainous regions, and that the upper portion of this country lies frozen for a greater portion of the year than does the lower half. The greatest average cost is that for the region adjacent to New York City, it being nearly three times as great as that for Texas, which is the least. This is evidently due to the excessively heavy traffic at this point. These conclusions, which are based on figures given in the reports of the Interstate Commerce Commission, appear to be justified even if the figures should vary slightly from actual expenditures.

A good foundation is absolutely essential to a superstructure: and no uncontained foundation can be wet and still be safe. The pressure on sub-grade has been variously estimated at from one to four tons per square foot directly under the rails. The disturbing effect of the motive power has been experimentally determined. It has been found to extend to a distance of eight feet out from the rail and to a depth of about five feet directly under it, and this last result was obtained on an embankment which has been built thirty-seven years. In order to drain the sub-grade thoroughly, it is necessary that it be sloped from the center outwards, the rise at the center being from 3 to 6 inches according to width of roadway. This is something we have all heard of, but how many times have we seen it? I have never done so, except after persistent attacks on the contractor. Careful attention to this minor point will pay huge profits in the future. I recall seeing a proposed section for double track in which the sub-grade slanted from the center of each track inward as well as outward, the scheme being to collect the water at the center in a longitudinal tile drain which emptied by means of cross drains placed at intervals. Needless to say, this never passed the "proposed" stage.

In cases of fills on marshy ground or in wet cuts, a well designed system of underdrains and storm-water sewers is necessary for the best results. If this is not done, you will find that the extra cost of labor alone, not to mention that of renewals, will more than be enough to pay interest on the system proposed, and also establish a sinking fund. It is false economy to narrow the roadbed in cuts and thus prevent the use of good wide ditches. The sodding of embankments from the bottom to the shoulders is advisable. Never sod the top of the roadbed or form a shoulder above the base of the ballast. This allows the water to collect and the track then becomes supported by an elongated mud puddle. Attention should be paid to this point in and about cities where the tendency to a park-like appearance is very strong. In all cases keep the grass short.

The ballast should be able to support the track, to prevent lateral displacement of the tie, to afford good drainage, and to be dustless, as well as of such character as to prevent vegetable growth from obtaining a foothold. It should also be well put on and in accordance with the standards furnished. None of the materials used fulfill all of these conditions. It has been supposed that stone, cinder and gravel were the best, their value standing in the order of their enumeration. Experiments made on track depression show that the supporting value of gravel is about 100 per cent. better than that of either cinder or stone, whose values in this respect are about equal. Furthermore, the stability of gravel seems to vary only slightly with the weight of rail used. Oiling the ballast decreases the repairs to rolling stock and indirectly the maintenance of way from a rail renewal standpoint. Some foreman will form a shoulder at the end of the tie in order to help prevent lateral displacement. Unless the ballast be one that drains well, this should be avoided, as it produces dampness at a place where incipient decay is easily started, and also, the shoulder being relatively thin, the end of the tie will become alternately wet and dry, a condition making decay certain and quick.

That rolling stock, especially motive power, is one, if not the chief, of the causes of poor permanent way, has long been recognized; that its relation to the roadbed has not been studied to the ex-

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tent the importance of the subject demands is equally well known; and that the investigations that have been made have brought out valuable information which has not been used to our greatest benefit, is a fact. An investigation of the relation of the motive power to the roadbed points the way to a betterment of both and a saving as a necessary result.

All who have ridden on one of our modern locomotives running at a speed of from 40 to 80 miles an hour can not fail to appreciate the great strains that are brought upon both the locomotive and the roadbed. This was especially noticeable when the locomotive took a curve, and continued with more or less violence until the tangent was regained where comparative quiet was once more reached. The causes of this violent swaying and plunging are due for the most part to the locomotive. On tangents, the action on the rail is chiefly confined to that indirectly caused by the reciprocating parts. This is due to the impossibility of balancing the locomotive in a vertical plane.

The counter-balance of the main driver of an engine somewhat of the Atlantic type weighs 431 pounds. This is placed at a distance of 30 inches out from the hub on the 80-inch drivers. At 80 miles per hour, no connecting rods on the engine being hauled dead, the centrifugal force would cause the driver to lift from the track five times each second, and deliver a 52,000-pound blow or pressure on the rail five times each second. If running under its own steam, the reciprocating parts reduce this so that the pressure on the rails varies from 14,000 to 34,000 pounds, a difference of 20,000 pounds, five times each second. These blows are struck at intervals of 21 feet. Some motive power authorities claim that this is not in the character of a blow but of a gradual pressure. Inasmuch as the time of action is one-fifth of a second, it appears to me that the effect will be much the same as that of a blow and that the stresses caused will be in the nature of impact stresses. That this effect greatly increases the stress in the rail is shown by actual experiments. These proved that the stresses in the lower flange were increased as much as 100 per cent. in some cases. The lower flange, however, only indicates the direct stress. To the direct stress must be added the effect of the localized loading. Assuming that the engine used in the experiments was the same as the engine mentioned above, the difference in the driver weights of the two engines being not very great, then the following is approximately true. The experiment showed a tensile stress of about 31,000 pounds per square inch in the lower flange. The direct stress in the extreme fiber of the head was the same, an 80 pound rail being used. Assuming the area of contact to be one-half of a square inch, we will have a localized effect of at least twice the weight of the driver, or 40,000 pounds per square inch. Resolving these stresses we get a total of 51,000 pounds per square inch as the stress in the head of the rail. To this must be added a certain indeterminate amount due to the impact of the engine made possible by the play in the axle boxes. The total stress is then well up to the elastic limit, and perhaps over in many cases. Is it any wonder that the head pours over? It is probable that this pouring effect is greatest upon the inner side of the rail head and that the flange turns it off as fast as it is formed, thus causing excessive wear on both wheel and rail. Another effect of the counter-balances is that of kinking the rails when engines are run at a speed greatly in excess of that for which they are designed. The blows are excessive and tend to bend the rail at points at a distance from each other equal to the circumference of a driver. One strange fact regarding this effect is that it appears to be greatest on the inner rail of curves, and that the rails are bent from the outside inwards. One explanation of this may be that the flanges were so worn that the rails not being canted, they bore upon the outer edge of the head. The canting of rails on curves would, I think, do away with this effect to a great extent.

It is customary to neglect to allow for balancing the reciprocating parts by an amount equal to 1-400 the weight of the locomotive. While this is a distinct advantage in greatly decreasing the counterweights, in some cases as much as 100 per cent., yet it produces a twisting moment in a lateral plane. Some of this is resisted by the pull on the draw bar of the engine and the remainder is evinced by the "nosing" of the engine or tendency of the truck to run from side to side of the track on tangents. This action tends to increase the wear on the rail as well as to throw the track from its alignment.

In rounding curves the rails are, in addition to the above actions, subjected to much wear from the grinding and slipping

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action of the wheels. This is greatest with long, rigid wheel-bases, too narrow gauges, and too many or too few flanged drivers. It also depends upon the position of the flanged drivers and upon the fact whether or not the truck is of rigid or swing center construction.

The remedy, or at least the lessening, of all of the above evils appears to lie with the motive power department. Four-cylinder compounds are about twice as deteriorating in their action on tracks as the simple balanced engine; balanced engines like the Shaw, Vauclain balanced compound, and others reduce the effect by almost 50 per cent. A better design for the connecting rod would help. Its center of gravity should be at the middle of its length instead of near the driver end, as is the case in many engines. Front and rear drivers flanged, intermediate drivers "blind," and the use of rigid-center trucks or three-point swing-trucks will help decrease the wear on curves. An increased coning and narrower wheel gauge on curves will be of benefit to the track. As the first change increases the rolling friction on tangents the problem resolves itself into one in which the increased cost in maintenance of operation costs balances the decrease in maintenance of way. The ratio of the length of curved to straight track is the important factor in this problem. The canting of rails on curves, and a study of the classes of engines in use on the road would be a factor for decreased curve-maintenance. The motive power and maintenance departments should "get together" and "hammer it out."

In 1881 the cost of tie renewals was $857,000 and the cost of rail renewals was $2,378,000. In 1891 the cost of tie renewals exceeded that of rail renewals by almost 54 per cent. In 1905 it exceeded that of rails by 102 per cent. The figures for 1905 are: Tie renewals, $36,856,864, or 2.66 per cent. of the operating expenses, and rail renewals $18,259,022, or 1.32 per cent. of operating expenses. Great opportunities are offered for a reduction in these costs.

The tie question is no longer worrying our engineers to any great extent. The worry is all spent in vain attempts to convince the directors, and through them the stockholders, that large present expenditures are economical. It will probably be some time before it will be seen that cheapness and economy are not synonymous terms.

Treated ties are no longer an experiment. Records of some roads show as high an efficiency as one-eighth of one per cent. removed in four years, 1.7 per cent. in five years, and 3.7 per cent. in six years. Most any of the preservative processes are good, there seeming to be little difference in the economy of the zinc-chloride, zinc-tannin, and creosote methods. One disadvantage of the creosote method is the scarcity of that oil. The output of this country for the next two years has been sold, and at present the imports considerably exceed the present home production. It is now considered that it is more economical to buy inferior hard woods at a cost of 45 to 50 cents, and treat them, than it is to buy first-class white oak ties. Another advantage of the treated ties is that the holding power of spikes is greater in the treated than in the untreated ties, being as much as 25 per cent. more. Also the holding power in most of the treated ties is, on an average, 85 per cent. of the holding power in a white oak untreated tie.

This, coupled with the fact that experiments show that spikes tightened up on track reduce the stresses in the lower flange of the rail by as much as 40 per cent. in some cases, is cause for congratulations, as this, together with the use of tie plates, gives us a practically unlimited supply of tie timber, only slightly less desirable than white oak. If screw spikes were used, they would only have to be 3 inches long in order to give the holding power of a standard 5½ spike in white oak.* The wave action of the rail tends to twist the tie in the ballast. The only means for reducing this action is the best of tamping and closer spacing of ties. As tamping the entire length causes "center binding," this method for reducing the twisting of the tie requires the best possible work from about 18 inches inside the rail to the end of the tie. It does not seem advisable to increase the spacing of wooden ties of present sizes. Wider ties would both tend to increase the effects of wave action, by reason of the wider bearing surface on the top, and to decrease it by reason of the greater bearing area below. As cost of rail renewals and labor thereof are small items compared with the cost of track labor and tie renewal, the thought suggests itself to the speaker that it might be advantageous to have the rail-bearing surface curved, to have tie

*Bulletin No. 6 of the University of Illinois Experiment Station.

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space further apart, and to take up the disturbing effects by the use of a heavy rail, say 110 to 120 pounds; the section to be deep, of narrow base width, and the use of tie plates to accompany it. For the purpose of further reducing this twisting moment, squared ties with a compact ballast, as stone or slag, is advised. The bearing stresses on the bases of the tie will not be uniform. This is due to the eccentric loading brought upon the two rails by reason of the action of the counter-balances. It is probable that this defect can not be remedied as long as we have continuous ties. It is probable that should ties with symmetrical bearing surfaces under each rail, connected with small angles or channels, be used, that the maintenance charges incurred by this eccentric stress could be entirely avoided. Much of the labor due to track could be saved if careful consideration was given to the method of the laying and the renewal of ties. Do not take out ties until necessary. One authority declares that by actual count 22 per cent. of the renewals on one section were avoided. Just consider, not only the interest on the new ties saved, but the expenditures necessary to get the track back to its old form. Do not lay alternate ties of soft and hard wood; try to avoid renewing alternate ties, and refrain from the false economy of putting tie plates on every other tie in a new or old track. These last mentioned conditions are responsible for kinks and fractures of rails and the increased cost of maintenance resulting therefrom. One road reports 38 breakages, all on the inside of the rail, in one mile, due it is thought to the alternate placing of tie plates.

Many forms of metal ties have been proposed and used to some extent. It seems probable that their adoption will not be very general in this country. Track maintenance is greater at first than with wooden ties, but decreases with time, their resistance to lateral motion is small, and in case of derailment a bad wreck is liable to result on account of their ease of distortion. Concrete ties will, I think, take the place of the treated ties. Their use is at present, on account of their high cost, confined to special localities as experiment track, tunnels, and places where refrigerator cars stand for any length of time. Perhaps when time has demonstrated their life and maintenance properties, they may come into more general use. Longitudinal concrete stringers connected at intervals have proven both costly and uneconomical, the latter on account of the disturbance of the track necessary when a portion breaks. It would seem that a reinforcement in the lower part of the bearing area would avoid this altogether, and at the same time greatly decrease the rail deflection. It is the speaker's belief that this is the rail support of the future, and that when it comes we will be nearer the so-called permanent way than ever before.

Wear and decay of ties are not always relative qualities. About 1 per cent. of redwood ties are taken out on account of decay. Redwood ties in side tracks, little used, have been there 40 years, and are still in good condition. The tie plate helps to prolong the life of soft woods with small tendency to decay. Old ties much worn and little decayed can be lapped and supplied with tie plates, thus greatly prolonging their life. The office of the tie plate is not to increase the bearing area of the rail, but to prevent its cutting into the tie by reason of the wave motion caused by traffic. They are not necessarily large. Results of experience have caused the 99 square inch by ½ inch thick plates to be discarded and 5x8-inch ones ¼ to 5-16 inches thick to be retained. Large plates turn up at the ends, allow dirt to get underneath, and thus grind up the tie and eventually start rot and destroy it. One disadvantage of a thick plate is that it greatly decreases the holding power of the ordinary spike. Tie plates should have some kind of projections on the under side in order to hold it to the tie in case the spikes become loose. The speaker's experience has been with those of longitudinal ribs, and they gave excellent results. One advantage of these ribs is that it allows of a thinner plate, as they strengthen it. Opinion as to the relative merits of the two classes seems to be evenly divided. A ridge on the outer edge should run all the way across the plate. This prevents "necking" of the outer spike and will allow the lateral thrust to be taken up equally among the spikes instead of all being transferred by means of the outer spike or spikes. It is unnecessary to add that the spikes should be driven vertically. Tie plates may be used on curves in place of rail braces. The general opinion is that they hold the gauge and consequently prevent cutting of the ties and outward canting of the rail. Some of the western roads are having tie plates with ⅛-inch and ¼-inch

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bevels being made for use on curves and in some cases on tangent. It will be interesting to note the outcome of these experiments. Those on the curves will probably be an advantage, but the advisability of their use on tangents is questionable. In some places in Europe tie plates of tarred felt and treated wood are used and give good results on tangents. Their use, instead of rail braces, has not been a success; and it is evident that they do not distribute the stress equally among the spikes. Tie plates, in addition to prolonging the life of ties, and consequently reducing the cost of labor due to renewal disturbances, decrease the stresses in the rail very materially; the decrease being as great as from 25 to 50 per cent. when the increase of speed was 100 per cent. As mentioned before, the speaker would like to see some experiments on curved tie plates and various weights of rails, and note the maintenance charges in this connection. To give the best and most economical results, tie plates should be put on the tie before it is placed in the track.

The item of rail renewals, although only half as large as that for tie renewals, allows latitude for a saving both in renewals and labor. Saving can be made in this item by the use of rails of better physical properties, of deeper sections, of better joint fastenings, and by the employment of a better class of labor. The question of the physical properties of rail has received much attention and has finally been reduced to the point where we are not so much at a loss to know what we want, as to know how to get it. If the stockholders could be made to see that economy would result in the paying of higher prices for a rail much-worked at lower temperatures, a considerable saving would be effected. The Am. Soc. C. E. section has given and is giving good results, but the great increase in wheel loads of late years seems to demand that a revision be made. At this time one of the foremost of eastern roads is using a section with a broader head, and it is expected that others will follow. The use of manganese steel rails where traffic is the heaviest appears to be one solution of special problems in train wear. Frogs and switches are also made of this alloy. About 6 per cent. of manganese is used. This makes the metal tough and ductile. It can not be rolled but is cast. The rails are in 20-foot lengths. It wears about 10 per cent. as fast as Bessemer steel, but the cost is high. They are economical for heavy traffic; some now in use give two and one-half years service under 44,000 tons per day.

The stresses which obtain in a rail are insignificant in the lower flange. In the top fibers it is past the elastic limit, and this is due to the localized loading. I would not suggest that we allow the stresses to be increased in the bottom flange. Rather decrease them, for with a decrease of stress comes a decrease of deflection, and this is to be aimed for just as truly as any point previously mentioned. With decreased deflection comes decreased tie twisting and decreased maintenance. Use a deeper section. Incompetent labor is the cause of uneven gauge and alignment, both of which increase the wear of the rail. The bending of rails on curves is often neglected, even after the limiting curvature for bending is past. The rail being sprung into place, presses against the inner spikes at its middle and the outer ones at its ends. Trains increase or decrease this as they pass and then the rail springs back, loosening the spikes all the more until they pull entirely away from the flanges, the gauge widens and the track deteriorates. The connections of the rails should be as efficient as the rails themselves. This, of course, is not possible. Various kinds have been proposed, but the one in most general use is the angle-bar joint. Experiments on these joints go to show that the stress in the lower flange of these angle bars was 100 per cent. of that in the rail at a section near its quarter point. This goes to show that this joint has an efficiency of about 50 per cent. I feel that it would be unprofitable to discuss joints any further, as experimental and maintenance data are very meager, and by no other means can they be discussed so intelligently.

It has been impossible to give credit for the information given in this paper. It has been derived from the literature of the past twenty years, from the opinions of track foremen, engineers of maintenance of way, bridge engineers, chief engineers, and from my own experience.

Of course, the "perfect track" and the "permanent way" are idle dreams of an unattainable perfection, still they are good goals for which to strive. If it would be borne in mind that the original location has much to do with the economics of permanent way, and that the disturbing of the roadbed is as great a

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waste as that of timber or rails, we may be able to reduce expenses, even in our present state of ignorance. If the results of a series of carefully and systematically planned and accurately performed experiments were available for our use, it seems evident that we could get much nearer our goal. Let us strive to spend our time not in determining what we have done, but rather in determining what we ought to do, and if we can not exactly attain the goal of our desires, let us at least attain it as nearly as we can.

I thank you for your attention.—April 12, 1907, meeting St. Louis Railway Club.

*Locomotive Injectors**

STRICKLAND L. KNEASS—Consideration of the relative merits of outside and inside delivery pipes must include the design of the boiler, the safety of passengers, and the convenience to the enginemen, as well as flue mileage and the relative efficiency of the two methods of feeding.

The main check has been applied to the back head of English and continental engines for many years, and this may be regarded as the standard location in the British Isles. It is true that the construction of the English locomotive boiler and cab yields readily to this arrangement, but there may be other reasons at the bottom. The chief objection against projecting side checks is that of danger to passengers, as serious accidents have occurred from the shearing of the boiler check by the upsetting of the locomotive or the derailment of a passing train. The question of safety has been partially met by an internal side check, but it is doubtful if this form is entirely satisfactory, as it is difficult to keep steam tight, and impossible to examine or regrind without relieving the boiler pressure. The extreme length of the branch pipe on large locomotives is also disadvantageous, on account of the cost of bending, the present high price of copper, and because of the weakening of the section at the bends.

It is very difficult to bend pipes and maintain a circular section. The cross section is almost always elliptical or the materials strained. The result is creeping of the pipe and occasional bursting when subject to excessive back pressure. I have taken indicator diagrams of the pressure in the branch pipe while starting and stopping an injector, rotating the drum by the stroke of the starting lever. An analysis of the diagrams is of interest; with careful handling, the pressure rises gradually from zero to boiler pressure; quick, careless starting of the feed causes an overpressure double that carried on the boiler, which may weaken or burst the branch pipe. Creeping due to flattened bends causes undue stress on the boiler check and the pipe joints; the writer has noticed one instance where a main check was unscrewed one-eighth turn by the warping of the branch pipe; in this specific case, the difficulty was corrected by using a check with a side instead of a bottom inlet.

The location of the boiler check upon the back head, with internal feed pipe delivery at the forward end, gives short direct and protected valves and pipe connections. It usually offers a convenient location for the two injectors, placing the operating levers directly beside the engineer and fireman, and out of the way of the reverse lever and throttle. The engineer then has his air brake and feed valves directly beside him; this enables him to feed the boiler to the best advantage with least possible trouble to himself, all of which make for the life of tubes and the advantage of the railroad. Where locomotive appurtenances are arranged so as to be convenient to the engineer, a conscientious employe will operate them economically: but if an engineer has to rise from his seat and reach a considerable height to apply or adjust his injector, it stands to reason that the feed will be intermittent, and simply used to fill up the boiler as necessity requires, without the careful adjustment of the

*Topical discussion at the annual convention of the American Railway Master Mechanics' Association at Atlantic City, N. J., June, 1907.—From The Daily Railway Age.

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quantity required for continuous feed or to maintain a constant water level. Further, as the sprinkler valve is connected to the feed on the left hand backhead injector, both can be operated by the fireman on the deck of the cab.

In regard to the location of the backhead check, it may be said that the outlet should enter the boiler below the low water level. The delivering pipe, connecting the backhead valve with the front end of the boiler, should be not more than 2 inches above the crown sheet, so that steam may not enter through opened joints. This recommendation is made, as excessive pressure has been noted in three instances in the backhead valves, due to water hammer. This phenomenon, due to faulty connections, seems to be explainable as follows:

If the rear end of the delivering tube has an open joint within the steam space, steam is drawn in by the feed water flowing downward toward the immersed end of the delivering pipe when the injector is shut off. The steam is instantly condensed, forming a partial vacuum, which causes a backward rush of water up into the delivering pipe against the backhead check. This causes a powerful water hammer; the remedy is simple: The delivering pipe should be immersed as recommended above; the conduit may be made in the shape of a trough, or the joints kept tight. When correctly attached, no water hammer has been noticed. As joints are liable to work loose, it is considered safer to use one of the first two methods given.

In regard to the relative merits of the side or backhead feed, it is the opinion of the writer that the backhead system is preferable, as it gives an opportunity for even distribution of the feed water over a larger tube area, instead of coming in direct contact with the nearer tubes and side sheets only. When the feed enters the side of the boiler, its greater density causes it to flow downward along the side sheet to the bottom of the boiler and the water leg, where it lies dead owing to sluggish circulation. This is aggravated by intermittent feeding, as frequent changes of temperature cause an expansion and contraction of the sheers and tubes which loosen the joints and produce leaks, increasing the cost of the flue mileage. On certain railroads there is applied to the shank of the side check an upward nozzle of reduced area, which forces the water above the tubes and into the steam space. This opening, however, is liable to be closed by incrustation when the water contains lime-bearing salts, and adds to the back pressure against which the injector must operate, reducing the life of the tubes.

In conclusion, it may be said that the safety of passengers and employes is the paramount consideration. Accidents from the use of the side check are many and of record. No such charge can be brought against the backhead method of feeding; while it is believed that the opportunity given for more perfect distribution of the entering feed water, and more careful adjustment of amount of water delivered are arguments in its favor.

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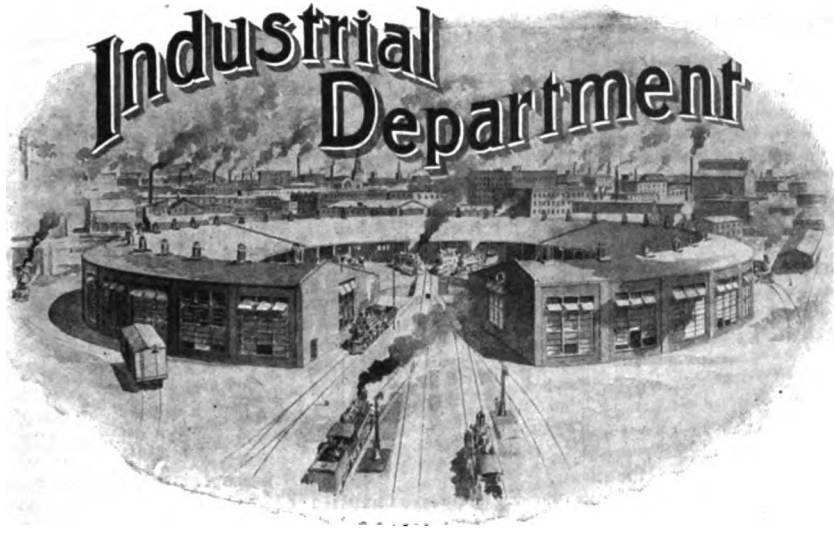

DISCUSSION OF CURRENT TOPICS

A Good Law Passed by the Wisconsin Legislature.

One of the most important recent legislative enactments of the Wisconsin Legislature is a law amending section 1816 of the statutes relating to liability of railroad companies for injuries sustained by employes. Probably the most important feature of this law is its provision that no contract or receipt between an employe and a railroad company shall exempt such corporation from the full liability imposed by the act.

This provision, as it will be readily seen, is especially intended to protect injured railroad employes from the operations of so-called voluntary relief departments maintained by certain railroad companies for the purpose of preventing by methods which, to say the least, are unjust, injured employes from securing damages.

Advices state that to the untiring efforts of Bro. John M. O'Rourke is largely due the enactment of this law, and that Brother O'Rourke has been so persistent in advocating legislation by the lawmaking body of Wisconsin, favorable to the interests of railroad employes, that he has lost his position in railroad service as a result thereof.

It would seem that no reform is ever accomplished without more or less sacrifice to some one, and it would appear that part of the cost of the enactment of this measure is the loss to Brother O'Rourke of the employment which provided him a means of livelihood.

The bill is as follows:

To amend section 1816 of the statutes relating to liability of railroad companies for injuries sustained by employes.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

Section 1. Section 1816 of the statutes is amended to read: Section 1816. Every railroad company shall be liable for damages for all injuries, whether resulting in death or not, sustained by any of its employes, subject to the provisions hereinafter contained regarding contributory negligence on the part of the injured employe:

1. When such injury is caused by a defect or insufficiency in any locomotive, engine, car, rail, track, roadbed, machinery or appliance used by its employes in and about the business of their employment.

2. When such injury shall have been sustained by any officer, agent, servant or employe of such company, while en-

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gaged in the line of his duty as such and which such injury shall have been caused in whole or in greater part by the negligence of any other officer, agent, servant or employe of such company, in the discharge of, or by reason of failure to discharge his duties as such.

3. In every action to recover for such injury the court shall submit to the jury the following questions: First, whether the company, or any officer, agent, servant or employe other than the person injured was guilty of negligence directly contributing to the injury; second, if that question is answered in the affirmative, whether the person injured was guilty of any negligence directly contributing to the injury; third, if that question is answered in the affirmative, whether the negligence of the party so injured was slighter or greater as a contributing cause to the injury than that of the company. or any officer, agent, servant or employe other than the person so injured; and such other questions as may be necessary.

4. In all cases where the jury shall find that the negligence of the company, or any officer, agent or employe of such company, was greater than the negligence of the employe so injured, and contributing in a greater degree to such injury, then the plaintiff shall be entitled to recover, and the negligence, if any, of the employe so injured shall be no bar to such recovery.

5. In all cases under this act the question of negligence and contributory negligence shall be for the jury.

6. No contract or receipt between any employe and a railway company, no rule or regulation promulgated or adopted by such company, and no contract, rule or regulation in regard to any notice to be given by such employe shall exempt such corporation from the full liability imposed by this act.

7. The phrase "railroad company," as used in this act, shall be taken to embrace any company, association, corporation or person managing, maintaining, operating, or in possession of a railroad in whole or in part within this state, whether as owner, contractor, lessee, mortgagee, trustee, assignee or receiver.

8. In any action brought in the courts of this state by a resident thereof, or the representative of a deceased resident, to recover damages in accordance with this act, where the employe of any railroad company owning or operating a railroad extending into or through this state and into or through any other state or states shall have received his injuries in any other state where such railroad is owned or operated and the contract of employment shall have been made in this state, it shall not be competent for such railroad company to plead or prove the decisions or statutes of the state where such person shall have been injured as a defense to the action brought in this state.

9. The provisions of this act shall not apply to employes working in shops or offices.

To take effect July 1, 1907.

* * *

Reports of the Legislative Committee, B. of L. F. and E., in Arkansas.

The following reports of the legislative committee of Arkansas show the good work being done in that state in the protection of the legislative interests of railroad employes:

LITTLE ROCK, ARK, Feb. 28, 1907.

To the Officers and Members of all Subordinate Lodges of the Brotherhood of Locomotive Firemen and Enginemen in Arkansas:

Dear Sirs and Brothers—I have the honor to submit herewith a partial report of the work accomplished through your legislative committee to and including February 27, 1907.

We take great pleasure in advising you of the passage through both branches of the general assembly of our long-desired "Fellow-Servant Law." This bill was presented in the senate the first week of the session by our friend from the Tenth district (Pulaski and Perry counties), Senator Kie Oldham, the bill being a copy of the present Colorado law, which was drafted by our assistant general counsel, Brother John H. Murphy, and presented to the last session of the general assembly, and passed through the house of representatives, but died on the calendar in the senate on account of undue corporate influence at that time prevailing in that body.

Senate Bill No. 28 (our fellow-servant bill) was presented as stated, and came up for consideration in the committee on judiciary on the afternoon of January 29, at which time your chairman, in conjunction with members of the other legislative committees, appeared

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before this committee and addressed them in behalf of the measure, and we had the pleasure, after receiving great assistance from Senators Goodwin, Holland, Wingo, Oldham and others, to receive a favorable recommendation for the bill, with amendment striking out the small companies and the word "individual," making the bill, as amended, read as follows:

"A bill for an act to be entitled 'An act to give right of action against an employer for injuries or death resulting to his agents, employes or servants, either from the employer's negligence or from the negligence of some of his other employes, servants or agents, and to repeal all acts and parts of acts in conflict herewith.'

"Be it enacted by the General Assembly of the State of Arkansas:

"Section 1. That hereafter all railroad companies operating within this state, whether incorporated or not; and all corporations of every kind and character; and every company, whether incorporated or not, engaged in the mining of coal; who may employ agents, servants or employes, such agents, servants or employes, being in the exercise of due care, shall be liable to respond in damages for injuries or death sustained by any such agent, employe or servant, resulting from the careless omission of duty or negligence of such employe, or which may result from the carelessness, omission of duty or negligence of any other agent, servant or employe of the said employer, in the same manner and to the same extent is if the carelessness, omission of duty, or negligence causing the injury or death was that of the employer.

"Sec. 2. That all laws and parts of laws in conflict herewith are hereby repealed, and that this act shall take effect and be in full force from and after its passage."

The above bill, we believe, will give the employes of all corporations and companies engaged in mining of coal, and especially the railroad employes, the relief along this line which we have been asking for during a period of ten years, and if it stands the test of the Supreme Court, and one of our members is injured or killed by the act of a fellow-employe, himself or his widow and children will have a right of action against the corporation for all the damages sustained through the carelessness or omission of duty of the employe causing the injury or death of his fellow-employe, when formerly, under the laws of this state, if the railroad company could establish the fact that one of our men was injured or killed by the careless act of a fellow-employe, they could set up the defense that such injury or death was caused by the act of a fellow-servant, hence they were not liable for said injuries or death so sustained, and you or your widows and children could secure no redress whatever, even though possibly the railroad company was indirectly responsible for the careless act of your fellow-employe, caused through his inability to properly perform his duties on account of long hours on the road, etc.

The bill was called up in the senate by Senator Oldham February 7, and on motion committee amendments were adopted and the bill made a special order for Monday morning, February 11, at which time the bill was taken up and passed, with only the following named senators voting in the negative: Amis, Carlock and Yopp.

The bill was then transmitted to the house and called up in that body February 15, read twice and referred to the committee on labor, of which Representative W. M. Moore of Pulaski county was chairman. Your representative, along with the representatives of the State Federation of Labor, the B. of L. E. and the B. of R. T., had a meeting with and addressed this committee in behalf of this bill, and received the unanimous indorsement of the committee on labor for the measure, the committee reporting same back to the house "that it do pass without amendment."

The bill was then called up Friday, February 22, by Representative A. D. Du Laney of Little River county, but the house refused to suspend the rules, and the bill was forced to go over until Tuesday, February 26, at which time it was again called up and passed, with only one dissenting vote, that of Representative Martin, of Crittenden county.

The bill was supported on the floor of the house by Du Laney of Little River, Meade of Pope, Coleman of Arkansas, Hunt and Rowell of Jefferson, Fletcher of Franklin, and the Hon. A. H. Hamiter, speaker of the house of representatives, who left his chair to make a speech in favor of the bill.

Representative Penny, secretary of the committee on labor, and a number of others gave us their hearty support, and,

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in fact, we believe the entire house to be composed of men who want to carry out the wishes of the majority of their people, as they have always done in the past when matters of importance to us and the common people have been up for consideration in that body.

Passing from the fellow-servant proposition, we will say that there are several other bills of much moment to us still pending in both bodies for action, among which are a bill to make more effective our present sixteen-hour law, a bill providing for certain qualifications of enginemen and conductors, a bill providing that all trains of twenty-five or more cars shall be operated with a crew consisting of not less than a conductor, three brakemen and one engineer and fireman; a bill providing that railroads shall equip all locomotives in road service with a headlight of such power and brilliancy that the engineer may see an object or obstruction the distance of eighty rods.

Your representative, along with the other legislative committees of the railway labor organizations, appeared before the senate committee on judiciary yesterday afternoon and addressed the committee on the bill pending in the senate, which is intended to make more effective our present sixteen-hour law, and the conference was continued until 6:00 p. m., the committee adjourning to meet again at 4:00 p. m. today, the 28th inst., to further consider the bill, the attorneys of the St. Louis, Iron Mountain and Southern Railway and the Rock Island Railway also being present to combat our arguments, but we believe we held our own, and think a majority of the committee will make a report in our favor.

Thanking you for your past support given your chairman in this work and trusting that you will continue to give me that support in the future while acting as your representative, and assuring you that I am not losing an opportunity to raise my voice in your behalf, and in behalf of the working people of our entire state, and further assuring you that a continuation of this report of work accomplished will be submitted at the end of the present session of the general assembly, I remain,

Fraternally yours,

J. M. BRICKHOUSE,

Chairman Legislative Committee of the B of L. F. and E. in Arkansas.

LITTLE ROCK, ARK., June 1, 1907.

To the Officers and Members of All Subordinate Lodges of the Brotherhood of Locomotive Firemen and Enginemen in Arkansas:

Dear Sirs and Brothers—As per attached copy of our partial report, issued February 28, we herewith submit a further report of action taken upon all matters which concerned our interest during the thirty-sixth general assembly of this state.

After having the satisfaction of passing through both branches our fellow-servant bill, and seeing that same was signed by the governor, your chairman turned his attention to other bills pending, among which was a bill prescribing certain qualifications for engine and trainmen, and which we believed would have had the effect of protecting our craft to a great extent, and read as follows:

"QUALIFICATION BILL."

The following bill, by Mr. Bolton, is our qualification bill:

House Bill No. 293. By Mr. Bolton.

A bill for an act entitled an act for the protection and safety of the traveling public of the State of Arkansas:

Be it enacted by the General Assembly of the State of Arkansas:

Section 1. That it shall be unlawful for any railroad company or corporation running or operating a railroad in this state to employ any person in the capacity of conductor of either passenger, freight or construction trains, unless such person has had at least two years' experience as a conductor for a term of two years, or has been employed as a brakeman for at least two years on either passenger, freight or construction trains. It shall be unlawful for any such railroad company to employ any person in the capacity of locomotive engineer unless such person has had at least two years' experience as a locomotive engineer, or has been employed as a locomotive fireman for at least two years on either passenger, freight or construction trains, or switching engines. It shall be unlawful for any such railroad company to employ any person in the capacity of flagman of any train or trains, unless such person shall have had at least two years' experience as a brakeman on passenger, freight or construction trains, and all persons employed in the

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capacity of flagman of either freight, passenger or construction trains, shall be held equally responsible with the conductor for any injury resulting from any act of negligence or carelessness of such flagman in the discharge of his duty. But nothing in this act shall be so construed as to prevent any such railroad company or corporation from retaining conductors, engineers or flagmen in its employ at the time of its passage.

Sec. 2. It shall be unlawful for any such railroad company or corporation to run over its road, or part of its road, outside of the yard limits, any passenger train with less than a full passenger train crew, consisting of one engineer, one fireman, one conductor, one flagman and one train porter.

Sec. 3. Any railroad company or corporation failing to comply with the provisions of this act shall be punished by a fine of not less than one hundred dollars, nor more than one thousand dollars.

Sec. 4. This act shall take effect and be in full force from and after its passage.

The above bill was introduced by Mr. Bolton, of Crawford, and numbered H. B. 293; read twice and referred to the committee on railroads.

After meeting with the committee, of which Mr. Ross was chairman, several times, finally secured a favorable recommendation that it do pass. The bill was called up in the house March 12, and passed by a vote of 59 to 19.

The bill was supported on the floor by Dick Davis, of Clark, and Bolton, of Crawford; Killough, of Cross, and Beck, of Sebastian, speaking against the bill, and will say just here these two men never lost an opportunity to belittle the labor organizations of the state and their representatives.

The bill was transmitted to the senate; called up in that body March 23; read first and second times; on motion of Senator Gross, was made a special order for Tuesday, March 30; the bill being supported on the floor by Senators Goodwin, Gross, Holland, McKnight, Bush, Pindall and Legate, and opposed by Senators DeRossitt, Hamiter, McDaniel, Cloud and Lee. The bill failed to pass by a vote of 17 to 13. Senators voting for the bill were as follows: Arnold, Bush, Greenhaw, Gross, Holland, Legate, Milan, McKnight, Nance, Patterson and Wingo. Against: Browning, Carlock, Cloud, DeRossitt, Floyd, Hamiter, Lee, Martin, Montgomery, McDaniel, McKenzie, Rector, Rowland, Simms and Yopp.

Senators Goodwin and Pindall voted for the bill, but changed to "no" in order to be placed in a position to move to reconsider, but failing to secure recognition, such action was not taken.

"SIXTEEN-HOUR AMENDMENT."

A bill for an act to be entitled an act to amend section No. 6652 of Kirby's Digest of the Statutes of the State of Arkansas.

Be it enacted by the General Assembly of the State of Arkansas:

Section 1. That section number sixty-six fifty-two (6652) of Kirby's Digest shall be amended to read as follows:

No company, corporation, or officer of court, owning or operating a railroad over thirty miles in length, in whole or in part within this state, shall permit or require any conductor, engineer, fireman, brakeman or any trainman on any train, or any telegraph operator who has worked in his respective capacity for sixteen consecutive hours, to remain on duty or perform any work until he has had at least eight hours' rest: Provided, That this act shall not apply to operating trains directly connected with a wreck or washout or relief trains: Provided, further, That the provisions of this act shall not apply to passenger trains.

Sec. 2. That this act shall be in full force from and after its passage.

The above bill was introduced by us for the purpose of making more effective our present sixteen-hour law, and after meeting the committee several times secured a favorable recommendation by the senate committee, and the bill was then called up by Senator Wingo, April 15, and passed the senate by a vote of 25 to 1; was transmitted to the house, and upon discovering that the bill had been tampered with and words added which would have had the effect of permitting a railroad to work their employes an unlimited number of hours until arriving at their terminal, and then give them eight hours' rest, and as our present law was better than this altered bill, we requested our friends to kill the measure, which was done by allowing it to die on the calendar.

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"FULL CREW BILL."

Following is Senate Bill No. 142, by Senator Goodwin:

A bill for an act to be entitled an act prescribing the minimum number of employes to be used in the operation of freight trains in this state, and providing a penalty for a violation of this act.

Be it enacted by the General Assembly of the State of Arkansas:

Section 1. No railroad company or officer of court, owning or operating any line or lines in this state, and engaged in the transportation of freight over its line or lines, shall equip any of its said freight trains with a crew consisting of less than an engineer, a fireman, a conductor and three brakemen, regardless of any modern equipment of automatic couplers and air brakes, except as hereinafter provided.

Sec. 2. This act shall not apply to any railroad company or officer of court, whose line or lines are less than fifty miles in length, or to any railroad in this state, regardless of the length of its said lines, where said freight trains so operated shall consist of less than twenty-five cars.

Provided, however, That this act shall not apply to any railroad when involved in a strike of its trainmen.

Sec. 3. Any company, corporation or officer of court owning or operating a railroad over fifty miles in length, in whole or in part within this state, violating the provisions of this act, shall be liable upon conviction, to a penalty of a fine of not less than five hundred dollars ($500), nor more than one thousand dollars ($1,000) for each separate offense, which shall be recovered in a civil action in the name of the state.

Sec. 4. That this act shall take effect and be in full force from and after its passage.

The above bill was introduced by Senator Goodwin, February 6, and referred to the committee on railroads, and after an extended session of the legislative committees and being opposed by the railroad lawyers, a favorable recommendation was received upon the bill and it was called up and passed the senate March 11, and transmitted to the house at once; called up in the house by Rowell, of Jefferson, March 12, read one time; called up March 15, read second time; the rules suspended and read third time and passed by a vote of 78 to 2.

The only members opposing the bill were Beck, of Sebastian, and Killough, of Cross, Killough saying a number of things derogatory to labor organizations in general and those engaged in railroading in particular, and asked if the legislature intended to pander to a "few little railbirds who sat around and called themselves a committee," and from his remarks we suppose that only the lawyers and the railroad corporations have any rights in this country; at least, from the standpoint of this jackleg lawyer from the country town of Wynne, who never let an opportunity slip to knock on the working man and his desires and always was on the side of the railroads, which seemed to be his special proteges—this regardless of the fact that we were only endeavoring to secure laws to make more safe our calling, as well as assist in protecting the lives of the traveling public, but this "would-be representative of the people" will always be found "braying like a jackass" against anything advanced by labor organizations through their representatives, and we trust that our membership will never forget his action, provided he ever bobs up for office again within the confines of this state.

The following bill by Senator Cloud was considered dangerous to our interest and was killed through the efforts of our friends, Senators McKnight and Goodwin, it dying in the hands of the committee of which Senator Goodwin was chairman.

"CLOUD'S BILL."

An act to prohibit discrimination in restraint of trade or callings by persons, corporations, associations and organizations, and providing penalties therefor.

Be it enacted by the General Assembly of the State of Arkansas:

Section 1. It shall be unlawful for any owner, lessee, agent or manager of any manufacturing or other industry to knowingly collect or receive from, or pay or deliver to, directly or indirectly, any person, firm, association, organization or corporation any money, goods or property, for the purpose of making, carrying out, or in pursuance of any contract or agreement in restraint of trade or callings, or for the purpose of assisting or aiding in the establishment or mainte-

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nance of any association, organization or corporation whose object or purpose is the making and carrying out of contracts and agreements in restraint of any trade or calling.

Sec. 2. Any owner, lessee, agent or manager of any manufactory or industry, or any person, firm, organization, association, or corporation, who shall violate the provisions of section 1 of the act shall be deemed guilty of a misdemeanor and upon conviction thereof in any court of competent jurisdiction, shall be fined in a sum not exceeding three hundred dollars for each offense.

Sec. 3. All acts and parts of the act in conflict with this act are hereby repealed.

Sec. 4. This act shall take effect and be in force from and after its passage.

Section 6 of House Bill No. 70, by Thomas, would have had the effect of preventing any railroad company from issuing any transportation whatever to any person, including their own employes or their families. We took this matter up with Mr. Thomas, along with the representatives of other railway labor organizations, explaining wherein this would work a great hardship upon our men. He stated that such was not his intention, and amended his bill by striking out section 6, which proved Mr. Thomas to be our friend, and we wish to state that he also supported all our different bills.

"HEADLIGHT BILL."

A bill for an act to be entitled an act for the better protection of railway employes and the public.

Be it enacted by the General Assembly of the State of Arkansas:

Section 1. Any company, corporation or officer of court, owning or operating a railroad over fifty miles in length, in whole or in part within this state, shall be required to equip, maintain and use upon each and every locomotive being operated in road service in the state, a headlight of such power and brilliancy, as will enable the driver or engineer of such locomotive to distinguish an object or obstruction a distance of not less than eighty (80) rods.

Sec. 2. Any company, corporation or officer of court, owning or operating a railway over fifty miles in length, in whole or in part within this state, violating the provisions of this act shall be liable, upon conviction, to a penalty of a fine of not less than three hundred dollars ($300), nor more than five hundred dollars ($500) for each separate offense, which shall be recovered in a civil action in the name of the state.

Sec. 3. It is hereby made the duty of any prosecuting attorney of any district in this state to enforce the provisions of this act, when complaint is properly filed in his office. It is further also made the duty of the officers of the railroad commission of this state to bring action, when complaint is properly filed in their office.

Sec. 4. That this act shall take effect and be in full force from and after January 1, 1908.

The above bill was introduced in the Senate by Senator Goodwin and numbered 258, read twice and referred to committee on railroads. The objects of the bill were explained by the legislative committees and the necessity for a better light on the head end of a locomotive was fully discussed, we convincing the senate committee on railroads that the proposed law was in the direct interest of the traveling public, as well as the safety of the employes and property of the railroads. The bill was returned to the senate with the recommendation that it do pass as amended by the committee, to read, "a headlight of 1,500 candle power" instead of one of such power and brilliancy as would enable the engineer to see an object eighty rods. This amendment being substantially just what we desired, having the effect to force the railroads to equip their locomotives with a headlight much better than the old coal oil light, now in use on freight engines, we accepted the amendment.

The bill was called up and passed the senate without opposition, was transmitted to the house of representatives March 29, was called up March 30, read twice and placed on the calendar; was again called up May 11 and passed without opposition, being returned to the senate May 13.

In connection with this bill, and in fact all other bills of interest to the engine and trainmen, we desire to mention the valuable services of Representatives Dick Davis, of Clark, an old engineer, and William Moore, a union printer of Pulaski, members of the house, the delegation from Jefferson county, Messrs. Hunt, Pinney and Rowell; also DuLaney of Little River, Owen of Miller, Fletcher of Franklin, Meade of Pope, Coleman of

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Arkansas, and the Hon. Allen H. Hamiter, speaker of the house, all of whom gave us their support with both voice and vote upon all occasions. We would like to mention every name of those who voted for our measures, but want of space prevents; however, the action upon different bills as recorded herein will give you the names of our only avowed enemies, and a roster of both the house and senate will give you the names of all the other members who are entitled to your support when seeking further political preferment.

Concluding this report, we desire to say that our legislative committees were accorded the best of treatment from four-fifths of the members of the house of representatives, and on most occasions by a majority of the members of the senate of the thirty-sixth general assembly, and especially those mentioned in this report who championed our cause on the floor of both houses, and we trust our members will not forget to remember our friends when assisting in dealing out political honors, and at the same time do not forget our open enemies: in the senate, Amis, Carlock and Yopp; in the house, Beck of Sebastian and Killough of Cross; all five of whom seemed to take special delight in opposing us and our measures whenever the occasion presented itself. Other members in both houses voted against us in several instances, but showed no such vindictive spirit, and we believe voted from an honest conviction that we were wrong in our ideas, and that they were right.

Wishing you all a full measure of success, and trusting that those bills enacted into laws will be of some benefit to our membership, I remain,

Fraternally yours,

J. M. BRICKHOUSE,

Chairman Legislative Committee, B. of L. F. and E. in Arkansas.

* * *

*Some Homely Suggestions.**

"I can not toast that flag, while trades unionism exists in this country." So, it is reported, said a speaker at an employers' banquet recently. Compared with this pharasaical utterance should be another statement, said to have been made by President Roosevelt: "I was surprised, during the Spanish War, to find how large a number of dead soldiers were identified by the trades union cards which were found in their pockets." Further comment seems unnecessary.

*By the Rev. Charles Stelzle.

"Be good, sweet maid, and let who will be clever." Charles Kingsley, who gave us this advice, was no milk-sop. He was a great factor in the social and economic life of his day. He it was who called attention to the opportunity for service in behalf of workingmen in their everyday lives. But he was not alone in the discovery that the brilliant man or woman isn't always the one to tie to. To tell a man "to be good" sounds rather soft to some people. But it involves more than a mere negative virtue—the mere keeping away from evil. It includes all the virtues that make a man's life really worth while. The fellow who can not be depended upon, for instance, no matter how brilliant he may be, counts for precious little. The most brilliant chap on a very important job was recently fired simply because he could not tell the truth.

"To win for ourselves the truth which gives to error what permanence it has"; "to seek to understand, and not to silence our adversaries"; these are pretty good mottoes for most of us who are troubled about those who seem to be forging ahead in spite of the fact that they are wrong—according to our notions.

* * *

Important Resolutions by the B. of R. T. Convention.

That the Brotherhood of Railroad Trainmen is fully alive to the great necessity which exists for wage earners to exercise their political influence in the protection of their industrial and economic interest is evidenced by the adoption, at the recent convention of that organization, of the following resolution condemnatory of the hostile attitude of Joseph G. Cannon, as speaker of the national house of representatives, towards the interests of railroad employes and other classes of workingmen:

"Whereas, we have reason to believe that Joseph G. Cannon has, as speaker of the national house of representatives, used the influence and power of that great office to defeat the passage of legislation sought by the railroad employes and other working classes, both in the way of appointing as members of the house committees to which such leg-

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islation was referred men who were known to be hostile to its enactment, and by denying it proper consideration by the house; also by personally going upon the floor of the house and by the use of threats, intimidation and force, compelling members to vote against our legislation, contrary to their own convictions; therefore be it

"Resolved, by the Brotherhood of Railroad Trainmen, in eighth biennial convention assembled at Atlanta, Ga., May 20, 1907, that we hereby denounce said actions of Cannon, as arbitrary, autocratic, and not in keeping with American principles of government or fair play, and we solemnly protest against his re-election to this high and honorable office, upon which he has brought reproach, as we believe his re-election would prejudice and render impossible of fair consideration by the house, legislation looking to the protection of the railroad emploves and other classes of labor."

Another important resolution adopted by the B. of R. T. convention was one condemnatory of the present indiscriminate flow of immigration into the United States, particularly from Asiatic countries, and advocating its regulation.

In another resolution the convention pledged the co-operation of the Brotherhood in the matter of securing anti-injunction legislation. The convention also instructed its legislative representative at Washington to watch the operation of the sixteen-hour law recently enacted by Congress, and where found inadequate, to work for its proper amendment.

A resolution was also adopted opposing the practice of issuing train orders by telephone, especially on single-track roads, the possibility of mistakes in understanding the order being pointed out, and the consequent liability of accidents ensuing therefrom.

Resolutions opposing child labor and any legislation looking to the compulsory arbitration of labor disputes but favoring voluntary arbitration were also adopted.

* * *

Mary's Union Goat.

Mary had a little goat
With manners meek and pleasant,
And when its birthday came around
She gave the goat a present.

She bought—now children do not laugh—
That goat a lovely bonnet;
He ate it up because it had
No union label on it.

—Adam Bugg in Trades Unionist.

Address of Hon. Edward A. Moseley, Secretary Interstate Commerce Commission, to the Convention of the Master Car Builders' Association Recently Held at Atlantic City.

This is the sixth consecutive convention of your association which it has been my pleasure to attend, and I have so well learned to appreciate the worth of your individual members that I count it an honor to be privileged to address you at these annual meetings. Indeed, my personal acquaintance with the master car builders has become so intimate that I have come to feel almost like one of them. These yearly conferences are pregnant with results of the highest value to the great transportation interests of the country, and I am glad to be able to say something concerning a phase of your work which involves problems that are becoming every year more important.

Since your last convention the question of car shortage has attracted a large share of public attention, and the Interstate Commerce Commission has conducted an extensive investigation into the matter. As you are doubtless familiar with the results of that investigation, I need not touch upon them, but there is one phase of the general subject to which I wish to briefly allude.

In so far as car shortage is affected by the handling of defective equipment, under your interchange rules and local agreements, it is a matter in which you are vitally interested. If the enforcement of your rules unnecessarily delays the movement of cars, the rules should be altered. On the other hand, if detention is caused by the non-observance of rules which, if lived up to, would clearly facilitate the movement of cars, then some method should be devised to bring about enforcement of those rules, both for the public interest and the benefit of the railroads. An honored member of your association recently called my attention to a paper on delay in the movement of empty cars at terminals, read at the April meeting of the Western Railway Club, by Mr. W. E. Beecham, car accountant of the C., M. & St. P. Ry. Mr. Beecham's paper treats of a condition with which we are all more or less familiar, and which loudly calls for reform. I quote him briefly as follows:

"It frequently happens that existing defects are augmented by the switching,

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and when such a car is returned to the delivering line it is rejected by the inspector and, without any attempt being made to adjust matters, the car is immediately sent back; then commences the shuttle-cock process, and before the case of that car is settled it may make many movements between two ralroads because one does not want it and the other won't have it—all the while piling up trackage and per diem for the juggling roads to pay and depriving the owner of the use of his car besides."

Specific cases are cited where three roads paid $72.50 for the privilege of juggling two empty foreign cars between them, equivalent to throwing so much money away, while the cars were held out of service for a period of two months. Mr. Beecham spoke particularly of Chicago; but the condition he points out prevails to a greater or less extent at all large terminals in the country, and it is mighty expensive for the railroads, besides tending to greatly augment the evils of car shortage. And the important point is that the condition is due to failure to observe the M. C. B. rules. As Mr. Beecham well says: "It is apparent that we don't need any more rules or agreements to meet the situation, and that failure to observe the rules and agreements now in effect is the cause of the trouble."

I have called attention to this matter because the charge has been made and reiterated that because of its unnecessary severity in enforcing the safety appliance law the Interstate Commerce Commission is largely responsible for the car shortage, and I want to refute that charge. I have never yet heard of a car being held up and juggled back and forth between two roads on account of safety appliance defects for which neither road cared to assume responsibility. Such work as that occurs only in the case of M. C. B. defects that are clearly provided for by the rules of interchange. It is true that cars are frequently sent back for penalty defects, but in all such cases the defects are promptly repaired and the cars again sent forward. There is no juggling of cars back and forth, and no piling up of trackage and per diem on account of penalty defects. I do not believe an inspector would take chances on treating penalty defect cars in that manner. He would fear that if he did so his road might be called upon to pay penalties in addition to trackage and per diem and he would be asked by his superiors for an explanation that might be hard for him to make. Besides, penalty defects are easily, quickly and cheaply repaired, and there is positively no reason why cars should be unnecessarily delayed on account of them. As a matter of fact, if all M. C. B. defects were covered by the safety appliance law there would be much less complaint about delay to cars at terminals than there is now, and the trackage and per diem charges would not mount up so fast. With knowledge that the handling of cars with those defects laid the roads liable to a penalty would come an adequate system for promptly and efficiently repairing them.

Neither is it true that the commission has exercised undue severity in its enforcement of this law. Copies of our inspection reports are regularly sent to the managing officers of all roads, so that they may note the condition of equipment as found by us at regular intervals and observe whether improvement or the reverse has taken place. We have never yet entered suit without giving fair warning and ample opportunity to correct any unfavorable condition that was shown to exist. It is not the purpose of the commission to enter into a crusade for the collection of penalties, and its inspectors are instructed to use the utmost care and circumspection in filing reports of violations. They have been impressed with the idea that the purpose of the statute is what we are seeking to obtain, and not the imposition of penalties. The commission has always discouraged the idea that the measure of an inspector's efficiency is the number of violations he may file against carriers, and it is a matter of supreme satisfaction both to the commission and its inspectors, when the ends of the statute can be obtained without prosecutions. I think I may safely say that the members of this association have had sufficient experience in dealing with the commission to know that carriers who are honestly and conscientiously endeavoring to comply with the law have no reason to complain that the commission is unduly severe in its enforcement. We have no wish to collect penalties. It would greatly please the commission were its inspectors able to report perfect conditions on all roads, and it is hoped that the members of this association may in the near future bring about such good

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conditions of equipment that prosecutions may practically cease.

But there will be no slackening of effort. The expressed determination of the courts is to uphold the law, and through the numerous opinions that have been filed its interpretation in practically all essential particulars has been clearly established. The uniform success that has attended prosecutions is a matter of gratification to the commission, and demonstrates the care which our inspectors have taken to secure correct information and the high character of the testimony they have furnished in court. In a case decided less than a fortnight past, a judge from the bench paid a high compliment to two of our inspectors for their intelligence, and the lucid testimony they furnished on the witness stand. Out of prosecutions for 927 violations of the statute to date, adverse decisions, involving four penalties, have been rendered in but one court. These cases are now pending on appeal to the circuit court of appeals for the eighth circuit. Four hundred and twenty-eight cases are now on the trial dockets, and penalties have been paid for 350 violations.

Of the various defects constituting the basis of prosecution, inoperative uncoupling mechanism constitute a large majority. There are 672 cases of this character. In 22 cases the chain had become kinked and wedged in the body of the coupler, thus rendering it impossible to lift the lock block. In 92 cases the lock block was either broken or missing. In 5 cases the chain connecting the lock block to the lever was too long, rendering it impossible to lift the lock block. In 76 cases the lever was missing. In 23 cases the lever was broken. In 433 cases the uncoupling chain was disconnected from the lock block, caused by broken links in chain, broken or missing clevis or missing clevis pins. There were 15 cases of link and pin coupler; 21 of inoperative driving wheel brakes on locomotives; 66 cases of failure to have the required percentage of air brakes; 2 broken couplers; 102 missing or insecure grab irons; 21 cases of draw bars either greater or less than the standard height, and 27 cases of cars without couplers fastened together with chains.

The most striking thing about these cases is that in many instances carriers have paid out hundreds of dollars in penalties which could have been entirely avoided by the expenditure of a few cents in labor and materials for repairs. One road paid $1,400 for defects that could have been repaired at a cost of $6.45; another paid $1,300 for defects that could have been repaired for $2.45; another paid $600 for defects that 80 cents would have fixed; another paid $300 which could have been avoided by the expenditure of 15 cents. In four typical cases, $4,900 would have been saved by the expenditure of $11.97; $4,200 by $8.53; $3,100 by $7.80, and $2,900 by $2.35. A total of 282 violations, involving fines amounting to $28,200, could have been avoided by the expenditure of $68.03, or an average cost per violation of 24 cents. These estimates have been made with considerable care from the scale of prices furnished by this association. They seem to indicate beyond any question of doubt that it is cheaper to repair safety appliances than to pay penalties.

There is still considerable complaint about unnecessary handling of chained up cars, and the commission has often been appealed to for a ruling as to a carrier's liability for handling cars in this condition. It is sufficient to say on this point that the commission has no power to modify the terms of the statute in any particular. Carriers must in all cases judge for themselves whether or not a particular act is in violation of the law. There is now such a large body of court decisions to refer to that little difficulty should be experienced in arriving at a correct understanding of a carrier's rights under the law in most cases that may chance to arise. The movement of chained up cars has been declared unlawful by Judges McPherson, Wolverton, Trieber and McCall. The substance of the holding of these four judges is that the carriers of the country can not localize all repairs at one shop of their entire system, but that they must have men and material which can make all these safety appliance repairs wherever there is any likelihood of defects occurring. As Judge Purnell said in his decision in the Atlantic Coast Line case that "The United States is entitled to recover the statutory penalty for violation of the Federal safety appliance act under all circumstances where an injured employe has under that statute the benefit of denial of 'assumption of risk,'" it would appear that the government has a right to recover penalties for any and all movements whatsoever of defective equipment.

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As the employe does not assume the risk attending the movement of equipment not complying with the requirements of the law even to a repair point, such risk must be borne by the carrier and not by the employe.

Complaints continue numerous respecting the bad condition of hand brakes. With the rapid increase in the use of air the hand brake has been neglected, and I can not too strongly urge that more attention be paid to its condition. The hand brake is called into use to a greater or less extent to insure the control of trains in cases of emergency and in special conditions of service. It is also necessary to use it when setting out cars along the road, and in switching movements, especially in gravity yards. Many employes have suffered serious injuries in gravity yards because of defective hand brakes, and to this cause may be attributed much of the damage to cars and their contents which is commonly laid to rough usage or carelessness in switching. Our inspectors still find many hand brakes working opposite to the air brakes. This is extremely dangerous and it has been so repeatedly condemned that it is somewhat surprising to find such a condition existing in any degree at this time.

There is still much to be accomplished in the direction of securing uniform compliance with the association's standards. Recognizing the need of uniformity, the Commission has endorsed your standards and endeavored to uphold them in every possible way. Its attitude has practically given your standards for the protection of trainmen the force of law. In view of this condition it seems as though it should be a matter of pride with every member to adhere strictly to the standards which have been agreed to after the most careful consideration. But we find many cases where individuals have adopted their own ideas of equipment, in opposition to standards, although employed by members of this association who have signified their approval of those standards. This lack of uniformity is particularly noticeable with respect to the application of grab irons. In many cases the practice seems to be to stick them on any old way, just so they are got onto the car, and it is not unusual to find grab irons applied differently on opposite ends of the same car. Uniformity in these matters is greatly to be desired. It is of more importance than the comparative merit of different devices or methods of application. Conceding that a particular method advocated by an individual may be, considered by itself, superior to the standard in point of both safety and convenience, still it can not be approved if it destroys uniformity. What trainmen want is uniform application. They want to know, when they attempt to use a grab iron, a sill step, ladder or uncoupling lever on any car, that they will find the device in the same location, and applied in the same manner as they would expect to find it on every other car of the same class. This is especially important for the protection of men in switching cars at night, particularly in gravity yards and terminals where large numbers of cars are handled with the greatest possible dispatch.

In this connection I desire to point out the need of a standard uncoupling arrangement for passenger cars. The old style of platform arrangement has been found inadequate, because it involves the practice of disconnecting the uncoupling chains in many cases where sharp curves exist, to prevent trains from parting while in motion; also, to obviate the danger of parting trains by passengers or other unauthorized persons meddling with the levers on platforms. To comply with the law it has been deemed necessary to adopt some device that can be operated by a man standing on the ground at the side of the car and which will obviate the necessity of disconnecting chains, and in meeting this need devices of various constructions and applications are used. In the interest of uniformity and safety, a standard should be adopted.

While interchange rule No. 36 has conspired with the safety appliance law to bring about a considerable increase in the number of air brakes in use during the past year, it is noted that there has been some decrease in the efficiency with which air brake equipment is maintained. The cleaning and oiling of triples is frequently done in a perfunctory manner. In several instances it has been complained to our inspectors, though no positive evidence has been obtained by us, that the complaint is well-founded, that in certain test yards it is the practice to restencil triples that pass the test without cleaning. Too much can not be said in condemnation of such a practice as this, and wherever the commission is able to procure direct evidence that it exists, vigorous measures will be taken

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to put a stop to it. Too little attention is paid to the adjustment of piston travel. The efficiency of the brake depends in great measure upon uniformity in piston travel and this is a detail that should be well looked after, especially on roads where heavy grades exist. The renewal of leaky packing leathers is also a feature of air brake maintenance that should be given greater attention.

In some portions of the western territory our inspectors have observed that in repairing safety appliance defects preference is given to penalty and per diem cars—that is, equipment of other roads. This, of course, is for the purpose of facilitating the movement of such equipment to avoid trackage and per diem charges, but it frequently results, in places where the repair force is limited, in the neglect of other equipment and such other equipment is handled about yards, delivered to industries and interchange tracks, and sometimes permitted to go forward in trains with safety appliances in defective condition. The remedy for this appears to be increase in the repair force to a point that will permit of prompt repair to all defects without reference to the character of the cars on which they exist, and what has been previously pointed out with respect to the cost of repairs as compared with the penalties paid in court may tend to convince carriers that an adequate repair force at all points is a measure of actual economy.

The tendency of federal legislation is to increase the financial responsibility of carriers for personal injury to their employes. This was attempted in the safety appliance law by providing two penalties for its violation, first, a direct penalty of $100 set forth in section 6, and, second, an indirect penalty involved in the denial of the defense of assumption of risk as contained in section 8 of the law. By the terms of this law, the government in effect said to the railroads: "Here are certain standards of equipment which you must maintain; you must use car couplers that can be coupled and uncoupled without the necessity of men going between the ends of the cars, and which are maintained at certain height; you must equip your locomotives with power driving wheel brakes and appliances for operating the train brake system; you must apply secure grab irons to the sides and ends of all cars, and you must have a certain percentage of the cars in every train equipped with power brakes in an operative condition, so that the engineer of the locomotive hauling such train can control its speed without requiring brakemen to use the common hand brake for that purpose. Failure to observe any one of these requirements will subject you to a penalty of one hundred dollars, and in addition thereto, if an employe is injured or killed through the use of equipment in violation of law, you can not avail yourselves of the common law defense of assumed risk to avoid financial responsibility therefor."

The enforcement of the penalty provision contained in section 6 has brought about a wonderful improvement in railroad equipment and greatly increased the safety of employes. Experience with regard to the indirect penalty imposed by section 8 has not been so entirely satisfactory. Previous to the enactment of the safety appliance law, the defense of assumed risk was very effective and was much employed in personal injury cases. Deprived of this defense, the railroads fell back upon another equally effective, namely, contributory negligence. While in legal theory assumed risk and contributory negligence are separate and distinct doctrines, it is nevertheless true that there is sufficient analogy between them to make it sometimes difficult to distinguish one from the other. As was stated by the Supreme Court of the United States in rendering its decision in the recent case of Schlemmer v. B. R. & P. Ry. Co., "The difference between the two is one of degree rather than of kind."

This condition led to the result that in numerous personal injury cases employes were deprived of the relief guaranteed them under section 8 of the safety appliance law, the railroads succesfully employing the defense of assumed risk under another name; whereas injured employes formerly had their cases thrown out of court on the ground of assumption of risk, they now suffer the same fate on the ground of contributory negligence. In the case above referred to, which came to the Supreme Court of the United States on error from the Supreme Court of Pennsylvania, Schlemmer, who was a brakeman on the B. R. & P. Railway, was killed while endeavoring to couple cars not equipped as the statute requires, and his widow entered suit for compensation for his death. Her case was thrown out of the courts of

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Pennsylvania on the ground that Schlimmer had contributed to his own death. In reversing the judgment of the Pennsylvania courts in this case, the Supreme Court of the United States has taken a step which will go far to clarify the situation with respect to the enforcement of the rights of employes under section 8 of the safety appliance law and make it more difficult for carriers to relieve themselves from the penalty imposed by it.

The difficulty in securing adequate enforcement of section 8 of the safety appliance law undoubtedly hastened the enactment of the employers' liability law of June 11, 1906, section 2 of which defines the rights of employes when charged with contributory negligence in personal injury cases and limits the extent to which this defense can be used by employers. The necessity for a law of this character has long been felt. All progressive countries have recognized the need for a modification of the archaic and inhuman common law rules governing the relations of master and servant, and have enacted far more drastic legislation than has ever been attempted in this country to govern those relations. It is true that many of the states have enacted employers' liability laws, but they have lacked uniformity and by reason of their essential limitations they are not applicable to interstate employments. As a consequence, the great body of railroad employes have been subjected to the injustice and inhumanity of common law rules.

The constitutionality of this law has been vigorously attacked by the railroads. In two cases their contentions have been upheld by the courts, while in five others the statute has been held valid. The Federal government, acting through Attorney-General Bonaparte, has taken all possible measures to defend the integrity of the law, and the two cases in which adverse decisions were rendered have been brought to the Supreme Court of the United States, where, by special favor of that body, they were advanced upon the calendar and heard on April 9th, 10th and 11th. It is expected that a decision will be rendered by the court immediately after it convenes for the October term. The friends of the law confidently expect that it will be upheld, in which case another strong incentive will be furnished railway managers to introduce measures of safety for the protection of their employes and the greatest possible care will need to be exercised in maintaining equipment in proper order. With two effective penalties for the handling of defective equipment, carriers will undoubtedly find it the highest economy to keep their equipment in proper repair.

I recognize the fact that were it not for the earnest co-operation which the commission has received from members of your association in its efforts to secure the ends of the safety appliance law, the extremely favorable conditions which now confront us would not exist. Our inspectors have always been treated with the greatest consideration by the master car builders; we have never yet received a complaint that the attitude of any member of your association was anything less than cordial and helpful in securing the safety of employes as contemplated by the statute, and I will say personally that whenever I have had occasion to call your attention to any matter that needed correction it has been promptly attended to. Were the matter of maintenance of equipment so as to preserve the conditions contemplated by the law left entirely in the hands of the master car builders, I feel confident in asserting that prosecutions for violation of the statute would be extremely rare.

For any failure that may arise to keep equipment in order, we recognize the fact that you master car builders are not to blame. The blame lies in the failure of those who are higher up to provide means to enable you to maintain an adequate repair force. I want to say that this law has been vigorously enforced in the past, and it is now supported by such a body of court decisions that we feel no doubt as to its application in practically all cases. Through its action in increasing the appropriations, the government has signified a determination to continue its policy of vigorous enforcement of the law, and it is but fair to say that it is the commission's intention, if possible, to demonstrate to the railroads that it is a measure, not only of economy, but of humanity to keep equipment in such a condition of repair that prosecutions in court will be no longer necessary; in other words, that it will be cheaper to repair equipment than to pay penalties for violation of the law.

It is a pleasure to me to mingle with you at these annual meetings in company with the inspectors of the commission;

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a better understanding of the needs of the situation is thus obtained and the interests of both the public and the railroads are served thereby. I wish all possible good to this association and the individual members thereof, and thank you for giving me the privilege of addressing you.

* * *

Supplemental Report of the Joint Labor Legislative Board of Texas Covering the Special Session of the Thirtieth Legislature.

The following supplemental report of the Joint Labor Legislative Board of Texas is additional evidence of the untiring vigilance and splendidly effective work of that body. Accompanying the report is given in full several of the important laws passed in the interest of labor by the thirtieth session of the Texas Legislature.

The report is as follows:

Supplemental Report Covering the Special Session of the Thirtieth Legislature.

To Organized Labor in Texas:

The regular session of the Thirtieth Legislature adjourned on May 12th. A special session was immediately called by Governor Campbell to consider important measures relating in the main to revenue and taxation and court reform. The Joint Board remained in Austin until May 23, compiling our report and closing up our work. There being only one matter pending before the special session at that time in which we felt an interest (the uniform text-book bill), many of our members returned home, and the others were preparing to follow, when, on May 24, there was introduced in the house and senate a bill of vital interest to the railway employes of the state. This bill, which was introduced in the senate by Senator Hudspeth and in the house by Representative Davis, both of El Paso, took from the railroad employes that work upon the railroads running across the borders of the state the right to sue in Texas for injuries received outside the state. The laws of Mexico and of the territories adjoining Texas on the north are extremely unfavorable to the recovery of damages for personal injuries. The law has always been that a suit for personal injuries could be brought wherever the responsible party could be found, and under this law employes who were injured across the border have often come to Texas to file their suits, the laws and courts of Texas being more favorable than those of the territories or of Mexico. This bill, known as senate bill 47, was introduced in the senate and house on May 24, referred to the committee and favorably reported the same day, and finally passed the senate on the morning of the 25th. Not until it had passed the senate did our friends become aware of its effect, and at once the Joint Board was reconvened and our efforts directed toward its defeat. The house bill on the same subject by Representative Davis was killed in the committee, but when the Senate bill came over, after a hard fight a majority of the committee voted against it, but a minority composed of Representatives Heslep and Neblett brought the bill out on a minority report, but, thanks to the good work of our friends in the house, it got no further, and died upon the calendar. The bill was introduced under that section of the governor's message calling for reform in civil and criminal procedure, and we feel safe in saying that such a bill was not contemplated by the governor when he issued the call.

Inasmuch as the legislature did not respond to the governor's recommendations concerning judicial reform, it is very likely that this and other efforts of the same kind will be made at future sessions of the legislature to destroy or weaken many of the laws now on the statute books affecting the rights of labor in the courts, and for that reason our organization should be exceedingly watchful.

The uniform text-book law passed by the regular session was vetoed by the governor and resubmitted to the special session. An effort was made at both sessions to prevent the adoption of an amendment championed by us making the law apply to the larger cities of the state. Our board earnestly sought to have the benefit of this law apply to all schools in the state. In this we were to a large extent successful, as the new law now applies to all public schools except high schools. In order to prevent a sudden change from the books now in use to the state-adopted books, it provides that the books now in use in the city schools may, with the approval of the state school board, continue to be used, provided the price does not exceed the

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price of the state-adopted books, and when a change is made the state books shall be introduced. On the whole we believe the new law to be fairly satisfactory, and that it has benefited the patrons of the public schools in the large cities.

During the special session there was much discussion throughout the state of contemplated changes in division points by railroads to comply with the new sixteen-hour law passed at the regular session. The people of Hillsboro, believing that the division would be moved from that city, endeavored, first, to have the law amended or repealed, and a committee came to Austin for that purpose, but, meeting no encouragement, they asked for an extension of ninety days in order that certain changes might be made so as to keep the terminal at Hillsboro. Many railroad employes residing at Hillsboro were vitally interested, and a committee from their number came to Austin to get the approval of our board for the proposed extension of time. After considering the matter fully in all its phases, and conferring with a large number of railroad employes from all parts of the state, our board consented to the extension of time, on condition that no other feature of the law should be changed. This was agreed to, and a bill extending the time at which the new law was to take effect, from July 12 to October 12, was introduced in the legislature. Fearing that some effort might be made to extend the time still further, or in some way to cripple the original law, we watched the course of the extension bill very carefully. In the senate an emergency clause was added, which, in the judgment of good lawyers, had a tendency to jeopardize the original law, whereupon we insisted upon the house bill by Mr. Graham taking the place of the senate bill, which was done. Later, however, when the bill reached the governor, he discovered that in the enrollment of the bill, after its passage by the legislature, some interlineations had been made which would nullify the original law. The governor very promptly refused to approve the bill, saying that he had agreed to submit the matter to the legislature only for the purpose of extending the time; that he was a friend of the sixteen-hour law, and that he would not give his approval to any measure that would kill or cripple it. The bill went back to the enrolling room, and after being corrected so as to conform with the law as passed by the legislature, it was again presented to the governor and approved by him.

To the friendship of Governor Campbell for this law and his watchful care we are indebted for the preservation of this very valuable law. And in this connection we desire to say that the working people of Texas owe a debt of gratitude they can never repay to the governor for the strong support he has given to all measures for their betterment. His office has been open at all times to members of our board, and he has always been ready to meet and confer with us on matters of legislation, and in countless ways has advised and assisted us. He has proven himself a true friend of the masses of the people, and has stood courageously by their cause in all matters. Fraternally submitted,

JOINT LABOR LEGISLATIVE BOARD OF TEXAS.

WALTON PETEET,
Texas Federation of Labor, Chairman.
C. F. GOODRIDGE,
O. R. C., Vice-Chairman.
H. G. WAGNER,
B. of R. T., Secretary.
C. D. JOHNSON,
B. of L. E., Treasurer.
JOS. S. MYERS,
B. of L. F., Statistician.

Sixteen Hour Law.

This bill was introduced in the house by Representave Hamilton, and while there was some opposition, it finally passed both houses by safe majorities. The opposition confined itself to urging amendments and exceptions which would have rendered the law of no effect, as was the case with a law on the same subject passed by the Twenty-Seventh Legislature.

Following is a copy of the law, which goes into effect October 12, 1907:

H. B. No. 364. By Hamilton.

AN ACT

To prohibit any corporation or receiver operating a line of railway, in whole or in part in the State of Texas, or any officer, agent or representative of such corporation, or receiver, from requiring or knowingly permitting any conductor, engineer, fireman, brakeman, train dispatcher or telegraph operator who has been on duty for fourteen consecutive hours, to perform

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any work until he has had at least eight hours off duty, except in certain cases, and to prohibit any such corporation or receiver, or any officer, agent or representative thereof, from requiring or knowingly permitting any such employe who has been on duty for fourteen consecutive hours, and who has gone off duty, to again go on duty or to perform any work for such corporation or receiver until he has had at least eight hours off duty, and providing penalties for violation of this act, and prescribing the venue of suits and prosecutions thereunder, and repealing Chapter 31 of Acts of the Twenty-eighth Legislature, and declaring an emergency.

Be it enacted by the Legislature of the State of Texas:

Section 1. It shall hereafter be unlawful for any corporation or receiver operating any line of railroad, in whole or in part in this state, or any officer, agent or representative of such corporation, or receiver, to require or knowingly permit any conductor, engineer, fireman, brakeman, train dispatcher or telegraph operator who has been on duty for fourteen consecutive hours to perform any work until he has had at least eight hours off duty, except in cases where such fourteen hours expire while a train is between stations or at a station where there are no facilities for sidetracking such train, in either of which events the conductor, engineer, fireman or brakeman, or all of them, may be permitted to proceed with such train to the first station where such facilities can be had, but no further; provided, however, that in case said fourteen hours shall expire when a train is within twenty miles of a terminal toward which it is going, or within twenty miles of its destination, the aforementioned employes operating such train may be permitted to proceed to such terminal or destination, but in such case shall not be required or permitted to do any switching or other work which would in any manner retard them in speedily reaching such terminal or destination; provided further, that this act shall not apply in the case of casualty upon such railroad, directly affecting such employe, nor shall it apply to sleeping car companies.

Sec. 2. It shall hereafter be unlawful for any corporation or receiver operating any line of railway, in whole or in part in this state, or any officer, agent or representative of such corporation, or receiver, to require or knowingly permit any conductor, engineer, fireman, brakeman, train dispatcher or telegraph operator who has been on duty for fourteen consecutive hours, and who has gone off duty, to again go on duty or perform any work for such corporation or receiver until he has had at least eight hours off duty.

Sec. 3. Any corporation or receiver operating a line of railroad, in whole or in part within this state, who shall violate any of the provisions of this act shall be liable to the State of Texas in a penalty of not less than two hundred dollars nor more than one thousand dollars for each offense, and such penalties shall be recoverable, and suit therefor shall be brought in the name of the State of Texas in any court having jurisdiction of the amount in Travis County, Texas, or in any county into or through which said railroad may pass. Such suit or suits may be brought either by the attorney-general or under his direction, or by the county attorney or district attorney of any county or judicial district into or through which said railroad may pass, and such attorney bringing any action under this act shall be entitled to a compensation of one-third of the total amount of penalties recovered.

Sec. 4. Any officer, agent or representative of any corporation or receiver operating any line of railroad, in whole or in part within this state, who shall violate any of the provisions of this act shall be punished by a fine of not less than one hundred dollars nor more than five hundred dollars for each offense, or by confinement in the county jail for not less than ten or more than sixty days, or by both such fine and imprisonment, and such person so offending may be prosecuted under this section, either in the county where such person may be at the time of the commission of the offense or in any county where such employe has been permitted or required to work in violation of this act.

Sec. 5. The fact that there is now no adequate law to prevent railroad employes from being required and permitted to work for more than fourteen consecutive hours without rest, and that it is extremely dangerous to the traveling public, as well as to the property rights of the citizens of this state, that trains

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should be operated by men who have been on duty for more than fourteen consecutive hours without rest, creates an emergency and an imperative public necessity that the constitutional rule requiring bills to be read on three several days be suspended, and that this act take effect from and after its passage, and it is so enacted.

Electric Headlight Law.

This bill was introduced in the house by Representave Witherspoon, and was the first labor measure passed by this Legislature. Its value to railway employes and the traveling public can not be overestimated.

Following is a copy of the law:

H. B. No. 52. By Witherspoon.

AN ACT

Requiring all railway corporations, or receivers, or lessee operating a line of railway in the State of Texas to equip its locomotive engines with electric headlights of not less than 1,500 candlepower without the aid of a reflector, or other headlights of not less than 1,500 candlepower without the aid of a reflector, and providing a penalty for the violation of this act.

Be it enacted by the Legislature of the State of Texas:

Section 1. It shall be the duty of every railroad corporation or receiver, or lessee thereof, operating any line of railroad in this state, within six months after the passage of this act, or within such additional time as may be prescribed by order of the Railroad Commission of Texas, after a proper showing of their inability to comply by the railroad has been made, to equip all locomotive engines used in the transportation of trains over said railroad with electric headlights of not less than 1,500 candlepower, measured without the aid of a reflector, or other headlights of not less than 1,500 candlepower, measured without the aid of a reflector; provided, that this act shall not apply to locomotive engines regularly used in the switching of cars or trains.

Sec. 2. Any railroad company, or the receiver or lessee thereof, doing business in the State of Texas, which shall violate the provisions of this act shall be liable to the State of Texas for a penalty of not less than one hundred dollars nor more than one thousand dollars for each offense, and such penalties shall be recovered and suit brought in the name of the State of Texas in a court of proper jurisdiction in Travis County, Texas, or in any county in or through which such line of railroad may run, by the attorney-general, or by the county or district attorney in any county in or through which such line of railroad may be operated, and such suits shall be subjected to the provisions of Article 4577, Revised Statutes of the State of Texas.

(To be Continued.)

* * *

*Labor Interests in the Courts.**

Duty to Keep Lookout.—In the case of St. Louis & S. F. R. Co. v. Bishard, taken in error to the Circuit Court of the United States for the District of Kansas, a judgment in favor of plaintiff was reversed for the reason that after the cause had been submitted to the jury and they had deliberated without result over one night, they were brought into the court room on the following morning, and in answer to questions propounded by the court the foreman of the jury said that they had not agreed upon a verdict; that he thought that it was impossible for them to agree; that they stood ten to one (one having been excused by consent) and that there had not been any change since the first ballot. Thereupon the court charged the jury as follows:

"I want to say to you, gentlemen of the jury, that this has been a very expensive trial to the litigants. It has consumed three days of the court's time, and that in justice to both parties, a verdict should be rendered if possible. The juror who is standing out against the other ten should listen to their arguments and should try and look at the case from their view point. As I charged you and now charge you, you are the exclusive judges of the evidence in this case." This conduct on the part of the court was held error.

The case is interesting to readers of this Magazine for the reason that it discusses the question of contributory negligence and particularly that of a fireman with reference to his duty to keep a lookout. Covering this point Circuit Judge Hook said:

"The plaintiff's intestate was a locomotive fireman and at the time of his

*Prepared for the Locomotive Firemen and Enginemen's Magazine by Geo. H. Murdoch, Jr., St. Louis, Mo.

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death was in the service of the railroad company upon a passenger train called the 'Meteor.' About five o'clock in the morning of December 21, 1903, the Meteor, northbound, was wrecked near Godfrey, a small station in Kansas, and the fireman and engineer were killed. The contention of the company that the trial court should have directed a verdict in its favor requires a consideration of the conditions surrounding the accident. We may say, however, without reciting all of the evidence, that it was abundantly sufficient to establish negligence on the part of the employes of the company and that the case turns more particularly upon the question whether the fireman was himself guilty of negligence contributing to his death.

"The station house at Godfrey is on the west side of the main track. There was no telegraph operator or agent there in the night time. To the eastward of the main track is a passing track about 2,000 feet in length, which connects with the main track about 1,200 feet south of the station. There is also a connection at the north, but with this we have little concern as the wreck occurred near the other end. At the south connection there is a switchstand about six feet east of the main track surmounted by a lamp which, when lighted, shows green on two opposite sides, and red, the usual signal of danger, on the other two. The mechanism is so arranged that when the switch is thrown to let a north-bound train from the main track onto the passing track the lamp shows red northward and southward. The lamp is between seven and eight feet above the ties. Commencing near the south end of the station the main track curves to the westward for nearly a half of a mile. During the night and several hours before the accident occurred a northbound freight train with a leaking engine became stalled upon the main line a short distance north of the station, and it became necessary that trains running in either direction should use the passing track to avoid the blockade. The duty therefore devolved upon the trainmen of the stranded train to advise the other trains of the situation by appropriate signals. Several trains made the passage in safety. The Meteor, northbound, was running under special orders which required it to maintain a speed of about fifty-five miles an hour. Those in charge of it were not advised by telegraphic orders of the obstruction at Godfrey. The passing track was not designed or so constructed as to take a rapidly moving train in safety. It was clearly insufficient for such traffic and hence the necessity of warning signals to other trains including the Meteor. We may at this point say that we do not regard the physical condition of the passing track, concerning which considerable testimony was given, as in itself primary evidence of the negligence of the company. It seemed to be sufficient for its ordinary use as a passing track for trains under control or moving slowly. Its structure, however, was one of the conditions of the situation, and the negligence of the company consisted, so far as this case is concerned, in allowing the Meteor, running under special orders at a high rate of speed, to run on to the passing track without sufficient warning of the thrown switch. A rule of the company, applicable to such an emergency, required the conductor of the stranded freight train to send a flagman back with stop signals, and it was the duty of the flagman to place torpedoes upon the rail at certain distances from the point of danger. There was sufficient proof of quite a satisfactory character that the flagman who was sent back wholly neglected to perform this duty and also proof that he did not otherwise warn the engineer and fireman of the approaching Meteor. There was evidence tending to show that the lamp at the switchstand was not lighted at the time of the accident; also that it had not always theretofore been kept burning in the night time. The Meteor, approaching from the south at high speed, took the passing track at the switch and the wreck occurred; the engine being derailed when it had proceeded about ninety feet from the point of entrance.

"The company claims that, as the switch was thrown for the passing track, the lamp, if burning, must have shown the red sign of danger, and that if it was not burning when the Meteor approached, the mere absence of a light at that customary place was in itself a sufficient warning under a rule of the company to that effect. Here arises the principal contention of contributory negligence on the part of the fireman. It is said that it was his duty, especially in approaching stations, to keep a lookout for signals, and that as his train was moving on the curve his position on the west side of the engine would have en-

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abled him to look along the chord of the arc and to detect either the presence of the red light at the switchstand or the absence of any light as the case may have been, and that in either event it was his duty to immediately notify the engineer of the result of his observations. Counsel for the company requested the trial court to charge the jury that it was the paramount duty of the fireman to keep this lookout, and to warn the engineer in time to avoid the danger, and that if he could have seen the signal in time to warn the engineer and did not keep the lookout, then the verdict should be for the defendant. The request was denied. The trial court in lieu thereof charged the jury that it was the duty of the fireman to keep the lookout when not necessarily engaged. We are of the opinion that the trial court was right. There were other important and imperative duties which the fireman was required by the rules of the company and the nature of his position to perform. Those rules expressly placed him under the supervision and direction of the engineer and required him to obey the orders of the latter respecting the performance of his duties. In keeping a lookout on the track for signals he was merely an assistant acting under the direction of the engineer, and it can not be said that upon the occasion in question it was his paramount duty to be on the lookout at any particular moment. The rules did not so provide, and we can not infer that the engineer so ordered. Other duties of moment may have demanded his attention elsewhere. Having due regard to that presumption which obtains in the absence of evidence a court would not be justified in declaring from the record before us that the deceased was not, during the approach of the Meteor, engaged in the performance of some duty of his position or of some order of the engineer that prevented him from observing either the presence or absence of a red light at the switchstand. Moreover, the evidence showed that even if the lamp had been burning and the fireman had been on the lookout at the precise instant, he could have seen the light just about four seconds before it came into the view of the engineer. Nor can we assume, in the absence of evidence, that if the fireman was on the lookout and observed that there was no light at the switchstand he did not seasonably notify the engineer who was in charge of the engine. It is not necessary for us to determine in this case whether the engineer was or was not remiss in the performance of his duties. Even if he was it does not follow that his negligence is imputable to the fireman or that the right of the latter or his personal representatives to recover for the injury so caused is in anywise impaired thereby. The negligence of the engineer, if there was such, can not be visited upon the fireman unless he concurred therein, and there must be proof, not mere surmise of such concurrence. The fellow-servant rule does not obtain in Kansas so far as concerns employes of railroad companies.

"It is also claimed that the red lights at the rear end of the stranded freight train as it stood upon the main track north of the station were a sufficient warning of danger. What we have already said applies to this contention. But, aside from it, the evidence leaves it doubtful that those lights could have been seen in time to be of service owing to the curve of the track and the presence of the station house as an obstacle in the line of vision. The evidence as to the conduct of the fireman whether negligent or not, presented a fair question for the determination of the jury and they found against the contention of the company. The trial court was right in refusing to direct a different conclusion."

147 F. 496.

Abrogated Rule.—A rule of an employer established for the safety of employes which is habitually violated to the knowledge of the employer, or vice-principals, or which has been frequently and openly violated for such length of time that the employer could by the exercise of ordinary care have known the facts will be deemed abrogated in determining the question of negligence on the part of an employe violating it.—Biles v. Seaboard Air Line Ry. Co., 55 S. E. (N. C.) 512.

Assault by Yardmaster.—Where a servant of a railroad made a mistake in switching a train and thereafter, but within a short time, the yardmaster spoke to him about the mistake, and a quarrel ensued, in which the yardmaster struck the servant, the test of the railroad's liability for the assault was not whether the act was done by the yardmaster while he was on duty or engaged in his duties, but whether it was done within the scope of

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his employment, and in the prosecution and performance of the business given him to do.—Roberts v. Southern Ry. Co., 55 S. E. (N. C.) 509.

Following Trains.—Where a train rule is positive in its requirement that passenger trains shall run at least ten minutes apart, and, under the rules the first of two passenger trains need not send out a rear flagman at a station until the train is ten minutes late, the engineer of the second train, acquainted with the rule, with the time, and with the leaving time of the preceding train, is guilty of contributory negligence in running into the forward train standing at a station less than ten minutes after its leaving time. In an action by an engineer for injuries sustained through running into a preceding train, there was a sharp conflict in the evidence as to whether under the company's rules, requiring ten minutes between trains, a flagman should have been sent back from the preceding train, standing at a station, before it was ten minutes late, and whether the collision occurred before the expiration of such time. Held, that a requested instruction to find for defendant if the flagman was not required, and the accident occurred within the ten minutes, was not chargeable on the weight of the evidence, and should have been added to the general instructions given as to the duties of trainmen.—International & G. N. R. Co. v. Brice, 97 S. W. (Tex.) 461.

Notice of Injuries Fixed by Contract.—Rev. St. 1895, art. 3379, provides that any stipulation in a contract, requiring notice to be given of any claim for damages as a condition precedent to the right to sue, shall be void if the time within which such notice shall be given is fixed at a less period than ninety days. A contract of employment entered into in Indian Territory provided that, unless the servant should give notice of any claim for injuries within thirty days, he should be barred of any suit on account of such injuries, and required the servant to give the notice to the master's attorney at a point in Kansas. Held, that the validity of the stipulation, in an action in Texas for the injuries, was governed by the law of the Indian Territory, and not by article 3379, or by the law of Kansas.—Chicago, R. I. & P. Ry. Co. v. Thompson, 97 S. W. (Tex.) 459.

Damages.—B. F. Garrett, a locomotive fireman on the Galveston, Harrisburg & San Antonio Railroad, was injured in a wreck caused by a washout on the track and recovered a judgment against the company for $15,000 damages, which has been affirmed by the Texas Court of Civil Appeals. There were other assignments of error, but the one of most interest was that attacking the verdict as grossly excessive and as manifesting passion, prejudice and improper motives on the part of the jury. With reference to this assignment the court said:

"After carefully examining and maturely considering the evidence, we have been unable to reach the conclusion advanced by appellant under the assignment. The evidence shows that after the wreck appellant was found pinioned under the tender, about one-half of his body and right leg being under it, and that it took the men about three-quarters of an hour to extricate him. He was bruised nearly all over, his foot mashed, his hand, leg and side cut, his head bruised and back injured. He was placed by appellant in the Santa Rosa Hospital, where he remained under the treatment of its surgeon six months. While the testimony of appellant's expert witnesses tends to show that he has recovered from his injuries, the same character of testimony, on the other hand, tends with equal, if not greater, weight to prove that his spinal cord is injured, and that such injury will gradually grow worse, and probably cause paralysis and culminate in his death. He was twenty-one years old, stout, healthy and vigorous, weight one hundred and seventy-five pounds, and earning from $85 to $105 per month when injured. Now he weighs only one hundred and thirty-nine pounds, is too weak to work, suffers constant pain in the back, and is weak in the back and one of his legs. In view of such testimony, it can not be said that a verdict for $15,000 manifests prejudice or improper motives on the part of the jury who rendered it, nor that it exceeds just compensation for the damages he has sustained."

98 S. W. 932.

A verdict for $20,000 in favor of H. R. Cherry, a locomotive engineer, against the Galveston, Houston & San Antonio Railway Company, because of injuries sustained by him caused by a step on the engine giving way, has been affirmed by the Texas Court of Civil Appeals, hol-

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ing that it was not excessive in view of great physical pain suffered by him and to be suffered, his paralytic condition, "his physical ability utterly gone," and the fact that he was forty-nine years old, had been employed by defendant as engineer for fourteen years, and during the last ten years earned from $2,100 to $2,400 a year.

98 S. W. 898.

Concurring Causes of Injury.—Where there are two contributory causes concurring, one for which the defendant is liable and not the other, defendant can not escape liability.—Godfrey v. Illinois Cent. R. Co., 42 So. (La.) 571.

General Labor News.

From the American standpoint, the wages paid both skilled and common laborers in France are very low, while the cost of living is relatively higher in France than in the United States, with the exception of house rent and servants' wages.

The central committee of German trade unions has published a statistical table showing the wages earned in each of the sixty-six organized trades of the Empire. The most remarkable thing about the table is the evidence it brings that in twenty-seven of these trades the average daily wage is less than 75 cents.

The third annual state convention of Postoffice Clerks, held at Sacramento, adopted resolutions recommending the passage of the $1,200 a year bill for clerks and for an eight-hour day. The association agreed to ask Congress for a thirty-day annual leave of absence and indorsed the pension bill for superannuated.

From two-thirds to three-fourths of the exports of Japan are produced by female labor. In tea, silk, weaving and other industries the labor of women is invariably required, while in marine and mining industries it is of no importance.

The strike of machinists, which began all along the line of the Erie Railroad, is said to be only the first step in a general strike of machinists against the railroads where the "piece work" plan is in vogue.

The boilermakers' strike on the Mexican Central Railroad will be arbitrated by President Diaz, who has been selected a mediator by both sides to the controversy.

T. V. Powderly has been appointed chief of the new division of information established in connection with the U. S. Immigration Bureau, at a salary of $3,500 a year. The new division will conduct correspondence with governors and officials of the various states and territories with a view to the best distribution of aliens.

The changes in hours of British labor reported during April, 1907, affected 653 work people, of whom 16 had their working time increased by 5 hours per week, and 637 had their working time decreased by 437 hours per week.

In 1900 the International Association of Machinists spent over $3,000,000 in establishing a nine-hour day. Last year the International Typographical Union spent over $3,000,000 in establishing an eight-hour day.

The wages of about 8,500 employes of New England cotton mills have been advanced 10 per cent.

The 1,600 funeral drivers in New York City get $14 a week for a twelve-hour work day.

The Wisconsin assembly has passed a bill limiting the hours for railroad telegraphers to eight a day, and has also passed a law giving street railway employes a ten-hour day.

The railroad workers of Chile have gone on strike for better wages and shorter hours.

Because of the continued decrease of work in the government printing office, at Washington, D. C., the public printer, in the last sixty days, dropped from the rolls seventy-five men and one hundred and twenty-eight women.

The Federation of German Seamen, 30,000 strong, is still on strike, having gone out May 20 last.

Twenty-six hundred and sixty deaths were reported to the coroner of Pittsburg, Pa., in the year 1906, 919 of which were the result of accidents in mills, mines or on railroads.

The United States immigration report for May shows a slight increase over May, 1906, in the number of arrivals from Japan. The number of laborers has decreased, but there has been a corresponding increase in the arrivals of "clerks," "students," "bookkeepers," etc.

Dissatisfied with an advance of 10 cents a day in their wages, which they obtained as a result of a strike several weeks ago, the railroad laborers of the Providence division of the New York,

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New Haven and Hartford Railroad are considering the advisability of declaring another strike.

In the Chicago Federation of Labor there are 400 local unions which, in addition to the leading industries, has unions of chandelier makers, coffee roasters, egg inspectors, feather duster makers, gold beaters, hair spinners, passementerie makers, tuck pointers, front cleaners, wardrobe tenders, and well drillers.

The wages of mechanics in Yukon Territory, per day of ten hours, is $10; common laborers, with board, $4 to $5; without board, $6; draft teams, per day (two horses), $25; clerks, per month, $150 to $300.

The Italian government having postponed consideration of a bill prohibiting night work, the bakers have declared a general strike throughout Italy.

The Farmers' Union of Georgia, with a membership of 80,000, has gone on record as being bitterly opposed to bringing foreign immigrants into the South.

Contributed

Proposal to Amend Texas Anti-Blacklist Law.

Section 4 of the Texas Anti-Blacklist Law says:

Section 4. Each and every person, company or corporation, who shall in any manner violate any of the provisions of this act shall for each and every offense committed forfeit and pay the sum of $1,000 (one thousand dollars), which may be recovered in the name of the State of Texas, in any county where the offense was committed or where the offender resides or in Travis County, and it shall be the duty of the attorney-general, or the district or county attorney under the direction of the attorney-general to prosecute for the recovery of the same, and the fees of the prosecuting attorney for representing the state in proceedings under this act shall be over and above the fees allowed him under the general fee bill.

It is evident from the foregoing section that not one cent of the amount "collected in the name of the state," can be used for the benefit of the poor victim who has been blacklisted. Why not give this $1,000, less the costs and attorneys' fees, to the injured person—the one who has been damaged—the one who needs it, and than whom probably no one could need it worse—the plaintiff in the case?

Under section 4 no one is benefited but the State of Texas and the prosecuting attorney representing the state in the proceedings under the directions of the attorney-general.

I would appreciate suggestions as to how we can arrange the matter so that the blacklisted brother can get an equitable share of the amount recovered and which the law says is due from the party or parties found guilty of its violation. I for one, as legislative representative of Lodge 702, will be glad to take the matter up with a view to the adoption of some amendment whereby the really aggrieved party will derive financial benefit from the law. Otherwise the state will get every cent forfeited and the victim gets nothing, not even witness fees. Will some good brother please advance some ideas on this subject, so that steps can be taken to effect a remedy at the earliest opportunity?

W. F. BAKER.

Engineer Failed to Oil Side-Bearings on Tank and Was Suspended.

There is probably no evil from which the railroad Brotherhoods have protected their membership more effectively than from the tyranny of the subordinate official. So well have they succeeded in this particular that unreasonable and unjustifiable discipline on the part of such officials can hardly be regarded any longer as a feature of railroad service. Occasionally, however, we still hear of some subaltern demonstrating his authority

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through a clearly unjustifiable decision and inflicting a discipline that is absolutely undeserved by his victim.

An instance of this has recently come to light on a large trunk line in the East. The tank of an engine hauling nine cars and running about six miles an hour, jumped the track while rounding a slight curve. The road foreman of engines, for some reason or another, attached the blame to the engineer, deciding that the accident was due to the fact that the side-bearings had not been oiled. The engine had just come out of the shop and the chances are that there had been some defective work on the flanges, which caused the derailment. The road foreman of engines, however, could not see it that way and decided that the engineer's failure to oil the side-bearings on the tank had been responsible for the accident, and consequently gave him a suspension of two days.

There is an old saying that those who are bent on committing an evil deed are never lacking for an excuse, but it is doubtful if an excuse for wrongdoing has ever been farther fetched or dug up from a more obscure oblivion than that upon which this road foreman of engines suspended the engineer in question. That the lack of lubrication of the side-bearings could under the circumstances lead to the derailment of the tank, is a proposition that is hardly entitled to serious consideration, and just when it has become an engineer's duty to lubricate said bearings has not yet been made clear by this particular road foreman of engines; at least, men who have been running for thirty and forty years declare that never before have they heard of an engineer being expected to keep the side-bearings lubricated on the tank of an engine that goes to the roundhouse regularly every twenty-four hours. No doubt the illustrious road foreman in question felt that it was up to him to find a scapegoat. If, however, he imagines that the service will be benefited by the infliction of such an unjust discipline, he has another guess coming.

Every train service employe on that system, who has heard of the incident, regards the suspension, under the circumstances, as nothing short of wanton tyranny and resents it accordingly.

MEMBER.

European Labor News.

Organized Workmen in France.

The French Board of Trade has published statistics showing that the total number of trade union members in that country rose from 437,733 in 1898, to 588,832 in 1901; 752,586 in 1904, and to 836,134 in 1906. These numbers are certainly too high, because the Board of Trade registrate as trade unions not only organizations having purely friendly purposes, but also the blackleg associations called the "yellow syndicate," whose leader is the renegade socialist Bietry, who was elected to the Chamber of Deputies in last May.

In the Confederation of Labor the affiliated unions paid in May, 1904, for 158,000 members; in May, 1906, for 203,273. Now certainly many unions give different numbers to the Board of Trade and to the Confederation. To the Board of Trade, where they want to "make a big show," they give exaggerated figures, but at the Confederation offices, where they have to pay per capita tax, they "minimize" their figures, so that the 200,000 affiliated members of the Confederation represent at least 300,000 members of the official statistics. Even so, the Confederation has still less than one-half of the total number of French unionists, but it is certainly the only representative body of the whole of the French trade union movement.

Labor Legislation in Switzerland.

The demand of the workmen for a legal Saturday half-holiday has led to the enactment of a federal law concerning the stopping of work in factories on Saturdays. According to this law, which came into operation on January 1, 1907, work may not last longer than until 5 o'clock p. m. on Saturdays and on days preceding high festivals, and may not exceed nine hours.

The Federal Council has published a bill for the establishment of sickness and accident insurance; it differs in many respects from the compulsory insurance laws of Germany and Austria. Whether the bill will become a law or not depends at last upon the result of the referendum vote which—there is no doubt—will be requested.

H. FEHLINGER.

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Miscellany

The Brownsville Raid.

The Magazine office is in receipt of copy of a song entitled "The Brownsville Raid," written by Walter S. Arnold, manager of the Postal Telegraph Company, Fort Worth, Texas, the music of which was composed by the Madden Music Company. The song is symbolic of this notorious incident, which has created quite a little interest lately on account of a marked division of sentiment as to the president's action thereon. The chorus is an appeal to the nobler traits of American patriotism, and the music is regarded as very well written. The song is published by the Melville Music Publishing Company of New York City.

*Interesting Facts About Alaska by a B. of L. F. and E. Gold Seeker.**

Leaving engine service on the S. P. Ry. in May, 1900, at Wadsworth, Nev., I cast my lot with the many gold seekers and arrived in Nome, Alaska, on the nineteenth of the following month. During the fall of the same year I went overland to the Arctic country, where I was engaged in placer gold mining until July, 1905. Having my ground worked out at that time I concluded to hunt new "diggings" and went back to Nome and got an outfit there. From this place a party of six (myself included) went to St. Michael, and from there up the Yukon eight hundred miles, and then blazed a trail across the country into the head waters of the Kuskokwin, where we passed by the base of Mt. McKinley, which is situated in the main Alaskan range and stands at an altitude of 20,600 feet. We got all the caribou and moose meat we wanted without hunting for it, and fed our dogs on meat straight.

The Kuskokwin region is a vast, unknown country. It is in the same judicial division of Alaska that Nome is, and is the largest mining district in that judicial division, including all the islands of Behring Sea, north of the 59th degree of latitude; also all of the country south of the Yukon watershed in the second judicial division, probably one-fifth of the entire area of Alaska.

The Kuskokwin river is about 1,100 miles long and is navigable for river steamers of light draft a distance of about eight hundred miles. The country bordering the Kuskokwin from Bethel for about 125 miles above its mouth to the source of the stream, is wooded. A pebbly beach marks the course of the stream. There is not a rapid in this magnificent stream, its waters being, except in case of flood and freshet, as clear as crystal, through which the rocks and pebbles at the bottom of the river, together with the myriads of fishes that live in these waters, are plainly seen. The source of the Kuskokwin is near the base of Mt. McKinley. Mt. Foraker, another mountain of great altitude, but not so massive as Mt. McKinley, is in this vicinity also. To the south the Kuskokwin watershed has a maximum width of about 250 miles, and is drained by numerous unknown streams. To the north the watershed area is not so extensive. In one place there is a portage between the Yukon and the Kuskokwin rivers of about seventy miles. In the summer time it is frequently traveled by boat, as it is almost an endless succession of lakes and sloughs. The forests of the southerly watersheds are composed of birch, cottonwood, spruce and poplar trees, some of the spruce trees measuring over four feet in diameter. The largest growth of timber is near the head waters of the river, where the valley on the south side narrows to a comparatively small width. The minerals that have been discovered in this vicinity are gold, silver, copper and cinnabar. Graphite has been found on the upper river Galena. The quartz prospects of this country are very encouraging. Placer gold has been found, but as yet no work other than prospecting has been done. Notwithstanding the vast region through which it flows, there has not been at one time over thirty white men on this river until last fall, and those were engaged in missionary work and trading, so it is obvious that the country has been but little prospected.

There are hundreds of square miles of this vast country where white men have

*By James McCormick, member of Lodge 19.

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never been. This region is twenty degrees warmer in winter than the Valley of the Yukon, and besides the mining prospects, it has possibilities as a farm and stock raising country. Great strips of this territory on the south side are covered in the summer season with succulent grasses growing waist high and forming extensive meadows. The Kuskokwin Valley is inhabited by Thlinket Indians—an excellent race of Indians. Most of the country, however, is still a wilderness. It was the site of early missionary work in Alaska. In 1833 the Russians established a trading post here, which is now conducted by Mr. Ed Lind. We have here at the present time a Russian mission, a Catholic mission and two Moravian missions, all of which are on the lower 300 miles of the Kuskokwin river. We have a number of native villages designated by such unpronounceable names as Chuppelgamute, Owhagamute, Obigemute, etc. The native population is about 600. Diphtheria has wiped the natives out of existence on the upper river.

The stream teems with many varieties of fish, including King Salmon, some of them weighing as much as 85 pounds; many varieties of trout, including Brook, Dolly Varden and Rainbow Grayling; also several kinds of white fish, some of which attain to the size of 50 pounds, and resemble in appearance and delicacy of flavor the Lake Superior white fish. During the spawning season there are millions of silver and red salmon.

This is also a wonderful country for game. On the Upper Kuskokwin river there are 400 miles of wilderness and near Mt. McKinley and Mt. Foraker the country is very rugged and precipitous. This is the home of the mountain sheep, where they may be found in bands of hundreds. Great herds of caribou live in this wilderness, unmolested by native hunter or white sportsman, their only enemies being the carnivorous animals that have their lairs in the mountains. The moose is here in all his glory. There are many kinds of bear, from the little brown bear to the large and ferocious silvertip. There are also beavers, martins and wolves, that hunt in packs; foxes of many kinds, link, mink and otter. In season there is a great variety of water fowl.

The lowest temperature recorded in the Kuskokwin Valley was 57 degrees below zero. Ordinary winter climate is not much colder than that of many of the northern states. The soil on the southerly watershed is fertile and frozen only during the winter season, and does not resemble the barren tundra which form coastal plains in the extreme north of Alaska; it is a rich loam with a sandy sub-stratum. Surrounding the missions in the valley there are splendid gardens, excellent vegetables are grown and vast areas may be adapted to agriculture. From what I have seen and learned of this unexplored, remote region, I have great faith in its mineral resources. What is needed here, as elsewhere in Alaska, are facilities for transportation. At the present time most of this stupendously great, marvelously magnificent, and wondrously wild country, possessing prodigious possibilities, is as absolutely unknown as darkest Africa.

In conclusion, I will say that I am in good health and any of the boys wishing to hear from me personally can do so by addressing my mail to Bethel, Kuskokwin River. That is the nearest postoffice, and it is 600 miles from where I am. I have not written for the Magazine in seven years, and am not likely to again soon, but certainly wish the Brotherhood of Locomotive Firemen and Enginemen, and its members and Grand Officers, long life and continued success.

* * *

Mark Twain's Ant.

"Mark Twain in one of his amusing books of travel attacks the ant," said a nature student. "He ridicules the idea that the ant is industrious and wise. He devotes three or four pages to an account of an ant making its way homeward with a burden. He shows the ant climbing grass stems instead of going round them, doing a hundred silly things, taking in every case the long and foolish instead of the short and sensible way home. And hence, naturally enough, he concludes that the ant's wise industry is overrated—naturally enough, I say, Mark Twain's ignorance being granted, for he was unaware when he wrote that long and interesting passage that many kinds of ants are blind. He did not, for all his close observation, take up his little ant subject, look for its eye sockets and find them absent. It was a blind ant Mark Twain studied, and he didn't know it."
—Cincinnati Enquirer.

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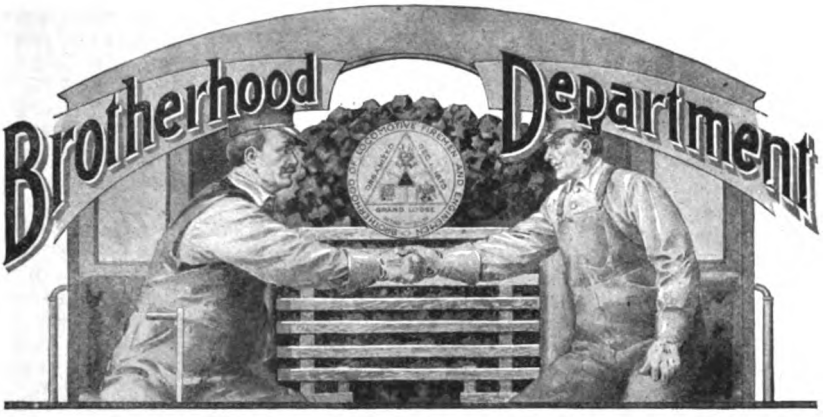

SOME C. B. & Q. STRIKE HISTORY

Since Grand Officers of the B. of L. E. have decided to call forth from its oblivion-curtained retreat the ghost of the C., B. & Q. strike, hidden, as it has been, behind nineteen years of history, it may be germane to state the following facts relative to that incident:

Our members on the C., B. & Q. could have secured every concession they sought without striking, but having once espoused the cause of the B. of L. E. they stood by that organization with a courageous and unflinching loyalty unsurpassed in history, a loyalty which entailed for themselves all the sacrifices incident to such a struggle and for the organization an expenditure of about half a million dollars and the loss of twelve hundred members. One would naturally expect, in the face of all that these men and our Brotherhood in general underwent for the sole purpose of helping a sister organization, that at least some sense of gratitude, respect or appreciation would have been evinced by that organization in return.

The first biennial convention of the Brotherhood of Locomotive Firemen was held at Atlanta, Ga., commencing September 10, 1888. The next convention of the B. of L. E. following that was held at Richmond, Va., commencing Wednesday, October 17, 1888. It will therefore be seen that the strike was still on during the conventions of both organizations held in the year 1888. It should be understood that but one motive actuated the Brotherhood of Locomotive Firemen in entering that struggle. That motive was loyalty to the Brotherhood of Locomotive Engineers and a determination to support that organization in the contest to the end.

Action of the (Atlanta, 1888,) B. of L. F. Convention.

The Atlanta Convention of the B. of L. F., which was held just prior to the Richmond Convention of the B. of L. E. in the year 1888, took official action renewing the determination of our Brotherhood to stand by the B. of L. E. to the last, but how did the convention of the B. of L. E. immediately following show its appreciation of such staunch loyalty? Its course in the premises is best expressed by the following words of a Grand Officer, which stand as a matter of record:

Action of the (Richmond, 1888,) B. of L. E. Convention.

"Completely ignoring the B. of L. F., treating it as of no consequence whatever, totally regardless of its services and its sacrifices, the B. of L. E. proceeded to appoint a committee of nine to devise ways and means whereby the strike on the C., B. & Q. might be brought to a close. In this movement no allusion was made to the B. of L. F. The B. of L. E. did not so much as propose to consult the B. of L. F., nor was the committee of nine authorized by the Richmond convention to consult the B. of L. F., or with any of its officers. One

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of the committee of nine was to go over the C., B. & Q. system. Having obtained such information as he could glean he was to report to the committee, his associates, and there and then exercise supreme authority in the matter of the strike."

Such narrow and contemptible ingratitude as that with which the sacrifices made by the B. of L. F. through its magnificent loyalty to the B. of L. E. and its devotion to principle were requited is possible only on the part of an organization based upon the intolerance, arrogance, selfishness, ridiculous exclusiveness and false sense of class superiority which constitutes the predominant charactertistics of the Brotherhood of Locomotive Engineers.

Owing to the drain on its finances incident to the strike—its treasury having become temporarily depleted at a time intervening between the receipt of its assessments—the Grand Officers of our Brotherhood deemed it advisable in October, 1888, and prior to the B. of L. E. Convention of that year, to accept a loan amounting to $25,839.60 from the Grand Officers of the B. of L. E. in order to meet the pay-rolls of its striking members.

From what has been said above it can be easily understood that the real motive actuating the B. of L. E. in the matter was purely a selfish one. This amount was paid back in full Feb. 9, 1889, to T. S. Ingrahm, F. G. E. of the B. of L. E., as records in our possession will show.

* * *

The Supplement to This Issue.

Every brother should read carefully the supplement which accompanies this issue of the Magazine. He will find therein a clear refutation of certain false charges that have been made with a view to placing our Brotherhood in a wrong light. This pamphlet, under the following heads, treats of the subjects suggested thereby:

THE B. OF L. E. STRIKE CIRCULAR.

THE B. OF L. E. AND THE CONCERTED MOVEMENT.

THE LOAN TO THE B. OF L. F. BY THE B. OF L. E.

THE ISSUE ON THE BANGOR AND AROOSTOOK RAILROAD.

B. OF L. E. MEN WILL TAKE THE SPADE.

SOME QUESTIONS MR. STONE SHOULD ANSWER.

Under the heading, "The B. of L. E. Strike Circular," it replies in full to the misrepresentations contained in a circular recently issued for distribution amongst our membership by the Grand Chief of the B. of L. E.

Under the heading, "The B. of L. E. and the Concerted Movement," is fully exposed the deceitful tactics of the Grand Chief of that organization through which he succeeded in preventing co-operation between our Brotherhood and the B. of L. E. in the recent concerted movement on the Lines West of Chicago while pretending to be desirous of carrying out the instructions of its last convention in that particular.

Under the heading, "The Loan to the B. of L. F. by the B. of L. E.," it is clearly shown that notwithstanding the representations of certain officials of the B. of L. E. relative to an amount loaned our Brotherhood by that organization during the C., B. & Q. strike, that the said amount was paid back in full and that our Brotherhood became involved in that trouble purely and exclusively with a view to assisting the B. of L. E., by which organization it was subsequently deserted. The letter to be found therein from Eugene V. Debs, former Grand Secretary and Treasurer, gives some interesting facts regarding the occurrence.

Under the heading, "The Issue on the Bangor and Aroostook Railroad," the perfidious treachery of the B. of L. E. is given publicity. Never before in the industrial history of the world has one labor organization devoted itself with such servile assiduity to the work of helping an employing company to undermine another labor organization and injure its interests.

Under the heading, "B. of L. E. Men Will Take the Spade," will be found part of a conversation which took place between a duly accredited representative of the B. of L. E. and an official of the Norfolk and Western Railroad, the authenticity of which is supported by the sworn testimony of ten of our own brothers.

Under the heading, "Some Questions Mr. Stone Should Answer," will be found some pointed interrogatories to which it will be interesting to learn just what replies the Grand Chief of the B. of L. E. will try to make.

As space will not permit of our publishing full details relative to the foregoing subjects in the regular issue of the

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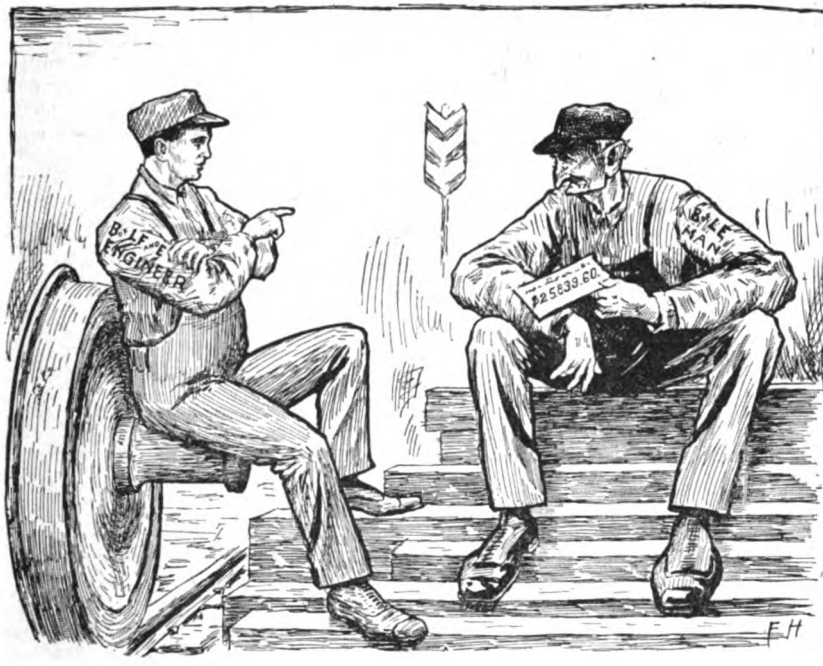
Magazine, they are submitted to our members in supplement form with this issue, copy of supplement accompanying each brother's Magazine.

strength and prestige. If there is a man within the circle of your acquaintance who is eligible to membership in the Brotherhood and who is not a member,



MONEY THEY LOANED TO HELP THEMSELVES

B. of L. E. Engineer.—By Gosh, we give you fellers about $26,000 fer to help you in the C. B. & Q. strike. The Grand Chief had 75,000 fotygrafs took of the check, and right hyer is one of 'em! What ye got ter say to that?

B. of L. F. and E. Engineer.—Hold on, Dad, you're only telling a small part of the story. Why don't you be honest and tell it all? Well you know that you people didn't *give* us that money—not by a long ways—that it was only a *loan,* and that right soon after we got it it was *paid back in full,* as we can easily prove. And why don't you tell that notwithstanding our Brotherhood went into that strike with the sole purpose of helping the B. of L. E. in its classification fight, you people entirely ignored us in the final settlement, declaring the strike off without ever even hinting to us that you contemplated such action. Why, Dad, if it had not been for the way you people "scabbed officially" on the Reading engineers the C. B. & Q. strike might have been won!

Attend Lodge Meetings.

One of a member's most important duties is attendance at lodge meetings. He should never be absent unless for some absolutely unavoidable cause. A large attendance at lodge meetings is encouraging to everyone present, but particularly to the new member.

All Who Are Eligible Should Be Members.

The stronger the Brotherhood is, the better will it be able to protect the interests of its members. Complete organization is the foremost essential to you should exert your influence to have him take his place amongst the tried and true who are banded together for mutual protection and advancement.

Don't Let Them Wait.

There are many men who are eligible to membership in the Brotherhood who defer to apply for membership in the expectation that some brother will approach them on the subject. They fully intend right along to become members—such men ought not to be permitted to lose any valuable time in waiting.

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B. of L. E. Treachery on the Bangor and Aroostook Railroad.

While the recent trouble was pendng on the Bangor and Aroostook Railroad (details of which are given in the supplement of this issue), and after the officials had learned that the poll of our members had resulted in favor of a strike, a letter, of which an exact reproduction is shown herewith, was sent to each member of the B. of L. E., with the exception of two or three "doubtful" ones—men whom it was feared had too much principle to become scabs. A copy of the circular, however, was secured by one of our Grand Officers and it is given herewith. As a matter of respect for confidences, names and train numbers are, of course, omitted therefrom.

DEPARTMENT OF
MOTIVE POWER AND EQUIPMENT
The B. & A. Bangor & Aroostook Railroad.
O. STEWART,
SUPT. M. P. & E.

May 18, 1907.

PRIVATE. MILO JUNCTION, ME.

Dear Sir:

An arrangement has been made between the management and the Engineer's committee, by which, if the firemen and some of the engineers strike, the engineers remaining in the service will act as firemen, or in any other capacity, until new men can be obtained. In the event of strike taking place you will please, under the above arrangement, at once report for duty as engineer or fireman for trains

running with Engineer and alternating with him, firing one day and running as engineer alternate days.

At the time of strike it may be necessary to somewhat change these assignments.

Yours truly,

O. Stewart,

Sup't Motive Power
E Equipment.

Engineers on trains when strike is declared will bring trains to proper terminal if possible, and, if not will side-track at telegraph station and wire both Division Superintendent and Motive Power Dep't for instructions.

O.S.

Intimidation of Women One of the B. of L. E.'s Methods.

Some of the contemptible methods of intimidation and misrepresentation to which the B. of L. E. is resorting with a

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view to driving men out of our Brotherhood and into their own, is shown by a letter recently received by Brother Thos. E. Ryan, chairman of the Joint Protective Board of the D. & H., from the master of one of the lodges situated on that system. The letter is as follows:

"Mr. Thos. E. Ryan:

Dear Sir and Bro.—At our meeting tonight one of the dirty tricks that the B. of L. E. are using was brought out. A final withdrawal card was requested by Bro. ————. This brother has been a member for nearly twenty years. The B. of L. E. people put the plea up to his wife that this was his last chance to leave our Order, and that if he did not do so he would not receive any benefits from the engineers; also, that if he didn't leave the B. of L. F. and E. they would drive him off from the road. His wife was in favor of him staying with us, but he was so badly frightened that he thought he had better go. What do you think of that for a deal?

. . . . . .

With best wishes, I remain,
Yours fraternally,

Master.

It would appear from the foregoing letter that the man who was thus intimidated was a member of both orders. This is but one of several instances which have recently come to light in which the B. of L. E. has resorted to such methods. A committee will go to a man's home and meet his aged mother or his wife, and through the grossest misrepresentations endeavor to convince them that the husband or son, as the case may be, is committing a grievous wrong by staying out of the B. of L. E. While the wife of the man referred to in the foregoing letter refused to be frightened by them, yet in some instances they are successful in carrying out the deception, and powerful influences to have him withdraw from our Order are consequently sometimes brought to bear on him by members of a man's family, who are thus fraudulently convinced that he is in the wrong by remaining in our ranks. Such methods, however, are fully in keeping with the course of action which has characterized the B. of L. E. for many years past along other lines.

Our members should ever be on the alert to see that such base browbeating and deception does not succeed in accomplishing its purpose.

Farley's Competitors.

I have frequently heard the question asked, "What has become of Farley, of strike-breaking fame?" Is it true he is a man of wealth today, or has he been driven out of his chosen field by the strong competition going on in his particular line of business?

Has it not come to be a fact that railroad officials in some localities are not getting up schedules with the B. of L. F. and E. without calling in outside assistance, or is it the outside assistants that are offering their services gratis, for I find in some places when the B. of L. F. and E. committee goes before the officers after their schedule that, in some place not very far away, a committee of another organization is frequently in session, with one of their grand officers in easy call if their services should be required.

Not long since, when working on a well-known Southern road to secure a schedule for the men I represented, I found a committee and grand officer of the B. of L. E. in session, although their schedule had been signed and put into effect, but I discovered before long that rather than allow the company to grant the request of the B. of L. F. and E. they were willing to give their valuable services to the extent of not only hiring all the colored firemen they could secure, but would go out during their spare time and teach the colored men how to fire—evidently preferring the company and sociability of a colored man to one of their own race, and as it is from the firemen's ranks that this organization must recruit their membership, there can be no doubt but in a short time one railway organization will be composed of mixed nationalities.

A few days ago I had occasion to go to an Eastern road to assist in getting a schedule for the members of our Brotherhood employed thereon, and before being there very long I discovered it was necessary for the officers of the company to have assistance to get up a schedule for the B. of L. F. and E., as the chairman of the B. of L. E. was granted indefinite leave of absence and a grand officer of that organization immediately arrived on the scene. I was not surprised at this latter arrival because it formed the same combination as worked so faithfully and so unitedly on the New York, New Haven & Hartford, and afterwards caused some resignations.

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I next found a special car and engine being dispatched all over the line, with one or more of the faithful allies in it, who appealed to cleaners, machinists, brakemen, news agents and many others, vised as to their success, and after all this trouble and for fear that they might not be able to keep all the "wheels turning," a circular was issued and given to the faithful members, but not to all

ON THE BANGOR & AROOSTOOK RAILROAD
B. of L. E. Braves discussing the situation—Getting ready for the Strike

Bill Scan-the-Rail.—How aire you hooked up for the firemen's strike, Tom?

Tom Stop-an-Start (Chief of his division B. of L. E.)—Why Cy Pumper-over and me's fixed to double up. I fire fer Cy one round trip, he fires fer me the next and so on ivery other trip, until Farley's boys and the min the Grand Chief's agoin' to sind gits here. If it gits too hot, the cump'ny'll board us free. They're a'fixin' up a bull pen now. How about rest did you say? Why ef we kaint git sleep 'nuff between trips, we can relieve one another an' sleep on the injin. 'Twont make no difference if the 'fficials does find it out. They wunt say nothin' to sich loyal min as us.

Jim Rocket-Shooter.—They tell me that some of thim gosh blamed hostler helpers an' cinder pit min's athinkin' o' goin' out with the firemins, and that putty nigh half o' the engineers on the road b'longs to their order and will go out with 'em too. How about it?

Bill Scan-the-Rail.—Let 'em go out. The 'Sistant Grand Chief 'lows he kin sind B. L. E. min 'nuff here to take th' places of ivery darned cinder pit man and ivery wiper the cump'ny's got, let alone thim engineers an' the firemin. Yis, an' ivery shoveller on the coal docks, too, fer thet matter, and thin whin Farley's boys comes, the B. L. E. min what's holdin' thim jobs can all go to runnin' and relieve our fellers that's been a firin'. Ball! their Vice Grand Master that was a 'talkin' up to th' public meetin' t'other night, sez they're a' goin' t'win. Well, mebbe they aire, but us fellers ort ter feel purty safe at thet a'bein' on the side o' the cump'ny.

offering good situations if they would fire and take the places of the firemen who they thought were going to leave the employment of the company.

The wires were also used from time to time en route to keep the officers advised as to their success, and after all this trouble and for fear that they might not be able to keep all the "wheels turning," a circular was issued and given to the faithful members, but not to all the engineers in the service. In fact, some of the doubtful members, I understand, did not secure them.

I forward you, for publication, one of a number of circulars which has been handed to me, so the readers of the Mag-

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azine can take copies, paste them in their hats, or perhaps, better still, put in a cheap frame and hang in a conspicuous place; also digest said circular and see what there is in it. First, we read about an "arrangement" being made between the company and "engineers'" committee. Then we find the company's officers take the whip in their own hand, and in three places say "you will do this and you will do that."

This same engineers' committee referred to had secured their schedule and were then working under it, by which they were given full control of every engineer on the road, and even the power to say whether an engineer could appeal his case if they said there was no merit in it.

In addition to that circular it was well understood that some of the faithful were to be brought in from other roads if others could not be hired to assist in running and firing alternate days, rather than allow the engineer members of our Order the right to choose their own counsel, or, in other words, the same privileges that are granted by the courts of our land.

Has it come to such a state of affairs that one of the oldest railway organizations, originally founded for the protection of its members against the inroads of capital, to obtain a fair day's wage for a fair day's work, and to enjoy the rights and liberties of a free country —I say, can it be possible that through the influence of some few selfish members that it should at this late date be found working hand in hand with those against whom the organization was originally intended to protect itself, and be dragged in the mire by forming a combination with railroad companies, and doing everything possible to defeat the sister organization from which it has to obtain its membership?

At the same time what a laughable farce to have two B. of L. E. engineers working together on the same engine, when it is a well-known fact that in some places they cannot agree in the same lodge room. It is about on a par with the B. of L. E. speaking about going on a strike, they knowing full well that their older members would not support them, and the preamble of the constitution does not give them that right.

I am in error for mentioning the B. of L. E. Constitution, as that does not apply when any point is to be gained.

I am one of those who believe there is plenty of room for both the B. of L. E. and B. of L. F. and E.; also am of the opinion that the members of each organization have enough to do to look after their own members, and attend strictly to their own business, and that if this is done in a proper manner there would be less time to attend to the affairs of others, and they would not leave themselves liable to unfavorable public criticism.

Besides, I am not aware of any law on the statutes of this country that gives the right to any organization or society to interfere with the liberties or privileges of others, as the laws governing that particular organization or society govern only those who are members, and amenable to the laws which they have adopted.

Why is it that some railroad officers are willing to join hands with the B. of L. E. when difficulties arise? I think the question is easily answered by saying that as the B. of L. F. and E. is the strongest organization of the two, and ready at all times to assert its rights, that the hope is perhaps entertained that through joint action between the companies and the B. of L. E. our Brotherhood can be kept down, knowing full well that through strict examinations, age limit, ear and eye test, and in many other ways, the B. of L. E. can be "put in line" at any time they so desire on short notice; and perhaps the day is not far distant when assistance will be required by those who are now taking sides against us, as we cannot expect the present prosperous conditon of the country to always remain, and as soon as there is a plentiful supply of men there is no doubt but what the "weeding" process will commence.

In writing this article I wish it to be distinctly understood that I have many good friends who are members of the B. of L. E., and as previously stated believe there is plenty of room and work for both. At the same time I do not believe the rank and file of that organization, through a referendum vote, would sustain any such actions as are here mentioned.

I cannot help but believe that many of those members are of the opinion that right and not might should prevail, and that with open doors and brotherly love this difficulty would be solved, and every member of both organizations stand

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ready to defend the rights, liberties, justice and freedom given us by the laws of a free country.

With best wishes for all our members, I remain,

Fraternally yours,

E. A. BALL,

Third Vice-Grand Master B. of L. F. and E.

Delay is Dangerous.

————, June 4, 1907.

Mr. ————,

————————

Dear Sir and Bro.—Enclosed please find postoffice money order for dues for quarter ending September 30; also for quarter ending December 31. Kindly forward receipts.

Thanking you in advance for your attention to this matter, I am,

Yours fraternally,

————————.

The foregoing is a copy of a letter written to the secretary of one of our lodges, who has sent it to the Magazine, together with a statement to the effect that its writer makes it a rule to pay his dues six months in advance. It is certainly a substantial evidence of the extent to which the brother who wrote it values and appreciates his insurance.

There are, unfortunately, members in our organization who for some reason or other are careless about the payment of their dues. They, of course, intend right along to pay them, but often fail to do so until after the beginning of the quarter. This results in some instances from pure negligence, and in others from the expectation that they will meet the collector from day to day, or that he will call on them. All such men should emulate the care evinced by the brother whose letter is given above, for whatever the cause may be, there is one thing certain, and that is that in failing to pay their dues prior to the beginning of the quarter they are not only taking steps to occasion themselves and others much unnecessary trouble, but are also running the risk of losing their insurance, or depriving their loved ones of it in case of disability or death. When a member fails to pay his dues, according to the provisions of the constitution, he thereby expels himself, and while thus expelled is not entitled to share in the insurance advantages of membership. The prompt payment of his dues in accordance with the laws of the organization, is a duty every member owes to himself, his family and the Brotherhood, the importance of which can not be overestimated. There are comparatively few members in our Order who are careless about paying their dues on time, but they are sufficient in number to occasion a great deal of unnecessary work to their local lodge officers, as well as in the offices of the Grand Secretary and Treasurer and the Magazine.

Unconstitutional Act of a Division of the Order of Railway Conductors.

Grand Master Hannahan recently received a letter from Brother A. B. Garretson, Grand Chief Conductor of the Order of Railway Conductors, a copy of which was also sent to the executives of the Railroad Brotherhoods. Same is self-explanatory, and reads as follows:

"I am in receipt of numerous copies of a circular issued by Mobile Division No. 310 of the Order of Railway Conductors, which was sent, I find, to all divisions and lodges of all these organizations, appealing for aid in behalf of one Ed Frenlich, a member of our organization. I would request you to call the attention of your divisions and lodges, through your regular channels, to the fact that this circular was issued in violation of the laws of our organization, and that the division had never made any attempt to secure the financial aid that our organization extends to its destitute membership, if the necessity therefor is shown. I sincerely regret that such action was taken, and that the sympathies of your membership were appealed to in a case which should have been confined wholly to the organization of which Mr. Frenlich is a member. I hope to take such measures as will prevent a recurrence of the incident."

A Resolution of Goodwill.

The following resolution was unanimously adopted by the eighth biennial convention of the Brotherhood of Railroad Trainmen, held during the month of May, last, at Atlanta, Ga., a copy of which has been sent our Grand Lodge under the seal of the Grand Lodge of the B. of R. T.:

"Whereas, We have received a letter

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of fraternal greeting and good wishes from Brother John J. Hannahan, Grand Master of the Brotherhood of Locomotive Firemen and Enginemen, expressing his regrets at being unable to attend our convention on account of the serious illness of his wife, and of a meeting of general chairmen of his organization which will necessitate his attendance; and

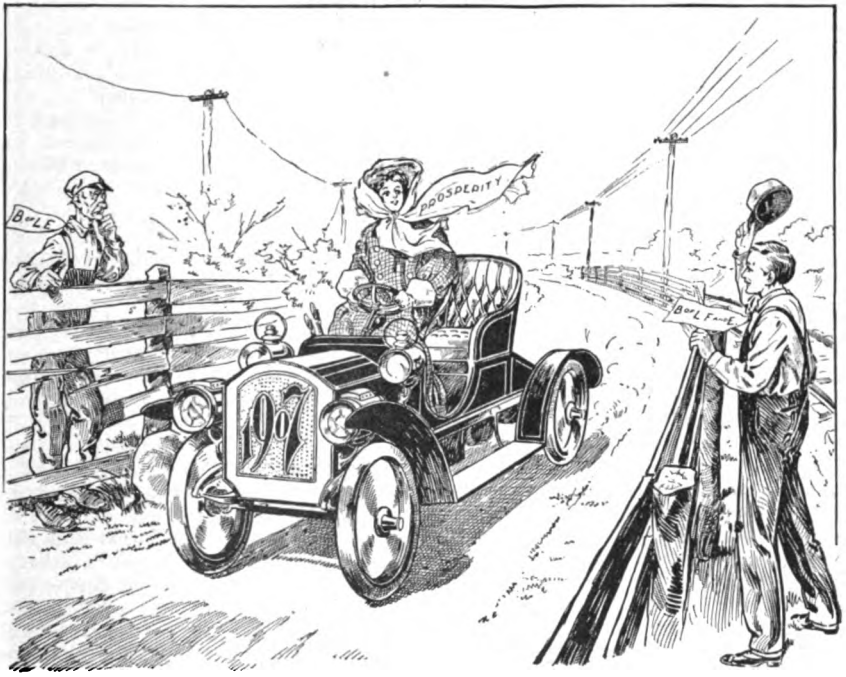
"Whereas, In Brother Hannahan's letter he expresses the continued friendship and fraternal feeling for our Brotherhood and wishes us 'a pleasant session and a valuable one in matters of legislation for our members;' therefore, be it

"Resolved, That the thanks of this convention be extended to Brother Hannahan, and through him to the members of the Brotherhood of Locomotive Firemen and Enginemen, for such expressions of goodwill, and to assure them that their good wishes are fully reciprocated; and be it further

"Resolved, That a copy be sent to Brother Hannahan, and be printed in the Railroad Trainmen's Journal."

Recent Conventions of the Order of Railway Conductors and the Brotherhood of Railroad Trainmen.

Our sister organizations, the Order of Railway Conductors and the Brotherhood of Railroad Trainmen, concluded their recent conventions in the cities of Memphis, Tenn., and Atlanta, Ga., respectively, in the enjoyment of conditions of prosperity unprecedented in the history of those orders.



AN ILL DISGUISED JEALOUSY

Well! Well!! It looks like she's losin' all feelin' fer me. I'll have ter figure on gettin' that young feller out o' the road somehow

The O. R. C.

The Grand Division of the Order of Railway Conductors met in thirty-first session in May, last, in the city of Memphis, Tenn., with over 500 delegates in attendance. The social features of the session, as arranged by the local division, were very attractive and much enjoyed by the delegates and visitors.

Among the important legislation enacted was the following: The titles of the executive officers of the organization were changed from Grand Chief Con-

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ductor, Assistant Grand Chief Conductor, Grand Senior Conductor, Grand Junior Conductor and Deputy Grand Chief Conductor for Canada, to the more simple ones of President, First, Second and Third Vice-Presidents and Vice-President for Canada.

Election of legislative representatives may hereafter be held in years that conform to the meetings of the legislative assemblies in the various states, and provision is made for the levying of assessments upon members employed in any state, province or territory, regardless of where their membership may be held.

Provision is made whereby any person shall be eligible to membership who is, at the time of making application, actually employed as conductor of a train on a surface railway outside of yard limits, where steam or steam and electricity are jointly used as motive power and who has had at least three months or seventy-eight days' actual experience as such and has had at least two years' experience in train service; provided, that if he has formerly at any time been a member of the Order and is in train service at the time of the filing of his application, he shall be eligible.

In the event of a division holding a limited number of members and another division holding nearly the entire membership on any line of road, the President will be empowered to transfer such limited membership to the division holding the larger membership on the system.

The provision is made whereby those who do not hold rights in road service will not be assessed for general committee purposes, but they will be assessed for expenses incurred by such committee in the handling of personal grievances, and further, that in the Republic of Mexico general committees will be permitted to legislate for yardmasters. The sum of $30,000 is made available from the general fund for the payment of bills of committeemen instead of $10,000 as heretofore. When a strike is ordered on any line every member except those holding official positions will be subject to the order.

Provision is made for an increase of the protective fund from $100,000 to $200,000, and this is done without any assessment upon the membership, a resolution providing that the sum will be set aside from the general fund to the protective fund.

Provision is made whereby the grievance of a member who can attend his division without loss of time and does not do so will not be entertained by his division.

The election of officers resulted as follows: President, A. B. Garretson; First Vice-President, L. E. Sheppard; Second Vice-President, E. P. Curtis; Third Vice-President, A. M. Clark; Vice-President for Canada, S. N. Berry; Grand Secretary and Treasurer, W. J. Maxwell; Trustees, J. E. Condit, J. E. Archer, W. Welch and Charles D. Baker. Insurance Committee, Wm. J. Durbin, W. H. Ingram and W. H. Budd.

Following the election and installation of officers the convention adjourned to meet in biennial convention in 1909 in the city of Boston, Mass.

The B. of R. T.

The Brotherhood of Railroad Trainmen met in eighth biennial convention in the city of Atlanta, Ga., during the month of May, last, with 760 delegates on the floor. The usual open meeting was held and entertainments provided by sister organizations during their stay in that city.

Among the important legislation enacted may be mentioned the following: There was created a board of insurance, consisting of seven members, who will meet annually at headquarters for the purpose of taking up all claims that have for any cause been disallowed during the year. This board will have the power to dispose of claims in the same manner that they have heretofore been disposed of by the conventions. This change is expected to save at least three days' time at the next meeting of the Grand Lodge.

The period of service prior to eligibility to membership was reduced to six months, and the year of probation has been done away with. It is expected that the adoption of this law will fill a long-felt want, and add materially to the membership of the organization.

The grand executive board has been increased by two members, making its membership five, and as one member of the board of grand trustees was elected to a higher office there was one vacancy on this board to fill.

A new name was adopted for the official publication of the Order, and instead of the Railroad Trainmen's Journal it will, on the change becoming effective, be known as "The Railroad Trainman."

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An arrangement was made whereby the B. of R. T. can act in conjunction with other railroad organizations for the purpose of building a home for disabled brothers.

The election of officers resulted as follows: Grand Master, P. H. Morrissey; Assistant Grand Master, William G. Lee; Grand Secretary and Treasurer, Albert E. King. The numerical standing of the Vice Grands was taken out of the law and they will now be known according to the order of their election. The first one elected will be first in order of succession to fill a vacancy above his office, and so on down the line. The first one elected will be the senior and the others will follow in their order of election. Brothers Tom R. Dodge, Val Fitzpatrick, William Newman, James Murdock and Al E. Whitney were elected in the order named. Brother Whitney was elected to the new position created as Vice Grand Master. The Board of Grand Trustees will be composed of Brothers James Hurlbut, of Lodge 186; Hiram W. Belknap, of Lodge 116, and William Dougherty, of Lodge 140. The Grand Executive Board will be composed of Brothers J. W. Rhoades, of Lodge 397; R. J. Powers, of Lodge 71; O. C. Cash, of Lodge 492; A. W. Evans, of Lodge 195, and F. C. Lockwood, of Lodge 752. The Board of Insurance will be composed of Brothers R. W. Cartmell, of Lodge 294; J. P. Ogden, of Lodge 90; W. L. Moorhead, of Lodge 312; K. R. Vought, of Lodge 338; James Bryan, of Lodge 108; J. L. Shaw, of Lodge 448, and H. A. Adams, of Lodge 577.

Following the election and installation of officers the convention adjourned to meet in two years from May, 1907, in the city of Columbus, Ohio.

Back Copies of the Magazine.

Anyone desiring to secure back copies of the Magazine for the following years: 188C, 1887, 1889, 1892, 1893, 1894, 1895, 1896, 1898, 1899, 1900, 1904, 1905, 1906, can do so by corresponding with H. P. Shaw, 333 College avenue, Kingston, Pa. Brother Shaw also has the June, August, September, October and November copies of 1884, and those for the entire year of 1888, with the exception of the January number; the entire year of 1890, excepting the October number; entire year of 1891, with the exception of the January number; entire year of 1901, with the exception of the March number; 1902, with exception of October, and 1903, excepting January.

Brother Shaw would rather not have the complete years broken. Anyone desiring back copies can make arrangements direct with him at the address given above.

Union Meeting at Indianapolis, Ind.

A union meeting, which was well attended by members of the O. R. C., B. of L. E., B. of L. F. and E., B. of R. T. and O. R. T., was held in Trainmen's Hall at Indianapolis, Ind., Sunday, June 30, 1907. The meeting was called to order by Bro. J. D. Posey of Division 103, Order of Railway Conductors, and was opened by prayer by the Rev. F. B. Griffice of the Congregational church.

The Brotherhood of Locomotive Firemen and Enginemen, the Order of Railway Conductors, the Brotherhood of Railroad Trainmen and the Order of Railroad Telegraphers were each represented by able speakers, who dwelt upon the objects and aims of organized labor, the conditions existing among unorganized railroad men and the advantages to be gained by their affiliation with the organization representing their calling. The advisability of employing attorneys to look after our interests in all localities, the necessity of entering politics, and the good to be derived by federation of the different railroad organizations were discussed.

During the course of the meeting a rising vote of sympathy and prayer was extended to Bro. E. C. Thompson of the O. R. T. on account of the death of his beloved wife, a bride of ten days. It was moved and seconded that same be spread upon the minutes of the meeting and a copy, together with a floral tribute, be sent to Brother Thompson.

It was moved and seconded that a committee be appointed to draft resolutions relative to the employment of legal counsel to defend the interests of the different railroad organizations, which committee reported as follows:

"Whereas, Injured railroad employes and the families of those who, by death or injury sustained in the line of duty as such, have been left without proper sustenance; and,

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"Whereas, Such railroad employes and their families are absolutely without such legal protection as will enable them to successfully combat the legal talent always at the service of the railroad companies and its influence with the courts; therefore,

"Be it resolved, That it is the sense of this union meeting that some steps be taken, without further delay, with a view to establishing a legal department to operate in connection with the various railroad labor organizations for the protection of the interests of such railroad employes or those dependent upon them in litigation.

"Be it further resolved, That a resolution be drafted and sent to the Grand Officers asking them to co-operate with one another for the purpose of bringing together a closer affiliation of our respective organizations."

The closing remarks were made by the Rev. F. B. Griffice, who spoke of the railroad men from personal experience, he having at one time been a locomotive fireman. Same were well received by the brothers, who tendered him a rising vote of thanks for the kind words expressed in their behalf, after which the Rev. Griffice closed the meeting with prayer.

HENRY ZINK,
Lodge 14, B. of L. F. and E.,
Secretary of Meeting.

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Back Volumes of the Magazine.

Anyone wishing back volumes of the Magazine for the years of 1883, 1884 and 1885 can secure these volumes bound in cloth with leather corners, by corresponding with W. H. Daniels, 2309 B street, Meridian, Miss.

* * *

Sparks.

The official emblematic button of the B. of L. F. and E. is handsome and distinctive and should be worn by every member of the Order. The price is one dollar, and same may be ordered through an officer of your lodge.

Bro. J. M. Dodge, the vice-president of the Orange Blossom Extension Mining and Milling Company, San Diego, Cal., began his life as a railroad man in 1873 in the capacity of a fireman for the Illinois Central Railroad, and after serving his apprenticeship in that capacity became an engineer on the same road. He is a Past Vice Grand Master of the B. of L. F. and E., and a charter member of Lodge 47, Chicago, Ill.

The orders that are being received for copies of the "Catechism of the Electric Headlight" are very gratifying, and show more than anything else the desire on the part of our members to become thoroughly posted on that modern and up-to-date appliance. Price, 50 cents. Address orders to John F. McNamee, Editor and Manager, 806-807 Traction Terminal building, Indianapolis, Ind.

When, in order to perpetuate its existence, a so-called labor organization declares warfare on a sister organization which has always been friendly to it, by re-enacting at convention after convention laws which are insulting and antagonistic—such as are contained in the B. of L. E. constitution—it is a sure indication of the impotency of such an institution.

A handsome 96-page souvenir, with frontispiece in four colors, is being issued by our brothers at Hamilton, Ontario, in commemoration of the Canadian Grand Union Meeting, to be held in that city August 5th, 6th, 7th, 8th and 9th.

If you are approached by a member of the B. of L. E. with a request that you make application for membership in its ranks—which, of course, means your forced withdrawal from the B. of L. F. and E.—tell him in plain and unmistakable terms that you already belong to an organization of locomotive engineers, the best there ever was and the only one that can do you any good, and he may decide in future to let you alone.

By displaying on the lapel of your coat the official emblematic button of the B. of L. F. and E. you proclaim to the world your connection with the only live, progressive and up-to-date organization of locomotive enginemen on the North American continent.

Your presence, accompanied by your wife, sister, mother or sweetheart, at the Canadian Grand Union Meeting, to be held in the city of Hamilton, Ontario,

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August 5th, 6th, 7th, 8th and 9th, will add pleasure to the occasion and weld closer the ties of Brotherhood. For hotel accommodations in advance apply to Brother Chas. V. Hayes, 111 Pearl street, North Hamilton, Ontario.

The B. of L. F. and E. has a record of which it is justly proud. It has ever met its obligations and fulfilled its promises to its own membership and to other organizations, and stands before the world clean and undefiled. How about the B. of L. E. with its record of scabbing, treachery, deception and betrayal of sister organizations? Which do you prefer, brothers: an organization, the pages of whose history are gladly and willingly opened for the world's inspection, or one which in an effort to appear consistent is compelled to screen certain pages of its own history by falsehood and misrepresentation?

Col. R. V. Dodge of the Orange Blossom Extension Mining and Milling Company, was employed as fireman and engineer with the Illinois Central Railroad from 1873 to 1879. He then entered the employ of the Santa Fe Railroad and was the first engineer employed on the California Southern Railroad, now a branch of the Santa Fe. The Colonel is very popular in San Diego, where he has filled many offices with distinction.

"Something Doing Every Minute," is the motto of our Canadian brothers who are making the necessary arrangements for the Canadian Grand Union Meeting to be held at Hamilton, Ontario, August 5th, 6th, 7th, 8th and 9th.

Brothers, when you are promoted to the position of locomotive engineer do you want to help shoulder the burden of the costly insurance feature of an organization such as the B. of L. E., which is fast nearing the end of its days of usefulness?

If you want to be able to pass a creditable mechanical examination, and especially in so far as it relates to the operation and maintenance of the most modern and up-to-date headlight, you should not delay sending for a copy of the "Catechism of the Electric Headlight." Price 50 cents. Address orders to John F. McNamee, Editor and Manager, 806-807 Traction Terminal building, Indianapolis, Ind.

By action of the Tenth Biennial Convention, held at Milwaukee, Wis., the B. of L. F. and E. adopted an official lapel button to be worn by its members. It is the only official emblem of the Order, and can only be secured from Brother W. S. Carter, Grand Secretary and Treasurer, Peoria, Ill. It is desirable that these buttons be ordered through an officer of your lodge, and where ten or more buttons are ordered at one time a substantial reduction in price is made. The price for a single button is one dollar, which, considering the handsome design, is very reasonable.

If our young runners, as they are promoted, will simply retain their membership in the B. of L. F. and E., it will be but a short time until the problem of representation will have been solved. Already on many systems of railroads we have over 45 per cent. of the engineers in our ranks. When we have over 50 per cent. we will have the right to represent engineers in all matters pertaining to their employment on such systems.

Read the supplement to this issue of our Magazine and become familiar with the facts bearing on the various subjects treated therein.

Don't be deceived, brothers, by the misrepresentations and false statements being circulated by the B. of L. E. They would deny us the right to represent and protect our own membership, but we are doing it nevertheless, and will continue to do so.

Prominent on the program for the Canadian Grand Union Meeting, to be held in the city of Hamilton, Ontario, August 5th, 6th, 7th, 8th and 9th, will be moonlight sails on Lake Ontario, a grand ball at one of the best summer resorts in Canada, a gala day at Niagara Falls, and other entertainments too numerous to mention.

One of the most popular mechanical instruction books on the market today is the "Catechism of the Electric Headlight." A study of its contents will give you the necessary information which will

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enable you to pass that part of your examination. Write for it today. Price, 50 cents. Address orders to John F. McNamee, Editor and Manager, 806-807 Traction Terminal building, Indianapolis, Ind.

Our brothers who are now and have been for years connected with the greatest and best Brotherhood of Locomotive Enginemen in the world should think long and seriously before being tempted to take such a fatal and retrogressive step as to withdraw from the *only* organization which can and does protect them and their families, to join the fossilized institution known as the B. of L. E.

The committee having in charge the arrangements for the Canadian Grand Union Meeting, to be held at Hamilton, Ontario, August 5th, 6th, 7th, 8th and 9th, and the men they represent, extend a most cordial invitation to the brothers, the members of the Ladies Society and their friends to be present and enjoy the many entertainments prepared for their pleasure.

Our Brotherhood took part in the C., B. & Q. strike for the purpose of assisting the B. of L. E. The fight was such a lengthy and strenuous one that our treasury became depleted and our Grand Officers accepted a short time loan of about $26,000 from that organization. Now, nineteen years after the conclusion of that struggle, we have it on reliable information that certain officers of the B. of L. E. are going around the country endeavoring to create the impression that that order *gave* us $26,000 at that time and that it has never been returned, when, as a matter of fact, it was paid back in a short time after the loan was made. Read the supplement to this issue for full particulars regarding the incident.

James A. Hodgman, the president of the Orange Blossom Extension Mining and Milling Company, started in life as a railroad man and was yardmaster at Needles, Cal., for the Santa Fe Railroad.

In a circular issued by Mr. Stone, under date of April 1, 1906, he made certain false charges as to the position of our Brotherhood in the Southern Pacific strike. In the supplement to this issue of the Magazine same are replied to in full and the real facts set forth, under the heading "The B. of L. E. Strike Circular." Do not fail to read same carefully.

Proclaim your membership and your pride in the work of the only live and progressive organization of locomotive enginemen in North America by wearing on the lapel of your coat one of the handsome official emblematic buttons of the B. of L. F. and E. Price, one dollar. Have an officer of your lodge order one for you today from Brother W. S. Carter, Grand Secretary and Treasurer, Peoria, Ill.

The attitude of the B. of L. E. during the Southern Pacific strike was so disgraceful that, with a view to evading its consequences, its grand officers have taken refuge behind equivocation, misrepresentation and culpable falsehoods, as evidenced by a recent circular on the subject issued by Grand Chief Stone. Supplement to this issue of the Magazine gives the facts in the case—facts, every word of which we can substantiate with proof that is incontrovertible.

Every brother and member of the Ladies Society who can possibly do so should not fail to attend the Canadian Grand Union Meeting, to be held in the city of Hamilton, Ontario, August 5th, 6th, 7th, 8th and 9th, and by their presence show their appreciation of the efforts being put forth by the committee of arrangements for their entertainment.

In a supplement to this issue of the Magazine, under the heading "Some Questions Mr. Stone Should Answer," will be found some interrogatories, his replies to which we await with interest.

Two hundred and ninety-six questions and their answers are contained in the popular little book, entitled "Catechism of the Electric Headlight," in addition to which is included an insert sheet showing illustrations of that modern and up-to-date lamp. It is just what you need to assist you in your examinations for promotion. A copy can be secured by sending 50 cents to John F. McNamee, Editor and Manager, 806-807 Traction Terminal building, Indianapolis, Ind.

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Brothers, should you have any doubt as to the B. of L. E. people "taking the spade" in case you should, in defense of your rights, lay it to one side, read in the supplement to this issue of the Magazine what you will find under the heading "B. of L. E. Men Will Take the Spade."

Ample accommodations with reasonable rates will be afforded all who can find the opportunity to attend the Canadian Grand Union Meeting, to be held in the city of Hamilton, Ontario, August 5th, 6th, 7th, 8th and 9th.

Bro. C. W. Maier has lately purchased a fine residence at San Diego, Cal., and will in the near future make that city his home. Brother Maier lately resigned his office as Third Vice Grand Master of the B. of L. F. and E. to go into the mining business and is now associated with Messrs. Dodge Bros., Hodgman & Holcomb in the management of the Orange Blossom Extension Mining and Milling Company's group of copper and gold mines, located near Amboy, Cal.

If you desire to familiarize yourself with Grand Chief Stone's real position relative to the Chicago concerted movement, read what the supplement to this issue says on that subject and you will clearly understand the extent to which that gentleman was himself responsible for the failure of the two organizations to co-operate in said movement.

Attend the Canadian Grand Union Meeting, to be held in the city of Hamilton, Ontario, August 5th, 6th, 7th, 8th and 9th, and enjoy true Canadian hospitality and good fellowship. The experience will do you good and you will feel the better for it.

In the supplement to this issue will be found some very interesting facts bearing on the conspiracy-like arrangement into which the B. of L. E. entered to scab on our members on the Bangor & Aroostook recently had our brothers engaged in a strike on that road in defense of their rights—an example of the most infamous treachery and obsequious servility that a body professing to exist for the purpose of upholding organized labor principles could be guilty of.

There is only one authorized official emblematic button of the B. of L. F. and E., which was adopted by the Tenth Biennial Convention, held at Milwaukee, Wis. Considering the very handsome design, the price of one dollar is very reasonable. Have your secretary or other officer of your lodge order one for you from Brother W. S. Carter, Grand Secretary and Treasurer, today.

The more the merrier—Thus say the boys who are in charge of the Canadian Grand Union Meeting, and the best way to express appreciation of this hearty welcome and their genuine hospitality is to attend in the largest numbers possible.

On the Norfolk & Western, the chairman of the B. of L. E. committee pledged the services of that organization to the company in case our Brotherhood should order a strike on that system. Read your supplement and learn what he said about B. of L. E. men "taking the spade."

Those desirous of securing quarters for the Canadian Grand Union Meeting in advance should write Brother Chas. V. Hayes, 111 Pearl street, North Hamilton, Ontario.

In reply to Mr. Stone's circular there are submitted to him some interesting questions, to which we would like to have him make reply, and which, in a supplement to this issue, will be found under the heading "Some Questions Mr. Stone Should Answer."

The time is about at hand to start for the Hamilton meeting. Complete all arrangements early so as to avoid haste and confusion at the last moment. A genuine good time is guaranteed to all.

In the recent threatened trouble on the Bangor & Aroostook the B. of L. E. has broken all records for degrading servility, diabolical treachery and cringing sycophancy. See details in supplement to this issue, under the heading "The Issue on the Bangor & Aroostook Railroad."

Hotel accommodations can be secured in advance for the Canadian Grand Union Meeting by applying to Brother Chas. V. Hayes, 111 Pearl street, North Hamilton, Ontario.

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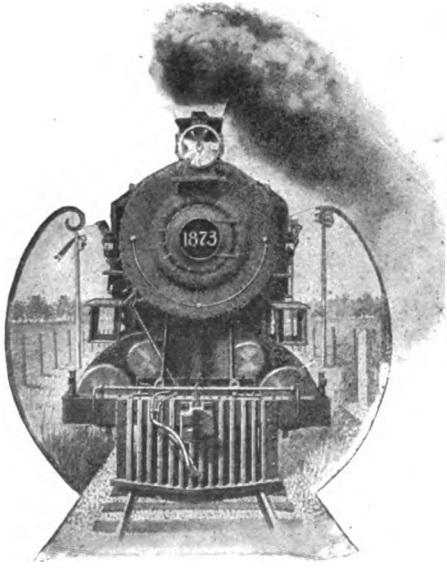
In a letter from former Grand Secretary and Treasurer Eugene V. Debs, appearing in the supplement to this issue, will be found some interesting statements relative to loan made by the B. of L. E. to the B. of L. F. during the C., B. & Q. strike in 1888 and the circumstances under which same was accepted.

A visit to Hamilton, Ontario, with all its natural attractions, is, of itself, a treat long to be remembered; but when, in addition to this, is added the pleasures to be derived from the various entertainments provided by our Canadian brothers for their visitors on that occasion, an idea can be had as to the good time in store for all who are able to attend.

The Grand Chief of the B. of L. E. has had much to say relative to the concerted movement on the lines west of Chicago and the failure of the two engine service brotherhoods to co-operate therein. Particulars relative to the matter can be found under the heading "B. of L. E. and the Concerted Movement," in the supplement to this issue.



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BROTHERHOOD BULLETINS

FOR THE INFORMATION OF ALL LODGES AND MEMBERS. CONDUCTED BY THE GRAND SECRETARY AND TREASURER

Joint Protective Board Assessment Work.

During the first six months of the collection of Joint Protective Board assessments by the Grand Lodge the assessments so collected have aggregated $83,570.75. Of this amount $62,852.75 has been paid to Joint Protective Boards on completed assessments, $17,389.25 has been paid to boards on assessments that were not completed before the end of the quarter, and $3,328.75 remained in the possession of the Grand Secretary and Treasurer.

Quarterly Reports Nos. 1 and 2 of Joint Protective Board assessments have been sent to the secretaries of all lodges and boards. Reference to these two reports will show the number of assessments levied on each system, the amount of such assessments, the number of lodges on each system, the number of members on each system, the amount collected, and the amount paid to each system. These reports are issued on the first of each quarter and should prove of interest to the membership.

During the six months ending June 1, 1907, the Grand Secretary and Treasurer levied Joint Protective Board assessments by orders of 77 different boards. These 77 different systems involved 691 lodges. In reaching this estimate, however, joint lodges were counted as many times as different systems were represented in their membership. Some lodges have members employed on as many as four different systems.

The following is a list of the ten largest systems, showing the number of members paying Joint Protective Board assessments on each system:

	Members.
Pennsylvania Lines (East)	3,700
N. Y. C. Sys. (East of Buffalo)	1,512
Canadian Pacific	1,471
Penna. Lines (West)	1,360
Baltimore & Ohio	1,336
Erie	1,080
C., B. & Q.	1,004
Missouri Pacific	1,002
N. Y., N. H. & H.	983
Boston & Maine	842

Beneficiary Claims Paid During the Past Fiscal Year.

The magnitude of the work of the Beneficiary Department of the Brotherhood will be realized by inspecting the following list of death and disability claims paid during the fiscal year ending July 1, 1907. It will be the purpose of this department of the Magazine to communicate statistical information from time to time, and in the next issue a statement will be published in which will be shown the causes of deaths and disabilities. It will prove a surprise when the proportion of deaths and disabilities from casualties are made known. It will be shown that war is not more fatal than railroading:

DEATH CLAIMS PAID FROM JULY 1, 1906, TO JULY 1, 1907.

No. of Claims.	*Class.*	*Amount.*
436	"A"	$654,000 00
74	"B"	74,000 00
24	"C"	12,000 00
16	"D"	32,000 00
9	"E"	27,000 00
1	Special	1,200 00
1	Special	1,150 00
1	Special	500 00
1	Special	1,000 00
563		$802,850 00

DISABILITY CLAIMS PAID FROM JULY 1, 1906, TO JULY 1, 1907.

No. of Claims.	*Class.*	*Amount.*
71	"A"	$106,500 00
12	"B"	12,000 00
7	"C"	3,500 00
5	"D"	10,000 00
3	"E"	9,000 00
1	Special	2,500 00
1	Special	750 00
100		$144,250 00

563 death claims aggregating...$802,850
100 disability claims aggregating 144,250

663 claims aggregating.....$947,100

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Lapses of Membership.

It was at the San Francisco Convention, in 1890, I think, that E. V. Debs, who was then Grand Secretary and Treasurer, told the delegates that the membership of the Brotherhood of Locomotive Firemen changed every ten years. A glance back over the past seven years shows the following facts:

Membership July 1, 1901.....		39,072
Admissions during seven years...		71,309
		110,381
Net expulsions during seven years.....	28,083	
Withdrawals during seven years	16,279	
Deaths during seven years	3,102	
		47,464
Membership July 1, 1907.....		62,917

This would indicate that our membership practically changes every five years. But these statistics are deceptive, in that they do not show the number of members that withdraw, or are expelled, and who are then readmitted. A very large proportion of members admitted each year are the same persons who are included in the list of expulsions and withdrawals of previous years.

The following table is published for the information of members:

Fiscal Year Ending	*Membership.*	*Net Expulsions.*	*Withdrawals.*	*Total Lapses.*
1901....	39,072	2,268	1,157	3,423
1902....	43,376	2,594	1,526	4,120
1903....	48,568	3,299	2,522	5,821
1904....	54,430	4,101	2,501	6,602
1905....	55,287	5,864	2,865	8,729
1906....	58,849	4,648	2,861	7,509
1907....	62,917	5,309	2,847	8,156
Totals		28,083	16,279	44,362

It will be noted that with a membership much larger on July 1, 1907, than on July 1, 1905, the net expulsions and withdrawals have both been less during the past fiscal year than two years ago.

Transfer of Members from One Lodge to Another.

Many members and officers of lodges have not yet become familiar with the new laws governing the transfer of members from one lodge to another. Occasionally a secretary writes to another asking for a "withdrawal card," as was the practice under the old law. All members and secretaries should carefully read the following laws upon this subject:

Sec. 187. A member desiring to transfer his membership to a lodge having jurisdiction on the division of railway on which he is employed, or if not employed in railway service, to a lodge more convenient to his place of residence, may make application to the lodge for admission by transfer. Accompanying the application the member shall file his current receipt which shows him to be in good standing for the quarter in which the application is made, and if such application meets with the approval of a majority of the members of the lodge at the meeting at which the application is presented, the secretary, over the seal of the lodge, shall immediately notify the Grand Secretary and Treasurer of the desire of the lodge to have the member transferred. Upon the receipt of this notification the Grand Secretary and Treasurer shall advise the secretary of the lodge from which the member desires to transfer that unless he files an objection to the transfer within fifteen days the transfer will be made by the Grand Secretary and Treasurer. Immediately after recording the transfer of a member the Grand Secretary and Treasurer will notify both lodges of the transfer, giving date of same and the date when collections of dues and assessments shall commence by the lodge to which the member has transferred. An application for transfer shall be made by members during the first two months of the quarter, and no application for a transfer made by a secretary shall be granted by the Grand Secretary and Treasurer unless said application reaches the Grand Secretary and Treasurer at least twenty days before the beginning of the following quarter. Should an application be received during the last twenty days of a quarter the Grand Secretary and Treasurer shall advise the secretary making the application that it has been received too late, and that the member shall pay his dues and assessments to the lodge from which he desires to transfer for the next quarter, and that the application may be renewed when the member presents his receipts showing that he has paid such dues and assessments. If a lodge should object to the transfer of one of its members to another lodge it shall file with the objection its reasons therefor, which objection shall be referred to the Grand Master, who shall promptly decide whether the objections are such as should prevent the transfer.

Sec. 188. A member accepting service

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on a foreign railway away from his home lodge shall be required to pay all assessments levied by the Joint Board representing said railway within the first ninety days, and at the expiration of ninety days from date of entering the service of said railway, the secretary of the lodge having jurisdiction over the division where the brother is employed, shall communicate by letter to the Grand Secretary and Treasurer the desire of the lodge to have the member transferred. Upon the receipt of this notification by the Grand Secretary and Treasurer the transfer will be made. Immediately after recording the transfer of a member the Grand Secretary and Treasurer will notify both lodges of the transfer, giving date of same, and the date when collections of dues and assessments shall commence by the lodge to which the member has transferred: Provided, That no member shall be required to pay any assessment levied by the Joint Protective Board unless he is employed on the line within their jurisdiction. On railway systems having but one lodge, the local board shall be the joint board, and the chairman and secretary of the local board shall be the chairman and secretary of the joint board of that system. Any member failing or refusing to comply with this section shall be subject to the provisions of the Constitution relating to the non-payment of dues and assessments. It shall be the duty of the lodge to whose collector payment should be made, to notify the lodge to which the member belongs about his failure to pay such assessment, and it shall be its duty to proceed as in all other cases of delinquent members.

Forum

A Word to the Young Runners of the B. of L. F. and E.

Just a short talk with our young engineers who are becoming eligible to join the B. of L. E., and who are being solicited with so much persistence, "for their own good," as they are told, to become members of that organization. I would like to ask why have they gotten to be of so much importance in a few short months, that those who thought it hardly worth while to exchange the time of day with these boys, are now so solicitous about them? Brothers, they need us far more than we need them; therefore the B. of L. E. has its dragnet out and wants to gather in all who can be persuaded to join it. Even Grand Chief Stone is spreading literature wholesale among our members, hoping to make some converts. I have failed, however, to find among said literature a copy of a letter which was sent out by a certain superintendent of motive power and equipment to the "safe" engineers, instructing them to report for duty as firemen in case the firemen and some of the engineers should go out on strike, telling them that an arrangement had been made between the management and the B. of L. E.'s committee to the effect that the engineers remaining in the service will act as firemen or in any other capacity, firing one day and running as engineer alternate days. Brothers, just consider and see if you want to join an order (which claims to be a labor organization) that will enter into an agreement to *scab* on you, when you are trying to better your condition, by using the only weapon you have to enforce fair treatment. Not only will they do that, but they will try to get you to help them kill your own organization by asking our engineer members to support them, misrepresenting to them the real conditions, when the whole trouble is that they want the company to give them the power of clubbing our engineer members into the B. of L. E. Now, brothers, I would only ask that all our members who are now running and all who are promoted during the next two years, stay with the B. of L. F. and E. We can then go to the railway companies and tell them that, as we represent over 50 per cent. of the engineers and all the firemen, we represent over 70 per cent. of their entire engine force. Then will we be able to do business in a business way, and not be held back by the deadwood that is now

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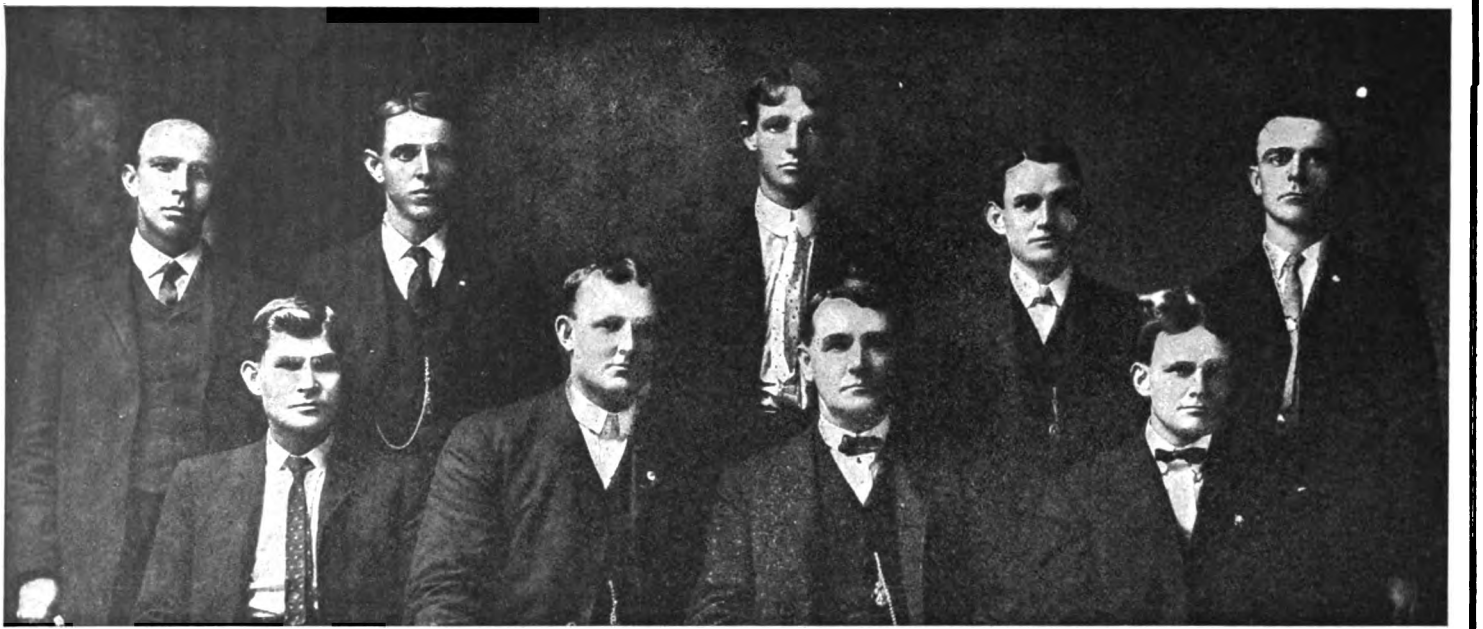

E. H. Barb, 147 G. M. Sewell, 324 Wm. Miller, 115 W. Smith, 449 I. E. Fowler, 677

R. O. McKay, 612 A. C. Long, 449 C. M. Rodgers, 449, Gen. Chairman O. R. Shearer, 147 Sec.-Treas.

JOINT PROTECTIVE BOARD, G. C. & S. F. RY.—GULF LINES

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encumbering the B. of L. E. Brothers, when the canvassers from the B. of L. E. come to you to solicit your application, tell them that the good old B. of L. F., with the E. added, is good enough for you, and extend to them an invitation to come back into the only order of enginemen that is up to date. I have heard members of the B. of L. E. say that had they stayed with the B. of L. F., they would not have had to leave their homes and those who were dear to them and start out to hunt a job because they did not get the protection they were entitled to. Brothers, on our division we have only lost two or three of the young runners in two years, and in this district none of them have been affected enough with the heat to leave a good, staunch craft and go over to a sinking ship.

Brothers, think well before you take a step which you will regret.

MEMBER.

Recent Work of the Joint Protective Board, Minneapolis & St. Louis System.

No doubt there are many who are anxious to learn what our Joint Protective Board accomplished while in session at Minneapolis, because it is generally known that we were not included in the list of roads that were benefited by the concerted action movement in Chicago, for the reason that the officials of our company declined to become a party to that movement, on the grounds that they had always in the past arranged conferences with their firemen when requested to do so with a view to the adjustment of employment conditions or the settlement of grievances, such conferences having always resulted in an amicable understanding between the parties interested, and that they were ready to follow the same course in the future, and we had every reason to believe that they would do just as they said. After giving the matter mature consideration, we decided to ask our general superintendent for an audience, expecting to secure for the men that we represent rates of pay and working conditions equal to those granted at the Chicago settlement. Acting on the suggestion of our Grand Master, we did not file our requests until after the firemen had made a settlement in Chicago. During this time we had succeeded in getting the engineers to work jointly with us, as they were not in the concerted movement, and were desirous of getting an increase of pay for their men. On the 18th of May, in pursuance to a call issued by the proper authorities, the General Committee of Adjustment of the B. of L. E. and our Joint Protective Board met at the Brunswick Hotel in Minneapolis, Minn., for the purpose of organizing a joint committee, of which Bro. C. E. Barton, chairman of the G. C. of A. of the B. of L. E., was elected chairman and myself (A. T. Keeney) secretary. Being thus prepared to represent jointly the Brotherhood of engineers and firemen employed on our system, we went, on Monday, May 20, to the general offices and there met with General Superintendent Noonan and Superintendent Hogan, and I am glad to say that we were cordially received by both of these gentlemen. We listened to a talk from Messrs. Noonan and Hogan, which was very interesting and instructive, and very well received. I hope, brothers, in the near future to be able to meet with every lodge on the system and relate in detail all that they said to us, for what they said to us as your representatives, they intended for every man we represented. I desire to say now that Mr. Noonan paid a very high tribute to our organization, saying that ours was a Brotherhood in fact as well as in name. He spoke along the lines of sobriety and industry, expressing it as his belief that the Brotherhood was deserving of very much credit for the way it cared for its members, and that our organization had a great deal to do with the men being sober and industrious. He also stated that the enginemen of the M. & St. L. represented, in his opinion, a very high standard, and that he appreciated the good-will of the men that worked under him. After a few days' conference we were able to adjust all of our grievances satisfactorily, and I am very glad to be able to say that the officials showed a spirit of fairness in all of their dealings with us. Mr. Noonan agreed to put forth every effort to improve the working conditions of the enginemen, and to relieve them of unnecessary labor. He promised to prepare a schedule of rules and regulations specifying such changes as were made in working conditions, rates of pay, etc., and submit it to us for our approval. Our committee being impressed with the kind and gentlemanly treatment we had

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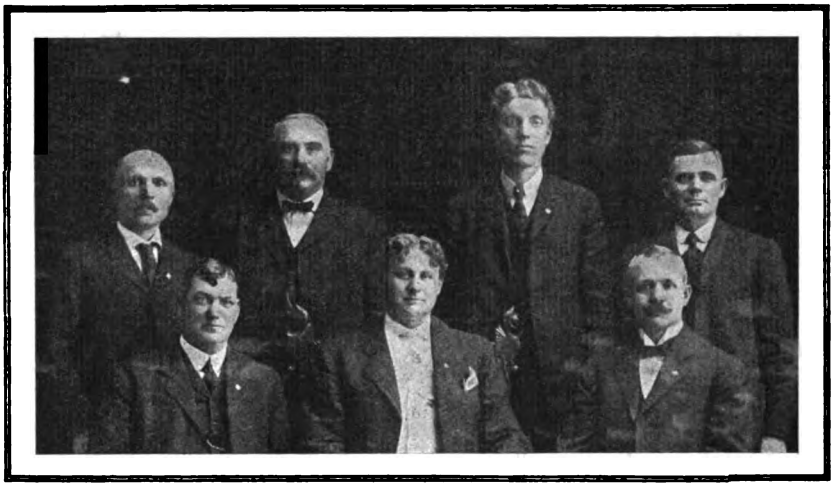
received from both Mr. Noonan and Mr. Hogan, and believing that Mr. Noonan would fulfill each and every promise he made us, left the office satisfied that as a result of our conference with the officials much had been accomplished in the interests of the men we represented.

When the schedule which Mr. Noonan had prepared was submitted we found that it embraced everything provided for in the Chicago settlement, which was all that we had asked for. After this the only thing left to do was to notify the



R. B. Timmons, 180, B. of L. E. J. Callahan, 525, B. of L. E. O. F. Sable, 82, Sec.-Treas., B. of L. F. and E. M. A. Doherty, 226, Sec.-Treas., B. of L. E.

T. Lonsdale, 102, Vice Chmn., B. of L. F. and E. A. T. Keeney, 222, Genl. Chairman, B. of L. F. and E. C. E. Barton, 180, Genl. Chairman, B. of L. E.

JOINT COMMITTEE OF ENGINEERS AND FIREMEN, M. & ST. L. SYSTEM

officials that the schedule was satisfactory to us, and on May 30 we signed up an agreement between the locomotive engineers and firemen and the M. & St. L. Company. The Joint Protective Board and the General Board of Adjustment of our system has just completed their labors and all have gone to their homes, and we hope that the work that has been accomplished by the board will be appreciated.

Brothers, feeling that we have done the best we could, and given you our very best service, we hope that there will be no disposition on the part of anyone to find fault with or express dissatisfaction at what has been accomplished. While we realize that it would be difficult to satisfy each and every one, we hope that due credit will be given for what has been done.

Brothers, the officers of the Joint Protective Board ask co-operation and assistance in our future work in your behalf. As you, no doubt, realize, we have many difficulties to contend with, and are liable, at times, to meet with reverses. There will be hills to double in the future, as there have been in the past, but success will depend upon the solid support of the brothers on the system. If we make a mistake, give us a chance to correct it, and remember that we have not yet had the experience of some Joint Protective Boards. Let us be conservative at all times, and show our officials that we are broad-minded and ever ready to put forth our best efforts with a view to improving the service and advancing the interests of the company as well as our own. It is very evident, from the disposition our officials have shown, that they stand ready to improve our conditions of employment when it is in their power to do so. If, therefore, brothers, you will co-operate with the work of your Joint Protective Board, we have every reason to believe that all will be well. If you will answer your correspondence

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promptly, and live up to the principles of the order, and fulfill your duties to your lodge and each other, there is no doubt but that everything will work to your entire satisfaction. Don't ask us to take up the valuable time of our officials with petty grievances which can be settled at home among yourselves.

We hope that every member will study the constitution and know just what is required of him. Brothers, ours is not a revolutionary body. We are organized for the purpose of uniting locomotive enginemen and elevating their social, moral and intellectual standing, and for the protection of their interest and the promotion of their general welfare. The interests of our members and their employers being mutual, we recognize the necessity for co-operation, and it is the aim of the Brotherhood to cultivate a spirit of harmony between them upon a basis of equity and justice, realizing the fact that it is a duty we owe ourselves, our families and those we feel obligated to aid, to make suitable provisions against those disasters which almost daily overtake us on the rail. The necessity of protecting our interests, of extending to each other the hand of charity and being sober, industrious and honorable men is self-evident. Let us at all times remember the cardinal principles of our order: "Protection, Charity, Sobriety and Industry."

I am glad to know that one of the cardinal principles of our organization and the first in our motto, viz., "Protection," is well recognized and lived up to by the protective department of our order over the entire system.

The next is "Charity." It is true we should show charity to our brothers, but charity means to help those who can not help themselves.

"Sobriety" and "Industry" come next. Let us always be sober and industrious and put forth every effort within our power to make the management a success. Let it never be said that a single member of our order, working on the M. & St. L., has been weighed and found wanting.

A. T. KEENEY,
Chairman.

Stolen Receipts.

All brothers are requested to be on the lookout for anyone who may present the receipts of Brother Gus Prouse, member of Neches Lodge No. 156, located at Palestine, Texas. Brother Prouse states that a man by the name of Calhoun, who claims to have at one time been a member of our Brotherhood, was rooming with him, and that while he (Bro. Prouse) was out on the road recently, this man Calhoun moved out of the room without notifying Brother Prouse. He also states that after Calhoun had gone, he (Brother Prouse) missed his quarterly receipts, and that it is his belief that Calhoun took them, as he (Calhoun) has been already known to have worked under different names at different places. The receipts stolen were for the quarter ending September 30 of this year. Calhoun's description is as follows: Height, 5 feet 6 inches; weight, about 160 pounds; light complexion, blonde hair and blue eyes. Should any other brother discover any person trying to in any way use these receipts for fraudulent purposes, he is requested to, if possible, obtain possession of same and turn the perpetrator over to the officers of the law.

W. T. SHROYER, Master No. 156.
H. D. SCOTT, Secretary No. 156.

A Question.

My engineer and I were talking some about the Southern Pacific strike today (July 8, 1907), and of course each of us was defending his own respective order. We finally came to a question that neither of us could answer. It is this: "Why isn't a vote to consolidate submitted to the membership of the two orders?" We, as well as thousands of others, want to know the same thing. Is this not feasible? Would like to have some views on the subject through the Magazine.

MEMBER 126.

A Remedy Suggested for Relief of Men Who Have Been Firing Too Long.

On some roads in the United States and Canada, men find it necessary to fire five and six, and in some cases as long as seven and eight years before promotion comes their way. Such men might be glad to better themselves—if they are so circumstanced as to be able to change their location without much inconvenience—by applying for positions

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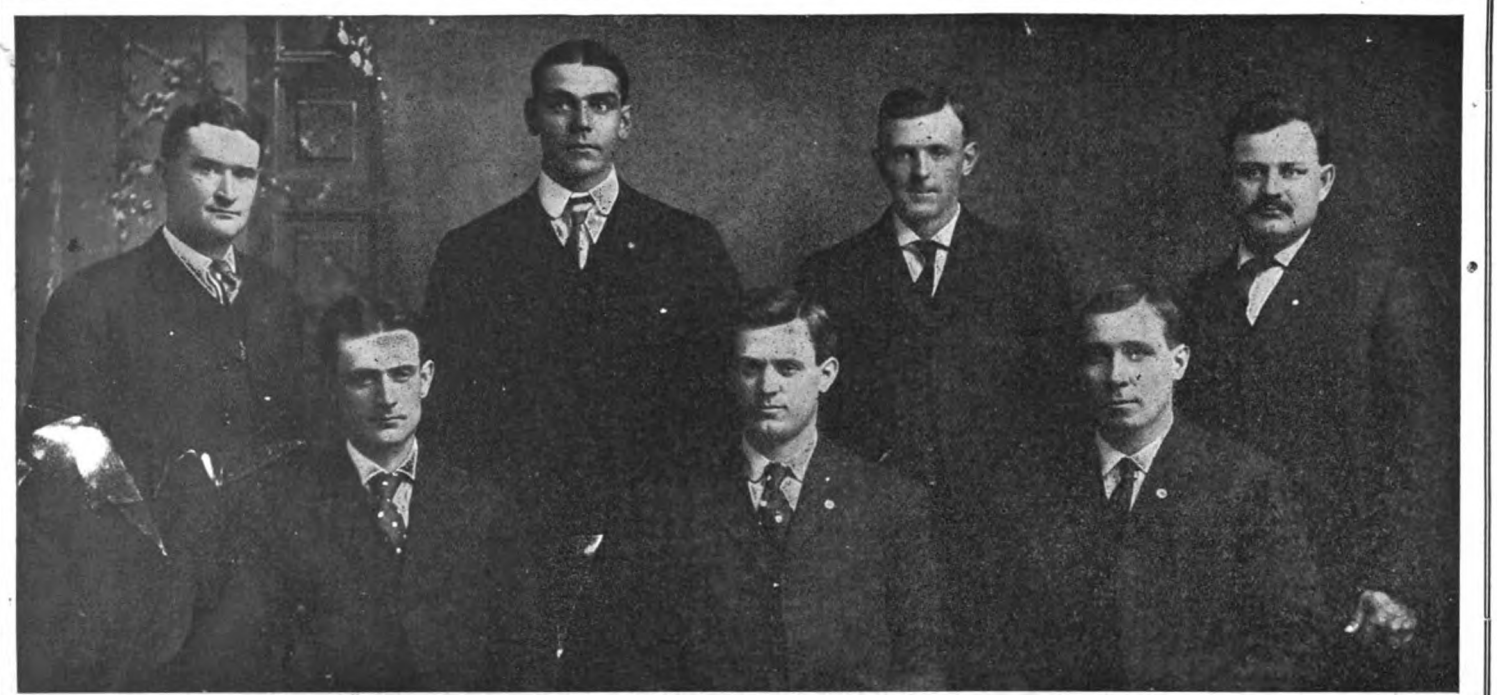

C. M. Printy, 322 — W. P. Thomas, 2 — J. P. Cuddy, 358 — B. A. Stauffacher, 658

W. A. McKibben, 547, Vice Chmn. — W. E. Benson, 565, Chairman — W. H. Costello, 358, Sec.-Treas.

JOINT PROTECTIVE BOARD, CHICAGO GREAT WESTERN RAILWAY

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where promotion is rapid. Within the last six or eight weeks, to my own personal knowledge, fifteen firemen left a terminal of a certain large trunk line and applied for positions as locomotive engineers to the Great Northern Railroad. They are every one now running engines on that system. While there may be openings on the Great Northern and other Western roads for firemen having the necessary experience to pass the examination for positions as engineers, it might be well for those contemplating such a move to correspond with the general chairman of the system on which they intend to seek such employment. I am reliably informed that the fifteen men above referred to secured the positions of engineer which they are now filling through correspondence with Brother John A. Cochran, general chairman of the Great Northern Railroad.

MEMBER.

Beware of Him.

One W. A. Holley came to Avondale and was employed as hostler by the Southern Railway Company. Everybody thought he was a nice, honest young man, and upon his making application for membership in our Order, his application was accepted and on February 25,

W. A. HOLLEY

1906. he was admitted to membership in Lodge No. 426. He was elected Secretary of this lodge for the remainder of the present year on August 26, 1906.

During the absence of our Collector the latter part of the year 1906, Holley, taking advantage of the power vested in him as Secretary, officially reported to the Grand Secretary and Treasurer his (Holley's) election and installation as Collector, which election or installation never took place, thereby causing the official directory to publish his name as Collector for this lodge.

He succeeded in collecting an indefinite amount of dues from our members, for which they received no credit, and the Treasurer no returns. Owing to complications, we had three (3) duly elected and installed Collectors from July 1 to December 31, 1906, and Holley, being aware of this fact, would collect from any member who would pay his dues to him, and give said member an official receipt, signing the name of our Collector thereto. His description is as follows:

Height about 5 feet 8 inches, weight about 180 pounds, color of eyes brown, color of hair black. He had a piece of left ear about one inch long bitten off the top. When last heard of was in Charleston, S. C.

Look out for him and show him no favors, as he is unworthy of any kindness or attention at the hands of our members.

We have a letter from him in which he admits having used $6.75 of our funds which he collected January 7, 1907, five days after his expulsion from this lodge.

C. J. GOFF,
Secretary No. 426.

C. H. SMITH,
Master 426.

The Parasite.

"Live loathed, and long most smiling, smooth, detested parasites."

No words can be more contemptuous nor voice the sentiments of the honest people more than the above quotation from the immortal Shakespeare.

When we search for the definition of the word "Parasite," we find, according to Webster, the following:

Parasite—One who eats beside or at the table of another; a parasite, a toady.

Formerly one who frequented the tables of the rich and earned his welcome by flattery; hence, a hanger on; a fawning flatterer; a trencher friend; a sycophant.

Do we in our everyday life meet up with the parasite? 'Tis only too true—we sleep, eat and associate with him every day we exist.

And who are they?

They exist in so many different phases that it would take an analytical investigation to analyze the subject properly.

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And where are they brought more forcibly to our attention?

To the members of our organization who do not take an interest in our order, we can see demonstrated the parasite, spelled with a big P. The Queen Bee of the whole swarm is the member of our own organization who does nothing for the organization and expects everything in return, and I will wager that there is no lodge in the entire order which is free from its drone.

Of this class, we have the member who never attends meeting. He is the one who feels that it is an imposition to expect him to give up his pleasure one or two nights a month to attend meeting, but expects to have the entire proceedings of the secret meeting read out to him on the street corner. The officers, in addition to having the responsibility of the lodge resting upon their shoulders, are expected to make a minute book of their brain.

Another distinguished character of this line-up is the member who always expects to be "held up" in his dues, when oftentimes he is in a better position to pay his dues than the members he is asking the favor of.

Outside of the order we have the parasite who enjoys the benefits earned by hard knocks and well-spent money of the men of our order. This class is very often loudest in their censure of the organization that plays the part of host and permits these parasites to live at its expense.

Enter into a conversation with any of these men, and call their attention to any man or woman who would lay back and let their poor old mother support them, and they would be more than ready to agree with you that this man is a disgrace to humanity. They forget that they are a hanger-on the same as the man they despise.

"Greed often defeats itself, as has been shown by the history of many a monopoly," is a quotation that would serve some of these men as a memory gem. Their greed for promotion often holds them back from joining the Firemen's Order, as they consider that promotion will thus come quicker.

Another character is the man who says "I'll go in the order when they get more for their men." Let him remember the scriptural proverb, "If thou faint in the day of adversity, thy strength is small." We consider that he is of very little help to any one and will not be regretted if he never joins the organization.

If we were asked which of these classes were the most to be despised, we would be at a loss to pick the winner. To the broad-minded they are all in the same rank.

When we hear patriotic speeches made and the speaker tells of the Declaration of Independence, and the speech of Patrick Henry, in which he says, "Give me Liberty or give me death," the applause is deafening, but when some of these same men leave the place where their enthusiasm knew no bounds, they fall right into line and become the same old slave of slothfulness, greed, envy, or any of the other causes that make them lose the spirit of 1776 and make them the dependents that they are.

W. M. WHELAN,
Algiers, La.

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Official

Addresses Wanted.

Persons requiring the address or any information concerning another will please communicate with the Secretary of the lodge located nearest the residence of the person making such request. Upon receipt of a communication from the Secretary of such lodge requesting that a notice be published in the Magazine inquiring for such address or other information same will be complied with. However, the Magazine can not undertake the office of a collecting agency and must decline to lend itself to such purpose. The following requests have reached this office since the last issue. Information should be sent to the persons specified in the notice:

John P. Connerty—Member of Lodge 360, B. of L. F. and E. The secretary of that lodge would be pleased to learn of his present whereabouts. A notice regarding this same brother was run in the December, 1906, issue of the Magazine. Since that time his sister Mary has died, and his mother, who is keeping up his dues, is exceedingly anxious to hear from him. She has not heard from him for nearly two years. After the first notice run in the Magazine she received two or three letters from different parties and corresponded with them, but has not heard from them since, nor has she learned anything definite regarding her son. Anyone in possession of any information regarding him will please correspond with Bro. J. H. Augustus, secretary of Lodge 360, 63 Pearl street, Springfield, Ohio.

H. M. Hampton—On March 5, 1907, Brother Glenn Hampton, a member of Lodge 523, died at Amarillo, Texas. In his beneficiary certificate H. M. Hampton, who was related to him as father, was named as his beneficiary. He gave the address of his father as Holdenville, Indian Territory. The certificate was issued on December 4, 1906. Since the death of Brother Glenn Hampton every effort has been made to locate his father, so that the claim could be paid, but so far the search has been without success. The suggestion has been made that perhaps "Glenn Hampton" was not the real name of the deceased member, and no such person as H. M. Hampton exists. If any member of the organization can throw any light upon this subject the information will be thankfully received by the Grand Secretary and Treasurer.

* * *

R. P. Shadoan.—Was a member of Lodge 584, B. of L. F. and E., Ludlow, Ky. Is supposed to have fallen from Grand Island bridge, St. Joseph, Mo., May 30, 1907, and to have been drowned in the Missouri river. He was six feet one and three-quarters inches tall; weighed 229 pounds; had light hair and

R. P. SHADOAN

light complexion. His latest picture is published herewith. At the time he is supposed to have been drowned he wore a gray coat and pants with a black vest, white shirt with small black stripes, white collar and black tie. His underclothes consisted of a union suit. He wore a ring, with a green set, on the third finger of his left hand. He also wore a watch chain with small white shell charm on it, and a B. of L. F. and E. pin in left lapel of coat. His wife, Mrs. R. P. Shadoan, of 821 East Eighth street, Newton, Kan., has offered a reward of $100 for the recovery of his body. Any one in possession of any information regarding the above will please correspond with L. Diesel, secretary of Lodge 584, B. of L. F. and E., 8 George street, Ludlow, Ky.

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Lost Traveling Cards, Etc.

This office has been notified of the loss of the following traveling cards, receipts, etc., and the request is made that all members be on the lookout for them. Should they be discovered in the possession of persons not entitled to them they should be retained and forwarded to the owner or to the Secretary of the lodge which issued same:

Red pocketbook, with rubber band, containing receipts and traveling card; also watch certificate, belonging to Walter Rickman, member of Lodge 525, B. of L. F. and E., was recently lost. If found, please return to Walter Rickman, 10029 Ewing avenue, South Chicago, Ill., and receive liberal reward.

Acknowledgments.

Mr. Michael P. Fitzgerald, Mattoon, Ill., desires, in behalf of himself and the family, to express their sincere thanks and appreciation to the Brotherhood for favors bestowed during the funeral of their beloved son and brother, William P. Fitzgerald, formerly of Lodge 111, but later a member of Lodge 499, and who for a number of years was a faithful employe in the Grand Lodge offices.

Mrs. Laura A. Constant and children of St. Louis, Mo., wish to thank the Grand Lodge of the B. of L. F. and E. for the payment of the claim of her late husband, Bro. Pierre K. Constant, of Lodge 390, who was recently killed. They also desire to thank the members of Lodge 390 for the many kindnesses shown her husband during his lifetime, and also for the sympathy shown herself and her children during their sad bereavement.

Bro. John Maloney, of Lodge 505, Tipton, Ind., desires to thank the Brotherhood of Locomotive Firemen and Enginemen for the allowance of his disability claim, $1,500, and expresses the sincere wish that our Brotherhood shall ever prosper.

Bro. Ed Walker, of Lodge 242, B. of L. F. and E., wishes to thank the Brotherhood for the allowance of his disability claim, by the Tenth Biennial Convention, on account of his having lost his eyesight.

The Home Account.

The following donations were received at the Home for Aged and Disabled Railway Employes for the month of June, 1907:

B. of L. F. and E. Lodges 75, $12; 558, $5	$17 00
L. S. to B. of L. F. and E. Lodges 12, $5; 47, $2.50; 74, $3; 76, $2; 79, $5; 102, $2; 105, $5; 106, $5; 118, $5; 174, $10; 184, $5; 219, $2	56 50
Lawrence Gannon, Lodge 4, B. of R. T.	1 00
O. R. C. Divisions	122 75
B. of R. T. Lodges	51 50
B. of L. E. Divisions	253 00
L. A. C. Divisions	35 00
L. A. T. Lodges	42 00
G. I. A. Divisions	27 00
James Costello, Division 270, O. R. C.	1 00
Alfred S. Lunt, Lodge 456, B. of R. T.	1 00
Carl and Russell Shank	10 00
Andrew Malm, Division 420, B. of L. E.	5 00
Subscription taken up at a union meeting held in Dallas, Texas, through Bro. J. Bruce	25 35
W. A. George, Lodge 75, B. of L. F. and E.	1 00
Station 14, Meridian, Miss., through Bro. Hull	7 00
B. B. Glime, Lodge 397, B. of R. T.	1 00
Total	$658 10

Miscellaneous.—Quilts from Lodge 312, L. A. T.

Respectfully submitted,

JOHN O'KEEFE,

Secretary and Treasurer, R. R. M. H.

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Beneficiary Statement

OFFICE OF GRAND SECRETARY AND TREASURER,
PEORIA, ILL., July 1, 1907.

To SUBORDINATE LODGES:

The following is a statement of receipts in the Beneficiary Department for the month of June 1907:

RECEIPTS.

Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.
1	.....	73	.....	145	.....	217	.....	289	.....	361	11 25	433	.....	505	87 00	577	138 75	649	.....		
2	.....	74	.....	146	.....	218	.....	290	.....	362	.....	434	.....	506	.....	578	.....	650	.....		
3	965 25	75	.....	147	.....	219	.....	291	.....	363	.....	435	.....	507	.....	579	.....	651	.....		
4	.....	76	.....	148	.....	220	.....	292	.....	364	4 50	436	.....	508	.....	580	.....	652	.....		
5	.....	77	.....	149	.....	221	.....	293	.....	365	.....	437	.....	509	.....	581	97 25	653	.....		
6	.....	78	.....	150	.....	222	.....	294	.....	366	.....	438	.....	510	.....	582	.....	654	75		
7	.....	79	.....	151	.....	223	.....	295	.....	367	11 25	439	.....	511	.....	583	.....	655	.....		
8	.....	80	.....	152	.....	224	.....	296	6 00	368	.....	440	.....	512	.....	584	143 50	656	.....		
9	.....	81	.....	153	.....	225	.....	297	.....	369	.....	441	.....	513	.....	585	125 25	657	.....		
10	.....	82	168 75	154	.....	226	.....	298	.....	370	.....	442	.....	514	.....	586	.....	658	.....		
11	.....	83	.....	155	.....	227	109 25	299	.....	371	159 75	443	.....	515	.....	587	.....	659	.....		
12	.....	84	.....	156	.....	228	.....	300	.....	372	1 50	444	4 50	516	.....	588	.....	660	.....		
13	.....	85	.....	157	.....	229	.....	301	.....	373	.....	445	.....	517	144 50	589	.....	661	.....		
14	.....	86	.....	158	.....	230	.....	302	.....	374	.....	446	.....	518	.....	590	.....	662	.....		
15	.....	87	.....	159	185 75	231	.....	303	.....	375	.....	447	.....	519	.....	591	.....	663	.....		
16	.....	88	.....	160	.....	232	.....	304	.....	376	63 25	448	.....	520	.....	592	116 00	664	.....		
17	.....	89	.....	161	.....	233	.....	305	.....	377	4 50	449	.....	521	.....	593	.....	665	.....		
18	.....	90	.....	162	24 75	234	150 75	306	.....	378	577 25	450	.....	522	4 50	594	.....	666	.....		
19	215 25	91	.....	163	.....	235	.....	307	4 50	379	.....	451	.....	523	.....	595	.....	667	.....		
20	.....	92	.....	164	.....	236	.....	308	.....	380	.....	452	.....	524	.....	596	.....	668	.....		
21	.....	93	.....	165	.....	237	.....	309	.....	381	.....	453	.....	525	.....	597	189 50	669	.....		
22	.....	94	.....	166	.....	238	.....	310	.....	382	149 25	454	.....	526	.....	598	.....	670	.....		
23	.....	95	.....	167	.....	239	.....	311	.....	383	.....	455	216 50	527	.....	599	.....	671	.....		
24	.....	96	.....	168	.....	240	.....	312	.....	384	.....	456	.....	528	.....	600	160 75	672	.....		
25	.....	97	.....	169	.....	241	14 25	313	.....	385	.....	457	.....	529	2 25	601	.....	673	.....		
26	.....	98	.....	170	.....	242	.....	314	.....	386	.....	458	.....	530	.....	602	.....	674	.....		
27	.....	99	.....	171	.....	243	.....	315	4 50	387	.....	459	.....	531	.....	603	.....	675	.....		
28	.....	100	.....	172	.....	244	.....	316	.....	388	.....	460	.....	532	.....	604	.....	676	.....		
29	.....	101	6 75	173	.....	245	.....	317	.....	389	.....	461	.....	533	.....	605	154 75	677	.....		
30	.....	102	.....	174	.....	246	.....	318	.....	390	.....	462	.....	534	243 25	606	.....	678	.....		
31	.....	103	.....	175	.....	247	9 00	319	.....	391	.....	463	.....	535	12 00	607	.....	679	1 50		
32	.....	104	.....	176	.....	248	.....	320	.....	392	.....	464	142 00	536	.....	608	157 75	680	.....		
33	.....	105	.....	177	.....	249	9 00	321	.....	393	.....	465	.....	537	.....	609	.....	681	.....		
34	.....	106	.....	178	.....	250	.....	322	.....	394	.....	466	.....	538	.....	610	.....	682	.....		
35	.....	107	.....	179	.....	251	.....	323	.....	395	.....	467	.....	539	.....	611	.....	683	.....		
36	.....	108	.....	180	.....	252	.....	324	.....	396	4 50	468	.....	540	.....	612	.....	684	.....		
37	.....	109	.....	181	.....	253	.....	325	.....	397	.....	469	.....	541	.....	613	.....	685	.....		
38	.....	110	.....	182	.....	254	.....	326	.....	398	.....	470	.....	542	.....	614	319 25	686	.....		
39	.....	111	.....	183	.....	255	75 75	327	.....	399	15 00	471	.....	543	.....	615	6 00	687	.....		
40	.....	112	3 00	184	.....	256	.....	328	1 50	400	.....	472	.....	544	2 25	616	.....	688	.....		
41	67 50	113	210 75	185	.....	257	.....	329	.....	401	.....	473	.....	545	.....	617	2 25	689	.....		
42	.....	114	.....	186	.....	258	.....	330	.....	402	.....	474	.....	546	.....	618	44 25	690	.....		
43	174 75	115	.....	187	.....	259	91 00	331	.....	403	.....	475	.....	547	.....	619	2 25	691	.....		
44	.....	116	141 75	188	.....	260	.....	332	.....	404	.....	476	.....	548	.....	620	.....	692	.....		
45	.....	117	.....	189	.....	261	.....	333	2 25	405	.....	477	.....	549	139 75	621	.....	693	.....		
46	.....	118	.....	190	.....	262	.....	334	.....	406	.....	478	169 00	550	63 75	622	.....	694	.....		
47	.....	119	132 75	191	.....	263	2 25	335	.....	407	.....	479	.....	551	172 50	623	.....	695	80 00		
48	.....	120	.....	192	2 25	264	.....	336	.....	408	.....	480	.....	552	212 25	624	83 25	696	.....		
49	156 25	121	.....	193	.....	265	.....	337	.....	409	.....	481	232 25	553	.....	625	.....	697	.....		
50	.....	122	.....	194	6 00	266	.....	338	.....	410	.....	482	.....	554	.....	626	132 00	698	.....		
51	.....	123	.....	195	.....	267	.....	339	.....	411	.....	483	.....	555	.....	627	.....	699	.....		
52	.....	124	.....	196	.....	268	.....	340	.....	412	.....	484	.....	556	.....	628	.....	700	.....		
53	.....	125	.....	197	.....	269	159 00	341	.....	413	.....	485	9 00	557	271 00	629	.....	701	155 00		
54	.....	126	.....	198	.....	270	.....	342	.....	414	.....	486	.....	558	.....	630	.....	702	.....		
55	.....	127	.....	199	.....	271	.....	343	.....	415	.....	487	.....	559	.....	631	.....	703	.....		
56	218 25	128	.....	200	.....	272	.....	344	.....	416	.....	488	.....	560	.....	632	.....	704	.....		
57	.....	129	296 25	201	.....	273	.....	345	.....	417	.....	489	.....	561	.....	633	.....	705	.....		
58	.....	130	.....	202	.....	274	.....	346	.....	418	.....	490	.....	562	.....	634	.....	706	.....		
59	489 50	131	.....	203	.....	275	.....	347	.....	419	.....	491	.....	563	.....	635	9 00	707	.....		
60	.....	132	.....	204	.....	276	.....	348	.....	420	75 75	492	.....	564	.....	636	.....	708	.....		
61	.....	133	.....	205	.....	277	.....	349	.....	421	.....	493	.....	565	.....	637	.....	709	.....		
62	.....	134	.....	206	1 50	278	.....	350	.....	422	.....	494	.....	566	172 00	638	.....	710	.....		
63	.....	135	.....	207	.....	279	.....	351	.....	423	.....	495	68 50	567	6 00	639	.....	711	.....		
64	.....	136	.....	208	.....	280	.....	352	82 00	424	145 50	496	.....	568	.....	640	70 50	712	.....		
65	.....	137	.....	209	28 50	281	.....	353	168 75	425	.....	497	.....	569	.....	641	.....	713	.....		
66	.....	138	.....	210	.....	282	.....	354	2 25	426	.....	498	.....	570	.....	642	.....	714	.....		
67	.....	139	.....	211	.....	283	.....	355	177 25	427	164 25	499	.....	571	4 50	643	25 50	715	.....		
68	.....	140	69 00	212	.....	284	.....	356	.....	428	.....	500	.....	572	.....	644	.....	716	.....		
69	.....	141	.....	213	.....	285	.....	357	.....	429	.....	501	.....	573	.....	645	.....	717	.....		
70	.....	142	.....	214	.....	286	.....	358	.....	430	4 50	502	.....	574	.....	646	.....	718	.....		
71	.....	143	.....	215	.....	287	.....	359	88 00	431	.....	503	.....	575	.....	647	.....	719	.....		
72	.....	144	.....	216	.....	288	.....	360	.....	432	.....	504	.....	576	.....	648	.....	720	.....		

Received during month of June $10,708.00

Respectfully submitted,

W. S. CARTER, G. S. and T.

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Statement of Death and Disability Claims

PAID BY THE GRAND SECRETARY AND TREASURER, FROM MAY 31 TO JUNE 30, 1907.

Claim No.	NAMES.	Lodge No.	Death or Disability.	Date.	Cause.	Am't. of Ins.	When Paid.
32	George L. Walker	340	Death	Sep. 21, 1906	Collision	$1,500	June 15, 1907
66	Edwin G. Blackburn	240	"	Jan. 22, 1907	Collision	1,500	" 15, "
119	Robert W. Topel	198	"	Feb. 18, "	Accidental poisoning	1,500	" 15, "
192	Richard F. Pheney	4	"	Mar. 10, "	Pneumonia	1,500	" 15, "
228	Martin W. Schuman	260	"	" 28, "	Derailing of engine	1,500	" 15, "
249	J. T. Jones	622	"	Apr. 9, "	Smallpox	1,000	" 15, "
255	Ardell R. Catterlin	327	"	Mar. 25, "	Boiler explosion	1,500	" 15, "
166	Louis F. Derry	286	"	Jan. 29, "	Meningitis	1,500	" 15, "
250	William H. Mokel	601	Disability	May 21, "	Paralysis	1,500	" 19, "
257	Wm. T. Foster	685	"	Apr. 28, "	Bright's disease	1,500	" 19, "
258	James J. Lindsay	319	"	May 13, "	Consumption of lungs	500	" 19, "
260	Thomas A. O'Neill	3	Death	Apr. 11, "	Accidental falling	1,500	" 19, "
261	Pierre K. Constant	390	"	Mar. 28, "	Run over by train	3,000	" 19, "
262	Frederick M. Cushing	231	"	Apr. 14, "	Crushed between engine and coal chute	1,500	" 19, "
263	George W. Ahern	138	"	" 1, "	Collision	1,000	" 19, "
264	David Van Allmen, Jr	59	"	Mar. 30, "	Collision	1,500	" 19, "
265	Charles W. Orr	191	"	Feb. 16, "	Collision	1,500	" 19, "
266	Zachariah Rushing	644	"	Mar. 20, "	Falling bet. eng. & tend'r	1,500	" 19, "
268	William G. Powell	416	"	Apr. 15, "	Falling from building	1,500	" 19, "
270	John J. Gaffner	390	"	" 19, "	Collision	1,500	" 19, "
271	Thomas W. Blessing	104	"	" 20, "	Typhoid fever	1,500	" 19, "
272	Carl H. Heinle	510	"	" 14, "	Pneumonia	1,500	" 19, "
275	Alexander J. McKay	557	"	" 16, "	Pneumonia fol'g. injury	1,500	" 19, "
276	James E. Snook	138	Disability	" 12, "	Amputation of foot	1,500	" 19, "
277	Burt E. Monroe	398	Death	" 16, "	Suicide	1,500	" 19, "
279	Ryland J. Bridgeforth	435	"	" 23, "	Hemorrhage from lungs	1,000	" 19, "
280	Michael Kass	159	"	" 14, "	Derailing of engine	1,500	" 19, "
281	H. E. Watson	416	"	Mar. 28, "	Boiler explosion	1,500	" 19, "
282	George A. Hubert	262	"	" 6, "	Striking mail crane	500	" 19, "
284	William C. Reany	442	"	Apr. 24, "	Pneumonia	1,500	" 19, "
285	Frank L. Vaughn	139	"	" 9, "	Boiler explosion	1,500	" 19, "
286	Charles W. Leslie	99	"	" 26, "	Inflam'tory rheumatism	1,500	" 19, "
287	John B. Slawson	363	"	" 11, "	Collision	1,500	" 19, "
291	Henry F. Walther	58	"	Mar. 28, "	Derailing of engine	1,500	" 19, "
292	John M. Kelly	564	"	Apr. 13, "	Crushed between cars	1,500	" 19, "
297	Olof Erickson	86	"	" 23, "	Run over by train	1,500	" 19, "
298	Samuel J. Sayer	349	"	" 24, "	Pneumonia	1,500	" 19, "
299	Matthew Kelley	491	Disability	May 21, "	Consumption of lungs	1,500	" 19, "
300	Arthur S. Browning	410	Death	Apr. 25, "	Tubercu'sis of the spine	1,500	" 19, "
301	William Stencell	321	Disability	Mar. 20, "	Amputation of hands	1,000	" 19, "
302	Harry F. Johnson	472	"	Apr. 25, "	Amputation of hand	1,500	" 19, "
304	William W. Brown	6	Death,	" 25, "	Derailing of engine	1,500	" 19, "
306	Will L. Murray	626	"	" 24, "	Consumption of lungs	1,500	" 19, "
307	Edward C. Schaeffle	300	"	" 10, "	Apoplexy	1,500	" 19, "
310	C. E. Hill	139	"	" 19, "	Pneumonia	1,500	" 19, "
311	Andrew Cavanagh	12	"	" 29, "	Heart disease	1,500	" 19, "
312	Gardner H. Swan	675	"	May 4, "	Typhoid fever	1,500	" 19, "
314	Charles Jones	262	"	Mar. 25, "	Collision	1,500	" 19, "
315	James R. McAllen	549	"	Apr. 18, "	Consumption	1,500	" 19, "
317	Geo. L. G. Sutherland	508	"	May 2, "	Pernicious anaemia	1,500	" 19, "
319	Fletcher Sullivan	402	"	Apr. 21, "	Derailing of engine	1,500	" 19, "
322	Eug. B. VanSchoick	1	"	" 29, "	Meningitis	1,500	" 19, "
323	Patrick J. Crowley	242	"	May 6, "	Heart disease	2,000	" 19, "
324	John C. Burkett	444	"	" 4, "	Collision	1,500	" 19, "
325	Wilburn J. Stanhope	78	Disability	Apr. 24, "	Amputation of foot	1,500	" 19, "
327	Arthur Fowler	5	Death	" 30, "	Gastric hemorrhage	1,000	" 19, "
328	Benjamin Keiser	3	"	May 8, "	Apoplexy	1,500	" 19, "
329	Harry A. Christy	356	"	" 7, "	Collision	1,000	" 19, "
331	John C. McAlicher	174	"	Apr. 25, "	Typhoid fever	1,500	" 19, "
332	Doug. B. MacDonald	127	"	May 8, "	Collision	1,500	" 19, "
320	Thomas S. Coolbaugh	415	"	Apr. 29, "	Gunshot wound	1,500	" 19, "
222	A. J. McCarthy	602	"	Mar. 29, "	Derailing of engine	1,500	" 24, "
245	Ernest Gelhaus	195	"	Apr. 5, "	Heart disease	1,500	" 24, "
282	Samuel W. Marshall	108	"	Mar. 30, "	Consumption	1,500	" 25, "
309	William H. Campbell	57	Disability	June 17, "	Locomotor ataxia	1,000	" 25, "

Death Claims Paid.		Disability Claims Paid.		
48—A	$72,000	6—A	$9,000	65 death and disability claims paid, aggregating $94,000.00.
5—B	5,000	2—B	2,000	
1—C	500	1—C	500	
1—D	2,000			
1—E	3,000			
56	$82,500	9	$11,500	

Pending Claims June 30, 1907.

96 death claims aggregating	$125,500
22 disability claims aggregating	30,500
Total of 118 claims aggregating	$156,000

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Statement of Death and Disability Claims

FILED WITH THE GRAND SECRETARY AND TREASURER DURING THE MONTH ENDING JULY 15, 1907.

Claim No.	NAMES.	Lodge No.	Date of Filing.	Death or Disability.	Alleged Cause of Death or Disability.	Am't of Ins.
394	West, William	312	June 17, 1907	Death	Falling from engine	$1,500
395	West, William	637	" 17, "	"	Run over by car	1,500
396	Haystead, John A.	81	" 17, "	"	Typhoid fever	1,000
397	Wall, Albert C.	494	" 17, "	"	Striking a tell-tale post	1,000
398	Radke, Paul J.	443	" 17, "	"	Drowning	1,500
399	Miller, Benjamin F.	673	" 19, "	"	Bright's disease	1,500
400	Williams, David T.	705	" 20, "	"	Derailing of engine	1,500
401	Maher, Matthew J.	213	" 20 "	"	Collision	1,500
402	Cotton, William C.	122	" 22, "	"	Heart disease	500
403	Miller, Woodward A.	557	" 22, "	"	Collision	1,500
404	Flynn, John	436	" 22, "	"	Consumption	1,000
405	Knight, Robert F.	13	" 22, "	"	Phthisis	1,500
406	Keegan, James	363	" 22, "	Disability	Deafness and general debility	750
407	Baldwin, Will D.	242	" 24, "	Death	Struck by train	1,500
408	Shaw, David	305	" 24, "	"	Striking a mail crane	1,000
409	Milbury, Vere	335	" 24, "	"	Typhoid fever	500
410	Gibbons, Royal A.	413	" 24, "	"	Derailing of engine	1,500
411	Anderson, Charles H.	443	" 24, "	"	Collision	500
412	O'Brien, Michael G.	59	" 24, "	"	Boiler explosion	1,500
413	Opeck John W.	56	" 24, "	"	Run over by engine	1,500
414	Dumolt, Eugene L	88	" 24, "	"	Falling from engine	2,000
415	Lowham, Garrett	88	" 24, "	"	Crushed bet. engine and r'dhouse	1,500
416	Meints, John	623	" 25, "	Disability	Amputation of foot	1,500
417	Munkhoff, John C.	27	" 25, "	Death	Appendicitis	1,500
418	Connelly, William	60	" 27, "	Disability	Consumption of lungs	1,000
419	Williams, James E.	694	" 27, "	Death	Striking a telegraph pole	1,500
420	Phillips, Samuel E.	641	" 27, "	Disability	Amputation of foot	1,500
421	Burns, John M.	129	" 27, "	Death	Heart disease	1,500
422	Bair, Theodore O.	204	" 27, "	"	Gunshot wound	1,500
423	Bornt, Peter	169	" 29, "	Disability	Pachy meningitis	1,500
424	Cooper, James H.	426	July 1, "	Death	Collision	1,500
425	Balersky, Edward	638	" 1, "	"	Intestinal obstruction	1,500
426	Kennedy, Guy E.	669	" 1, "	"	Derailing of engine	1,500
427	Yencer, G. W.	372	" 1, "	"	Derailing of engine	1,500
428	Gladding, G. F.	135	" 1, "	Disability	Partial blindness	1,000
429	Wenninger, Frederick	107	" 3, "	Death	Drowning	1,500
430	Willmott, James G.	442	" 3, "	"	Typhoid fever	500
431	McEvilla, Frank J.	220	" 5, "	"	Collision	1,500
432	Eberle, John L.	393	" 5, "	"	Splenic leukemia	1,500
433	Remmet, George W.	75	" 5, "	"	Collision	1,500
434	Ziegler, George C.	252	" 5, "	"	Diabetes	1,500
435	Wilson, Clyde E.	153	" 5, "	"	Consumption	1,500
436	McEwene, Duncan	559	" 5, "	Disability	Amputation of foot	1,000
437	Fanning, James	518	" 5, "	Death		500
438	Culbertson, James G.	198	" 6, "	Disability	Injury to right ankle joint	3,000
439	Ross, Leon S.	240	" 6, "	"	Amputation of foot	1,500
440	Howes, Frederick	485	" 8, "	"	Amputation of foot	1,500
441	Bloom, Lewis H	381	" 8, "	"	Amputation of foot	1,500
442	Beddow, Samuel J.	584	" 9, "	Death	Falling from engine	1,500
443	Rooney, James	634	" 10, "	Disability	Consumption of lungs	1,500
444	Nance, Thom. L.	677	" 10, "	Death	Run over by car	1,500
445	Henderson, Carlton J.	677	" 10, "	"	Struck by engine	1,500
446	Davies, John W.	175	" 10, "	"		1,500
447	Robinson, Frank A.	405	" 11, "	"		1,500
448	Anderson, Edward J.	192	" 11, "	"	Peritonitis	1,500
449	Giguire, Albert	144	" 12, "	"	Typhoid fever	1,000
450	O'Leary, John E.	233	" 12, "	"	Consumption	1,500
451	Stanley, James S.	426	" 12, "	"	Collision	1,500
452	Hutchins, John O.	432	" 13, "	"	Typhoid fever	1,500
453	Vance, Wilbert	597	" 13, "	"	Derailing of engine	1,500
454	Ruddick, Edward	172	" 13, "	"	Collision	1,500
455	Robinson, Benjamin	4	" 15, "	"	Gunshot wound	1,000
456	Shannon, Paul M.	441	" 15, "	Disability	Injury to right arm	1,500
457	Moore, Robert H.	110	" 15, "	Death	Struck by car	1,500
458	Evans, William N	115	" 15, "	"	Typhoid fever	1,500
459	Combs, Frank P.	48	" 15, "	"	Heart disease	500

Respectfully submitted,
W. S. CARTER,
G. S. and T.

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Beneficiary Assessment Notice No. 6.

SERIES H.

GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., August 1, 1907.

To the Treasurers of Subordinate Lodges:

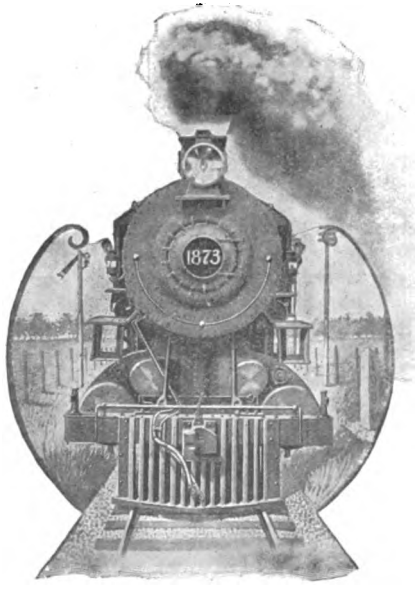
Sirs and Brothers:—You are hereby notified that assessments for death and disability claims are hereby levied as follows: For each beneficiary member whose name appears on the rolls of membership on July 31, 1907 (also for all beneficiary members transferred from your Lodge after July 1), carrying a Beneficiary Certificate of THREE THOUSAND ($3,000) DOLLARS, you are required to forward the sum of SIX DOLLARS ($6.00). For those carrying a Certificate of TWO THOUSAND ($2,000) DOLLARS, you are required to forward the sum of FOUR DOLLARS ($4.00). For those carrying a Certificate of FIFTEEN HUNDRED ($1,500) DOLLARS, you are required to forward the sum of TWO DOLLARS AND TWENTY-FIVE ($2.25) CENTS. For those carrying a Certificate of ONE THOUSAND ($1,000) DOLLARS, you are required to forward the sum of ONE DOLLAR AND FIFTY ($1.50) CENTS, and for each member carrying a Certificate of FIVE HUNDRED ($500) DOLLARS, you are required to forward the sum of SEVENTY-FIVE ($0.75) CENTS. You are hereby requested to make remittance for assessment No. 6 as soon as possible, and in no event to reach the Grand Lodge later than August 20, 1907, as provided in Section 82 of the Constitution.

Yours fraternally,

J. J. HANNAHAN, G. M.

W. S. CARTER, G. S. and T.

SPECIAL NOTICE.—All remittances must be made by BANK DRAFT, MONEY ORDER, OR EXPRESS ORDER. Beneficiary members whose applications were approved after July 31 are not liable for this assessment.



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Notice.

All communications intended for publication in the Ladies Department of the Magazine should in all cases be addressed to the Editress, Mrs. Agnes G. Strong, 527 Green street, Boone, Iowa.

From the Grand President.

Important.

The attention of all officers and members is directed to the following:

Letters addressed to the Grand President, and purporting to be written by direction of the lodge, should invariably be signed by the secretary, approved by the president, and have the seal of the lodge attached thereto. Frequently letters are received from members marked "personal," requesting a decision on a point of law or upon a matter in controversy in the lodge. Upon official matters there can be no personal opinions given. The Grand President, nor any other Grand Lodge officer, can not separate herself from her office. Personal letters upon official business are not in line with good administration. In fact, they come very close to the anonymous, for the reason that they may contain statements of which the lodge has no knowledge. The better and safer plan is to have all correspondence conducted by the secretary, who is really the proper and lawful corresponding officer of the lodge. If any member feels that an injustice has been done her by the action of a lodge, Section 121 of the Constitution provides a remedy. It should be understood by all officers and members that the Grand Lodge officers can not consistently render "personal" opinions upon official matters. It should be further understood that when "personal" letters upon official subjects are received by the Grand President, before a reply is made thereto such letters will be referred to the lodge, through its secretary, for a statement in connection therewith, and return of the letter, and when the official reply is made it will be sent through the secretary of the lodge, and by her read at the following meeting of the lodge. If an officer or member does not agree with the decision of the lodge and she desires to note an appeal, let her letter or appeal be sent through the secretary. By this means there is a complete record of the transaction. Of course there is nothing to prevent an officer writing direct to the proper Grand Lodge officer for information in regard to her special duties, but the reply received in response to such inquiry should be read at the following meeting of the lodge after its receipt. The policy of the Society is that *all* members shall be informed upon the law and practices or regulations. A letter addressed to the Grand President will, upon its receipt by that officer, become a part of the permanent record of the Society. The same rule applies to letters received by lodges through their officers; that is to say, they become a part of the lodge's record.

Meetings.

It has been the practice in some lodges to change the time and place of meetings

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without regard to the laws. When a lodge has adopted a by-law or a regulation providing for the holding of meetings, the time and place can not be arbitrarily changed by a few members. If it is contemplated changing the time and place of meetings, notice thereof should be served upon all members, in effect that at a certain meeting the matter of changing the time and place of meetings would be up for final action. Furthermore, if the hour for opening the meeting is, say, 8 o'clock, it would be unlawful to call it at half-past seven or a quarter to eight. If the time and place of meetings could be changed at pleasure, it requires no stretch of imagination to grasp what could be accomplished if a certain few desired to gain their particular end against the wishes of the majority.

In all matters of vital interest to a lodge special notice should be sent to the members, so that no one can justly say she did not know.

Duty of Officers.

It is to be hoped that the newly-elected officers will thoroughly familiarize themselves with the duties of their respective offices. A careful reading of the Constitution, especially those sections defining the duties of the particular office to which one has been elected, will save much future trouble and annoyance. The collector should make herself thoroughly conversant with the laws pertaining to her office. Her especial attention is directed to laws governing the payment of dues, as well as the laws governing her duties. The provision of law prohibiting the collector from accepting partial payments should be understood by her. Section 86 and the sections relating to the payment of dues (Sections 102 to 107, inclusive), should be carefully read by her.

In the case of the president, she should familiarize herself with all of the laws. While it is not expected that she will be able to commit all to memory, she should at least know of the existence of all laws, as well as know where to find a particular law. It is not so much in memorizing as in knowing just where to find what one wants. For example: If a sister should arise and make an oral request for a final withdrawal card, the president should know that such request must be made in writing. Again, if a sister should ask for a transfer card, she should promptly be informed that such request must be made by the secretary of the lodge to which she desires to be transferred, or, in the case of a proposed new lodge, by the acting secretary thereof. If there is a doubtful point let a letter be addressed to the Grand President, requesting information or a decision thereon. If a resolution is submitted, the adoption of which would be contrary to law, the president should not hesitate to promptly declare it out of order. The said officer should not take unto herself authority not conferred by law; neither should she permit the lodge to do likewise. After all, our laws have as a foundation reason and common sense. There are very few cases that can not easily be settled by the lodges if the officers and members would but devote a little time and a little thought to the subjects under discussion in their relation to the laws of the Society.

It affords me much pleasure to say that during the past year our lodges have shown a wonderful improvement in the way of conducting their affairs in a business-like way.

Official Pins.

In these days of increased price on practically everything, wages excepted, of course, it affords me much pleasure to state that in the future the official pins will be furnished at the following prices, the quality of the goods guaranteed to be the same as heretofore:

	Former Price	*Present Price.*
Plated or filled gold pins.	$1 25	$1 00
Solid gold.....	3 25	3 00
Solid gold, with bar for name, etc.....	4 50	4 00

Cash should invariably accompany all orders for these pins.

Official Badges.

In the June issue of the Magazine attention was directed to the arrangements made with the firm of S. N. Meyers, 1231 Pennsylvania avenue, Washington, D. C., to furnish the lodges with official badges. In placing these orders with the firm a postal or express money order or draft should be sent, payable to S. N. Meyers, and an explicit statement made as to the number and kind of badges desired. It is recommended that no order be for less than twenty or more badges, so that the lodge can get the benefit of the lower price, namely, 85 cents each for officer's and 60 cents each for member's badges. These orders can now be promptly filled.

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Prosperity.

In these days of prosperity, when everyone is telling about his or her rush of orders, it would certainly be rare if the Society did not have its share. The month of May has been one of the most prosperous in our history. Seven new lodges have been organized, each having a fair membership. This shows that we have many earnest workers in our efforts to spread the gospel of Friendship and Charity. In this connection we should not overlook the valuable aid and encouragement which we have received from the brothers, who are ever ready to extend to us a helping hand. They have always co-operated with the Society in its work, and on account of their familiarity with its laws their advice to those contemplating organizing a lodge or seeking membership is of value. It is suggested that they be consulted by those who desire information in regard to the Society.

Membership.

Attention is invited to the provisions of Section 97 of the Constitution, defining who are eligible for membership in the Society. Many letters are being received, requesting that permission be granted to admit Mrs. ———, who formerly was a member of the Society, but to whom a final withdrawal card was granted, and whose husband, brother or father no longer holds membership in the Brotherhood of Locomotive Firemen and Enginemen. Section 114 provides that any person desiring to regain membership shall conform to the laws governing the admission of applicants. A condition precedent to membership in the Society is stated in Section 97, viz: That she shall be the mother, wife, sister, daughter or widow of a member, in good standing, etc. It will be readily seen that unless an applicant belongs to one or more of the classes enumerated in Section 97, she is not eligible for admission or readmission. The laws do not make exceptions of applicants who previously had held membership in the Society. Therefore it is hoped that all lodges will understand that no applicant can be admitted whose status is not that as defined in Section 97.

In conclusion, I desire to say that it was my good fortune and pleasure to attend the union meeting held in Albany, N. Y., during the month of May, where opportunity was afforded me to meet and greet many of the sisters. I trust that this issue of the Magazine will contain a report of the said meeting, as the several Magazine correspondents certainly had sufficient material upon which to base a very interesting letter for publication.

With the opening of the new fiscal year we hope that each lodge will try to achieve better results than those achieved heretofore. In those places where there is not today a lodge of the Ladies Society we trust that an interest in our work will be awakened and that shortly arrangements will be made for the organization of a lodge. Information in regard to the organization of lodges will be gladly furnished upon application, either to the Grand Secretary and Treasurer or to the writer.

G. M. SARGENT,
Grand President.

❁ ❁ ❁

Memphremagog Sisters, No. 154.

On April 17 the writer, assisted by Sister Isabelle Reynolds, vice-president of Pride of the East Lodge No. 155, organized Memphremagog Sisters Lodge No. 154, at Newport, Vt., with thirty-five charter members.

The afternoon was taken up with the preliminary proceedings, nomination and election of officers. About 6 o'clock the brothers of No. 301 came to the lodge room and the ladies were invited to partake of a banquet prepared for them in the banquet hall. I am sure the ladies appreciated the kindness of the brothers and did justice to the good things.

Later we returned to the lodge room, accompanied by a number of the brothers, where we held a short social meeting. Brothers Blake, Ryther, Campbell, Neal and others gave us an interesting talk on the good of the order, which I am sure all enjoyed.

The brothers soon retired, after which we continued with our work of installing the new officers, who are as follows: President, Mrs. Myrtie Cass; V.-P., Mrs. Beryl Gregory; P. P., Mrs. Carolyn Pearl; R., Neal; Col., Mrs. Addie Blake; Treas., Mrs. Katherine Wright; Warden, Mrs. Mabel Mills; Cond., Miss Maggie Magoon; Guards, Mesdames Bessie Moody, Julia Gould; Magazine Correspondent, Miss Edith Reece.

After installation the new sisters held a meeting, at which they did excellent work.

I understand this new lodge will hold

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joint meetings with the brothers of Lodge No. 301.

We took a late train for Boston, arriving the next morning, tired, but feeling that our trip had been all that we could ask. We thank all the sisters of No. 154 for their kindness to us while we were their guests, and I am sure that all sister lodges join with us in wishing No. 154 success in their progress.

ROSELTHA S. MCGREGOR,
Boston, Mass.

Whatever Is—Is Best.

I know as my life grows older,
And mine eyes have clearer sight—
That under each rank wrong, somewhere,
There lies the root of Right;
That each sorrow has its purpose,
But the sorrowing oft unguessed,
But as sure as the sun brings morning,
Whatever is—is best.

I know that each sinful action,
As sure as the night brings shade,
Is somewhere, sometime punished,
Tho' the hour be long delayed.
I know that the soul is aided
Sometimes by the heart's unrest,
And to grow means often to suffer—
But whatever is—is best.

I know there are no errors
In the great eternal plan,
And all things work together
For the final good of man.
And I know when my soul speeds onward,
In its grand eternal quest,
I shall say as I look back earthward,
Whatever is—is best.

—ELLA WHEELER WILCOX.

Notes.

By this time the lodges are newly officered and doubtless have thoroughly memorized the work and are prepared to render it with credit to themselves and their Society. Of course, perfection in this world is never attained, and there is always something just ahead to be striven for, and a conscientious officer will keep this in mind and will never indulge in self-satisfaction.

"The work of our Order is worthy of our best, and we should be satisfied to give to it nothing less than this. Too often it seems that offices are accepted by members without proper consideration having been given to the fact that there are accompanying duties, and yet we are taught that with "honors come responsibilities." One can not accept an honor and shirk the responsibility that accompanies the honor. Honor is not gained merely by the acceptance of an office, but by the faithful discharge of its duties, and one who would win approbation must give service. Not infrequently the work of a Society is marred by the inattention of one officer, when otherwise things would go smoothly. If this can be remedied the inattention or neglect is inexcusable.

What's done's done; and if the Lord let it be done, we may. We can't always make people do as we would. There's no use in being dragged through the world like a dog under a cart, hanging back and yelping. What we must do we may as well do willingly—as well walk as be dragged.—Harriet Beecher Stowe.

The man with a jacknife or a piece of chalk, who makes a specialty of whittling or carving comments on trees or old landmarks, does not regard Copp's Hill burial ground as sacred. On one tombstone there is this inscription, written in 1798:

Stop here, my friend, and cast an eye;
As you are now so once was I.
As I am now so you must be,
Prepare for death and follow me.

To these lines have been added in chalk, by some facetious person:

To follow you I'm not content,
Unless I know which way you went.

"If you have a friend worth loving,
Love him, and be sure you let him know
That you love him, ere life's evening
Touch his brow with sunset glow.
Why should good things ne'er be said
Of a friend till he is dead?"

"The present moment is all that any of us can really be sure of. The past, with its joys and sorrows, its lost opportunities, and its chances for sacrifice, is beyond recall. The future, with its great possibilities, be it ever so pleasant in prospect, may never be ours. How important, then, that the present be utilized before life's fitful fever ends."

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"Believe not each accusing tongue
As most weak people do,
But still believe that story wrong
Which ought not to be true."

Remember, Sisters, that even though you may be taking your vacation, we are still on duty and want the news. Please unfold your hands long enough to write the items and send them.

"Don't whine. Take what comes to you and do your best with it. Make the bravest fight you can; train yourself to see the cheerful side of things, even the funny side of the mishaps you can not help; strangle complaints with a laugh; a cheery laugh is good for the heart and brain and clears the mists from the eyes of faith."

"It's uphill work," writes a good, true-hearted sister. "There are so few of us who really seem to have the interest of the lodge at heart." I think I appreciate the situation. I do not wonder that sometimes you grow weary and are discouraged. To us all at times effort seems so feeble and the field so vast. And then we question whether, after all, results attained are worth the labor. It may be that you have borne the heat and burden of the day while others, having equal interest, were indifferent or neglectful of duty. It may even be that your earnestness and enthusiasm have been scoffed at by those too cold-blooded to feel your ardor and too indolent to share your labor. But are you sure that you have measured all the fruits of toil. There is likely to be much more to your credit than you imagine. It is just possible that without your efforts the lodge itself might have languished and died. And all the good it is doing and will do is indirectly owing to your work. Don't get discouraged, for patience and perseverance will win, as against indifference and opposition."

"Inventiveness is not usually regarded as a feminine characteristic, even by those who know that almost any woman will use a hairpin to cut the leaves of a magazine, button her gloves, fasten flowers in her belt or pick a lock. Women have received patents for a car-coupler, a valuable improvement in the printing press, a trouser-stretcher, a mustache guard, a shirt-front protector, a traveling bag and bathtub combined, as well as a combination of a washing-machine and see-saw. We hear more of the inventor of the steam engine and the cotton gin, but surely the above boons deserve some recognition."

"The fan is of the East and so many centuries old that its origin is lost in antiquity. Doctor Holmes derives it from one of the doves of Venus, a fan-tailed pigeon, plucked to ingenious purpose by its mistress.

"The goddess spoke, and gently stripped
Her bird of every caudal feather.
A strand of gold-bright hair she clipped,
And bound the glossy plumes together;
And lo, the fan! for beauty's hand,
The lovely queen of beauty made it."

* * *

Guests at Dinner.

Brother John F. McNamee, Editor and Manager of the B. of L. F. and E. Magazine, and Brother W. S. Carter, Grand Secretary and Treasurer of the B. of L. F. and E., were honored guests at dinner, June 6th, of our Worthy Grand President and Worthy Grand Counselor, Mr. and Mrs. F. P. Sargent, at Washington, D. C.

* * *

New Lodge.

Myrtle Lodge No. 227, Meadville, Pa., organized June 12, 1907, with twelve charter members, by Sister Jennie Creagh of Lodge No. 15, Cleveland, Ohio.

* * *

Ladies Auxiliary and Local Lodges Hold Joint Session.

The members of Fort Orange Lodge No. 113, Ladies' Auxiliary of the B. of L. F. and E., and the various local lodges met in a joint session at McElveney's Academy last night. Representatives from Rensselaer, Green Island, Whitehall, Saratoga and Rutland, Vt., were present.

Mrs. Georgie Sargent of Washington, D. C., Worthy Grand President of the Ladies' Auxiliary of the Order, who was the honored guest, delivered an address on "The Benefit of the Order."

The meeting was opened by the singing of an original song of welcome, composed by Mrs. Flora Cornell. Mrs. Cornell also delivered a humorous recitation entitled "Uncle Josh's First Visit to New York." The officers of Fort Orange

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Lodge participated in a costumed drill under the leadership of Mrs. Elizabeth Truax. A. F. Hayes of Whitehall, R. Comstock of Saratoga, C. Y. Chesebro, James Reilly and Martin Luther Haines of this city, Mrs. LaPoint of Rensselaer, Mrs. James Toomey, Mrs. Alice Keating and J. E. Coons of Green Islnand also spoke.

Mrs. Sargent is inspecting Pride of Capital City Lodge No. 218 today. Tomorrow she will visit Rensselaer Lodge No. 118, and on Friday she will go to Green Island to inspect Christmas Lodge. —Exchange.

June.

As rose-crowned Empress June ascends
The throne so lately May's,
'Twill seem a storm of love impends
Her reign of thirty days;
High pressure of affection will
From North to Southland sweep,
There'll flurries be, though far from chill,
Of kisses drifting deep.

Typhoons of arch, coquettish smiles,
Of artfulness prepense,
Will sweep o'er all the ocean isles,
Yea, more—the continents!
Rose-petal showers, too, there'll be,
The near-drawn heads to bless
Of those who question tenderly,
And those who answer yes!

Conditions barometric show
There'll be disturbing tides
In matrimony's sea, but lo!
A multitude of brides
Will ride the breakers safely, and
Be thankful 'twas in June
They took, and bound for Happyland,
The good ship, Honeymoon.
—Roy Farrell Green in Munsey's Magazine.

Well, the long cold springtime is over at last, and sunny, happy June is here again. Bright and beautiful month. I wonder why it always takes us back to childhood's happy days? Why is it we feel, in spite of circumstances and surroundings, that we are only eighteen? Possibly it is because the mind and heart never really grow old, only the poor body does that, and some learned ones ("scientists," do you call them?) tell us that is the least of us, anyway.

I wish that I could describe beautiful Capitol View Hill as it lies before me this bright and happy Sabbath morning, June 30. But as I do not possess Washington Irving's "descriptiveness," or dear old Sir Walter Scott's never-failing optimism, I can only say it is indescribably lovely. The new state house is nearing completion.

Last week brought us the sad intelligence of the serious illness of one of our dearly beloved charter members, Sister Mary P. Nash of Texarkana. Our prayers and sympathy are with her in this her great affliction.

For some time the usually active, and always social, Primrose Lodge No. 80, has not been doing very much, and well, to be honest, I have very little to write that will interest the Ladies Society.

Once more it is election of officers, and ere this appears in print (if it does) the installation of officers will be over. However, I can not refrain from saying, in the selection of suitable members to fill our offices lies, to a great extent, the success or failure of a whole year of lodge work. Some of us, though willing, are so situated as to make a regular attendance at meetings practically impossible. As I look around me today and count five dear little ones, I foresee only homemaking and housekeeping for many years to come, and do not see any prospect of attending lodge even once. But there is always the happy thought that they will not be babes always—did I hear some one say I would be old when they are grown? Oh! well, that is only a small matter—I shall buy a pink dress, trim it with lace, puff my snow-white hair, and—and, well, go to lodge, at any rate.

Yours, with best wishes,
ORA BOON,
Little Rock, Ark.

Big Ten.

Below is given the membership of the ten largest lodges in the Ladies Society, reported July 1, 1907:

1. No. 142, Empire, Buffalo, N. Y.—120.
2. No. 70, Holly, Buffalo, N. Y.—105.
3. No. 3, Hazel, Peoria, Ill.—101.
4. No. 60, Pride, Harrisburg, Pa.—92.
5. No. 125, Charity, Jackson, Mich.—78.
6. No. 51, Grayson, Denison, Texas—78.
7. No. 10, Helpmate, Elkhart, Ind.—75.
8. No. 151, Missouri, St. Louis, Mo.—75.
9. No. 146, Virginia, Chicago, Ill.—74.
10. No. 58, Sisters of 99, Rochester, N. Y.—73

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Charter Applications.

Charter applications have been sent to the following places, and the new lodges will be numbered as follows:

Clarksburg, West Virginia, No. 235.
Lafayette, Louisiana, No. 232.
Sacramento, California, No. 231.
Houlton, Maine, No. 234.

Grandmother's Visit.

Grandmother was ninety-four, her friend eighty-two; and they were both coming to spend the afternoon with me. It was the Fourth of July, and I was a bit uneasy about the entertainment, but with the assistance of a neighbor and her small son I was able, so they declared, "to give them a charming afternoon.'

Upon their arrival we conducted them to the rear of the house. On the piazza we had fitted up a tiny dressing-room where they could remove their bonnets and rest for a little while. In about an hour we took them out upon the lawn, where we served our luncheon. Afterward we brought out a phonograph and some books and magazines for them to amuse each other with while we gathered up the lunch. Grandmother, who was ever fond of reading aloud, read about a party taking an automobile vacation on one dollar and sixty cents per day. The small boy meanwhile was paying strict attention and we were made aware of it later.

Grandmother's friend was a Southern lady, and to please her we set the phonograph to playing songs of the Sunny Southland which we knew were so dear to her heart. Then as the shadows on the western slope began to lengthen, we sang, my neighbor and I, grandmother's favorite, "Lead, Kindly Light," and as we sang

"And with the morn those angel faces smile,
That I have loved long since and lost awhile,"

grandmother joined us with her dear old faltering voice, knowing well, as did we, that the rosy dawn of meeting them was near at hand.

To cheer us up we started "America," and then it was that the small boy, who had slipped away, returned and calmly announced that "An automobile was at the front door waiting for us." He had telephoned to a garage for one to take grandmother for a drive.

This was, indeed, a surprise, as automobiles, up to this time, had held no part in our lives, they being considered too great a luxury for any of us. My neighbor and I looked at each other helplessly, and I began to see in the near future a good shaking for a small boy. However, for the present, the automobile was at the gate, and the old ladies were tying on their bonnets with beaming eyes, anxious to take their first ride in such a machine. We were quickly seated inside, the first we had ever taken of that kind. In our hearts, my neighbor and I forgave the small boy, and later, when the old ladies had been returned safely to their homes and the good-night had been said, as I paid the waiting chauffeur, I stealthily slipped a quarter into the small boy's chubby palm, who smiled sleepily up into my face.

IMOGENE BATES.

Oneonta, N. Y.

Good Advice.

Dear Editress—As election of officers is at hand a few words from the far off frozen Northwest may be of interest to our more southern sisters.

Prairie Flower Lodge, No. 208, has been frozen hard, but has come through the earth all O. K. and enters on her second year with the renewed hope of being a well conducted and model lodge.

I hear the question, "How would you bring about this state of perfection?"

First, by selecting officers who are interested in the order. They should be prompt and regular in attendance. Should have all of the paraphernalia in place before time to open the meeting, then rap the gavel on time. Carry out the work in detail according to law. Do not let the work drag, fill every moment with something of interest. When the work has been disposed of close promptly. After the meeting have a spicy program lasting about thirty minutes, or serve light refreshments, limited to two or three articles. If such a plan is persistently carried out the lodge room will always be well filled.

A good plan for lodges with large memberships is to divide their membership into twelve sections, one for each month. At the end of the year note which section gave the best time, the losing sections

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to banquet the winners. For smaller lodges divide in two sections, the red and the blue. Have two captains to choose their sides and at the end of six months the losing side to treat the winners. Then select two more captains for next six months and so on.

The first requisites are peace and harmony, for without these our work is in vain. If you should be so unfortunate as to have a "knocker" try to cure their unfortunate disposition with love and kindness. But with some the disease is incurable; it becomes chronic with long standing. The lodge, with such a member, must hold the reins and keep them in their place.

Never allow any personalities or bickerings in the lodge room; use the emblem of authority the moment it is necessary. Give every one the glad hand of welcome, and make all feel at home.

A model lodge must have something doing all the time for the "Good of the Order," something that will prove a recreation, and then when lodge is closed go home with a feeling that we have been benefited and resolved to do more and better work for our beloved order and its members. Be sure and leave all private affairs and secret work in lodge room. Outside, speak only kind words for the order and its members, and remember that:

If we have words of help or cheer
With which to fill life's cup,
Speak them, speak them, now and here,
But otherwise, shut up.

JANE GOODERHAM, L. S. 208.
Winnipeg, Manitoba, Canada.

Chesapeake, No. 61.

This lodge has been rather quiet for some time. We have initiated one sister since our last report. One of the most interesting features of our work is the joint meeting, which occurs the second Saturday in each month. These meetings are a source of much benefit to us, as we are able to avail ourselves of the counsel of the brothers.

We expect in the near future to make strong effort to greatly increase our membership. We have splendid material from which to draw, and hope in the future to be able to report many new members. While our membership is small the sisters are enthusiastic and wide awake, and we feel sure we can increase it, and at the same time be helping others along by our devotion to principle, honesty and uprightness, as well as encourage our noble brothers on the road, who are daily toiling for perhaps a widowed mother or darling sister.

With love and best wishes to all of our sisters. Fraternally,

TEXIE A. WHITLOCK.

Letters from Friends.

FROM L. S. 22—(*Aimee C. Perrin, Denver, Colo.*) Scenic Route Lodge 22 has not, as yet, been heard from. We have a thriving lodge here in the beautiful city of Denver. We have not added any names to our membership roll this year as yet, but we have several prospective members in view. The hearty cooperation of the brothers in all of our social affairs is fully appreciated.

A most enjoyable evening was spent a few weeks ago at the home of our past president, Sister Sieb. It was a surprise party and it certainly was a surprise, and a complete one, to our sister. An elaborate supper was served during the evening.

We wish all the sister lodges success and hope they are all as happy in their work as we are in ours.

FROM L. S. 31.—(*Mrs. Mary G. Chapman, Minneapolis, Minn.*) May 11. Today, the writer, together with the president and three other members of our beloved order, visited Minnehaha Lodge, No. 57, of St. Paul. We had a delightful trip and found our sister order not many in numbers but very enthusiastic in their work. They have a class of five for initiation which was the cause of our going over; however, we had been misinformed as to the date and found that the initiation would not come off until their next meeting. Sister Brisanham, the worthy president of Pride of St. Paul, No. 25, was in attendance and surprised us with a treat in the most popular tea rooms of the city.

We meet on the second Monday evening of each month in the Masonic Hall, corner of Twenty-third and Central avenue, N. E., Minneapolis, Minn. Last Monday evening we had as our guest Sister Minnie Groner, the president of Headlight Lodge, No. 16, Boone, Iowa, and Sister Brisanhan of St. Paul. We

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were very much pleased to have them with us and enjoyed their talks very much.

On February 22d Twilight Lodge, No. 49, consolidated with us, and as we have added strength to our strength, we hope soon to be one of the largest lodges in the L. S.

Miss Henderson, our state organizer, is a great help to us and will probably write and tell you about the organization of a new sister lodge at Abbotsford, Wis.

I wish all sister and brother lodges good and prosperous times.

* * *

FROM L. S. 214.—(*Mrs. Gertrude Brickle, Basalt, Colo.*) Some time has passed since Roaring Fork, No. 214, has been heard from through the columns of the Ladies Department, and as I have been appointed press correspondent I deem it a great pleasure to report the success of our meetings. There has not been but one or two meetings since we organized that we have not had some one to ballot on or to initiate. We have been organized since October 25, 1906.

Although we have not been heard from often, we are not so quiet here, and if any of the sisters had been in Basalt on April 17 I am sure they would have all agreed with me that we are all in for a good time. On the named date Brother Paul Noble and Miss Frances Hall were united in the holy bonds of wedlock. They left the same evening for Colorado Springs on No. 6, and the L. S., as well as the brothers, had a jolly good time with them. We are glad to see our boys take unto themselves wives, and we hope that many more will follow Brother Noble's example. After reading Brother Thomas Crago's letter, of Lodge No. 533, I wonder if there are not a great many of the boys that think the same of the L. S., and I think it would be encouraging to all of us to have more such letters sent to the Magazine.

We gave a St. Patrick ball March 18th, and it was a success. Quite a number of our boys here have lately changed places and are now to be found on the right hand side of the engine cab—but I don't think that more than one or two have left the B. of L. F. and E.

A goodly number of the boys came up to our lodge rooms after our last meeting well supplied with sweetness (candy), and we had coffee and sandwiches, after which we enjoyed dancing a couple of hours.

We have a president and secretary that we are justly proud of, for neither have missed a meeting since we were organized.

We are going to lose one of our sisters at the end of this quarter, as her husband has been promoted and joined the B. of L. E, and she thought that there was no need of her staying in the L. S. Good luck to you, sister.

Business is not very good here on the Colorado Midland at present, but I think the boys expect it to pick up before long. We hope to be able to hold joint meetings here before long.

I wish that more of the brothers would write for the Magazine, for we enjoy reading their letters fully as much as those of the ladies.

Fearing this letter will get tiresome to my dear readers, so wishing all lodges success as well as the Grand Officers, I am, yours in F. and C.

* * *

FROM L. S. 142.—(*Mrs. E. Bush, Buffalo, N. Y.*) As the sisters of the Ladies Society have not heard from Empire Lodge No. 142 for a long time through the Ladies Department of the Magazine, will think that we have lost all interest in our lodge; but I assure you we have not, as each sister looks forward with pleasure to our meeting day and there all work in harmony and good-will to promote the interest of each other.

January 7th B. of L. F. and E. No. 614 gave a ball at St. Patrick's hall; also, Red Jacket Lodge No. 85 gave a ball in the same hall.

January 15th, Omega Lodge No. 316 gave a hop at Odd Fellow's Temple. On all these occasions Empire Lodge No. 142 served the refreshments and the proceeds were turned over into our treasury.

On the evening of March 27th, Omega Lodge 316 entertained the members of Empire Lodge No. 142 and their husbands with an oyster supper, and also ice cream and cake, nothing being spared to make the occasion a very enjoyable one, as they are a jolly lot of brothers, and hope we will be able to return the compliment and entertain them as well at our hop to be given May 29.

It is with profound sorrow that we are called upon to pay the last sad tribute of respect to Brother Charles Eccles, husband of our inner guard; also brother of our Sister Collector Mary Gardner, who was killed while working in the Erie

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R. R. yards on the afternoon of February 25. The funeral services were held from the family residence and the body was taken to Campbell, N. Y., his former home, for burial, the services being in charge of J. G. Hubbard Lodge, B. of L. F. and E.; also S. U. N. A.

With best wishes for one and all of the L. S. members, we remain, yours in F. and C.

FROM L. S. 20.—(*Mrs. Bessie Estabrook, Susquehanna, Pa.*) Please forgive me for not sending news of our lodge before, but sickness has prevented.

We have not a great many members and part of what we have live out of town, so our meetings are not very large, but they are pleasant.

We celebrated our anniversary the first day of May with a 5 o'clock tea and a public dance in the evening, at which we had some ninety guests.

We have received invitations to visit the Port Jervis sisters the 29th of May.

With best wishes for all sisters from No. 20.

FROM L. S. 133.—(*Unice Struthers, El Paso, Texas.*) Just a few lines from L. S., B. of L. F. and E., New Franklin No. 133, to let you know how we are getting along.

We hold joint meetings with the B. of L. F. and E. on the last Wednesday of every second month, which are well attended by the boys, and every one that comes is certain of a welcome. We always serve light refreshments and have some kind of a program or dancing.

On November 22, 1906, we gave a measuring social, which was much fun. It was given at Sister Schwartz's home and netted us $17 for our treasury. The house was prettily decorated for the occasion with crepe paper in our lodge colors and everyone present reported a good time.

Sister Walker had the sad misfortune to lose her husband by an engine explosion at Agnas Caluntes, Mexico.

Sister Rhing lost a dear brother with that dreadful disease, typhoid fever. The sympathy of the entire lodge goes out to these two sisters in their sorrow.

We are slowly but surely growing and have some splendid workers. Sisters McLain and Garven joined us by initiation and Sister Ford was transferred from Houston, and three more names on the table to be initiated into our fold at our next meeting.

Sister Like's home was gladdened by the arrival of a little son. May he always be a joy and a blessing to them.

FROM L. S. 151.—(*Mae Gensel, Denison, Texas.*) Brother Firemen, why is it your wives, daughters and sisters put off joining the L. S.? Why don't they come and join in the good work? Should they not feel the same interest in your noble work that we do who are already members of the fold? Tell them not to wait to be invited to join, but simply to apply for admission at once, and we shall be glad to receive them into the fold.

April 25 we gave a social at the home of our collector, Sister McCune, which was a decided success socially and financially.

May 3 a farewell surprise was tendered Sister Fossett at the home of our president, Sister Smith. Dainty refreshments, consisting of coffee and cake, were served. A pretty souvenir, in the shape of a silver cold meat fork, was presented to our sister. The following Monday Sister Fossett left for her new home in California and our best wishes go with her.

May 23 we had a called meeting to initiate a class of five candidates. After the business session the ladies served lunch, consisting of grape-juice and cake, and gladly welcomed the new sisters.

May 25, L. S. No. 51 received a special invitation to meet with the brothers of No. 8. The brothers were the entertainers and I assure you we were royally entertained. Nothing was left undone to make it a very enjoyable affair. After the sumptuous banquet they served, the evening was spent in amusements, music and dancing. At a late hour all departed, after expressing their sincere thanks to the brothers for giving them such a pleasant evening.

Yet, in the midst of our gaieties we were called to mourn with our dear Sister Williams in the loss of her husband by accident May 21, and which cast a gloom over, not only our lodge circle, but the entire community, in which he was held in the highest respect. Grayson Lodge No. 51 extend to Sister Williams their sincerest sympathy in this her sad bereavement.

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FROM L. S. 178.—(*Della C. Henman, Louisville, Ky.*) Queen of the Falls Lodge No. 178 was organized just one year ago with a charter membership of fifteen. The past year of our existence has been very prosperous, both financially as well as socially, which is due to the loyalty of its membership and to the careful and conservative administration of the officials, who have discharged the duties of their respective offices with accuracy and dispatch. We have not grown so very rapidly, as we have only initiated six into the mysteries of our order, making us at the present time a little band of twenty-one devoted sisters. We sincerely hope that the year 1907 will not close until we are twice this amount. The prospects are encouraging, for we have two applications on the table and several in view.

We gave a banquet in honor of Ohio Falls Lodge No. 578 at the home of Sister Mary Blenner. Of course a good time was had, as is usual when we get together.

Sister Minnie Honnaker entertained us in a very pretty manner in her home. Various amusements were indulged in and then we were invited into the dining room, where the tables were spread and fairly groaned under their weight of good things to eat.

Last, but not least, among our good times was our first anniversary celebration on May 22. All brothers and sisters and their families were invited to attend. The hall was beautifully decorated with our lodge colors, potted ferns and palms. Refreshments were served and then dancing was indulged in until a late hour. Everyone seemed to have a jolly good time and the pleasures of the evening will long be remembered by those present.

A L. S. baby has arrived at the home of Sister Mary Watters; the stork has also visited the homes of Brothers Eugene Gardner and S. Campbell, leaving the former a little lady and the latter a little fireman.

Before closing I wish to compliment Sister Ella Thomas, of Lodge No. 33, for her splendid advice in the May issue of the Magazine.

FROM L. S. 221.—(*Bertha L. Ford, Kern, California.*) God, in His infinite wisdom, has seen fit to take from our midst our beloved brother, Frank L. Vaughn, who was killed in a boiler explosion on the Tehachapi Mountain, on the evening of April 9.

"And the place that knew him shall know him no more," but his memory lives in the hearts of his loved ones and friends, and the heartfelt sympathy of our Ladies Society is extended to his bereaved wife. When the first great agony of sorrow has passed, surely consolation must come to our beloved sister, and to all his friends, from the knowledge that he died at his post—"On Duty" till the last. Greater praise than this can be said of no man.

"There is no death! The stars go down
To rise upon some fairer shore:
And bright in Heaven's jeweled crown
They shine for evermore.

Born unto that undying life,
They leave us but to come again:
With joy we welcome them the same—
Except their sin and pain.

And ever near us, though unseen.
The dear, immortal spirits tread:
For all the bqundless universe
Is life—there are no dead."

FROM L. S. 202.—(*Katie R. Brown, Washington, D. C.*) Our little band, which numbers now twenty-one, is getting along fine. We meet every second and fourth Friday in the month and always have a fairly good attendance. We also have a few very hard workers, which we do appreciate very much, and we are always on the go with some pleasure, such as socials, parties, entertainments, balls, etc., which as a rule prove very beneficial to us.

On May 12 the brothers of Potomac Lodge No. 7 gave an entertainment and asked the ladies to assist them, which we very gladly did and enjoyed it immensely, for they have been awfully good and kind to us since we have been organized, and I think "one good turn deserves another." Their program was very select and dainty refreshments were served in abundance.

FROM L. S. 36.—(*Lizzie Detrick, Sayre, Pa.*) As some time has elapsed since Autumn Leaf Lodge No. 36 has been heard from through the columns of the Ladies Department, and being reminded that I was the scribe for No. 36, I thought it was high time that I was sending word of our "goings on." Don't think for a minute, because we have been

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silent so long, that we are a thing of the past, for here we are, very much alive and doing well, with forty names on our roll-call, and we hope to gather more into the fold in the very near future.

Tuesday evening, May 28, we opened lodge in due form with Sister Anna Bull in the chair. After lodge we celebrated a very enjoyable surprise party in honor of Brother and Sister Joseph Repp, who are going to leave us so soon to make a new home in Haleyville, Indian Territory. Sister Repp will be greatly missed by all who know her, for she was a charter member of our lodge, and always a cheerful and willing worker. She was presented with a very handsome cut-glass bowl as a slight token of the great esteem she is held in by our lodge, with best wishes for many happy days in her new home. Sister Repp thanked the sisters in a few well-chosen words for their great kindness to her.

Then Brother John Bull of Weaver Lodge No. 379, presented Brother Repp with a watch charm and emblem of the B. of L. F. and E. Brother Repp was very much pleased and thanked them for remembering him so kindly.

Dainty refreshments, consisting of ice cream and wafers, were served by the ladies, and all departed in a very happy mood, wishing Brother and Sister Repp a long, happy and prosperous life.

Quarterly Insurance Assessment.

(Second Series Numbers.)

Notice No. 19, for the Quarter Ending September 30, 1907.

GRAND LODGE
LADIES SOCIETY OF THE BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN.

Office of
GRAND SECRETARY AND TREASURER,
BOONE, IOWA, Sept. 1, 1907.

To all Treasurers of Subordinate Lodges:

Sisters—Assessment No. 19, for the quarter ending September 30, 1907, is hereby levied upon all members holding membership in the Insurance Department of the Society on or before August 1, 1907. You will forward to this office, so as to reach here on or before the tenth day of September, 1907, the sum of sixty (60) cents from each member carrying a $200 policy and one dollar and twenty ($1.20) cents from each member carrying a $400 policy, using the two printed blanks which accompany this notice.

All remittances to be made by draft, postoffice or express money order, payable to "Grand Secretary and Treasurer, Ladies Society, B. of L. F. and E."

Members initiated on and after August 1, 1907, will not be liable for this assessment.

MARY E. DU BOIS,
(Seal) *Grand Sec. and Treas.*

Approved:

GEORGIE M. SARGENT,
Grand President.

Note.—We enclose *two printed* blanks upon which Treasurers will make returns to the Grand Lodge for the above assessments. Both statements will be filled out *exactly* alike and sent with returns. If all names do not appear in the printed list, they will be added. If any corrections are necessary they can be made by the Treasurer. One of the printed statements, with receipt, will be returned to the Treasurer.

For the names, lodge number, cause of death, etc., of deceased sisters, in the payment of whose claim this assessment is levied, see issue of the Brotherhood of Locomotive Firemen and Enginemen's Magazine, where detailed statement of the same will be given in department devoted to the Society.

Death Report.

Rozella I. Childs, Lodge 2; died May 27, 1907; cause, paralysis of heart. Insurance, $200.

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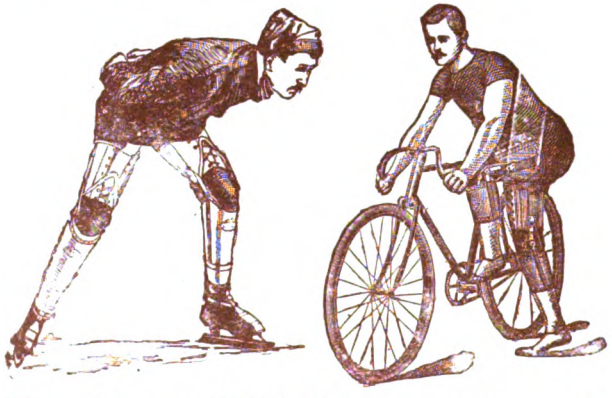

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BROTHERHOOD OF

Locomotive Firemen and Enginemen's Magazine

Published at INDIANAPOLIS, IND.
by the
Brotherhood of LOCOMOTIVE FIREMEN AND ENGINEMEN

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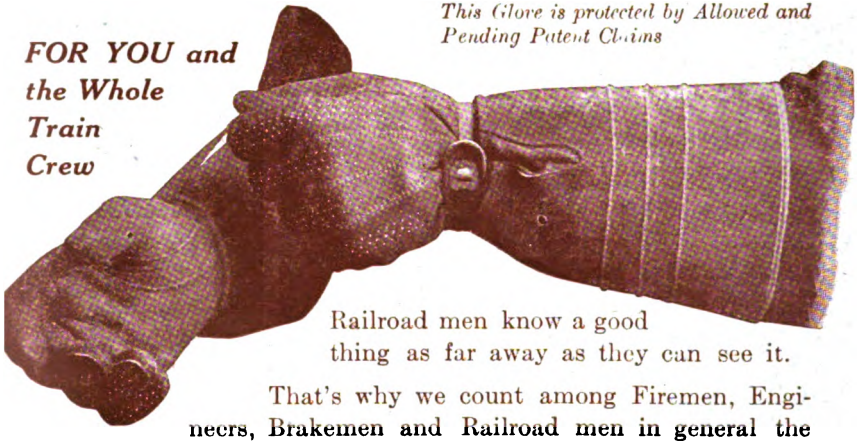

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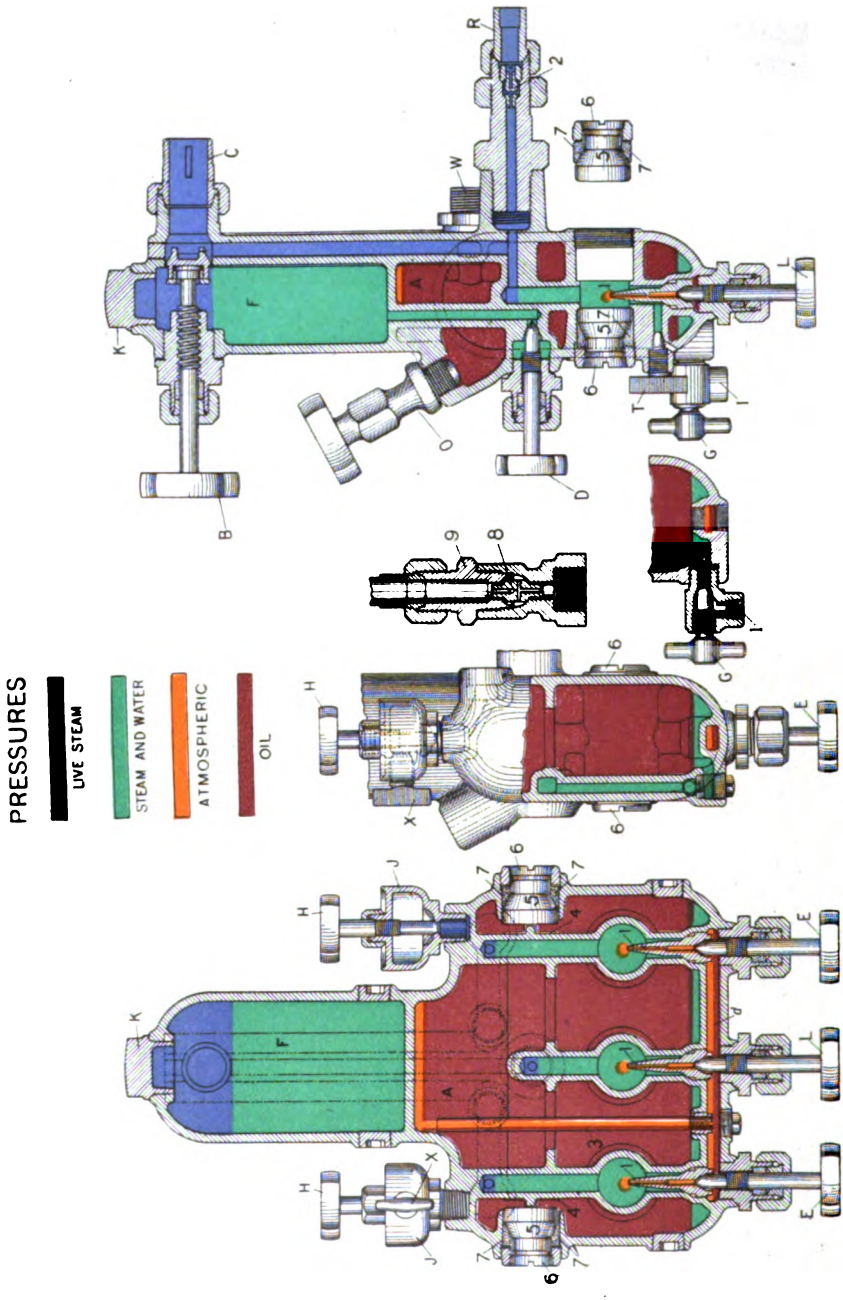

Locomotive Firemen and Enginemen's Magazine Educational Charts

LOCOMOTIVE APPLIANCE SERIES

PLATE XII.—DETROIT No. 21 TRIPLE FEED LOCOMOTIVE LUBRICATOR (Oil Expanded)

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BROTHERHOOD OF
Locomotive Firemen and Enginemen's Magazine.
TECHNICAL DEPARTMENT

JOHN F. McNAMEE
EDITOR AND MANAGER

SUBSCRIPTION PRICE
$1.50 PER YEAR

PUBLISHED MONTHLY BY THE BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN

Entered as Second-class Matter December 27, 1906, at the Post Office at Indianapolis, Ind., under the Act of Congress of March 3, 1879

VOL. 43 NO. 3 INDIANAPOLIS, IND. SEPTEMBER 1907

Plate XII—Detroit No. 21 Triple Feed Locomotive Lubricator (Oil Expanded).

Plate XII of the Locomotive Appliance Series of the Locomotive Firemen and Enginemen's Magazine Educational Charts shows sectional views of the Detroit No. 21 Lubricator in which the oil with which the oil reservoir *A* has been filled is now expanded.

Steam valve *B* has been opened and we now note that condensation has fully taken place, the expansion of the oil has been completed, and oil now occupies the expansion chamber, oil tube *3* and oil feed chamber *d*. Water occupies the condensing chamber *F* up to its highest point of condensation, and has also gathered in the bottom of the oil reservoir *A* and in the sight feeds, and is exerting hydrostatic force to all parts of the lubricator and feeds alike, but the reader will note that there is evidence of atmospheric pressure in the highest point of the expansion chamber, a trace of same in the oil tube *3*, oil feed chamber *d* and feed nozzles *1*, but this will quickly disappear after the feeds *E L E* have been opened, as every engineman knows from experience, and solid drops of oil will be fed until the lubricator runs empty.

The Word "Pilot."

The Victorian Railways Magazine asks: "What is the origin of the word 'pilot,' as applied to a locomotive? It usually describes with us an engine employed in yard work. 'Shunting' engine or 'switching' engine are terms that convey their own meaning, but 'pilot' engine conveys nothing except the idea of a misnomer. There are other railway words not easily traced to their origin, and some inappropriate, but that the locomotive drudgery of shunting or switching should be called piloting is incongruous."

In America the word "pilot" as applied to a locomotive has reference to the appliance on the front of the locomotive which is attached to, and suspended from, the bumper or "pilot" beam, for the purpose of arresting and brushing from the track any obstructions, such as horses, cattle, etc., and preventing them getting under the wheels of the locomotive. In early days the pilot was commonly referred to as the "cow-catcher," and is so called even today by many people.

When, through accident or otherwise, one railroad company has occasion to send one of its trains over another road, it is customary for the latter road to supply one of its own employes to accom-

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pany the crew of the other company for the purpose of instructing the engineer as to the gradients, stations, water tanks, meeting points with other trains, etc., and giving him such information as is necessary to take the train safely over the road. This is called "piloting," and the employe performing this duty is referred to as the "pilot."

Sometimes, on special occasions, railroad comapnies have deemed it expedient to send a light engine over the road ahead of some regular or special train to insure the safety of the said regular or special train, and the engine performing this service was referred to as the "pilot" engine.

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Celebrates the Delivery of Its 5,000th Locomotive.

With festivities appropriate to the occasion, the Hannoversche Machinenbau-Actien-Gesellschaft of Hanover, Germany, recently celebrated the delivery of the 5,000th locomotive built by these works, on which occasion there was present a number of public officials and representatives of German and foreign railroads and neighboring industrial firms.

The works were founded in 1835 by Georg Egestorff, who was succeeded by the present firm, the first locomotive being delivered in 1846, and it was ten years later that the 100th had been built. The 500th was completed in 1870; the 1,000th in 1873; the 2,000th in 1888; the 3,000th in 1897; the 4,000th in 1903, and now the 5,000th. A large number of these locomotives were for lines in Russia, Roumania, Japan, Java, Denmark, Turkey, India, Austria, Portugal, Italy, Bulgaria, Holland, China, Siam, Finland, Argentina, Sweden, Greece and Chili. As will be seen from the extensive territory over which the locomotives of this company are running it is widely known as an important industrial institution.

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Tractive Power Derived from a Balloon.

A mountain railway designed on a novel plan is said to be in use on the Hochstauffen, Bavaria. The principal feature is that the force of traction is directed vertically upward, and is derived from a balloon. A single rail is used for the only purpose of directing the course of the train and keeping the balloon with its load captive. To this end the rail is made T-shaped, and the car runs on it, gripping it from the sides and from below. The rail is fastened to the ground at distances of about 15 feet. In the descent the propelling force is gravity, and the balloon acts as a check to prevent accelerated motion. A ballast of water, taken up at the top of the mountain, provides the additional downward force required. The truck carries the water receptacle, which can be opened by the aeronauts during the journey. When it is windy the strain between the balloon and the truck is diminished by letting the water out of the receptacle, thus compensating for the difference in power. There is a storage house where the balloon may be left in case of storm, and all possible measures are observed to insure the absolute safety of the passengers.—The Victorian Railways Magazine.

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*The Brotan Water Tube Firebox.**

The ordinary locomotive firebox, with its several hundreds of stays, constitutes probably the most serious item of the cost of maintenance of the engines. The increased steam pressures which have been adopted during the past few years, and the resulting increased stresses to which the material of the firebox and stays are constantly subjected, tend not a little to shorten the life of this vital part of the engine, and have in a few cases been the cause of disastrous explosions.

The constant contraction and expansion to which the metal of the firebox is subjected and the inaccessibility of parts have from time to time induced locomotive engineers to adopt forms of construction which they considered more rational than the one that has been so long in use on our railways.

The usual construction has the great defect that the roof girder stays are a weak mode of strengthening the crown plate, as no dependence can be placed on the sling stays. Moreover, these roof stays occupy too much space, and are unduly heavy. A great improvement was the introduction of the so-called Belpaire firebox, with direct vertical stays and flat-topped wrapper. This is a decided

*By E. Gobert, in The Railway Magazine, London, Eng.

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improvement, superior even to the radial staying, which retains the round-topped wrapper. But the direct staying, although it makes the firebox much lighter, improves the circulation of water, etc., does not do away with the constant source of trouble arising from the horizontal stays, which break usually clean off the wrapper plate, and more particularly at the upper longitudinal rows. A remedy has been sought in the adoption of a stronger material, such as stone bronze and manganese bronze; this does not, however, eliminate the local stresses due to the unequal expansion of the various parts of the firebox, the sides of which, consisting of water spaces or legs enclosed by flat surfaces, must necessarily be stayed in a more or less regular fashion. Some engineers have tried to dispense with the firebox altogether, and others have sought to adopt in its stead corrugated flues. But, bad as it is from a structural point of view, the firebox of a locomotive is by far the most important factor of its power as a generator of potential energy, so that more recent attempts at improvement have been in the direction of a more rational form of construction, while at the same time retaining, if not improving, its evaporative power.

In this respect the Brotan firebox, which has been applied to some thirteen engines on the Austrian and Hungarian State Railways, is the most successful attempt towards a rational form of firebox. The Austrian State Railways use on their lines a variety of brown coals containing sulphur, and, as this soon deteriorates the plates of the firebox, they decided, in 1901, to adopt the design proposed by Herr Brotan. The first application to a six-coupled goods engine, built in 1867, was so successful that a further number of engines have been fitted with the improved firebox.

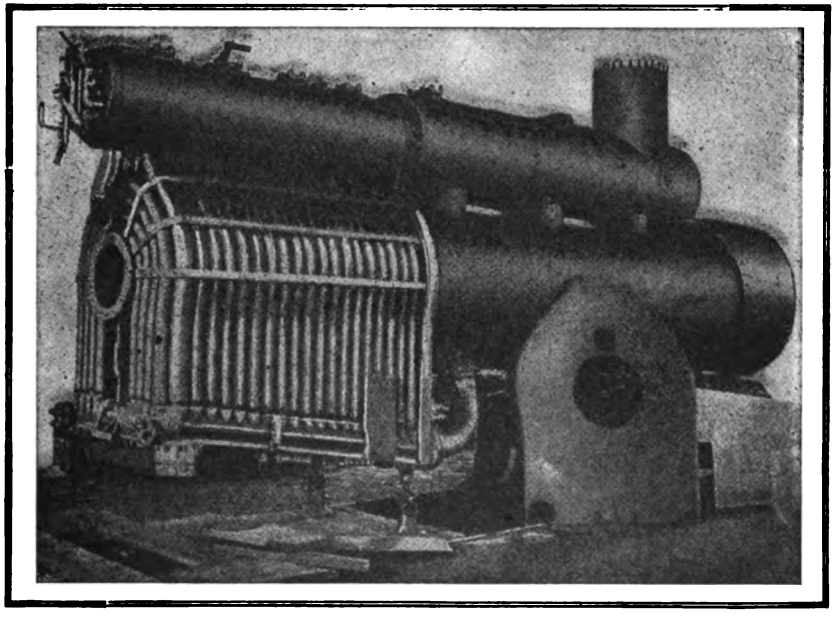

Fig. 1. LOCOMOTIVE BOILER WITH BROTAN'S FIREBOX

(From The Railway Magazine, London, Eng.)

As regards the general aspect of the engines, it is not unlike the Flaman boiler, introduced some twelve or thirteen years ago on the eastern railways of France, for the Brotan boiler is likewise a double barrel boiler. The lower barrel, which has the larger diameter, is a plain tubular boiler, and entirely filled up with flue tubes; the upper barrel, of lesser diameter, is connected by three short tubes to the lower barrel, and is partly filled with water, the remaining space constituting the steam chamber.

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The upper barrel extends beyond the rear end, or firebox, tube plates of the lower barrel, and there forms, so to speak, the crown of the firebox, which we will now proceed to describe.

From the lower part of this extension of the upper barrel depend water tubes, which are arranged close to each other, and so bent as to approximate the external shape of an ordinary firebox. It will be at once understood that these groups of tubes replace the longitudinal water spaces of the usual firebox. The back, or fire door end, is likewise formed by tubes so bent as to leave a space to receive the fire hole ring. (See Fig. 1.) These water tubes, which are of weldless steel, and manufactured by the Deutsch-

pander, provided the surfaces in contact are duly cleaned before expanding the tube ends. The throat plate of the ordinary firebox is here replaced by a brick wall, on which the brick arch abuts.

The small spaces left between the water tubes were at first filled up with a strip of copper, but now asbestos is used. On the outside the water tubes are covered with layers of an asbestos fabric and the usual cleading, to which is also attached the supporting and expansion brackets of the firebox. The top of the upper barrel and the hollow foundation ring are provided with suitable hand holes, through which the water tubes can be easily cleaned, expanded, etc.

It will be understood that the water

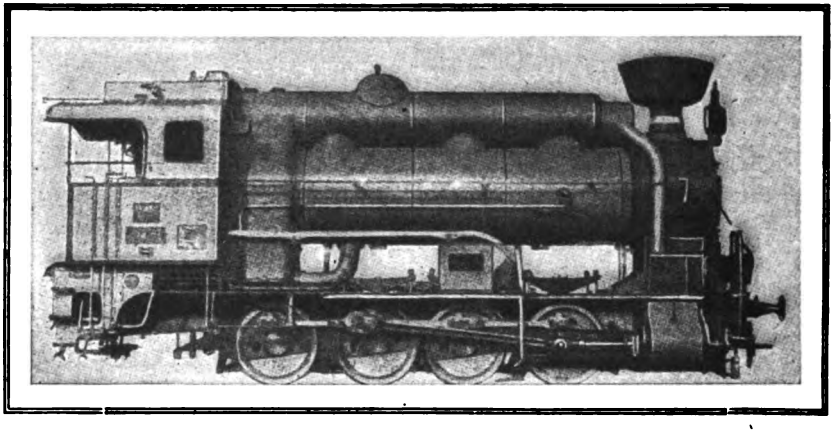

Fig. 2. 0-8-0 FREIGHT LOCOMOTIVE WITH BROTAN'S FIREBOX FOR THE I. R. AUSTRIAN STATE RAILWAYS

(From The Railway Magazine, London, Eng.)

osterreichische Mannesmannrohrenwerke, are 3¾ inches outside diameter, and about 3-16 inch thick. These tubes are expanded at their upper end in the bottom plate of the upper barrel, and at the other end into the upper part of the hollow foundation ring, a steel casting of circular cross section. The joints at both ends are rendered tight by a thimble or ferrule of copper, screwed on the tube and expanded with it into the upper barrel and foundation ring respectively. The same applies to the ordinary flue tubes of the barrel. Our readers will at once recognize in this the method usually adopted in America to keep flue tubes tight. It has, however, been discovered that the copper thimbles could be done away with for the water tubes, and a tight joint of metal made by the ex-

tubes, after being bent to shape, have to be annealed slowly, and, before being put in place, tested to about 750 pounds per square inch.

In order to promote the brisk circulation which is one of the characteristic features of the Brotan boiler, the front portion of the hollow foundation ring is connected to the bottom of the first barrel ring by two copper elbow pipes, about 7½-inch bore, and ¼-inch thick, which can be seen in both Figs. 1 and 2.

The substitution of the Brotan firebox for the ordinary type has, as a rule, resulted in an increase of direct heating surface; in one case it has increased as much as 11.7 per cent, while the increase of weight was only 4.4 per cent.

While it takes two hours and fifty minutes to get up steam in an ordinary

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boiler, only one hour and fifty-five minutes are required for this purpose in the boiler fitted with the Brotan firebox, the quantity of water and initial temperature being the same.

As a rule, the reboilering of old engines with boilers of the Brotan type increases both the direct and indirect heating surfaces, but the increase of weight is not anything like the proportion of increase of heating surface.

The great advantages of these arrangements are: the suppression of stays of all kinds, the use of tubes of thin steel, which conduct heat quite as readily as the ordinary copper plates, the increase of direct heating surface, the rapid circulation of water between the upper barrel foundation ring and lower barrel, and last, but not least, the great facilities afforded for examining and thoroughly washing out the firebox.

While the substitution of the Brotan firebox in the engines that have been rebuilt has, in some cases, resulted in an increase of weight at the trailing end of the engines, this need not always be so, and new engines can be so designed that the weight is kept at the lowest limit consistent with adhesion.

There are at present, says our contemporary, *Die Locomotive*, of Vienna, in its April issue, fifteen locomotives at work fitted with the Brotan boiler, and the success of these has been such that nineteen new engines so fitted are being built, not only for Austrian railways, but also for other foreign railways. One of these, intended for the Royal Hungarian State Railways, is a compound engine, and will be provided with a superheater. The addition of a superheater would present no difficulty, as there is plenty of space available for it both in the lower barrel and firebox.

Six-wheel Type Switching Locomotives.

The American Locomotive Company has just issued the ninth of its series of pamphlets covering the standard types of locomotives. As indicated by the title, this number of the series is devoted to six-wheel switching locomotives, and contains halftone illustrations and the principal dimensions of twenty-six different designs of this type. The designs illustrated range in weights from 102,000 to 176,500 pounds, and are adapted to a variety of service conditions.

Rules and Regulations for Inspecting, Testing and Washing Locomotive Boilers.

A law recently enacted by the New York Legislature—reference to which will appear in the report of Brother Ryan, chairman of our Legislative Board for that state, in the next issue of the Magazine—makes special provision for boiler inspection, testing and washing under a code of rules and regulations which are both interesting and instructive, and which are as follows:

General Construction and Safe Working Pressure.

The chief mechanical officer of each railroad company will be held responsible for the general design, construction and inspection of the locomotive boilers under his control. The safe working pressure for each locomotive boiler shall be fixed by the chief mechanical officer of the company or by a competent mechanical engineer under his supervision. The safe working pressure must be determined in accordance with calculations of the various parts after full consideration has been given to the general design, workmanship and condition of the boiler.

Inspection of Interior of Boiler.

Time of Inspecting. The interior of every boiler shall be thoroughly inspected before the boiler is put into service and also whenever a sufficient number of flues are removed to allow examination.

Flues to be Removed. All flues shall be removed at least once every three years and a thorough examination made of the entire interior of the boiler. After the flues are taken out, the inside of the boiler must have the scale removed and be thoroughly cleaned.

Method of Inspection. The entire interior of the boiler must then be examined for cracks, pitting and grooving. The edges of plates, all laps, seams and points where cracks and defects are likely to develop, or which an exterior examination may have indicated, must be given an especially minute examination. It must be seen that braces and stays are taut, that pins are properly secured in place, and that each is in condition to support its proportion of the stress.

Repairs. Any boiler developing cracks in the shell shall be taken out of ser-

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vice at once and thoroughly repaired before it is reported to be in satisfactory condition.

Lap Joint Seams. Every boiler having lap joint longitudinal seams without reinforcing plates shall be examined with special care to detect grooving at the edges of the seams.

Lagging to be Removed. The jacket and lagging shall be removed whenever the inspector considers it desirable or necessary in order to thoroughly inspect the boiler.

Testing Boilers.

Time of Testing. Every boiler before being put into service, and at least once every twelve months thereafter, shall be subjected to an hydrostatic pressure 25 per cent. above the allowed working steam pressure.

Removal of Dome Cap. Preceding the hydrostatic test the dome cap and throttle pipe must be removed and the interior surface and connections of the boiler examined as thoroughly as the conditions permit.

Foreman to Witness Tests. When boilers are being tested by hydrostatic pressure the foreman of the shop having under his charge the repairs of boilers or an authorized competent boiler maker shall personally attend and assist the inspector in his examination.

Repairs and Steam Test. Leaks and imperfections developed in tests must be repaired and made perfect before the boiler is reported to be in satisfactory condition. When all necessary repairs are made the boiler shall be fired up and the steam pressure raised to not less than the allowed working pressure.

Stay Bolt Testing.

Time of Testing. All stay bolts should be tested at least once every month and no boiler must be used over three months under any circumstances unless thorough stay bolt inspection has been made. Stay bolts shall also be tested immediately after every hydrostatic test.

Method of Testing. If stay bolt tests are made when the boiler is filled with water there must be not less than fifty pounds pressure on the boiler. This will produce sufficient strain upon the stay bolts to cause the separation of the parts of the broken ones. Should the boiler not be under pressure the test may be made after draining all the water from the boiler, in which case the vibration of the sheet will indicate any unsoundness. The latter test is preferable.

Broken Stay Bolts. No boiler must be allowed to remain in service when there are two or more adjacent stay bolts broken in any part of the fire box or combustion chamber nor when five or more are broken in the entire boiler.

Tell Tale Holes. All stay bolts shorter than 8 inches applied after September 1, 1907, except flexible bolts, shall have tell tale holes 3-16 inch diameter by 1¼ inches or more in the outer end. These holes must be kept open at all times and must not in any case be plugged. All stay bolts shorter than 8 inches, except flexible bolts, shall be drilled when locomotive is in the shop for heavy repairs or at other suitable opportunity, and this work must be completed prior to September 1, 1908.

Note.—Applications from companies desiring to omit the use of tell tale holes will be considered when it can be shown to the satsfaction of the Commission that unusual care is used in stay bolt testing, both as to the frequency of tests and the selection of inspectors.

Steam Gauges.

Location of Gauge. Every boiler shall have at least one steam gauge that will correctly indicate the working pressure. Care must be taken to locate the gauge so that it will be kept reasonably cool, particularly in case of gauges located on the back head of boilers.

Siphon. Every gauge shall have a siphon of ample capacity to prevent steam entering the gauge. The pipe connection shall enter the boiler shell direct and shall be maintained steam tight between siphon and gauge.

Time of Testing. Steam gauges should be tested at least once every month, and no boiler must be used over three months under any circumstances unless a thorough test has been made of the steam gauge.

Safety Valves.

Number and Capacity. Every boiler shall be equipped with at least two safety valves, the combined capacity of which shall be sufficient to prevent, under any conditions of service, an accumulation of pressure of more than 5 per cent. above the allowed steam pressure.

Setting of Valves. Safety valves shall be set by the gauge employed upon the

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boiler, to pop at pressures not exceeding five pounds above the allowed steam pressure, the gauge in all cases to be tested before the safety valves are set or any change made in the setting. When setting safety valves the water level in the boiler must not be above the highest gauge cock.

Time of Testing. Safety valves should be tested under steam at least once every month, and no boiler must be used over three months under any circumstances unless the safety valves have been thoroughly tested.

Water Glass and Gauge Cocks.

Number and Location. Every boiler shall be equipped with at least one water glass and three gauge cocks. The lowest gauge cock and the lowest reading of the water glass thall not be less than three inches above the highest part of the crown sheet.

Water Glass Valves. All water glasses shall be supplied with two valves or shut off cocks, one at the upper and one at the lower connection to the boiler, so constructed and located that they can be easily opened and closed by hand.

Time of Cleaning. All gauge cocks and water glass cocks shall be removed and cleaned of scale and sediment at least once every month.

Plugs in Fire Tubes.

Plugs Prohibited. No boiler shall remain in service which has one or more fire tubes plugged at both ends of the tube unless the plugs are securely tied together by means of a rod not less than ⅝-inch diameter.

Washing Boilers.

Time of Washing. All boilers shall be thoroughly washed not less frequently than once in thirty days.

Plugs to be Removed. When boilers are washed all washout, arch bar and water bar plugs must be removed.

Water tubes. Special attention must be given the arch and water bar tubes to see that they are free from scale and sediment.

Office Record. An accurate record of all locomotive boiler washouts shall be kept in the office of the railroad company. The following information must be entered on the day that the boiler is washed:

(1) Number of locomotive;
(2) Date of washout;
(3) Statement that boiler was washed;
(4) Signature of the boiler washer;
(5) Statement that gauge cocks and water glass cocks were removed and cleaned;
(6) Signature of the employee who removed and cleaned the cocks.

Steam Leaks.

All steam valves, cocks and joints, studs, bolts and seams shall be kept in such repair that they will not at any time emit steam in front of the engineer, so as to obstruct his vision.

Copies of Regulations.

The chief mechanical officer of each railroad company shall see that each inspector of locomotive boilers under his supervision is provided with a copy of these regulations. Copies can be obtained upon application to the Secretary of the Public Service Commission, Second District, Albany, N. Y.

Filing of Reports.

Specification Card. A specification card form No. ..... containing the results of the calculations made in determining the working pressure and other necessary data shall be filed in the office of the Public Service Commission, Second District, for each locomotive boiler used in this state. A copy shall also be filed in the office of the chief mechanical officer having charge of the locomotive. Every specification card shall be verified by the oath of the engineer making the calculations and shall be approved by the chief mechanical officer. These specification cards shall be filed as promptly as thorough examination and accurate calculations will permit, but no locomotive boiler must be used after January 1, 1908, unless specification cards form No. ..... have been filed as required above.

Certificate of Inspection. Not less than once in three months and within ten days after each inspection, a Certificate of Inspection form No. 1 shall be filed with the Public Service Commission, Second District, for each locomotive boiler used by a railroad company in this state, and a copy shall be filed in the office of the chief operating officer having charge of the locomotive. A copy shall

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also be placed under glass in a conspicious place in the cab of the locomotive before the boiler inspected is put into service. Each certificate shall give the number and the condition of the boiler inspected, the date of the inspection and other required details and each certificate shall be verified by the oath of the inspector.

Reporting Washouts. The inspector shall examine the record of boiler washouts on file in the company's office not less frequently than once every three months and if he is satisfied of its accuracy he shall enter the dates of every washout made during the preceding three months on the Certificate of Inspection form No. 1. In case the record is not satisfactory the inspector shall note same on the certificate.

Form No. ....., 1907.

By Authority of the State of New York Under Chapter 208, Laws of 1907.

SPECIFICATION CARD

FOR

LOCOMOTIVE BOILER No. ....

Owned by.....Railroad Company
Operated by.....Railroad Company
Builder .....
Builder's No. .....
When built .....
Where built .....
Type of Boiler .....
Material of Boiler .....
Kind of fuel used.....
Grate area in sq. ft.....
Boiler was originally built for a steam pressure of.....lbs per sq. inch
Steam pressure allowed.....lbs. per sq. inch.
Height of lowest gauge cock—lowest reading of water glass above crown sheet .....
Fire tubes, total No. .....
Fire tubes, O. Diam. .....
Arch tubes, gauge or thickness.....
Arch tubes, O. Diam. .....
Water Bar tubes, gauge or thickness.. ..... O. Diam. .....
Injectors—make and style.....
Number ..... Capacity of each.....
Safety valves, make and style.....
No. .....Size of each .....
Fire Box Stay bolts, O. Diam. .....
Fire Box Stay bolts .....x.....
Combustion Chamber stay bolts—
O. Diam. .....spaced .....x.....
Crown Stays O. Diam, Top.....
Crown Stays O. Diam, Bottom.....
Crown Stays O. Diam, Spaced....x....
Crown Bar rivets O. Diam, Top.....
Crown Bar rivets O. Diam, Bottom.....
Crown Bar rivets, Spaced .....x.....
Shell sheets—
Front tube .....thick.....Diam.
1st course .....thick.....Diam.
2d course .....thick.....Diam.
3d course .....thick.....Diam.
Mem. When courses are not cylindrical give inside diam. at each end.
Fire box—
Thickness of sheets—
Tube .....Crown .....Side .....
Door..... Combustion chamber .....
Inside throat (if tube sheet is in two pieces) .....
External Fire box—
Thickness of sheets—
Wagon top .....Sides .....
Throat .....Back Head .....
Inside Diam. .....
Thickness of Sheet .....
Thickness of Base .....
Make working sketch of longitudinal seams used in shell of boiler indicating on which course used.
Were you furnished with authentic records of the tests of materials used in boiler?

The stresses at the allowed working pressure were found by calculation to be as follows: Stay bolts at root of thread..... pounds per sq. inch. Stay bolts at reduced section, ... pounds per sq. inch. Crown stays at root of thread ..... pounds per sq. inch. Round and rectangular braces ..... pounds per sq. inch. Gusset Braces, ... pounds per sq. inch. Rivets, ... pounds per sq. inch.

State of ....., County of ....., SS.:

.....being duly sworn, says that all the dates and items in the above specification card are correct; and further that the said boiler and appurtenances at the date hereof are, in all things, in conformity with the law and the rules and regulations of the Public Service Commission, Second District.

Sworn to before me, this.....day of ....., 190..

.....Notary Public.

Approved,

.....Supt. Motive Power.

Mechanical Engineer.

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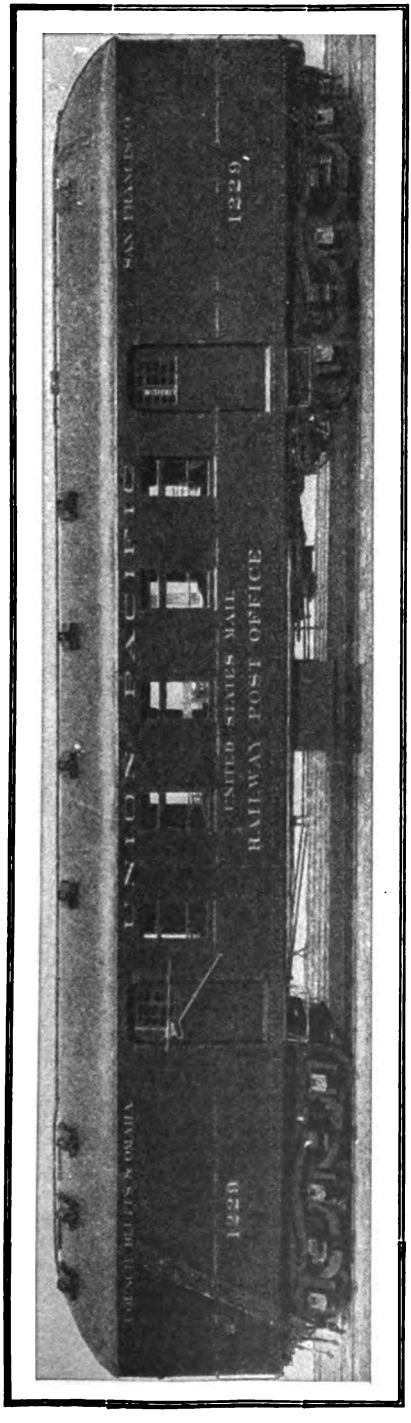

STEEL POSTAL CAR FOR THE HARRIMAN LINES

All-Steel Postal Cars for the Harriman Lines.

Illustrations are shown herewith of an all-steel postal car for the Harriman lines which, it is stated, the postal authorities have favorably commented on. One of these cars has recently been turned out of the shops of the Union Pacific at Omaha and another from the shops of the Southern Pacific at Sacramento, and it is understood that contracts have been let for thirty-five additional cars of this type. From the Railway and Engineering Review we learn that:

"These cars are a new departure in postal car construction, and mark another step forward in the evolution of steel passenger train equipment. The design is original with the motive power department of the Harriman lines and provides for an entirely fireproof equipment, less liability to telescoping and reduction of deterioration to a minimum. As a prevention from fire the usual gas lighting system has been eliminated—only electric lights, generated from the axle, being used. The usual steel heaters are not in force, the car heating being dependent on steam heat furnished by the locomotive. The steam heating apparatus automatically regulates the temperature of the car. An ordinary stove is, however, applied in one corner of the car for emergency use.

"The interior is lined with asbestos on the sides and ends, while the ceiling is steel plate. The floor is a fireproof cement; all the interior fixtures are either of iron or brass. The only wood used in the construction are the window sashes. The entire outside is composed of steel plate, the principal feature of the lower framing consists of two twelve-inch I-beams weighing 31½ pounds per foot, and extending through buffer beams. On account of their depth, platform sills or draft timbers are not necessary, the draft gear being made secure to lower flange of I-beam. These I-beams are capable of standing over 200 per cent. more resistance in shock than the ordinary bar with wooden sills; they are trussed with two 1½-inch truss rods, which extend through steel castings in end sills.

"The flooring is formed of two courses of corrugated steel, corrugation being laid crosswise of car, and between the two courses a layer of hair felt is placed. To provide a smooth floor surface mono-

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lith is used. The shape of the roof is elliptical, the usual upper deck being dispensed with. The framing of the roof consists of 5-16x1¾x4 5-8-inch angle irons, elliptical shaped to conform to the roof. A foot at either end of these angle irons is riveted to side plates of the car. The outer roof lining is 1-16-inch sheet steel, extending down the side plate angle, and is overlapped by the ⅛-inch steel plate forming letter board sheet. The inside roof sheets are 1-16-inch steel framing of car. In design the entire framing is so completely bound together that the most severe shock will tend to buckle the entire framing and render it impossible to telescope the car."

STEEL POSTAL CAR FOR THE HARRIMAN LINES—INTERIOR VIEW

sheets, flanged on the edges and riveted through the angle iron column, forming panels two feet in width.

"The ventilation is provided by Cottier ventilators placed radially on the roof and which can be regulated to suit the temperature of the car. The ends of the car framing are composed of rectangular plates ¾x3 inches to which heavy angles are riveted and extend from end sill to top of car frame, to which they are substantially secured. The door framing was constructed of two heavy angles to give additional strength as well as utility. To take up any heavy shocks on the end frame a 5-16-inch steel plate 20 inches wide is riveted across top

The Wilder Radial Snow Plow.

The Wilder Snow Plow and Manufacturing Company, Worcester, Mass., has issued a neat little pamphlet illustrative and descriptive of its radial snow plows for electric railroads. From the pamphlet we quote the following:

"The evolution of transportation methods has progressed so rapidly in recent years that it demands a knowledge of special character to meet the requirements of every branch. This is especially true in snow fighting, for the weather is such an unknown quantity the average railway man has not the time or the opportunity to study advantageously the various conditions presented.

"Snow fighting is an art, and to be carried on successfully requires a knowledge gotten only through years of theoretical and practical study. As the result

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of many years of exhaustive investigation and experience, this company is pleased to offer what it believes to be the most complete and efficient snow-fighting equipment to date."

The plow is designated with a square or shovel-nose, which the manufacturers state was adopted by steam roads some years ago as the only device which would do the work and stay on the track under all conditions. However, on account of the sharp curves and sudden changes of grades encountered on electric roads it has been practically impossible to use this type of plow on such roads until now. From the pamphlet in question we learn these plows are built on and form a part of the trucks, substantially covering the ends of the body, which terminates practically at its point of support on the trucks, thereby allowing the plow to turn with the trucks and clear the rails even on curves of 25 feet radius. They are equipped for air throughout (wings, diggers, flangers, sanders, brakes, etc.), being under the complete control of the motorman. They are built in two sizes, single or double track, right or left-hand running, for third rail or overhead trolley.

The manufacturers claim for this plow that with adequate power they can take any drifts that a steam-road plow can (allowing only the proportionate difference in the size of the nose); that in working under and lifting the snow it is practically impossible to derail this plow, and for this reason, also, the snow acts as ballast, and naturally the traction is better, resulting in a great saving of power and doing away with an immense loss of power now incurred in bucking drifts, etc.; that owing to the fact that this plow throws the snow away form the tracks instead of merely pushing it back, they can fight the snow infinitely longer and easier than with the present type of plow; that on account of the radial feature of this plow, sharp curves and sudden changes of grade are taken perfectly without special adjustment; that on account of the simplicity of construction, repairs are reduced to a minimum; that, while a radical change from the present type of plow, it has fully passed the experimental stage, and in its four years' use has absolutely proved their original claims for it; that in this plow are embodied the results of fifteen years' practical and theoretical study by an expert; that as all auxiliary appliances are controlled by the motorman, the handling of the plow is greatly simplified and expenses reduced, and that while the original cost may be slightly more than the present plows used, it will prove much the cheapest in the long run.

One of the illustrations in the pamphlet shows the Wilder radial snow plow on a 45-foot radius curve; another view shows the plow going thirty miles an hour through snow that would average three feet deep; another view shows the plow breaking through drift five feet deep and 800 feet long, going at about twenty miles an hour, while another view shows path made by plow through drift from 4 to 6 feet deep and nearly 1,000 feet long; width of path, 8 feet at 3 inches above rail, and 12 feet at 33 inches above rail. Diagrams showing points of superiority of the radial plow over the present type are also given.

* * *

*The Use and Abuse of Fire Brick for Locomotive Fireboxes.**

Fire brick arches have been used for so many years in locomotive fireboxes that the purchasing departments and motive power departments of the railroads, as well as the manufacturers of fire brick for this purpose, seem to have fallen into a rut, and apparently the subject is not receiving the attention it deserves. In the opinion of the writer there is room for improvement in both the manufacture and use of fire brick arches.

Cold air after extreme heat is the hardest test of a good fire brick. It is a regular occurrence, on most roads, to run an engine over the ash-pit at the end of a run, turn on the blower and knock out all the fire. The cold air striking the red-hot bricks cools the outside, and, unless properly made, the bricks crack and are destroyed. Experience has shown the writer that a fire brick can be made by any of the larger manufacturers that will increase the life of the arch an average of 100 per cent.; that is, while on most roads the fire brick arch lasts from ten days to two weeks, by giving proper attention to the design and mixture of the clay, the average life could be increased to from twenty days to a month.

Manufacturers generally have an idea that the vibration of the locomotive is a great factor in the destruction of the

*By J. E. Bond, in The Railroad Gazette.

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arch, and that a tile must be made of such a mixture as will give as great physical strength as possible. As a matter of fact, vibration is a small factor in the destruction of the arch. The writer realizes that each clay requires a peculiar treatment of its own to get the best results; that a method of handling the clay in a given district would not be successful with another clay, even a few miles distant. Therefore, it is impossible to have a specific rule that will apply to all clays, but there are certain general details that apply to the manufacture of all fire brick.

For the benefit of those not familiar with the subject, a brief description of the process will be given. Fire clay usually occurs under coal measures and is virtually a pure clay. The chemical analysis is of great importance in certain lines of work; it is of less importance in railroad work than the physical qualities, since the gases of coal do not cause much deterioration, unless there is a considerable percentage of iron in the clay, when the sulphur of the coal may unite with the iron pyrites and cause injury to the brick. Fire clay is mined about the same as coal. When it first comes from the mine it is as hard as stone and fractures of the clay will be so sharp that the pieces will cut the hands. The clay is of three general varieties: plastic, semi-plastic and flint. The first, when tempered, becomes like putty and is easily worked with the hand. The second, if exposed to the weather sufficiently, or if sufficiently tempered, will also become plastic. The flint clay will not become plastic when exposed to weather, but will break up into small crystals if exposed for some time. The chemical analysis of these three clays may be identical. The clays are ordinarily pulverized in a dry pan crusher, and mixed with calcine (burned fire clay) ready for tempering. The tempering is ordinarily done in a wet pan. The clay is taken from the wet pan to the moulders, where it is moulded into the desired shapes by hand. It is then placed on a hot floor, where it is dried, and afterwards burned in a kiln at a temperature of about 3,000 deg. F., after which it is allowed to cool down slowly for a number of days before opening the kiln.

Now it is the mixture of the clays that determines the character of the brick. For high grade, such as is used in blast furnaces, steel furnaces, etc., the mixture is largely flint and calcine, with just enough plastic clay to form a bond to unite the particles. It is made in as soft mud as will retain its shape after being moulded. When this is dry it is exceedingly porous and is not physically strong. It is nearly white in color after burning and when fractured can be pulled apart by the fingers in many cases. However, when this brick is subjected to high heat and sudden changes of temperature it does not crack or check because its porosity enables it to cool more uniformly throughout its mass. The expansion and contraction is also much less than in the more plastic kinds of brick. High grade bricks will not answer for all purposes, since they are too easily injured by abrasion. For instance, in the top of a blast furnace, where the charging of the furnace would destroy high grade brick, it is necessary to use more plastic clay and less flint.

A great deal of study has been given by iron and steel makers, as well as by manufacturers of fire brick, to get up a material exactly suited to each process connected with the art. It is not advisable to make locomotive tiles of the same mixture as high grade brick, because they would not have sufficient strength to get them into the fireboxes; but the mixture should approach nearer to the high grade than that which is generally supplied to railroads. Now the higher the proportion of flint clays and calcined clay used up to the point that will be bound together, the greater the heat and the variations of temperature the brick will stand, but the more delicate the brick will be to handle cold. Conversely, the greater the proportion of plastic clays used in the mixture, the less change of temperature it will stand, but the stronger physically the brick will be while cold. It is not altogether the fault of the manufacturer that he makes his mixture too low a grade to stand the changes of temperature incident to the locomotive operation. It costs him no more, ordinarily, to make a high grade than a low grade brick, but the designs submitted will not stand up in the higher grade material. It is therefore up to the railroads to design a brick that will stand.

But it is impossible for a designer who is not familiar with the processes of manufacture to design fire brick intelligently. It would be money well spent to send the designing engineer to the fire brick factories to spend as long a time as he needs

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to get an insight into the business, and that he may co-operate with the manufacturer in getting out designs that can be made. As a case in point, a manufacturer of fire brick in Missouri showed the writer a design from a prominent western road that called for iron bars in the tiles to strengthen them. They ran the entire length of the arch. This manufacturer simply made holes through the tiles, which were for wide firebox engines, and told the railroad people they could supply their own iron. For it is well known by all who are familiar with the art that iron heated to the temperature of the firebox has little or no strength, even if it is not melted, and had the iron been placed in the tiles before burning, it would have been melted long before the furnace attained the heat necessary to burn the brick, and would have ruined any other bricks in the kiln as well.

Most roads make tiles for wide firebox engines in two sections, butting the tiles together in the middle of the firebox. This the writer believes to be wrong in principle where arch tubes are used. There are usually four tubes to support the tiles. The joints should be made over the tubes in order that there be as little overhang or cantilever as possible. Now, because the tubes, containing water, keep the adjacent part of the tile cooler than the part which is away from the tube, this causes the material to expand on the top of the tile and remain contracted on the lower side, causing the tile to droop and gradually to fracture. Then when a rough place is produced by the drooping of the tile, the action of the gases and cinders becomes much greater at this point, causing more rapid abrasion. In narrower types of fireboxes containing two tubes it is better to make a joint over each tube, with a special tile supported on studs in the side sheets for the ends; or make the end tile longer so that the end resting on the tube is lower than the end resting against the side sheet. The studs can thus be dispensed with.

The writer has seen large quantities of fire brick arches stored in the open air on certain roads in the West and Northwest. Nothing could be worse for fire brick of a quality good enough to stand the changes of temperature than exposure to winter weather, for the reason that a good fire brick is exceedingly porous and absorbs a great deal of water. When the water freezes it expands and fractures, if it does not break, the brick. It is economy to erect good dry storage sheds for all fire brick. Even the moisture absorbed from the atmosphere makes a brick more delicate in cold weather. Summer rains are not so injurious as the winter rains.

Complaint came to the writer that a certain road was having heavy loss in its locomotive tile. It was high grade material and should have yielded good results. Investigation revealed the fact that the tiles were piled 20 to 25 feet high in a shed. It was being handled by cheap help, and indeed the breakage was a serious item. Manufacturers seldom, if ever, pile fire brick to exceed 8 feet high, because it is not strong enough to withstand the pressure incident to higher piling, especially in the winter when frost weakens the material.

Another abuse often seen is to bring tiles covered with ice into the roundhouse, install them in a firebox and then build a fire under the arch with forced draft. The unequal expansion is sure to cause injury to any fire brick under such circumstances, and very often the arch will break down before the engine reaches her train.

The higher the grade of brick, the better it will stand this kind of abuse, since the greater porosity enables the steam to escape more readily, but it will be much better to store the bricks in a warm place for a few days before installing, in order that they may become as dry as possible. In starting up a new stove or blast furnace, steel manufacturers take several days to get their furnaces up to heat, but they expect to get months or even years of service out of a lining.

Intelligent study of the subject will, without doubt, reduce expense in the use of fire brick arches.

* * *

*Ganz Steam Motor Car for the Erie.**

The first Ganz steam motor car to be constructed and given its initial operating test in this country was delivered to the Erie Railroad at Dayton, Ohio, on June 24 by the Railway Auto Car Company of New York. The car left Dayton for a leisurely trip to Jersey City over the Erie Railroad under its own steam. After reaching Jersey City the car was placed in regular service on one of the suburban lines of the Erie, and

*From The Railway Age.

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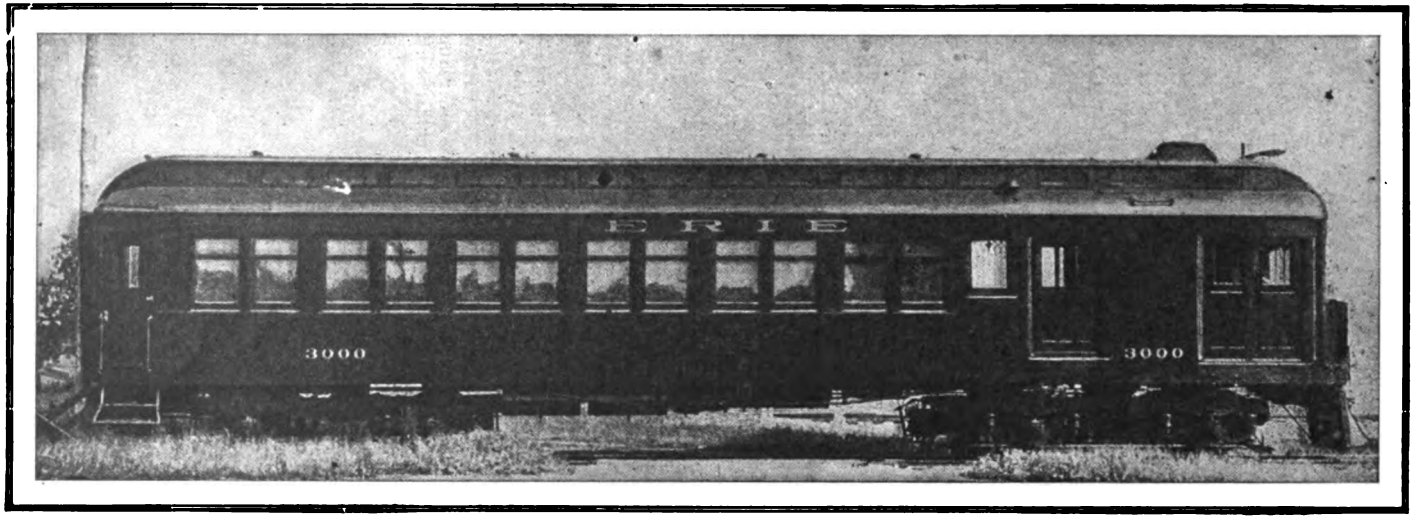

GANZ STEAM MOTOR CAR FOR THE ERIE RAILROAD

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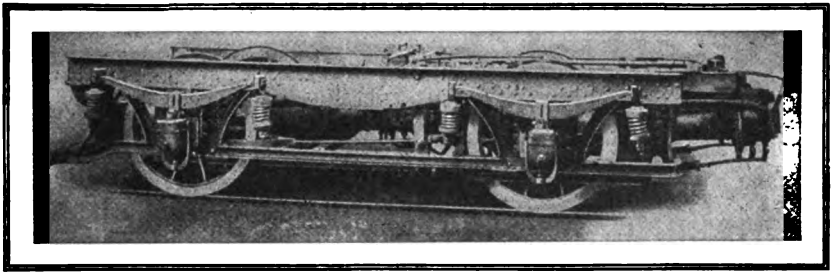
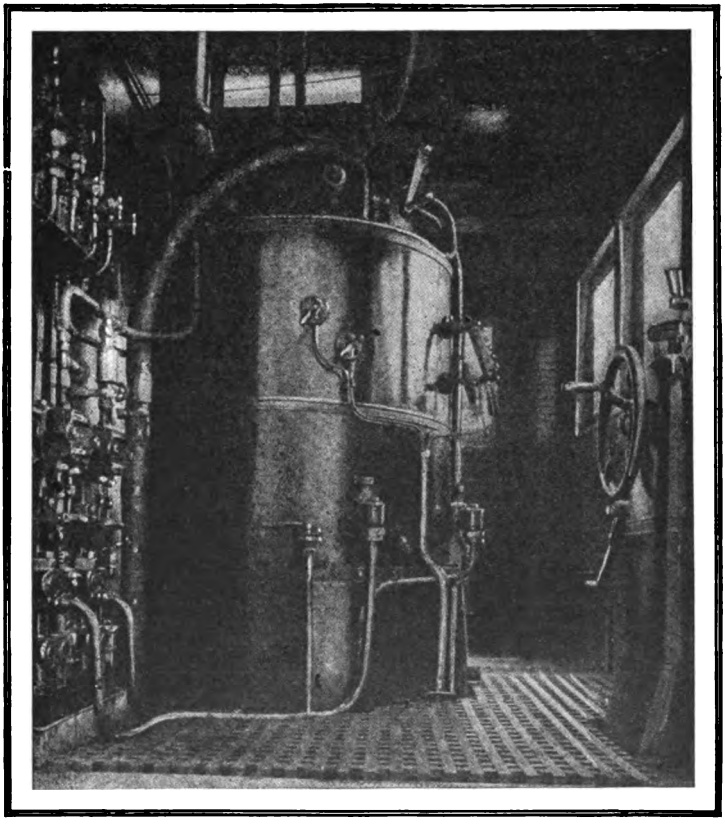


GANZ STEAM MOTOR CAR FOR TH ERIE RAILROAD—TRUCK ON WHICH ARE MOUNTED THE ENGINE CYLINDERS

will be subjected to thorough tests. The only other Ganz car in actual service in this country is the one in use on the Florida East Coast Railway. This car was imported from Europe, where a great many of the cars are in use, giving satisfactory service.

The Erie car, as may be seen from the accompanying illustrations, is similar in appearance to the standard suburban passenger coach of the railroad company. The car is divided into four compartments. The motor compartment in the forward end occupies six feet. Imme-



GANZ STEAM MOTOR CAR FOR THE ERIE RAILROAD—INTERIOR VIEW OF CAB, SHOWING BOILER

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diately behind this is a similar space for baggage. Next is the smoking compartment with twelve seats. The rest of the car is the general passenger compartment. The car is 58 feet long over all and has seats for fifty passengers. The weight in working order is 45 tons, the use of a wooden body making the car heavier than the all-steel construction Ganz car, which is being built for the Chicago, Rock Island & Pacific Railway, and is to weigh 36 tons.

The car is equipped with two compound inclosed steam motors of 60-horsepower each. These are mounted in the forward truck, each driving one axle through gears. The cylinders are 4.7 inches and 6.7 inches, with a 5½-inch stroke. The maximum tractive effort is 3,700 pounds, and the motors are arranged so that either may be operated independently of the other. All the working parts of the motors are inclosed in water and dust proof cases and run in oil. The steam generator, which is 42 inches in diameter and 5 feet high, is of 120-horsepower capacity, with a heating surface of 212 square feet and 6 square feet of grate area. The steam pressure is 270 pounds, the steam being superheated. The boiler compartment also contains the control levers.

The fuel to be used is anthracite coal or coke, and this is carried, as shown in one of the accompanying engravings, in a bunker on the front end of the car which will hold enough coal for a continuous run of fifty miles. The fuel consumption is not expected to exceed 15 pounds per mile. The water tank, with a capacity of 600 gallons, is built into the underframe of the car. The air brakes are of the Westinghouse type, the air compressor being mounted on the trailer truck. The lighting is by Commercial acetylene gas and the car is heated by steam. The car is designed to make a speed of forty miles an hour on level track and fifteen miles an hour on 2 per cent. grades, and will haul a trailer at a speed of thirty miles on level track or at eleven miles per hour on 2 per cent. grades.

The Ganz principle for motor car operation has been described in detail at various times and was recently the subject of an interesting paper presented before the New York Railroad Club by Charles Ducas, secretary of the Railway Auto Car Company.

*Western Railroad Activities.**

Will Spend Millions on Cut-Off.—In order to shorten his Union Pacific Line as much as possible President Harriman is spending millions of dollars near Omaha to make a cut-off. This work is on a similar scale to the famous Bay-Shore cut-off just south of San Francisco, and the equally noted Lucin cut-off across the great Salt Lake. Work is being conducted steadily on the Omaha cut-off, and no particular attention is being paid to the old theory that waterways should be followed to facilitate construction.

The double track line cuts across three natural drainage systems, the Little Papillion Creek, the Big Papillion Creek and Hell Creek. At the point where the cut-off crosses Little Papillion Creek Valley, it is approximately 3,000 feet wide, and Big Papillion Valley approximately one and one-eighth miles wide.

Both of these valleys are nearly level for their entire width, and, while the creeks themselves are small at normal times, both valleys have been at various times covered with water from one to five feet deep.

The Valley of Hell Creek is narrow and deep—considerably narrower than the other two mentioned—though it drains a large area and is subject to sudden and deep floods. Besides the grading of the wide valleys, there will be required before the work is finished, excavation of more than 2,800,000 cubic yards of material. To make the necessary fills, approximately 3,389,000 cubic yards of material must be excavated, hauled, and dumped. This is one of the heaviest and most expensive pieces of work the great Harriman System will be called upon to do, perhaps for years to come.

S. P. Begins a New Feeder.—Operations on President Harriman's Cananea, Yaqui River and Pacific Railroad, in Old Mexico, has already been commenced out of Orendain, on the Guadalajara extension. It is to be, like the latter, a Southern Pacific feeder in Old Mexico.

By the end of August, this work will be well under way, as there is plenty of available labor in the Tequila district of the State of Jalisco, in which Orendain is located. The construction of the

*By J. Mayne Baltimore, special correspondent to the Locomotive Firemen and Enginemen's Magazine.

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Guadalajara extension is progressing rapidly. On the southern end of the line up the Yaqui river valley, and on the branch to the Alamos, about 4,200 men are employed now, of which number there are 900 Chinese, and 200 Russians. These foreigners are proving very satisfactory as workmen, and it is probable that more will be imported as necessity requires.

Already the work of grading on the main line has been carried on to a point across the border of Sinaloa, and it is expected that connections will be made in August with the Kansas City, Mexico and Orient road at Gil Blas. The force on the work out of Mazatlan will be doubled at the end of the present rainy season, and operations in both directions pushed vigorously. It will be necessary to import more Japanese railway ties for the road, as the supply from Sinaloa contractors has not been as large as was expected. The Japanese ties are not very expensive, and are as good as any that can be obtained.

An Important Branch Line.—Negotiations are now in progress in New York for sufficient funds to build a proposed railway in the counties of Marin, Sonoma, Napa and Lake, California. This project is mainly headed by Richard Hotaling, a prominent capitalist of San Francisco. Traffic Expert George Ristine and a number of Baltimore engineers have reported favorably on the cost of construction, equipment, operation, etc.

These reports were received some time ago, and have been accepted by the New York syndicate. Its members have sent for Mr. Hotaling to arrange for the underwriting of $10,000,000 or $12,000,000 bonds. The road has been surveyed, and a bridge across the Napa river is now being built in order to preserve rights of way given the company by the Napa authorities.

The line will start at a point on Richardson's Bay opposite Sausalito, and runs by way of Corte Madera to San Rafael. It passes through Sonoma and Napa counties to Napa City. From the latter place it runs to Lakeport in Lake county.

Dangerous Roadbed to be Rebuilt.—The branch line of the Southern Pacific between Santa Cruz and Watsonville, which has been in a dangerous condition since the last big storm, is to be entirely remodeled. The single track is to be torn up and in its place a double track will be laid. This work will be completed before the end of this year at the farthest. The line is about twenty-five miles in length.

Immense Contract For Terminals.—The Western Pacific Railroad has just shown great vigor in its fight for a portion of Mr. Harriman's transcontinental business. The former corporation is making immense preparations across San Francisco Bay and northward, paralleling the tracks of the Southern Pacific into the rich territory along the Berkeley and Contra Costa shores, and also on the San Francisco side. The Western Pacific has awarded a contract to the Western States Construction Company for the railroad company's terminals in San Francisco, the total cost being $4,000,000.

This is one of the largest railway contracts ever let on the Pacific Coast in all its railroad-building history. The contract let for work on the San Francisco side of the Bay will give to the city much of the advantage that has heretofore been secured by Utah, Nevada, and Northern California, where until now building operations of the Western Pacific have been confined.

According to the terms of the big contract let, work must be commenced within fifteen days. Much of the time consumed in finishing the contract in San Francisco will be devoted to the difficult engineering feat of constructing a 1,600-foot tunnel.

The Gould people have been securing a great deal of land in the vicinity of San Francisco, and declare that their freight yards and slips will be large enough to accommodate all of the traffic that will be offered the company for years to come, and as convenient as the yards of the Southern Pacific or Santa Fe.

At present there are more than 8,000 men employed by the Western Pacific on its road, and more are being added to that number all the time. Sub-contractors are arriving every day at Winnemucca and Boca to begin work on their contracts on the line across the "Sagebrush State."

Before the end of the year, the Chilcoot and Spring Garden tunnels will be connected by tracks. It is also determined to proceed with track-laying east and west from Winnemucca at once, and rails for the work have been stacked in

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Nevada and California and many trainloads more are on the way.

Great Railway Bridge Projected.—It may be stated that many leading engineers of the great Northwest and others are planning not only bridges in British Columbia, but are projecting engineering schemes by which, if carried out, they will connect the island of Vancouver with the mainland.

The Canadian Pacific (owners of the Esquimalt and Nanaimo Railway in Vancouver Island) is preparing to extend the line beyond the eighty-three miles between Victoria and Wellington to points north and west. One extension of fifty miles is to run from Wellington to the Comox coal mines. Another fifty miles is to connect Nanaimo with Albeni on the west coast.

What the people of Victoria and Vancouver Island most desire, and are persistently endeavoring to bring about, is the extension of the island railroad to Cape Scott, the extreme north of the island, and the bridging of Seymour Narrows by a Canadian Government toll bridge, such a bridge to be open to all roads (whether Grand Trunk Pacific, Canadian Northern, or Canadian Pacific) direct to Vancouver Island with Victoria as the natural terminus. With this in view the board of trade and citizens of Victoria have presented strong memorials to the Dominion authorities asking the construction by the government of a railroad bridge at Seymour Narrows, connecting Vancouver Island with the mainland of British Columbia.

Plans have been prepared for the construction of such a bridge. The scheme proposes a series of bridges, from island to island. The longest span from Valdez Island to rock would be nearly 1,000 feet in length, but as the Quebec bridge across the St. Lawrence has a span of 1,840 feet, the one contemplated here could be erected without danger, once the pier is built on rock in the center of the narrows. Competent engineers declare that this is entirely feasible. It is estimated that the cost of this bridge would be from $14,000,000 to $18,000,000, to be paid for by Dominion funds.

North Line to be Built.—At length the long-talked of coast line to Oregon has been ordered by Mr. Harriman. The first work will be the construction of 110 miles through the mountainous region between Willits, in Mendicino county, and Shiveley, in Humboldt county, which will connect San Francisco and Eureka by rail. Work will then be continued along the coast into Oregon.

The Northwestern Pacific has sufficient funds to carry on the whole work. The company's stock issue of $35,000,000 is held in equal parts by the Southern Pacific and Santa Fe. Its authorized bond issue is also $35,000,000, of which $25,000,000 is available for construction work. The portion of track to be built between Willits and Shiveley will cost $13,000,000, or $120,000 a mile, much more than the road into Oregon.

There is one stretch on the new work where it will require $3,000,000 to build seven miles of track, from Dyerville to Eel River. A tunnel of 3,000 feet and a steel bridge over the river will be built as rapidly as possible at this point, and working forces from the north and south will lay track toward this difficult piece of construction.

Gould System Purchases Ship Yard.—A tract of very valuable land fronting on the Oakland, Cal., estuary and occupied by the ship yard of W. A. Boole & Son has recently changed hands, and there seems to be no doubt but the purchaser is the Western Pacific Railroad Company. The consideration involved is $650.000. The railway company owns a large tract (over ninety acres) just north of the Boole holding. This tract belonging to the railroad company was originally a tide flat and is being filled in with suction dredges. The Gould interest has long been endeavoring to increase its land holdings at that point on the bay. With the Boole property secured the Western Pacific will have the largest railway terminal facilities on the Oakland side of the bay. Besides, the Western Pacific will need a dry dock and shipbuilding yard to accommodate its own fleet of boats, transfers, etc.

May Purchase Union Iron Works.—The Western Pacific Railroad has, for some time past, been seeking to secure the site of the great Union Iron Works for a freight yard in San Francisco. Since President Charles M. Schwab announced that the Union Iron Works, on account of unsatisfactory labor conditions, would go out of the battleship business and devote itself more particularly to smaller work, the great iron works will need much less room than it

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now occupies in the Potrero, and can afford to part with enough of its grounds to make a good-sized freight terminus for the Western Pacific.

The Western Pacific covets this site for its San Francisco freight yards on account of the advantageous position in relation to the new wholesale district and on account of the deep water at this portion of the bay making it possible to load and unload deep-sea vessels at the yards. It is also the shortest distance from the Oakland terminus of the Western Pacific that could be obtained.

Heavy Tunnel Slide.—Recently another heavy cave occurred in the Franklin Tunnel on the Santa Fe's main line in Contra Costa county, which will prevent the running of trains for several months. This tunnel is about a mile in length and has at different times caused the company a great deal of trouble. Not long ago many of the timber supports in the tunnel caught fire, closing it for traffic for a number of weeks. At that time the Santa Fe was compelled to use the Southern Pacific line from Martinez.

Rushing the Work of Construction.—The Western Pacific is crowding the construction of its line from Salt Lake to the Pacific with all possible speed, and every man available is being sent to one of the fifty camps established between Elko and Winnemucca. The rails are laid to within twenty miles of Elko and grading has been done along the survey throughout the State. Three carloads of men have recently arrived at Reno, making 15,000 laborers.

Sixty tunnels have been bored along the right of way, and now that this slow work has been completed the construction will rapidly progress. Half the work on the Chilcoot Pass tunnel, about 4,000 feet, has been completed and tracks are being laid east of Beckwith toward Sacramento. From Sacramento rails are being placed north to a point forty miles east of Oroville, which will connect with the tracks already laid from Oakland.

Santa Fe's New Concrete Freight Depot.—The Santa Fe Railroad Company has very recently completed at Los Angeles, Cal., one of the largest and most expensive freight depots west of the Missouri river. The contract price for this immense depot was $225,000, but the total cost was approximately $300,000. Throughout, the mammoth depot is constructed of strongly reinforced concrete. The total length of this depot is 1,320 feet (one-fourth of a mile); total width 91 feet, and it is two stories high. In every respect the building is practically fireproof. Mr. Carl Leonhardt, the prominent Southern California contractor, was awarded the concrete work. However, all the work was under the personal charge of General Manager Wells and Acting Engineer Morse, both of the railway company. All the plans and specifications were prepared by Architect Harrison Albright.

Strongly reinforced concrete has been principally used in this structure, with clear spans between columns 60 feet apart. One of the features of the new building is the ease with which it can be converted from a closed building into an open one. The mere turning of two levers will open up one-half mile (each side for the entire length of the depot) of pivoted transom windows. The reverse movement of the same levers closes the windows. On most of the ground floor the space will be devoted to inbound and outbound freight, on opposite sides of the building.

This building contains a great many offices of the railroad company, including those of the general manager, chief engineer, assistant engineer and other officials.

This new building is one of the most complete and perfect in the world in the way of facilities for the rapid handling of freight, system of elevators, ventilators, steam heating, lighting, automatic sprinklers, etc. In fact it is unsurpassed. The new depot is the largest and most commodious building of the kind belonging to the entire Santa Fe system.

New Alaskan Railway.—A railroad, international in character, is to be built from Haines Mission, on Pyramid Harbor, through that section of Alaska and across a stretch of Canadian northland territory to Fairbanks and thence on to Nome.

New York capitalists and Alaska operators are back of the enterprise. C. Wynn Johnson represents the Eastern syndicate. He has just returned to Skagway from New York and Washington, where he says he secured the necessary franchise rights, and that he obtained from the Canadian government a charter. The junctions of the two companies necessary to form the inter-

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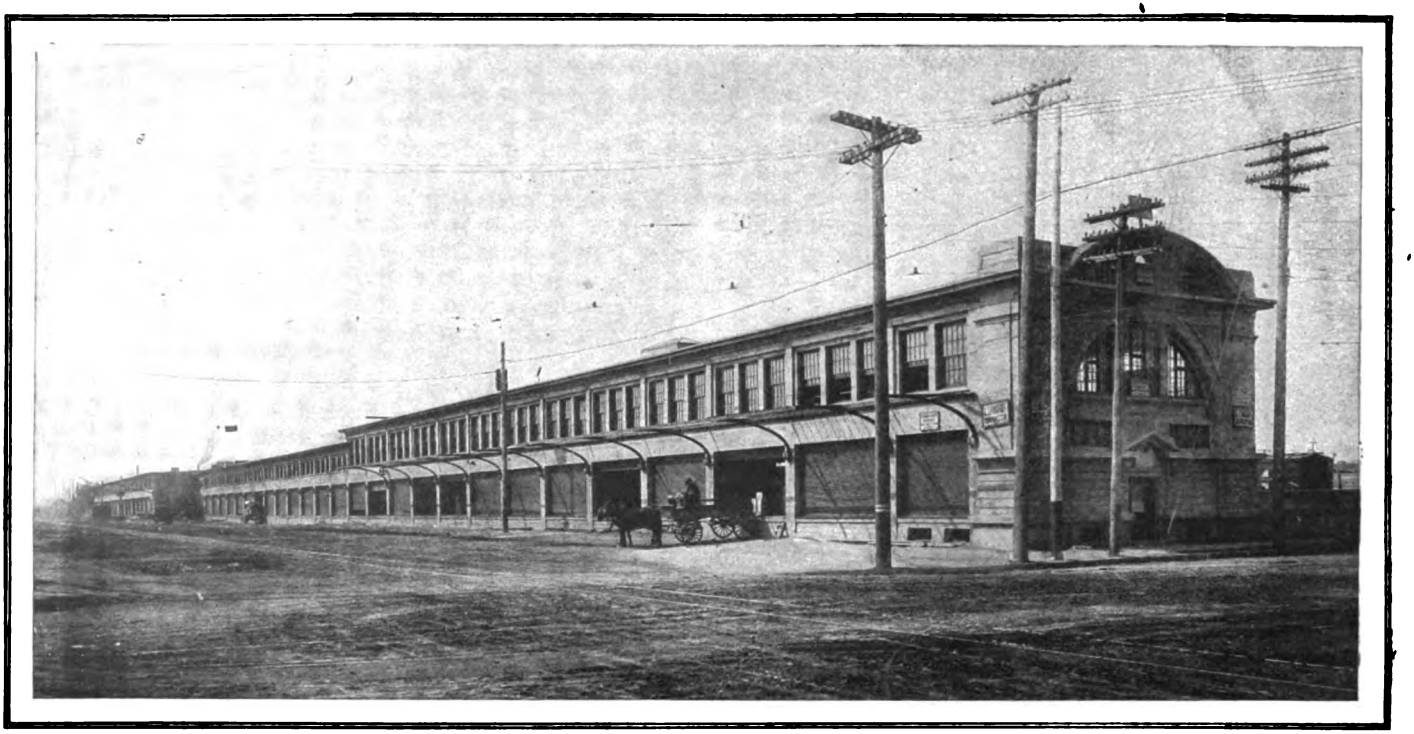

NEW CONCRETE FREIGHT DEPOT, SANTA FE RAILROAD, AT LOS ANGELES, CAL.

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national system will be found about the head of White river.

Rushing Work on Big Freight Yards.—In order to facilitate the handling of freight, the Southern Pacific is rapidly completing its two new immense freight yards. One of these yards is located in the southern part of San Francisco, in Visitacion Valley. This district is close to the six-mile house, and joins the Bay Shore cut-off, which is very soon to be thrown open to traffic.

The Visitacion Valley yard will have sixty-one miles of side track, and be one of the largest west of Chicago. When the Dumbarton Point cut-off is finished, this immense yard will be made use of as an adjunct of the other large yard nearer San Francisco.

The second large yard is located at Roseville, a few miles east of Sacramento. The company there is putting down forty-five miles of side track. The completion of these two immense yards, jointly representing 106 miles of side trackage, will very greatly facilitate the handling of the vast quantities of freight on all the western lines of the Southern Pacific, south, east and north.

Structural Bridge Material.—General Manager C. C. Calvin, of the Southern Pacific, states that all the structural bridge material for the four bridges on the Bay Shore cut-off is now on the way from the East. As soon as this material arrives, work will be commenced on putting the bridges together. This will be crowded forward with all possible haste. Manager Calvin thinks the cut-off, when ready for operation, will be one of the fastest pieces of railroad in the United States. The cost of the eleven miles of road amounts to nearly $7,000,000 and will, like the Lucin cut-off across the Great Salt Lake, be a second monument to the ability of Chief Engineer William Hood.

Killing Weeds with Salt Water.—The briny water of Great Salt Lake has been tried by the Oregon Short Line Railroad Company for a rather novel purpose, and with remarkable success. Stored in large tanks, the salt water from the lake has been hauled over the line by water trains and sprinkled liberally along the right of way. Under this treatment the rank weeds which are the bane of the gangs of section hands have withered away and died. The advantage of using this very strong brine is that it destroys the troublesome weeds, "root and branch." Sixteen months have elapsed since the first experiments of this sort were made, and the new method has been permanently adopted by the company.

The Art of Railroading, or the Technique of Modern Transportation—A Recently Published and Most Valuable Work.

The old time method of calling a man into the office and saying to him: "Here, Bill, I want you to get on the 77 and run her—you've fired long enough now and you ought to get along all right"—without any preliminary examination as to his qualifications for filling the position and assuming the increased responsibilities attached to same, has long since been discarded. Increased traffic and modernized equipment, with vastly superior transportation facilities, has made it imperative for the safety of life and property to place only those men in responsible positions in the motive power and transportation departments of our great railroad systems who have shown their adaptability to the service and demonstrated their possession of all the knowledge so essential to the successful performance of their very important duties.

The engineer who knows only enough to "stop and start her" and the trainman who is content to rely upon someone else's judgment as to whether or not his train has a right to the main track is antiquated and no longer tolerated. With the mammoth locomotives of today, veritable power houses on wheels, and long and heavy trains laden with valuable merchandise, each representing many thousands of dollars, to say nothing of the numerous first-class trains of costly construction and palatial apartments laden with passengers who are traveling along blissfully content to place their trust in the skill and judgment of the train crews and other employes who are charged with the responsibility of getting them safely over the road, it can readily be seen why it is so necessary to exact of train service men the highest standard of capability. These changed conditions require that the employe study and become thoroughly familiar with every detail of his duties, and in order that he may advance to a higher position he is required to undergo rigid examinations

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on mechanical subjects, train rules, etc. The one who improves his spare moments with a system of study and seeks diligently after knowledge pertaining to his calling is the one who succeeds, while he who idles away time that could be more profitably spent works against his own best interests and is, as a rule, doomed to failure. In pursuing any study one can not hope to at first master any and every difficult problem as it comes up. It requires courage and perseverance, but if he would conquer he must wrestle with the problem until he succeeds in dispelling its mystery, when the joy of victory will more than repay him for the time invested. To such as have the will power and a determination to succeed the opportunities to attain an education which will add dollars to his earning capacity are numerous.

One of the best and most efficient sources of information for railroad men that has come to the Editor's attention is that supplied by the Railway Publishing Society, 350-352 Wabash ave., Chicago, Ill., which has recently published a most valuable work entitled "The Art of Railroading, or the Technique of Modern Transportation." This work comprises eight volumes supplemented by correspondence instruction. These volumes cover a wide range of subjects pertaining to railroad construction and operation. Following many of the chapters, in order that the student may test his knowledge of the subjects studied, are review questions, while in other instances the questions are asked and answered in the manner of a catechism. The publishers state that they make no pretense of furnishing a regular correspondence course of lessons, but issue supplementary to the set of eight volumes a certificate which entitles the student to additional assistance and information, should he need same, on the subjects treated in the books upon his submitting reasonable questions pertaining thereto, and that he has only to make his needs known to them in order to receive their aid in removing any stumbling blocks in the way of his progress which he may encounter. The following is a brief synopsis of the subject matter contained therein:

Volume I—Locomotive Engineering.

Beginning with a simple course of instructions relating to the duties of a locomotive fireman, every phase of the subject is fully dealt with. The language used is so simple that it can be easily understood by anyone able to read a newspaper. From the moment he enters the roundhouse until his engine arrives at the other terminal at the end of his run he is instructed as to what he should do. A simple explanation of combustion is given on grates and boiler tubes, the generation of steam, the various kinds of steam and its action in the cylinders and valves, the locomotive boiler, the throttle and dry pipe, the manner in which the steam from the boiler is conveyed to the valves and cylinders, is all fully and clearly described and illustrated by drawings and diagrams. The treatment of valves and valve gear is very comprehensive. There is a valuable chapter on valve setting, which is followed by a description of piston valves and balanced valves, all of which are also fully illustrated. Then comes a chapter on the indicator and another on compound locomotives. Following each chapter (or instruction paper), a series of review questions are given.

Volume II—Locomotive Engineering.

This volume, on the same subject as the preceding one, is more advanced and treats fully of locomotive appliances and their construction and operation, giving minute details with which the locomotive engineer should be familiar in order that he may, in case of defects, know where to locate the trouble and just what to do. Injectors and lubricators, inspirators, boiler washers, steam gauges, pop valves, sanders and other fittings, electric headlights (Pyle and Edwards), description and operation of engine and dynamo, engine governor, precautions for installing engine and dynamo, care of engine and dynamo, care of the engine, speed of the engine and dynamo, testing the governor, description and operation of the lamp, lamp connections, trimming the lamp, short circuits, precautions to be observed, incandescent lamps, mechanical stokers, firedoor openers, etc., are very fully treated, being followed by review questions for students. There is a chapter on locomotive breakdowns in general and an exhaustive description of the Walschaert valve gear, its construction, operation and adjustment, followed by review questions. The sight feed locomotive oil pump, four-cylinder balanced compounds, and the Ohio injector are also

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fully treated. At the end of volume II is a general index covering both volumes I and II.

Volume III—Modern Air Brake Practice.

This volume gives a plain, clearly-stated and simple description of the Westinghouse and New York air brake systems, together with their allied equipments, train signaling systems, etc., including the Dukesmith improvements. It explains why the air brake is sometimes not understood and why it is neglected. The Westinghouse and New York equipments and their functions are fully described, followed by questions and answers on their operation, then comes a description of their defects, with information as to how to test for and remedy them, together with questions and answers. The Dukesmith air brake control system is described, and is followed by a most valuable treatise on the philosophy of air brake handling, rules and tables for computing leverage, equalization of pressure, sizes of cylinders and reservoirs, testing and inspection, etc., with a full description of the straight air brake as used on electric cars. A thoroughly plain, clear and simple description of the new Westinghouse ET equipment with review questions concludes the volume. A general index at the end of the volume makes it complete in itself.

Volume IV—Mechanical Examinations.

This volume contains three standard mechanical examinations with questions and answers, with a very complete account of link motion and numerous tables. Many valuable additional pointers for firemen and engineers are given. There is a chapter of "Dont's," and a complete account of fuel-oil locomotives, their construction and operation. Included in this volume is a full reference to the more recent progress which has been made in air brake practice, as for instance, the New York B2-H. S. equipment. For firemen who have mastered the elementary or fundamental principles of combustion contained in Volume I, an advanced treatise on fuel combustion is given, by a mastery of which a fireman should be able to secure the greatest quantity of steam with the least possible fuel consumption, and should be enabled to a large extent to prevent "black smoke." In addition to the foregoing the Westinghouse compound air pump is fully described, and the various subjects are profusely illustrated.

Volume V—Locomotive Breakdowns.

This volume is described editorially in the Magazine for May, 1907, under the heading "A Mechanical Literary Treasure." It treats of locomotive breakdowns, together with questions and answers relating thereto, each question and answer being numbered, and is specially indexed for quick reference. Besides the large number of questions and answers on almost every conceivable form of breakdown, it contains tables and useful pointers that embody information which is exceedingly valuable to men in locomotive service, treating on care of flues, adhesion and traction of locomotives, distribution of weight in locomotives, tractive power, how to figure what a locomotive will pull, train resistance or locomotive rating, short cuts in arithmetic, and hydraulics. The book contains, in addition to its regular illustrations, two large folding inserts, one of which shows a balanced compound locomotive with Walschaert valve gear and latest improvements, while the other shows the Pyle National Electric Headlight. On each of these inserts the different parts are numbered, and the names and numbers corresponding to same are given in list form. In addition to the special index, a general index is given at the end of the book.

Volume VI—Machine Shop Practice.

The author in his preface states that this work has been compiled for the use of machinists, engineers and others who are interested in the use and operation of the machinery and machine tools in a modern machine shop, and that every effort has been made by him to deal with the subjects which come within the scope of this work in as practical and non-technical a manner as possible. Beginning with simple arithmetic, it leads by easy steps into practical geometry, mensuration of plane surfaces, etc., and applied mechanics. Complete and full information is given on measuring devices, machinists' tools, shop tools, machine tools, boring machines, boring mills, drill presses, gear cutting machines, grinding machines, lathes and milling machines, also auxiliary machine tools, portable tools, miscellaneous tools, plain and

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spiral indexing machines. There are notes on steel, gas furnaces, shop talks, shop kinks and a large number of tables. Explanation of the problems and examples worked out are given, some being illustrated by line drawings. To the machinist apprentices in railroad shops this volume is particularly valuable.

Volume VII—Station and Train Work.

Part I—Railway Organization and Station Work, deals fully with railway station work. Part II—Train Work: Trains, Movement and Operation; How Governed, and Standard Code Rules, explains in detail how trains are operated. Part III—Telegraphy, explains all about telegraphy. Each part is separately indexed. The qualifications and duties of employes at stations are given, with general rules governing the proper management of such stations, etc. The purpose of train rules, prime requisites in railroading, duties of employes, etc., and full instructions on all train rules and signals in use are dealt with. The duties and qualifications of train brakemen, conductors, dispatchers, trainmasters and superintendents are given, and the subject of color blindness, standard code of train rules, definitions, single track rules, double track rules, etc., are very fully treated. The volume contains the examination for trainmen, questions and answers, general rules covering the operation of trains and the handling of freight and passengers, trainmen handling the air brake, with questions and answers, clearance cards, forms, train orders, etc., and first aid to the injured. The fundamental principles of telegraphy, with lessons and exercises for the beginner, are given, as well as instructions and rules for telegraph operators and train dispatchers, train orders, examples, commercial telegraphy, cables, etc. Where necessary, illustrations have been freely used, and examples are given explaining the methods of signaling, besides forms of various kinds.

Volume VIII—Electrical Railroading.

The electric locomotive is now in active and successful operation and is being rapidly developed and improved, and it is only a question of time—probably a very short time—when it will, to a large extent, take the place so long occupied by the steam locomotive in certain classes of service or in special territory. This fact is appreciated by progressive railroad men to whose interests it is essential to secure all the information possible on the subject. The series of lessons in this volume on electrical railroading are most thorough, plain and straightforward, and in language which is easily understood. They tell of the principles of direct and alternating currents, single phase, poly phase, measuring instruments, voltmeters, ammeters, wallmeters, ohm meters, bond testers, generation of power, power houses, steam power, water power, steam engines and turbines, dynamos and generators, trolley wire, third rail, series system, parallel system, overhead conductors, underground conductors, submarine conductors, pole lines, conduits, electric traction, steam and electric traction compared, locomotives as compared with motor cars, advantages of electric traction, systems of controlling trains, description of existing systems, description of electric locomotives, description of motor cars, car bodies and trucks, instructions for operating locomotives and cars, special air brake instruction, location of troubles, and remedies for troubles when found. The instructions are intended to make the student conversant with the use of the various pieces of apparatus in connection with the electrical rolling stock of the large railroads, and should enable them to have a good understanding of same when preparations are being made for the electrification of their roads.

The above described volumes constitute a most complete technical library for the ambitious and progressive railroad man. The publishers make a most advantageous offer to purchasers, issuing supplementary to the set of books a certificate entitling them to the privileges of railway service correspondence instruction for a specified time without additional cost. Full information may be obtained by addressing Railway Publishing Society, 350-352 Wabash avenue, Chicago. Ill.

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Electric Locomotive and Train on the New York, New Haven and Hartford Railroad.

The illustration herewith shows one of the new electric locomotives, with train, on the New York, New Haven & Hartford Railroad, which run into the Grand Central Station. These trains are operated for thirty-one miles by electric loco-

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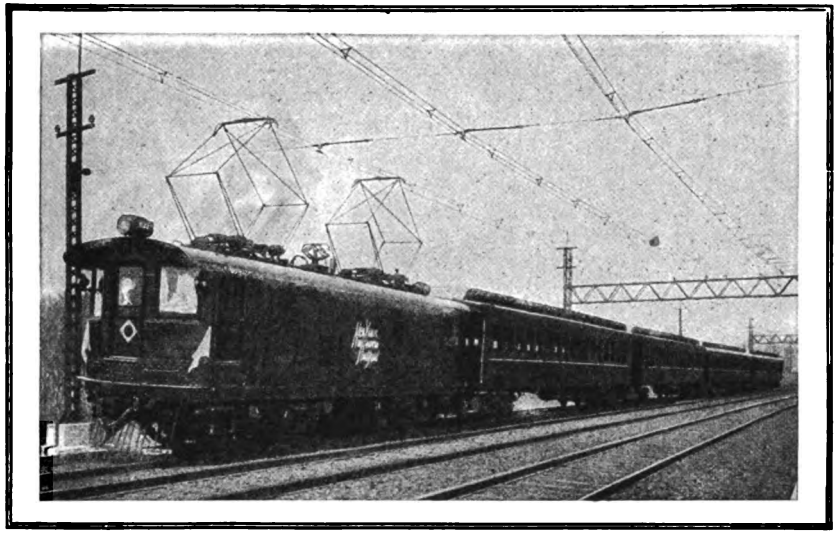
motives, each of which are equipped with four motors having a maximum total of 2,000 horsepower. The locomotives are of the single-phase system and the motors are said to operate as well on the 650-volt direct-current lines as on their regular 11,000-volt alternating-current circuit, which is necessary, as they must run not only on the alternating-current line of the New Haven system but on the direct-current lines of the New York Central as well.



ELECTRIC LOCOMOTIVE AND TRAIN ON NEW YORK, NEW HAVEN & HARTFORD RAILROAD

*Corrugated Tubes for Locomotive Service.**

G. W. West (N. Y., O. & W.)—My attention was called first to the spirally corrugated tube in 1887, by Charles Whitney, who was at that time United States representative for a foreign made corrugated tube. Previous to that time I had been experimenting with plain tubes to improve circulation and overcome the leaky tube habit and had fitted up three different classes of boilers that were originally designed for plain 2-inch and 2¼-inch tubes. It had always seemed strange to me that locomotive tubes, no matter how well they were set in the firebox or how poorly set in the smokebox, yet they would invariably leak at the firebox end and when it was not considered bad practive to remove part of the set of tubes we often found two or three rows at the extreme sides and top would often outlast two settings of tubes near the center.

I concluded that there was one of two, possibly both, reasons for this other than the excuse often given, that of expansion and contraction; my reason was that the tube sheet in the firebox did not get the protection that the smokebox sheet did or the tubes would leak where the poorest work was done and the secret of smokebox end of all tubes and the extreme top and side rows in the firebox end not leaking was due to their having sufficient amount of water to fully protect them.

By welding 1¾-inch safe ends six or eight inches long on our 2-inch tubes and 2-inch safe ends on our 2¼-inch tubes, we could increase our tube hole unions or bridges ¼-inch, thus strengthening the tube sheet and increasing the volume of water around the tube sheet where it was needed, and also improving the circulation. This practice we have kept up and our engines steam better, tubes leak less and our trouble from clogging with cinders is almost entirely done away with. So much for the plain tube.

*Topical discussion at the annual convention of the American Railway Master Mechanics' Association at Atlantic City, N. J., June, 1907.—From The Daily Railway Age.

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When Mr. Whitney came to us with his corrugated tube, it was the same size throughout, and I told him that if he would furnish us with a set with plain ends and the one end reduced in size to fit a flue sheet we were then putting in a passenger engine, our No. 67, we would give him an order, which he did. We looked for trouble of clogging which never came. We were using at that time a very poor grade of bituminous coal and kept a gang of men at each terminal boring out tubes. I have forgotten how long this engine run, before a flue auger or any other device was used to clean them, but of sufficient time to make friends of the engineer, fireman and flue cleaners.

The corrugated tube made double the mileage of any plain tube we had ever before used in this particular engine or any of this class, and since the tubes have been made in this country we have applied them to all classes of engines, the wide and narrow firebox, burning both bituminous and anthracite coal, often a mixture of both, and we believe the extra first cost is soon met by increased mileage and saving of labor.

Another very important advantage in their favor is the almost total elimination of hot sparks thrown from the stack. We have a new passenger locomotive fitted with these tubes that is pulling eight cars up a continuous grade of twenty-one miles, eighty feet to the mile and on the darkest night, or through all our tunnels, two of which are nearly a mile long, you can hardly see a red hot spark thrown from the stack. The effect of this is shown in the temperature of smokebox front. The paint on the front end of engines equipped with these tubes clogging up over the plain tube. We use a very fine grade of the plain tubes.

I have a statement from the New Jersey Tube Company, which simply corrugates the tube, giving me a list of about 20 railroads that are using these tubes, and I thought it would be a subject well worthy of consideration. Unfortunately, I am unable to give you any data from other roads except one, which I am not at liberty to mention, but I think the subject is one well worthy of consideration.

PRESIDENT DEEMS—As this subject is so closely related to some of the other subjects which we discussed yesterday and today, it ought to be worthy of a good deal of careful consideration.

F. P. ROESCH (Southern)—We have one experimental set of spiral corrugated tubes in use on the Southern Railway Company which we tried last December, and up to this time we have had no trouble, of course, from flue leakage, on account of the short length of time. We have found practically no difference in the tubes clogging up over the plain tube. We use a very fine grade of coal and have more or less trouble with it, but I can not see, with the corrugated tube, that it stops up any less than with the plain tube. So far as the elimination of sparks is concerned I am not in position to give any data on that, because we use a spark arresting front end, the same as any one else, and we do not expect to get the sparks there with the corrugated tube or any other kind of tube, but it appears to me that this tube will eliminate sparks that might escape, and in practice it might do away with quite a number of devices we have in the front end now for the prevention of sparks, and in that way we might be able to obtain a little better or a little freer exhaust, that is, a freer and more unobstructed passage for the gases. As I understand the theory of this corrugated tube it is that the passage of the gases is obstructed to a certain extent in their passage through the tube, and in that way the heat of the gases is absorbed by the water. However, as I said before, I am not in a position to give any definite information. I believe from what we have seen so far that there is something in its favor as regards flue leakage from the fact that another locomotive of exactly the same type that received plain tubes at the same time is now beginning to show signs of flue leakage, and it is only a question of a short time when the flues will have to be renewed. Whether this is altogether due to the spiral corrugated tube or the way in which both locomotives were handled, both in the same condition, and in the same class of service and operating under the same conditions, I am not prepared to say.

There might be something in favor of the corrugated tube due to its stiffening qualities; that is, it would not have the same tendency to vibrate that an ordinary tube has.

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Boiler Explosions.

There is but one broad general cause for all boiler explosions, and that is the simple one that the boiler was not of suf-

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ficient strength to withstand the pressure to which it was at the time subjected. This is axiomatic, and may be made to cover the multitude of contributing causes to one or more of which the explosion is usuallly directly attributed. In the days of not-knowing, there is always a tendency to attribute natural phenomena which we are unable to explain, to some mysterious agency, and the theories that have been propounded to account for what happened are many and strange, while few are based upon real knowledge. It matters little what may be the cause of the weakness of a boiler; whether it comes from deterioration or design, the result is that when it is not strong enough to withstand the pressure it bursts.

In the case of stationary boilers, the causes of weakness still run the whole imaginable gamut, and to the man who has been in close touch with the cheaper grades of work and unskilled attendance the wonder is not that there are so many explosions, but that so many boilers hold together as long as they do. Owners and operators seem to think that a boiler is a boiler, and because it is one it can be subjected to all manner of abuse and still remain intact. But when a mud-drum head is repaired by using a flat cast plate one inch thick and three or more feet in diameter, and then subjected to a rising pressure, the wonder is that it did not let go before the 40 pounds pressure which did burst it was reached. Of course, it could not hold, and the reaction of the steam made a fine skyrocket of the parts that remained intact. Where the water is bad and boiler cleaning difficult, the unskilled and ignorant boiler attendant is more than apt to neglect the necessary cleaning, and the thrifty owner begrudges the services of an inspector until it often happens that the boiler is really working on the strength of the scale. In one case where these conditions prevailed, the scale had formed so hard and so thick on the water-leg of a locomotive-form boiler that the metal had been nearly eaten through by the action of moisture and coal, so that when cleaning was finally done, a pin could be pushed through the sheets. How near the attendants of that boiler room were to eternity and for how long a time will never be known, but it is safe to say that the margin of escape was a narrow one. Such may be the effects of carelessness and neglect.

Maltreatment due to thoughtlessness and ignorance can not but be regarded as a very potent cause, and this may often be due to a disregard of all principles of mechanical decency, in the setting of the boiler, whereby stresses are set up that may manifest themselves in leaks, but too frequently develop incipient cracks that hold on until some critical moment when a disastrous explosion follows. For example: A small vertical boiler was set up with the feed-pump delivery in the bottom of the water leg. The water was taken direct from a driven well and had an average temperature of about 50 degrees F. When in full action it was not an uncommon thing to see the lower part of this boiler sweating like a pitcher of ice water, while the gauge indicated a pressure of 90 pounds. When it was pumped up previous to shutting down, the men complained that the water, as drawn from the blow-off cock, was too cold to wash in. Fortunately this treatment developed a big blister on the inside sheet of the water-leg, which was cut away and a heater put in the feed pipe, so that there was no disaster. But while this abuse lasted it would have been interesting and somewhat startling if the actual internal stresses set up in that boiler could have been ascertained.

These three cases are merely cited as awful examples of bad design, gross neglect and abuse; the journal of every boiler inspector of experience is filled with a multitude of just such cases.

Leaving the stationary field and turning to the locomotive, we find that quite a different condition exists, though it has not always been an ideal one. For the most part, locomotive boilers have always been in charge of men skilled in the work they have had to do, and the accusation of bad design and gross neglect can not often be made against them, while faulty design is becoming more and more of a rarity.

The locomotive has undergone a decided revolution in its development during the past quarter of a century, and in no part has this been more strongly marked than in the boiler. When we look back at the unscientific way in which locomotive boilers were built and mounted at that time, the strange part is that explosions were not of more frequent occurrence than they were, and the only apparent explanation lies in the low pressure and thinness of the sheets, by which indefinite bendings could take place with-

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out fracture. Just consider what those conditions were. A boiler was stiffened and braced throughout its whole interior by tubes and staybolts and braces until its rigidity was brought up to the highest notch. It was then securely bolted or riveted to the saddle at the front and braced by two bars reaching from the smoke box down to the front buffer. It was then carefully set upon expansion plates resting on the frames at the firebox, so that it could move freely to and fro as it expanded and contracted under the varying influences of the heat to which it was subjected; but a careful examination of hundreds of locomotives would fail to reveal any evidence of any motion having taken place. Why? Principally and simply because the back end was braced down against the back end of the frame, so that, by no possibility, could there be any longitudinal movement between the firebox and the frame.

Then what happened? The pump, and later the injector, threw its stream of cold water into the front end of the shell and it settled down to the bottom, cooling that part, in comparison with the top with which the steam was in contact, and so nicely bending the boiler into an arc, with the top on the convex side, and sometimes even lifting it clear of the frames, so that the whole weight at the rear was carried by the back braces, which had a bearing against the back head of from 50 to 80 square inches. To what useless stresses was a boiler subjected that found itself in that condition? Well, we did find that the sheets were apt to bulge and yield, and after many years of this sort of work we slowly arrived at the conclusion that these back braces had best be omitted. In the meantime, what with light frames and bad cross-bracing, and the impossibility of proper expansion, the boiler was called upon for all manner of services, from transmitting the pulling effort of the cylinders to the tender and taking up buffing shocks, to carrying the pressure and generating the steam.

And how about the boiler itself? It seems strange that the simple lap seam should have persisted for so many years, when the story of its inefficiency and misconduct was told at every inspection. With a lap seam, the shell of the boiler could not be made truly cylindrical, nor could the internal pressure bring it into that condition without a distortion of the metal at or near the lap. This distortion usually occurred at the edge of the lap on the inside, where it was concealed from view by the tubes and scale and was of such magnitude that the metal was strained beyond the limits of its elasticity and so at first took on a permanent set, then cracked and gave the water entrance to the interior. Then corrosion started at once and grew until it manifested itself as grooving. Since bending will always occur at the smallest part, this section that was made smallest by cracking and corrosion was obliged to sustain all the strains due to the adjustment of the shell to the internal pressure, until at last the plate became too weak to sustain the load and it gave way. Then we had another explosion, due to grooving, and we wondered what could have caused that grooving, and laid the fault at the door of galvanic action, or acid in the water, or defective plates, or carelessness in handling the plates during construction, and did not for years look to what we were doing in the use of the lap seam.

But this is of the past; the lap seam has gone, never to return for locomotive work, and if state legislatures really want to interfere in such things they can well enact a statute making it a criminal offense to use it on any kind of stationary work.

With the disappearance of the lap seam one of the most prolific causes of locomotive boiler explosions was done away with and the seat of these disasters was transferred, as it were, from the shell to the firebox.

When the firebox was set down between the frames, and the length was limited to the allowable clearances between the eccentric straps at the front and the rear axle at the back on the American or 4-4-0 locomotive, there was comparatively little difference in the expansion of the inner and outer side sheets, so that while staybolt failures were not unknown they did not assume the proportions that they did later, when the fireboxes had been lengthened and widened as in modern designs. Although the to-and-fro movement of the sheets bends the bolts and breakages are frequent, sometimes almost appallingly so, the points on the firebox most likely to suffer from such breakage are so accessible to inspection that disaster has been very successfully averted. It is a rare occurrence that a locomotive boiler explodes because of an accumulation of broken staybolts, though this does sometimes happen. If, then, we have removed boiler explosions from the shell

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because of the use of the sextuple riveted welt seam, and can protect the firebox from failure because of broken staybolts, it would seem that there is little else to cause trouble. Yet we know that locomotive boilers continue to explode, at the rate of about three a month, taking the country as a whole. This is certainly a large enough figure, but it constitutes a small percentage of all boiler explosions that occur. For example: From Sept. 1 to Dec. 31, 1906, 152 boiler explosions were reported, of which 14, or less than 10 per cent. of the whole, were on locomotives.

It may be assumed that we have now learned fairly well how to design a locomotive boiler and place it upon the frames in such a way that it will not be subjected to abnormal strains, so that, when such a boiler does explode, we may usually look for the immediate cause elsewhere than in the design. Broadly stated, there may be two causes for undue deterioration of the modern boiler: one in neglect and the other in abuse at the hands of the driver. Neglect may take the form of failure to wash out at intervals of sufficient frequency to prevent the accumulation of mud and scale in the interior, or it may occur through the omission of inspections by which the condition of the staybolts can be watched. Press of work upon the road and the consequent demand for engines is responsible for much of the neglect of washing: or sometimes the delay is due to the fact that the engine is marked up for the shop, and it is not considered worth while to wash out for only a few days' run. But when a boiler is opened and it is found that it contains three or more wheelbarrowfuls of sediment, the evidence is pretty good that someone has been taking chances. The chemical properties of the scale itself may be so inert that no direct attack is made upon the metal, but its non-conducting qualities shield the plates from the absorption of heat by the water and overheating and the resultant injury takes place.

In regard to overheating, it is not probable that a general elevation of the temperature would be injurious to the sheets. That it should be, hardly stands to reason, for the sheets are heated in all flanging processes without injury, provided they are properly cared for. It is local heating that does the mischief, by setting up internal stresses that hold the metal in tension until something yields. It is not often that overheating upon a boiler in service is anything more than local; but when it is, the statement is corroborated. An instance of this is to be found in the case of a night switching engine that was standing for some time, and on which the crew went to sleep. They were awakened by the burning of the cab, and found not only that, but the wooden lagging in flames, with the firebox and back head red hot. Steam had risen while they were asleep and the boiler had emptied itself through the safety valve, and then the fire came up and caused the overheating. Of course, it was supposed that the boiler was ruined, and it was taken to the round-house. But a most thorough inspection failed to reveal any defect other than a few leaky tubes. So these were rolled out, the lagging and cab replaced and the engine sent back to work. That the boiler was uninjured is evidenced by the fact that it remained in service for twelve years thereafter without requiring new sheets! So it is safe to say that local overheating is the danger, and an accumulation of scale is a good way to cause it.

The fact that the men in charge and those employed in the locomotive power department are skilled has led to the belief that the locomotive boilers in their care are well looked after. This presumption is strengthened by the small number of locomotive boiler explosions that occur. It has always been held superfluous for the state to interfere in the matter, as it has been considered that the railroad officials were doing and would do all that any statute could possibly enact. Two years ago, however, the New York Legislature passed a law requiring an inspection of every locomotive boiler in the state at least once every three months, and a report upon its condition filed with the railroad commission. This was amended in March of this year by adding some further requirements. This statute has been generally regarded as useless, because unnecessary, but if the statement from the twenty-fourth annual report of the commission is true, the condition of affairs before this periodic inspection was enforced was deplorable. According to this report:

"Prior to the passage of the boiler inspection law many roads made no inspections at all, while others employed 'handy men' or other incompetent inspectors, which meant that boilers were often operated under dangerous conditions. Sev-

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eral roads operating in this state have no mechanical officers, consequently the boilers in the past received little or no care. These roads now realize the danger of operating old and ofttimes cast-off locomotives from other roads, and are inspecting the boilers regularly. The larger roads made inspections more or less thorough and with varying degrees of regularity, dependent on the demand for power. In busy seasons inspections and repairs were often of a most superficial character, and the safety of the boiler was a matter of doubt."

This is certainly a pretty stiff arraignment and one that should be followed by some modifications. To those who are in touch with this matter it is a known fact that the reports of boiler conditions have been most regularly and efficiently rendered, and it would not be difficult to name roads within the limits of the state where there is a complete record of the condition of every boiler, and of every staybolt, for years, taken at monthly or bi-monthly intervals. Had there been any widespread neglect of these boilers, explosions would have rivaled in frequency the popping of firecrackers on our national birthday. The comparative immunity from locomotive boiler explosions has been due to good management, not to good luck.

It is an unfortunate fact, however, that there are cases of neglect and sometimes of faulty repairs. When soft patches are used on the inside of a firebox, it is simply an invitation to disaster. To be sure, disaster does not always accept the invitation, but the encouragement thus offered to a bad practice is more dangerous than a prompt failure of every soft patch would be, by stimulating the expectations that the boiler will hold. Once in a while a bad matter is made worse by the use of a copper patch in a steel firebox because this metal is more easily shaped than a steel sheet would be. Then, when such sheets do let go, instead of laying the calamity on poor Providence and calling it an accident, it should be recognized as a crime and the man responsible promptly sent to the penitentiary to think over the advisability of using soft patches or other dangerous means for repairing steam boilers.

Collapsed tubes are probably the most common form of boiler failure, and while they do not properly come under the category of explosions as the term is generally understood, they are dangerous and should be avoided as far as care and inspection will permit. On European roads, where brass tubes are used, much trouble is experienced from the scoring of the inside surface by the small particles of coke or coal. In this country the same difficulty is experienced, but to a much less extent.

The railroad companies may, therefore, be held accountable for preventable deterioration that occurs as the result of neglect or inefficient repairs. But it is regrettable that the carelessness of the engineman is responsible for so large a proportion of terrific explosions. Usually this carelessness manifests itself in low water, an overheated and collapsed crown sheet, and then a wrecked engine and men killed. As has been stated, low water in itself, with the resultant uniform heating of the crownsheet, need not necessarily cause an explosion or injure the plate; but when this heating is carried to so high a temperature that the metal is weakened and cannot sustain the steam pressure above it, it will yield and tear away from the stays, and the explosion is at hand. When this happens, the sheet always tells its own story of the treatment that it has received, and there can be no question whether it was overheated or not, as this is clearly proven by its color.

Given a rupture large enough to cause an explosion, no man can foretell the course of the tear or what will happen. Naturally, the rent follows the line of least resistance, but what this is likely to be no one can say. After the explosion, an examination of the metal is apt to show that it has been overstrained, so that physical tests of the metal of an exploded boiler cannot be relied upon to indicate its true conditoin previously.

The results that are witnessed when a boiler explodes can well be compared to what would happen were a powder magazine to be ignited. The heat of the contained water is sufficient to cause a percentage of its own volume to flash into steam, and this, with the expansive properties of that already existing, is sufficient to follow up any weakness and act as a constantly decreasing accelerating impulse to project the parts away from the point of rupture. Usually, in fact it might almost be said invariably, the boiler tells a very graphic story of what has happened to it and why it happened. The point at which the rup-

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ture started is usually so clearly indicated as to leave it in no manner of doubt, and from this the course of the rent can be followed and the general path of the boiler through the air can be determined. With the commencement of the fracture located within an inch or two, an examination of the metal at that point will usually fix the exact cause, whether it be an overheated sheet, a broken staybolt, a corroded or cracked sheet or a case of bad repairs.

Often when the cause is an oveheated sheet, it is inferred that the engineer was putting water in the boiler at the time; but this is not necessarily so. If the specific heat of steel and water be compared it will be seen that the heat of the latter is so low that the amount of water that could be flashed into steam at boiler pressure by coming in contact with the steel would be so small as to be insignificant; hence it can be disregarded. In fact, attempts to explode boilers by such treatment have not been successful. To be sure, this does not tend to improve the quality of the sheet, but it is doubtful if it ever caused an explosion. Usually a hot sheet yields by tearing away from the stays or lagging until it bursts, and not as the result of a sudden increase of pressure.

Among the favorite theories of the past for the explanation of boiler explosions was that of tne spheroidal formation of water and steam. According to this, the steam accumulates beneath the water as it does beneath the drop on a hot stove, and by holding the liquid in suspension, increases in pressure until it can be held no longer. Then it was supposed to burst up through the superincumbent mass with terrific force, and the explosion would ensue. It may suffice to say that there is no evidence that this has ever occurred. Water that is perfectly calm and quiet, uniformly heated, may, by the exercise of care, be raised to a temperature above that corresponding to the pressure to which it is subjected, without ebullition, but the slightest jar or inequality in the application of heat will stop this increase and ebullition will take place instantly. That such a condition should ever obtain in a locomotive boiler at rest is unbelievable; when it is in motion, it is clearly out of the question. And even when this is accomplshed, the increase in temperature is too small to be considered as a factor capable of causing an explosion.

The water hammer has also been held responsible for boiler explosions, and this may have been the case with some ruptured steam pipes in stationary practice, but where the water hammer can occur or what can produce it on a locomotive is difficult to say; so that it may be passed by as a mere guess that can hardly be qualified as even ingenious. Sifted down, then, it truly does appear that boiler explosions are due to weakness of the boiler, and it appears that this weakness may be caused by inherent defects in design or in the metal; by neglect on the part of those charged with the care, cleaning and inspection of the boiler, and by carelessness on the part of the driver. Whatever may be the cause, the exploded wreck will usually tell a straight story of what has happened, that will admit of no dispute to him who has the eyes and training to read the book as it is written. —The Railroad Gazette.

Experiments With Warning Signals.

The Prussian railway authorities have been making experiments on the line between Berlin and Stettin to find a method for insuring greater efficiency in observance of signals. In the effort to obtain a preliminary signal to give warning of a stop signal many devices were tested. These included flashlights by the side of the track when nearing a signal and other visible signs. Electric wave transmission to the locomotive also was tried. The method found most satisfactory consists of fastening two or three horns with a rubber bulb, similar to those used on automobiles, to the telegraph poles at intervals. These are electrically operated, and have been found trustworthy in warning engineers. The railway authorities have already decided to experiment further with these preliminary signals on a number of roads.—The Railway and Engineering Review.

Wreck on White River Division, St. L., I. M. & S. Ry.

Views are shown herewith of a wreck which occurred on the White River Division of the St. L., I. M. & S. Ry., near Branson, Mo., June 5, 1907. Our correspondent states that engine 2734, shown in the views, was in charge of Bro. C. M. Rhodes, engineer, and Bro. C. A. Marsden, fireman, both members of Lodge 676 B. of L. F. and E., and

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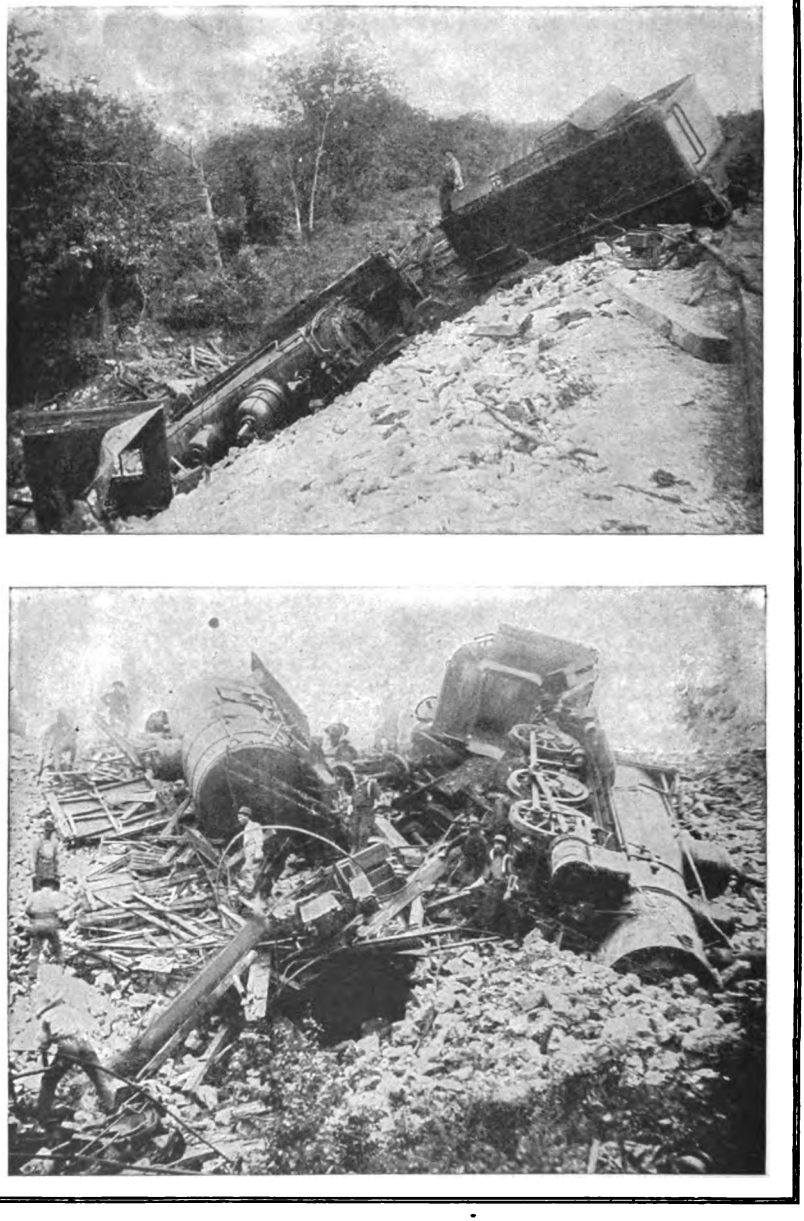

WRECK ON WHITE RIVER DIVISION, ST. L., I. M. & S. RY., NEAR BRANSON, MO., JUNE 5, 1907

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was following another train down a 13-mile hill when the leading train broke in two and was hit before a flagman could be sent back. Brothers Rhodes and Marsden were both seriously injured and Brakeman John Groves was killed.

* * *

Locomotive Firing.

This is the title of a new book by T. S. Reilly, and published by the Crandall Publishing Company, 510 Security Building, Chicago, and 132 Nassau street, New York City, and is compiled from a series of articles which have appeared in the regular issues of the Railway Master Mechanic. The author, who has been a traveling engineer and master mechanic, and who is consequently familiar with railroad and locomotive work and well qualified to handle the subject, says in his preface:

"Next to wages, the fuel bill is the largest single item in the cost of conducting railway transportation. Recognition of this fact by railway managements has long been evident in their efforts toward its reduction through a consistent policy of giving trial to practically every feature of locomotive design which gives promise of enabling increased economy of operation. Both money and time have been freely given to exhaustive trial of all ideas in boiler proportions, front end arrangements, compounding, superheating, etc., as well as to investments in fuel handling plants seeking to cheapen the cost of placing the fuel on the tender.

"Is it unreasonable, then, for the management to expect the co-operation of the engine crews in obtaining the results sought for by all this investment, viz: a reduction in the fuel cost of conducting transportation? For, since the actual generation and utilization of the steam is entirely in the hands of the engine crews, the greatest factor in the fuel bill is, of necessity, entirely a matter of engine crew skill and judgment, and our managements are certainly entitled to much credit for their policy of encouraging rather than insisting upon reasonably economical methods of firing and running.

"Since one must know the reason for doing things in order to be sure of getting satisfactory results, it has been thought of interest to gather certain scientific facts relating to fuels and the combustion process and show their relations to the operation of locomotive firing. No one appreciates better than the author the seemingly remote relation of theoretical expositions to the work in prospect, when one crawls up the left side of a power-house-on-wheels, attached to a little less than a mile of cars, at 3 o'clock of a winter's morning. Yet he remembers an instance where such relations were most distinctly brought out in a case where life was made miserable for a succession of firemen who could not keep hot a class of engines which had the name of being good steamers on the division from which they had been procured. * * * "

The author then goes on to state that on the division on which the locomotives had previously been running the coal used was of much better quality, requiring less of it, and resulting in a greater evaporation of water per pound of coal than was possible with the coal supplied on the present division, and requiring a combustion rate of coal per square foot of grate area per hour that was a practical impossibility.

Chapter I treats on the combustion of fuels and methods of firing them. Chapter II gives the theory of combustion. Chapter III deals with the steaming qualities of locomotives. Chapter IV treats on oil burning. Chapter V is on general considerations. The book closes with an appendix which gives a more detailed explanation of the use of the words "evaporation per pound of coal."

Taken as a whole, the book is replete with good, practical information on locomotive firing and fuel combustion, and had the author confined himself to the dissemination of the knowledge which the book is intended to convey, instead of injecting therein his own personal opinions as to the discipline that should be imposed upon an engineman for failure to make proper reports relative to "not steaming," there would be none but the most favorable criticism to offer, and the work would be accepted in a much kinder spirit by the men for whom it is intended. In dealing with the steaming qualities of locomotives the author says:

"On most lines a large proportion of the number of engine failures is charged to 'Not steaming.' While this report covers a multitude of sins, there is no question but that on many lines there is not sufficient care taken to insure the uniform good steaming of all locomo-

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tives. Yet the matter of good steaming is closely related to fuel economy, for there is a satisfaction and confidence in firing a good steaming locomotive which impels a man to show what he can do; while with a poor steamer the most expert and conscientious fireman will burn more coal in the endeavor to furnish steam than he would with a good steamer, and in the disgust at the always doubtful success of his efforts, he loses interest."

After going on to explain that a locomotive designed for the development of a practical maximum power with a grate area involving the burning of coal at a certain rate of combustion per square foot per hour can not be made to furnish steam for an equivalent rate of working with a poorer grade of coal, and that a locomotive designed for a certain rate of working with a grate area intended for the poorer grade of coal and a lower rate of combustion per square foot per hour would prove wasteful with the better quality of coal at that rate of working, and giving the reasons therefor, among other things the author says: "And it is in the roundhouse reporting of matters in this regard that poor steaming locomotives are often the fault of the crews. How usual it is to note on the roundhouse work report book the simple statement 'Not steaming!' *The author thinks frankly that an engineer making such a report deserves discharge* (the italics are ours.—Editor), for everyone connected knows that the poor steaming may be due to any one or all of a dozen causes, many of which cannot be located by the roundhouse foreman because it is necessary to observe the engine under steam and working in order to diagnose the trouble. The engine crew have had this opportunity and if the specific cause for the failure of the engine to steam (where others of the same class steam well with the same coal) is not reported by the engineer, *he is either too ignorant or too careless to be retained in charge of a locomotive.*" (Again the italics are ours.—Editor.)

The Magazine believes that such expressions of personal opinion bearing on discipline are altogether out of place in a work of this kind, as such matters are entirely and exclusively within the province and subject to the discretion of the motive power officials in charge.

Such statements are hardly compatible with the concluding paragraph of the book, wherein the author says: "* * * for, after all, the key of railway efficiency is the doing of the square thing by both the management and the men. And there is no class of men whose sense of fairness is more keen than the engine crews of this country." With the one exception stated, the book is a very meritorious and valuable work. It is 6x0 inches in size, and contains sixty pages, bound in paper covers. Price, 50 cents. It may be procured by addressing the publishers at the address given in the first part of this article.

* * *

Passenger Locomotive Design.

While the locomotive designer in Europe has been perfecting the compound locomotive for passenger service, the designer in this country has been developing the simple engine for the same work. In view of the results obtained from the respective types of passenger locomotives at home and abroad, the question of the proper type to select for future development is worthy of the consideration of motive power men.

The Pacific type locomotive represents the extreme development of the simple engine as applied to passenger service. In several cases it has almost reached the limit of height, width and weight permissible with the present track arrangement. A powerful locomotive capable of starting a heavy train has been developed, but at high speed the excessive friction of the heavy machinery and the energy absorbed by the machine itself, reduces the tractive force available at the tender drawbar, to an amount out of proportion to the work developed in the cylinders. The enormous boiler and cylinder capacity of the locomotive is not available as motive power at high speeds, on account of the percentage of power required to maintain the heavy locomotive at the desired speed.

Considering the performance of the heavy simple locomotive in high-speed passenger service, should not greater attention be given to perfecting a more efficient type of locomotive which will deliver a larger percentage of the developed tractive force, at the drawbar, than the simple type of locomotive under consideration? Investigation of the performance of the four-cylinder balanced compound will show that with this type of locomotive it is possible to obtain a maximum amount of power with the least

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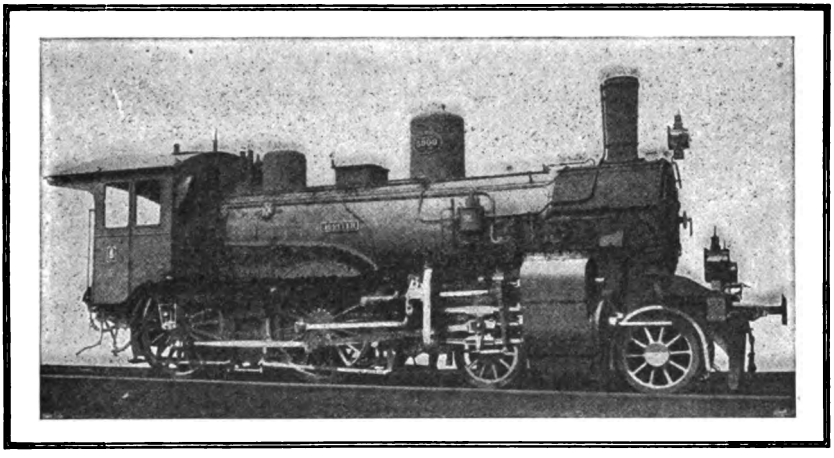
weight and friction losses. With equivalent cylinders of relatively small size, a high tractive force can be maintained. The economical distribution of steam gives the boiler a large reserve power. There are a great number of parts and the cost of maintenance is perhaps a little higher than the simple locomotive, but the saving of the balanced compound in fuel more than compensates for the extra cost of maintenance.—Railway Master Mechanic.

Two-Cylinder Compound Passenger Locomotive, Grand Duchy of Oldenburg Railroads.

The two-cylinder compound passenger locomotive, illustration of which is shown herewith, was recently completed by the Hannoversche Machinenbau-Actien-Gesellschaft of Hanover, Germany, for the Duchy of Oldenburg Railroads. It is of the standard type used on the State Railroads of Prussia. The cylinders are 18 and 27 inches in diameter by 23½ inches stroke, in connection with which the Lindner starting device is used, which permits live steam to enter the low-pressure cylinder when the reverse lever is at either of its extreme positions. The valves are of outside admission and are operated by the Walschaerts valve gear, the radius rod being lifted direct by the lifting shaft arm. A number of peculiarities in the arrangement of parts will be noticed by those who are accustomed to American practice. The exhaust pipe from the Westinghouse air pump, as will be seen, is carried up outside of the smokestack, instead of into the smokebox and thence into the stack as is the custom here. While this arrangement has an unsightly appearance, it has the advantage of not creating an unnecessary draft on the fire when the engine is standing. The staybolts of the firebox are provided with thimbles which are placed through the jacketing of the boiler, and which permit of inspection, removal and replacing of any one or more of them without disturbing the jacketing. The engine is provided with Staby's smoke consuming device, which is operated by steam drawn from the second dome on the boiler. The Ranafier smokebox type of superheater is used, which consists of forty-six 1 5-8-inch seamless iron tubes into which the receiver is subdivided, and so arranged as to act as a spark arrester at the same time. The driving wheels are each provided with two brake shoes, one on each side, which it is claimed makes the wear on the wheels more uniform than where the pull is all in one direction, and relieves the boxes and rods of all strain due to brake pressure.



TWO-CYLINDER COMPOUND PASSENGER LOCOMOTIVE FOR THE GRAND DUCHY OF OLDENBURG RAILROADS

When Tonnage Does Not Pay.

"Recently," says Railway Master Mechanic, "a heavy freight locomotive was started on a turn-around trip on its

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second day out of the shop. On its first trip over a district of fifty miles, this engine handled a work train during a part of the trip and made the rest of the run light. At the district terminal the engineer found that a drag had been made up for his engine with full tonnage of 1,900 tons. He objected to this on the ground that he had had a hot driving journal while handling the work train, but had been standing for such a length of time that the journal had cooled and did not then feel hot when touched by the hand. Telegraphic instructions were sent the roundhouse foreman to inspect the engine and report if it was in condition to take full tonnage. He replied that the engine was capable of taking two-thirds tonnage.

"From this report the dispatcher naturally came to the conclusion that the foreman and engineer had conspired together to keep him from giving the engine a full train. He reasoned that if a journal would run hot on a light train it was hardly probable that a drag would cause the journal to run any hotter. The weight on each driving wheel being the same, regardless of the tonnage behind the engine, it was natural to suppose that a journal was less likely to heat while revolving slowly than when revolving at high speed. With a drag which is necessarily a slow speed train the temperature of the bearing should therefore not be increased.

"While this may be considered a rather unusual line of reasoning and not justified by practical experience, this view is upheld by some mechanical officers, who require an engine to go into freight service immediately upon leaving the shop. Full tonnage is assigned the engine, which is not expected to exceed ten miles per hour. A reduction of tonnage would not be considered on account of hot journals, and the engineer is expected to take the train over the division without damage to the engine.

"In contrast to this practice the opinion generally prevails that new driving box brasses are not in proper condition for a tonnage train until they have "come down" to an even bearing, which is usually obtained by running the engine light or with light trains for a few hundred miles after coming from the shop. Proper care of a driving box at the start, even though the engine does not go into regular service for several days after leaving the shop, is economical practice. It will prevent many delays from hot journals and result in a material saving of oil. An engine with a set of driving boxes that will not run cool under the most severe road conditions is an asset of doubtful value and a most unsatisfactory possession.

"One of the inconsistencies of an organization which is perhaps altogether too common, is to demand the utmost care in fitting driving box brasses in the shop and then allowing the bearings to be almost ruined by failure to have a reliable system of breaking them in for service. This is a self-evident waste of economy and not in accord with good practice.

"The earning capacity of a new engine should not be considered until it has been put in condition for service. The cost of a proper 'break in' will be more than compensated by the returns which are received from the performance of the engine. This is about the only time when full tonnage does not pay."

* * *

*Development of Motor Cars for Light Passenger Service.**

The paper presented on "Electricity on Steam Railroads" at the convention of 1906, devoted considerable attention to gasoline, gasoline-electric and steam rail motor cars, and showed the development of those types of cars up to that period. The advantages of the single motor car train unit were considered and discussed. There would appear, therefore, to be no need of considering that phase of the subject at this date, and this paper will deal simply with the development of the motor car in this country during the past year, and touch upon the situation as it exists abroad at this time.

Gasoline Motors—Mechanical Transmissions.

Union Pacific.—In this country, the most extensive development work in the rail motor car field has been done by the Union Pacific Railroad. To date, that railroad has built nine gasoline motor cars, all of which have direct mechanical drive.

*Report presented at the annual convention of the American Railway Master Mechanics' Association at Atlantic City, N. J., June, 1907, by a committee consisting of H. F Ball. F. T. Hyndman, W. R. McKeen, Jr., L. R. Johnson, G. W. Wildin.—Reproduced from The Daily Railway Age.

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Their latest design of car, motor car No. 8, is equipped with a 200-horsepower motor, especially built for the rough service incident to use on suburban lines. The motor consists of six cylinders, 10 inches in diameter by 12 inches stroke. The total weight of the car is 61,300 pounds, equivalent to practically 300 pounds weight per horsepower. This car has, since last summer, been running regularly between Beatrice and Lincoln, Neb.; it has shown remarkably uniform results and has materially increased the traffic between those two towns. Ten additional cars, similar to this successful model, are being built, as well as a number of trailers to be used in connection with them. Four regular branch line services have been maintained in Kansas and Nebraska, on the Union Pacific alone, during the severe weather conditions of the past winter, and with notable success. The motor cars have been remarkable in regularity of service, having demonstrated that they are even superior, in this respect, to the steam train service.

After two years of continuous service, it has been found that the average cost of fuel the year around, taking into consideration both summer and winter conditions, using 72-degree gasoline, amounts to 3.5 cents per car-mile. As a substitute for gasoline, California distillate has been used in regular service with gratifying results. Obviously, the cost per car mile is thereby greatly reduced, as the distillate is a much cheaper product than gasoline. Some interesting experiments have been conducted with the motor of car No. 8, using denatured alcohol as fuel. The results were very satisfactory; in fact the newest type of motor (No. 8) gives equally as good performance with that fuel as with gasoline.

"Sunny Brook."—A light railway motor car, the "Sunny Brook," has recently been built at Indianapolis, Ind., for service in Yellowstone Park. This car has a four-cylinder gasoline motor, cylinders 6 by 6 inches, the engine developing 50 horse-power at 700 revolutions per minute. The car is built after the conventional street car design and weighs 30,000 pounds. It is asserted that, at full speed, the car can attain thirty-five miles per hour. The transmission is of the mechanical type with three speeds forward and three reverse, with chain drive of the Renold silent chain type.

Gasoline Motors—Electric Transmissions.

Strang Cars.—Another example of gasoline rail motor cars in successful operation is the Strang car, mentioned in last year's report. Three of these cars are in regular operation between Kansas City and Olathe. The first one has been in continuous service for over a year, the second and third cars having been in operation between six and seven months. Other cars of this type are now under construction for use on several steam roads. The transmission used in the Strang system is of the electric type, the generator being direct connected to the motor, forming a self-contained generating unit. Directly from the brushes of the generator, main wires lead to a controller of the series parallel type. From this controller, wires lead to electic motors hung on the axles of the front trucks according to standard electric railway practice. In multiple with the wires between the generator and controller, is connected a small storage battery, and in one of the main wires between the battery and the generator is placed a rheostat, which is used for the purpose of temporarily converting the generator into a motor when starting the engine. The first of these cars weighs 78,000 pounds, and it is claimed that the gasoline consumption has averaged about .45 of a gallon of gasoline per motor car mile for a mileage of 60,000 miles. The largest and latest of the three cars is 52 feet 9 inches long, weighs 84,000 pounds and has the following equipment: 100-horsepower gasoline engine, 50-kilowatt generator, two 65-horsepower motors and storage battery of 112 cells, with 250 ampere-hours capacity.

St. Joseph Valley Traction Company.—The motor car used on this road has been described a number of times in the technical press. It is of the gasoline-electric type and has been in actual daily service for two years. Within the past two months the equipment was destroyed by fire. The service of this car consisted in hauling from one to three trailers, three round trips per day, over a road eleven and one-half miles in length, making the half trip in thirty-five minutes with four stops, the heaviest grade being 1½ per cent. It is stated that the fuel consumption with one trailer was three-fourths of a gallon per mile. The motor consisted of a four-cylinder 70-horsepower gas engine direct connected to a 50-

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kilowatt, 250-volt generator in parallel with which was connected a battery. Four 50-horsepower motors were used on the trucks. Weight of motor car 70,000 pounds; trailer 38,000 pounds. Very satisfactory service results are reported to have been obtained from this car.

General Electric Company Car.—This company is now bringing out its second-rail motor car of the gasoline-electric type. While the system used is the same in both cases, the second car is radically different in both design of car body and the power equipment, and promises to give very satisfactory results. The car body is of steel, the ends being rounded to decrease wind resistance. The roof is of the Mann type, equipped with globe suction ventilators. The car body is divided into an engine compartment, baggage, smoking, main and toilet compartments, and operating-cab at rear end. It has a seating capacity of forty.

The equipment consists of an eight-cylinder V-construction gasoline motor of 150 to 175 horsepower, direct connected to an eight pole, commutating pole, 90-kilowatt generator with an exciter of 3½ kilowatts capacity, for the purpose of exciting the fields of the main generator, and effecting the variable potential control. From the generator leads are conducted to two 65-horsepower motors, situated one upon each truck of the car. These motors are always connected in parallel, the required torque or speed being obtained by varying the field current of the generator through the intermediary of a specially constructed controller, embodying essentially the required resistance suitably arranged in fifteen steps.

The gasoline motor is of the four-cycle type, equipped with two separate systems of ignition; one, the high tension using induction coil connected to a four-volt storage battery, the other make-and-break connected to a direct-driven Simms Bosch low tension magneto. The carbureter is of the single-nozzle hand-compensated type, gasoline being supplied to it by means of a diaphragm pump. Radiators for water cooling are located on the roof of the car. The circulation is by thermo syphon. The gasoline motor is controlled by one lever superimposed over the controller handle. The normal speed of motor is 550 revolutions per minute.

The car is heated by by-passing as much as required of the exhaust gases through pipes approximately in the same position as steam pipes in the standard railway coach.

An acceleration of a mile per hour per second is obtained to approximately twenty-five to twenty-eight miles per hour. From this point, acceleration falls off gradually until full speed is attained at approximately fifty to fifty-five miles per hour. The total weight of the car is 60,000 pounds.

Steam Motors.

Canadian Pacific.—In the steam motor car field, one of the noteworthy examples of original development work is found in the car designed and built by the Canadian Pacific Railway. This car was in operation all of last summer between Montreal and Vaudreuil, a distance of twenty-four miles, giving a service of three round trips per day, on a regular schedule, allowing one hour for the run out, including twelve stops, and the same on the return trip. It was popular with the passengers and gave fairly good satisfaction to the railway company.

The boiler is of the return tube marine type, carrying 180 pounds pressure, equipped with superheater coils and a Morrison furnace, brick lined; crude oil is used as fuel with a burner of the "Booth" type having a 1-inch slot.

The cylinders were originally turned out with bushes 10 to 15 inches, but after a time the bushes were removed, leaving the cylinders 11 by 15 inches. The valves, which are of the piston type, are fitted with Walschaert gear.

When the car was first put into service, 1.8 imperial gallons of oil were consumed per mile, but as the men gained experience in the handling of machinery, the consumption was reduced to 1.6 imperial gallons per mile; 5,000 gallons of water were evaporated per hour, giving a factor of one pound of oil to ten pounds of water.

Experiments have recently been made on the testing plant at the Canadian Pacific shops with the same boiler and motor, using ordinary run of mine coal as fuel, instead of oil, with very satisfactory results, namely: during a test of one and a half hours, an average steam pressure of 172 pounds was maintained at a speed of forty-seven and a half miles per hour.

Total water evaporated, 8,569 pounds.

Water evaporated per hour, 5,720 pounds.

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Total coal consumed, 1,300 pounds.

Pounds of water evaporated per pound of coal, 6.6.

Average temperature of gases in combustion chamber, 952° F.

Average temperature of steam at steam chest, 578° F.

Ganz Cars.—Motor cars of this type are being built for four different roads. All-steel construction is used for the body, which has a seating capacity for fifty-two passengers. Total weight of car in working order is 70,000 pounds.

The boiler or steam generator is of special design, carrying a working pressure of 270 pounds, the steam being superheated, capacity 120-horsepower. The steam motor is of the enclosed type with compound cylinders, all moving parts running in oil. It is mounted on the forward truck and drives the rear axle thereof through one set of gears.

This car is designed to maintain a speed of thirty-five miles per hour on a level track. Average fuel consumption is claimed to be from 10 to 12 pounds coal per mile.

The development of motor cars abroad has made greater strides than in this country. Numerous English and continental railway companies have permanently established rail motor car service in different localities with marked success. One may see such cars in operation on unimportant branch lines as feeders to trunk line trains; on main lines through thickly populated districts carrying passengers to and from more important towns served by express trains: on suburban lines in competition with trolley cars and steam trains and on an entire railway system where there is no other means of transportation except for heavy freight.

A brief description of the motor cars in operation on the principal railways of England and the continent is given herewith, which will serve to show the development of this type of motor car abroad. It is not the purpose of this report to enter minutely into the details of construction, but rather to show up in a general way the present situation.

Gasoline Motors—Mechanical Transmissions.

German Daimler Car.—The German Daimler gasoline car has been used in considerable numbers on some of the smaller German railways, notably the Wurtemburg State Railway, and on the Swiss Federal Railway. It is a comparatively small car, having a total length of 33 feet, with a seating capacity of thirty-six. It is equipped with a 30-horsepower Daimler engine of the heavy, slow-speed type, its normal speed being about 550 revolutions. The motor has four cylinders 5¼ inches diameter by 6¾ inches stroke. It is located in the middle of the car, attached to a sub-frame upon which the car body is supported by eight elliptic springs, the subframe being carried rigid on the two axles. Power is transmitted from the motor through a leather-faced cone friction clutch, and through a sliding gear transmission (arranged to give four speeds and reverse) to one of the axles. Control levers are provided at each end of the car, by means of which the speed of the motor, or the direction of motion, is controlled from either platform.

Gasoline Motors—Electric Transmission.

Northeastern Railway Car. — About three years ago, the Northeastern Railway of England put into service two "petrol-electric" cars. The power plant consists of a four-cylinder horizontal opposed Wolsey gasoline engine (8½ by 10 inches, 85 brake horsepower at 420 revolutions per minute) direct connected to a compound wound, separately excited generator, of 55 kilowatts capacity, which furnishes current to two 50-horsepower electric motors, of the ordinary railway type, on the leading truck. The total weight, including 60 gallons of gasoline and about 100 gallons of cooling water, is 35 tons, of which 22 tons are carried on the power truck. These cars are used during the summer season only. Three and one-half car-miles per gallon of gasoline is claimed for them. As this particular type of car has not been perpetuated by the original builders and users, it is safe to assume that it is not entirely satisfactory. The enormous size and weight of the power plant and the space occupied (being about one-third the total length of the car) are undoubtedly the reasons for discontinuing the construction of this design.

Arad & Csanadar Railway.—On the Arad & Csanadar Railway, in Hungary, a number of gasoline electric cars are used, the largest of which has a 70-horsepower gasoline motor direct connected to a 45-kilowatt generator, which supplies current to ordinary railway type motors attached to the two axles.

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The usual series parallel controller is provided for starting. After the car is once under way, its speed is almost entirely controlled by the throttle of the gas engine. Controlling apparatus is provided at only one end of the car. The car is equipped with air and hand brakes, air being supplied by a small compressor driven from the outer end of the armature shaft. Jacket water from the motor is passed through coils inside the car for heating during cold weather. When no heat is required the water is passed through a coil of tubes on the roof. The space occupied by the power plant is considerably less in proportion to the length of the car than that of the Northeastern Railway, although the systems are practically identical in principle. The acceleration of the car is very good. its maximum speed is about thirty-five miles per hour without trailer. It is claimed by engineers of this road that 65 per cent. of the motor's power is delivered at the wheels. Very satisfactory results are reported from these cars.

Steam Motors.

Great Western Railway of England.—One of the most satisfactory cars in operation abroad at the present time is the one developed by the chief engineer of the Great Western Railway of England. In the neighborhood of sixty of these cars are in service on various parts of the Great Western system, and others are in course of construction. They combine to a remarkable degree many of those qualities essential to success, namely, large seating capacity with only moderate weight, flexibility of control, reasonable speed and acceleration, reliability, low maintenance and fair operating costs.

The boiler is of the vertical, fire-tube type with no superheater, supported directly on the frame of the power truck and serving as a center pin by transmitting the driving effort to the sills of the car through flat springs. It is enclosed within a compartment of the car body (about 14 feet long), which contains coal bunkers, operating levers, etc. As the car is arranged to run in both directions and controlled from both ends, a stoker is employed in addition to the driver. Aside from attending to the fire, it is his duty to regulate the cut-off when the driver is at the other end of the car, as only brake and throttle connections are provided there.

The motor consists of two single-expansion cylinders, 12 by 16 inches, coupled direct to the rear driving wheels, which in turn are coupled to the front drivers. Walschaert valve gear is used. The water supply is carried in tanks hung beneath the car midway between the trucks. The cars are equipped with brakes. A maximum speed of fifty-five miles per hour can be obtained, although the average running speed is from thirty to thirty-five miles per hour. Their maximum acceleration is about one mile per hour per second.

Taff-Vale Railway.—The Taff-Vale Railway has built a number of cars for its own use and for other railways, being similar in design to the Great Western car, the chief difference being in the construction of the boiler. This is of the fire-tube type and consists practically of two horizontal barrels placed on either side of a central furnace, the hot gases passing horizontally through the fire tubes to the smoke box at the outer ends, and from there through the flues to a central stack. The boiler is placed transversely with reference to the car body and rests directly upon the truck frame back of the forward axle, which is the driving axle. The forward end of the car body is pivoted on the power truck, but does not include a compartment for boiler equipment, as in the case of the Great Western. The power truck is self-contained and a cab is provided for the driver similar to that of a small locomotive. The cylinders are placed outside and the valves operated by an ordinary link motion with rocking shaft. This car is capable of running thirty-five miles per hour on the level and will ascend a 2½ per cent. grade at twenty miles per hour. It can be operated from either end, and all operations, except starting, are performed from the guard's compartment. The following data show the general dimensions of the car and power truck on the latest type of Taff-Vale car:

Over all, length, about 70 feet.
Seating capacity, 43.
Total weight, 42 tons.
Weight on power truck, 30 tons.
Cylinders: bore 10½ inches, stroke 14 inches.
Total heating surface of boiler, 465 square feet.
Grate area, 10 square feet.
Capacity of water tank, 550 gallons.
Steam pressure, 180 pounds.

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Tractive force, 5,292 pounds.

Boiler has 232 tubes, 1⅝-inch.

Lancashire & Yorkshire Railway.—The Lancashire & Yorkshire Railway has cars similar to the Taff-Vale, in that the forward end is pivoted on the power truck. The boiler is of the usual locomotive type with horizontal fire tubes. The engine is practically a small locomotive with drivers coupled. The following gives the principal engine and boiler dimensions:

Heating surface:

199 fire tubes, 1¾-inch outside diameter, area	455 sq. ft.
Fire box area	54 sq. ft.
Total	509 sq. ft.
Grate area	9.4 sq. ft.
Water capacity	550 gal.
Boiler pressure	180 lbs.
Coal	1 ton

Two cylinders, bore 12 inches, stroke 16 inches.

Ganz System.—Ganz cars are used rather extensively in Central Europe in three sizes, 35, 50 and 80-horsepower at 260 revolutions per minute. The general arrangement is the same in all three, the boiler being placed in a compartment at the forward end of the car, together with fuel bunker, feed pumps and controlling apparatus. The motor is placed horizontally on the leading truck, and drives the rear axle through spur gears. It is supported in the usual electric railway motor style, one end being swiveled above the axle, and the other supported elastically from the truck frame. The car is controlled from only one end, and one man is required to operate it. The boiler consists of four concentric cylinders with headers (held in place by bolts) forming two annular water spaces joined together by means of slightly inclined steel water tubes, 25 millimeters outside diameter, and 2 millimeters thick. Within the inner cylinder is another cylinder of slightly smaller diameter through which the fuel is fed to the grate below, the flame and hot gases passing around the water tubes to the stack. The motors are two-cylinder cross compound. The largest car, 80-horsepower, weighs 23 tons, and is capable of climbing 1.6 per cent. grade, with two trailers weighing 12 tons each, at a speed of twenty-five miles per hour.

Purrey System.—The Paris-Orleans road has ten cars and twelve power trucks equipped with the Purrey System. This system has also been used for a number of years on different tramway lines in the city of Paris.

The Paris-Orleans cars have a total length of about 60 feet, with a capacity of thirty third-class passengers in three compartments, and twenty-five first-class passengers in twenty-two compartments, and in addition there is a baggage compartment at the forward end 11 feet 6 inches long. The forward end is pivoted on the power truck, the rear end being carried upon a single axle. The total weight of this car is about 35 tons. The power truck, which carries the boiler, motor, fuel, water, etc., has a 126-inch wheel base, the rear wheels only being used for driving. The Purrey boiler is tubular, consisting of two drums, the lower one of rectangular section and made of cast steel, the upper one cylindrical and of cast iron. The lower drum is divided into three compartments, two of which are provided for water, the third being for superheated steam. The outer and lower compartment is connected with the upper drum by two large return pipes. It is also connected with the intermediate compartment of the same drum by 41 U-shaped tubes. The feed-water entering the lower compartment is thus heated in passing through these tubes, which are in direct contact with the flame. From this point the water rises through a series of U-shaped tubes to the upper drum, and the steam thus formed is returned from the upper drum through a number of similar tubes to the third compartment of the lower drum, from which it is taken to the motor. The steam is highly superheated in these tubes, the average temperature of superheat being from 750 degrees to 900 degrees F. Coke is used for fuel, fed automatically from a bunker attached to the side of the boiler, the supply being regulated by a vertical sliding door. The motor is a four-cylinder tandem compound, rated at 260-horsepower at 650 revolutions per minute. Ordinary D-type valves are used, operated through Stephenson link motion. In this design the motor is attached horizontally to the frame of the car and its power transmitted to the rear axle by two toothed chains of similar construction to the Renold and Morse silent type. As a rule, one or two trailers are attached to these cars, the average weight of the train being 50 tons. The fuel consumption of this train is about 21 pounds of coke per mile. The

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car is capable of maintaining a speed of about fifty-six miles per hour. The cost of operation per train-mile is about seven cents.

Serpollet System.—The Serpollet system differs from the Purrey and Ganz types chiefly in that the boiler is of the flash type, and kerosene is generally used as fuel. A very high degree of superheat is obtained (reaching even 1,200 degrees F.), which, together with the incrustation attending the use of more or less impure water, is conducive to the burning of tubes. The experience of the Paris Lyons & Mediterranean Ry. with this type of car has geen rather unsatisfactory, because of tube troubles, and the Purrey car is now being adopted in its place.

Komarek Car.—This car is used to some extent by the Austrian State Railway and several of its branches. It is manufactured by F. X. Komarek in Vienna. Although built in several sizes and many forms, the following type may be considered as a representative:

Car body, total length, 51 feet.

Seating capacity, 35.

Baggage-room, 44 by 96 inches.

Length of boiler and fuel compartment, 10 feet.

Weight, empty, 20 tons.

Coal capacity, 1,100 pounds.

Water capacity, 420 gallons.

Motor, 2-cylinder cross-compound, outside cylinders.

Cylinders, diameter, 10 by 15 inches, stroke 16 inches.

This car is capable of running at a speed of twenty-five miles per hour on a level while hauling trailers comprising a total of 50 tons. The operating cost is said to be about five cents per train-mile (exclusive of the guard's pay), coal costing $3.25 per ton, made up as follows:

Coal	$0.0253
Oil	.0014
Labor	.0046
Maintenance:	
Material	.0011
Driver	.016
	$0.0484

Conclusion.

That there is a field for the rail motor car can not be questioned; its breadth at the present period being limited only by the development of the motor-car power equipment.

Steam, as a motive power, has always possessed the distinct advantage of flexibility of control as well as reliability.

The internal combustion motor within certain defined limits of horsepower sizes has been developed to that stage of excellence where these advantages can not be said to apply exclusively to the steam engine.

With the experimental work that is being conducted in the development of the internal combustion motor using lower cost fuels than gasoline, and with promising results, who can predict the final outcome of the motive power that will be the most satisfactory from all points of view for the rail motor car? It is probable that both types will have their distinctive fields, depending upon the availability of the fuel.

* * *

*Standard Time.**

The subject of "time" is one which could, in the hands of a good writer, be made very interesting if followed up from the earliest days; but as this association is more concerned in the present requirements than in ancient history, I will not take up your time in tracing the various systems in vogue since the creation for determining the divisions of the day.

A vital necessity in the safe and efficient handling of trains is that all clocks and watches must indicate uniform time. Many serious accidents have resulted from a difference between the timepieces of two employes, and during the past few years most of the railway companies on this continent have spent a great deal of money toward securing uniformity throughout their systems.

The Canadian Pacific Railway Company's management, recognizing the great importance of a uniform time system, has established a Time Service Department, under the supervision of Mr. J. J. F. Houghton, to whom the writer is indebted for a large part of the matter contained in this paper.

The daily transmission of time signals is looked after by the telegraph department, and the following description of the method may be of interest. On account of the very long circuits worked,

*Paper by W. J. Camp, Electrical Engineer, Canadian Pacific Railway Telegraphs, read before the convention of Railway Telegraph Superintendents at Atlantic City, N. J., June, 19-21, 1907.—Telegraph Age.

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it has been found best to transmit the signals by hand. At 11.53.50 the preliminary caution, "BK time," is given by Montreal on all duplexes and half quads over which it is desired to send the signals, as a warning to the various repeater offices to cut in their combinations. The single wires are then cut in at Montreal and other points are switched on, and a second warning of "time" is given, then single beats are made corresponding to the swing of the main clock pendulum, by alternately closing and opening the circuit each second; the beats are therefore one second in length. These are continued until 11.54.50, when the circuit is left open for ten seconds. At exactly 11.55.00 a long double beat is given and continued each alternate second until 11.55.50, when another pause of ten seconds is made and at 11.56.00 a double beat completes the transmission.

The repeater arrangements at Montreal consist of five relays of seventy-five ohms, each connected up in series with an ordinary Morse key in a pony circuit. The lead from the local dynamo to the desired duplex and quad tables passes through the contact points of one relay. By means of the loop switch any duplex or half quad can be thrown into the combination. The positive and negative 130 and 200-volt dynamo leads pass through the contact points of the other four relays to the various single wires—a by-path is provided so that any leased or other wires over which "time" is not to be sent can be switched out of the combination.

The sparking at the relay contact points is almost nil, but should it become too great by adding more circuits, a small condenser would reduce it. A similar arrangement is used at all repeater offices where storage or dynamo current is employed, the pony circuit being worked by the relay on one of the incoming circuits. At points where a repeater office is equipped with gravity battery there is seldom more than one or two side lines to connect up for time and in these cases an ordinary relay is employed for each of such lines. The combinations at the various repeater offices are made up at 11:30 or even earlier, but the pony circuits held closed by a button switch until the warning signal is received from Montreal, when it is only a moment's work to turn the switch and throw into the "time" circuit all wires on which it is desired that the signals be sent.

Canadian Pacific Railroad time is regularly forwarded to Fanning and other islands in the Pacific Ocean and to Bermuda, Jamaica, and the Azores Islands in the Atlantic. Officers on vessels of the British navy frequently check their chronometers with this time at Vancouver, B. C., and Halifax, N. S., and of the German navy at the Azores.

A few words as to the accuracy of the time may be mentioned here. Some years ago a long series of observations were carried on by astronomers of the Dominion of Canada and Great Britain and signals exchanged over the wires of the Canadian Pacific Railway and cables of the Commercial Cable Company. An astronomer was located at Montreal, one at Canso, one at Waterville, Ireland, and one at Greenwich, England. Each astronomer was stationed at each of the points named in turn, in order to eliminate the personal error. Signals were exchanged in each direction giving the transit of various stars over the meridian. Finally the land lines and cables were connected through repeaters and signals exchanged both ways direct between McGill Observatory, Montreal, and Greenwich, as a check of the preceding results. From these observations was obtained the true longitude of Montreal. I believe that afterwards Washington, D. C., and various other points on this continent checked up their longitude with Montreal.

A master clock at McGill Observatory sends out signals over a circuit connected with an ordinary sounder in our main office. This clock is closely regulated by a siderial clock at the observatory, which in turn is frequently checked up by observations of the stars. We have on several occasions noticed that the "time" given over the railroad lines in the United States has been as much as three seconds in error. We are satisfied that our own standard was right from the fact that the reports from the various comparison clocks on the system showed a uniform variation, while the signals coming in over the New York Central Railway wire jumped two or three seconds in one day coming practically into unison with McGill.

Comparison clocks (Nos. 17 or 18 Regulator, Seth Thomas) are located at all divisional points. At all comparison stations a daily record is kept of the clock variations and a report sent to the chief inspector at the end of each month. This

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report shows the seconds fast or slow, and when the clock is wound, set or regulated. Each month these reports are checked up and the average weekly rating ascertained from which a statement is compiled and a copy sent to each master mechanic, superintendent, general superintendent, the vice-president and general manager. The time inspector visits every station from one to three times per year and checks up the handling of records. All way stations are supplied with a standard telegraph clock (Seth Thomas); variations are recorded daily, in same manner as comparison clocks.

Watch inspectors are located at all divisional points. They are practical watchmakers, doing a regular business with the general public. It is their duty to see that all trainmasters, road foremen of locomotives, locomotive foremen, roadmasters, bridge and building masters, engineers, firemen, conductors, train baggagemen, brakemen, yardmasters and yard foremen carry watches up to the required standard and that the watches are regularly cleaned. For this purpose the inspectors are advised by the proper official of the railway of all changes in the staff of the employes mentioned.

The minimum standard of excellence adopted is a grade known among American movements as 17 jeweled, double roller escapement, Brequet hairspring, patent regulator, adjusted to temperature, isochronism and at least five positions, and corresponding to Waltham, Appleton, Tracy & Co. "Nickel Premier;" Ball, "Official Standard" 16 and 18 size; Elgin "B. W. Raymond nickel;" Hampden "New Railway;" "Illinois Bunn;" Hamilton "936," and all grades equal or above, also Swiss movements complying with these specifications, the variation of which must not exceed thirty seconds per week. Watches which were in service prior to the reorganization of the time service, October, 1899, may remain in use subject to the approval of the chief inspector as based on the record of their performance, or on actual test in his office of their reliability. Almost every one of these watches has been removed from the service.

Employes required to carry standard watches must submit them for half-yearly inspection to the time inspector of their divisions, and receive a certificate that it is satisfactory, a copy of which is forwarded to his superior officer and duplicate to the chief time inspector. In addition to the half-yearly inspection, employes must submit their watches to the inspector for comparison with standard time within the first and third weeks each month, and the inspector keep a record of the rating. Failing to make such comparison the employe is not eligible for duty without an order from his superintendent. No charge is made for these comparisons. Cards for keeping record of these ratings must be carried on the person subject to inspection on demand of a superior officer. Employes must not set or regulate their own watches, unless a watch stops through neglect to wind it. Watches must be cleaned at least once in fifteen months. The rate card must be filled in in the presence of the employe, who is required to initial the corresponding entry in the inspector's rating book. When a watch is repaired and cleaned by other than an inspector, it must be submitted to the inspector for approval before being used in the service. When left with an inspector for cleaning or repairs a standard watch will be loaned to the employe free of charge until his own is returned to him.

Inspectors are required to have a thoroughly accurate seconds pendulum clock and must ascertain the error thereof to the nearest second at least once each day by comparison with the standard time sent over the company's telegraph wires. A local circuit is extended from the contact points of a telegraph relay in the station to the place of business of each inspector for this purpose. A similar circuit is provided for roundhouses, etc. There are a number of rules and instructions to the inspectors regarding cleaning, etc., which it is not necessary to mention here.

The Canadian Pacific Railway Company has only installed electric clocks at Montreal and Winnipeg general offices and stations. At Montreal there are 81 clocks on five circuits worked by one master clock. These circuits obtain current from a small storage battery which is kept continually charged by a lead from the 25-volt local motor-generator in the main telegraph office, a mile distant. The five circuits are worked in multiple from one pair of cells. I believe this road was the first to work clock circuits in this manner. At Winnipeg there are thirty-seven clocks on two circuits.

The results since the establishment of the present time service have been very

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satisfactory. On one trip across the continent by the time inspector he found that the average variation of all comparison clocks was less than five seconds from standard time.

Board to Test Block Signals and Automatic Stops.

The Interstate Commerce Commission has appointed a board of experts to conduct experimental tests of block signal systems and other safey devices used on railroads in the United States, as provided for by act of congress last winter. The members of this board are Prof. Mortimer E. Cooley of the University of Michigan; Azel Ames, Jr., signal engineer of the New York Central R. R.; Frank G. Ewald, consulting engineer of the Illinois Railroad & Warehouse Commission, and B. B. Adams, editor of the Railroad Gazette. Professor Cooley has been named as the chairman of the board. Mr. W. P. Borland, who has been designated by the commission as secretary of the board, has been employed by the commission for the past five years in charge of safety appliance work. A meeting of the board was called for Friday, July 12, when organization was completed and a plan of work outlined. In the appointment of this board of experts, the commission had the co-operation of the American Railway Association. A subcommittee of that association went to Washington and conferred with the commission with reference to the proposed tests and the composition of the board of experts. This sub-committee was composed of Mr. F. C. Rice, general inspector of transportation of the Chicago, Burlington & Quincy Ry.; A. M. Schoyer, general superintendent of the Northwest System, Pennsylvania Lines West of Pittsburg; W. G. Besler, vice-president and general manager of the Central Railroad of New Jersey; A. T. Dice, general superintendent of the Philadelphia & Reading Ry.; E. C. Carter, chief engineer of the Chicago & Northwestern Ry., and D. C. Moon, assistant general manager of the Lake Shore & Michigan Southern Ry. The committee has tendered the commission the use of railway tracks and other facilities for conducting the tests and will co-operate further, if necessary.—Railway and Engineering Review.

Echoes from the Firing Line

Doesn't Use Coal.

I am a member of Lodge 17, Chadron, Neb., but at present am running a hoisting engine. We don't use any coal on this desert—it is all gasoline, so that I can not express my opinion on "poor coal." However, I used to have my hands full when I only had eleven loads on a freight train, and two coaches on passenger. I have recently seen on a Southern Pacific freight seventy-four loads, one engine and caboose! also a passenger train with five Pullman cars, two chair cars, one smoker and a baggage and dining car, and only one engine.

MEMBER.

Not All a Picnic.

I have taken quite an interest in reading "Echoes from the Firing Line," and not seeing anything from this vicinity I have decided to "take my pen in hand" and let the brothers know something of the conditions here.

Our engines are good, bad and indifferent, nearly all being of the Pittsburg cross compound type, with a few small simple engines. Some are quite free steamers, while others require the fireboy's presence on the "plate" all the time if he wishes to "hit the ball."

Although we are in the heart of the coal mining district of this part of the

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mountains, we get considerable "real estate," which is the sweepings from the mines, and which the company gets pretty cheap. Then again we will get a tank of A No. 1 Fernie, and then the fireboy is in "heaven on earth" until it is all used. Then it is some place else—on earth for the rest of the trip.

Our mechanical men holding office here are of rather a good sort, who do all in their power to help the engine men along. One good point in our 168-mile division is, that in going east it is all down hill for twenty miles, but we have to work quite hard for the next eighty miles. When we get to the end of our run we go and feed up at the "beanery," go to bed and lay awhile in dreamland fighting our battles all over again, and not long after we are asleep we hear in the long distance "22 K. West." Oh, zounds, but we have a good job!

I have the best wishes for other brothers who are up against it with bad coal and poor water.

MEMBER LODGE 559.

There was a fireboy from Missouri,
And sad, though it is, to relate,
The coal that he burned—from him we have learned—
Was chock full of rock and of slate.

But to him things are now looking brighter,
He's been dealt with kindly by fate,
For in this world of toil he is now burning oil
And thinks no more 'bout re'l 'state.

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Technical Contributions

THE OPERATION OF THE ET EQUIPMENT IN PASSENGER SERVICE

BY WILL W. WOOD

The fine art of smooth air braking seems to be no longer a pursued science nor an active principle, either, on the Air Line nowàdays—that is, in the passenger service, where you would naturally expect the best results. Engineer Lincoln Gides says it's on account of this new ET equipment; so complicated that it takes too much time to operate it; and is no good anyhow. Hi Wheeler, another engineer who is running one of the big, new Prairie types, said the other day, with a wink of the eye, that "you bet it won't be long after the next adjustment of grievances until them distributin' valves won't be a distributin' trouble no more on this road. No, sir!"

It seems that reports have been coming in regularly against most of the passenger engineers who operate ET engine and tender brake equipment, stating that they shock the trains most insufferably in making regular station stops, and also at other times while running. Our air brake instructor has not interfered much, as yet, against the practice of those "old heads"; he knew they would all double-up against him unless he could prove his case. So he selected three of the most progressive and level-headed engineers on one division and laid out to them a certain method of braking; told them to make all of their station stops in that way, and to report results to him as they were acquired. In ten days, or so, they reported; and at about the same time the S. M. P. was advised by the G. M. that his private car, attached to train No. 1 of the 17th inst.—L. Gides, engineer—and on No. 2, of the 18th inst. —H. Wheeler, engineer—was most rudely and severely mishandled, glassware broken, etc., and as he had information that such rough handling of passenger trains was becoming general, of late, and was attributed to improper air-braking—that it had to be stopped, and at once, if it required a resort to the most extreme measures.

Then the air brake instructor talked at some length to the S. M. P.; the S. M. P. understood, and notified all engineers running out of Smithville both ways to report to the air brake car for special instruction on the operation of the ET equipment, and to report there each day they were "in" until released by certificate from the instructor; and particularly—*to follow the instructions, exactly.*

There was heavy attendance at the car the first day for instructions after the order was posted—the day of which I am about to report some of the proceedings—and to be there was worth an admission charge, in more ways than one. The instructor informed them of the cause for the general coming together, and Engineer Cox—Gage Cox—cut out any elaborate opening ceremonies by at once assuming the defensive and opening on what he imagined to be his own individual case. "They needn't lay it to my air brakin'," he began; "the old man's bottles got busted jest fer nothin' in the world but the bad condition he allows them car couplers to git into. When I stopped at Henley I see the conductor and brakeman a dodgin' along the train, a lookin' and examinin' of each couplin', so I went back an' sorta rubbered, and old Hickson ast me if I didn't feel 'em hit, 'n' I said I didn't, 'n' what was all the excitement about? And—he —told—me—sir, that that train had uncoupled twice while runnin' an' the safety chains kept the hoses from separatin', and that the cars come together again somethin' fierce—and coupled all right, too, each time. Instead of chasin' me up here they had better a left me at home a helpin' the old woman renovatin' the wall paper, where the State Railroad Commission inspectors ain't likely to get me and make me tell 'em what I know about our car couplers."

"That big engine of yours," suggested the instructor, "might work up such a speed that the couplers would *jump apart* around those reverse curves at Stubblefield and Lakeside."

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"No, sir. Naw. I always pinch 'em up, down there, with the independent brake valve; and that's the only real good thing there is in the whole ET business."

"And right there, at those two points, is where the trainmen thought the train had broken in two and come together again. The train wasn't uncoupled at all, Mr. Cox. But don't experiment any more with steadying your train, while using steam, with the straight-air brake; it bunched the train, and when you released with the independent valve the engine sprang forward with such a lurch that—the buffer springs assisting—the engine nearly tore herself loose from the train, and the cars apart from each other. The independent brake valve should not be used while running, with a passenger train, under any ordinary circumstances. *It is of the least value,* in passenger service, of any part of the ET equipment. Use it, of course, with the light engine, or to hold the train while standing. And in freight train operation it should be handled like a stick of dynamite.

"A relation of their experiences, from several men here, would be of interest and instructive; but first, I have learned the causes for some of these undersirable happenings, and I am going to tell you how to avoid those shocks complained of in making your stops in the future.

"Better drop this thing of 'knocking' the ET equipment; making faces at it won't scare it out of service; it's come to stay, and you won't want, in a few years from now, the younger fellows to point you out as a souvenir of the dark ages, and say—'there's a man that kicked against the ET, so Pa says, and against the whole air brake in installments as one improvement after another was introduced into the service. The chances are that he knocked the injector, too.'

"Why, over on the Central they are not only specifying the ET brake for all new equipment, but have decided to re-equip all regular freight, passenger and switching engines of modern build with the inmproved ET. And when the Middle Atlantic Line adopted the high-speed brake for all of their passenger trains there was no change made to the standard, high-speed, locomotive brake equipment that is catalogued as such; they simply cast off the old and put on the new ET equipment.

"If there was nothing in the nature of improved operating facilities in the ET equipment, a reason why it should displace the old, standard, automatic equipment is that with the ET you have got, for the first time, a dependable engine and tender brake. Before its introduction you were never able to have your piston packing leathers and brake cylinder pipes in a condition that would hold pressure long enough for the engine to do her share of the entire train braking, at any old stop—and the engine and tender brakes represent a major per cent. of the total *expected* braking power of some entire passenger trains. And then, the piston travel: always irregular and incorrect, diminishing or dangerously increasing the shoe pressure, and always to be reported for adjustment, which is seldom attended to. With the ET you make a certain train pipe pressure reduction from 70 pounds, and a fixed, unvarying resistance will be exerted by the brake shoes against the engine and tender wheels that will not become less from any probable cause, except in extreme cases, where the brake may be 'killed' should the piston travel so far as to strike the non-pressure head of the cylinder. An extraordinary amount of leakage will not decrease the brake cylinder pressure of the engine and tender; in fact, the total cylinder leakage may be as much as can pass out through a circular hole 5-16 inch in diameter without affecting the pressure. Such conditions of heavy cylinder pressure leakage and long piston travel are highly improper, of course, and are hard on the pump and the equipment in general, but the force imparted to the brake pistons is not altered. And don't forget this—with the ET equipment you can't excuse the results of your own bad judgment in making a stop, when you run by, or hit something, by claiming that the engine and tender brakes didn't hold.

"The old style of brake was specially adapted on each engine to the branch of service in which that engine was employed. When the ET equipment is ordered for an engine no questions are asked, except as to the foundation brake and weight on the wheels, in order to get the proper size of brake cylinders; and you choose the size, or type, of air pump. The engine may be for heavy freight, light, or heavy passenger with or without the highspeed accessories, or switching service—the ET equipment furnished will be the same, identically, for each; and it not only covers all previous re-

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quirements, but there is nothing that the engineer should be able to do with the train line and main reservoir pressures that he can not do with one, or both, of those two brake valves if used correctly.

"The power to do these things is contained within the ten points of the two valves—four positions of the independent brake valve and six positions of the automatic brake valve—as against only the five positions of the brake valves formerly used. Now isn't it a natural presumption that, given those ten causes for possible braking effects, an engineer must be sufficiently familiar with those of the working tools of his profession? That he should have knowledge, and use skill and judgment to obtain the particular results desired in his special branch of the service, and in regard to local conditions that may arise?

"In switching service, or when working the air brake on the engine and tender alone in any branch of service, use the independent brake valve exclusively, of course. With a train of any kind, be cautious, however, in applying or releasing the straight-air while running, and the more cars there are in the train the more severe will be the bad results from its mishandling, on account of the increased slack. In freight train operation most of the results while running that used to be required from the previous type of straight-air brake—the SWA-SWB—may now be obtained by the automatic brake valve (H5) of the ET equipment; so don't use the independent brake valve unless you really have to, with a train.

"In freight service always use the release position of the automatic brake valve when releasing the train brakes, and when returning the handle get into the habit of coming back to holding position first—that gives you time *for another think* before you knock off your engine and tender brakes; *then*, if you believe it's all right, move the handle into running position and release them; or, you can graduate them off gently, by moving the handle in a slow alternation between holding and running positions until, when they are completely released, they will leave the valve in the running position; and the 70-pound pressure supply to the train line is constant while you are doing this. If you should, by mistake, leave the brake valve in holding position after the locomotive brakes are off, there can be no danger in it; but if there was any leakage to the application chamber of the distributing valve the driver and tender brakes would begin to re-set, thus calling your attention to the wrong position of the valve.

"In any service, however, with the ET equipment, if you notice that the engine or tender brake is beginning to creep on, yet the automatic brake valve is in running position—"

"Wait! Jus' let me give 'em de score on dat, will yous, Mister Wise?" requested Daly, the new fireman off the "Middle At." "I got nex' to dat so's to save unnecessary exercise. On our firs' trip wid de ET, when we's leavin' a station I notice de driver brakes a hangin' on, an' old Baldy he pushes de straight-air valve into release an' knocks 'em off. An' den he frames up a t'eory dat it's fer him to push dat han'le to release position while he's a runnin', about every time he turns 'roun' to spit on de shovel han'le. Dey's a come-back to dat valve, an' each time he lands her in de release position an' lets go de han'le, it chases back an' jumps over de shoulder, an' *lap* she is. I don't know about dis fer awhile, an' Baldy's a notchin' her, an' I give a continuous performance; an' den Baldy says t'ell wit de ET bus'ness—de driver brakes a draggin' an' it ain't time fer his regular push at de independent valve. So, when Baldy ain't lookin' I reach up an' move de independent valve han'le from lap to runnin' position; an' me an' de rest of de stockholders of dis company's to de good on coal. Ain' dat de spiel?"

"You've translated it exactly," replied the instructor; "the independent brake valve is often left on lap position, or permitted to jump over to lap after using the release position, as, if the handle is given any pull at that time, it will assist the return spring to carry the valve past the running position; watch out for that, and be sure the independent valve is regularly carried in running position, for if it is in any other position it will be impossible to release the engine and tender brakes by the automatic valve after an application, and they are liable to creep on at any time.

"When coupling to a train that is not already charged, or if its train line pressure is rather low, the air pump will stop, dead, the instant that the hose are coupled between tender and train and the angle-cocks opened, if the automatic brake valve should be left in running position; so always in such case place

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the handle in release position until the gauge pointers are within 15 pounds of each other—being careful, of course, to return it to running position before the black pointer passes the 70-pound figure—and your pump will then keep working all right.

"But it is the passenger service that we are concerned with today, because the complaints are chiefly against passenger runners, and on account of rough service stops; now, Lincoln Gides, first: How have you been making your regular stops?"

"I can tell you that mighty quick," was his response. "I always had a good record in makin' station stops before this new-fangled contraption come out, didn't I? Well, I'm doin' my brakin' jest exactly the same's I useta; and don't that prove, plain enough, that all the trouble they're a kickin' about is the fault of the brake?"

"If the ET brake should be handled just like the old one it would," was the instructor's reply; "but explain in detail your methods."

"Well, I make two-application stops—that right? *All* right. And my idee is that the first application must be as heavy as all git aout, an' the second one as light as I kin make it an' stop, too; *that* right?"

"Exactly right. Go on."

"That's all, exceptin' fer results. When I release after the first application everything happens all right, no jar at all—"

"Use the release position?"

"Of course. That's what it's for. It's the way I always have done it."

"But don't the engine brakes fail to release?" inquired the instructor.

"Certain; and that holds the train bunched so's when I make the second application they cain't, nohow, be no bump."

"Well," admitted the instructor, "that was my theory all along, and it seemed a logical one; but the 'bump' does occur at the second application although you may not feel it on the engine—a severe shock, too—and I found that my theory wasn't perfect. I was expected to find out how to avoid that shock, and I have. It happens because the driver and tender brakes *are held on* at the pre-release; and it must be that when the car brakes, only, are released the compressed buffer springs expand and stretch the train—and to prove this, a slight jerk is usually felt on the rear cars just as the triple valves whistle off. Next, the cars begin closing in again on the engine, as the driver and tender brakes are holding back, and there would probably be a 'bump' anyway; but at that instant you start on your second application, the distributing valve is naturally quick to respond, and the application chamber and brake cylinders being already filled with pressure and the shoes pressing the wheels, a small-sized collision takes place, and I will admit that the amount of slack that is permitted between our passenger cars heightens the effect."

That's when Hi Wheeler blew in to the Air Car, excited, his face red from recent encounter elsewhere. "The Old Man just been roastin' me," he announced; "wha' juh think? Says the G. M.'s a contempolatin' of havin' his private car padded all 'round on the inside like a dippy house; or else have the car attached to the local freights when he goes over the road, so's he can enjoy more comfort than at present. I just told him he'd better have somethin' done to that distributin' valve on my engine; I been reportin' it right along and can't get nothin' done to it. So he can't expect nothin' else."

The distributing valve responsible for shocks at station stops! Was it another excuse, or was something to be discovered? "Explain, Hiram," said the instructor.

"Well, comin' into a station I draw off a right smart chunk of air. I look up at the brake cylinder gauge and see about 30 or 35 pounds, maybe, and pretty soon I release—Hey? Yes, full release position, of course. Now, I ain't watchin' that single-pointer gauge all the time, but when I make my second application—and *lighter than the first one*, a whole lot—I look again and there's 50 pounds on that cylinder gauge. Now look here: when I make a light application of the *car* brakes, and at the same time the distributin' valve lets 50 pounds of pressure into the driver and tender brake cylinders, *P'st!*—that quick—no wonder they's something doin'; and how can I help it?"

Everybody present would have laughed only for the fact that their minds were too busy. Was Hi just jollying? Or was it possible that a man who had stepped right on to one of the first five engines that we received with ET equipment, and had run that engine steadily ever since, didn't know that the single-pointer gauge does not fall when the au-

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tomatic brake valve is placed in release position?

"I think, Hiram," advised the instructor, "that your distributing valve is not working badly. Say that the brake cylinder gauge was given 35 pounds at the first application and 15 pounds at the second one—how much pressure would you expect to see indicated on the cylinder gauge after making the second application?"

"Why, 15 pounds, of course."

Then the gang let loose; they were certainly amused, and Hi Wheeler was divided between anger and bewilderment. The instructor finally got him to go through an explanation of the H5 brake valve and it was found that he could explain the direct results from the use of each position of the handle, and he knew that the engine and tender brakes would release only in the running position. He was one of those men—and he is not in a class by himself—who receive instruction in a mechanical sort of way, because they are required to, and then do not apply their learning to their work; men who do not understand the application of any kind of knowledge that does not come from their own actual observation, or experience. The knowledge he had gained of the brake valve's action he didn't extend any further than the brake valve.

(To be Continued.)

THE AIR BRAKE ASSOCIATION CONVENTION

BY F. B. FARMER

(Continued from August Number.)

Recommended Practice.

The Air Brake Association is preparing a list of details, covering the methods of applying and maintaining air brake apparatus, which they will recommend be followed. A committee reported on this subject at the previous convention; their report was quite thoroughly discussed, and was then left in their hands for alteration and addition. They reported again at the Columbus (1907) convention; the able and thorough report was well discussed and the report will now be submitted to letter ballot. Owing to the possibility of this resulting in changes which would make the report misleading, it can not be printed at present.

Mr. Geo. R. Parker (Gen'l A. B. I., G. N. Ry.) recommended, during the discussion on air pump repairs, that at each overhauling the air end of the piston rod be heated for about 4 inches, examined for cracks and, if none are observed, that it be annealed. The object is to reduce breakage at this point.

Mr. W. V. Turner (M. E., W. A. B. Co.) stated, during the discussion as to whether 1-inch or 1¼-inch pipe should be recommended for locomotive tenders, that exhaustive tests have shown there is practically no difference in ability to get quick action on connected car brakes, any slight difference being in favor of the smaller pipe.

Brake Maintenance.—Throughout the convention it was very evident that it was the opinion of all members that better brake maintenance is greatly needed, and particularly so as regards brake cylinders. These being where the work of the air is performed, their pistons must travel the right distance and their piston packing leathers must not leak.

The opinion was general that more attention should be given to testing brake cylinders, particularly after cleaning and lubricating them, so as to insure that the desired results are obtained, and that otherwise many leaky brake cylinders will remain so after cleaning. The employment of a gauge to test for brake cylinder leakage was favored, in so far as it is possible to get it used, the plan proposed being to connect it to the triple valve exhaust port, fully apply the brake and then force the triple valve to release position, thereby connecting the gauge with the brake cylinder. Where a car is fitted with a retaining valve the pipe to the latter would have to be disconnected near the triple valve to connect the gauge.

It was recommended that with 50 pounds in the brake cylinder the leakage allowed to go unrepaired should not

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exceed five pounds in one minute, but many believed that, while this should now apply for passenger service, it is too severe for freight, although undoubtedly desirable. These members favored a less severe test until the condition of freight brake cylinders could be considerably improved.

A much less accurate but easier-made test and one which would result in a material improvement. if observed, was proposed as a substitute where a gauge could not be employed. It consists of fully applying the brake (20 pounds reduction) from 70 pounds, quickly measuring the piston travel and measuring it again in three minutes. If the piston has leaked back one-fourth inch or more at the second measurement the brake should not be passed as satisfactory.

"B2" Equipments of the New York Air Brake Co.

On May 16th a very thorough paper was read on the above subject, describing the construction, operation and maintenance of these equipments. As the same brake apparatus was illustrated and described in a recent issue of this Magazine it is unnecessary to reproduce any of the paper. It was prepared by Mr. H. R. Mason and read by Mr. C. P. Lovell, both of the N. Y. A. B. Co.

Engine and Car Devices Using Pressure Drawn from the Air Brake System.

An interesting paper on this subject was presented by Mr. S. H. Draper (Gen'l A. B. I., N. P. Ry.), but as it was completed too late for printing before the convention, any interested are referred to the proceedings, which will soon be ready, for information covered by it. It showed that in some cases where air pressure is used the work could be performed as well or better by steam or manually, and that where air is required the device using it is often neglected, to the great detriment of the air brake apparatus, owing to the air loss by leakage. As illustrating this, a member said that in testing some compound freight locomotives on which air was used to work them simple, he found the majority wasted air to a considerable extent and that one required 84 single strokes or exhausts per minute of a 9½-inch pump to supply the simpling device alone. As these locomotives worked on a steep grade it would not be surprising if air pumps occasionally got hot or if there was a shortage of air down the grade, the instructions being to drift the locomotives in simple position.

An inquiry by Mr. C. B. Conger (Int. Corres. Schools) developed that the governor valve used on sleeping cars to prevent air from flowing from the auxiliary reservoir to the air tank for the water raising system, until the former has 60 pounds or more, is not set higher with high speed brakes where 110 pounds is used than with 70 pounds brake pipe pressure. One object of the governor valve is to insure enough air for braking before any can go to the water raising system.

It was explained that the adjustment of the governor valve could not be increased for high speed brake service because sleeping cars, the class on which it is commonly employed, are frequently changed from one road to another and from one train to another on the same road. Therefore, with this valve adjusted above 70 pounds no water would be raised to the wash basins when the cars were in a train carrying 70 pounds brake pipe pressure.

Hand Brakes for Freight and Passenger Cars in Mountain Service.

A very instructive paper on this important subject was presented by Mr. Mark Purcell (A. B. I., N. P. Ry.) As showing the difficulties to be met today, the following is quoted from the paper:

"The committee appointed to report on this subject, respectfully calls your attention to the fact that a large percentage of the hand brakes found in service are braking at a percentage that is much too low, faulty in construction and lacking in needed repairs. Under the head of 'Faulty Construction,' we might classify those where the hand brakes do not work in conjunction with the air brakes; forms of foundation gear which do not apply the brake with equal force to each wheel braked; lack of sufficient room for chain to wind on the brake staff; forms of lower staff-brackets which allow the chain to wind around them in such a way as to prevent the proper pull being exerted on the hand brake rod. As a result of lack of repairs we find brake staffs bent, ratchet wheels loose on staffs, ratchet wheel pawls not fastened securely in their proper position, staff brackets loose, winding chains and hand brake rods broken.

"In mountain grade service, trainmen

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often fail to get the full power of hand brakes on account of having to apply a number of brakes in the shortest time possible; thus, in many cases the hand brake is set up quickly and left, not allowing sufficient time for it to gather up the slack in trucks and journal boxes, which would permit of a few more notches being taken on the ratchet. The slack just referred to will be readily understood as that which causes the difference between standing and running piston travel of the air brake."

The following from the paper is quoted from the 1906 report of the Interstate Commerce Commission:

"Hand brakes should also be covered by law, as they are very necessary to the safe handling of cars, and since the general introduction of air brakes the condition of hand brakes has been sadly neglected. It is all the more necessary that hand brakes should be kept in serviceable condition when it is considered that employes are not infrequently called upon to control trains by hand on account of the failure of air pumps between terminals. Hand brakes are also necessarily used in switching cars."

The report calls attention to the time required to set a number of hand brakes heavily on either passenger or freight trains, owing to the delay in getting from one to another, made worse by many holding but little when applied as heavily as possible; to a steep grade tending to rapidly increase the speed; to a considerable braking power being needed to even prevent such an increase and *more* to stop the train; by expensive wrecks resulting from speeds no higher than four to six miles per hour when an opposing train or an open derail is met; and to the too frequent delay on the part of engineers to call for hand brake assistance before the speed is high or the air pressure low, and similar delay to render this aid without it being called for, when they note excessive speed or low pressure (caboose air gauge).

Probably the most valuable feature of the paper is a table showing the results of some tests with a single car where various speeds were attained by gravity on a 2.2 per cent. (116 feet per mile) grade and the stop was then made by the hand brake alone. The comments on same and the table follow:

"The necessity of having a hand brake that can be applied effectively in the shortest time possible was demonstrated by a few tests made with a single car (air brake instruction car) on mountain grades. It was found that the increase of speed was so rapid that when a given speed was attained and an application of the hand brake made, the speed would increase several miles per hour before the brake could be fully applied. For instance, in one test when the application on the hand brake was commenced at a speed of fifty miles per hour, the speed rose to fifty-five miles per hour before the increase could be checked. This might be considered a condition seldom met with, since it occurred when the speed was higher than that attained in practice on mountain grades; however, we must give it due consideration, as it was noticeable to a greater or lesser degree, proportionate to the speed, in each test made and is illustrative of a runaway train.

"This leads us to consider what may be expected when, instead of a single car on which the maximum brake power could be applied in a few seconds, we are handling a train consisting of a number of passenger equipment cars, on which it may take several minutes to apply the requisite number of hand brakes to bring the train to a stop within a reasonable distance from the speed at which it is moving when the application is commenced. During the time required to get this amount of hand brake power applied, the speed will have so increased as to require an additional force to make the stop, and in many cases even to check the increase of speed. If the requisite amount of brake power is available on the train and can be applied rapidly enough, the stop can be made, but a greater distance will be required in which to make it. If the requisite amount of brake power is not available, or it can not be applied rapidly enough, the results are a matter of conjecture.

"The conditions above cited will point to the advantage of having hand brakes of sufficient power to provide a margin for safety. To enable us to get some idea of results which may be obtained on each individual car, the following figures may be of service. These figures show results of tests made with one car on different grades, with different percentages of braking power, speeds, etc., as follows:

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Test.	Speed per Hour.	*Per cent. of Brake Power.	Per cent. of Grade.	Distance of Stop.	Remarks.
1	15 M	32	4	1760 ft.	
2	25 M	37.5	4	2640 ft.	
3	30 M	27	2.2	3300 ft.	
4	15 M	27	2.2	1760 ft.	
5	35 M	32	2.2	2000 ft.	
6	20 M	27	2.2	1200 ft.	
7	25 M	27	2.2	2000 ft.	
8	30 M	27	2.2	3960 ft.	
9	25 M	27	2.2	2500 ft.	
10	35 M	27	2.2	5000 ft.	
11	40 M	27	2.2	5280 ft.	Heavy head wind.
12	30 M	32	2.2	2550 ft.	
13	45 M	32	2.2	4500 ft.	Heavy head wind.
14	45 M	37.5	2.2	4650 ft.	
15	48 M	37.5	2.2	5400 ft.	
16	40 M	37.5	2.2	2550 ft.	Used brake club.
17	50 M	37.5	2.2	3600 ft.	Used brake club.
18	44 M	37.5	2.2	5280 ft.	No club used.

*Based on a pull of 1,000 lbs. on the hand brake chain, as shown by dynamometer tests on this particular car.

"It must be borne in mind that throughout very nearly the entire distance shown in each test there was a constant braking power exerted, force being applied to the brake wheel at frequent intervals to take up all slack as trucks, levers, etc., adjusted themselves to the pull on hand brake rod, while in case of a number of cars constituting a train there would be only a small percentage of the whole braked from the start, and for at least a considerable distance there would be some on which no brakes would be working. These would render the percentage of braking power very low, taking into account the whole weight of train to be controlled. At the time enough brakes would have been applied to otherwise counterbalance the force of gravitation which would be causing the speed to constantly increase, their efficiency would be so much reduced as to require more being applied or these set heavier. With the low percentage of brake power usually employed the use of all available hand brakes would be found short of what is required with some passenger trains on 2.2 per cent. grades to handle them safely without considerable aid from the air brakes.

"The standard percentage of maximum air braking power to empty weight adopted by most roads is 90 per cent. for passenger, and 70 to 80 per cent. for freight, based on a 60-pound cylinder pressure; yet the hand brake power is always far less and is largely what it happens to be. Neither in original installation nor in maintenance does it get the same attention as the air brake or near what its importance justifies.

"In cases where it is desired to get the hand brakes on quickly to aid in controlling or stopping a train, or where it is necessary to depend on them alone to anchor a train on a grade after it has been stopped with air brakes, or to hold cars that have broken off on an ascending grade, we are handicapped by the existence of many passenger equipment cars on which the hand brakes do not work in harmony with the air brakes. These will be of no use as a holding power when set while the air brake remains applied and the air afterwards leaks down. If a number of brakes of this kind are in a train it is liable to start when the air has leaked down. This result can be avoided if the precaution is taken to bleed each brake down while the hand brake is being set, but this process is impracticable on a moving train, and is not satisfactory otherwise on account of the time required to make it effective.

"It is the opinion of your committee that hand brakes which will work in harmony with the air brakes should be used on all equipment; also that the power exerted by the hand brake be not less than 40 per cent. of the light weight of car, nor more than that of the air brake, on passenger equipment. It is believed that the average hand brake power now available on such cars will approximate 25 per cent.

"The figures before given, showing results of tests, would indicate that 25 per cent. is too low and that 40 per cent. is about the least that should be used. It should be borne in mind that the hand brakes on the majority of mail and baggage cars are not available when the cars

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are in a train, owing to the location of hand brake wheels being such that the trainmen can not get to them. Also, that many of such are very inefficient in other than leverage. This lowers the percentage of available hand brake power according to the relative number of cars in the train having this kind of equipment.

"Since the use of vestibules on coaches, sleepers, etc., has come into almost universal use, some form of lever must be used instead of the old-fashioned brake wheel for applying hand brakes. A number of different forms of levers and cranks are being used, but to obtain the most positive action and generally satisfactory results we consider it best to use a lever about 24 inches in length and of similar type as the one known as the "Lindstrom" lever, now in common use.

FREIGHT BRAKES.

"Much of the foregoing relative to hand brakes on passenger equipment holds equally good on freight trains. There are, however, other details in connection with hand brakes on freight equipment which demand attention to enable us to reach a proper understanding of the situation.

"The percentage of hand brake power will be found to vary widely as a result of the cars being loaded or empty. The percentage of hand brake power with loaded cars will be found much lower on freight than on passenger, especially so on freight cars having 10-inch brake cylinders. Owing to the greater number of cars in freight than in passenger trains it is necesary to apply a larger number of brakes on the former to obtain an equal percentage of braking power on the train. In order to apply the required number of hand brakes, it is often necessary for the men to climb over open cars loaded with lumber or machinery, etc., which is a laborious task and consumes considerable extra time. The nature of load and manner of loading also render the hand brakes inaccessible or unusable on a large percentage of open cars, such as gondola and flat cars.

"It has been found that the average hand brake power on mixed loads having 8-inch air brake equipment approximates 11 per cent. with hand brake alone and 22 per cent. where a club is used. (The pull on hand brake rod estimated at 1,000 lbs. without and 2,000 with a club.) It is also found that the hand brake power developed by the use of a club on loaded cars having 10-inch air brake equipment will average about 15 per cent.

"The use of 10-inch brake cylinders on freight cars makes it possible, as it is desirable, to use a much lower rate of leverage than is required where 8-inch cylinders are used. The rate of leverage for the hand brake is reduced in the same proportion, while the power developed at the hand brake rod remains the same, thus resulting in a much lower percentage of hand brake power on this class of equipment, and as the number of freight cars having 10-inch cylinders increases, the average hand brake power available on trains will decrease in a corresponding ratio unless the hand brake rigging is changed to keep pace with improvements made in the air brake equipment.

"It is reasonable to presume that as freight cars of the larger and heavier type come more extensively into use, and the advantages gained by the use of heavier air brake equipment are more fully understood, the 8-inch will be superseded by the 10-inch brake cylinder for freight cars.

"Many freight cars can be found in service having the cylinder lever extended to provide a connection and a means of increasing the hand-brake leverage. This method gives an increase in the leverage, but it causes the power developed to be divided unevenly, so that a much heavier braking power is delivered to one truck than is to the other, as explained at the 1905 convention. To illustrate; no cars are found in service on which the hand brake will develop a braking power of about 75 per cent. on one truck and 55 per cent. on the other, the average or total being 70 per cent. of light weight of car, as a result of this cause.

"One of the several forms of increased levers referred to in the foregoing will furnish a means of increasing the hand brake power and at the same time of delivering the same force to each truck.

"While it is believed that 22 per cent. braking power is reasonably effective, 15 per cent. is too light in view of the time consumed in getting hand brakes enough set to give the full percentage of braking power available on the train.

"Another thing that must be considered is the fact that hand brakes do not receive the attention and repairs necessary to keep them in good working order

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so they can be depended upon when needed.

"Your committee would recommend that this subject be taken up and some conclusion reached covering the best means of bringing about a higher standard of maintenance, and the advisability of increasing the hand brake power to equal that developed by the air brakes. The necessity of this latter is apparent from the fact that difficulty is frequently experienced in handling trains on mountain grades by means of air brakes which are practically simultaneous in their application throughout the length of the train while that of the hand brakes is comparatively slow."

Discussion.

Mr. S. J. Kidder (W. A. B. Co.) said he had seen cars with brake beam release springs so strong that 12 to 18 pounds brake cylinder pressure was required to bring the brake shoes to the wheels, and Mr. C. B. Conger (Int. Corres. Schools) cited a similar case. Both urged the importance of reducing the tension of these springs to the lowest practicable amount so as to increase the effectiveness of the brakes and to reduce the amount of air required for braking.

A member cited a case where a brakeman was injured by the air brake being applied while he was using the hand brake, owing to their working against each other, and urged that they be made to work together on all equipment.

As showing the need of hand brake improvement on passenger cars, Mr. W. C. Hunter (N. B. C. & Ry. Co.) and Mr. Geo. Fredericks (P. R. R.) mentioned roads that have been compelled to discontinue the use of hand brakes on heavy passenger cars, especially sleepers and diners, owing to damage resulting from their inefficiency. Another member called attention to this, demonstrating the dangerous condition where such cars break off on a grade or where a passenger train must be held down a grade with hand brakes because of a pump failure.

Mr. S. G. Down (W. A. B. Co.) called attention to another serious fault occasionally observed with passenger car brakes, it being levers striking on the ends of their guides and destroying all brake power, due to wrong location of the guides, the latter too short, or to slack not being taken up at the point or points that will restore the levers to their proper positions. He also urged the importance of using a design of brake rigging which will permit of the automatic slack adjuster maintaining the slack for the hand brake as well as for the air brake.

Mr. W. V. Turner (W. A. B. Co.) showed the importance of a good design, adequate power and good maintenance of hand brake by the statement that an unbraked car on a 4 per cent. grade will attain a speed of 100 miles per hour in three minutes after starting.

Mr. H. A. Wahlert (T. P. Ry.) stated that some hand brakes are rendered defective, especially weak designs, by being applied while the air is set, where they worked together, and the air brake afterwards leaks off, thus throwing the entire strain on the hand brake, this showing the importance of strong hand brake rigging, and that, where possible, the air brakes should be released before the hand brakes are applied.

Mr. S. J. Kidder (W. A. B. Co.) cited a test with a 50-car train down a one per cent. grade where six brakemen located advantageously required one and one-fourth miles to stop the train from a speed of forty miles per hour.

To insure that the hand brake on a new car will not be rendered useless by the chain fouling or some lever striking and that the latter shall also be avoided with the air brake it was moved and carried that both the hand and the air brakes on new cars be tested with 11-inch piston travel and not passed if these requirements were not met.

(To be Continued.)

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ELECTRICITY—MOTORS

BY ELWOOD GRISSINGER

In the previous papers it has been the aim to explain the dynamo, how a current was generated by it and the care such apparatus should receive. In the dynamo, energy in the form of mechanical power is converted into electrical energy. The electric motor represents the converse of that operation. As a matter of fact, any dynamo that will generate a current can, by suitable arrangements, be made a motor. This is true, no matter whether the dynamo be capable of furnishing a direct or an alternating current.

The north pole of any magnet will attract the south pole of any other magnet, If one magnet be fixed and the other free to move, the latter will be moved toward the former in proportion to their relative strengths and the distance they may be apart from one another. The tendency will be to set themselves in such a way that their respective lines of force will join one another and move in the same direction. What happens, therefore, in an electric motor, is that there are a number of magnets on the armature of the motor whose lines of force are endeavoring to work into and in the same direction with the lines of force of the stationary magnetic field, and this interaction causes the armature to revolve about its axis.

If the simplest form of dynamo, illustrated in a previous paper, is recalled, it will be remembered that it consisted of two field poles and a single coil of wire fastened to a two-part commutator. If a current of electricity were sent through such a coil, the passage of the current through the wire would produce lines of force circulating about it, and would make of that coil a form of magnet as long as the current of electricity was passing through it. There being lines of force passing through the coil from the north to the south pole of the field magnets, those lines of the armature coil would endeavor to set themselves parallel and in the same direction with the other magnetic lines; and if the coil were free to move about an axis, it would move until those lines coincided and acted in the same direction. A part of a revolution of the armature coil would therefore be made, and if at this juncture, by means of a commutator, the direction of travel of the current in the armature coil were to be reversed, the direction of the lines of force would be reversed, and the armature coil would therefore be caused to move into a new position. This movement will continue as long as current is supplied.

In a commercial motor, the number of armature and field coils are multiplied just the same as in a dynamo. What really makes a motor go is the attraction of one magnet for another, the fixed magnets of the motor field constituting one magnet and the ever-changing magnets on the armature forming the others. The function of the field magnets on a motor is the same as on a dynamo, that is, they form the stationary magnetic field. The commutator receives current through the brushes from the source of supply, and automatically changes the direction of the current through the armature coils. The armature of a motor is of the same type as that of a generator—rotates on an axis and carries the active electrical conductors. A motor and a generator will look alike and weigh about the same for an equal output at the same speed of the armature shaft. When in operation, however, there is some difference in the relative strengths of the magnetic fields, as between armature and fixed field. The elements of design are the same all the way through. In the design of a dynamo, the first point to be attained is uniform voltage; in the motor, uniform speed when receiving current at a uniform pressure. Both are analogous in electrical operation.

There are as many forms of motors as there are forms of dynamos. In an earlier paper, drawings were shown outlining the windings of different forms of dynamos. Those drawings will suffice to illustrate the different styles of motors. The first class to be considered is termed a *shunt wound motor*, the armature and field of which can be understood by referring to Fig. 3 of the July number of the Magazine.

The shunt motor is so called because its field circuit is in shunt relation to the

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main circuit, from which main circuit the motor derives its supply of current. The shunt winding on the fields consists of a large number of turns of fine insulated copper wire. It may or may not have a field rheostat in series with it. Usually, on motors of ten-horsepower capacity and under, no field rheostat is used, but motors of larger sizes should be so equipped. The function of a field rheostat in such a motor is to regulate or change the speed; as with a dynamo, inserting a resistance in the field circuit will weaken the field. When the field of a motor is weakened from any cause whatever, the armature will rotate more rapidly irrespective of the load. Therefore, by using a rheostat in the motor field, the speed of a motor can be changed by hand regulation. Any variation in the voltage of the circuit supplying power to a motor will cause a corresponding variation in the speed of the motor. This variation of speed is almost directly proportional to the variation in voltage delivered—that is, if the voltage varies up or down 10 per cent., the speed of the motor will vary through about the same range, except in the case of alternating current motors of the two and three-phase type, whose speed is independent of voltage regulation.

Shunt motors are used for all general power purposes, such as are found in machine shops and other industrial enterprises where may be found general manufacturing. They are always used where uniform speed is required. The latter feature is very important, and is possessed by the shunt motor in distinction to all other forms of direct current motors made. Throughout the range of load of such a motor, the variation in speed from no load to full load should not exceed a few per cent. of normal speed. Such a motor is safe to handle and easily controlled. It will run just as well at no load as at full load, and whatever may be the load upon it, the power taken from the supply circuit is only that necessary to do the work at the pulley plus the internal losses in the machine. The reason that the motor runs at practically uniform speed at all times is because the field is independently excited. If the pressure of supply is constant, the strength of the field current will be constant and consequently the strength of the field magnetism will remain nearly constant. There will be some irregularity in the strength of the permanent magnetic field, which is caused by armature reaction or the demagnetizing effect which the armature current creates. In well designed motors the field is so designed or proportioned as to overcome the armature reaction, thus reducing speed variation to a minimum.

Motors should have the same care as dynamos. They should be installed with the same general precautions. When starting a motor it is necessary to know that the voltage of the supply circuit is of the proper pressure. A 110 or a 220-volt motor can not be run on a circuit the voltage of which is 500, and vice versa.

The wiring to a motor should lead first to a two-pole switch which is equipped with fuses or other safety device. From the switch the wires should be carried to the shunt field winding. A second set of wires should then be carried from the switch to the armature, one wire going directly to one of the brushes on the commutator and the other wire passing to the starting rheostat, and from the last-named piece of apparatus to the other brush. The starting rheostat is known as an automatic starting and stopping rheostat, with an underload release and in some cases with an overload release. It is constructed very similarly to a field rheostat, but is of lower resistance and able to carry a much heavier current. Such a rheostat is built up in different forms. Sometimes the resistance element consists of iron wire, in others German silver is used, and in still others cast metal grids are employed. The resistance is made up of elements in the form of spirals, coils, grids or other forms, and connected together at the top or side of the rheostat case by means of copper contact segments or buttons. These segments may be mounted in the form of a circle or an arc of a circle. Over these segments a blade is mounted which can be caused to traverse them in rotation by means of a handle. When the handle of the rheostat is in the off position no current can pass through the rheostat, and consequently no current can reach the armature.

When the apparatus is set up and wired in, observe whether or not the blade of the starting rheostat is at the off position. If it is, the main switch can be closed. If the wiring is correctly done the motor fields will now be ex-

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cited but no current will flow into the armature. Make certain that the motor fields are excited by approaching them with a small piece of iron or steel. If the fields are excited as they should be the small piece of iron or steel will be attracted to the poles. If the fields are not excited and it is known that there is current on the line, then the wiring must be traced to find where the mistake has been made. If the fields are excited, it is then safe to start the motor by letting current into the armature gradually. This is done by turning the handle of the starting rheostat so that the blade covers the first segment, and then as the motor starts and begins to get under speed, revolve the handle from one segment of the rheostat to another successively until the blade has passed to the last of the segments, where it should remain. To stop the motor, open the main switch quickly, when the handle of the starting rheostat will return automatically to its off position.

To reverse the direction of rotation of such a motor, change the armature lead wires from one side of the armature to the other at the brush terminals or reverse the terminals at the shunt field connections, which will accomplish the same purpose. When making such changes in the connections to a motor, it is of course necessary to have main switch open, so that no current is on any part of the motor.

The starting device of any motor should be kept perfectly clean. It corresponds to the throttle of a steam engine and is equally important. In general, motors can not be started unless a resistance element is placed in series with the armature.

Another form of motor, less in use, is illustrated diagrammatically in Fig. 4 of the July issue of the Magazine. It is known as the *compound-wound motor*, by virtue of its having a shunt and a series winding on the field poles. In this motor the speed will drop off as the load increases, provided the series and the shunt field windings are working in the same direction. If they are working in opposite directions—differentially—the motor will increase in speed as the load is increased. The speed drops in the first case because the main current is passing through the series field, and therefore makes the main field stronger, causing a lower speed of the armature. In the second case the main current again passes through the main field winding, but in an opposite direction to that of the current in the shunt winding, and therefore the magnetic field will be weakened in proportion to the load put upon the motor, and the armature will be caused to revolve more rapidly. A field rheostat can also be used with a motor of this type, and a starting device is a necessity. Wiring and connecting it should be arranged for the same as in the case of shunt motor just described. Compound-wound motors have a narrow field of service. Their present use is almost limited to some classes of elevator service, although there was a time when they were advocated for street car service.

Another class of motors is known as the *series-wound* motor and is shown in Fig. 2 of the July number of the Magazine. This is the most interesting, perhaps, because it is the type in use almost exclusively on all electric cars in existence, and for many other classes of service. As in the dynamo, all current passing through the armature passes through the field windings. The field strength, therefore, will vary with the amount of current flowing through the armature, which latter depends upon the amount of work the motor may be doing at the time. With every change of current strength in the armature there will be a corresponding change of the current strength in the field, and this will produce a corresponding change in the speed of the armature. Such variation of armature speed will therefore cover a very wide range.

We have all been on a street car and noted how much slower it ran when overloaded. A shunt motor would have drawn the car at almost uniform speed. The question is asked, perhaps, why use the series motor? It has other advantages which are paramount. Chief among them is its starting torque, or starting effort. It is capable of developing much more power at the start than is the shunt motor. It will do its heavy work with less fuss, is less liable to get out of order and will attain its full running speed more quickly.

With a series motor, a starting device is also employed, and this starting device is at once a combination of starting rheostat and field rheostat, for the reason that the current which passes through the armature also passes through the rheostat and the field.

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The series motor for street car service is an enclosed motor and practically water-tight. The speed of the armature, except in special cases of construction, is entirely too high to make it a part of the car axle, so it is necessary to reduce the speed through the medium of gearing. Upon the end of the armature shaft a pinion is mounted, which plays into a split steel gear fitted to the car axle. Both gears are best cut gears, and are enclosed in a cast steel gear case which is water and dust tight. This gear case must always contain enough heavy grease so that the larger gear wheel revolves in it and keeps the teeth of both wheels thoroughly lubricated, thereby minimizing wear and noise. Rawhide pinions are used to a very limited extent. It is an open question, perhaps, which is the better, but practice seems to have settled upon the all-metal types. All motors now used are of the single reduction, four pole field type. Older types had two pole fields, and a double reduction, necessitating two sets of gears.

The street car motor is suspended from the truck of the car, and has one side of the frame fitted with bearings in which an axle of the truck revolves. The other side of the frame may or may not have a projection, or nose, which has a coil steel spring above or below it. These springs rest upon an angle iron extending across the truck. Such suspension is called a *nose-suspension*—the springs permitting a limited motion up or down, when starting or stopping the motor, and also giving some protection to the motor when a car passes over a rough section of track. If a nose suspension is not in use it may be what is termed a cradle suspension, in which case parallel bars support the motor from each of its ends, running at right angles to the shaft, these bars resting at each of their ends upon short coiled springs, which springs are supported by the truck proper.

Ordinarily, street car equipments consist of the following apparatus: Two motors of equal size, two gears, two pinions, two controllers (one for each end of the car), one diverter (rheostat or resistance box), one lightning arrester, one choke coil, two canopy switches, one fuse box or one circuit breaker, one trolley hose containing the wires which pass from controller to motors, diverters, etc., and car lighting circuits with snap switches. Most of the modern cars now also have a motor-driven air compressor outfit for the purpose of operating the air brake system.

Two controllers are used because it has been found in practice that a single controller mechanism to be operated from either end of the car was not a practical device. A controller is of as much importance as the motors themselves. It corresponds to the steam engine throttle —is a starting device. Controllers are of different design, depending upon whether they are to operate one or more motors and what capacity. Controllers in use upon the two motor equipments are known as the series-multiple type. These permit of the motors starting in series with one another and the rheostat, and gradually increasing in speed and power until they are in multiple with each other and the line—all resistance in the rheostat having been cut out.

The controller, in general, consists of a rectangular metal case, three feet or more in height, eighteen inches in width and about eight inches in depth. The front of the controller case can always be removed. Within the case there is a cylinder which stands vertically. The shaft of this cylinder rests in a conical bearing at the bottom, and projecting through the case at the top terminates in a short brass handle. Upon this cylinder are mounted copper segments, carefully insulated from one another and from the cylinder. These segments are so placed that when the cylinder is turned the part of a revolution corresponding to a step of the controller handle some one or more of the segments will make contact with spring fingers ranged beside the controller cylinder and thus complete connections between the motor and rheostat circuits. The function of the cylinder and fingers is virtually that of a large number of switches. Different controllers have different numbers of starting notches, such as five, seven and nine, depending upon the class of service, capacity of motors, etc. The greater the number of notches, generally speaking, the more gradually the car may be started. In the stopping of a car the controller handle must move backward over the same course that it took in the beginning. This movement is, of course, executed more rapidly than when starting the motor from rest. In the early forms of controllers vicious sparking often took place at the controller contacts and caused much trouble. Subsequently it

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was discovered that the electric arc could not maintain itself in a magnetic field. The magnetic blowout principle was then incorporated in motor controllers and a great source of trouble removed.

MOVEMENT OF TRAINS

BY H. A. DALBY

Train Dispatchers' Convention.

Hotel Brunswick, in Boston, was made the meeting point for the Train Dispatchers' Association on the 18th of June, and in fulfillment of the order almost a hundred of them arrived and got into clear on schedule time. The middle order was put out to the Boston men and they saw to it that none ran by the meeting point. They set the red board in good old New England style, and it was not cleared until the object for which it was displayed had been accomplished. Furthermore, there was no impatience on the part of those who were held to be given a clearance card, and they did not get it until the proper time. It was one of the best meetings ever held; the attendance was the largest in recent years and the subjects discussed were of interest to all in the transportation department.

The Secretary's report showed a membeship of 1,018, and about thirty-five applications for membership were received at this meeting. The treasury contains a neat balance, with all the bills paid; eighty members were assisted to employment during the year, and the requests from the railroads exceeded the supply of available men. The Train Dispatchers' Bulletin, the official publication of the association, continues to do good work, and it is to be increased by four pages, making forty-eight in all.

As a result of the work of the train rules committee, a number of subjects were presented to the convention, all of which were freely discussed. Perhaps the most important of these was the "A B C" rules, which are used on certain districts of the Northern Pacific and which have been described in these columns.

The convention expressed itself in favor of the 19 order for both the superior and the inferior trains when used in connection with the Middle Order at the meeting point. It was pointed out that there was less danger of failure to deliver this form of order than the 31, for the reason that the operator is on the platform with the order in his hand, and if there were any indications that the train order signal was to be disregarded he is in a position to give additional hand signals, while in the case of the 31 he remains in his office and depends entirely on the train order signal.

The method of handling the clearance card was taken up and it was recommended that a clearance card be delivered with all orders, the card to show the number of each order, so that the conductor and engineman may observe whether all orders intended for their train have been received. The card should be made in manifold, making enough copies for the conductors, each engineman and the pilot, if there be one; also a copy for the operator to retain for himself. The Standard Code form of clearance card does not expressly provide for giving the number of each order, but it could be used by a very small alteration of the wording.

The fact was mentioned that on some roads it is very important that the conductor and engineman of a train passing a train order signal should know whether the operator is on duty, and it was recommended that an additional signal be used in case he is excused for meals or for the night. On some roads this would be valuable in cases where the train order signal is also used for blocking trains.

The Standard Code makes no mention of the train register, and it was deemed proper that so important an element in single track work should be recognized in this way. It was shown that on some roads no register is used, the conductor and engineman of a train leaving its initial station receiving a train order from the dispatcher saying that all trains af-

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fecting their rights have arrived and departed, making certain exceptions if there are any. The dispatcher furnishes this information from the regular reports given to him by the operator, the latter obtaining his information merely by observation of the trains as they arrive and depart. It would seem that this method of reporting trains to the dispatcher is not suitable for a terminal station and might easily contain an element of danger, as it is frequently the case that an operator at such a point is not in a position to know positively that a train has fully arrived. There is also the possibility of his mistaking the identity of a train and making an incorrect report. It was considered necessary to safety, therefore, that the report of the arrival of a train at a terminal station be made in writing by the conductor of such train. Whether the information be given to a departing train by the dispatcher or by consulting the record of the conductor may not be so important, but it was recommended by the committee that the original information be given in writing by the conductor of the train.

The above topics were all discussed from the standpoint of actual experience, and the plans and methods recommended have been used on one or more roads. Other subjects of equal importance and practical value were brought before the meeting and suggestions made tending toward improved conditions.

A decidedly important matter was that of signals displayed for following sections, and it seems that a safer and more consistent method of giving this information is worthy of consideration. The dangers of the present practice are well known and need no explanation. It is based on a principle which is contrary to general signaling practice, inasmuch as an inferior train in meeting a superior is held for a following section if it observes the signals on the engine, and if it observes no signals it may proceed. That the method is defective is evidenced by the fact that the superior train is required to give a whistle signal to call attention to the flag or light. It is just the reverse of what it should be and the reverse of the foundation principle of signaling. It has been suggested that the signals be displayed by the last section on a schedule or by the only train using a schedule, and that if a section is to follow that no signals be displayed, and this would come nearer to correct principles. The suggestion was made in the committee that a distinctive signal be displayed on every train to indicate whether or not another section is to follow. By this means it would make it obligatory for each train to carry some kind of a signal, and men would then become trained to look for it in every case. It would become a fixed signal, and if it were not displayed in its proper place it would come under the requirements of Rule 27 and be considered a danger signal, requiring the opposing train to ascertain the cause. Without mentioning a particular method of carrying out the principle, the convention recommended that a "Schedule Fulfilled" signal be adopted to indicate that a train is the last on a schedule.

Closely related to the above is the general subject of identification of trains. It was the unanimous opinion that there should be a more positive means of determining the identity of trains, particularly those which pass without stopping. It was voted to recommend that each train be equipped with an indicator of some kind, and this has especial reference to passenger trains. The transparency sometimes used in the cupola of the caboose and the headlight of the engine was deemed the best form to be used. Past experience on almost every road furnishes proof of the necessity for such action.

The Standard Code rules and forms of train orders received but little attention. This may be accounted for, partially at least, by the fact that the revised form of the rules has corrected so largely the imperfections of the previous rules. There was, however, a recommendation that another example be added to Form G, as follows: "After extra 211 arrives at C Engine 160 run extra C to G." Probably this form of order is used to some extent, although not authorized by the code, because it is the really correct way of expressing the intent of the order. The only way to express the meaning and to come within the authorized form is to say, "Extra 160 run extra C to G and meet extra 211 west at C." This answers the purpose and can not be misunderstood, but it was considered that the word "meet" may not be strictly applicable in this case, as the extra may arrive a considerable time before the other is ready to leave, so that they do not actually meet. The proposed form, if adopted by the American Rail-

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way Association, will be both clear and logical and will serve to make rulable a practice now more or less general.

The train rules committee attempted the work of formulating a plan for the handling of bulletin notices affecting train movements, the practice on different roads being far from uniform. They were prevented from accomplishing this by reason of lack of time, and the matter was laid over for future consideration.

Other subjects of discussion had particular reference to the office work of the dispatcher, such as the form of the train sheet and the information it should contain, one suggestion being that the large and unwieldy sheet of a heavy district might be displaced by an arrangement after the manner of the card system of records, now so popular. The object would be to have before the dispatcher only the record of such trains as are actually on the district, thus reducing the table space and relieving him from the necessity of picking out a few "live" trains from several dozen, perhaps, that are "dead." The suggestion was that a stationary frame containing a printed list of the stations be placed on the table and movable cards used for the record of the trains. Another subject was the matter of keeping records of train orders issued, whether by the use of a book or loose sheets. The dispatcher's transfer was also discussed and it was voted that the shortest and safest form is that of writing only the numbers of outstanding orders rather than to give a summary of the contents of each.

The A B C Rules.

One of the most important matters considered by the committee was the above system of rules. It was partially described (so far as it was developed at that time) in the June number, page 805. Further information was given at this time, however, showing very satisfactory progress. The most important item is that they now apply to every train and not to freights only, as in the start. There are now absolutely no "rights" of one train over another and no timetable is necessary so far as train movements are concerned. Schedules of passenger trains appear on the timetable, but they only serve to show that a train may be expected at a certain time.

Information was received in regard to the use of the telephone at a blind siding, a valuable acquisition, since it seems necessary that some stations must be without telegraph facilities. The telephone is placed where it is accessible to trainmen and is so arranged that communication may be had with the telegraph offices on either side. A conductor whose train takes a siding to be passed by another reports to the office in the rear that his train is clear of the main line, which has the effect of making that block clear. Another train may then be admitted. After it has passed the blind siding the conductor communicates with the station in advance and obtains a report when the train has passed that point so that his own train may proceed. He is thus enabled to operate the block system for himself. Another way in which the telephone is of value to a train which is to meet another at a blind siding is that if it becomes desirable to move it farther the conductor may receive an order to that effect, there being a regularly authorized method of procedure and a special form of stationery provided for this purpose. In either of these movements the block system is in full effect just as though they were arranged by telegraph in the usual way.

While the general rule calls for the positive block, i. e., only one train being permitted in the section, occasionally exceptions are authorized when the weather is good and the grades favorable. In such a case one train may follow another into the block and, like the arrangement for a meeting point between telegraph stations, an exception is made on the block card.

Work trains are provided for by a special form of the block card, giving it permission to work between two stations until a certain time, naming whatever other exceptions may be necessary. They may be required to clear, protect against or meet certain trains, or any other instructions may be given just as though regular train orders were used.

There are four forms of block cards which may be used as occasion demands. The regular form is used when permission is given to run to the next telegraph office without exception or limitation. This is termed a "Block Card." Another form is to be used when a meeting point is to be made before reaching the next telegraph office, and is called a "Meeting Card." When a train is permitted to enter a block section before

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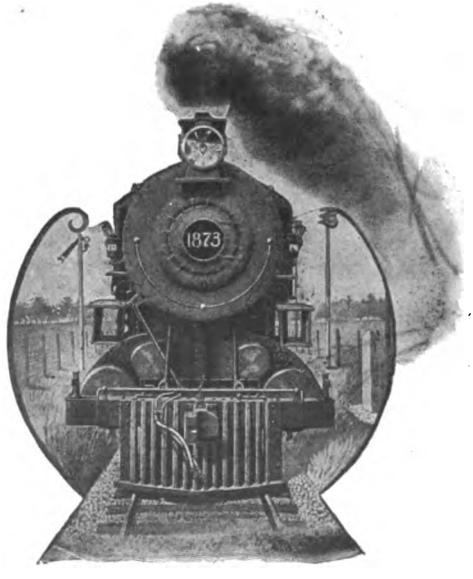
the preceding train has cleared it is given a "Permissive Card." Permission to run in either direction between telegraph stations is given on a "Work Train Card." These four forms cover all ordinary movements and it is seldom necessary to give instructions which may not be covered in this way.

In case the dispatcher can not be reached on account of wire trouble the rule authorizes operators to arrange train movements themselves, provided there are no positive instructions to hold the train desiring to proceed. Of course this can only be done when the operator can communicate with the adjoining telegraph office and regular block protection can be maintained. Of course in case of total wire failure there is no way a train can be moved except under protection of a flagman. But this is very unlikely to happen and the possible disadvantage from this cause is of small account compared with the great advantages of this system over the ordinary method.

Late reports indicate that the rules are proving all that was expected of them and we predict that this is the beginning of a marked advance in single track methods. The experiment will, at least, be watched with great interest.



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Questions and Answers

Locomotive Running and Repairs.

Answers by F. P. Roesch.

320. Peculiar Action of Injector.—"Recently I had an engine with a 10 H Metropolitan injector on. While standing still or drifting the injector would work all right, but when using steam the injector would break. It was taken apart and examined by the machinist and nothing found wrong. Another trial was made, but with the same result as before. Another injector of the same style was then applied, which worked all right all the time. What was the trouble with the injector, and why would it work when not using steam and break when using steam?"—*J. M. W.*

Answer.—At first glance one would be inclined to believe that the opening of the throttle had some effect on the working of the injector by raising the water in the boiler to such an extent as to cause it to flow over into the injector steam pipe and thus interfere with the operation of it. This theory, however, is disproven by the fact that the second injector worked all right. Next, the fact that the first injector worked when engine was standing still or drifting would indicate that there was nothing wrong with the injector itself. There remains then but one more possible cause for this action, viz., in the feed pipe connections, and here no doubt lay the cause of the trouble. The injector evidently was not fastened to the boiler, but depended on the pipe connections for support. Now the joint at the feed pipe and injector, while perhaps apparently tight, was no doubt defective, but with the engine standing still or drifting along smoothly the injector may have rested on this joint in such a way as to make it practically tight, but when the throttle was opened the jars or pounds incidental to working steam would loosen it at this joint, and by admitting air cause the injector to break. This was undoubtedly the cause, and could be proven beyond doubt by trying the same injector on another engine.

The Westinghouse Air Brake.

Answers by F. B. Farmer.

319. Air Pump Blows.—"When an air pump blows on both up and down strokes, just like a blower, what is the defect?"—*A. J. D.*

Answer.—It indicates a generally bad order condition of the steam cylinder, but the most of the leakage is usually past the steam piston, though considerable can also pass the valve motion when badly worn.

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320. Air Brake Problem.—"I have handled several cases recently where solid air trains have parted and the air brakes failed to apply on the front portion of the train, and for the benefit of the readers of the Magazine, as well as information for myself, I would thank you to explain why the brakes failed to stop the front portion of train. I will explain the last case I handled in detail.

"A freight train, consisting of 50 loaded coal cars, 3,500 tons. Engine had 9½-inch air pump. Main reservoir 64,000 cubic inches. All the Westinghouse equipment, including caboose, was piped.

"While descending a grade (70 feet to the mile) at a speed of 18 or 20 miles per hour, the engineer attempted to make a service application of the brakes, when all brakes worked quick action, causing such a shock to the rear of the train as to detach the caboose from train, knocking the conductor out of the cupola and slightly injuring him. When he had recovered from the shock he discovered that the caboose was detached from the train and was following the train some three or four car lengths from the rear car. He let the caboose follow and recoupled to train about one-half of a mile from the point at which it became detached. After coupling the caboose he closed the angle cock on the rear car and proceeded on down the grade until stopped by an automatic block signal, where the engineer made the stop with a service application of the brakes. At this point a defective triple, which caused the quick action, was located and cut out. At the investigation the engineer stated that when he attempted to apply the brakes at the point where the caboose broke off his brake valve service exhaust closed and, having had trouble with a defective triple in this train, he immediately placed the brake valve handle in release position to keep the train from stopping, and that he knew nothing of the train line being open on the rear of train until told by the conductor.

"I will be glad to have you explain through the columns of your valuable publication why the brakes failed to stop this train with the angle cock open on the rear."—*C. M. K.*

Answer.—This appears to be one of those cases that can not be explained with equal satisfaction to all parties, and especially so as regards the most responsible ones. In the first place it is dif-

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ficult to conceive of a serious shock to any part of a 50-car, loaded freight train descending a grade of 70 feet per mile at a speed of 18 miles per hour, even with an emergency application, if the air brakes are operating to the rear, but not so if a considerable number of the rear cars have no brakes in operation. In fact, it seems quite clear that the air brakes were not cut in to the caboose. If they should have been and were later it would look as though the man at fault had found it out and quietly cut in the closed angle cock after the circumstance related.

Cabooses should have air gauges and the man or men riding there should know by the gauge that the air is cut in and that the pressure is what it should be at all times when a train is in motion. The caboose gauge and these instructions enforced will go far toward eliminating such statements, and will also add an invaluable safety feature for an insignificant expense.

If the caboose was fitted with an air brake it should have stopped, being empty, in a short distance after breaking off unless the air was not cut in that far back.

The writer has heard of one or two similar cases where it was claimed that the forward part of the train went on because the hose on the rear of the front section kinked and caught on something to hold it in this position, as the couplings were pulled apart, but can not vouch for the accuracy of the statements. This could not explain the case in point, as the conductor would have been sure to have observed and reported it. While one could theorize on a loose obstruction at the rear of the brake pipe being suddenly moved so as to close the pipe as the hose pulled apart, it would be a weak explanation and unworthy of consideration unless subsequent tests located the obstruction and thereby permitted of its removal.

A trainmaster once told the writer that, following a visit of the instruction car and during which visit it was explained how a broken graduating pin or a sticky piston in a triple valve could cause quick action and break-in-twos, he noted that two reports covering the latter almost invariably contained the explanation that the damage arose from undesired quick action, due to one of these causes, but that the car numbers with the faulty brakes were not given. He said that the majority of the undesired quick action was apparently prevented by making it quite clear that this explanation was being worked too hard and that overtime on it was not allowed.

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Railway Club Proceedings

Engine Failures and Their Report.*

The failure of an engine in service interests so many of the various departments of a railroad directly or indirectly, as well as the traveling or shipping public, that every energy is bent toward avoiding them. Shortage of power at times may compel the use of engines on the road which, under ordinary circumstances, would be held for back-shop repairs. These engines, then, should not be expected to handle full tonnage, but should be favored to a degree decided upon by the master mechanic in charge. But on the other hand, no engine should be permitted to start on a trip unless the round-house foreman is sure, to the best of his knowledge, that the engine will make the trip successfully, if it is handled properly and is not delayed unreasonably. Particularly is this latter condition true in what are known as bad water districts, as has been definitely demonstrated. And, too, an engine crew should be given as much consideration as we do our engines. They can not work perpetually on short hours of rest unless their working hours are made short.

It is naturally during a rush period, whether of short or long duration, that engine failures increase in number and often also in proportion to the total miles run in a given period of time. However, there is a practice which, if once tried under such conditions, is usually adopted; i. e., reduced tonnage. There is the consequent increased speed over the road, more frequent attention to engines in round-house, shorter rest hours required by engine crews and more cars handled in the same given time. This is very pronounced on single track roads where a great deal of time is consumed in waiting at meeting points. The train dispatcher can make better meeting points and the little petty annoyances on the engine which make trouble and delays on tonnage trains have no effect. It may be that the cost per ton mile of freight per train is slightly increased, but the cost per ton mile of freight handled in the given period of time is not. For one or two engine failures will quickly wipe out the figured profits of full tonnage trains.

*Paper by Mr. W. E. Dunham, M. M., C. & N. W. Ry.

An engine failure, when charged, should be fair and just. The plain fact that an engine has died on the main line or has given up its entire train and has come to the terminal caboose "bounce" is not in itself a cause for the recording of an engine failure. Very often the circumstances are such that a credit mark should be given instead of a demerit. Many of you know of instances on outlying divisions where up-to-date round-house equipment is not very extensive and round-houses themselves are not elaborate or frequent, when an engine has been worked back and forth between outlying points and the dispatcher wants to make one more trip before sending it in as requested. In an endeavor to help the dispatcher, the engine crew will attempt to do what is asked of them. The consequence is that a train is left on the main line or some important movement is delayed. Is that properly an engine failure, or is it a man failure? Such a case surely is one for investigation first before reporting.

The failure report should be accurate as to facts. These reports originate usually in the train dispatcher's office. Too often the compilation is left until the last moment, when every one is in a rush and when the easiest way is to take the notes from the train sheet. As a consequence any occurrence which has annoyed the dispatcher during his trick, is charged as an engine failure if there is half a chance. The result is that the division superintendent and the master mechanic, as well as other division officers, are bothered with useless letters and memoranda sustaining charges and making explanations of a little petty incident that should have been thoroughly sifted on the spot. This not only wastes valuable time of responsible men, but creates an undercurrent of feeling that often in the end causes bitter enmity. On the other hand, imagine what would have been the result if the dispatcher had stopped for a moment, before making the record, had obtained all the required information and had considered as to whether the service had been delayed or not, forgetting his own personal annoyance. Every one would have been happy, all had smiling faces and been ready for a dig into the work of the

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division instead of a dig into the other fellow.

The failure report should be definite as to details. That is, it should not say "leaking" when there are flues that can leak, staybolts that can leak, mud ring that can leak, etc. It should not say "not steaming" when flues stopped up, honeycombed flue sheet, poor coal, green fireman, leaky steam pipes, etc., can be selected as the definite cause.

And finally the record should stay when once made. If the proper care, as rudely outlined above, is taken there will be no such thing as having "failures" canceled.

But what constitutes an engine failure? Is it not a train failure or delay for which the engine or its crew are alone responsible? With this thought in view, the Chicago & Northwestern Railway has adopted the following rules for guidance in making engine failure records.

DEFINITION OF WHAT CONSTITUTES AN ENGINE FAILURE.

1. All delays waiting for an engine at an initial terminal, except in cases where an engine must be turned and does not arrive in time to be despatched and cared for before leaving time.

2. All delays on account of engines breaking down, running hot, not steaming well, or having to reduce tonnage on account of defective engine making a delay at a terminal, a meeting point, a junction connection or delaying other traffic.

DELAYS THAT SHOULD NOT BE CONSIDERED AN ENGINE FAILURE.

1. Do not report cases where engines lose time and afterwards regain it without delay to connections or other traffic.

2. Cases where a passenger or scheduled freight train is delayed from other causes and an engine (having a defect) makes up more time than she loses on her own account, should not be called an engine failure.

3. Do not report delays to passenger trains when they are less than five minutes late at terminals or junction points.

4. Do not report delays to scheduled freight trains when they are less than twenty minutes late at terminals or junction points.

5. Do not report delays when an engine is given excess of tonnage and stalls on a hill, providing the engine is working and steaming well.

6. Do not report delays on extra dead freight trains if the run is made in less hours than the miles divided by ten.

7. Do not report engine failures on account of engines steaming poorly, or flues leaking, on any run where the engine has been delayed on side-tracks other than by defects of engine, or on the road an unreasonable length of time: say fifteen hours or more per one hundred miles.

8. Do not report an engine failure for reasonable delays in cleaning fires and ash-pans on the road.

9. Do not report failures against engines that are coming from outside points to the shops for repairs.

10. Do not report cases where an engine is held in the round-house for needed repairs, and called for by the operating department, they being informed that the engine will not be ready until a stated time. Failure to provide that engine before that stated time should not be called an engine failure.

11. Do not report broken draft rigging on engines and tenders caused by air being set on train, account of bursted hose or breaking in two.

12. Do not report delays to fast schedule trains when the weather conditions are such that it is impossible to make the time, providing the engine is working and steaming well.

13. Do not report delays when an engine gets out of coal and water, caused by being held between coal and water stations an unreasonable length of time.

In collecting the information for the failure the engineman and the dispatcher are the first ones concerned. The engineman advises the dispatcher just what is the trouble with the engine and says what must be done to get the engine to the terminal or place of tie-up. His statement shows whether the boiler, the machinery, or special attachments are troubling, and gives a brief detail of what is wrong. The dispatcher then advises the master mechanic or the division foreman and also the local foreman of the terminal to which the engine is going. As soon as the engine arrives, the round-house foreman makes a close examination and prepares a statement which he sends to the master mechanic along with the engineman's written explanation. These various statements give the master mechanic full knowledge of the case, and he should have these papers within twenty-four hours after the failure occurred. In

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this prompt action rests a large part of the value of an engine failure report for the division officers. It convinces everybody concerned that things are being watched and that indifference to the service will be treated accordingly.

The final ten-day or monthly statement of failures for the division is of value to both the operating and the mechanical departments. To the former it should show the result of long hours on the road on both engine and engine crew as well as train crew, the result of inferior coal, poorly designed and operated coal stations, scanty and bad water supply, overloading of engines, indifferent train dispatching, lack of harmony in action on the part of the men in charge of a train.

To the mechanical department the report gives not only all this same information, but it also shows up poor design, weak parts, inferior material, bad shop practices, careless handling, indifferent inspection and poor workmanship. In order to fully indicate these defects the round-house foreman sends in with his personal examination report, a marked sketch of the defective part.

With a view to having uniformity in these reports and save time, the blank breakage report forms, printed in copying ink, as are shown in the last pages of the paper, are used. The local master mechanic and shop foreman first make use of these reports by inspecting the broken part, if necessary, investigating the matter of its preparation and application. They are then forwarded to the assistant superintendent of motive power and machinery, where they are again checked up and where, by the frequency of similar reports, attention is drawn to some particular defect. It may be some one design of cylinder head, rod strap, eccentric or strap, or any such part of the machinery of a certain class of engine is regularly giving trouble. These reports quickly show it up to those who have such matter in charge, and the detail is quietly and efficiently remedied without the necessity of any further investigation. Such would be the case if the shops are at all careless in preparing the detail and are passing as good enough parts that are not true as to dimensions, etc.

After the assistant superintendent is through with the reports they are sent to the mechanical engineer, who checks the dimensions of the broken piece and makes use of the data obtained in designing new parts for old engines or preparing plans for new ones. If he finds that some one style of detail designed several years ago is not holding up under the present-day methods of operation, he takes steps to have it discarded as fast as possible and substitutes a modern design. He also strengthens a pattern here and re-arranges the metal there with a view to overcome external and internal defects that have been brought out by these reports.

As a further record and for the purpose of comparison, a monthly statement is prepared in the office of the superintendent of motive power and machinery, which classifies and details the failures and also shows totals for each division of the railway.

PRESIDENT BENTLEY—Before the discussion is opened, the secretary has a few letters here giving some written discussion on the subject; we will be glad to have him read them.

THE SECRETARY—I sent out copies of this paper to certain superintendents of motive power and master mechanics and asked them if they would not, at least, furnish us with their records or their forms; in some cases I have received those and also some little discussion of the paper.

W. H. WILSON (S. M. P., B. R. & P. Ry.)—We have no rules in effect for making records of engine failures. We have, however, a set of rules that if occasion demands we expect to put in effect, a copy of which I hand you.

My experience so far on this property has been that a fixed set of rules is not necessary. The mechanical department accepts, without serious question, the reports of the dispatchers on engine failures, believing that considerable time and friction is avoided by not debating with the transportation department whether their reports are just or not. The reports are carefully gone over, however, by myself and staff, and if faulty design, shop, or round-house practice or neglect is shown by the reports, the matter is taken in hand at once. We stand for an engine failure caused by poor coal, by tired out engine crew and overworked engines after being on duty over the usual time.

Consequential delays to other trains caused by an engine failure are also shown on our engine failure report. . . .

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BUFFALO, ROCHESTER & PITTSBURGH RAILWAY COMPANY.

Mechanical Department.

RULES GOVERNING REPORTS OF ENGINE FAILURES.

No. 1. A delay of more than two minutes to a passenger train or more than five minutes to a freight train, caused by any defects in the engine or tender, will be an engine failure. Time made up after a failure occurs not exceeding two minutes for a passenger train or five minutes for a freight train, will cancel that failure. Time made up after a failure exceeding two minutes for a passenger train and five minutes for a freight train, will not cancel failure, but the amount made up must be shown on engine failure report, Form 512. Show the same engine once only on form 512 for failures on the same train, but specify all causes of failure.

No. 2. Reports must be accurate and intelligible. No indefinite reports, such as "engine not steaming," "hard pulling train," and "engine not working good," will be accepted.

No. 3. Engineers running over more than one division with the same engine and train will not be charged with more than one failure on account of same defect.

No. 4. Consequential delays to other trains, caused by an engine failure, will be shown on engine failure report, form 512.

The following delays will not be considered or accepted as engine failures:

No. 1. Delays to trains in terminal yards, on account of work not being completed in time on the engine which is ordered to take train through to the next terminal.

No. 2. Anything occurring to an engine before it leaves the turn-table, or after it leaves its train at the terminal.

No. 3. Delays due to accidents or derailments of which the engine or tender is not the primary cause.

No. 4. Breakages, derailments or delays caused by engines striking obstructions on or beside the track.

No. 5. Delays to switch engines caused by necessary repairs, fire cleaning, taking coal, water or sanding at the end of its day's work.

No. 6. Delays due to taking coal, water or sand at regular stations, or on account of heavy trains, bad rails or long hours on the road.

No. 7. Delays due to brakes sticking on train when not caused by any defects on the engine.

No. 8. Delays due to lack of coal or water when caused by engine being held out on the road an unreasonable length of time.

No. 9. Delays due to an engine slipping, stalling or reducing tonnage on account of bad weather, wind, snow, cold or foreign substance on rails.

No. 10. Broken draft gear on either engine or tender, when caused by train parting, or airbrakes being otherwise improperly set on the train.

No. 11. Work done on engines while waiting for orders, or for passing trains, or while station work is being done.

No. 12. Engines going to shop for repairs coupled in or dead in train. But if handling train alone, whether it pulls full tonnage or not, they will be treated the same as other engines.

A. BUCHANAN, JR. (S. M. P., Central Vermont R. R.)—The question of engine failures, to my mind, is an important one. . . .

We consider an engine failure any detention, reduction of tonnage, or giving up of train on account of defects in the locomotive. We do not consider it an engine failure where fuel only is responsible. We attempt after each failure to locate the responsibility, taking it for granted that practically all failures are avoidable by proper inspection and maintenance by either the enginemen handling the engine or the locomotive force at the engine house. There are few failures, in my opinion, which can not be avoided if proper inspection is given to the manufacture, application and maintenance of material.

G. S. MCKEE (S. M. P. & C. E., M. & O. R. R.)—Our practice of charging engine failures is that we only charge such failures for which the engines are directly responsible, such as broken parts of machinery, boilers leaking, steam failures and hot bearings.

JOHN TONGE (M. M., Minn. & St. Louis R. R.)—The subject of engine failures is an important one, but it always appeared to me that railroad managers never "took the bull by the horns" properly in order to prevent engine failures; and what I term the "bull" is the train dispatcher or "chief," if you please.

A general manager or a general superintendent may issue instructions to their subordinates, giving the same deep con-

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sideration, but when these instructions are left to the judgment of a dispatcher, it rarely ever occurs that the consideration given by the higher officials is considered, because it must be taken for granted no higher official desires to lose money in the operation of his road. The train dispatcher, strictly speaking, is the man through whom proper returns can be had or not had.

For many years I have taken the position, and I still believe it is the only position for a railroad manager to take, that all dispatchers should be compelled to have as thorough knowledge of the proper care of an engine and of firing an engine as an engineer or fireman, and if such were the case, we would have reason to expect fewer engine failures, because it would be plain to him from his examination his superior officers would have reason to tell him that he knew better than to do this or that, which tends to engine failures.

I consider it the keynote upon which we should hang, and hang tightly, as motive power managers insist upon our general officers that dispatchers be not employed unless they thoroughly understand how to care for a locomotive.

WM. MCINTOSH (S. M. P., C. R. R. of N. J.)—There are as many different methods of recording engine failures as there are railroads, and about as much uniformity in results as there is in locomotive performance sheets as variously compiled.

The plan followed on the North-Western Road, as explained by Mr. Dunham, appears to be as fair and liberal as could be desired, due allowance being made for time made up, and for delays resulting from causes beyond the control of the motive power department. I do not see that Mr. Dunham's list makes any allowance for poor coal. Possibly such an exception would be too indefinite and lead to contention; or it may be his road furnishes a uniform grade of coal, always of good quality. This would be the exception, however, as there are usually some wide variations in the quality of coal on the majority of roads, some grades being of such poor quality that no locomotive could steam with it.

On the road with which I am connected we follow up engine delays to a finish, each report being traced until the facts are known, all delays of one minute or more being recorded, and no allowance being made for making up time or reaching destination on time; the delay or failure, once occurring, can not be eradicated. In addition to a ledger record of each failure established, we have the graphic or diagrammatic report similar to the North-Western, which is indispensable, enabling, as it does, the mechanical engineer to locate weak points in the engine design. A few failures of any part of the machine in the same place points to a defect that needs immediate attention, frequently calling for radical treatment.

While engine failures may be classed among the disagreeable features of railroading, they are like the poor—always with us, and a complete record enables those in charge of designing and maintaining motive power to follow it up from day to day and gather the information necessary to reinforce weak parts and overcome the difficulties promptly as they develop. . . .

W. O. MOODY (Mechanical Engineer, Illinois Central Railroad)—The engine failures, with the method followed by the man who is responsible for getting his engine or engine and train from the main line in the minimum amount of time, is an education to others who may have to face similar conditions, and brings out those qualities which may in the future, because of resourcefulness in emergencies, cause their selection to oversee and instruct their fellows.

Seemingly an engine inspector should have a previous training, either in shop or on the road, or be put through some sort of an examination to determine his fitness for the position, because much depends upon the thoroughness and intelligence of his examination.

His road experience gives him a knowledge enabling him to locate the probable sources of future trouble and to bestow upon these parts a more searching examination and with a greater degree of intelligence.

A more rigid and thorough examination of engines while housed would probably result in increased work for the roundhouse force in order to promptly and properly care for defects discovered.

Efficient engine repairs can be traced to proper entries made on the work book; such entries as "injector would not lift" or "lubricator not working" leaves much in the hands of the machinist delegated for the work, and entails much additional time to locate the trouble before proceeding to rectify it.

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When men have regularly assigned engines, the personal element occasionally manifests itself in work report books. Sometimes a man will report the right cylinder loose on one side, to insure that the engine will not be held over for work, when as a matter of fact both cylinders were loose, and the next trip in, the left side is reported. By this scheme he is sure of going out on his regular engine, to which by long familiarity he had become attached.

It is understood that defects, such as concealed flaws in materials, may exist, even when engines are under construction at the builder's, which no amount of inspection will reveal.

Improperly fitted crosshead keys may produce a failure, unless the work is inspected during its progress from vise to engine, which is another phase of the inspection proposition. But this and many other causes for future trouble may be eliminated by a systematic method of inspection by a corps of trained and conscientious inspectors.

PRESIDENT BENTLEY—Gentlemen, you have heard the written discussion on this very important subject. I thought it was rather unfortunate that the original plan we had outlined last month of having the discussion on "Train Dispatchers" and "Engine Failures" on the same evening could not be carried out, but as it happens, it turned out to be rather wise, otherwise there might have been serious recriminations. I understand, however, that the train dispatchers' meeting was a very interesting one; I was very sorry I could not be here. Seeing that the train dispatcher has been spoken of so disparagingly, I think it would be very nice if we could hear from a train dispatcher, if there is one in the room, and see what he has to say about the engine failures that cause him so much trouble. If there is anybody here who has held an official position in dispatching trains, we would be very glad to hear from him.

MR. H. C. HOPE (Supt. Telegraph, C., St. P., M. & O. Ry.)—I was a visitor here a month ago. I am not a train dispatcher, but had the pleasure of listening to the very able paper as read by Mr. Mackie and the discussion. I am here today on a telegraph superintendent's committee meeting and was invited by some of your members to attend this meeting tonight.

What I wish to say is that several weeks ago the management of our railroad was out on an inspection tour, our general manager having been former superintendent of the division where we laid up for the night. We spent some time at the division headquarters, checking up train sheets and visiting with the train dispatchers and trainmen and several engineers.

By having a meeting of this kind with the division superintendent and his assistants, we found there were two sides; in some cases the train dispatchers were not using the good judgment they should. Also the engineers were sending back word to the round-house foreman that they were sick and other reasons. These matters have been gone into by our officials, and we think the engineer and the dispatcher will become more interested in each other for the good of the service.

PRESIDENT BENTLEY—Gentlemen, let us know how to overcome the trouble. There is no doubt, if the train dispatcher and engine department do not work in harmony, the engine failures will keep growing. A great deal of dissatisfaction exists, but there are two sides to this question, and I always try to get in close touch with the other department, if possible. The way I would like to feel about these things is that the mechanical department makes a great many mistakes and the other department sometimes is not "behind the bush" in telling about it. I feel this way, that we absolutely must make some mistakes, if we do anything, but when we do make mistakes, when we have trouble of that sort, let us own up and say it was our fault. We cannot be perfect, but I would like to see the train dispatchers, if they make a mistake, be free to tell us that the trouble is theirs and not with the engine.

MR. W. G. WALLACE—Some years ago it was my pleasure to serve a railway officer who informed me that he desired excuses for trains being on time rather than an excuse for their being late. His advancement to more responsible positions is an indication that his aim was in the right direction.

An engine failure report is simply an excuse or explanation of the delay to the train to which it is attached and to others which it affects. The author of the paper has brought out many points that are worthy of consideration by all departments of the railway.

On page two the question is asked: "When a train dispatcher has worked an engine between outlying points until

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it is unfit for service and then endeavored to send her to the shop terminal with full tonnage that she is not able to handle, is that an engine failure?" In answer to that question it would seem proper that it should be termed a "man" failure and one that properly belongs to the operating department and the train dispatcher, instead of to the mechanical department.

An engine that is not capable of handling the train tonnage of her class is known as a "weak sister," and the train dispatcher cannot afford to tie up the first class power by laying it out in order to insure the inferior engine the right of track and prevent failure. But he should endeavor to get her to the terminal with as much of the train as can be handled instead of killing her at stations as he is often forced to do in order to keep other trains moving. It would seem more practical to bring the inferior engine in with a tonnage that would insure schedule movement of train.

Engine failures—men failures—or failure to prevent failure—result in delays to trains and reduction in tonnage, and at times it appears that if the same effort were expended in preventing the failure as is manifested in fixing up the engine failure report after the failures have occurred, there would be quite a reduction in the number of failures and a corresponding improvement in the service.

The train dispatcher wants the power and gives the roundhouse a "jolly" over the phone—wants the engine to get the train out of the yard; will get her right back and give you all kinds of time to do the work next trip. The engine is allowed to go. A failure is the result, and the train dispatcher forgot all about the condition of that engine and his promise to get her back until he required information for the engine failure report so the failure could be charged to the mechanical department. On the other hand, had the roundhouse foreman informed the train dispatcher that he could not have the engine until she was in proper condition for service there would have been less liability of failure and a saving of overtime for engine and train crew.

The engine failure report from the train dispatcher cannot give complete information regarding the failure in all cases, for the reason that it is impossible for the train dispatcher to obtain it from the engineer. Engineers are rather cautious about sending reports of defects existing on an engine on snap judgment when there is a possibility of having to apologize for it later in the office of the master mechanic, and usually give the train dispatcher only enough to satisfy him as to the nature of the failure, such as knocked out cylinder head, engine not steaming, etc. When the dispatcher asks why not steaming, he will often get an evasive answer or none at all, because the engineer hesitates to place himself on record until he is fully satisfied that he has located the defect. It may be possible that it is a man failure, and he desires time to think it over and have the best explanation he can make up ready on arrival at terminal.

To illustrate a combination failure: An Atlantic type locomotive, handling a passenger train of less than 400 tons, broke a link hanger, drifted into the station and the train dispatcher was notified of the failure. After some delay an engine from work train service, with small wheels, was sent to relieve the passenger engine. The work train engine soon ran hot and had to give up the train, and a freight engine was provided. The delay resulted in the train being delivered to the connecting line three hours late, charged with an engine failure. The defect in the hanger could not be detected by the engine inspector at the terminal. This caused the failure. When the failure occurred, had the engineer blocked the links on that side at a cut-off that would have insured the proper handling of the train, he could have made the time and prevented both the man and the engine failure. He was not equal to the emergency and lost the opportunity to prevent the failure or obtain a credit mark for himself.

There are numerous combination failures which in the end are not chargeable to the man, the operating department or the mechanical department, but are charged to the railroad company and result in increased cost and loss of revenues. While reduced expenses in shops and roundhouses are desirable, the efficiency of the service should not be overlooked in making comparisons, and the reduction of a very few engine failures would often pay for the additional force necessary to maintain the equipment and allow the engine to leave the terminal with less possibility of failure. The enginemen should be educated to meet and overcome

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reasonable failures and bring trains to destination with as little delay as possible. There are many engineers who prevent failures and bring in trains when a defect exists, that with less skillful men would be charged as an engine failure. In one case the roundhouse foreman is the only one who will know about it, and in the other it may attract the unfavorable notice of the general manager.

With engines in proper condition, manned with engine crews that study their business and are interested in giving A No. 1 service and willing to exert themselves beyond the requirements set forth in the schedule of compensation to prevent failure, and a train dispatcher that will receive a suggestion from an engineer, who may briefly state a condition or a defect that may cause a failure unless suggested movements or reductions in tonnage are made, and the entire transportation force working together to get traffic over the road for the company instead of for the particular department with which they are connected, the reduction in failures and improvement in the service should be apparent.

The blank breakage reports shown in the paper are very desirable and furnish correct information that is of value to the mechanical departments, as well as to the builders of locomotives.

MR. M. K. BARNUM (C., B. & Q. Ry.)—It seems to me there are two objects in the reporting and discussion of engine failures, viz., information and improvement. For the purpose of information the reports are worthless, or worse than worthless; they are misleading, unless accurate and reliable. The author of the paper has covered this point quite fully and I can only add the suggestion that both the engineer and conductor should be required to sign telegraphic reports of engine failures, as in my experience that has been necessary to get a trustworthy report. Reports sent in by the conductor alone, or by the conductor reporting something that the brakeman took verbally from the engineer, are very apt to cause misunderstandings at headquarters.

It is very desirable that all the railroads should agree upon one definition of an engine failure, for statements of engine failures made by different roads are not now uniform. The definition given in the paper is probably as liberal toward the mechanical department as any in effect. Another extreme definition used by a road in the west is as follows:

"All delays of any kind whatever chargeable to engines."

That is pretty broad, to say that practically any kind of delay that can possibly be charged to the engine is an engine failure. The road with which I am associated has adopted the following definition, which is midway between the two extremes, and we believe fair to all concerned:

"A delay of more than two minutes to a passenger train, or more than five minutes to a freight train, when caused by any defect in its engine."

A set of rules similar to those of the Northwestern Road, given in the paper, have also been adopted, but differ from them in some particulars. Delays when once made are not canceled by afterwards being made up. The reason for this is that we think one of the primary objects of such a report to be information, and if so, the information should be given, even though the delay is afterwards made up. The smaller limit of time allowed before reporting an engine failure is also thought to be in the interest of good service and makes the report more valuable.

Improvement is really the most important object of the reporting and discussion of engine failures and the author's most valuable suggestion toward that end is this:

"No engine should be permitted to start on a trip unless the roundhouse foreman is sure, to the best of his knowledge, that the engine will make the trip successfully if it is handled properly and is not delayed unreasonably."

Where this rule is followed faithfully, and it is understood by both the mechanical and the transportation departments to be absolute and final, that in no case will an engine be turned out until it is in shape to be reasonably sure of making a successful trip, the engine failures will be few compared with the road where they are turned out simply because the transportation department crowds the roundhouse foreman for power.

It is very desirable that all roads should adopt a uniform definition of an engine failure, and also uniform rules for reporting them, if possible, so that an intelligent comparison of performance on different roads can be made, which is not now possible. Under the definition and

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rules adopted by the road with which I am associated, an average of less than 5,000 engine miles per failure is considered poor, from 5,000 to 10,000 engine miles fairly good, and anything over 10,000 engine miles per failure is satisfactory.

I think that one of the most important suggestions in the paper is that pertaining to reports of defective machinery which are sent to the assistant superintendent of motive power and through him to the mechanical engineer for his files. By faithfully following up such reports a very valuable record will accumulate, which will enable the weak points of the various classes of locomotives to be strengthened and thereby materially decrease the engine failures.

Briefly, my suggestions for keeping down engine failures are: First, all necessary roundhouse work must be found, reported, and properly done. It is quite possible to run engines successfully for some time, although about ready for general overhauling, if the roundnouse work is watched closely and kept up in the very best manner. Next, engineers should be induced to take a lively interest and pride in avoiding failures. This is a matter of education and calls for patient and persistent work on the part of all of the mechanical department officials. And, last, but not least, co-operation between the mechanical and transportation departments will prevent a great many engine failures. It is a good thing, when possible, for the master mechanic and chief dispatcher and superintendent to have frequent visits together; we may call them heart-to-heart talks, and in this way they will anticipate and avoid many things which otherwise would develop into engine failures.

PRESIDENT BENTLEY—I think you are entirely right, Mr. Barnum, about the uniform system of reporting failures and what constitutes one. It might be a good thing to bring up before the Master Mechanics' Association, to have a committee appointed to look into that thing. Mr. Seley, have you anything to say?

MR. C. A. SELEY—I have not very much to say, Mr. President. The matter of engine failures can better be discussed by other people present. I would say, however, that the forms showing pictures and drawings of parts will certainly facilitate getting reports from the road. We have a report on the Rock Island on which the broken parts are supposed to be sketched and sent in for our information. It is pretty hard to get these adequately filled out, and I think we are short a great deal of information by reason of not perhaps making it easier for obtaining sketches somewhat in the manner shown up in the paper.

I have with me all the forms that are in use on the Rock Island road for the various purposes in reference to recording engine failures and so on, and if any of them should be desirable for reproduction in the record, they are at your service.

MR. J. F. DEVOY (M. E., C., M. & St. P. Ry.)—. . . . . There is perhaps no paper which could have been brought up which would have caused any more discussion or could have been of any more benefit, either to the engineer on one side or the dispatcher on the other side, than this paper. So far as I am particularly concerned, I do not think the train dispatcher is a very bad fellow; and I am just as sure as that I am here tonight that if you force him to swell that three-minute delay or diminish the ten-minute delay, if you force him to give you an itemized account of every failure and what it was, he would require so many bookkeepers that there would not be any train dispatchers left.

I believe, so far as the diagrams are concerned, that there is nothing better to determine engine failures. I do not just understand how the writer of the paper intends that we shall keep track of them. I have been looking them over now for twenty years; I look them over every morning, and I never will forget my first two years in railroading. I had a job assigned me which was to take the diagrams of couplers, and mark a little red line where the defect occurred, and I have gone down to the shop more than one cold morning and hauled those couplers over until I said more than I would like to say tonight. And I want to say right here to you that a man will talk a great deal louder than I could talk if you forced him to keep on marking engine failures anywhere outside of what is ordinarily termed a "back" shop. If, for instance, your grate rigging is giving you trouble, you will find if you use dump grates, a man will put "dump grates" down every morning as a cause of failure.

Let me tell you something laughable.

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I get our engine failure reports about half-past eight every morning, and yesterday morning there were three causes of failures; the first one was, the bell tongue fell out; the next fellow lost his air pump; the next fellow lost his water valve, and every man in the office came in to me in turn to know what the water valve was. I told them I guessed the fellow's water can leaked or the spout fell off. But, seriously now, you will find somebody outside of the dispatcher causing trouble, and the dispatcher is just as bad as you can make him; there is not anything worse. If you would get on an engine tonight (I am going to try it), and ride from here to Milwaukee, you would probably get up to the North-Western and Pacific Junction and he will hold you up for four or five minutes; then get up to Rondout and he will hold you up another four or five minutes; then get to the C. & E. I. crossing and he will hold you up there, and then you have got to make it up before getting to Milwaukee! You have no business to be an engineer if you cannot make it up. When you get right down to business, gentlemen, no matter whether you are a mechanical man, train dispatcher, operating official or engineer, you are not very much good in this age unless you have something up your sleeve ready for an emergency.

Now, to my mind, Mr. Dunham, who belongs to the mechanical engineering profession, ought to have told you that 50 per cent. (I believe it is true of every road in the United States), that 50 per cent. of the failures of locomotives are due to inherent or bad design in boilers; that is, the boilers have caused 50 per cent. of the trouble, and I want to say to you right here that we are not paying enough attention to the design of the boiler to bring it where it should be. I do not dare talk narrow firebox, because you think I am "daffy" on the narrow firebox; I do not dare to go to the wide ones, because I know they are wrong; but I do believe this, that it is entirely possible for the mechanical engineering department of any road to overcome 25 per cent. of the failures of locomotives themselves, without the aid of any train dispatcher or anybody else. You have to build a boiler today that will not fail and you can get pretty near to it. I did not get the paper until this morning, and there is another case where neither the engineering department nor the train dispatcher was at fault. I would have had a little bit more to say if the secretary had gotten the report to me sooner, but it only came to me this morning and he has to get his tonight with the rest. But in looking through the reports this morning, I took particularly the boiler failures, and I found that a certain type of boiler for the past thirty days had given 55 per cent. more failures than any other type. You will have to guess about those types, because I have talked about them, both the narrow ones and the wide ones, and I believe that if we could get together on that part—the engineering department I am talking about now—that we could eliminate to a certain extent a great many of those failures.

I think the paper is a good one; it is one that ought to have been brought up; it is one that engineers and train dispatchers ought to prepare themselves upon, but I do not know how we are going to follow up all the rules. If I do I will have to go home and ask for an increased clerical force to the amount of about a dozen clerks to keep my business up.

PRESIDENT BENTLEY—Gentlemen, this subject is a very important one. Mr. Peck, can we hear from you?

MR. P. H. PECK (M. M., C. & W. I. R. R.)—You ought to treat engine failures as I do. I treat them just as Chicago treats the Drainage Canal: it is a good thing to throw anything into that you want to get rid of. It does not make any difference, you know. The train department, trainmaster, general yardmaster and everyone can throw everything on the engine they want to. I was rather surprised that Mr. DeVoy says it will take dozens of clerks to follow these rules; he must have a terrible lot of failures. The Milwaukee road has such fine engines, I do not see why it should take so many clerks to do that work. For a man who has the usual number of failures and on as good a road as the Milwaukee, one clerk suffices.

One thing that causes a great many failures, is shortage of power. They talk about the roundhouse foreman not letting an engine go out unless he is sure that it will make a trip successfully. We would all like to do that, but when trains come in late and the engine is cut off at the lower end of the yard and has to go back again in a few minutes, it is impossible to do good work. We are all

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crowded for power; we do not have much trouble with engine failures due to boilers; our boilers must be of a better design than Mr. DeVoy's. Our boilers pan out all right, but the other parts wear and tear, and I say that one reason why we cannot take proper care of them is because we are crowded for power in cold weather, and then is when most engine failures occur.

MR. DEVOY—I want to inform Mr. Peck that the day before yesterday morning—and I believe Mr. Barnum will bear me out in this—I saw a statement compiled by the Santa Fe, in which the engines on the St. Paul road had made more miles than any road in the United States—no, pardon me, had made more engine miles per engine failure—than any road in the United States except one Southern road, and that the cost per engine mile for repairs was second on the list of about fifty, so I think he will not say that we are quite as bad as some of the rest; the boilers have not been as bad as they might be. I think if a man will take the time to inquire, he will say, "Well, the Milwaukee is not quite behind the drum major, but it is along in where the clarionets come in the band; it is not 'way back in the procession."

PRESIDENT BENTLEY—We have heard from the train dispatcher and . . . . mechanical engineer; I would like to hear from the roundhouse foreman, or somebody who has come in close contact with the train dispatcher when he is short of power. Mr. Barnhart, can you tell us how you handle the matter?

MR. A. H. BARNHART (Foreman C. & N.-W. Ry.)—I get an order about every day for one or two more engines than I have. At the point where I am located all the engines are assigned to regular runs and we have very little extra work except on Sundays. When an engine plays out we are compelled to double one of the others. This gives us sometimes two hours, sometimes one hour and sometimes no time at all in which to get the engine ready for the run. I have always made it a practice, that no matter how urgent the call for the engine was, to hold the engine for necessary repairs, the repairs that in my judgment were necessary to enable it to do the required work before coming back to the house. As a result of this we have had few engine failures in this district.

I believe the greatest cause for engine failures is the lack of proper inspection and the failure to make proper repairs. I believe that three-fourths of the engine failures could be prevented by proper inspection and proper repairs being made. My experience has been that to have proper repairs made it is necessary for the roundhouse foreman to be constantly on the ground and see for himself that the work reported by the engineers and inspectors is done in a proper manner.

MR. PECK—That is the great trouble; they have not the time to work on engines because very few engines have assigned runs. With our engines the rule in the summer time is, "First in, first out." In the winter time it is, "First in, right out;" then we have trouble.

PRESIDENT BENTLEY—There is no doubt but that the enormous business the railroads of this country have been called upon to handle in the last year or two has made it very hard for not only the mechanical, but also for the operating departments, to keep things going, and the pooling of engines, of course, has had its share in bringing about the condition that favors engine failures. I do not suppose that within the next twelve months to come, from the business outlook, we will be able to give regular engines to regular men. I wish we could, because I think it would obviate a good many of our troubles. Now, gentlemen, do not wait to be called upon. The hour is not yet late and we would like to hear from everybody.

MR. A. J. COTA (C., B. & Q.)—Mr. President, I believe a great many engine failures could be avoided by a closer roundhouse inspection. I believe it is a good plan to have engines thoroughly inspected in the roundhouse. We are all after engineers to make a work report showing all defects that they find on engines on their arrival. In addition to this each roundhouse should be provided with sufficient engine inspectors to make a thorough inspection of the engines. All work reported by the engineer and all work reported by the inspector should be attended to before the engine is allowed to go. On the road that I am connected with there is an order that all engines must be put in first-class condition as far as the roundhouse foreman can judge before they are allowed to leave, and I think that points of that kind do more to reduce engine failures than any other.

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T. S. REILLY (Railway & Engineering Review)—A point has been brought up bearing on the relation of long hours on the road to engine failures. This reminds me that some time ago I took the trouble to collect some data to ascertain the percentage of time locomotives are actually required by the mechanical department for maintenance purposes. Figures were obtained from a busy division on each of three of the largest single-track systems running out of Chicago. Considering the total number of locomotives, multiplied by 24 hours, multiplied by 30 days, as representing the number of engine hours the locomotive investment represents, the averages exhibited the locomotives required by the mechanical department for roundhouse purposes, as follows:

Passenger, 21.2 per cent. of their life; freight, 33.9 per cent.; switch and work, 50.6 per cent., so that the average showed the mechanical department required the locomotives 28.5 per cent. of the time. A striking feature, however, was that of this 71.5 per cent. of the time the locomotives were available by the transportation department, but 43.3 per cent. (of this 71.5 per cent.) was utilized in the actual movement of trains. So that, of the investment represented by a locomotive, 28.5 per cent. is used up by the mechanical department for maintenance and supply purposes, 11 per cent. in lying idle in the hands of the transportation department, and 60.5 per cent. in actually hauling trains. In other words, 39.5 per cent. of the investment in locomotives is not utilized for the purpose for which the investment is made.

The roundhouse foreman has been held up here as responsible for a large portion of engine failures. I consider the position of roundhouse foreman one of the most difficult on a railroad, if not the most difficult. He has no prestige, his pay is a matter of ridicule; it is generally his first experience in an executive capacity; he is the storm center of locomotive operation and maintenance. Seldom is either his force or facilities equal to his needs, and he must constantly exercise the highest judgment and diplomacy to successfully equalize mechanical with operative needs. Yet we are observing a present disposition to give "shop system" cranks full swing, with ideas which seek to specify the repairs which locomotives shall receive, before they reach the back shop. In order to let these faddists exhibit paper records, it is becoming the order of the day to say in advance that a locomotive coming into the back shop shall receive repairs to the amount of $800 or $1,200 or $2,000, and no more.

In the light of considerable practical experience I, for one, consider such propositions not only absurd, but that such "paint overhaulings" are the principal cause of the abnormally large percentage of engine failures in evidence during recent years. The only way to overhaul a locomotive is to strip it and thoroughly overhaul it—in the full sense of the word. It is impossible to properly inspect and state in advance the amount and cost of repairs such complete stripping will reveal. And the subterfuges resorted to in this regard by shop system idealists to escape this fact—results in the furnishing of roundhouses with power which is supposed to be, but is not at all in the condition locomotives should be on emerging from the back shop—as is well exhibited in the daily engine failure report, despite the superhuman efforts of the earnest roundhouse foreman.

Mention of the dispatches in relation to engine failures reminds me of an official not yet brought into the argument tonight, yet whose duties are, or should be, chiefly concerned with the subject, viz.: the traveling engineer. The point I want to make in this connection, is that if the dispatchers and the traveling engineer keep in touch when he is on the road, many engine failures may be obviated by the dispatcher dropping him a wire about a man who may be in trouble in his vicinity and, moreover, the traveling engineer will know who is, or is likely to be, in trouble and where to find him, thus enabling the best disposition of his efforts.

In regard to the paper itself, it strikes me that the essential point is that the Chicago & Northwestern Railway has established a good precedent in defining engine failures as in this list. There are very few lines which have established the definitions of an engine failure, and in the absence of such clear definitions, there is a great deal of lack of harmony between the mechanical and operating departments. For instance, I notice in Rule 13 it says: "Do not report delays when an engine gets out of coal and water, caused by being held between coal

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and water stations an unreasonable length of time." One of the worst controversies I ever had with the operating department was over that very thing. I charged such engine failures to poor dispatching; they claimed that there could not be an engine failure on account of poor dispatching. It was mentioned here, by one of the correspondents, I believe, as being of very great benefit if railroads could make and establish a uniform list of definitions of engine failures. I believe there should be put in practice on all roads a standard ruling something along the line already established by the C. & N.-W. Ry. I understand the present example has been in effect several years and it is therefore well proved as having been well worked out in actual service.

MR. M. H. HAIG (Railway Master Mechanic)—In discussing this very important subject of engine failures, I have heard several sides of the question brought out: for instance, the engineer, the train dispatcher and various others. I would like to hear someone discuss the question of the effect on long divisions with regard to engine failures, especially in handling very heavy trains. I have heard it said that 50 per cent. of engine failures occur during the last few miles over divisions of unusual length, where handling heavy tonnage. This is on account of the fire becoming dirty, especially with green firemen. Such conditions aggravate the tendency for flues to leak, etc. I would like to hear someone who has had experience on long divisions.

PRESIDENT BENTLEY—Is there any gentleman here that has a division of 250 to 300 miles that can make any suggestions on that question?

MR. R. E. STATE (R. H. F., C., R. I. & P. Ry.)—Our division on the Rock Island is, I believe, 159 miles for freight engines, and the way we get after the engine failures is with the best boilermakers we can get. Good boiler work is very necessary. Next, the best inspection that can be given; then follow up the machinists, that they do the work that is given to them. The Illinois division for December showed one engine failure in freight service to 42,000 miles.

PRESIDENT BENTLEY—That is a very good record. I do not believe there is anybody in the room who can duplicate that report.

MR. STATE—In September it was 44,000 miles in freight service and in passenger service it was 24,000 miles.

MR. BARNUM—I would like to ask the definition of an engine failure prevailing on the road of the gentleman that just spoke.

MR. STATE—The dispatcher turns in an engine failure, and he generally puts in all there is to it. It is investigated most thoroughly, and, if just, it stands. If not, it is canceled.

PRESIDENT BENTLEY—How bad can you stand? (Laughter.) I would like to have some information given in line with Mr. Haig's request about long divisions. There is not a doubt about it, if you have a 200-mile division, that at the tail end of the division, especially if it is uphill, the engineer and firemen get tired, the firebox gets into bad shape, the flues begin to honeycomb, and a long division is responsible for many engine failures. If there is any gentleman here who can give us any information in line with that suggestion, we will be glad to hear from him.

MR. GEO. L. BOURNE—I used to have the somewhat doubtful pleasure of running an engine on a long division, the division being a 175-mile freight division and Chicago the eastern terminal. We had joint track at each end of the division, which, of course, made it hard to get to terminals, and usually consumed from ten to twenty hours getting over the division. It was a frequent occurrence to have to clean a fire within ten or fifteen miles of either terminal, and this, of course, constituted an engine failure. With a dirty fire and the firebox almost full of clinker and shale, as long as a man can keep the engine moving and keep the clinker warm, it is possible to get to the end of the division; but when, after worrying along with a dirty fire and consequently a poor-steaming engine, after reaching the terminal we had to go to the stock yards with our train of stock and consume anywhere from two to six hours between Western Avenue and the chutes, and getting back to Western Avenue, I do not think there was any excuse necessary for an engineer to give as to why he had an engine failure. Oftentimes it was necessary for the men on this division to clean fire when on stock yard terminal tracks in order to get their train of empty cars back to their own terminal yard.

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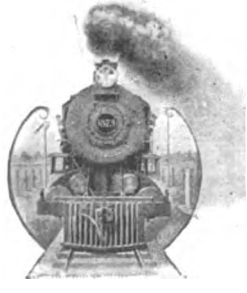
On the other end of the division there were about twelve miles of very heavy grade, and a vivid recollection of the necessity of having a clean fire in order to make the last forty miles of this division and haul the tonnage leads me to believe that this division was just sufficiently too long to make engine failures.

It gives me a great deal of satisfaction in listening to the discussion here tonight to know that there are others responsible for engine failures besides engineers. I do not think I was any more conscientious than the average engineer, yet to me there was always a nightmare about an engine failure; I knew there was always an explanation necessary and I always thought I got the worst of it. Is it not a fact that the engineer has always been blamed more or less for engine failures, and is it not due to the fact that the transportation department has been successful, in a great many cases, in having a delay charged as an engine failure whether it was so or not? I have oftentimes had an opportunity to prevent an engine failure by a little attention given to the crosshead, rods, or wedges, as the case may be, when taking water, but if I did not happen to be through by the time the fireman had finished taking water the mechanical department was charged with an engine failure; but if a train crew starts to pack a hot box, or put in a new brass when an engine crew is taking water and are not ready to go for ten or fifteen minutes after the engineer has gotten his clearance and is ready to leave, it is very doubtful if a train failure or delay report will show up on the dispatcher's sheet. It may be that it is always deliberately covered up; for instance, it is an easy matter for the conductor to take five of six minutes to walk back to the caboose before he is ready to go.

I think that if the mechanical department, and the engineers in particular, were to get a little more credit for endeavoring to avoid engine failures, this source of worry to the operating and mechanical departments could be eliminated to a very great extent. By that I mean if the mechanical department, or its representative, the engineer, can by five or ten minutes' attention to the engine between terminals prevent an engine failure and make up the time lost before reaching terminal, should not the mechanical department really be given credit for preventing an engine failure instead of being charged with one?—January 15, 1907, meeting Western Railway Club.

(Continued in October Number.)



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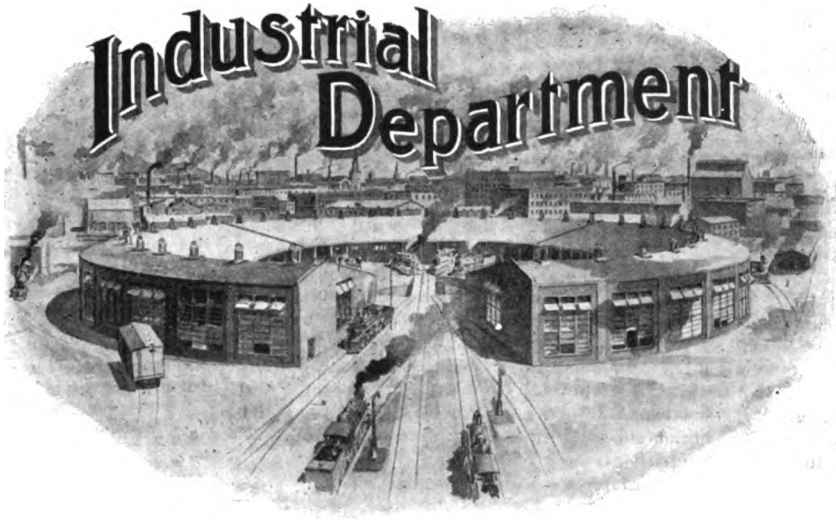

DISCUSSION OF CURRENT TOPICS

The Strike of the Commercial Telegraphers.

The telegraphers' strike which is now general throughout the country constitutes a revolt on the part of the Commercial Telegraphers' Union against employment conditions which, being nothing short of brutal in their character, have long since become intolerable to its members. Excessively long hours of service and miserably inadequate wages constitute the principal grievances for the adjustment of which the commercial telegraph operators are now striking.

The officers of the union did everything possible to avert trouble, but the persistent arrogance of the companies and the flagrant violation of agreements entered into in the settlement of recent local differences left no other course open to them but to declare a strike. By their action these haughty monopolies proclaim that in their opinion working men should have no voice in the establishment of conditions under which they sell their labor, and that they should be content with such as the employer may regard as suitable. They absolutely refuse to recognize the union as a factor in the present trouble, or to meet or treat with its officers in any way. Such an attitude of stubbornness and bitter antagonism on their part is but a demonstration of a realization on their part that the union is the only effective medium through which their employes can enforce fair treatment. All advances with a view to a settlement made by National Commissioner of Labor Neill and others the companies have met with the conventional response of "nothing to arbitrate." This they seem to have adopted as their slogan in the present difficulty. They profess perfect satisfaction with the situation and declare that their business is going on as usual, but it is not quite clear how they can reconcile such a statement with the fact that by far the greater number of what messages they are receiving are being sent by special delivery mail and long distance telephone, and with the further fact that commercial bodies throughout the country are appealing to President Roosevelt to interfere with a view to settling the strike.

It has not been so very long since the anthracite coal barons assumed the same haughty attitude towards the United Mine Workers of America, but notwithstanding their persistent refusal to treat with its officials they were eventually forced, through the action taken by President Roosevelt, and by the weight of pub-

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lic opinion, to meet with them and settle their differences. It is evident that the commercial interests of the country which are being seriously affected by the present telegraphers' strike are in hopes that President Roosevelt will take similar action in the present trouble.

How, at the present cost of the necessities of life, the telegraph companies can expect a man and his family to live on from $40 to $60 a month is inconceivable. It would seem, however, that to them it is not a question as to whether or not their employes can live on such wages—it is purely a matter of getting their services as cheaply as possible. Press reports state that the wages of commercial telegraph operators range from $25 to $75 per month. They fail to explain, however, that the instances in which they have been receiving more than $50 per month are few and far between.

One of the chief concessions sought by the telegraphers in their strike is an eight-hour day, and in their efforts for its establishment they are doing their part in the fight for the emancipation of labor in general from the burden of unreasonably lengthy hours of employment. Notwithstanding the various proclamations of the employing companies to the effect that they are perfectly satisfied with the situation, etc., they are resorting to every expedient to induce men to return to work from amongst the strikers. It is known that with a view to the accomplishment of this end local managers are writing letters to men amongst the strikers with whom they had been on friendly terms prior to the trouble and requesting them to come to the office, as they are desirous of talking with them personally etc., etc. As a matter of fact, owing to the lack of confidence on the part of business men and others in the capability of the scabs to handle their messages the telegraph companies are doing but little or no business and their statements to the contrary, together with their assumed complacent exterior, is but a stupendous "bluff." It is known that they are paying their scabs unusually large wages as an inducement to them to remain in their service. It is also known that in some instances the strike breakers themselves demanded increased compensation, which was promptly granted. Notwithstanding this, however, they are dissatisfied and in some cases are quitting the service of the companies, latest reports being to the effect that twenty-five have gone out in New York and twenty in Chicago. Some of these miserable, avaricious wretches are in many instances working without rest beyond the limit of human endurance. A report from New York is to the effect that one of them by the name of Behmekin, went insane as the result of working without rest night and day almost continually since the strike began. It is said that he leaped on his desk and declared he would give every operator $1,000 a day, and after jumping from one desk to another throughout the office drove all of his fellow scabs into the street. He is now in Bellevue Hospital. Already nearly all brokers have agreed to pay the union scale and their operators are all working.

Order of Railroad Telegraphers.

The Order of Railroad Telegraphers is closely allied with the Commercial Telegraphers' Union and in the present trouble it is rendering that organization every possible aid that it can consistently extend. In many instances individual railroad telegraphers have declined to handle Western Union and Postal Telegraph messages, but in only one or two cases have the companies undertaken to discipline them, as the railroad companies wisely prefer to avoid complications that may lead to a general industrial upheaval.

Both the Order of Railroad Telegraphers and the Commercial Telegraphers' Union are, however, strenuously opposed to members of the Order of Railroad Telegraphers in railway service, who are working under contracts or agreements with their companies, doing anything that would be a violation of such contract or agreement, as is evidenced by the following general communications which have been issued from the headquarters of both organizations:

FROM THE GRAND SECRETARY AND TREASURER ORDER OF RAILROAD TELEGRAPHERS.

St. Louis, Aug. 13.

All Members O. R. T.:

Am informed message purporting to have been signed by me is being sent over railroad wires instructing railroad telegraphers to refuse to handle Western Union business. That message is a fake. Pay no attention to messages of that character. You are requested to strictly observe your agreement with the railroad

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company. You should perform the same duties now that you did before the commercial telegraphers' strike occurred, nothing more, nothing less. Telegraphers at junction points are requested to furnish a copy of this message to other lines.

L. W. QUICK,
Grand Secretary and Treasurer.

FROM THE GENERAL EXECUTIVE BOARD COMMERCIAL TELEGRAPHERS' UNION.

To the Press:

The Western Union and Postal companies and the Associated Press are bending every effort to cause a sympathetic strike of the railway telegraphers, thus making allies of the railroads and precipitating a general panic in which they hope to beat the strikers. They are sending out reports calculated to incite the railway telegraphers to a refusal to handle commercial business which they are now handling under contract. At least certain newspapers are refusing to publish interviews with railway presidents in which they express a desire to keep out of the trouble and let the commercial companies fight their own battles.

The commercial companies are beaten now. They realize it is an absolute impossibility to resume operations to handle their business, and also that the ranks of the strikers can never be broken, with every railway telegrapher and private wire operator to contribute a large percentage of his wages to the support of the Commercial Telegraphers' Union. The only hope of the Western Union and the Postal companies lies in involving the railroads and the precipitation of a general strike.

GENERAL EXECUTIVE BOARD.

We Can Not Afford to Let Them Lose.

Organized labor can not afford to let the telegraphers lose in the present conflict. They are entitled to and should receive from its members throughout the entire continent the most staunch support, both moral and financial. Their fight is the fight of the entire labor movement. It is a battle against the arrogance and haughty antagonism of tyrannical monopolies that are opposed to the payment of living wages, and the maintenance of fair labor conditions—monopolies that would, were it in their power, reduce wage earners to the condition of serfs.

While public opinion is in sympathy with the telegraphers, and the fact is universally recognized that their grievances are just, the plutocratic press of the country is endeavoring through its editorial columns and garbled news items to misrepresent facts and create prejudice against the strikers.

We are gratefully conscious of the fact that in our recent trouble on the Southern Pacific we had no better, more practical or more active friends than the telegraphers, particularly those of the O. R. T., and the O. R. T. is so closely allied with the Commercial Telegraphers' Union as to make its trouble also their fight in a sense; and, besides that deep sympathy which we entertain for all labor organizations under such circumstances, we have a special interest in the successful outcome of that union in its present struggle.

We quote the following from a speech recently delivered by President Small of the Commercial Telegraphers' Union:

PRESIDENT SMALL'S SPEECH.

"In order to carry this strike on successfully we will have to ask labor organizations to assist us in raising a fund of at least $2,000,000. If we get this amount of money sixty days will see the telegraphers' strike ended with victory for the union men.

"We are going to ask our friends among the middlemen to assist us. The brokers on LaSalle street and Wall street will be given an opportunity to contribute to our strike fund. We are not going to ask the members here to make a donation today, but we will leave it with you whether we are deserving of your financial support.

"The big companies are about ready to sue for peace, and if they are convinced that we have the funds that are necessary to make a determined fight, then the end of this strike is not far off. The companies hope to succeed by starving us into submission. And when they starve us into submission they will make their own terms as to what will terminate the conflict.

"There are not enough telegraphers in the United States or Canada to fill our places, and the companies know this. Our members are fighting mad and will not give up. When we win a victory for ourselves it is a victory for all organized labor."

It is to be hoped that President Small's appeal for financial aid will not be in vain. If every member of organized labor in the United States would contribute but a trifle, funds enough to carry this strike to a successful issue would be realized.

The Commercial Telegraphers constitute a magnificent division of our great organized industrial army and we must not stand idly by while it is engaged in a deadly conflict, fighting for its very existence against the combined forces of plutocracy.

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The Haywood Verdict.

The verdict whch concluded the trial of Wm. D. Haywood, national secretary-treasurer of the Western Federation of Miners, was all the more satisfactory to lovers of justice, because it was unexpected. That the movement to try Moyer, Haywood and Pettibone on the charge of complicity in the murder of ex-Governor Steunenberg was the result of a bold conspiracy on the part of enemies of organized labor and their political tools, must be apparent to all who are familiar with the proceeding ever since those men were kidnapped in the dead of night and dragged from their homes in Colorado in February, 1906. The object sought was, through the legal assassination of Moyer, Haywood and Pettibone, to so weaken and disrupt the Western Federation of Miners as to destroy its efficacy in protecting the economic interests of its members, thus leaving them easy victims of the mine owners' avarice—and incidentally to discredit organized labor in general, not only in America but throughout the world. Realizing that the trial would attract international attention it was confidently expected that the hoped for verdict of "guilty" would have that result. One factor, however, essential to the carrying out of their plans—the jury—they failed to control. They had hoped that the twelve men who would be chosen could be influenced through their sympathy for the dead governor and through prejudices which it was sought to arouse in their hearts against the accused Federation officials. So depraved are the so-called "authorities" that brought Moyer. Haywood and Pettibone to trial, that they could not conceive of the idea of men being governed by conscience in the performance of a duty. The jurors were honest men, true to their obligation as such, and hence the conspiracy, at least as far as Haywood was concerned, collapsed. Consternation in the ranks of the conspirators was apparent when the verdict was announced. A verdict of "not guilty" was a result they did not contemplate. When it was pronounced, and after the usual congratulations were over, the man whom the prosecution sought to hold up to the world as a cold-blooded murderer, rushed to the nearest telephone and announced to his invalid wife and beloved children the joyous news that he would be with them in a few minutes—a free man. He then hastened to the hospital, where he had the happy experience of breaking to his sick mother the news that he was free. Entering her room, they were alone together. No one had yet told her. His voice trembled with joyous emotion as he said, "I told you, mother, I would come to see you this morning." Inquiringly she looked at him. "See," he said, "I have come alone." Then she understood and her's was the happiness that in such a moment a mother's heart alone can feel. On leaving his mother, he hurried to his beloved family—his two daughters and suffering wife, and was soon afterward at the bedside of his true, steadfast and loyal friend and counselor, Brother John H. Murphy, who is a victim of a malady that is slowly sapping his life away. Few, indeed, can understand — few, indeed, can realize — the agonizing suspense which the loving mother, the devoted wife and darling children of Wm. D. Haywood suffered during those awful eighteen months that he was in the power of his kidnappers. With them his vindication compensates for all, but where is the justice that will punish their persecutors?

It is doubtful that more disgusting expedients could have been resorted to with a view to securing a conviction than those which characterized the trial of Wm. D. Haywood. The entire legal and political machinery of the State of Idaho, the Mine Owners' Association and other commercial and employing interests were allied with the plutocratic press of the country in an herculean effort to secure his conviction.

An incarnate fiend named Orchard was the chief witness for the State. He is a self-acknowledged murderer, burglar, incendiary, bigamist, liar and thief. Without the slightest emotion or sense of shame or fear he told of murders over fifty in number that he had committed in cold blood. On the ground that he had been converted, the prosecution, however, endeavored to claim justification for credence in his lying testimony to the effect that he was paid to commit some of these murders by the Western Federation of Miners through Haywood. It is alleged that his evangelist was James McParland, the Pinkerton spy and detective, in character hardly less vile than Orchard himself, and of whom it is freely stated without denial that he incited the commission of crimes in order that he might have cases against

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those committing them. It is even alleged that during his career as detective he has actually been a party to murder. This fellow claims to have converted Orchard to Christianity and that under the influences of repentance for his past crimes he consented to confess all and incidentally, of course, endeavor, as far as in his power, to involve the Federation officials.

It is known that this debased criminal was surrounded by every comfort in the jail and was specially privileged, the testimony developing the fact that he received a donation of $115 from Governor Gooding during the period of his incarceration. He was kept constantly under the watchful care and tutorship of McParland, and well drilled in the part he should play on the witness stand. It was shown during the trial that Orchard had for years been in the employ of the Pinkerton Detective Agency, and that he was in its service while committing his self-acknowledged crimes. That institution, no doubt, thought that they would convert him for the occasion and utilize his testimony given under the cloak of his professed and recently acquired sanctity as a factor in the accomplishment of their heinous purpose.

Even Mrs. Steunenberg, the wife of the assassinated ex-Governor, is said to have "pitied" him, and a statement from her which went the rounds of the press, no doubt with a view to influencing public opinion in favor of Orchard, is as follows:

"Harry Orchard has done many wrongs, but I hope that he has repented, now that he understands their magnitude, and that he will be given a chance to lead a good and honest life, after the present ordeal has passed."

That a woman under these circumstances could entertain or even express such a sentiment towards her husband's acknowledged assassin and feel no pity for the family of the innocent man whose death she sought by the hangman's rope, is a rather striking evidence of how nature's instinctive impulses can be subordinated to class hatred. It is also a practical contradiction of the oft-repeated and blatant announcement of Gooding, McParland and Company to the effect that no immunity or other inducement has been promised Orchard in exchange for his testimony against Haywood, as she evidently expects he will be given a "chance" to lead a "good" (?) and "honest" (?) life—how disgusting—what a prostitution of these terms!

Another evidence of how the feminine heart can be perverted under the same influences is to be found in the attempt made by certain female members of the exclusive social set—Idaho's 400—to induce President Moyer of the Western Federation of Miners, also awaiting trial for his life on the same charge, to turn State's evidence, by playing upon the terrors and affection of his wife. They figured that the wife's solicitude for her husband's life would impel her to seek his release at any cost. They showered every attention upon her, and it is said induced her to propose to him to save his life by testifying for the prosecution. It is unnecessary to say that such a proposition was met with scorn by the manly Moyer, to whom life without honor and principle would not be worth the living. While this disgraceful attempt was being made to induce him to assist in sending his friend and brother to the gallows, the Pinkerton Detective Agency, operating through the monopolistic press of the country, was seeking to assassinate his character through the widely heralded report that he was an ex-convict. In head lines so conspicuous as to unfailingly command attention it was announced that he had served a term in Joliet penitentiary, Illinois, for burglary. When the report was subsequently proven to be absolutely false and without the slightest foundation, many trust papers failed to make any retraction at all and those that did published the item so obscurely as to cause it to be noticeable only upon the closest scrutiny.

At the conclusion of the trial Governor Gooding and others interested ostentatiously declared that Moyer and Pettibone would both be tried regardless of the general belief that they could not be convicted. This belief is based on the realization that the probability of honest men getting on the jury in their cases is no less great than in that of Haywood. Moyer, however, was admitted to bail in the sum of $25,000 and it is still thought exceedingly doubtful that he will ever be brought to trial. The prosecution, however, has refused to release Pettibone on bail, and has set his trial for October 1. Much as the Haywood verdict may have inspired them with hope, the hearts of Pettibone's dear ones will naturally be wrung with the anguish of suspense as long as he remains in the

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power of the present "authorities" (?) of the State of Idaho.

If punishment of the guilty is what they really seek, why don't they hang Orchard, whose guilt has been proven and acknowledged by himself? From their failure to take this step it is but too evident that punishment of the really guilty is not their game. It must be remembered that Orchard is a Pinkerton, and regardless of how heinous and numerous his crimes may be, or how putrid his black soul or whatever he may have as a substitute, to hang him would spoil his usefulness to his "agency" and the "authorities" (?) and to administer justice in his case is therefore out of the question.

A lesson drawn from the Haywood trial, and one which organized labor would do well to pay heed to, is the disclosure of the operations of the Pinkerton Detective Agency, and institutions of a similar nature, in the ranks of organized labor. It was shown that the spies of some of these institutions gained membership in the Western Federation of Miners, and that they were among the most apparently ardent advocates of radical measures. That they sought to incite to crime and involve the organization in the commission of it, with a view to making cases for their agency and the mine owners against the Federation. Their plans were, however, thwarted by the wise counsel of the Federation officials, which always prevailed in the interest of peaceable and law-abiding methods.

* * *

Our Opponents Are Ever on the Alert.

A circular letter, which we publish herewith, from the Manufacturers' Association, issued to their members throughout the State of Indiana, is evidence of the extent to which that organization is constantly on the alert to resist the enactment of any and all legislation that may in the slightest conflict with what they regard as their interests, or restrict their freedom to do as they please in the matter of employing such help as they see fit, regardless of the extent to which the safety of others interested may be involved.

The letter was issued during the last session of the Indiana Legislature and was sent to the Magazine through a confidential source. It is published with a view to keeping our members in mind of the extent to which the employing class is ever watchful to advance its own legislative interests and to remind our members of the constant necessity that exists for wage earners to direct their collective political influence so that it will operate for the defense of their legislative rights and the promotion of their legislative interests. The letter is as follows:

"Dear Sir—Inclosed please find copies of Senate Bills 134 and 258. These bills have been favorably reported to the Senate for passage. We believe both bills should be defeated and we wish to urge you to write to your senators protesting against their passage.

"Senate Bill 134 creates a State license and examination system for stationary engineers, firemen and boiler tenders. It is a paternalistic measure, and there seems no good argument for its enactment into law, unless it is thought desirable to have the State unionize various occupations. Boiler explosions very seldom occur and it is hard to see how those that do occur could be prevented by a State license system. Employers are pretty good judges of the competency of their men, and heretofore have been quite capable, without State assistance, of selecting men who will not cause things to explode.

Senate Bill 258 is also paternalistic, requiring inspections of boilers by men holding State license and requiring a fee for the service.

"We are pleased to say that the cooperation of the manufacturers over the State in writing their legislators on various bills has been very effective. Quite a number of unwise and unjust measures have been killed, but there is still work to be done and we hope you will continue to assist us by writing to your legislators.

"BY ORDER OF THE EXECUTIVE COMMITTEE."

* * *

Coal Mine Fires Being Fought With Chemicals.

For fighting fire in its anthracite coal mines, a new form of chemical fire engine is now being used by the Delaware, Lackawanna & Western Railroad. This engine is built on a truck, provided with wheels which enable it to run upon tracks throughout the mine. When an alarm of fire is sounded the engine is attached to an electric mine locomotive, and is rushed to the scene of trouble at high speed.

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Fire must not be allowed to make any headway in the labyrinth of a modern mine. Water played upon a coal fire is almost instantly converted into steam, which further disintegrates, forming a gas so suffocating that it drives away the men fighting the fire. Blue flames which shoot out when water strikes the hot coal often set ablaze pockets of gas in the ceiling.

When a chemical engine plays upon burning coal the heavy gases evolved cling to the floor and smother the blaze by excluding the air. Men are not annoyed by fumes, and can stay close enough to do effective work.

Before putting the new engine in service, the fire brigade of employes had thorough training in its use, and became very proficient.

The complexities of mine working have increased in every direction as the thinner and less accessible veins are being worked, so that the increasing attention and expense directed to fire fighting are typical of necessarily increased expenditure in every department.

* * *

*Supplemental Report of the Joint Labor Legislative Board of Texas Covering the Special Session of the Thirtieth Legislature.**

Full Crew Law.

This bill was introduced in the house by Representative H. P. Robertson of Bell and W. S. Moore of Grayson, on January 14, 1907, read first time and referred to committee on common carriers; January 31, 1907, reported favorably.

While there was much opposition in the committee of the house, we had no trouble in having a favorable report, but its career through the senate committee was a very stormy one, but was brought out on a floor report and finally passed. The day following its passage Senator Meachum made a motion to rescind the action of the senate upon this bill on the ground that the senate was not aware of the fact that they had passed this identical bill, but that a great number of members of the senate were under the impression that they were voting upon a substitute to said bill offered in the committee and which was really written and presented to the committee by the attorneys of the railroads, and which, if passed, would have been worthless. On the following day this motion to rescind was put to the senate by a viva voce vote and tabled on motion of Senator Looney.

Senator Meachum was the only senator to openly oppose this bill on the floor of the senate, and Senator Terrell refused to sign the floor report to bring it before the senate.

Following is a copy of the bill which has been approved by the governor. It went into effect on July 12, 1907:

H. B. No. 80.

By Robertson of Bell and Moore.

AN ACT

To protect the lives and property of the traveling public and the employes of railroads in the State of Texas.

Be it enacted by the Legislature of the State of Texas:

Section 1. That it shall be unlawful for any railroad company doing business in the State of Texas to run over its road, or part of its road outside of the yard limits, any passenger train with less than a full passenger crew, consisting of four persons, one engineer, one fireman, one conductor and one brakeman.

Sec. 2. It shall be unlawful for any railroad company doing business in the State of Texas to run over its road, or part of its road, outside the yard limits, any freight train, gravel train, or construction train with less than a full crew consisting of five persons, one engineer, one fireman, one conductor and two brakemen.

Sec. 3. It shall be unlawful for any railroad company doing business in the State of Texas, to run over its road or part of its road outside of the yard limits, any light engine without a full train crew, consisting of three persons, one engineer, one fireman, and one conductor; provided that nothing in this act shall be construed as applying in the case of disability of one or more of any train crew while out on the road between division terminals, or to switching crews in charge of yard engines or which may be required to push trains out of the yard limits.

Sec. 4. Any railroad company doing business in the State of Texas, which shall violate any of the provisions of this act, shall be liable to the State of Texas for a penalty of not less than $100.00 or more than $1,000.00 for each offense, and such penalty shall be recovered and suit brought in the name

*Continued from the August, 1907, Magazine.

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of the State of Texas in a court of proper jurisdiction in Travis County, Texas, or in any county in or through which such line of railroad may run, by the attorney-general, or under his direction, or by the county or district attorney in any county, in or through which such line of railroad may be operated, and such suits shall be subject to the provisions of Article 4577, Revised Statutes of the State of Texas.

The fact that there are no adequate laws for the protection of a large portion of our citizens, employed by railroad companies and passengers riding on railway trains, creates an emergency and an imperative public necessity requiring the suspension of the constitutional rule which requires bills to be read on three several days in each house and the rule is hereby suspended and that this act take effect and be in force from and after its passage and it is so enacted.

Employes' Contract Law.

This bill was introduced in the senate by Senator Brachfield and in the house by Representative W. S. Moore. It passed both houses by an overwhelming vote, though there were a few votes against it in the house. It passed with the emergency clause and is now in effect.

S. B. No. 34. By Brachfield and Moore.

AN ACT

To amend Article 3379 of the Revised Civil Statutes of the State of Texas, 1895, and declaring an emergency.

Be it enacted by the Legislature of the State of Texas:

Section 1. No stipulation in any contract requiring notice to be given of any claim for damages as a condition precedent to the right to sue thereon shall ever be valid unless such stipulation is reasonable, and any such stipulation fixing the time within which such notice shall be given at a less period than ninety days shall be void, and when any such notice is required, the same may be given to the nearest or any other convenient local agent of the company requiring the same: Provided, That no stipulation in any contract between a person, corporation or receiver operating a railroad or street railway or interurban railroad and an employe or servant requiring notice of a claim by an employe or servant for damages for injury received to the person, or by a husband, wife, father, mother, child or children of a deceased employe for his or her death, caused by negligence as a condition precedent to liability, shall ever be valid. In any suit brought under this and the preceding article it shall be presumed that notice has been given, unless the want of notice is especially pleaded under oath.

Sec. 2. The great necessity for this law, and the near approach of the close of the session creates an emergency and an imperative public necessity requiring the suspension of the constitutional rule requiring bills to be read on three several days in each house, and said rule being so suspended, and that this act take effect and be in force from and after its passage, and it is so enacted.

Labor Bureau.

Representative Hamilton introduced a bill creating a Bureau of Labor, but after carefully considering the matter, we decided not to press this bill, but unite with the Farmers' Union in support of a constitutional amendment by Senators Looney and Brachfield creating a Department of Agriculture and a Bureau of Labor. This amendment will be submitted to a vote of the people at a special election to be held on the first Tuesday in August of this year, and we urge all our members to turn out on this day and vote for this amendment.

Following is a copy of the proposed amendment:

JOINT RESOLUTION.

Proposing an amendment to Article four (4) of the Constitution of the State of Texas by adding thereto a section, to be known as Section 27, providing for a Department of Agriculture, with a Bureau of Labor.

Be it resolved by the Legislature of the State of Texas:

Section 1. That Article four (4) of the Constitution of the State of Texas be amended by adding thereto section 27, when a majority of the qualified electors for members of the legislature of Texas, at an election for that purpose, shall vote in favor of the amendment, shall read as follows:

Sec. 27. The Legislature shall provide for the office of Commissioner of Agriculture, who shall be either elected by the qualified voters of the state, or appointed by the governor with the advice and consent of two-thirds of the senate present, as the legislature may provide; whose term of office, duties and salary

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shall be prescribed by law; in which department there shall be established by the Legislature a Bureau of Labor, when required by the public interest.

Sec. 2. The governor of the state is hereby directed to issue and have published the necessary proclamation for the submission of this resolution to the qualified voters for members of the Legislature of the State of Texas, as an amendment to the Constitution of Texas, to be voted upon on the first Tuesday in August, 1907.

All persons favoring said amendment shall have written or printed on their ballots, as follows: "For amendment to the Constitution providing for a Department of Agriculture and a Bureau of Labor." And those opposed to said amendment shall have written or printed on their ballots, as follows: "Against the amendment to the Constitution providing for a Department of Agriculture and a Bureau of Labor."

Eight Hour Telegraphers' Bill.

Much credit is due Representative Davis of Brazos County in the passage of this bill. He, in connection with Representative O'Brien, introduced the same in the house February 1, 1907. Read first time and referred to committee on labor, which reported the same favorably February 20, 1907. There was much opposition to this bill in the committee, but through the efforts of Mr. Davis and the board, it came out victorious. After its final passage through the house, Mr. Davis personally followed it to the senate and remained upon the floor urging its passage and talking individually to each senator with respect to the matter.

The telegraphers of Texas owe much to Mr. Davis for his untiring and ceaseless work in their behalf.

H. B. No. 336. By Davis of Brazos.

AN ACT

To provide for an eight-hour day for railroad telegraph or telephone operators, and providing penalties for the violation thereof, and declaring an emergency.

Be it enacted by the Legislature of the State of Texas:

Section 1. That it shall be unlawful for any person, corporation or association operating a railroad within this state to permit any telegraph or telephone operator who spaces trains by the use of telegraph or telephone under what is known and termed "Block System," defined as follows: Reporting trains to another office or offices or to a train dispatcher operating one or more trains under signals, and telegraph or telephone levermen who manipulate interlocking machines in railroad yards or on main tracks out on the lines connecting sidetracks or switches, or train dispatchers in its service whose duties substantially as hereinbefore set forth pertain to the movement of cars, engines or trains on its railroads by the use of the telegraph or telephone in dispatching or reporting trains or receiving or transmitting train orders as interpreted in this section, to be on duty for more than eight hours in any twenty-four consecutive hours; provided that the provisions of this act shall not apply to railroad telegraph or telephone operators at stations where the services of only one operator is needed.

Sec. 2. And be it enacted that any person, corporation or association that shall violate section 1 of this act shall pay a fine of one hundred dollars for each violation of this act.

Sec. 3. It shall be unlawful for any railroad telegraph or telephone operator to work more than eight hours in twenty-four consecutive hours at such occupation, and any such operator violating this section shall pay a fine in any sum not less than twenty-five dollars nor more than one hundred dollars; provided, that in case of an emergency, any operator may remain on duty for an additional two hours.

Sec. 4. And be it enacted that the fine mentioned in section 2 of this act shall be recovered by an action of debt in the name of the State of Texas, for the use of the state, who shall sue for it against such person, corporation or association violating this act, said suit to be instituted in any court in this state having appropriate jurisdiction.

Sec. 5. And be it enacted that the said fine, when recovered as aforesaid, shall be paid into the public school funds of the State of Texas.

Sec. 6. Owing to the crowded condition of the calendar, the near approach of the end of the session and the necessity for a law providing for an eight-hour day for railroad telegraphers, creates an emergency and an imperative public necessity, requiring the constitutional rule requiring bills to be read on three several days in each house be suspended, and

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that this bill take effect and be in force from and after its passage, and it is so enacted.

Anti-Free Pass Law.

This law is printed in our report for the benefit of our members, so that they may understand the same and govern themselves accordingly. It will be seen that the employes and their immediate families are exempted, as well as ex-employes seeking employment for four months after leaving the service of any company. The board worked diligently in their behalf, and much credit is due Hon. Chas. A. Graham, who always looks to the interest of railroad employes. He was a member of the conference committee which was appointed to bring the house and senate together on this measure. This law went into effect July 12, 1907.

S. B. No. 8. By ————

AN ACT

To prohibit railway companies, street railway companies, interurban railway companies, or any other chartered common carrier or transportation companies or express or sleeping car companies or telegraph or telephone companies, or the receivers or lessees thereof, or their officers, agents or servants in this state from carrying persons free of charge, or carrying property free of charge, or transmitting messages free of charge, or giving to or for any person or passenger a free pass or authority to travel on pass free, or to have property or messages transported free over any line or lines owned, operated or controlled by any such company in this state, and naming certain persons who are excepted from the prohibition, and also prohibiting any of said companies, their officers, agents, employes, receivers or lessees from discriminating among persons in rates and service; prohibiting any person not excepted from using or enjoying such free pass or free transportation, or from becoming the beneficiary of any discrimination, and prescribing suitable penalties, fines and imprisonment for the violation of the provisions of this act; providing for prosecutions, fixing venue of suits, and appropriating any penalties that may be collected hereunder.

Be it enacted by the Legislature of the State of Texas:

Section 1. That if any steam or electric railway company, street railway company, interurban railway company or other chartered transportation company, express company, sleeping car company, telegraph or telephone company or person or association of persons operating the same or the receivers or lessees thereof or any officer, agent or employe of any such company in this state, shall knowingly haul or carry any person or property free of charge or give or grant any person, firm, association of persons, or corporation, a free pass, frank, a privilege or a substitute for pay or a subterfuge which is used or which is given to be used instead of the regular fare or rate for transportation, or any authority or permit whatsoever to travel or to pass or to convey or transport any person or property free, or sell any transportation for anything except money or for any greater or less rate than is charged to all persons under the same conditions, over any railway or other transportation line or part of line in this state; or shall knowingly permit any person to transmit any message free in this state or shall give any frank or right or privilege to transmit messages free in this state, or property free of charge or for greater or less fare or rate than is charged other persons in this state for similar service; except such persons as are hereinafter exempted under the provisions of this act, shall be guilty of a misdemeanor, and upon conviction in any action brought on this account, and for that purpose, shall pay to the State of Texas the sum of five thousand dollars ($5,000) for each and every act which violates the provisions of this section; and any person, president, director, officer, employe or agent of any such corporation or association of persons who shall sell any transportation for anything except money, or knowingly give, grant, issue or cause to be issued a free pass, a frank, a privilege, or any substitute for or in lieu thereof, for the transportation of any person, article or thing, or the sending or transmitting of any message over the wire or other means of transmitting messages in this state, except to such persons as are hereinafter exempted from the provisions of this act shall be deemed guilty of a felony under the laws of this state, and upon conviction for such act shall be punished by a fine of not less than five thousand dollars ($5,000) nor more than ten thousand dollars ($10,000), and may, in addition

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thereto, in the discretion of the jury, be imprisoned in the penitentiary for a term of not less than six (6) months nor more than two (2) years.

Sec. 2. That the provisions of section one (1) of this act shall not be held to prohibit any steam or electric or interurban railway company or chartered transportation company or sleeping car company, or the receivers or lessees thereof, or persons operating the same, or the officers, agents or employes thereof from granting free or exchanging free passes, franks, privileges, substitute for pay or other thing herein prohibited to the following persons: The actual, bona fide employes of any such companies and the dependent members of their immediate families. The term employe shall be construed to embrace the following persons only: All persons actually employed and engaged in the service of any such companies, including its officers, bona fide ticket, passenger and freight agents, physicians, surgeons and general attorneys and attorneys who appear in courts of record to try cases and who receive a reasonable annual salary, and also ex-employes within four (4) months after leaving the service of any such companies and while seeking employment. Also persons actually employed on sleeping cars, express cars, linemen of telegraph and telephone companies, newsboys employed on trains, railway mail service employes, postoffice inspectors, chairmen and bona fide members of grievance committees of employes, bona fide custom and immigration inspectors employed by the government, the state health officer and one assistant, and Federal health officers; also when live stock, poultry, fruit, melons or other perishable produce is shipped, the necessary caretakers while en route and return; also trip passes to the indigent poor when application therefor is made by any religious or charitable organization, Sisters of Charity; also persons injured in wrecks upon the road after such injury, and the physicians and nurses attending such persons at the time thereof; also persons and property carried in cases of general epidemic, pestilence or other calamitous visitations, at the time thereof or immediately thereafter. Also the state rangers, sheriffs or other bona fide elective peace officers whose duties are to execute criminal processes; provided, that if any such railroad or transportation company shall grant to any sheriff a free pass over its line of railroad, then it shall issue like free transportation to each and every sheriff in this state who may make to it written application therefor; and provided further, that said sheriffs and other peace officers above mentioned using such free passes or transportation shall deduct the money value of the same, at the legal rate per mile, from any mileage accounts against the state and litigants earned by them in executing process when such pass was used or could have been used; also members of the Live Stock Sanitary Commission of Texas, not exceeding twelve (12) in number for any one year; provided, that nothing in this act shall prevent any such companies, the receivers or lessees thereof, or the officers, agents or employes, from granting to ministers of religion reduced rates of one-half (1-2) the regular fare, nor shall anything in this act prevent any such companies, their receivers or lessees from transporting free of charge any article being sent to any orphan home or other charitable institution; provided further, that nothing in this act shall be construed to prohibit any such companies, their receivers or lessees or officers, agents or servants, from making special rates for special occasions or under special conditions, but no such rate shall ever be made without first obtaining authority from the Railroad Commission of Texas; and provided further, that no persons who hold any public office in this state shall at any time during their term of office be entitled to any such free pass or transportation, privilege or franks or substitute for fare or charges over any railway or other company mentioned in section one (1) of this act, except employes operating trains when in the actual discharge of their duties as such, and the officers heretofore exempted; provided, further, that nothing in this act shall prohibit any street railway company from transporting free of charge police officers and firemen in any city when said company is authorized so to do by any ordinance or authority from the city council of any such city; provided, however, that no person or persons, beneficiaries of free transportation herein permitted, shall ride on a free pass or enjoy free transportation to or from any political convention or on any political errand. That nothing in this act shall prohibit any express company from hauling or carrying free of charge the packages and

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property of its actual and bona fide officers, attorneys, agents and employes who are actually in the employment of such company, its receivers or lessees at the time when such free transportation or right thereto is given; and provided further that nothing in this act shall be construed to prohibit any telegraph or telephone company from carrying and transmitting free of charge the messages of its bona fide officers, attorneys, agents and employes who are actually in the employment of any such company, its receivers or lessees at the time when such free transmission or the right thereto is given.

Sec. 3. If any person shall present or offer to use in his own behalf any permit or frank whatsoever to travel, pass or to convey any person or property or message which has been issued to any other person, or shall, knowing that he is not entitled under the provisions of this act, apply to any railway, express, telegraph or telephone company, officer, agent, lessee or receiver thereof for any free pass, frank, privilege or substitute for pay given or to be used instead of the regular fare or rate for transportation, or for any other consideration except money, he shall be deemed guilty of a misdemeanor, and upon conviction shall be punished by confinement in the county jail for not less than thirty days and not more than twelve months, and by a fine of not less than one hundred dollars ($100) and not more than one thousand dollars ($1,000).

Sec. 4. No company subject to the provisions of this act shall, directly or indirectly, by any special rate, rebate, drawback or other device or exchange, demand, charge, collect or receive from any person, firm, association of persons or corporation a greater or less or different compensation for any service rendered or to be rendered in the transportation of passengers, property or messages than it charges, demands, collects or receives from any other person, firm, association of persons or corporation for doing for him, them or it a like service, if the transportation or transmission is a like kind of traffic or service under substantially similar circumstances and conditions, and any such company violating these provisions shall be deemed guilty of a misdemeanor, and for each offense, on conviction, shall pay to the State of Texas a penalty of five thousand dollars.

Sec. 5. That each and all companies subject to the provisions of this act, their receivers and lessees, shall report annually, on such dates as may be fixed by the railroad commission of this state, the name and residence of each and every person to whom free transportation or right thereto was given to travel or to have his property or messages transported or transmitted over its transportation, express, sleeping car or railway or telegraph or telephone line, and any company violating this provision shall be deemed guilty of a misdemeanor, and for each offense, on conviction, shall pay to the State of Texas a penalty of one thousand dollars.

Sec. 6. Any person other than the persons excepted in this act who uses any such free ticket, free pass or free transportation, frank or privilege over any railway or other transportation line or sleeping or express car, telegraph or telephone line mentioned in this act, for any distance under the control and operation of either of said companies subject to the provisions of this act, or under their authority, or shall knowingly and wilfully by any means or device whatsoever, obtain, use or enjoy from any such company a less fare or rate than is charged, demanded, collected or received by any such company from any other person, firm, association of persons or corporation doing for him, them or it a like service, if the transportation or service is of a like kind of traffic or service under substantially similar circumstances and conditions, such person or such officer or agent who acts for such corporation or company thus favored, shall be guilty of a misdemeanor, and on conviction, for each offense, shall be fined not less than one hundred dollars ($100) and not more than one thousand dollars.

Sec. 7. Any director, officer, agent or any receiver, trustee, lessee or person acting for or employed by any company subject to the provisions of this act who, alone or with any other corporation, company, person or party, shall wilfully do or cause to be done, or shall wilfully suffer or permit to be done, any act, matter or thing in this act prohibited or declared to be unlawful, or who shall aid or abet therein, or shall wilfully omit or fail to do any act, matter or thing in this act required to be done, or shall cause, or wilfully suffer or permit any act, matter or thing so directed, required by this act to be done, not to be done, or shall aid or abet any such omission or failure,

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or shall be guilty of any infraction of this act, or shall aid or abet therein, shall be deemed guilty of a misdemeanor, and shall, upon conviction, be subject to a fine of not less than one hundred dollars nor more than one thousand dollars, and if the offense for which any person shall be convicted under this section shall be unlawful discrimination in rates, fare or charges for the transportation of passengers or property or the transmission of messages, such person may, in addition to the fines hereinbefore provided for, at the discretion of the jury, be imprisoned in the penitentiary for a term not less than six months nor more than two years.

Sec. 8. Suits brought under this act for the recovery of penalties may be brought in any court in this state having jurisdiction of the subject matter in any county (1) where one act violative of the provisions hereof is committed; (2) where such company or receiver has one agent or representative; (3) where the principal office of such company is situated or such receiver or receivers, or either, reside; and one-half (½) of all monies collected under the provisions of this act, less the commission and expenses allowed by law, shall be paid into the state treasury and constitute a part of the general revenue of the state, and the remainder thereof shall be paid into the treasury of the county where such suit or suits may be maintained and constitute a part of the jury fund of such county.

Sec. 9. It is hereby made the duty of the Railroad Commission of Texas, the attorney-general and the district and county attorneys of this state, under the direction of the attorney-general, to see that the provisions of this act are enforced and obeyed, and penalties due the state are recovered and collected; and said commission shall report to the attorney-general all violations within their knowledge, with the facts in their possession, and request him to institute, or have instituted, the proper proceedings for the recovery of any penalty that may be due the state.

Sec. 10. In any investigation, suit or prosecution which may be had or instituted under the provisions of this act the court or tribunal in which the investigation, suit or prosecution is pending may compel all persons to attend and give testimony, and to produce such papers, books and documents as may be desired by the state, and no person shall be exempt from giving testimony therein: provided, however, that no criminal action or proceeding shall be brought or prosecuted against such witness on account of any testimony so given or furnished by him.

Sec. 11. If any provision or provisions of this act which exempt or except any person, corporation or class of persons from the operation and effects of this act, or which authorize any such persons, corporations or class of persons to give, grant, issue, receive or accept free transportation or transportation at any rate other than is granted to any and all persons of this state, shall be held unconstitutional or invalid, such holding as to any such provisions shall not invalidate any other portion of this act.

For the information of our members, as well as to show the wisdom of our plan of legislative co-operation we reproduce a summary of the work of the board, as shown by legislative enactments since its organization:

TWENTY-EIGHTH LEGISLATURE.

Laws Passed—

Child Labor Law.

Sixteen-Hour Law for Railroad Employes.

Siding and Switchlight Law. (Vetoed.)

Law against Coercion and Blacklisting for refusal to trade at company store or commissary.

Barber Law. (Vetoed.)

Law requiring two outlets to mines.

Street Car Vestibule Law.

Measures Successfully Opposed—

Bill to require all persons suing for personal injuries to exhibit his or her person as often as required by opposing counsel.

Constitutional amendment to repeal exemption of wages from garnishment.

TWENTY-NINTH LEGISLATURE.

Laws Passed—

Law to relieve railroad employes from assuming the risks of defective equipment and appliances.

Siding and Switchlight Law.

Law making it unlawful to pay employes in checks or merchandise scrip.

Law taxing out of existence the "ten-per-cent-a-month" money sharks, who prey upon and blackmail workmen by means of assignment of future wages.

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Measures Successfully Opposed—

Bill to increase the poll tax.

Two so-called anti-conspiracy bills, the effect of which, if passed, would have been to make all labor unions unlawful.

A compulsory arbitration law, fraught with great danger to labor.

A stock report bill, which would have been exceedingly troublesome to locomotive engineers

THIRTIETH LEGISLATURE.

Laws Passed—

Mine Inspection Law.

Electric Headlight Law.

Full Train Crew Law.

Anti Blacklist Law.

Employes' Contract Law.

Sixteen-Hour Law for Railroad Employes.

Eight-Hour Law for Railroad Telegraphers.

Barbers' License and Inspection Law.

Constitutional amendment for the creation of a Bureau of Labor.

Extension of benefits of uniform textbooks to cities above 10,000 population, which were exempt under previous law.

Amendment to Anti-Free Pass Law exempting railway employes.

A law limiting the granting of injunctions.

* * *

School of Safety for Coal-Mining Foremen.

Believing that prompt and effective application of state laws and its own rules is the best preventive of accidents in anthracite coal mines, and realizing that the rules are readily forgotten unless constantly discussed, the Delaware, Lackawanna & Western Railroad has instituted a plan to hold competitive examinations every six months concerning the details of the regulations. State mining laws and company's rules must be on the "tongue's end" of every mine foreman, fire boss, barn boss or driver boss employed in the D., L. & W. mines.

The company's collieries have been divided into four districts, each under a superintendent and assistant. The districts each average about five collieries, and examinations in each district will be carried out separately.

An examining board, consisting of the general manager, his assistant, and the chief engineer, are to examine the men in a hall specially engaged for the purpose. To each man will be given practical questions to answer. A man's answers will indicate his knowledge of the application of state law or company's rules. After all examinations have been completed, the answers, recorded by a stenographer, will be carefully gone over and receive marks of relative merit. To the district showing the highest average for all men examined, will be awarded a handsome trophy, which can be retained until the next competitive examination. If any district wins the trophy three times in succession, it is then to own it.

Mine foremen and assistant foremen are examined by boards appointed by the State before receiving certificates which permit them to hold their position. The examinations conducted by the company are intended to supplement those prescribed by the State, and it is believed that their effect will be very beneficial.

* * *

A Course in Railroad Traffic and Accounts.

A special one-year course in railroad traffic and accounts, designed to train men in the railroad business for positions of broader scope, and also to equip men for positions on public utilities boards, or state or municipal railway commissions, will be opened by the School of Commerce, Accounts and Finance, of New York University, on Washington Square, New York City, on September 26. The classes will be held on Monday and Thursday evenings. They will embrace the following subjects: Railroad accounts, corporation securities and reports, railroad transportation in the United States, and railroad traffic problems. Every effort has been made to make the course thoroughly practical, and the schedule has finally been adopted under the advice of railroad men of experience.

* * *

System of Apprenticeship on the New York Central Lines.

The above topic was the subject of an excellent paper which was prepared by Mr. C. W. Cross, superintendent of apprentices on the New York Central Lines, and his assistant, Mr. W. E. Russell, and presented to the recent convention of the American Railway Master Mechanics' Association, held at Atlantic City, N. J., during the month of June.

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The following outline and plan of the system is reprouuced from the Railway and Engineering Review, and will give a good general idea of its operation:

Purpose.—The purpose of the apprentice system is to provide the motive power department with an adequate recruiting system which will eventually produce from the ranks of a large number of skilled workmen, a number of foremen, a sufficient number of good draftsmen, a few master mechanics and an occasional superintendent of motive power. The first apprentice class under this plan was started at West Albany Shop May 7, 1906.

Plan.—The general plan is twofold, and provides for shop instruction of the apprentice in the trades and also for his instruction in mechanical drawing, practical mathematics and shop problems during working hours while under pay.

Inauguration.—A department headquarters was first organized to outline the courses of instruction and to prepare the necessary instruction sheets and text-books. Two instructors—a shop instructor and a drawing instructor—were then appointed at each of the larger shops; a uniform set of apprentice regulations was adopted for all shops and a schedule provided showing the time allotted in the shop to each class of work. This schedule is sufficiently flexible to insure a prompt movement of the apprentices from one type of work to another and to still leave opportunity for rapid movement in case of special merit. Both the shop instructors and the drawing instructors are under the local shop officers and responsible directly to them. Regular reports are made by both instructors to their immediate superiors, who forward them to the apprentice headquarters. In the educational work, however, the instructors are kept in direct touch with the apprentice department.

Difficulties.—There are really no serious difficulties except that of securing the thorough and hearty co-operation of everybody in the scheme. The work can not be successful without the enthusiastic support of the administration and of the local officers.

Present Operation.—The plan is now in operation at nine of the largest shops of the system, and includes about 450 apprentices. The work is gradually being extended to the smaller shops. The drawing instructor in every instance is a draftsman or mechanical engineer, located either at the shop or a company drafting room close at hand. The shop instructor in most instances holds some other position in the shop in addition to that of apprentice instructor. The apprentices are under the foreman, and responsible to him as formerly, but the foreman is relieved of the duty of instructing them in the trade, thus enabling him to give his full time to directing the work of his department.

Methods.—The work in drawing and shop problems is outlined at the apprentice headquarters at New York City, and sufficient flexibility is allowed to fit the personality of the local instructor and the needs of the local apprentice. The plan of instruction is arranged to give the closest possible connection between the work in the shop and the work in the classroom.

Class Work.—The instruction is largely individual, with classes limited to 24 apprentices at one time. At the expiration of apprenticeship, those who have satisfactorily completed their term receive certificates which entitle them to preference in employment at all shops on the New York Central Lines.

Hours.—Instruction is given each apprentice four hours a week during shop time; that is, two mornings from 7 to 9 o'clock, and such instruction is all classed under the name of mechanical drawing. Apprentices ring in before coming to class and are under shop discipline during the session. At 9 o'clock they proceed directly to the shop. Homework is expected on the problems. Both instructors are available for consultation during the noon hour.

Facilities.—The facilities for handling work of this nature on a railroad are almost boundless. The authors appreciate the fact that they have only made a beginning thus far and that the apparatus at hand in most railroad shops would rival the outfits of some of the laboratories in the large technical schools.

Attitude of Men.—The rank and file, not excepting the politician, the labor reformer, the practical joker and the workmen of all grades and peculiarities, unite in giving their approval to a plan, the object of which is to train their own sons in a business that will enable them to gain a livelihood, and possibly advance to a position of authority and responsibility.

Interest of Apprentices.—No more in-

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teresting study has presented itself than the personality of the average apprentice. On the whole, he is below the standard of education and ambition generally presumed by most motive power officers, who naturally think all apprentices possess the same exceptional initiative and earnest endeavor which has brought them up from the ranks. Reports show that apprentices started during the last year have evidenced a most commendable enthusiasm. It might be interesting to state that at nearly all points there are advanced apprentices who take full charge of classes when the instructors are absent.

Effect on Apprentices.—The effect upon the apprentices has already been awakened interest and marked improvement in skill in the shop, ability to read drawings, ability to lay out templates, and in several cases skill in drafting sufficient to warrant assignment to the drafting room for 60-day intervals.

Effect Upon Output.—It is difficult to determine exactly the effect upon output. The time spent in class, four hours per week, would appear to cause a slight decrease, but this is more than offset by the increased skill of apprentices due to the presence of the shop instructor to make each machine count, even with a green apprentice.

Effect Upon Men.—A feeling among the men that perhaps the apprentices would outdo them has been met by the organization of evening classes for foremen and mechanics at seven shops, taught by the drawing instructors of the apprentice department.

Effect Upon Instructors.—The effect upon the instructors themselves has been most pleasing. Without exception, they have developed, not only as enthusiastic instructors, but also in all-around ability.

Treatment of Apprentices After Graduation.—It is not too much to say that most railroads and most large industrial establishments need to put their organization in such order as will render not only employment desirable, but advancement possible. As an incentive to all and a reward to the especially studious and proficient, it is desirable to give a limited number of those showing the best records a prize in the way of a more advanced course at a technical school at the expense of the railroad; the young man to work in the shops during vacation time, thus retaining his close relationship to the work.

Probable Results.—It will undoubtedly take years to show the full value of the apprentice system. Already draftsmen are being provided for the company drafting rooms, and New York Central standards are becoming familiar to all apprentices. In the future every journeyman will be able to read drawings and make working sketches. It is not expected that all of the boys will attain a degree of efficiency that will qualify them for leadership, or that all workmen will possess the same measure of ability and activity, on account of the difference in their natural intellectual and physical qualifications, but it is expected that each will be developed to a high degree in his particular line, with the result that eventually each shop will be manned by a force of mechanics embodying an advanced state of proficiency from which at least a few competent men may be had at all times for positions of leadership.

Attitude of Other Roads.—The criticism has been made that the New York Central Lines is educating apprentices for other roads, and the statement is to some extent true at present. The awakening of interest, however, in industrial education, and the inquiries and observations from all directions indicate that other railroads are now giving this matter the consideration it deserves, and in some instances have taken action with a view to inaugurating some part of the plan proposed.

The reading of the paper brought forth an interesting discussion of the merits of the new apprenticeship system as compared with former attempts along that line. As showing the deep interest taken in the subject by men who are prominent in the motive power departments of some of the leading railroads, locomotive works and educational institutions, the following report of the discussion appearing in the Railroad Gazette is reproduced herewith:

A. M. Waitt.—At the present time there is no more serious problem confronting the railroads, and especially the mechanical department of railroads, than the future relationship between the employes in the mechanical department and the companies. We find that probably as much of the time of motive power officers is taken up in considering the difficulties of the labor problem as is devoted to strictly technical subjects of the department. The growing tendency to specialization seems to have led to a

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lack of general all-round mechanics in the shops. It has been noticed in probably every shop in the country that there is a great dearth of suitable men when a good man is desired for a foreman, and the man in charge of the shops, or of the department, looks about to find a man of the right caliber and a man who has enough of general information on his department work to be put in charge of men. That problem has got to be faced, and it seems to me that this step that has been taken by the New York Central Lines, on a comprehensive and broad scale, is one of the most important steps that has been taken by railroads in this country for a long time. I think there is nothing more important for the future good of railroads, in the mechanical department, for raising the standard of mechanics in the shops than the establishment of a thoroughly comprehensive and wisely carried out system for educating apprentices, so that we can have all-round mechanics and men who will not simply know one little specialty and take no interest outside of that. There has been a tendency lately, in connection with various organizations to lower, seemingly, the standard of efficiency of the men. I believe that a system, such as has been outlined by Mr. Cross, is one of the steps to offset that tendency and to raise permanently for the future the standard, as it should be raised, so that instead of going through our shops and comparing the present class of men with those of fifteen or twenty years ago, and commenting as we do now that they are not up to the old standard, that we may in five or ten years from now look through the shops and find the standard constantly improving, and so that others may look to the railroads as an example of the best methods of raising the caliber and the general standard of the mechanics. There is a common tendency in shops for general foremen to feel that they must, in taking young fellows into the shop and training them eventually to become mechanics, to get all that they can out of them, get all the value possible at first from their services, forgetting that one of the desirable features in training apprentices is to make them first-class workmen. The value cannot come in the first years of their apprenticeship, but just as surely as they are properly trained the value will come to the company and to the community at large from their services after they have been properly trained. I think we should not forget to make the proper training of the young men the first consideration and the getting of the value of their services in the first years of their apprenticeship secondary, and surely the best results will come in the end by carrying out that principle.

H. Emerson (Coun. Engr.)—It may be of interest to give a statement of what apprentices were doing under the old system, which I hope will soon become obsolete, and perhaps some time in the future it may be possible to find out what they are doing under these new systems that I hope to see spread. In the boiler shop (on the Sante Fe) we had twenty-three apprentices whose average efficiency was 87 per cent. in the work that they did. The efficiency of the whole shop, including the apprentices, was 94 per cent., so that the apprentices, as a rule, were below the efficiency of the men. On the list I find one apprentice with an efficiency of 136 per cent. and another with an efficiency of only 43 per cent. In the machine shop there are fifty-six apprentices with an average efficiency of only 69 per cent. The first man on the list has an efficiency of 136.8 per cent., the next man an efficiency of only 33 per cent., showing the tremendous variation in individuals. The first man is four times as good as the second man, and my impression is that throughout life he will steadily gain, as time goes on, and he will not be only four times as good, but ultimately ten or twenty or 100 times as good. One of the features that perhaps is necessary is to check up the apprentices throughout their course of service with reference to their efficiency so as to encourage those who show a high degree of efficiency, and if possible divert those that show no ability whatever into other walks of life. During the time of apprenticeship, more than at any other period of life, it seems to be necessary to impress upon the apprentice the question of his own efficiency, that what he is learning is not simply to absorb a certain amount of knowledge, but to carry it into actual work, so that he himself becomes efficient.

D. R. MacBain (Mich. Cent.)—We found when we were trying to carry out our old system of apprenticeship work, when we undertook to have the apprentices attend a course of instruction for an hour or an hour and a half after the

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work of the day, we got little results out of that practice; the boys did not put the enthusiasm into the work which they are doing now. Also since the inauguration of the new system, and particularly within the last five or six months, since the thing has become advertised, we are getting applications from a much better class of young men than before. They have learned that our apprenticeship system is very much like a fairly good technical education when the young man starts in. For that reason the applications are very numerous and are many more than we can take care of.

G. M. Basford (Am. Loc. Co.)—Nearly all railroads and industrial establishments have preached apprenticeship and nearly all have made serious efforts to practice it. In spite of this, it would probably require from forty to seventy years for most of these establishments to recruit their service of skilled labor through apprenticeship if they relied upon present methods for the purpose. We need definite systematic apprenticeship, adapted to present conditions. Even if we had plenty of apprentice material shop people are too busy to teach boys, and if the boys are put into shop organization to learn trades under prevailing conditions they will quickly absorb much that is harmful and more slowly learn some of the things we wish them to know. For sixty years the British navy has profited by a plan somewhat similar to the one described.

Professor Hibbard (Cornell Univ.)—The trade schools of Germany have taken a position in educational matters in Germany that is practically unknown in the United States. I hope that the influence of this paper and the influence of the New York Central Lines in the progress that they are making, and will make in this regard, will stir up our public school educators, so that something will be done to put us on a par with Germany's manual training and manufacturing education.

W. McIntosh (C. R. R. of N. J.)—In former methods of apprentice instruction the effort has always been made to give boys instruction outside of the regular working hours, expecting them to go back to the works after the regular hours of the day and to give considerable time at night to instruction. It is not surprising that that did not prove successful. The plan to give instruction during regular working hours is one of the important features of the system, and one that is absolutely necessary to meet with success. In 1905 we established a school in connection with our road very much on the lines here described. We have sixty students under instruction at the present time, and some of them are advancing very rapidly.

Le Grand Parish (L. S. & M. S.)—This method of instructing apprentices is a good, sound business proposition—no charity in it. We have found that by thus instructing the boys we get a much greater output from them. We are not losing anything in the matter of dollars and cents—from the financial point of view we are gaining.

W. B. Russell (N. Y. C.), one of the authors of the paper, gave a long description of certain of the features of the work, the methods, etc., in the course of which he said: "The two features of the work are the drawing courses, and what we call the problem courses, which will mean a good deal in the long run. The drawing courses for apprentices are nothing new, but this method of teaching drawing is different from anything I know of in this country. The geometrical work, which ordinarily takes a year or two in most evening schools, is omitted entirely. The boy starts immediately on practical work, being called upon to deal with actual conditions. The geometrical knowledge may be necessary, but that is introduced as it is wanted. We do not teach him the principle and then let him apply it, but teach the application and the principle at the same time, the idea being to keep the object in view all the time to accomplish something definite, and not the idea of the theory of training. . . . . The problem work is unique in this respect, that we have nothing to fall back upon. We found it impossible to use text-books. There is nothing in the country at the present time to fit the needs of an apprentice in the machine shop, and it has been necessary to start from the beginning. . . . .

"We are endeavoring as rapidly as possible to bring in experimental work, not the kind the colleges have, because we are not trying to prove the laws of nature, but the kind that will show the reason for things. We have introduced at most points a small engine, because we have found many apprentices did not know what a valve was, nor understand the definition of lapping and leading in the class room, but they can see these

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things on the actual locomotive. I think every machinist in our class will be able to set valves before he graduates.

"It was stated this plan would not work where piece-work was inaugurated. It will work equally well with either piece-work or day-work. We have it on both plans. Specializing and not piece-work is to blame for the present condition of lack of apprentices. This plan will also work in a small shop, and we expect to put it in shops where there are only five apprentices. It may be that the shop instructor and the educational instructor will be one and the same man in that case, but he will be able to give lots of his time to this work. Provision is made for the college man. We have no objection to the college man's taking our regular apprenticeship course. Many instructors in the college are taking that view of the matter. Provision is made in the apprenticeship regulations for allowance to be made for previous experience, and that covers the college man."

F. P. Roesch (Southern.)—There has been inaugurated in the Spencer shops of the Southern during the past few months a system practically on the same lines as laid down by Mr. Cross. With some of the boys it is necessary to commence at the beginning, to teach them the A B C's. From that on they are taught drawing, arithmetic, some of the elements of geometry, although not in a regular way; they are taught the strength of materials, and what is the minimum cutting speed of the different steel and tools. The maximum cutting speeds we allow them to determine for themselves, and we find they are doing pretty well at that.

Mr. Waitt.—In view of the evident interest taken in this subject and the importance that seems to be given to it, I move that it be placed in the hands of a competent committee to consider the developments and advancements in the apprenticeship system of education during the coming year and to report upon that, and also to consider the advisability of continuing or substituting something more up-to-date for our present recommended practice that is printed from year to year in our reports.

Motion carried.

* * *

General Labor News.

The secretary of war has decided that the national eight-hour law applies in Alaska as it does elsewhere, without regard to the difficulties of obtaining an eight-hour day at certain times of the year.

The establishment of a minimum wage in New Zealand doesn't prevent the best workers from getting a higher rate, according to a member of the Employers' Association there.

Union labor in Portland, Ore., has decided to enter the coming municipal campaign with a full ticket of its own. Because of the attitude of the present municipal administration, labor has decided to alter its former policy, which was to indorse candidates of other parties.

Arrangements are being completed between the American Federation of Labor and national trade unions of England, Scotland, Germany, Denmark, Austria, Belgium, Norway, Netherlands, and other foreign countries, to interchange union cards between unions of kindred crafts and callings. In addition to this world-wide movement between the organized wageworkers of the world, the American Federation of Labor and the American Society of Equity (the farmers' unions of the United States) have formed an alliance. The vast armies of the organized wageworkers of the world represent more than 50,000,000 people. The more advanced leaders propose an international convention of all craft unions.

The Chinese again are entering Canada in considerable numbers in spite of the $500 head tax, deemed sufficient at the time of its imposition a few years ago entirely to bar them out, and which was effective until recently, not a Chinese entering the Dominion except merchants and a few others who were exempted.

A strike of the blast-furnace men, at Pittsburg, Pa., which, it is said, will affect between 10,000 and 15,000 men, possibly will be called in the near future. The difficulty is over the eight-hour day.

The highest accident death rate among industrial workers in Great Britain is among seamen (53 per 10,000); and the death rate of seamen in sailing vessels is three times as great as even this ratio.

In a great many instances where trade unions pay sick and death benefits men are dropping fraternal societies in favor of their unions. The Stonecutters' Journal on this subject says: "The first four months of this year sixty-seven stonecutters died in good standing and received $6,700 by return mail to pay

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their death benefit. This is the largest number of stonecutters that ever died in that space of time in the entire history of the general union.

A plan by which the metal trades of the United States may act as a unit and if need be call vast sympathetic strikes, extending over the whole country, is suggested by President Gompers of the American Federation of Labor, who issued a call to John Fitzpatrick, president of the Chicago Federation of Labor, who in turn called a conference of the officials of the metal workers' unions of Chicago.

According to a report issued from Manchester by the International Federation of Textile Workers, the weekly wages of English operatives are: Weavers, $4.86; spinners, $9.72; card-room workers, males, $7.29, and females, $5.35; beamers, $7.29; bleachers, males, $8.76, and females. $4.37, and loom fixers, $10.20.

Inquiry into the needs of various states and territories for immigrant labor have been instituted by T. V. Powderly, chief of the division of information, recently established in connection with the bureau of immigraton.

In the paper-working industry in India the average wage per day for men is 15 cents; women, 8 cents; and children, 3 cents.

The terrible disasters which have recently occurred in the coal mines of Germany and France have directed the attention of scientists, especially in the former country, to introducing methods of protecting the miners against a recurrence of such calamities, or at least of diminishing, as far as possible, the loss of life.

The Te Fang (China) cigarette factory employs about eighty workmen, the majority of whom are boys. The wages range from $1 to $1.65 per month for the boys, and from $3.60 to $5.50 per month for the more experienced workmen. These wages include their food, which consists of two meals per day.

A government bill has been introduced in the Hungarian parliament prohibiting employes of state railroads from participating in strikes, under pain of instant dismissal.

The Department of Commerce and Labor has received information of the arrival of a large number of Japanese at Salina Cruz, Mex. Large numbers are being imported to Mexico for the ostensible purpose of working in the mines, but after a short stay many leave for the United States.

In addition to the Bricklayers' and Masons' International Union the Brotherhood of Railway Clerks is taking a referendum vote to decide whether the order shall be affiliated with the A. F. of L.

In the United States, the State of Pennsylvania especially, there is no union label more counterfeited than that of the cigarmakers.

Fifteen states, namely: California, Connecticut, Illinois, Kansas, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, Washington, West Virginia and Wisconsin, have free public employment offices in operation within their borders. Eleven of these states have state sysfems, maintaining twenty-eight offices in twenty-six cities, and five states have eight municipal offices in as many different cities.

The entire working force of all the packing houses in South Omaha, Neb., comprising about 6,000 men, were recently notified that an advance in wages of from 5 to 15 per cent. had been granted them.

When the Electrical Workers' Union was organized in St. Louis in 1891 wages ranged from $2.25 to $2 a day from sun-up to sun-down. Today the union has 50,000 members who receive from $3 to $5 a day for eight hours.

The British Board of Trade returns furnish an interesting comparison of the amount of weekly wages paid to agricultural laborers in England, Scotland, Wales and Ireland. It appears that in England the highest average wage is $5.32, and the lowest $3.48; in Wales the highest is $5.10 and the lowest $3.76; in Scotland the highest is $5.32 and the lowest $3.36, while in Ireland the highest is $3.12 and the lowest $2.10. The highest wage in Ireland is 14 cents lower than the lowest in Scotland.

The report of Immigration Commissioner Sargent for May shows that 2,263 Japs entered the United States during the month, exactly 139 more than the entries during May, 1906.

By an executive order the employes of the government printing office are now enjoying a half-holiday on Saturdays during July, August and September, the same as employes of other departments.

It is estimated that in New York one out of every nineteen persons is a member of a labor organization. In England the

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proportion is one in every twenty-two, in Germany, one in thirty-one, in France one in fifty, in Italy one in 125, and in Spain one in every 325.

At Preston, England, a company has been fined in the police court for stealing the labor of workmen. The theft was committed by putting back the hands of a clock to deceive the men into working longer hours.

President Michael J. Donnelly of the Amalgamated Meat Cutters and Butcher Workmen's Union has retired owing to ill health. Edward W. Potter, first vice-president, has become the executive.

For some years past a number of female inspectors have been appointed on the boards for factory inspection in the Grand Duchy of Baden and in the Duchy of Saxe-Coburg-Gotha. So satisfactory have been the results secured that the central German States have decided to also introduce the practice.

The Glass Bottle Blowers' Association has a membership of 13,000 and its assets are approaching the million-dollar mark. There have been no strikes for fifteen years, and that body is now one of the strongest labor organizations in the world.

The recent advance in wages in the textile mills in New England, amounting to 5 per cent., makes the wages prevailing in that section the highest ever known. About 200,000 operatives share in this advance.

According to the statistics of the Women's Trades Union League there are in this country over 5,000,000 working men, and about 3,500,000 of them are in the trades and professions susceptible of organization.

Delegates from towns and cities of New Hampshire, Massachusetts and Rhode Island, representing machinists' lodges, met in Boston recently and planned to make a united effort for a shorter workday and a wage increase for the machinists of New England.

Louisville has secured the next biennial convention of the Retail Clerks' International Protective Association.

Scottish bakers in 1888 only earned from 20 shillings to 23 shillings a week; the average wages now stand at from 28 shillings to 35 shillings a week.

Contributed

Conditions of Labor in European Transportation Industries.

The wage movement of the railway men in England is being continued with unabated vigor. To the claims made by the railway men the railway companies have replied as follows: "We realize that your hours of labor are too long and that your wages are too small, but we regret to say that we are not in position to allow you even one penny more, because the interest on our capital is only a little over 3½ per cent." This statement seems rather strange if you look a little closer into the matter. The companies count with a capital of £1,175,001,000. Two hundred million pounds of this amount have never actually existed; they have simply been added in order to deceive the population with regard to the dividends. One hundred eighty thousand financial men are interested in fifty-one railway companies. There are 250 committees and useless managers—3,000 persons, all told—who get paid for doing nothing. The Board of Trade estimates the average wage of the railway men at 25 shillings a week, but 100,000 railway men earn less than 20 shillings a week. A signalman, who has in his hands the lives of hundreds of human beings, gets for twelve hours' work a day from 19 to 23, or in some cases 25 shillings a week. Only in very busy cabins they get up to 30 shillings a week for eight hours' work per day. The income taxes paid by the railway companies in 1906 were on a profit of £43,000,000. The claims of the laborers would amount to £4,000,000 per annum. An average of about 300 laborers meets with accidents, and an average of ten men get killed per week. The railways employ 581,664 men; 70,000 of these belong to the trade union. Since the commencement of the agitation work this number has been increased 20,000, which fact, however, is not recognized by the employers. A conference was held in

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Birmingham on June 25th, which was attended by 470 employes of the various grades, and where a resolution was passed, with 467 against 80 votes, to again present the claims of the railway men to the companies. Should this action be without any result, such steps will be taken as appear necessary in view of the circumstances.

The Railwaymen's Union of Germany celebrated its tenth anniversary and for this purpose the number of the "Weckruf der Eisenbahner" (Call of the Railwaymen), issued on July 1st, was made up in a special manner. Ten years of attacks from the railway companies and of discharges of union members, whose names had been denounced to the companies, have not been able to destroy the organization, which will continue the fight wth the same energy as during the first ten years of its existence. How hostile the Prussian Railway Administration is to any organizing efforts is proved by the fact that the management in Halle has put up a notice warning the railway men to join the Trade and Transport Workers' Union of Germany. In opposition to this we must also mention the fact that the railway men succeeded in Munich in having their fellow-worker Rosshaupter, varnisher in the railway workshops of that city, elected as socialistic deputy in the Bavarian National Parliament. The "Blacks" are now using all efforts in order to induce the Bavarian Minister of Traffic, Mr. von Frauendorfer, to send Brother Rosshaupter away from the railway workshops because, accordng to their opinion, his work there does not agree with his views.

The Railway Men's Society in Sweden is continually progressing, one victory is being secured after the other. In some instances they have been able to obtain increases from 50 up to 73 per cent. But such results can only be secured by the most perfect harmony among the railway men themselves. The wage question has now been settled, at least for the near future, so that the railway men can now commence with the inner development of their organization. There is another question, however, which it will be much more difficult to solve, i. e., the improvement of the pension and benefit funds on some of the lines, which are still in a very deplorable condition. Considerable attention will also have to be given to the security appliances, which are in a very bad state, and it will require considerable effort to render them really useful again.

As has repeatedly been said, the condition of the railway men in Spain is badly in need of improvement. The men go on slaving one day after the other without taking an interest in anything. This accounts for the low wages, which are in no way an equivalent for the work they are doing. They get no rest, and the law regarding the Sunday rest only applies to a small percentage of railway men. They have no parliamentary representation, nor are they represented in the city councils, not even in the Instituto de Reformas Sociales. All this is due to their not having a proper organization. Bro. Luis Zurdo Olivares is now going to try again after a short interruption to shake and wake the railway men and to win them for the organization. For this purpose he has made an arrangement with the editor of the paper "El Intransigente" (The Intolerant), which is being published in Madrid, to the effect of having a special number published at a certain day under the name of "Tribuna Ferroviaria." This is a very good solution of this difficult question and we hope that Brother Olivares may succeed in waking the Spanish railway men from their indifference.

Regarding the strike of the seamen in Antwerp we can state that the Congo Line has increased the wages. The firemen, the trimmers and the sailors get now 12.50 francs more a month. The Red Star Line still maintain their standpoint not to grant anything.

Brother Marin of Barcelona writes us that the marine workers find themselves in a very sad position, owing to the heavy economical crisis and owing to the persecutions to which their organization is exposed.

The furniture transportation laborers in Darmstadt, Mannheim, Heidelberg, Frankfurt-on-Main and Wiesbaden have undertaken a wage movement. In Meerane all the transport workers are on strike. In Strassburg the cab drivers have been on strike and have secured considerable concessions. The teamsters in Buffalo are still on strike. The strike of the engineers and firemen on the Rhine, about 1,200, has ended with a victory.

Fraternally yours,

HERMANN JOCHADE.

Hamburg, July 5, 1907.

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Miscellany

Important Notice: Congress Acts With a View to Greater Safety on Railroads.

With a view to promoting safety in railroad operation the last session of Congress by a joint resolution directed the Interstate Commerce Commission to investigate the necessity for block signal systems and appliances for the automatic control of trains in the United States, and the efficiency of such as are at present in use. For the carrying out of this work the commission has appointed a board to be known as "The Block Signal and Train Control Board," relative to the organization of which the following official communication has been received from its secretary, Hon. Edward A. Moseley:

INTERSTATE COMMERCE COMMISSION, OFFICE OF THE SECRETARY.
EDWARD A. MOSELEY, Secretary.
WASHINGTON, July 24, 1907.

John F. McNamee, Editor Locomotive Firemen and Enginemen's Magazine, Indianapolis, Indiana:

Dear Sir—The Interstate Commerce Commission has appointed a board, to be known as the Block Signal and Train Control Board, to investigate and report on the use of and necessity for block signal systems and appliances for the automatic control of railway trains in the United States, in accordance with Public Resolution No. 46, approved June 30, 1906, and the appropriation act of March 4, 1907.

This Board consists of the following members:

Mortimer E. Cooley, chairman, Dean of the Department of Engineering, University of Michigan;

Azel Ames, Jr., signal engineer, Electric Zone, New York Central & Hudson River Railroad;

Frank G. Ewald, consulting engineer of the Railroad and Warehouse Commission of Illinois;

B. B. Adams, associate editor of the Railroad Gazette.

The secretary of the board is W. P. Borland. Its office will be at the headquarters of the Interstate Commerce Commission, Washington, D. C.

The Commission hereby gives notice that the investigating board is now organized and ready to consider devices or methods coming within the scope of the resolution named, a copy of which is inclosed. All communications should be addressed to W. P. Borland, Secretary, the Block Signal and Train Control Board, Interstate Commerce Commission, Washington, D. C.

In presenting information relative to any device or method you are requested to comply as nearly as practicable with the inclosed form, No. B. S. 1, and are informed that it should be forwarded at the earliest practicable date.

Your attention is also directed to those portions of the Public Resolution and Appropriation Act which bear specifically upon the duties of the board and define the scope of its work.

Very respectfully,
EDWARD A. MOSELEY,
Secretary.

The joint resolution (Public Resolution No. 46) directing the Interstate Commerce Commission to make this investigation and the act appropriating the funds for carrying out the work are as follows:

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Interstate Commerce Commission be, and it is hereby, directed to investigate and report on the use of and necessity for block signal systems and appliances for the automatic control of railway trains in the United States. For this purpose the Commission is authorized to employ persons who are familiar with the subject, and may use such of its own employes as are necessary to make a thorough examination into the matter.

In transmitting its report to the Congress the commission shall recommend such legislation as to the commission seems advisable.

To carry out and give effect to the provisions of this resolution the commission shall have power to issue subpoenas, administer oaths, examine witnesses, require the production of books and papers, and receive depositions taken before any proper officer in any State or Territory of the United States.

Approved June 30, 1906.

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APPROPRIATION ACT.

To enable the Interstate Commerce Commission to investigate in regard to the use and necessity of block signal systems and appliances for the automatic control of railway trains, including experimental tests, at the discretion of the commission, of such of said signal systems and appliances only, as may be furnished in connection with such investigation free of cost to the government, in accordance with the provisions of the joint resolution approved June thirtieth, nineteen hundred and six, fifty thousand dollars.

Approved March 4, 1907, at 11 a. m.

The following is the order in which descriptions of signals or train control devices or systems should be made up for presentation to the board:

1. Name of device or process.
2. Name and address of proprietor.
3. Number and date of U. S. patent or patents.
4. Purpose of the device or process.
5. Brief statement of how the purpose is carried out.
6. Description of fixtures at side of roadway.
7. Description of fixtures on or between rails or track.
8. Description of fixtures on any overhead structure.
9. Description of fixtures on locomotive.
10. Description of fixtures on cars.
11. General description.
12. Statement of relation to other signaling apparatus or operations.
13. Name of railroad or railroads on which used or tried and length of time in use.
14. Name of town, district, or railroad division on which used or tried.
15. Names of railroad officers of whom inquiry may be made.
16. Names of other references.

July 12, 1907.

*Seattle Will Hold World's Fair.**

An international exposition is to be held in the city of Seattle in the summer of 1909. It has been named the Alaska-Yukon-Pacific Exposition, and will aim primarily to exploit the resources of the little-known Northland. It will be a $10,000,000 enterprise, representative of the marvelous development of the Pacific Northwest in the past few years.

The United States bought Alaska in 1867, for $7,000,000, the purchase being made principally for the sake of doing a good turn to Russia, which had been faithful to the United States during the civil war. Since that time, the government's revenues from Alaska have been more than $10,000,000, and the federal government is $1,500,000 ahead in the Alaskan account, according to figures supplied by Secretary Taft.

Alaska has produced more than $100,000,000 worth of gold, and the fur output since 1870 has been $80,348,762. There are millions of acres of lands available for settlement, and farming will be the principal industry as soon as better transportation facilities are secured. It has been demonstrated that all sorts of vegetables and the hardier grains will grow in the Northland, while the inland valleys are excellently adapted to stock raising.

The Alaska-Yukon-Pacific Exposition will bring together in trade the shores of the Pacific. Nine hundred million people —more than half the population of the globe—live in the Orient. Yet the trade between the Orient and the United States is not large, and that with the Tropical Orient is not increasing. Through the medium of exhibits, the Alaska-Yukon-Pacific Exposition will teach buyer and seller what each needs.

The exposition of 1909 has been excellently started by the subscription by Seattle citizens of $650,000 worth of stock in the enterprise. This subscription was made in one day, and amounted to more than $3 for every man, woman and child in the city. No city ever before raised so large an amount for any purpose in so short a time.

The State of Washington will appropriate $1,000,000 for the fair, and the Federal Government will be asked to participate with the same amount. State participation will be on a large scale, and the displays made by the western commonwealths will be especially elaborate and interesting. Manufacturers from every part of America and abroad will show their wares. Participation by foreign countries will be confined to those which border on the Pacific Ocean or have dependencies there. It is assured that the representation which these nations will make will excel the showing made at all earlier world's fairs.

*From Department of Publicity.

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Seattle, the New York of the Pacific coast, is located on the shore of Puget Sound. The greatest ships of the world ride at anchor beside her miles of wharves. Skyscrapers crowd one another on her business thoroughfares. The city is growing so fast that census takers fail to keep pace. The population now exceeds 200,000, having more than doubled since the census of 1900.

The exposition site has been chosen, and laid out by John C. Olmsted, the famous landscape architect. It embraces 250 acres of the University of Washington campus, and is picturesquely situated on the shore of Lake Washington, within the city limits, and distant twenty minutes by street car from the business center.

* * *

Startling Report Basis for Interstate Commerce Commission Safety Appliance Investigation.

A remarkable report, originating in Washington, D. C., which has gained some ground throughout the country, is to the effect that an investigation has been ordered by the Interstate Commerce Commission for the purpose of determining what has become of numerous safety appliances patented in this country during many years past. It has been intimated that railroad companies and large safety appliance manufacturing concerns have secured control of these patents for the purpose of suppressing their manufacture.

It is said that it will be the duty of the expert investigators employed by the commission to examine all patents on record in the Patent Office intended to promote safety in transportation, and to accurately determine their respective merits. It is claimed that the motive actuating the suppression of some of the more meritorious inventions is a desire on the part of the accused corporations to prevent the devices now in use from becoming obsolete as a result of their adoption and thus avoid the expense of substituting them with new patent appliances.

It is hard to conceive that railroad companies and safety appliance manufacturers would deliberately assume responsibility for the appalling fatalities and injuries and their attendant train of sorrows occasioned by railroad accidents. We, therefore, feel that they should not be prematurely condemned and that the public should suspend its judgment regarding the matter until after the investigating committee has been able to submit proven facts.

* * *

The Boy Who Wins.

The knowledge, experience and success that we get out of our work have glue on them—they stick; but the things that come to us without effort on our part are greased—they often slip away.

The boy who is unable to think a second thought until he forgets the first one, will never amount to a hill of beans on a cheap Tennessee sidehill. But the boy who can hold two thoughts in his mind and evolve a third thought out of them, may become a man—a real man.

A Polish boy applied at a large newspaper office one day for work. His parents were poor—he must have work. No job was open for a boy. The persistence of the lad interested the circulation manager, who concluded to try him.

He had a delivery route that gave him much trouble. It was scattered; several subscribers were distant from the main route and customers were continually missed and complaining. The boy was put on this route for a week on trial. No complaints. A month brought no complaints. Many cold, rainy days had intervened. A better job was soon found for the boy. He became superintendent of carriers by and by.

This occurred twenty years ago. That boy is today business manager of the biggest newspaper in Ohio—the same paper he started on as a delivery boy, and his salary is $10,000 a year. No luck about this. What he did, he did well.

One of the hardest things to find today is a boy who will do his best, keep on doing his best, and not grow careless. Each effort prepares one to make another effort. There is no telling what a boy can do if he would only try and do his best every time.

The boy who can pass nothing by without disturbing it and who finds fun in annoying people is no good. His bump of destructiveness is too large. His indulgence of this evil propensity indicates a vicious mind and a lack of the natural qualities that lead to success. Have nothing to do with him.

Again we have the boy who has to be "told" and "told" again—and again. Any

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boy may be "told" once. If he has to be "told" twice, look out; if three times, pass him up. He is no good. Put him on the "hog train" with the boy who deceives and steals. The liar is always a thief and a coward. All thieves are cowards.

The boy who slights his work in order to get off sooner to play may not always prove a failure, although the chances are against him. Warning, a little sensible advice and education may do something, if the real stuff is in him.

Every boy should know that the good things are never all gone. The opportunities are still here. They pass along, too busy to stop and awake a sleeping boy or convince a blockhead. They just pass along. Some boy finds them. They are never lost. It is the boy who fails to see them who is lost.

But opportunity is of little use to a boy who is not prepared to seize it—to him who has not learned to stick and do something. The boy who is always looking for a better job, a softer snap, drifts along and seldom cuts any figure in affairs. The boy makes the job and when he makes it well, it makes him.

The boy who devotes his time and mind to the technicalities of baseball, football, prize fights, sensational plays and yellow novels is a "goner." His case is hopeless. He has got on the downward trolley and the further he goes the worse for him. He planted no good seed in springtime, no beauty for him in summer and no harvest in autumn. He is a bad failure.—Toledo Press.

*Notes on Alaska-Yukon-Pacific Exposition.**

The next great western world's fair will be held in Seattle in the summer of 1909. It is to be called the Alaska-Yukon-Pacific Exposition.

The city of Seattle raised in one day for the Alaska-Yukon-Pacific Exposition the sum of $650,000. This is thought to be more than was ever before secured for any purpose anywhere in so short a time.

Seattle, whch is to be the seat of the next big western world's fair, the Alaska-Yukon-Pacific Exposition, is a city of more than 200,000 population, located on Puget Sound, an arm of the Pacific, on which the greatest ocean liners ride with ease. The fair is to be held in the summer of 1909.

A number of states are planning to erect permanent buildings on the grounds of the Alaska-Yukon-Pacific Exposition. These will be used afterwards by the Washington State University, on the grounds of which the fair will be held.

The Alaska-Yukon-Pacific Exposition, to be held at Seattle in 1909, will exploit the resources of Alaska and the Yukon territory. Alaska has yielded nearly $200,000,000 worth of gold since the Klondike rush.

J. E. Chilberg has been elected president of the Alaska-Yukon-Pacific Exposition, I. A. Nadeau vice-president and W. M. Sheffield secretary. All are men of high standing in Seattle. The fair is to be held in 1909, and work on the grounds has already begun.

The Want of the Age.

It has been truly said that the want of the age is men. Men of thought; men of action. Men who are not for sale. Men who are honest to the heart's core. Men who will condemn wrong in friend or foe, in themselves as well as others. Men whose consciences are as steady as the needle to the pole. Men who will stand for right if the heavens totter and the earth reels. Men who can tell the truth and look the world and the devil right in the eye. Men who can have courage without whistling for it, and joy without shouting to bring it. Men through whom the current of everlasting life runs still and deep and strong. Men too large for certain limits, and too strong for sectarian bands. Men who know their message and tell it. Men who know their place and fill it. Men who mind their own business. Men who will not lie. Men who are not too lazy to work, nor too proud to be poor. When in the office, the workshop, the counting room, the bank, in every place of trust and responsibility, we can have such men as these, we shall have a Christian civilization the highest and best the world ever saw.—Progress.

*From Department of Publicity.

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UNION MEETINGS

A wholesome interest is developing in union meetings throughout the entire jurisdiction of the Brotherhood and it is certainly well that such should be the case, as these gatherings afford an opportunity for the brothers and members of the Ladies Society and their friends to indulge in happy social intercourse and enjoy the pleasures afforded by the entertainments that always constitute a feature of such events.

Union meetings also afford one an opportunity to be benefited by the instructive addresses of Grand Lodge officers and other able speakers, both inside and out of the organized labor world.

From an economic standpoint they are productive of much good, as they have the effect of uniting men closer in the work of advancing the common interests of all. More union meetings are being held now under the auspices of our Brotherhood or in connection with the other railroad labor organizations than ever before, which clearly demonstrates an awakening on the part of the membership and a realization of the necessity for a closer affiliation and a better understanding of industrial problems.

Attendance on the part of every brother and sister who can possibly be present is the most effective way of encouraging union meetings and expressing appreciation of the efforts of those who promote them.

Announcement of union meetings to be held at Cumberland, Md., September 23d and 24th, and in Indianapolis in October, appear elsewhere in this issue of the Magazine.

* * *

The Canadian Grand Union Meeting.

The Canadian Grand Union Meeting, held at Hamilton, Ont., August 5th to 9th, was in every particular a magnificent success. The attendance was much larger than had been hoped for by the most sanguine of its promoters, and the weather everything that could be desired. In the event, from beginning to end, health-giving pleasure and profitable business were so intermingled as to produce the most desirable results. Members and their ladies were in attendance from all over Canada and the United States. Never in the history of the Brotherhood has a union meeting been held that has been productive of more good or proven a more pronounced success, and never has a more enthusiastic determination to advance the interests of the Brotherhood and defend its principles been witnessed than was evinced by the immense body of men in attendance at the business sessions.

Everywhere in the city Canadian hospitality and good will "smiled hearty and free" and the delegates and ladies were, by the disposition of the people towards them and the profuse decorations in honor of the occasion, made to feel that they were indeed amongst their friends and that as visitors to Hamilton they were truly welcome.

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August 6.—The exercises commenced at 9 a. m. with a secret meeting in Arcade Hall, James street North, the Ladies Society meeting in A. O. F. Hall, James street North, on same date, at 2:30 p. m. The Brotherhood meeting was called to order by Bro. John McElwain, chairman of the committee of arrangements. Bro. McElwain, in well-chosen and appropriate words, extended a hearty welcome to the brothers present, and at the

E. A. BALL, Third V. G. M.,
Chairman, Canadian Union Meeting, Hamilton, Ont.

conclusion of his address the meeting organized by choosing Bro. E. A. Ball, Third Vice Grand Master, as chairman; Bro. Albert E. Williamson of Lodge 174, Harrisburg, Pa., as secretary; Bros. C. McI. Elder, Lodge 174, Harrisburg, Pa., and Harry Smith, Lodge 66, Belleville Station, Ont., as inner and outer guards, respectively, and Bros. Chas. A. Boyd, Lodge 597, Winnipeg, Man., W. A. Cahoon, Lodge 7, Washington, D. C., John H. Williamson, Lodge 174, Harrisburg, Pa., and G. S. Allen, Mr. Katahdin, Mont., as wardens.

Bro. Ball, on assuming the duties of the position of chairman, addressed the meeting on matters of importance to the organization, and was followed by Grand Master Hannahan and First Vice-Grand Master Wilson, who also dwelt at length upon subjects of general interest to the Brotherhood. The session adjourned at noon to meet on the following morning at 9 o'clock.

The meeting of the Ladies Society at A. O. F. Hall was largely attended. Sister G. M. Sargent, Grand President of the society, opened the session. A proposed change in the present insurance plans and other questions of importance were made the subjects of lengthy and profitable discussion.

Public Reception.

The public reception was held at the Savoy Theater, commencing at 8 p. m. The house was filled with a happy and appreciative audience, and the entire program from start to finish was most interesting and entertaining. Amongst those occupying the stage were Third Vice Grand Master E. A. Ball, chairman of the meeting; Mayor Stewart and Allan Studholme, M. P. P.; Mrs. G. M. Sargent, Grand President of the Ladies Society; First Vice Grand Master C. A. Wilson, Grand Master John J. Hannahan, and Bro. John McIlwain, chairman of the committee of arrangements. In his opening address Bro. Ball dwelt on the history of the organization. He referred to the fact that it is now about thirty-four years old and that from the few men who constituted its membership at its institution in December, 1873, it has grown to its present proportions—a magnificent industrial army of 65,000 men. Bro. Ball stated that since the Brotherhood was organized it had paid the enormous sum of $10,500,000 in death and disability benefits, that it was steadily growing in numbers and influence each year, and that the death and disability claims paid during the fiscal year ending June 30, 1907, amounted to the sum of $947,100, just $52,900 less than an even million, and that out of this sum the amount paid for amputations was $85,500.

Brother Ball also stated that the Canadian lodges at present number fifty-nine, with a membership of 3,644, that the total amount of beneficiary assessments paid by Canadian lodges into the Grand Lodge from the date of organization to June 30, 1907, was $584,094, and that the total amount paid by the Grand Lodge to Canadian lodges in death and disability claims from the date of organization to June 30, 1907, was $486,700. He said that the object of the annual Canadian meeting was for the purpose of better familiarizing the brothers with the benefits to be derived from the organization and to invite general attention

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to the many advantages it possesses, and the good work it is doing.

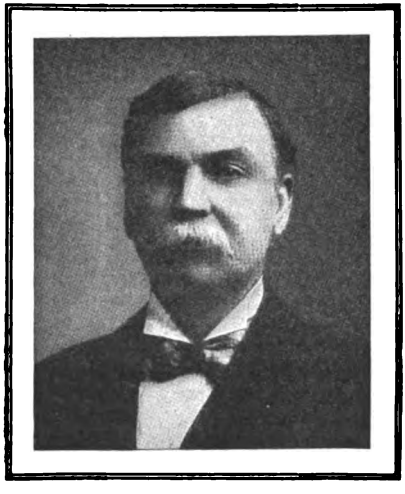
Brother Ball concluded his very appropriate address with an expression of the hope that all firemen and enginemen who were eligble to membership, and who had not yet joined the Brotherhood, would do so at the earliest opportunity. He then introduced Mayor Stewart. His worship said he was pleased to be present and that it afforded him much pleas-

ALBERT E. WILLIAMSON,
Secretary, Canadian Union Meeting, Hamilton, Ont.

ure to extend a hearty welcome on behalf of the people of Hamilton to the visiting brothers and their ladies. He gave them the freedom of the city and wished the organization every success. He referred to the growth of the city during the past few years and prophesied that at its present rate of progress and prosperity, the next annual meeting would find it a far greater city in every way than it is today. He assured the meeting that no city in Canada stood so strongly for organized labor as did Hamilton, and he believed that a great part of the city's success was due to this fact.

Allan Studholme, M. P. P., was next introduced and delivered a stirring address on organized labor and its work. He said he was glad to be amongst those who surrounded him on the platform and those he saw in front of him as he felt certain that the Brotherhood was an organization which, like others of its kind, made for the peace of the world and better working conditions of those who had to labor. He said that precautions should be taken without further delay to prevent foreign labor from cutting the wages of American and Canadian working men and that all white men should stand solidly together against the encroachment of the Mongolian coolies.

He touched upon the present situation in South Africa, stating that thousands of precious lives had been sacrificed in the Boer war in settling the franchise question and that now white labor in the Transvaal is confronted with the competition of armies of Chinese coolies who have been imported for work in the mines by avaricious mine owners. He said that the influence of organized labor throughout the entire British empire should be brought to bear, with a view to remedying these conditions. He dwelt upon the magnificent success that was attending the movement amongst the working classes, in the United Kingdom, to send men to the House of Parliament, men from their own ranks, and assured them that it was only necessary for working men every-



MAYOR STEWART,
of Hamilton, Ont.

where to exercise their franchise rights unitedly in order to secure for themselves proper legislative recognition and protection.

Mr. Studholme's address was a manly and vigorous advocacy of the rights of wage earners. It was very interesting

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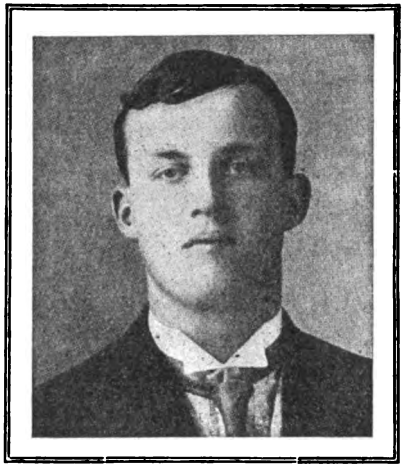
and thoroughly appreciated by all present.

Sister G. M. Sargent, Grand President of the Ladies Society, was next introduced and delivered a most entertaining address on the work of that organization.

She said that the Society was organized in 1884, starting with ten members, and today it numbers over 6,000; that it was instituted for the purpose of helping the sick and distressed families of the



JOHN McILWAIN,

General Chairman Committee of Arrangements, Canadian Union Meeting, Hamilton, Ont.

members of the Brotherhood and that it had done great good since its organization. She touched upon the insurance feature of the organization, and in concluding expressed the hope that the Society would grow rapidly and that the members of the Brotherhood would take an interest in seeing that ladies eligible to membership whom they could influence to join, would soon be found within its ranks. Sister Sargent was followed by Bro. C. A. Wilson, First Vice Grand Master.

Brother Wilson, as usual, delivered an address that was most entertaining and interspersed with sallies of wit and humor, which, from the thunderous applause and hearty laughter which greeted them, it was plainly evident were thoroughly appreciated. He said he felt perfectly at home in Canada, as he had done a great deal of work for the organization in the Dominion and he was familiar with the great work that had been accomplished by the organized effort of the Canadian brothers. He said he felt that meetings of that kind were productive of much good, as each one who attended learned something and told it to his companions, all deriving more or less benefit in different ways as a result. He said the Brotherhood stood for fairness between employer and employe and that he hoped to see the spirit of fraternalism, which it was establishing, spread until it embraced every fireman and engineman in the North American continent.

Brother Wilson was followed by Grand Master Hannahan, who, in opening his address, heartily thanked Mayor Stewart, Mr. Studholme and the citizens of Hamilton for their genuine welcome and kindly greetings, and assured them that he was speaking for all present when he said that the visiting brothers and their ladies would carry away only happy recollec-

C. W. COOPER,

General Vice Chairman Committee of Arrangements, Canadian Union Meeting, Hamilton, Ont.

tions of their city. He then pointed out the benefits to be derived from membership in the Brotherhood and that the end of organization was a protection to working men in general. He expressed his regret that there was not a branch of the Ladies Society in Hamilton, and urged the ladies to form one at once. He referred to the gathering as a family affair and declared that it was not called for the purpose of disturbing the labor

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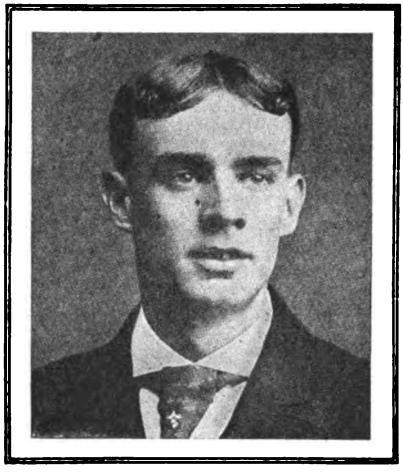
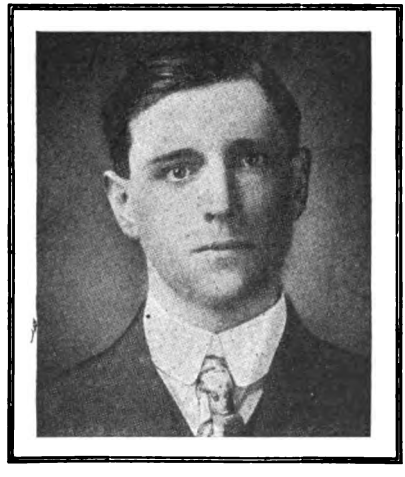
situation in any part of Canada. What the Brotherhood wishes, he said, was honorable peace, and that they hoped to secure it by just and fair means. Organized labor, he said, had come to stay. Its voice had been heard at Ottawa and at Washington, and it was growing stronger all the time; that the sentiment had been crystallized in that form. We have seen, he said, within the last few days, how a judge had assessed upon a great corporation a fine of over $29,000,000 for rebating, but that one thing remained to be done and that was to place the guilty man behind the bars, regardless of whether he was rich or poor. He said that the Brotherhood was not organized to injure the railroads or to break the laws of any company; that all they desired was fair treatment and justice and that they would endeavor to secure these things by peaceable means, as it was their desire to work in harmony with their employers. Referring to conditions in Canada, he said that if railroad building continued for the next 25 years as it had during the last few months, Canada would have as much mileage as the United States has now, which would leave a proportionate increase in the number of firemen and enginemen employed. The men in Canada, he said, were not getting as much pay from the Grand Trunk and the Canadian Pacific as they should. These companies charged the same passenger and freight rates as the roads in the United States did, and they should pay their men as good wages. Firemen and enginemen were, he said, indispensable on railroads; they were the heart which moved the commerce of the country and they should feel their might and stand for their rights.



F. R. MARTIN,
Chairman Advertising Committee, Canadian Union Meeting, Hamilton, Ont.

The Grand Master's address was listened to with the deepest attention and his fearless denunciation of wrong and vigorous advocacy of fair play and justice for wage earners received from the audience in the form of enthusiastic applause its free and hearty endorsement. Between the addresses a most enjoyable program of songs and dancing was given, in which the following took part: Mr. George Allan, baritone; Vernon Carey, tenor; Master Willie and Miss Rita Ryan and Master Gorden Flett danced the sailor's hornpipe and the Highland Fling.



JOHN NORRIS,
Chairman Reception Committee, Canadian Union Meeting, Hamilton, Ont.

The accompanists were Mrs. Coghlin and Mr. Ed Pearce.

Wednesday, August 7.—The business session was held in the forenoon and the afternoon was devoted to sightseeing, a visit to the mountains being a feature of the day's entertainment. Grand Master Hannahan, Vice Grand Master Wilson and Bro. Wark, of the Grand Executive Board, delivered addresses on matters of vital importance to the Brotherhood in general, and to Canadian members in par-

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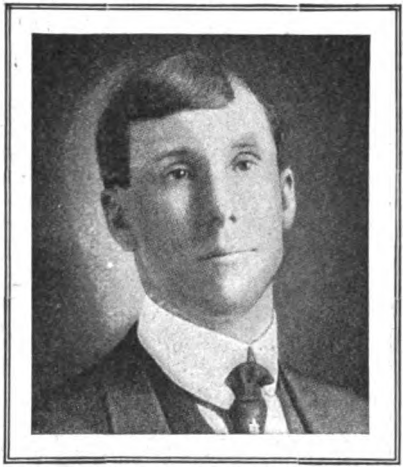
ticular. The inhumanly lengthy number of consecutive hours during which men are compelled to be on duty was one of the subjects considered. During this meeting Bro. Wilson exemplified the secret work and spoke on the welfare of the organization in a most interesting way, and Bros. Hannahan and Wark spoke at considerable length upon the subject of legislative boards and their work, and the necessity for an organized



JAMES SMILEY,

Chairman Entertainment Committee, Canadian Union Meeting, Hamilton, Ont.

effort with a view to protecting and advancing the legislative interests of the members. On adjournment of the meeting, the delegates and visitors assembled at the court house, where the entire body was photographed.

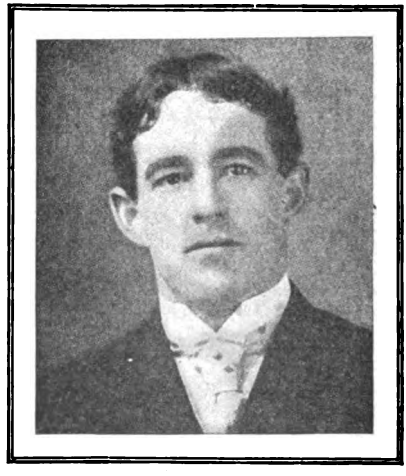
The Ladies Society also held a session in the forenoon, during which the secret work was exemplified, and further consideration given the subject of insurance.

In the evening a grand ball and luncheon were given at the Brant House, Burlington Beach. There were present over 900 of as happy people as ever assembled in a ball room. The dancing continued until midnight and all enjoyed themselves thoroughly.

Secret Meeting at Arcade Hall.

Thursday, August 8.—A secret meeting was held which lasted all day, adjourning at noon for dinner. Many matters of interest to the Brotherhood, which had not before been touched upon, were considered, and subjects of discussion at former meetings reintroduced for further consideration. The meeting did not adjourn until 6:00 p. m. It was decided to hold Canadian Union Meetings biennially during the year between conventions, instead of annually. This decision was reached because it was the consensus of opinion that the attendance of members at conventions of the Brotherhood has a tendency to conflict with their being present at the Canadian Grand Union Meeting, also, when both are held in the same year. Winnipeg was chosen as the city in which the next Canadian Grand Union Meeting will be held in 1909, the dates for same to be decided upon later.

During the Brotherhood meeting the ladies also held a session in their hall. In the evening the delegates and visitors were treated to a delightful sail on Lake Ontario, on the steamer "Modjeska," which was greatly enjoyed by the several hundreds who participated in the pleasures of the event.



C. V. HAYES,

Secretary-Treasurer Committee of Arrangements, Canadian Union Meeting, Hamilton, Ont.

Friday, August 9.—An excursion was given to Niagara by the courtesy of the Grand Trunk Railway officials and the visitors spent the day in the enjoyment of the magnificent sights which nature has provided in and around that locality. From this point the visitors separated to their respective homes, feeling much the better and happier as the result of their

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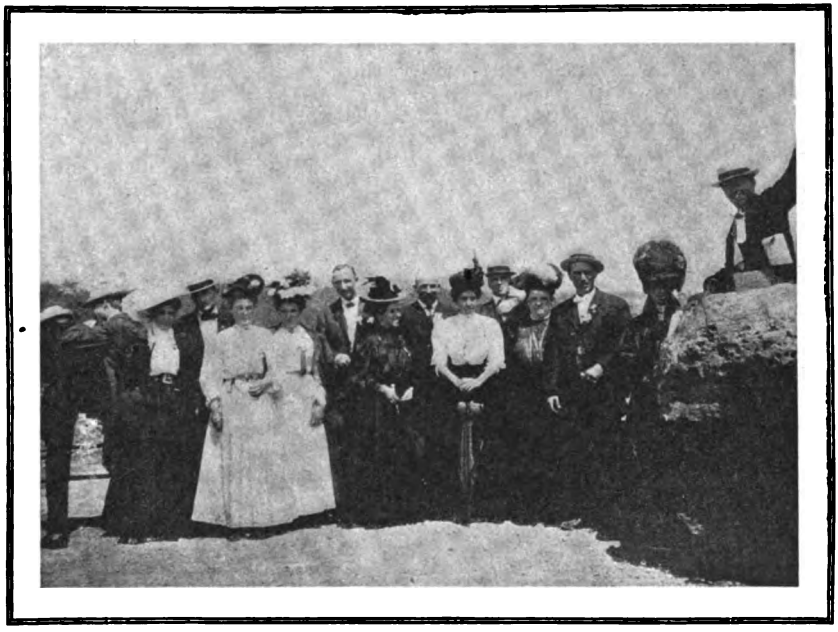
attendance at the Hamilton Grand Union Meeting. During the meeting the capacity of the hotels was severely taxed. It was estimated that there were two thousand visitors present.

An extract from one of the references to the meeting appearing in the Hamilton Herald, is as follows: "This morning they assembled on the Court House steps and a group photograph was taken. Some idea of the number here may be gathered when it is said that the steps of the court house did not provide anything like sufficient room for the party, and they were not all there either. It was one of the best-natured gatherings one could wish to see, and a prominent citizen passing through the square said, on looking over the gathering: 'So these are the firemen and enginemen, are they? Well, I have always thought of a fireman as a man with a smoke-blackened face and oily clothes. These are all well-dressed and have a look of prosperity that is pleasant to see. And it is one of the most good-natured and best-behaved gatherings that I have ever seen in the city, and I am sure the people of Hamilton feel honored in having them as their guests.'"

Great credit is due the committee of arrangements for the untiring zeal with which they worked to make the Hamilton Union Meeting such a splendid success.



GROUP OF DELEGATES AND THEIR WIVES RETURNING FROM CANADIAN GRAND UNION MEETING AT HAMILTON, ONT. PICTURE TAKEN AT PROSPECT POINT, NIAGARA FALLS, AUGUST 9, 1907

The Cumberland Joint Union Meeting.

Great preparations are being made by the brothers of our lodges in Cumberland, Md., and the members of the B. of L. E., the O. R. C., B. of R. T., O. R. T. and B. of R. C. (Brotherhood of Railway Clerks) for a Grand Joint Union Meeting which is to be held in that city on the 23d and 24th of September.

The first day's session will be in the nature of a public gathering, and arrangements have been made for the attendance of Grand Officers of the above named organizations and prominent speakers who will address the meeting. The second day will be devoted to a secret session and will finish with a picnic in the afternoon and a grand ball at the dancing pavilion in the picnic grounds in the evening. The committee having the arrangements in charge is determined to

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make the event a magnificent success. From a business standpoint union meetings are productive of great good. They afford an opportunity for interchange of thoughts and ideas that make for the advancement of the best interests of railroad wage earners. Another feature connected with union meetings, and one which should not be overlooked, is the opportunity they afford for health-giving entertainment and relaxation. It is to be hoped that every member who can possibly do so will be in attendance on this occasion, as they owe it to themselves to make the meeting a success as well as to show their appreciation of the work of the committee on arrangements.

The Indiana State Joint Union Meeting.

Arrangements are already under way for the Grand Union Meeting of the various railroad brotherhoods of the State of Indiana, to be held at Indianapolis, Ind., in October next. The Indiana State Joint Union Meeting is an event of annual occurrence and is looked forward to by members of the railroad brotherhoods with the most pleasant anticipation. A public meeting at which prominent speakers will be in attendance, possibly a secret session, and enjoyable entertainments will be features of the gathering. Full particulars will appear in our October issue. It is expected that the attendance this year will be greater than ever before, as the interest has been constantly on the increase.

Brother Hawley's Bereavement.

It is with deep regret that we announce the death of Mrs. A. H. Hawley, wife of Bro. A. H. Hawley, chairman of the Board of Grand Trustees. Brother Hawley was on duty at the Magazine office in his official capacity when the sad message came summoning him to her deathbed. Mrs. Hawley died on July 31st from the effects of an operation performed on the 27th of that month. She had been accompanying Brother Hawley on a trip through the northwest, and through California since November, 1906. She left Sacramento on April 13, 1907, for Portland, Oregon, and was taken sick on the train, reaching Portland on April 15th. On the following day she was operated on for appendicitis, and although for two weeks there was little chance for her recovery, she eventually improved, and was getting along very well until July 10th, when other complications set in, necessitating a second operation. Brother Hawley remained with her until May 28th, when he left to make his annual official visit as a member of the Board of Grand Trustees to Grand Lodge headquarters and the Magazine office. At that time Mrs. Hawley was feeling very well, and it was confidently expected by the attending physicians that within a comparatively short time she would again be able to travel and join Brother Hawley at Indianapolis or Peoria. On receiving a message to the effect that a second operation was necessary, Brother Hawley immediately left for Portland, arriving there a few days before she died. The funeral was held from her late home at Davenport, Iowa, on August 8.

Mrs. Hawley was forty-three years of age and had she lived until August 26th would have been married eleven years.

To Brother Hawley, in his sad bereavement, the Magazine extends its sincere condolence and deep sympathy.

"The Noblest Roman of Them All."

The esteem in which Bro. John H. Murphy—one of our most beloved Grand Lodge officers—is held by the Western Federation of Miners, is best expressed by an editorial appearing under the above heading in a recent issue of the Miners' Magazine—the official publication of the Federation—and which is as follows:

"While the Western Federation of Miners is being showered with congratulations, and while Richardson and Darrow, the shining lights of the legal profession, are receiving the highest encomiums of praise for their ability and eloquence as lawyers, yet, when we return to our normal condition of mind after such a grand and glorious victory achieved, we can behold the wan and wasted figure of a man looming up before us, whose very name and work are linked inseparably with the history of the Western Federation of Miners.

"The history of the labor movement of this country cannot be written in full without placing the name of John H. Murphy upon its pages. Murphy, the general attorney for the federation, has

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made history in every state and territory covered by the jurisdiction of the organization. From the statute books of Colorado, Utah, Nevada, Missouri and other states, eight-hour laws rise as monuments to perpetuate the heroic energy of the man whose advice and counsel have been priceless to the organization that has faced courts, bull pens and deportation. Murphy, the attorney, is a man who has carved an enviable name and record out of the hard rock of adversity. His youth was not spent in the lap of luxury. As a boy he reveled in no dazzling magnificence, but was among that great army that was struggling for the necessaries of life. In his young manhood, with the bloom and blush of health upon his cheek, we find him upon an engine, serving in the capacity of fireman. But while he was exhausting his physical energies in the battle to secure the necessaries of life, this student upon the engine was communing with Blackstone and other great legal minds that had filled the libraries with the products of their brains.

"Murphy, the fireman, became the lawyer, and his heart and soul at once became aroused in a yearning desire to render service to the great mass that were struggling against the wrongs of oppression. In the state of Utah he made his first great fight for the constitutionality of the eight-hour law. With the ablest lawyers which corporations could secure to assassinate the validity of the Utah eight-hour law, Attorney Murphy ultimately won a decision from the Supreme Court of the United States which stamped him as a gladiator in the judicial arena worthy of the best steel.

"For four years Attorney Murphy has been in a battle against death. His close attention to his work and the long hours that he has spent in equipping himself to meet the ablest at the bar, has undermined his vitality, and he is now a physical wreck, bravely struggling against the inevitable.

"No member of the Western Federation of Miners can forget the services that Attorney Murphy has rendered to the organization.

"When the great trial at Boise, Idaho, opened, he arose from his bed of pain, and though the dew of death was gathering upon his brow, he wended his way towards the "Gem of the Rockies" to give his counsel and advice in one of the greatest trials that has ever taken place in this country. Day after day he sat in the court room in the sweltering heat, and though he endured the agony of a thousand deaths, yet his loyalty to the organization nerved him for the ordeal. The pale and emaciated face, upon which disease had written the lines of pain and suffering, lighted up with hope and joy whenever the defense scored a point in the great legal battle that had human life at stake, and the future of the militant labor organization of the West.

"When Haywood was at last liberated and vindicated by a jury of twelve men, and rushed from the court room to embrace the silvery-haired matron at whose knee he once lisped the name of mother; when he had clasped his invalid wife to his breast and folded in his strong arms his two loving daughters, in his great joy he did not forget the brave, fearless little man upon his couch of pain in the hospital, who had braved death to be identified in the struggle. In that moment, when Haywood lifted in his arms the devoted attorney of the Western Federation of Miners, and when there broke from the lips of the frail and wasted lawyer, "Bill! In this hour of your great triumph be humble and thankful," the great, big, whole-souled Haywood must have felt that here is a loyalty that rivals the fraternity of a Damon and a Pythias. In the years that are to come, when memory shall revert to the great trial that has taken place at Boise, Idaho, when men and women shall be paying tributes to the great lawyers who have participated in the battle, the name of John H. Murphy shall shine as 'The Noblest Roman of Them All.'"

* * *

Pictures for Publication.

Notwithstanding what has appeared in the columns of the Magazine in the past with reference to the publication of pictures which are of purely local interest, the Magazine office continues to receive many pictures of engines and crews, ball committees, lodge groups, individual members, base ball clubs, etc., with the request that same be published.

For the Editor to have to decline the publication of such pictures is a most unpleasant duty, but in accordance with a long established rule of the Magazine office, and in view of the action taken at the Tenth Biennial Convention, held at Milwaukee, Wis., in September, 1906, restricting the Magazine to the publication

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only of such matter as is of general interest, it is not permissible to do so, and it will readily be seen that the editor has no discretion in the matter.

That our members may fully understand just what pictures are permitted to be published in the Magazine, as well as those that are not, it is deemed advisable to again publish the rules governing the matter, with such revision as has been found advisable and practicable. This is done in the hope of saving all brothers not heretofore aware of these rules the trouble and expense of sending in such pictures as can not be published, and of sparing the Editor the pain of being compelled to decline such requests. The rules referred to are as follows:

Pictures Which Can Be Published Under the Rules.

Technical.—Railway appliances; steam and electric locomotives embodying special features of design; motor cars, whether steam, electric, gasoline, etc.; new mechanical appliances or inventions of interest to railroad men; new ideas or improvements in air brake or locomotive equipment; in short, anything in the field of steam, air or electricity with which railroad men are to a greater or less degree associated; also railroad wrecks and scenes.

Brotherhood.—Joint Protective Board groups; committees and sub-committees having in charge the arrangements for conventions and union meetings; groups of officers and delegates to conventions and union meetings; public officials and others taking part or speaking at conventions and union meetings; portraits of newly elected Grand Lodge officers and members of committees serving at conventions and union meetings of the Brotherhood; scenes in connection with conventions and union meetings which are of interest to the membership; in special cases, portraits of long missing brothers as an aid to their identification and location; also portraits of impostors and other criminals in whose arrest and punishment the Brotherhood may for any reason be particularly interested.

Industrial.—When articles of an industrial nature can be improved by illustrations, suitable pictures will be used when procurable: State Legislative Board groups; portraits of legislators, attorneys or members of the Brotherhood who have been specially active in securing legislation beneficial to the membership.

Miscellany.—Such pictures as will suitably illustrate the several articles.

Pictures Which Can Not Be Published Under the Rules.

Engines and crews, except when used to illustrate an article or story, and then without reference in the title of the picture to the men composing the group; ball committees, individual members, lodge groups, picnic groups, base ball clubs, anything of a purely local nature and what would not be of interest to the membership and readers of the Magazine in general.

The Editor requests the readers of the Magazine who have the opportunity of securing views which would be of general interest, such as railway construction or engineering feats, new locomotives embodying some special features of design, new mechanical appliances or inventions of interest to railroad men, or anything which is novel and pleasing to the general reader of a railway technical publication such as the Locomotive Firemen and Enginemen's Magazine, to send them in. Such pictures are always welcome and will be accorded space in their turn.

The publication of Joint Protective Board or State Legislative Board group pictures are of general interest, as these boards represent large portions of the general membership, either on systems of railroads or within a State, and it is desirable that the membership become acquainted with the men composing such boards, where it is not convenient to meet them in person, through the publication of these pictures.

The Editor believes that the members in general are in accord with the rules governing such matters, and that they fully appreciate the immense amount of valuable space which it would require to publish all pictures sent in which are purely of local interest, and the large amount of valuable reading matter that would necessarily be excluded as a consequence of their being reproduced.

Matter for Publication Must Be of General Interest.

Notwithstanding the fact that the publication of obituary and local resolutions and notices in the Magazine is and has

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for some years past been prohibited by the Constitution, and the further fact that by action of the Tenth Biennial Convention held at Milwaukee, Wis., in September, 1906, the Editor and Manager was instructed to exclude from the Magazine all reference to balls, banquets, picnics and other matters of a purely social or local nature, on the ground that the space thus occupied could be utilized to better advantage in discussing matters which would be of interest to the members of the Brotherhood in general—many requests continue to be received for the publication of such notices and references.

The recommendation of the Magazine Committee adopted by the Tenth Biennial Convention, held at Milwaukee, Wis., in 1906, and which by its adoption became a law of the Brotherhood, is as follows:

"Considerable valuable space has been taken up in the Magazine by communications concerning balls, banquets, picnics and other matters of a purely social or local nature, which are of no interest to the readers of the Magazine in general:

"We, your Committee on Magazine, would respectfully recommend that in the future all references to such events be entirely eliminated from the Magazine, as we believe that the space thus occupied could be utilized to better advantage in discussing matters which would be of interest to the members of the Brotherhood in general, and that the Editor and Manager be instructed by this convention to carry out the above recommendation."

Section 94, page 54, of the Constitution, says:

"Obituary and local resolutions and notices shall not be published in the Brotherhood of Locomotive Firemen and Enginemen's Magazine."

However much the Editor and Manager might desire to oblige the brothers by complying with such requests, it will readily be seen that he has no discretionary power in the premises whatever and must abide by the Constitution and the will of the convention. When, however, on the occasion of a convention, a national, state or international union meeting or a Joint Protective Board meeting, a ball or banquet is given in connection therewith, the publication of reference to same is permissible on account of the general interest attaching thereto.

The Editor would request that our members kindly refrain from sending matter to the Magazine for publication, to which, under the laws above quoted, he has no authority to give space, as the necessity for his having to decline to comply with their requests in the premises is to him a most painful duty.

* * *

Sparks.

One of the biggest fifty cents' worth of instruction ever contained between two covers is embodied in that popular little book entitled "Catechism of the Electric Headlight." Order one today from John F. McNamee, Editor and Manager, 806-807 Traction Terminal Building, Indianapolis, Ind.

The Hoosier Stove Company has increased its advertisement for September to quarter-page space and is making a very attractive showing. This company is said to be operating a strictly union factory throughout, and this fact, coupled with the excellent quality of the goods, will certainly recommend this advertiser to the favorable consideration of our readers who have the purchase of a stove under contemplation.

Another big State Union Meeting of all the Orders will be held at Indianapolis in October next. This is an annual occurrence and promises to surpass all preceding events of the kind. Brothers of the Hoosier and adjoining States, do not forget the place nor the date. It will be indeed a treat.

We frequently receive letters signed "A Member," and other anonymous communications, which we cannot give attention to. If our members would but obey the rules requiring that all communications must be signed by the writers, we would be spared much annoyance, and those letters which now come in unsigned would receive proper attention instead of being consigned to the waste paper basket.

Bro. H. S. Peters of Lodge No. 3 claims the attention of our readers to his page advertisement of "Brotherhood" overalls, which appears in its usual position in this month's Magazine. Those who will carefully read the ad will observe that Bro. Peters has been truly progressive and aggressive in the advancement of his manufacturing industry. The fact that Bro. Peters is a member of our Brotherhood; the fact that he has operated his factory for the past ten years on a strict eight-hour work-day

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basis, with Saturday half-holidays the year around; and the further fact that no child-labor-made denims enter into the construction of his garments, certainly entitles Bro. Peters to the encouragement and support of the readers of the Magazine who are wearers of overalls; and the encouragement and support that counts is the purchase of his goods.

The brothers at Cumberland, Md., are well deserving of the encouragement of a large attendance at their Joint Union Meeting, to be held September 23d and 24th. Union meetings are most profitable to the Brotherhoods and their members. They permit of the making of new acquaintances and cementing of old friendships. Everybody who can, should go. For pleasure, it will surpass a regular old Georgia camp meeting.

The Kalamazoo Stove Company is again represented with an attractive advertisement in the columns of this issue of the Magazine. The Kalamazoo Stove Company has been a regular advertiser in our Magazine during stove-selling seasons, for a number of years, and thousands of the railroad boys in all sections of the country have bought their stoves, to their entire satisfaction. Any member of the Brotherhood who finds it necessary to buy a new stove or range for the coming winter should in justice to himself consider the offers made through the advertising columns of the Magazine before buying.

Two hundred and ninety-six questions and answers on the operation and maintenance of the electric headlight, together with an insert sheet showing illustrations of that modern and up-to-date lamp! Where can you find them? In the "Catechism of the Electric Headlight." What is the price of this book? Only 50 cents. How can it be procured? By addressing your order and enclosing the price to John F. McNamee, Editor and Manager, 806-807 Traction Terminal Building, Indianapolis, Ind.

Our readers will be interested in the "Headlight" ad, which appears on the first page of this month's Magazine. The men whose pictures are there shown represent the committee in charge of the recent ball given by the B. of L. F. and E., Lodge No. 127, of Winnipeg, Manitoba. They conceived the idea of all dressing in complete suits of "Headlight" overalls as their ball costume. Looking at the picture it is easy to believe that they were the hit of the evening.

Remember the Cumberland, Md., Union Meeting to be held September 23d and 24th. Every member who can should attend.

We have an excellent letter, bearing the postmark of Boulder, Colorado, but unsigned, and we cannot, therefore, publish it. If the brother who wrote the letter had signed his name, not necessarily for publication, we could have complied with his wishes. If the writer will sign the letter we will publish it, withholding his name if he so desires.

The Hartman Furniture Company, after a short absence during the summer months, has again returned to the advertising columns with an attractive offer of bargains in household furnishings on easy terms. This company gives special attention to orders received by mail, and by answering the ad in the Magazine and securing its catalogue the purchaser can secure goods delivered at a distance at little trouble and perhaps a saving in cost.

The official emblematic button of the B. of L. F. and E. is most handsome in design and should be worn by every member of the Order. Have the secretary or other officer of your lodge order one for you today from the Grand Secretary and Treasurer, Bro. W. S. Carter, Peoria, Illinois.

The advertisement of the American Box Ball Company appears in this issue of the Magazine in new form. A box ball alley is a bowling alley on a slightly smaller scale and can be installed and operated at less expense. Winter will soon be here with its requirements for indoor sports. A disabled member of the Order can install a box ball alley in a live community at small expense and earn a good living the year around. The Box Ball Company will gladly furnish particulars in response to replies to their ad.

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THE DEAD AND WOUNDED ON THE RAILWAY BATTLEFIELD

Recently a prominent government official was quoted as saying that the "railroad legislation" of the next Congress will be the fixing of the responsibility for railroad accidents. Later a prominent railway official was quoted as saying that investigations conducted by the Government would place the responsibility for most railway accidents upon railway employes. Whatever be the cause let us hope that Congress will find at least a partial cure.

During the twelve months ending June 30, 1907, 282 members of this Brotherhood have lost their lives on the "Railway Battlefield," and in addition thereto fifty-eight members have lost their hands or feet. Of the total death and disability claims paid by this Brotherhood during the period named the following exhibit shows that more members "died with their boots on," to use a cowboy's expression, than died from disease:

Nature of Cause.	No. of Members.	Percentage.	Amount Paid in Insurance.	Percentage.
Railway accidents.	282 Deaths..... 58 Amputations.	51.282	$404,500 00 85,000 00	51.684
Disease.....	245 Deaths..... 42 Disabilities ..	43.288	346,700 00 59,250 00	42.862
Other causes.....	36 Deaths.....	5.43	51,650 00	5.454
	663	100	$947,100 00	100

The following is how 282 of our members lost their lives in railway accidents:

Character of Accident.	Number of Deaths.	Paid in Death Claims.
Collisions	98	$140,000 00
Derailing of engines or cars	68	97,000 00
Struck by engines or cars	39	56,500 00
Boiler explosions	24	37,000 00
Struck by objects too near track	18	26,500 00
Falling from engines or cars	14	19,000 00
Crushed between engines and cars	10	13,500 00
Jumping from engines	2	3,000 00
Other railway accidents	9	12,000 00
	282	$404,500 00

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The fifty-eight members who lost hands and feet in railway accidents were paid $85,000.00 in disability insurance.

The following shows from what diseases 245 of our members died:

Nature of Disease.	Number of Deaths.	Paid in Death Claims.
Diseases of stomach and bowels	73	$100,500 00
Diseases of lungs	68	95,500 00
Diseases of heart	26	38,500 00
Diseases of kidneys	19	27,700 00
Diseases of brain	13	18,000 00
Cancer	8	11,000 00
Meningitis	7	10,500 00
Blood poisoning	4	7,000 00
Paralysis	3	4,500 00
Cirrhosis of liver	2	3,000 00
Smallpox	2	2,500 00
Other diseases	20	28,000 00
Total	245	$346,700 00

The following subdivision of diseases will be of interest:

DEATHS FROM DISEASES OF STOMACH AND BOWELS.

Typhoid fever	51	$70,000 00
Appendicitis	7	9,000 00
Other diseases	15	21,500 00
	73	$100,500 00

DEATHS FROM DISEASES OF LUNGS.

Consumption	37	$51,500 00
Pneumonia	23	33,000 00
Other diseases of lungs	8	11,000 00
	68	$95,500 00

DEATHS FROM DISEASES OF KIDNEYS.

Brights disease	11	$17,000 00
Diabetes	4	6,000 00
Other diseases of kidneys	4	4,700 00
	19	$27,700 00

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DEATHS FROM DISEASES OF THE BRAIN.

Apoplexy	8	$11,000 00
Other diseases of brain	5	7,000 00
	13	$18,000 00

In addition to the foregoing losses, thirty-six of our members died from causes other than railway accidents and disease, as follows:

Cause.	Number of Deaths.	Amount Paid in Death Claims.
Gunshot wounds	6	$9,500 00
Suicide	6	9,000 00
Poisoning	5	7,000 00
Accidental falling	4	5,000 00
Drowning	3	4,150 00
Street car accidents	3	4,000 00
Unknown	3	4,000 00
Heat prostration	2	3,000 00
Anesthetic	1	1,500 00
Asphyxiation	1	1,500 00
Bursting of emery wheel	1	1,500 00
Exposure to cold	1	1,500 00
Total	36	$51,650 00

Aside from deaths from railway accidents and disease forty-two members were declared totally and permanently disabled from performing manual labor because of the following diseases:

Nature of Disease.	Number of Disabilities	Paid in Disability Claims.
Consumption of lungs	15	$20,000 00
Paralysis	10	15,000 00
Locomotor ataxia	10	14,500 00
Brights disease	6	8,250 00
Paralysis and locomotor ataxia	1	1,500 00
Total	42	$59,250 00

In addition to the foregoing regular Beneficiary Claims paid during the fiscal year, $95,300 was allowed 130 members whose disabilities did not come within the laws of the Brotherhood.

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Expulsion of Members for Non-Payment of Joint Protective Board Assessments.

It is evident that the officers of many lodges are not observing that portion of section 225 of the Constitution which says, concerning the collection of Joint Protective Board assessments, that "any member failing or declining to pay such assessment shall stand expelled on the second day of the month following the last day of payment."

By failing to collect Joint Protective Board assessments from members liable therefor and to forward such assessments to the Grand Lodge as required by section 225, or by failing to report the expulsion of members who fail or decline to pay Joint Protective Board assessments, officers are necessitating the suspension of their lodges.

Section 225 says that "Any lodge failing to collect and forward the same to the Grand Secretary and Treasurer shall stand suspended according to the laws governing the non-payment of dues and assessments."

Soon after the collection of Joint Protective Board assessments began under the new law, the question of the enforcement of the section arose, and the matter was referred to the Grand Master for an interpretation, as provided in section 96. The following is a copy of the decision of the Grand Master, addressed to the Grand Secretary and Treasurer:

"Replying to your letter in which you ask for an interpretation of section 225 of the Constitution, having in view the fact that a lodge may owe a Joint Board assessment for only a few members, while the enforcement of section 225 would mean the suspension of perhaps as many as two hundred members, will say that I have carefully considered the question and I am satisfied that it was the intention of the Convention that the law should be applied just as it reads, even though its enforcement might carry with it the suspension of members of a lodge who were not liable for the particular assessment in question, the object of the law being to compel them to report to the Grand Secretary and Treasurer the expulsion of all members who are liable and who failed to pay same when due. If secretaries of subordinate lodges will report the expulsion of all members who fail to pay Joint Protective Board assessments the same as they report those who fail to pay their quarterly dues, no further difficulty of this kind would be encountered.

"Inasmuch as there has been some question as to the proper application of the law in question, I believe it would be advisable to notify all lodges now delinquent for Joint Board assessments that they must remit the amount due or be placed under suspension on July 1, 1907, and that in all future cases this question will be treated in accordance with the laws governing the non-payment of beneficiary assessments. That will give them an opportunity to adjust the present delinquency and at the same time serve as a notice of the application of the law in the future, under the present Constitution."

If members receive notices of the suspension of their lodges for the non-payment of Joint Protective Board assessments they will understand the situation by reading the foregoing.

The sure way to prevent the suspension of a lodge for non-payment of Joint Protective Board assessments is to enforce the law, as laid down in section 225.

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Forum

A Voice from Texas.

Greetings to the B. of L. F. and E.

Some one may ask how to prevent a member of the B. of L. F. and E. from going into the "Big E"; if it is not too presumptuous on my part I would like to unfold a plan.

In the first place there can be no glory in joining an organization that deprives you of your rights, and more especially is this true when it is the weaker of the two and can give no more protection to its members than can the one you already belong to. Then again, the insurance of the B. of L. E. is much higher than it is in our organization, and by the way, not nearly so good; then why should they go to the "Big E"?

There is one thing that will prevent it, and that is to put that "Little E" into force, stay with it without fear, and in two more years the "Big E" will realize that they can not grow flowers without a garden.

Remember, brothers, that the affixing of that "Little E" is amongst the best and noblest work organization has ever done, as it will most assuredly sound the death knell of tyranny of the "Big E"; it has already delivered it the biggest blow it ever received. Now surely the "Little E" will protect the runner as well as the fireman, and to put that "Little E" in force will give the engineer all the protection he requires and can get anywhere, and would forever put a stop to the arrogance and intolerance of the "Big E." Missionary work amongst the young runners who think the "Big E" looks prettier than the "Little E" will be productive of the desired results along these lines.

I have often wondered why the "Little E" was not included with many other matters at the Chicago conference. No better time could have presented itself. If we wait for the railroad companies to come up and put this power into our hand we will have a long time to wait, and it may be another case of the "Ship That Never Returned." Now then, brothers, if this little idea of mine does not meet with your entire approval, tell me in what way it falls short of argument or logic and we can then go after what you think is right and make the comparison.

I hope to live to see the day when the B. of L. F. and E. employes of every railroad in the country will have a clause in their contract to the effect that the B. of L. F. and E. shall have the exclusive right to adjust grievances of its membership employed on that road, regardless of what capacity they may be employed in. It is up to the present membership of the B. of L. F. and E. to do this. You must make your own bed, and just as you make it so you must lie. You need just such protection as that, and if you expect to continue to flourish you must have it; stay together, don't leave the ranks and you can get it. The more determined you are not to leave the old ship, and the more you do missionary work amongst the young runners, the sooner it will come.

You will possibly infer from my letter that I am an engineer. I am, and have been for a long time, and a member of the B. of L. F. and E. as well, and shall continue so as long as I can get the protection with my membership in the B. of L. F. and E. that I could were it transferred to the B. of L. E.

There is nothing that pleases the railroad companies so much as to have continuous strife between the "Big E" and the "Little E"; but when you put the latter into full force you put the fight up to the "Big E" and the railroad company, and then the majority of the old sensible members of the "Big E" will come back into the ranks of the Tried and True.

It is time for me to stop and give others a chance to say something, and I hope they will take it; but I promise you this will not be my last, for, as an engineman of twenty-three years' experience, I feel like doing some stirring in my declining years to better the condition of the boys if I can. With best wishes to all of the boys in the B. of L. F. and E., I am yours to serve.

B. of L. F. and E. RUNNER
OF 23 YEARS' EXPERIENCE,
AND PROUD OF IT.

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Welcomes the "Blue Book."

I want to thank the Grand Master for his reply to the circulars issued by the Grand Chief of the B. of L. E.; I have long thought we needed something like that, as it will doubtless bear on the minds of those of our members who are getting over on to the right-hand side of the cab. The "Blue Book" will do its work, and it will show some of the doubtful ones just what was done by the other organization during the Southern Pacific strike.

I was talking some few days ago with an engineer about the trouble on the S. P. He asked me who put the B. of L. F. and E. runners back to work, and I told him that was what the arbitration meeting was for. He replied that I was mistaken, and that it was the B. of L. E. who put the B. of L. F. and E. runners back, I told him he might make some others believe that, but he could not stuff me with it, for if they could have prevented the B. of L. F. and E. runners from going back to work they would have done so and kept their own men at work who had scabbed.

There are, I have heard, some B. of L. F. and E. runners in this lodge who are going to join the B. of L. E., but so far as I can learn they are only the ones who have ceased coming to meetings and have lost their grip on the working of the organization. Several of our boys are being promoted and they say they are determined to stay with the B. of L. F. and E., and I am confident they will keep their word.

I wish for all lodges and the Order in general the greatest success during the time that the figures 1907 hang over us, and hope that we will go to the next Convention at Columbus with a good big increase over the total membership when convened at Milwaukee.

J. H. WALLACE,
Member 548.

It's Funny How Things Will Turn Out.

I will try and write a few more lines to the Magazine. We are getting along splendidly now. Our contracts have all been completed and everybody is satisfied with the efforts of the committee.

One of our members, who met a good B. of L. E. man walking down the street the other day, asked him where he was going; he replied, "o get a shave." It was suggested that he patronize a certain union barber shop, there being one in our town; but he said "no," he "could not." Being pressed as to his reason, he said: "It's against my principles," with the additional remark: "Them barbers don't want to shave me because I am a member of the B. of L. E." I wonder if it is not the effect of B. of L. E. influences that is responsible for his aversion to patronizing a union barber shop? Yet this is the order that seeks to increase its membership from the ranks of an organization that has fought hard to maintain the principles of organized labor.

I want to say, right here and now, that they have chosen the rugged and narrow path in trying to get the writer into their ranks. I have been approached on several occasions and asked why I would not join the B. of L. E. and why I would not let them take my application; but it doesn't take long to stall them, for when it comes to argument they have none to make.

They are getting a few young runners now and then, but I am happy to say that our boys are always willing to let such easy marks go, as we have no room in our ranks for men that can sympathize with the methods of the B. of L. E. and condone their offenses against union labor principles.

Right is right and wrongs no one, so let us be firm and hold to our honorable position and stand steadfastly by the only order representing locomotive enginemen that can accomplish results in protecting and promoting their interests. If our members will simply retain their membership in our Order after they are promoted that is all that will be necessary. Our Brotherhood can show a clean and unblemished record. Throughout its entire history it has fearlessly stood for the right under any and all circumstances. I, for one, would hate to have to belong to an organization feeling that I lacked the confidence of members of every other organization; were I coerced into joining it I would prefer to seek employment where such coercion could not operate, before I would surrender my birthright as an American citizen. Let us hold fast to the Order, brothers, that has carried us safely through and showed us the right path of duty as men and

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brothers. Let us study one another and the benefits of each other, and practice the lessons that are taught in our motto: "Protection, Charity, Sobriety and Industry," then our consciences will be clear. Let us steer clear of an order that has persistently violated all of its professions as a labor organization.

MEMBER 499 B. OF L. F. AND E.
Cleburne, Tex.

* * *

"A Question" Answered.

I have noticed in the Forum department of the August number of the Magazine that "Member 126" desires some views as to the feasibility of consolidating the B. of L. E. and the B. of L. F. and E. If the brother will just look back for, say, ten years, he will see the utter fallacy of such a proposition, as the B. of L. E. is so arrogant that no self-respecting member of the B. of L. F. and E. could combine his interests with theirs and retain his manhood in any community.

OLD TIMER, Lodge 21.

* * *

Would Consolidate.

I am always looking for our valuable Magazine, and I enjoy reading the letters from our brothers. Not being a composer I enjoy reading the good words of our able writers, but when I read the little sharp letter from the member of 126, in regard to submitting a referendum vote to the members of the B. of L. F. and E. and the B. of L. E. for consolidation, I could not resist the temptation to write and reach out my hand and say, "Shake, brother," for that is what I have wished for ever since I joined our noble Order 25 years ago. How many members of either order could conscientiously cast a vote against consolidation of the twin Brotherhoods is beyond my comprehension. We have fought together and won victories, and were trimmed to a standstill together, and have put the victories and defeats in our pockets and said nothing, but one of these fine days we will be up against a proposition and if we don't hang together we will hang separately, for the companies are together. Submit this proposition to the rank and file and let us see if the majority of the members of the B. of L. E. want their Order to scab. Let us have a referendum for consolidation by all means.

Brother from 126, shake! I am yours for consolidation.

T. H. LYNCH, Lodge 212.

* * *

A Noble Character.

A noble character radiates far more brilliantly than a diamond of purest ray. It is the most beautiful gem one can gather. A thousand diamonds of the first water could never bring forth the lasting effulgence, the encomiums that the lifelong magnanimity and self-sacrifices of Bro. John H. Murphy, our Associate General Counsel, warrants.

Let us look at his part in that momentous battle recently fought at Boise City, Idaho. His name is not placarded far and wide; there is no ostentatious display: but we see a modest gentleman in somber clothing, enduring the fiery heat of that court room in spite of a serious affliction; we see one upon whose countenance is written the words *Determination, Hope.* His solicitude for the cause of the wage earners knows no bounds, and is only limited by human weakness; we see him rising from a couch of affliction and undertaking the fatiguing journey to the seat of war, in order that he might aid and counsel those engaged in that fight for freedom.

Brother Murphy has ever been indefatigable in his efforts to advance the cause of labor, and his generous spirit has endeared him to a vast multitude of admirers. When he assumed the arduous duties of a locomotive fireman, the laborious task did not frighten him, the inclement weather did not cow him; not for one moment did his brain fag or remain idle; but on the other hand he systematically stored his mental granary with knowledge that might be utilized for the betterment of his fellow man; his mental superiority received recognition at the hands of his brother firemen, as they chose him as the general chairman of the committee; and as such he served through one of our fiercest fights—the C., B. & Q. strike. He has ever fought the good fight, gradually climbed higher and higher in his profession, until today he is conceded a position amongst the

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foremost mental giants of the judiciary, worthy of his foeman's steel.

The brilliancy of his legal achievements reflects splendor back upon our own Order, for it was he who fought some of our hardest fights. During the infamous Wabash injunction case, it was this loyal brother who marshaled the legal talent and sent the corporation attorneys down in defeat. Again, it was he who so valiantly fought for the eight-hour law in many of the States, and he won from the Supreme Court a decision which crowned him with the coronet of success, as it was a complete victory for the laboring men of this country.

His close attention to duty, and persistent studies has undermined his health, and he is now no longer able to bear the burden of the forefront of the fight. But his past achievements will stand out as mammoth obelisks, throughout the cycles of time, declaring the glory of his work. Long, long after he has left us his name will be revered and his deeds will yet be fresh in the memory of man.

When the last gun had been fired and the enemy had retreated and Haywood had walked forth a free man, we see that muscular giant, first seeking the gray-haired mother who had taught him at her knee, then he went to the afflicted and faithful wife and his family; but as soon as he had performed the duties devolving upon him as a son, husband and father, he sought the counsellor and brother who had toiled so earnestly and zealously to bring about his release. Let us mentally picture the scene when the big whole-souled miner picked up the emaciated form of his friend and former companion, who spoke the words that so ably portray the grand character of the man: "Bill, in this hour of your triumph, be humble and thankful." What a grand character is there portrayed; what a magnificent mind. What a tremendous fount of gratitude must have welled up within the bosom of the released miner when he heard those words.

Brother Murphy may never reap his reward here on earth; humanity may treat him even shabbily; but the happiness which he enjoys in knowing that he has done his best, and no man can do more, is a recompense beyond price. Honor to his name.

MEMBER 492.

Pittsburg Union Meeting a Great Success.

About two months ago our First Vice Grand Master, Bro. C. A. Wilson, gave us a pleasant call, and joint union meetings were mentioned and the secretary of Lodge 490 was instructed to write to the Grand Master for full information on the subject. While Brother Wilson was in this section of the country he was not idle. At our last regular meeting on July 14, he was present with us, and it was there that the joint union meeting was arranged for, to be held in our hall, July 28, 1907.

As usual, success crowned his efforts, and but two weeks elapsed from the time the meeting was arranged for until it was held, and never was a union meeting more successful in point of attendance, enthusiasm and demonstration of the true brotherhood spirit. This result the lodges worked hard to accomplish, and when it was over they all felt that they were well repaid for their efforts. Everybody seemed like the old woman who had gone to church, when she exclaimed "I am glad I was there."

Grand Master Hannahan and First Vice Grand Master Wilson made some very interesting and profitable addresses. The following General Chairmen were also present: Brother O'Neill of the Monongahela Connected Railroad, Brother Buck of the P. & L. E. R. R., Brother Anderson of the Lehigh Valley Railroad, Brother Roberts of the B. & O. R. R., Brother Barris of the L. S. & M. S. R. R., Brother Woodward of the P. S. & N. R. R., Brother Graber of the B. R. & P. R. R., Brother Norris of the P. & R. R. R., Brother Bartlett of the Penna Lines East of Pittsburg, and Brother Kauffman, Secretary-Treasurer of the J. P. B. Penna Lines East of Pittsburg.

The following lodges were represented: Nos. 11, 287, 381, 319, 646, 647, 392, 601, 347, 703, 490, 630, 633, 465, 338, 318, 673, 434, 235, 219, 682, 592, 448, 659, 700, 651, 395, 541, 214, 3, 383, 378, 496, 175, 162, 316, 60, 223, 50, 326, 499, 406, 574, 104 and 568; a total of 45 lodges from as far east as New York and as far west as Chicago.

There were present 221 members, 118 of whom were firemen and 90 were *engineers*, 13 being otherwise employed. Now, brothers, is this not a splendid showing? The Grand Secretary and

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Treasurer and the Editor and Manager of the Magazine were amongst those invited, but much to the regret of all interested they could not be present, owing to the large volume of business at their respective offices, which made it impossible for them to attend. We hope, however, that when we have another union meeting they may have the pleasure of being with us.

In addition to the speeches made by the Grand Master and First Vice Grand Master Wilson, neat and appropriate addresses were made by Bro. F. A. Davis of Lodge 287, and all the General Chairmen who were present. Their remarks were most interestingly descriptive of the great good being accomplished for its members by the B. of L. F. and E. and the rapidly progressive strides the organization is making. I have been present at many union meetings, but this is the best I ever had the pleasure of attending.

At the close of the first meeting some brother made a mistake and took the Grand Master's hat and left his own instead. At the evening session Brother Wilson made the fact known and a collection was taken up by several of the brothers and the amount realized—about $15—turned over to Brother Wilson to purchase for the Grand Master a hat—a Panama—which he did the following morning and Brother Hannahan went his way rejoicing.

This is but one of the union meetings to be held in the Eastern country, and if equally good results are derived from the other meetings, I can safely say that they will prove most profitable to the organization and its members.

We must not forget our collector, Brother Barnett of Lodge 490, for his services in furnishing and serving fine lemonade and "Pittsburg Weed Burners."

The Grand Master assured us that it was the liveliest meeting he ever attended, and the members returned to their homes with most pleasant remembrances of the event.

Speaking of 490, I am glad to say we are doing well. We have at present 127 members and we are in good financial standing. We also have on file at the present writing 21 applications for membership and the boys are enjoying prosperity on our division.

We wish to take this method of thanking the Grand Officers for their visit and for holding the meetings in our hall. Lodge 490 will surely reap good results, not only in the matter of increase of membership, but in holding our promoted men as well.

Brothers, we want to thank you each and every one for your attendance and hope you will come again, and that the next meeting will be larger and more productive of good results than was this one. We extend to all our best wishes for success.

I. J. GIBBS,
Secretary 490.

Railroad Men Should Have Better Food Away from Home.

If government officials had charge of the food served to railroad men, I think there would be a radical and immediate change in it. A man who lives at home or has a good boarding place, is to be envied by the victims of railroad lunch counters, where one gets a ham sandwich, dish of cold beans, hard-boiled eggs, pie, cake and doughnuts, and then has to eat it on the jump, being often compelled to wash it down, half chewed, with a cup of coffee, glass of milk, pop or soda water. Think of it. Such food. Is it any wonder that railroad men suffer from stomach trouble, indigestion, kidney trouble and similar derangements, or when a man feels weak and unfit for duty he should feel the need of a stimulant to brace him up and give him nerve force to face the perils of his dangerous occupation? Let me say that as a real and lasting stimulant there is nothing that can take the place of food. I believe there are no finer athletes in the world than the boys in Uncle Sam's Navy. I have seen many of them and they are strong, healthy lads, and their physical condition is perfect. The reason for this is that they lead an outdoor life and eat plain, simple, nourishing and properly cooked food. When at sea canned foods enter largely into their diet. While aboard one of our war vessels recently I drank, for the first time in my life, some freshened salt water. By the use of pumps and condensers the salt water is prepared for use, the drinking water being cooled by compressed air.

One thing particularly noticeable in our Navy is the cleanliness of the men and the ships. The Government build-

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ings contiguous to the Navy Yard are also kept in good condition.

The boys in the Marine Corps are a healthy body of men. Their food is very plain, but strengthening. Their physical exercise and drills afford them that exercise so conducive to good health. Their bill of fare, while always wholesome, is varied so they will not get tired of any particular line of diet. It runs as follows:

Sunday.—Breakfast: Ham and eggs and breakfast food. Dinner: Roast mutton or pork, mashed potatoes and gravy, onions, radishes (in season) and pie. Supper: Oyster stew, in season.

Monday.—Breakfast: Baked beans and coffee. Dinner: Soup, roast beef. Supper: Beef stew.

Tuesday.—Breakfast: Codfish balls or crab cakes (in season). Dinner: Corned beef and cabbage. Supper: Baked beans.

Wednesday.—Breakfast: Liver and onions. Dinner: Roast beef. Supper: Beef stew.

Thursday.—Breakfast: Fish. Dinner: Soup and boiled beef and pie. Supper: hash.

Friday.—Breakfast: Baked Beans. Dinner: Beefsteak and vegetables. Supper: Canned meat, prunes or peaches.

Saturday.—Breakfast: Ham and Eggs. Dinner: Roast beef and vegetables. Supper: Beef stew and fruits.

Their food is simple, yet wholesome and substantial. Furthermore, the government employs people who know their business and who know the amount of food a man requires, and the expense is reduced to a minimum.

If some of our railroad companies furnished as good quarters and food for their men at the terminals where they are away from home, it would certainly be appreciated.

Another great advantage of the navy is the educational facilities it affords. For instance, at the United States Academy at Annapolis, Md., the Government has spent thousands of dollars on the new buildings and parade grounds, and everything has been done to secure the best instruction for the boys in training for Uncle Sam's Navy. Both physical and mental development are given careful consideration. They stand well in athletic sports, and the team or crew that bucks against them better be in good condition. The boys receive careful attention and food at all times, and especially while in training. The strictest observance of rules is demanded and the very best discipline maintained. Their diet is plain and substantial. The team or crew is in charge of a trainer who gives the strictest attention to each man. If the railroad companies would hire some good instructors and trainers, instead of having so many spotters and informers, they would be advancing their own interests very materially.

Any man or boy who handles the scoop should be in as good condition, physically, as a man preparing for an athletic event. While talking with a master mechanic recently, I was asked why I did not go to see the general manager, and I replied that "he would kick me out of the office;" but if the Brotherhood was to take the matter in hand I do not believe there is an official in the country who would refuse to help the matter along. They are getting stronger engines, and they could have stronger men if they were willing to help in supplying them with better food and allowing them proper hours of work and rest.

MEMBER.

Look Out for Him.

Lodge 99 is being pestered with a lot of bills which have been contracted by one L. G. Greenway, formerly a member of Lodge 99, and recently expelled from Lodge 327 of Needles, California. Ample evidence is in our possession that this party has been going over the country posing as a member of this lodge and using his standing in the Brotherhood as a means of ingratiating himself with the membership and as a means of obtaining credit and contracting bills. We wish it distinctly understood that he is not now a member of Lodge 99, and is not entitled to any consideration on that score. We wish to warn our brothers in other sections of the country of his behavior so that they may be on the lookout and not advance any courtesies, as he is not deserving them.

Fraternally,

W. FRANK FINCH,
Master, Lodge 99.

Attest:

W. P. COUCH,
Secretary, Lodge 99.

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Joint Protective Board, Chesapeake & Ohio Railway.

The Joint Protective Board of the C. & O. Ry. convened in executive session at Gladys Inn Hotel, Clifton Forge, Va., August 1, 1907, with the following members present: W. H. Meadors, 393; A. J. Shale, 424; I. G. Lycan, 294; N. M. Read, 718; W. C. Marrs, 675; J. C. Coleman, 236; W. H. Eakin, 274; W. E. Stevens, 588, and I. C. Clark, 497.

A committee from Lodge 274 met the Board at the station and escorted it to the hotel, and after all had been comfortably cared for and refreshments served, the Board was called to order by General Chairman W. H. Meadors. During the day the routine business was disposed of and on adjournment the Board went in a body to the spacious reception hall of Lodge 274, where there were assembled to meet them the officers and members of that lodge, with the Alpine Brass Band in attendance, together with a large delegation of ladies and representative citizens, city officials and the speakers of the evening. An excellent program of speaking, music, etc., was carried out. Bro. W. H. Eakin occupied the chair and made the introductory speech and address of welcome, he in turn being followed by the mayor of the city, Mr. Bowles, and other distinguished speakers.

To add to the splendor of the occasion an elaborate banquet was served in honor of the Board, which took the lead to the banquet hall, where, to the delightful strains of music, five hundred guests partook of a bounteous repast. After the banquet a ball was given in honor of the board and dancing was indulged in until the wee sma' hours of the morning.

The following day routine business, left over from the day previous, was taken up, and just before the members of the Board started for Richmond, Brothers Grasty, Williams and Sizer met them at the hotel with carriages and took them for a delightful drive over the city, a treat they enjoyed most thoroughly. This is the way to encourage the boys who fight our battles in the field, and we hope that our Board will ever merit such treatment as well as the confidence of all the members employed on this line of railroad. How often do we find men grumbling and growling at what the J. P. B.'s accomplish. Boys, they do their best and no one can do more; give them encouragement and it will make their work all the lighter and a little more pleasant.

W. C. MARRS AND I. C. CLARK,
Committee.

Correspondence

LODGE 596—(*Member, East Toronto, Ont.*) Our lodge is still progressing. We take in an occasional straggler now and again. There are not very many newcomers here, but we gather them into the fold as soon as they are eligible. We would like to see some of the Grand Officers once in awhile. However, let us all labor to the best advantage possible and be up and doing for the grand old Order.

LODGE 262—(*Member, Toronto Junction, Ont.*) Our lodge is increasing its membership at every meeting, having initiated nearly a dozen at a recent meeting. I am glad to state that a great many of our brothers have been promoted to the right side lately. We are expecting a new schedule soon, with better conditions and a raise of pay for all engines. On June 1 last, all freight engines were pooled, and none of the boys like this. I am sorry to state that death has visited us three times since the New Year, and taken three brothers whom we will always miss. Two held offices in the lodge and were good workers. I also regret to state that a number of our brothers have taken final withdrawal cards and joined the B. of L. E.

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LODGE 375—(*B. F. Rice, Dayton, Ohio.*) It has been some time since anything from our lodge has been published in the Magazine, but, however, we still exist and take in additional members at most every meeting.

We met with quite a pleasant surprise at our meeting of August 14th, although there were only a few members present to enjoy it. Our worthy Fourth Vice Grand Master, Bro. A. P. Kelly, being engaged in work on the Queen & Crescent Railroad and having a day off, came up and met with us. Brother Kelly is a man who does not believe in idleness, but is up and doing whatever good he can find to do, and so on this occasion he delivered a grand speech on labor organization, especially referring to the grand old Order of the B. of L. F. and E., of which we are all so justly proud. It came to us as a message from heaven, or as a thunderbolt from a clear sky, and was gladly received by all present. We believe Brother Kelly is well worthy of the position he holds. May success crown his efforts wherever his lot may be cast, and in the end his reward be such as cometh to him who doeth all things well. This was Brother Kelly's first meeting with us but we trust it will not be his last.

We would be pleased to have all of our Grand Officers meet with us occasionally as time permits.

LODGE 548—(*J. H. Wallace, Commerce, Texas*). I have anxiously waited to see something from Lodge 548, but so far have been disappointed, and although but a young member in the ranks, I will endeavor to say a few words. We are exceedingly proud of the name which our lodge bears, that of "Dixie," and right in keeping with her name are the officers whom we have recently elected and installed, and when the Directory comes out showing the names, the members of the Order throughout the country may rest assured that they are a fine lot of men, and thorough Brotherhood men at heart.

Our Joint Protective Board is a splendid one and is composed of both engineers and firemen. All are men who will not flinch at the discharge of their duty, and will work for the interest of the members on the system.

We have been initiating members right along, and have a few more eligibles in sight as soon as we can get them in town long enough to make out their applications, be examined and mount the "goat." The new members will find that there is a fine lot of active, energetic boys in the lodge and they are all proud of being members of the "Old Reliable."

LODGE 271—(*Member, Port Morris, N. J.*) We are still doing business at the same old stand and recently added thirteen new names to our membership, due largely to the work of the secretary, who wrote each non-Brotherhood fireman a letter setting forth the benefits to be derived from membership, etc. This resulted in fourteen applications, one having left here before he could be initiated. We expect 10 or 12 more applications soon, which will leave but one or two non-Brotherhood men here. The B. of L. E. is getting very few of our engineers, as the B. of L. F. and E. is giving them good protection.

With the young material taken in, the lodge has put on new activities and we expect to see some big results in the near future. For the first time in the history of the lodge the entire official staff, except two, was installed at our meeting for installation.

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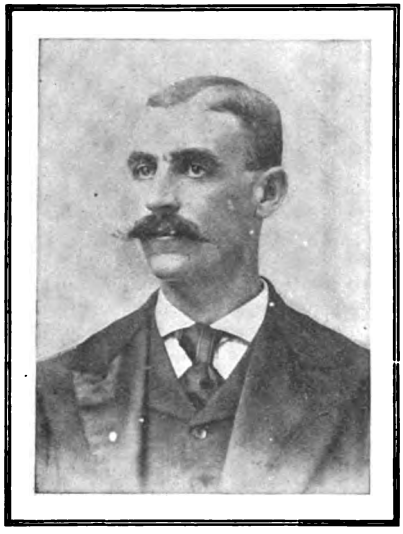
Official

Addresses Wanted.

Persons requiring the address or any information concerning another will please communicate with the Secretary of the lodge located nearest the residence of the person making such request. Upon receipt of a communication from the Secretary of such lodge requesting that a notice be published in the Magazine inquiring for such address or other information same will be complied with. However, the Magazine can not undertake the office of a collecting agency and must decline to lend itself to such purpose. The following requests have reached this office since the last issue. Information should be sent to the persons specified in the notice.

Harry J. Longenecker.—Left his home eight years ago. Is now 39 years of age and thought to be married. The accompanying picture is the last taken of him



HARRY J. LONGENECKER

before he went away. When last heard of was in Philadelphia, Pa, working for a telephone company. Any one knowing his whereabouts or in possession of any information regarding him will please correspond with his brother, Charles Longenecker, Master of Lodge 498, B. of L. F. and E., Bellwood, Pa., who is very anxious to locate him.

Fred Long.—Formerly a telegrapher and employed on the C. & E. R. R. at Lima, Ohio, during the years 1888 and 1889. Any information as to his present whereabouts will be gladly received by J. R. Long, lock box 277, Springfield, Ohio.

John Baird.—Left Argenta June 1, 1907, ostensibly for Kansas City, Mo., and promised to correspond with his lodge in order that traveling card might be forwarded to him. Nothing has been heard from him since, and any one knowing his present whereabouts will confer a great favor on Choctaw Lodge 551 if they will write to the secretary, James A. Keel, Argenta, Ark. Brother Baird is about 28 years of age, reddish hair, blue eyes, florid complexion, smallpox marks on face, teeth of a very dark color; he weighs in the neighborhood of 145 pounds and stands 5 feet 7 inches in height. If any of our members should happen to see this brother, kindly call his attention to this, or write direct to the secretary of 551, as indicated above.

Lost Traveling Cards, Etc.

This office has been notified of the loss of the following traveling cards, receipts, etc., and the request is made that all members be on the lookout for them. Should they be discovered in the possession of persons not entitled to them they should be retained and forwarded to the owner or to the Secretary of the lodge which issued same:

Card and receipt for present quarter with order for works, also old style card dated October 4, 1906, and bunch of old receipts extending back for about five years, belonging to Bert Wasson, member of Lodge 137, B. of L. F. and E., were lost or stolen on July 20, 1907, in Albuquerque, N. M. If found please return to C. A. Stephenson, Eldon, Iowa.

Special assessment receipts, local receipts and last receipt with order for secret work belonging to L. G. Harris, member of Lodge 428 B. of L. F. and E., were recently stolen at Carrizozo, N. M. The special assessment receipts were from Lodge 373 and the local receipts

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from Lodge 428. If found please return to L. G. Harris, Carrizozo, N. M.

Pocketbook with receipts from January 1, 1906, to the present time, belonging to H. Billingsley, member of Lodge 325, B. of L. F. and E., was recently lost. Anyone finding same will please correspond with H. Billingsley, 815 Stella street, Fort Worth, Texas.

Traveling card and receipt for present quarter, property of James Welch of Lodge 578, B. of L. F. and E.; description as given on card: Hair, black; eyes, brown; stature, tall; weight, 150 pounds. Anyone findin- same will please return them to Bro. C. O. Hutton, collector of Lodge 578, B. of L. F. and E., 3002 Bank street, Louisville, Ky.

Traveling card and receipt for quarter ending September 30, 1907, belonging to Warren T. Shaw, member of Lodge 293 B. of L. F. and E., was recently lost or stolen. If found, please return to Warren T. Shaw, 222½ Division street, Spokane, Wash.

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The Home Account.

The following donations were received at the Home for Aged and Disabled Railway Employes for the month of July, 1907:

B. of L. F. and E. Lodges 8, $3; 11, $12; 25, $12; 26, $15; 30, $5; 31, $6.10; 59, $5; 86, $3; 150, $5; 214, $10; 216, $5; 226, $5; 255, $10; 273, $12; 327, $5; 378, $5; 379, $12; 395, $5; 401, $10; 429, $5; 450, $12; 463, $19; 514, $12; 539, $15; 566, $5; 574, $5; 623, $5; total..	$223 10
L. S. to B. of L. F. and E. Lodges 3, $10; 4, $5; 8, $3; 10, $2; 16, $5; 18, $10; 20, $2; 42, 50c; 44, $2; 46, $5; 50, $2.50; 53, $5; 61, $5; 64, $10; 70, $5; 81, $2; 86, $5; 87, $3; 88, $2; 92, $5; 93, $6.50; 98, $5; 117, $5; 121, $5; 124, $1; 133, $5; 137, $5; 144, $2; 149, $1; 147, $3; 151, $5; 177, $5; 178, $2; 187, $1; 191, $2; 202, $2; 209, $5; total.....	149 50
O. R. C. Divisions.....	$625 10
B. of R. T. Lodges.....	439 90
B. of L. E. Divisions.....	755 25
L. A. C. Divisions.....	120 50
L. A. T. Lodges.....	258 00
G. I. A. Divisions.....	141 50
James Costello, Div. 270, O. R. C.	1 00
Alfred S. Lunt, Lodge 456, B. of R. T.....	1 00
Interest in bank in Cleveland, Ohio	180 00
Councilman and members of 33, L. A. T.....	8 50
Members of Lodge 552, B. of L. F. and E., and their friends, Prescott, Arizona.....	97 00
Employes of Illinois Central Suburban Service (through Bro. W. H. Gerry).....	20 00
Proceeds of a picnic given at the Home by G. I. A No. 1..	20 00
F. A. Edwards, Division 519, B. L. E.....	1 00
Total.....	$3,041 35

Respectfully submitted,
JOHN O'KEEFE,
Sec. and Treas. R. R. M. H.

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Acknowledgments.

Mrs. Judd Irish and family desire to extend to the Brotherhood in general, and Lodge 419 in particular, their heartfelt thanks for all kindnesses received in their sad bereavement, as well also for the prompt payment of the death claim of Bro. Judd E. Irish.

Mrs. Benj. Keiser desires to thank the Brotherhood in general for the prompt payment of the death claim of Bro. Benj. Keiser of Lodge No. 3, and at the same time especially to thank that lodge for all kindnesses and courtesies extended, including the beautiful floral offerings sent by the lodge.

Harry J. Lenfesty, member of Lodge 407 B. of L. F. and E., Marion, Indiana, wishes to thank the officers and members of the Brotherhood for the prompt payment of his disability claim, and sincerely trusts that none of the brothers may meet with so great a misfortune as he has, in losing his eyesight.

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Beneficiary Statement

OFFICE OF GRAND SECRETARY AND TREASURER,
PEORIA, ILL., August 1, 1907.

To SUBORDINATE LODGES:

The following is a statement of receipts in the Beneficiary Department for the month of July 1907:

RECEIPTS.

Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.
1	447 25	73	278 00	145	188 75	217	177 50	289	.....	361	114 00	433	135 50	505	72 75	577	120 00	649	39 75
2	32 25	74	183 00	146	287 75	218	229 50	290	153 50	362	87 75	434	210 25	506	141 75	578	269 50	650	51 75
3	888 75	75	460 50	147	209 75	219	290 25	291	73 50	363	365 25	435	152 50	507	136 50	579	49 00	651	116 25
4	271 25	76	18 00	148	240 25	220	587 50	292	48 00	364	.....	436	258 00	508	287 50	580	.....	652	111 25
5	314 25	77	402 00	149	432 00	221	.....	293	135 75	365	55 50	437	40 50	509	73 50	581	89 50	653	.....
6	390 25	78	139 50	150	342 25	222	124 50	294	131 50	366	.....	438	123 25	510	188 00	582	89 25	654	76 75
7	203 00	79	63 00	151	105 75	223	244 50	295	282 75	367	185 25	439	92 25	511	231 50	583	93 75	655	73 75
8	485 50	80	87 25	152	267 50	224	79 75	296	290 25	368	114 00	440	181 75	512	135 75	584	159 00	656	120 00
9	307 75	81	124 75	153	138 75	225	97 50	297	241 50	369	175 00	441	193 00	513	99 75	585	90 75	657	164 00
10	872 00	82	118 50	154	129 25	226	277 75	298	167 00	370	48 00	442	114 75	514	108 75	586	.....	658	100 00
11	249 75	83	264 75	155	84 00	227	109 25	299	125 50	371	157 50	443	.....	515	179 75	587	202 25	659	164 50
12	219 00	84	118 50	156	237 75	228	403 50	300	212 25	372	131 75	444	392 75	516	153 75	588	57 75	660	96 00
13	270 75	85	272 50	157	82 50	229	234 25	301	132 75	373	180 75	445	248 25	517	.....	589	62 25	661	8 50
14	460 25	86	239 00	158	94 50	230	.....	302	439 00	374	246 00	446	230 50	518	41 25	590	.....	662	61 00
15	101 25	87	171 00	159	176 50	231	473 25	303	99 75	375	85 50	447	79 00	519	195 00	591	249 25	663	143 00
16	481 25	88	175 75	160	181 50	232	198 75	304	225 00	376	47 50	448	695 00	520	41 25	592	133 75	664	104 50
17	206 50	89	40 50	161	50 25	233	.....	305	.....	377	202 50	449	314 25	521	168 50	593	64 75	665	75 25
18	172 50	90	99 75	162	430 00	234	159 75	306	240 00	378	527 25	450	251 25	522	240 50	594	154 50	666	231 00
19	200 75	91	314 00	163	186 25	235	232 50	307	.....	379	355 00	451	158 25	523	85 50	595	53 25	667	74 50
20	42 00	92	171 00	164	90 25	236	457 50	308	62 75	380	68 25	452	136 00	524	28 75	596	124 50	668	151 50
21	241 00	93	76 25	165	71 50	237	393 50	309	322 75	381	396 75	453	51 75	525	154 00	597	170 00	669	77 25
22	96 00	94	.....	166	.....	238	75	310	272 75	382	...	454	171 75	526	43 50	598	84 75	670	234 50
23	84 25	95	52 75	167	145 00	239	70 00	311	102 00	383	203 50	455	.....	527	118 50	599	87 75	671	89 50
24	367 75	96	.....	168	240 75	240	352 25	312	190 25	384	185 25	456	157 00	528	188 50	600	160 75	672	106 50
25	277 75	97	330 75	169	382 00	241	291 25	313	144 75	385	81 75	457	152 50	529	168 00	601	276 00	673	813 00
26	220 50	98	254 50	170	195 00	242	268 25	314	182 75	386	59 25	458	57 00	530	84 75	602	170 25	674	33 00
27	237 75	99	572 00	171	135 00	243	117 75	315	188 50	387	73 50	459	78 75	531	109 00	603	107 00	675	136 50
28	158 50	100	111 25	172	78 75	244	201 75	316	215 50	388	150 75	460	90 00	532	109 50	604	82 00	676	.....
29	103 75	101	423 00	173	.....	245	120 75	317	.....	389	115 25	461	118 50	533	121 50	605	140 50	677	112 00
30	177 25	102	137 25	174	697 25	246	.....	318	337 75	390	159 75	462	207 50	534	227 50	606	30 25	678	67 75
31	118 50	103	44 75	175	373 00	247	356 50	319	160 75	391	160 00	463	171 75	535	179 50	607	73 75	679	87 25
32	169 00	104	179 25	176	174 75	248	318 00	320	68 25	392	147 75	464	130 75	536	109 00	608	165 25	680	63 00
33	147 00	105	122 00	177	193 75	249	154 75	321	119 25	393	210 75	465	252 75	537	98 00	609	57 00	681	128 50
34	199 00	106	81 00	178	204 75	250	192 25	322	81 75	394	24 75	466	138 25	538	184 50	610	45 75	682	111 75
35	118 75	107	249 25	179	101 25	251	342 75	323	39 75	395	123 00	467	98 25	539	236 00	611	85 75	683	129 50
36	141 75	108	.....	180	9 00	252	378 75	324	144 75	396	211 25	468	30 00	540	264 00	612	87 25	684	75 75
37	182 50	109	217 00	181	45 75	253	252 75	325	75 50	397	79 25	469	132 00	541	172 25	613	37 50	685	58 75
38	.....	110	161 25	182	569 75	254	112 25	326	195 50	398	134 75	470	235 00	542	204 75	614	302 00	686	36 00
39	127 25	111	191 00	183	225 25	255	74 25	327	374 00	399	89 25	471	33 75	543	255 75	615	105 00	687	86 75
40	348 50	112	65 25	184	73 50	256	76 75	328	185 25	400	201 50	472	379 25	544	116 25	616	63 00	688	51 75
41	72 75	113	.....	185	96 00	257	109 00	329	58 50	401	250 50	473	64 25	545	99 75	617	140 50	689	104 75
42	39 00	114	55 50	186	86 50	258	.....	330	286 00	402	.....	474	127 50	546	37 50	618	.....	690	66 50
43	175 25	115	111 25	187	122 75	259	95 50	331	160 00	403	45 00	475	.....	547	95 25	619	88 50	691	23 25
44	273 50	116	107 25	188	346 50	260	245 50	332	121 50	404	109 00	476	86 00	548	77 00	620	82 00	692	38 75
45	531 75	117	120 75	189	254 75	261	76 50	333	286 00	405	226 50	477	405 75	549	137 25	621	79 25	693	21 00
46	48 00	118	55 50	190	54 00	262	287 25	334	254 50	406	67 50	478	123 00	550	.....	622	206 75	694	93 25
47	256 25	119	.....	191	328 00	263	182 50	335	47 25	407	231 50	479	79 75	551	188 25	623	216 25	695	.....
48	366 25	120	218 00	192	314 50	264	108 25	336	99 00	408	212 50	480	40 50	552	209 25	624	81 75	696	49 00
49	102 50	121	312 50	193	115 75	265	430 75	337	336 00	409	217 00	481	219 50	553	259 00	625	78 00	697	54 25
50	85 50	122	73 00	194	421 75	266	321 75	338	153 00	410	154 50	482	.....	554	103 50	626	.....	698	126 00
51	171 75	123	334 75	195	98 50	267	102 00	339	102 75	411	281 50	483	78 25	555	103 50	627	79 50	699	84 25
52	337 25	124	153 00	196	111 25	268	36 00	340	125 50	412	180 25	484	167 25	556	54 00	628	71 00	700	42 00
53	122 25	125	57 75	197	91 50	269	.....	341	220 75	413	37 50	485	826 50	557	248 25	629	33 50	701	158 75
54	457 25	126	145 00	198	386 00	270	278 50	342	264 25	414	172 50	486	94 50	558	188 25	630	147 25	702	80 75
55	60 75	127	194 75	199	176 25	271	124 75	343	....	415	150 00	487	28 50	559	113 50	631	99 00	703	70 50
56	190 50	128	119 75	200	104 25	272	60 00	344	145 75	416	209 00	488	69 75	560	78 00	632	49 50	704	132 00
57	517 00	129	262 50	201	329 25	273	193 00	345	186 25	417	79 50	489	153 75	561	183 00	633	142 50	705	62 25
58	202 00	130	463 00	202	219 75	274	128 50	346	33 75	418	213 75	490	284 75	562	374 25	634	219 50	706	24 00
59	463 00	131	40 00	203	313 25	275	323 25	347	106 50	419	118 25	491	60 00	563	240 00	635	141 00	707	59 50
60	335 50	132	122 25	204	260 00	276	217 25	348	177 75	420	70 50	492	266 00	564	175 50	636	51 75	708	82 50
61	139 50	133	346 75	205	103 50	277	132 75	349	351 75	421	81 00	493	52 50	565	48 25	637	85 00	709	52 75
62	108 00	134	111 75	206	108 75	278	28 50	350	103 25	422	73 50	494	119 00	566	....	638	126 25	710	79 00
63	226 50	135	181 50	207	306 50	279	87 00	351	45 25	423	51 25	495	.....	567	134 00	639	50 50	711	25 50
64	235 25	136	.....	208	80 25	280	105 25	352	75 25	424	153 00	496	168 00	568	160 00	640	45 75	712	35 25
65	198 75	137	123 25	209	218 00	281	200 00	353	168 00	425	.....	497	108 25	569	141 25	641	118 25	713	71 25
66	129 00	138	332 75	210	79 50	282	33 75	354	242 25	426	272 00	498	.....	570	89 50	642	74 75	714	16 50
67	143 25	139	322 75	211	258 50	283	108 75	355	173 50	427	...	499	41 25	571	178 00	643	28 50	715	22 75
68	119 50	140	327 75	212	169 75	284	668 50	356	205 75	428	102 75	500	104 25	572	177 50	644	89 00	716	33 25
69	75 00	141	646 75	213	192 75	285	434 25	357	78 75	429	122 25	501	218 00	573	177 00	645	68 00	717	.....
70	205 50	142	227 25	214	496 25	286	155 50	358	164 50	430	132 75	502	228 25	574	162 75	646	279 75	718	29 25
71	308 75	143	377 25	215	381 00	287	1268 75	359	85 75	431	70 50	503	170 50	575	81 00	647	102 50	719	198 75
72	333 75	144	36 75	216	129 75	288	108 25	360	108 00	432	227 25	504	63 00	576	69 75	648	40 50	720	.....

Received during month of July $117,011.75

Respectfully submitted

W. S. CARTER, G. S. and T

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Statement of Death and Disability Claims

PAID BY THE GRAND SECRETARY AND TREASURER, FROM JUNE 30 TO JULY 31, 1907.

Claim No.	NAMES.	Lodge No.	Death or Disability.	Date.	Am't. of Ins.	Cause.
227	Joseph L. McLaughlin	286	Death	Jan. 1, 1907	$500	Pneumonia.
295	Brackey E. Gary.....	223	"	Apr. 28, "	1,500	Boiler explosion.
316	John G. Wells.....	266	"	" 25, "	1,500	Run over by engine.
200	Michael H. Burke....	228	"	Mar. 7, "	1,500	Heart disease.
267	W. G. Neel.....	141	"	Apr. 10, "	1,500	Consumption.
2125	Raymond E. Collors .	203	"	Nov. 12, 1906	1,500	Collision.
230	William Fulton.....	9	"	Jan. 2, 1907	1,000	Striking portal of bridge.
318	Eugene Hutchinson..	253	Disability	June 25, "	1,500	Consumption of lungs.
169	George W. Carpenter	284	Death	Mar. 2, "	1,500	Collision.
269	Robert A. Hughes....	10	"	Apr. 19, "	1,000	Suicide.
290	Frasie H. Babcock...	183	Disability	June 11, "	1,500	Consumption of lungs.
318	W. H. Alleman	107	Death	Dec. 25, 1906	1,500	Collision.
2071	G. D. Flesher	423	Disability	May 24, 1907	1,500	Paralysis.
321	Abner L. Wenger.....	162	Death	" 6, "	1,500	Derailing of engine
108	William E. Green	342	Disability	June 28, "	1,500	Bright's disease.
178	Merrison Holt	51	Death	Feb. 13, "	500	Typhoid fever.
213	Edward H. Krug	313	"	Apr. 18, "	1,500	Typhoid fever.
333	Carl F. Taylor	40	Disability	" 24, "	1,500	Amputation of foot.
324	Edmond F. Hoar	563	Death,....	" 28, "	1,500	Consumption.
336	John Hartman.....	21	"	" 20, "	500	Cancer.
337	Judd. E. Irish	419	"	May 7, "	1,500	Heart disease.
338	Benton G. Wood.....	352	"	" 13, "	1,500	Cancer.
339	Edwin D. Benjamin..	326	"	" 12, "	1,500	Typhoid fever.
341	Preston G. Roberts ..	665	"	" 15, "	1,500	Consumption.
342	Elmer Crouse.....	396	"	" 1, "	1,500	Spinal meningitis.
343	William P. Scherer ..	241	Disability	June 22, "	500	Paralysis of both legs.
345	James McIsaac	198	Death.....	Apr. 28, "	1,500	Derailing of engine.
346	John J. Flaherty	383	"	May 17, "	1,500	Derailing of engine.
349	William Forsyth.....	3	Disability	June 20, "	1,500	Paralysis.
350	Joseph A. Donivan...	97	Death.....	May 11, "	1,500	Bright's disease
351	Henry Lahey.....	16	"	" 24, "	1,500	Bright's disease.
353	Hend'son M. Simpson	695	Disability	" 21, "	2,000	Amputation of both feet.
355	Arthur F Haile	145	Death.....	" 22, "	1,500	Falling from engine.
356	Harry H. Marshall...	576	"	" 28, "	1,000	Collision.
357	Jesse O. Benton.	617	"	" 27, "	1,000	Derailing of engine.
358	Emett H. Benedict...	43	"	Mar. 30, "	500	Falling between car and engine.
359	Robert L. Williams..	8	"	May 22, "	500	Striking mail crane.
363	John D. Downey.....	324	"	June 1, "	1,500	Collision.
364	James P. Cates.....	238	"	May 17, "	1,500	Crushed by falling building.
366	Louis N. B. Prentice.	192	"	" 6, "	1,500	Gunshot wound.
367	Ermel J. Truell.....	276	"	" 27, "	1,500	Typhoid fever.
368	William G. Sample ..	252	"	" 25, "	1,500	Gastritis.
371	Harry J. Lenfesty	407	Disability	July 2, "	1,500	Totally & permanently blind, both eyes
372	Michael J. McKenna.	151	Death....	May 31 "	1,500	Consumption.
373	Anthony Simms.....	13	Disability	June 19, "	1,500	Locomotor ataxia.
374	Cecil E. Wilklow	430	Death.....	" 1, "	1,500	Consumption.
375	James E Dysart.....	280	Disability	Mar. 25, "	1,000	Amputation of hand.
376	William T. Osbourn ..	225	Death.....	May 16, "	1,000	Striking car.
379	Fred J. Quinn.....	533	"	" 20, "	1,000	Derailing of engine.
381	George C. Kuhns	26	"	June 6, "	1,500	Cancer.
385	Wm. P. Fitzgerald ...	499	"	" 8, "	1,500	Abscess of kidneys.
387	John E. Pepper.....	489	"	" 2, "	1,500	Derailing of engine.
389	Akin B. Hill	551	Disability	Apr. 4, "	1,500	Amputation of foot.
390	Patrick J. Sullivan ..	94	Death.....	May 27, "	1,500	Collision.
391	Russell H. Martin ...	219	"	" 11, "	1,500	Crushed between engine and car.
392	J. H. Blatt	27	"	June 8, "	1,500	Heart disease.
463	William H. Gable (1)	....	.....	.....	200	
199	Lloyd L. Kniewasser.	262	Death.....	Mar. 4, "	500	Pneumonia.
344	Oscar U. Whetsel	109	"	May 10, "	1,500	Run over by car.
354	Martin E. Plumstead	23	"	" 18, "	2,000	Heart disease.
360	Samuel J. Honecker .	241	"	" 27, "	1,500	Boiler explosion.
370	Oscar E Bergquist ..	348	"	" 30, "	1,500	Crushed between engine and car.
2160	Avey R. Richey	364	"	Nov. 17, 1906	1,500	Derailing of engine.
330	Edelbert L. Warner..	511	Disability	July 3, 1907	1,500	Paralysis.
365	Edward Corey	196	Death.....	June 3, "	500	Derailing of engine.
382	William J. Warne....	568	Disability	" 8, "	1,000	Paralysis.

(1) William H. Gable was an expelled member of Lodge No. 228, and died. Suit entered against the Brotherhood. Suit now settled for $200.

Death Claims Paid.		Disability Claims Paid.	
37—A	$55,500	10—A	$15,000
6—B	6,000	2—B	2,000
7—C	3,500	1—C	500
1—D	2,000	1—D	2,000
1—	200		
52	$67,200	14	$19,500

66 death and disability claims paid, aggregating $86,700.00.

Pending Claims July 31, 1907.

86 death claims aggregating	$114,000
18 disability claims aggregating	24,500
Total of 104 claims aggregating	$138,500

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Statement of Death and Disability Claims

FILED WITH THE GRAND SECRETARY AND TREASURER DURING THE MONTH ENDING AUGUST 15, 1907.

Claim No.	NAMES.	Lodge No.	Date of Filing.	Death or Disability.	Alleged Cause of Death or Disability.	Am't of Ins.
460	Harrison, John	83	July 16, 1907	Death	Suicide	$1,500
461	O'Rourke, Francis L.	21	" 16, "	Disability	Consumption of lungs	1,500
462	Russell, C. E.	109	" 17, "	Death	Crushed bet. car and engine	1,500
463	Carrel, Charles D.	162	" 17, "	Disability	Paralysis	500
464	Michel, George W	18	" 18, "	Death	Heart disease	500
465	Gable, William H. (1)		" 18, "			
466	Hudson, Peat	572	" 19, "	Death	Derailing of engine	1,500
467	Howard, Ray R	284	" 19, "	"	Struck by engine	1,500
468	Scheer, Jacob	166	" 20, "	"	Bright's disease	1,500
469	Frothingham, Wm	228	" 20, "	Disability	Amputation of foot	1,500
470	Fraser, Anderson	13	" 22, "	"	Hip joint disease	1,500
471	Graham, James S.	194	" 23, "	Death	Derailing of engine	1,500
472	Tressel, Stolly	202	" 24, "	Disability	Locomotor ataxia	1,500
473	Knowles, Harlie A	431	" 24, "	Death	Collision	500
474	Satterfield, Richard N.	231	" 24, "	"	Falling from engine	1,500
475	Wells, John J	195	" 27, "	Disability	Sundry ailments	1,500
476	Arbuckle, William C.	249	" 27, "	"	Amputation of arm	1,500
477	Cox, Peter	54	" 29, "	"	Consumption of lungs	1,500
478	Youngblood, Harry J.	198	" 29, "	Death	Appendicitis	1,000
479	Haines, Frederick A.	72	" 31, "	Disability	Consumption of lungs	1,500
480	Shields, Charles A.	596	" 31, "	Death	Crushed bet. eng. and shop door	1,500
481	Kauffman, W B	251	Aug. 1, "	"	Murdered	1,500
482	Elrod, Ernest B.	86	" 1, "	"	Crushed between cars	1,000
483	Kupp, Noah F.	214	" 1, "	Disability	Amputation of foot	2,000
484	Heather, Wilford	144	" 1, "	Death	Collision	500
485	Alexander, David	378	" 2, "	Disability	Consumption of lungs	1,500
486	Drew, David	295	" 3, "	Death	Paralysis	1,500
487	Miller, Richard	312	" 3, "	Disability	Totally and permanently blind	1,500
488	McCord, Charles R.	202	" 3, "	Death	Heart disease	1,500
489	Farlardeau, Charles	335	" 5, "	"	Bright's disease	500
490	Williams, Edgar	470	" 5, "	"	Derailing of engine	1,500
491	Yetter, Lewis	320	" 5, "	Disability	Bright's dis. and loco'm. ataxia	1,500
492	Petrie, Charles	355	" 5, "	Death		1,500
493	Bowman, John G	687	" 5, "	"	Typhoid fever	1,500
494	Ricks, Albert J.	399	" 5, "	"	Derailing of engine	1,000
495	Markley, Adam J.	514	" 5, "	"	Derailing of engine	1,500
496	Spotts, William M.	174	" 6, "	Disability	Bright's disease	1,500
497	Ford, Delnos	659	" 7, "	Death	Derailing of engine	1,500
498	Eble, Frederick	475	" 7, "	Disability	Amputation of foot	1,500
499	Terhune, William H.	3	" 7, "	Death		1,500
500	Chapman, Avra	473	" 8, "	"		1,000
501	Link, Edward R.	617	" 8, "	"		1,500
502	Roberts, James	329	" 9, "	"	Peritonitis	500
503	Wilcox, Mat E	667	" 10, "	"	Abscess of liver	1,500
504	Clements, Charley F.	609	" 10, "	"	Derailing of engine	1,500
505	Bristow, David	517	" 10, "	"	Boiler explosion	1,500
506	Studley, Charles A.	666	" 12, "	"		1,500
507	Bornt, Peter	169	" 12, "	Disability	Locomotor ataxia	1,500
508	Evans, James H.	426	" 12, "	Death	Gunshot wound	1,500
509	Gilchrist, Samuel	189	" 13, "	"		1,000
510	Pratt, Albert E.	120	" 14, "	Disability	Bright's disease	3,000
511	Toohey, Timothy J.	666	" 15, "	Death		1,500

(1) William H. Gable was an expelled member of Lodge No. 228. Suit was entered against the Brotherhood and now settled for $200.

Respectfully submitted,
W. S. CARTER,
G. S. and T.

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Quarterly Dues Notice

OFFICE OF THE GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., September 1, 1907.

To Members of Subordinate Lodges:

SIRS AND BROTHERS—You are hereby notified that the dues for the quarter ending December 31, 1907, are now payable, and must be paid to the Collector of your Lodge on or before October 1, 1907. Said dues shall be such an amount as may be determined by the several Lodges, provided, in no case shall it be less than twelve dollars and fifty cents ($12.50) for each member carrying a beneficiary certificate of three thousand dollars ($3,000), eight dollars and fifty cents ($8.50) for each member carrying a beneficiary certificate of two thousand dollars ($2,000), five dollars ($5.00) for each member carrying a beneficiary certificate of fifteen hundred dollars ($1,500), three dollars and fifty cents ($3.50) for each member carrying a certificate of one thousand dollars ($1,000), and two dollars ($2.00) for each member who shall carry a certificate of five hundred dollars ($500). All beneficiary members now enrolled, and those admitted prior to November 1, 1907, are liable for the dues above referred to. All members initiated during the months of November and December will be exempt from the payment of dues for the said quarter as provided in Section 171 of the Constitution. Beneficiary members initiated during the month of October are liable for the full amount of quarterly dues for the above quarter. All officers and members are requested to give the foregoing their careful and strict attention, and govern themselves accordingly. Any member failing or declining to make payment as above provided will be subject to the penalty of expulsion from the Order, as per Section 174 of the Constitution, said expulsion taking effect October 2, 1907. Yours fraternally,

W. S. CARTER, G. S. and T. J. J. HANNAHAN, G. M.

Notice to Treasurers

OFFICE OF THE GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., September 1, 1907.

To Treasurers of Subordinate Lodges:

SIRS AND BROTHERS—You are hereby notified, as provided in Section 80 of the Constitution, that no beneficiary assessment is required for the month of September, 1907, and that therefore none has been levied for said month.

Yours fraternally,

W. S. CARTER, G. S. and T. J. J. HANNAHAN, G. M.

Notice to Secretaries

OFFICE OF THE GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., September 1, 1907.

To Secretaries of Subordinate Lodges:

SIRS AND BROTHERS—Pursuant to Section 174 of the Constitution, you are required to report to the Grand Lodge as expelled all members who fail to make payment of their Quarterly Dues for the quarter ending December 31, 1907. The names of said members must be reported to you by the Collector of your Lodge not later than October 2d, and by you reported to the Grand Lodge, as per Section 174 of the Constitution, immediately thereafter. Failing to report the names of expelled members as herein provided, the Grand Lodge will hold Subordinate Lodges liable for their assessments, as per Section 85 of the Constitution.

Yours fraternally,

W. S. CARTER, G. S. and T. J. J. HANNAHAN, G. M.

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Notice.

All communications intended for publication in the Ladies Department of the Magazine should in all cases be addressed to the Editress, Mrs. Agnes G. Strong, 527 Green street, Boone, Iowa.

New Lodges.

Aerial Lodge No. 230, at Duluth, Minn., organized July 23, 1907, with thirteen charter members. Organizer, Sister Maggie Fuller, of Lodge No. 92, West Superior, Wisconsin.

Notes.

As we enter upon our new year, with all of its possibilities before us, may the principles of our sisterhood be more deeply inculcated into every heart, and each one do her part, that we shall feel more strongly the sacredness of the tie that binds us, and this year be the most prosperous we have ever known.

Only those who are members of our order can appreciate the bond that unites us, the spirit of sisterhood, helpfulness, sympathy and loving kindness that actuates our intercourse with each other. A present-day writer of note, and incidentally a maker of mottoes, has lately said: "We need some one to believe in us. If we do well, we want our work commended, our faith corroborated. The individual who thinks well of you, who keeps his mind on your good qualities, and does not look for flaws, is your friend. Who is my brother? I'll tell you. He is one who recognizes the good in me." It is this spirit of mutual recognition that cements the tie between L. S. members. We know for what we stand. We know that the principles we advocate, the good we try to do, the wrongs we try to right, all these, lead us to believe in one another; in a word, to recognize one another as co-workers, friends and sisters.

In every phase of life we find there is no strength like that of union, of concerted action. A long pull, and a strong pull, and pull altogether, is the secret of wonderful success.

After all, it is not what is around us, but what is in us; not what we have, but what we are, that makes us really happy.—Geikie.

What makes life dreary is want of motive.—George Eliot.

Human nature is so constituted that what everybody has to give is what everybody else most needs. It is not silver and gold which the majority of our friends would think of receiving from us, but all are grateful for sympathy and love. Here none are so rich they do not need and none so poor that they can not give.—Christian Standard.

Stand with anybody that stands right.

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Stand with him while he is right, and part with him when he goes wrong.—Abraham Lincoln.

Books are a guide in youth and an entertainment for age. They support us under solitude and prevent us becoming wearisome to ourselves. They help us to forget the crossness of men and things, compose our cares and our passions, and lay our disappointments asleep. When we are weary of the living, we may repair to the dead, who have nothing of peevishness, pride, or design in their conversation.—Collier.

"A good book is like a vision from a mountain top. From it you can see not only more of the earth, but more of heaven. It means a widening horizon, whether you look out or up."

"A little kindness does away with a great deal of bitterness."

The passing of years is like the coming of dawn—slow, silent, inevitable. The most eager cannot hasten the quiet, irresistible movement, and the most reluctant cannot forbid. Some gifts the years bring which we would fain decline—age, sorrow, disappointment. Some treasures they take which we would keep forever—youth, beauty, innocence. But there are more precious treasures which time cannot supply and the years cannot remove—friendship, virtue, patience, faith and love.—H. L. Willett.

Another New Instructor.

Mrs. G. Miller, 292 Greenwich avenue, New Haven, Connecticut, has been appointed by the Grand President as instructor for the New York, New Haven & Hartford R. R. System, all through Connecticut, from New York City to Boston.

Complainers.

Just pause a moment, each one who may happen to read these lines, and think, observe, and possibly wonder why so many people complain, grumble, or are discontented?

In every rank of life, in every occupation, most people say how much easier and pleasanter something else would be. Successful people always desire change and wish to try something else. Those who fail, to do nothing but grumble against fate or because some person or several did not treat him fairly, justly, or in a proper manner.

There is a difference between complaining and discontent. A person may be discontented merely from a desire to improve, but is often silent while striving for better things. The complainer does not benefit any one, even himself.—Aimee Barbarian Marsh, Boston Ideas.

Resting the Heart.

To rest the heart now and then is the advice given by an instructor in gymnastics; but it may be argued that the heart cannot be rested, as it works incessantly from birth to death. That is very true, but it rests the heart to lie down, for every night's sleep of nine hours saves the heart the lifting of 32,400 ounces of blood, and that means considerable rest. When we lie down, the heart's action becomes slower, slower by ten strokes a minute. Thus, in an hour, six hundred strokes are saved, and in nine hours, 5,400 strokes. Each stroke pumps six ounces of blood, and therefore in nine hours the heart is saved the labor of pumping 32,400 ounces.—Tennessee Mason.

The Big Ten.

Below is given the membership of the ten largest lodges of the L. S. to B. of L. F. & E., reported August 1, 1907:

1. No. 142, Empire, Buffalo, N. Y.—120.
2. No. 70, Holly, Buffalo, N. Y.—105.
3. No. 3, Hazel, Peoria, Ill.—102.
4. No. 60, Pride, Harrisburg, Pa.—91.
5. No. 125, Charity, Jackson, Mich.—78.
6. No. 51, Grayson, Denison, Texas—77.
7. No. 10, Helpmate, Elkhart, Ind.—75.
8. No. 151, Missouri, St. Louis, Mo.—75.
9. No. 58, Sisters of 99, Rochester, N. Y.—73.
10. No. 146, Virginia, Chicago, Ill.—71.

[I feel that I owe Virginia Lodge No. 146 an apology for not giving its mem-

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bership entirely correct in the July issue. I cannot account for the mistake, but had it printed as it had been given me. I am very sorry that this occurred and shall be doubly careful in the future, as we want to keep the membership absolutely correct in the "Big Ten."—ED.]

Charity.

The late Sir Knight Joseph K. Wheeler, of Connecticut, rightly said: "Charity, like Jacob's ladder, plants its foot upon the earth in the great heart of humanity, and its top reaches into the beyond, the soul of the divine." Such charity is more than alms-giving. It is the approving, cheering, comforting word, the aiding, assisting, relieving hand; the commanding, upholding and shielding phrase, and the merciful tempering of justice. It is the protecting of the innocent and worthy; the reclaiming of the erring and sinful; the sheltering, feeding and clothing of the destitute; the comforting of the desponding, the mourning and the sorrowing, and is loving others as the Master loves us. It is from the heart, goes to the heart, and reaches into the temple of life in the heavenly land.—John W. Brown, in Star Messenger.

*Three Sixty-one.**

I am craving a favor, my dear Mrs. Strong,
It is to publish some verse, I will not make them long,
For the dear, jolly boys on the good B. & O.,
Who in hot or cold weather on their run they will go.

Mr. Wallace is foreman of the Firemen crew.
He is a hustler for sure, but the men like him too;
He is stern in his manner, and yet he is kind,
When he issues his orders the men know they must mind.

Will Thomas and Oscar Snyder I know very well,
A column in praise of these men I could fill,
For they live very near me and I see them each day,
Either coming in home or going away.

Schoonover and Wisehart and Hallows and Cook,
No men more deserving to place in our book;
Another good fellow, a right jolly man,
Who because he is so true the boys call "Uncle Sam."

There's Rolston and Creagar and Fowler and Shuck,
Should he fall in White river he can swim like a duck;
There's Grannon and Kellam, always found on their run.
Oh! the Pride of the Order is three-sixty-one.

There's Chatten and Colston and Hodges and Jones
(So far, the last named has escaped broken bones);
Then Leffler and Morras and Murry and Lough,
To use a slang phrase, these men handle much dough.

We will call Will McKenzie, just Fritz, if you please,
The weather being so torrid, we can say that with ease;
When the caller wants either on his run for to go,
There are none of these men that he ever finds slow.

There's Keith and there's Belcher belong to this Lodge,
And neither I know any duty will dodge;
There's never—no, never—not under the sun,
A better division than three-sixty-one.

Then Eahler and Clyde Reddick, I also must name,
In firing a compound there's none are more game;
With Boyd and with Wagner and Anderson, too,
The names of our Local I now have gone through.

When my life here is ended and a seat I am given,
No matter how humble, if it is just inside of Heaven,
In large glittering letters, as bright as the sun,
I shall read,—These were members of three-sixty-one.

*Dedicated to the members of Lodge No. 361, Washington, Indiana, with the author's compliments and best wishes.

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Dear Editress, I thank you, in behalf of our boys;
May your sorrows be few and many your joys;
May you edit these columns for many a long day,
In your excellent, brilliant and masterly way.

MRS. HENRY B. JONES, Washington, Ind.

Get Out of the Rut.

Habit is a relentless taskmaster and almost every man on earth is its slave. We have a way of getting into ruts and losing our individuality. We are slaves to ambition, and in reaching for our goal we forget the world about us and its countless beauties. We dig and delve and struggle, and strive for our one primal object, forgetful of the environment that lies just beyond everyday surroundings. In that broader environment is rest and joy and new life. In the office and street and home we become mechanical; we go and come over the same routes, do the same things and naturally think the same thoughts day after day. We are slaves of habit! We owe ourselves, our families and our business interests a debt which we are ignoring. Lest we forget that recreation and relief from the routine of business is a good paying investment as well as a pleasure, it would be wise to stop short, set a date, take a rest, enjoy the broad fields, the fresh air and the quiet of the country and snap our fingers in the face of that taskmaster who has made us an abject drudge.—Four Track News.

Back to Nature.

Mr. Robin and I in the black cherry tree
Are filled with the greatest contentment;
We bow to the wind, and the clover's enchantment,
And roundly applaud the soft tunes of the bee.

We care not, we two in the black cherry tree,
For the baubles of earth that we lose heart over;
We bow to the wind, and smile at the clover,
And roundly applaud the sweet tunes of the bee.

When the branches are bare in the black cherry tree
And the robin has long since departed,
In memory I'll cherish, and be not sad-hearted,
The sweet scented clover, and the soft tunes of the bee.

Father had been a locomotive engineer for many years, when a stroke of paralysis unfitted him for railroad duties, and he retired to the old homestead among the Pennsylvania farmlands to spend the remaining years of life. This was our first visit to him, and we were looking forward eagerly to a delightful vacation away from the noise and smoke of the city.

A day's journey by rail, and a twelve-mile drive brought us to our destination; but the drive being taken after dark it was left for daylight to reveal to us the beauty of the country about us, and we could only creep into bed tired and happy.

We were awakened early by father's voice calling us back from dreamland, and raising the curtain we beheld the beauty of the morning on a farm.

Great fields of snowy daisies, meadow lands yellow with buttercups, and the roadside pink with scented blossoms of red clover. But here the breakfast call put an end to beauty worship. When the dew had dried from the grass we visited every nook and corner on the farm. Father took us to the spring where the cattle were going for their morning's drink; to the barn where the big black horse was waiting to be turned out in the sunshine; to the poultry yard where his famous black Minorcas were feasting on their morning's mess of bran and meal, and last, but not least, by any means, we visited two tiny white pigs that were grunting away in comfort in their beds of straw.

Oh! what days those were, as the hours flew by on golden wings. Each of us found entertainment in doing whatever we liked best. Some fishing—for the Delaware river was only a few miles away—driving or lounging in the shade, and I confess to once, when no one was looking, running barefoot up and down the brown road, burying my toes three inches deep in the soft red dust. The evening hours before bedtime were among the pleasantest of the whole twenty-four. Mother would bring out upon the wide

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piazza great pitchers of sweet cider that she had canned fresh from the press the fall before, and we would pass the hours singing old time songs and in sweet family converse until the clock struck nine; after that the old house was left to the silent watches of the night.

Sunday on the farm is indeed a holy day. Sabbath school at ten o'clock, with the regular church services at eleven, held in a little white church overlooking a fine view of the surrounding country.

I felt that those were true worshippers of God—those men who tilled the soil and women whose faces were browned by many suns—and I knew as never before the meaning of "Blest be the tie that binds," when the hearty hand-clasp was given the stranger within their gates.

My first and last impression of those days on a Pennsylvania farm, back to nature, was that it was a country that God loved.

IMOGENE BATES,
Oneonta, New York.

Mount Vernon Lodge.

Mount Vernon Lodge No. 202 is in a prosperous financial condition, and its membership is increasing at a satisfactory rate. We now have twenty-three members on our rolls, but this hoodoo number is by no means "skidoo" for us, as several more applications are now awaiting action, and if enthusiasm on the part of our officers and members is any criterion to go by we may expect to take our place among the banner lodges of our beloved Ladies Society in the not distant future.

It is pleasant to note the change of sentiment that has taken place among the brothers of Potomac Lodge No. 7 since we organized Mount Vernon Lodge. I do not mean to imply that the brothers have not always been kind and helpful, as that would not be true; indeed, they were more than kind right at the beginning and have continued so throughout. Their action in donating six months' hall rent when we first organized, with an empty treasury staring us in the face, was a great factor in aiding us to withstand the vicissitudes of a somewhat precarious existence, and will always be remembered by our members with feelings of gratitude. Nevertheless, it cannot be doubted that many of the brothers regarded us with feelings of kindly tolerance, and looked upon our feeble efforts as something of a joke. But they have come to understand us better, and have awakened to the fact that the Ladies Society is a factor of considerable importance in maintaining what may be called the social spirit in the B. of L. F. and E. Unless this social spirit is kept alive no organization can hope to at all times present an attractive face to new or prospective members, and just in proportion as this spirit permeates the membership of a lodge will it grow and prosper. To assist in maintaining this spirit is the most important function of the Ladies Society as an auxiliary to the B. of L. F. and E., and I wish the brothers generally would come to a better understanding of that fact. It would be of benefit to both organizations.

The details of our visit to Baltimore, where we were entertained by the sisters of Pride of 216 Lodge, have already been chronicled in the Magazine, and I need not repeat them. I can only extend to our Baltimore sisters, on behalf of the members of our lodge, heartfelt thanks for the royal manner in which we were treated, and ask their pardon for this extremely belated acknowledgment of their courtesy and kindness. But we hope soon to have our Baltimore sisters with us for a return visit, on which occasion we shall endeavor to reciprocate in kind and convince our sisters that the members of Mount Vernon Lodge are not unmindful of the exceptional courtesies that were showered upon them on February 14th. We cannot hope to excel the feast of good things that we enjoyed at the residence of Sister Bopp, but we shall do our best to equal it.

The next event of importance on our social calendar is a joint excursion and picnic to Marshall Hall by Potomac Lodge No. 7 and Mount Vernon Lodge No. 202, on August 14th. Marshall Hall is one of the most attractive of the many beautiful pleasure resorts around Washington, and if the weather man is in good humor we are expecting that the 14th of August will be one of the red-letter days in the history of the two lodges. A steamer has been chartered especially for the occasion, and the members of both lodges are exerting themselves to make the event an unqualified success. JEANETTE BORLAND.

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Twenty-nine.

Just look a little further and a word
from us you'll find,
For we wish to be remembered—we of
Twenty-nine.

We're not so very many, and yet we're
quite a few,
And we're just as bright and happy as
the morning with the dew.

For what's the use of crying if the
clouds grow dark sometimes,
For just a little farther the sun's rays
there you'll find.

So lightly fan your spirits and put your
shoulder to the wheel.
And try to help our brothers, whose
interests we should feel.

So let's cast a beam around them and
keep up their spirits, too,
And show them that life's worth living;
that's what we mean to do.

And we never forget our motto—
Friendship and Charity—at all
times,
For we mean to be true and faithful—
we of Twenty-nine.

MARGUERITE BOSTIC,
Topeka, Kansas.

Kitchen Showers.

Tuesday, June 11, and June 18, marked the occurrence of kitchen showers in the lodge room of Utopia L. S. No. 43, having a limited number of invited guests, friends of each bride-elect.

The first date was in honor of Sister Alice Ritchie, whose marriage to Mr. James Murphy took place on the 26th inst., and on the 18th, Sister Lulu Bilderback, whose marriage to Mr. William Warburton also occurred on the 26th inst., was complimented in the same manner as Sister Ritchie.

The lodge room was profusely decorated in the lodge colors, with palms, ferns and cut flowers and green leafage. A cozy corner was arranged in one corner of the room, where a table was placed with the many useful gifts from the sisters and friends of the bride. The president, Sister Katie Fitzgerald, on each occasion presented the gifts, with a beautiful wedding guest book as a special souvenir of the occasion, to the bride-elect.

The table was decorated with hand-embroidered center pieces with red and white roses. The colors of the society were strung from the chandelier to the bride's chair, forming a canopy with green leafage encircling, having a large bag of rice suspended, and while the guests were being seated the bride-elect was showered with rice.

The refreshments consisted of red and white cream with delicious cake, the frappe bowl on each occasion being presided over by young ladies of the lodge. After refreshments several instrumental and vocal numbers were rendered by the friends and sisters of each bride-elect and formed a feature of a very pleasant afternoon.

The members of No. 43 wish every blessing bestowed on these happy young couples, and we hope to have Sisters Murphy and Warburton often in our lodge room.

KATIE WELSH,
Houston, Texas.

Pleasant Visit.

On July 12th, Pride of No. 214 Lodge No. 116 took a trip to Washington, D. C., to visit Mt. Vernon Lodge No. 202, who five months ago had honored us with a visit. There were ten in the company who left Union Station on the 12:50 train, reaching Washington shortly after two o'clock. Sisters Brown, Rullman and Flynn of No. 202 were there and acted as guides through the Capitol and Congressional Library.

After viewing the beauties and magnificent splendor of the Library we were escorted to the home of Mr. and Mrs. Smith, where we were made acquainted with more of the members of No. 202.

A short while was spent in social chat. Then we were invited to the dining room, which was gaily decorated for the occasion in our lodge colors, and were served with a most bountiful repast. I am sure none of the sisters of No. 116 will ever forget the pleasant afternoon spent at Sister Smith's home nor the feast of good things prepared for us.

Some of the company then went for a stroll over the city until time for their regular lodge session, to which we were most anxious to go. They have everything down fine and all business conducted in "apple-pie order." Our Worthy Grand President Sargent was with us

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and made a brief address, giving us some excellent advice.

After the business session members of the Brotherhood and our Grand Counselor Sargent were welcomed and enjoyed the rest of the evening with us.

We were served with refreshments, after which we had to turn our faces homeward, as Mr. Sargent said, "Back, back, again to Baltimore," with pleasant thoughts of a very happy afternoon and evening as guests of Mt. Vernon Lodge.

We shall ever cherish on memory's page our visit to Washington on July 12th as one of the bright, happy days of our lives. Those who were not permitted to go for various reasons deeply regretted their inability to go with us.

No. 116 is growing steadily and is soon going to add five or six new recruits to its membership.

Yours in F. & C.,
LILLIAN F. MARKEY,
Baltimore, Maryland.

Pleasant Surprises All Around.

The following extracts from a clipping taken from the Review, Cleburne, Texas, was kindly sent me by Mrs. Viola Ricks. It may be suggestive to others:

"The fair members of the Ladies Society of the B. of L. F. and E. believe in pleasant surprises, and dealt them out last night with a lavish hand. It was a joint meeting night of the society and the lodge, and when the men belonging to the latter assembled at the Eagle's Hall they were first treated to an unexpected but delightful program of music and recitation by their co-workers of the gentler sex.

"Following the program delicious refreshments were served shortly afterwards.

"There were several visitors present from out of the city, among them several young ladies talented in music, who helped entertain their hosts the evening with many choice selections of instrumental music.

"Following the pleasant evening at the lodge hall came the most unexpected and important surprise of the whole occasion. Two of the handsomest ladies were delegated to take a bountiful supply of the delicious cream and cake which had fortunately survived the onslaughts of their partners of the evening to the night force of the Review, in order that this overworked and weary crew might partake of the evening's refreshments also.

"This kind intention was carried out to the full of the deed, and after expressing their appreciation of past favors received from the Review, the ladies mentioned brought in our cream and cake just in the nick of time to save our souls, if not our lives.

"We had been having trouble with machinery and lights sufficient to cause a veritable saint to tear his hair and loudly swear, and the atmosphere had been of indigo hue for some time. The cream came at an unusually welcome time and soon cooled the tempers made hot by provoking lights and malicious imps in the machinery, for which great service the Review crew spoken of will always hold lodge, society and the two angels in disguise in kindly remembrance."

Letters from Friends.

FROM L. S. 48.—(*Mrs. J. S. Teter, Brookfield, Mo.*) Once more I take pleasure in writing to the sisters and telling them about our lodge here, although I must confess I felt a little disappointed at my last letter being delayed so long in being published. I really had given it up and thought that the Editress had discarded it altogether and had thrust it headforemost into that great waste-paper basket of hers; but after long waiting it appeared at last, and I took courage and will try again.

Our lodge is doing some fine work since we held our annual election of officers, and all seem to take hold of the work with renewed interest. I think our lodge will prosper, as we certainly have an energetic set of officers, with our same old president re-elected again, as we all think her the proper lady in the proper place.

We are soon to hold a joint meeting with the brothers and we are all looking forward to same with great anticipation.

The stork has visited one of our sisters, Mrs. Jane Griffin, and left her a little son. This little fireman is welcomed by all the sisters, and we hope that Sister Griffin will be enabled to meet with us again soon.

Our attendance has been so good this summer, due to a great many of our members being gone on vacation trips, etc., but they are commencing to return

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and we hope to soon see all in their places again.

Sister Foreman, one of our most faithful members, has been very sick this summer, but I am indeed glad to report her some better at this time.

Sisters McNish and Clark have also been ill and obliged to seek other climes for the benefit of their health.

With best wishes for all members of the L. S.

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FROM L. S. 225.—(*Gertie Leach Cunningham, Sedalia, Missouri.*) Dear Sisters in Friendship and Charity: I must send you a few lines so that you will know that we are alive and hustling. We held a very enjoyable entertainment and ice cream social at our hall last month, to raise funds to get new badges. Needless to say, we were very successful.

It is with a deep feeling of regret that I must announce the death, on June 28th, of our beloved sister, Emma Baker, one of our charter members and a trustee of our lodge. We shall miss our dear sister very much, for she was always faithful in attendance and so interested in our work. We sympathize with the dear little daughter that is bereft of a mother's care and with her devoted husband.

We feel that we have lost a loving sister as well as a faithful friend.

But God knows best, and what is our loss is her gain.

On July 11th, we held joint installation of officers with the brothers, and after the ceremonies of installation were completed we were served with a fine supper and all had a good time. We are very proud of our new officers and feel that we have made a wise selection, and we hope with their help to have a truly prosperous year.

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FROM L. S. 41.—(*Nellie G. Alspach, South Cumberland, Maryland.*) I feel sure that the many sister lodges will be pleased to hear a word from Pride of No. 448, as I have been a member for almost four years and have never yet to my knowledge had the pleasure of reading a letter in the columns of the Ladies Department from Lodge No. 41. I have just recently been appointed Magazine correspondent and will try my hand for the first time in this capacity.

Some time ago Altamont Lodge No. 448 promised us a joint meeting the fifth Tuesday evening of the month. So on April 30 we held our first joint meeting. All eligibles to join either lodge were invited to attend. The hall was beautifully decorated for the occasion with bunting and flags, palms, and ferns. There were some two hundred and fifty present, and promptly at 8 p. m. the meeting was called to order and the evening's exercises were opened by an address of welcome by C. F. England, the Master of No. 448. A fine program, consisting of speeches, recitations and several very fine solos were rendered. Music was furnished by the South Cumberland orchestra. After the program was given all repaired to the dining room, where an elaborate banquet, consisting of all of the delicacies of the season, was served.

The committee in charge worked hard to make this event a success and it certainly must have been, from the many compliments they received afterwards.

I love to read in the Ladies Department about sister lodges being in such flourishing conditions, and wish I could say more about our lodge.

We are composed of thirty-six members and almost half of that number live in other localities, and it is almost impossible for them to attend meetings, consequently our attendance is small.

As our next meeting day is nomination of officers, I hope, if any changes are made in our staff of officers, it will be for the good of the Order.

We extend a hearty invitation to all visiting sisters to visit us in our lodge room when in our city. We meet the second and fourth Wednesdays of each month.

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FROM L. S. 33.—(*Mrs. Ella C. Thomas, Paducah, Ky.*) Dear Sisters—This is my last venture as Magazine correspondent for No. 33. It is with a feeling of regret that I must lay down the pen, notwithstanding that I feel my inefficiency greatly; but it is a pleasure to me to tell the sisters of the happenings of dear old 33; but all things have an ending, and so my turn has come to an end, for long before this is in print I shall have moved to the beautiful city of Chattanooga, Tenn. It is with a feeling of regret that I must leave my dear "old Kentucky home," but duty calls and I obey.

The election is near at hand and I trust that we will get as good officers as

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we have now, and I am sure whoever our worthy president is, she will appoint a live correspondent for the Magazine. If the sisters forget me it will not be through me keeping silent, for I certainly expect to "bob up" every now and then in the columns of the Ladies Department. I hope that ere this year closes there will be a L. S. organized in the city whither I am going.

We gave a dance on May 17 at Wallace Pary Pavilion, it being the second open-air dance of the season, and was a decided sucess in every respect. We will give another dance at the same pavilion on June 6, and hope to do as well as we did with our first attempt.

We have the reputation of giving the finest dances of any order or club in the city. We ladies manage everything ourselves, with the exception of a gentleman to manage the floor. We hope to retain the reputation that we now enjoy.

We should be so pleased to have some of our Grand Officers at some of our social functions. It has never been our pleasure to entertain any of our Grand Officers, and what a pleasure it would be for us to do so. Grand Officers, let me urge you to come. We had the pleasure of meeting one of the Grand Officers of the B. of L. F. and E., Brother Shea, and we would enjoy another visit from him.

Our worthy president, Sister Varble, and Brother Varble, celebrated their crystal wedding on May 11, it being the fifteenth anniversary of their marriage. Sister Varble, at our joint meeting, extended an invitation to all brothers and sisters and their families to attend. Needless to say, this invitation was quickly accepted. It was a very enjoyable affair indeed. The house was prettily decorated in ferns and cut flowers. Delectable refreshments were served and a delightful evening was spent in merrymaking. Our gift to Brother and Sister Varble was a handsome cut glass water bottle.

Our "goat" is not overworked of late, but we manage to have a candidate often enough to keep "her" in practice.

Long live dear old "Heartease." May she keep her banner ever unfurled and cast the broad mantle of charity around the brothers of No. 238 and No. 165, in whose interests we are organized, and for whom we so cheerfully labor. May she stand as firm as a giant oak—ever onward, ever upward; and may many brothers who are weary and heartsore find shelter and comfort in the shadows of her protecting love.

"Long live our Order bright,
Offspring of truth and right,
Sent from above."

I hope No. 33 will ever be as pure as the flower whose name she bears, the beautiful "Heartease."

FROM L. S. 177—(*Elizabeth M. Herman, Middletown, N. Y.*) Just a few words to let the sisters know we are still on the L. S. roster and getting along nicely. It will soon be time for election of officers, and one of our first aims should be to put officers in our chairs that have good sound judgment and women that have a good, warm heart towards every member; ones that will endeavor to be impartial to all, will visit all members and not just a few; women that will stand by their convictions and not fly all to pieces when everything does not go just the way they think it ought to; women who are not fault-finders, particularly with the members who try to aid our worthy president by filling a vacancy—we all know that a member acting in an absent officer's place is always a little nervous and liable to make mistakes. Do not call her down, but take the mistake in a kindly way and give your criticisms with a kindly feeling in your heart. I have seen this done in lodge rooms, and think of the humiliation of a member who is trying to do the best she can, to receive harsh criticisms. A member should be shown the same respect and courtesy as an officer.

One more thing to the sister officers: Don't, by all means, be too sedate in your lodge rooms; it makes everything too lonesome. We want to be smiling, and a little joke now and then will make everything just as pleasant and all will enjoy themselves as one large family out for an afternoon of pleasure. Is that not one of the chief objects of our organization? All working together for the good and welfare of our beloved Order.

I think when Sister Sargent, our Grand President, reads this, she will think that I am a little too plain in my way of thinking and expressing myself. But Sister Sargent knows me, and sisters, it is true, that if we make our meetings pleasant it will be an inspiration to all to attend every meeting. As the sisters go

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home from lodge meeting and meet a sister on the way who has not been present, they will say: "Oh! you just ought to have been out to the meeting; we had such a lovely time today. You must try and come out next meeting day," and thus it will put the stay-away to thinking, and she will want to come and enjoy the good times with the rest. But, on the other hand, if you meet a sister who is a stay-away, after a dry meeting, you will very likely answer her question of: "Been to meeting?" with "Oh, yes, but just as soon stayed at home." "Why?" "Oh! it was so dry." And that stay-away will think, "Well, I am glad that I did stay away; there is nothing to go there for." Frankly, I thought that way myself, once.

I could go on telling things we all could do to make going to meeting a pleasure, but I fear Sister Strong will be tired when she finishes reading this as it is, and so, with this little clipping from the Grand Union Herald, entitled "A Philosophy of Joy," I will close:

"A quiet home; vines of our own planting; a few books full of the inspiration of genius; a few friends worthy of being loved and able to love us in turn; a hundred innocent pleasures that bring no pain or remorse; a devotion to the right that will never swerve; a simple religion, empty of all bigotry, full of trust and hope and love—and to such philosophy this world will give us all the joy it has."

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FROM L. S. 155—(*Mrs. R. S. McGregor, Boston, Mass.*) I do not think Pride of the East Lodge No. 155 has been heard from through the columns of the Magazine since the lodge was organized, February 8, 1902. Five years old past last February; but better late than never. We have taken in twelve new members since convention and have two applications on file, which will make a membership of thirty-seven. We heartily welcome the new sisters, and hope their membership will be a benefit to us, as well as to them.

Our lodge is not large, but the sisters are all willing and earnest workers.

Through the past season we have held social dances and whist parties, which have been very successful, socially as well as financially, and have in a way been the means of our gaining new members.

Saturday, June 8th, we invited the members of No. 485, and their families, to join us in a social evening, and I am sure as many of them as could came. Dancing and other entertainments were enjoyed, after which a delightful luncheon was served in the banquet hall, and it looked as if the efforts of the committee were fully appreciated.

I am sure the committee, of which Sister Nettie Pierce was chairman, deserves much praise for the supper provided, as well as the efficient manner in which it was served.

All appeared to enjoy the evening, and we hope to have many more of them in the future.

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FROM L. S. 209—(*Mrs. Ora Oates, Dalhart, Texas.*)

Although I'm not a poet,
As you will plainly see,
Will write you just a few lines,
So you'll know you've heard from me.

Rita Blanco's growing nicely;
Yes, she's coming to the front,
With Keener for our president
We'll sure not be a runt.

The sisters all are anxious for
The lodge day to come, I'll "bound,"
For they know one thing is certain,
There'll be "Moore Oates" passed around.

Though they may not be the best kind
That there is in the land,
They are of the "sure" kind—
"Sure," to be on hand.

Our lodge has been organized only about one year, but have grown to more than twice the number it was when organized; also have some new names on the table that we hope to initiate at our next meeting. We have our eye on the "Big Ten" and hope to be in that column before long.

We have had several social gatherings, the last being a dance given to celebrate our first anniversary.

The hall looked very inviting in its pretty decorations, with our emblematic colors, and each of the L. S. members wore the red carnation, our emblematic flower.

Quite a pleasant evening was had, and when the orchestra played the last strains of the "Home, Sweet Home" waltz, the large crowd departed, well satisfied, and expressed themselves as having had a delightful time.

We extend thanks to the brothers of

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No. 105, who so kindly assisted in making this event a success.

As this is my first attempt at press correspondence, will not stay longer, as there would be more room for criticisms, which may be too numerous already to escape the eagle eye of the Editress and the big waste-paper basket.

I have the best wishes for the B. of L. F. and E. and the Ladies Society.

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FROM L. S. 219—(*Lottie Jones, Green Island, New York.*) Christmas Lodge No. 219 has had so many social times since we last wrote you that I scarcely know just where to begin to tell you about them all. We held a joint ball with the brothers and it was a decided success. I do not know just what the proceeds were from that, as the returns are not all in as yet. We also held a very enjoyable popcorn social at the home of Sister Prefountain.

We have changed our meeting place and we will now be found in Odd Fellows' Hall, and all visitors are always welcome to any and all of our meetings and to our social good times.

We were indeed glad to have a visit from our Grand President, Sister Georgie M. Sargent, and wish it were possible for her to be able to meet with us more often. We were very sorry that we could not meet in our new hall while she was with us, but Sister Kai kindly donated us the use of her new home (which, by the way, is very beautiful), and entertained us very nicely. We were also very much pleased to have several other visitors from Albany, including Sister May Foley, who is always welcome.

I must not forget to tell you of the arrival of a "bran" new fireman at the home of Brother and Sister Clapper.

We have one application on the table and expect to take in a new member at our next meeting.

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FROM L. S. 112—(*Emma F. Helker, W. Philadelphia, Pa.*) Have had the honor to be appointed Magazine correspondent for No. 112, but, unfortunately, have not been able to fill this office on account of protracted illness. I take this, my first opportunity, of writing a few lines for the Magazine, just to let our sisters throughout the land know that No. 112 is still alive and prosperous. Through the long winter which has held us in its chilly grasp, our little lodge has had a most enjoyable time. First of all, Sister O'Mally gave a sauerkraut supper and a sale of fancy goods, which was thoroughly enjoyed by all. Many brothers of the Joint Protective Board, then in session in Philadelphia, helped to make this affair a grand success financially; in fact, they did not care how they spent their money. Come again, boys.

Next on the program was a visit to Camden, in response to a cordial invitation from the brothers of No. 72, who are anxious to organize a Ladies Society in their city—a business meeting, in which we endeavored to make plain the workings of our beloved Order, and in which we succeeded in enrolling sixteen names for a charter application. We were escorted by the brothers to the dining hall, where we were royally entertained, being catered to by the brothers alone, and what the boys of No. 72 don't know about serving a supper is not worth learning.

We then took a trip to Pottsville, where we were received and entertained by the sisters of Lodge No. 172 and brothers of No. 560, who made every effort to make our trip a pleasant one, and who succeeded so well that one and all of our little party declared they were sorry they had to go home.

Having received an invitation to attend the anniversary of Pride Lodge No. 60, of Harrisburg, on May 18, also to be present at a joint meeting with the brothers on the same evening, we next turned our faces west, arriving in Harrisburg Saturday afternoon. We were received by a committee from Lodge No. 60 and escorted to their hall, where again we had a royal good time. On Sunday we attended a joint meeting with the brothers, which was very much enjoyed by every one present. We left for home late Sunday evening, arriving in Philadelphia a tired but happy band.

Now, sisters, do not think it has been all play with us, as we have worked, too. We have enrolled seven new members on our roll and have several more applications on file. We have also added to our treasury in several ways, one of which was selling sofa pillows made in the Brotherhood colors, red, white and green, which took splendidly. We received about ten dollars each for these cushions.

As I have taken up so much space already, I will close with best wishes for the continued growth and prosperity of the Ladies Society.

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I should be pleased to exchange souvenir postals with the sisters of the L. S. Address me as Mrs. Emma F. Helker, 3860 Aspen street, West Philadelphia, Pa.

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FROM L. S. 155—(*A Member, Somerville, Mass.*) Having seen nothing recently of our lodge in the Ladies Department, I venture to write and let you know a little of what we are doing. I feel quite sure that the sisters would be interested in knowing that "Pride of the East" is very much alive and prospering.

We have added several new members this year and have each month enjoyed a social dance, which has helped greatly to add to our membership and also to the general fund in our treasury.

We are very proud to tell you that our lodge is in a prosperous condition. Our membership enjoy the work of the lodge and cheerfully helps in bringing in new members, visiting the sick and afflicted and attending all of the social events of our Order.

On the evening of June 8 the brothers of No. 485, with their families, were entertained. A bountiful supper was served, after which dancing was enjoyed, followed by vocal and instrumental solos. The hall on this occasion was tastefully decorated with the stars and stripes, and at each plate a miniature flag was placed as souvenirs of the occasion.

♦ ♦ ♦

FROM L. S. 77—(*Fannie Meredith, Peru, Ind.*) We are about to close another successful quarter and also our fiscal year. The outgoing officers have nearly completed a term of faithful work and the new ones are looking forward to future success. We will have installation at our next regular meeting, and expect, also, to have a social hour afterwards.

On May 8 the sisters of No. 77 gave a party and dance, from which a neat sum was realized. We repeated the experience on June 5th and 26th, with equally good results.

Our lodge has lost a number of its members through withdrawals, but we hope to add a few new members soon, who will take the place of those we have lost.

We wish to extend our sympathy to the widow of Brother Robinson, recently deceased. Brother Robinson was taken ill very suddenly with the worst form of diphtheria, and in a very short time death had claimed him.

No doubt this will be my last writing for the Magazine, at least for a while, so I desire to greet all sisters with best wishes and hopes for a bright and prosperous future.

♦ ♦ ♦

FROM L. S. 229—(*Elizabeth M. Fletcher, Toledo, Ohio.*) Being appointed Magazine correspondent of East Toledo Sisters No. 229, I take pleasure in writing you a few lines in behalf of our lodge. We were organized April 26, 1907, with eighteen charter members, and have lost no time in working for the good of the Order.

We gave a social May 16 and held a joint meeting with the brothers of Coldwater Lodge No. 63 on May 31st, which was a very interesting meeting.

June 21st we held a lawn fete, which was a very enjoyable affair and a success, as the proceeds placed in our treasury proved.

We have initiated one new member and have four applications now on file, and we hope to see each of them ride the "goat" at our next regular meeting.

We have had our annual election of officers, and after the installation, which comes on our next meeting day, we expect to have a social hour and serve refreshments.

I trust that you will find space in the L. S. Department for this letter. Best wishes for all sister lodges.

♦ ♦ ♦

Death Report.

Anna Osborn, Lodge 26; died June 18, 1907; cause, cancer of stomach and liver. Insurance, $200.

Margaret Hutchinson, Lodge 1; died April 18, 1907; cause, pernicious anaemia. Insurance, $200.

Emma Baker, Lodge No. 225; died June 28, 1907; cause, cancer of breast. Insurance, $200.

Jessie Covell, Lodge 70; died June 30, 1907; cause, tuberculosis. Insurance, $200.

Inga Nerwick, Lodge 31; died July 19, 1907; cause, general tuberculosis. Insurance, $200.

Kate King, Lodge 80; died July 9, 1907; cause, general tuberculosis. Insurance, $400.

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The M. C. B. Association recommends a

Knuckle Opener

"Which will throw the knuckle completely open and operate under all conditions of wear and service"

This recommendation exactly describes the operation of the

PITT—COUPLER

To make the operation of opening the knuckle by means of a "Kicker" as safe as it has always been by hand it is essential that the "Kickers" should work every time. The failure to do so has been the cause of many serious accidents.

We find many switchmen who, taught by experience, disregard the presence of any "Knuckle-Opener" or "Kicker" and open the knuckle, always, by hand, thus, in a very practical way is made manifest the necessity for a safe design in a "safety-appliance."

The "Knuckle-Opener" in the Pitt coupler is positive in its operation and pushes the knuckle open to its fullest range of movement either from a fully closed position or from any partially open position ***regardless of rust.***

With the Pitt coupler the switchmen will never be obliged to reach in—on sudden impulse—at the last moment and when the car is in motion to open the knuckle by hand.

Manufactured only by

The McConway & Torley Co.

Pittsburgh, Pa.

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WINKLEY ARTIFICIAL LIMB CO.

Jepson Bros.
SOLE OWNERS.

LARGEST MANUFACTORY OF ARTIFICIAL LEGS IN THE WORLD.

THE LATEST IMPROVED
PATENT ADJUSTABLE
DOUBLE SLIP SOCKET

Artificial Leg

WITH
SPONGE RUBBER
MEXICAN FELT OR ENGLISH WILLOW
Foot

WARRANTED
NOT TO CHAFE THE STUMP.

Made from Measurements and Cast Without Coming to Factory.

This cut shows leg for amputation six inches below the knee, with inside socket thrown out of its proper position in order to show its construction.

Waverly, Ky., Feb. 12th, 1906
Winkley Artificial Limb Co.:

GENTLEMEN:—I lost my leg in a wreck on the Southern Railway. Five months after the accident I received one of your Double Slip Socket Legs and can now walk nearly as good as before I suffered the accident and the leg does not chafe or hurt my stump in the least and I have walked miles at a time. I will gladly answer any letters of inquiry concerning the subject. Yours truly,
BOYD PHIPPS,
No. 409 B. of L. F.

Ft. Smith, Ark., Feb. 24, 1906
The Winkley Artificial Limb Co.:

GENTLEMEN—I am more than pleased to say that your leg is giving the most perfect satisfaction and it has proven just as you represented it to me. It does not chafe my stump or give me any discomfort whatever. I am a perfect walker and can hardly realize that I am a cripple. I can run and jump just the same as I did before my misfortune. I am on my feet continuously every day and with perfect ease and comfort. I will gladly answer all correspondence and especially to Railway men, who have had my misfortune.
HARRY GLENN, No. 244 B. of L. F.

THE WINKLEY ARTIFICIAL LIMB CO.:

SOMERSET, KY., Feb. 19, 1906.

GENTLEMEN:—Five months after amputation I received your leg and took my engine again. Can catch on or get off a train running 15 miles an hour; have been on my leg from 30 to 50 hours at a time; can take water and coal as quick as ever; am firing through a mountainous system and railroad boys know what that means. I ordered a second leg of you after wearing the first one several years and finding it satisfactory. Will answer any letters from the boys.
L. B. GUFFEY, No. 367 B of L. F.

MINNEAPOLIS, MINNESOTA, U. S. A.

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BROTHERHOOD OF

Locomotive Firemen and Enginemen's Magazine

Published at INDIANAPOLIS, IND.
by the
Brotherhood of LOCOMOTIVE FIREMEN AND ENGINEMEN

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GRINNELL "Rist-fit" Ventilated Gloves

This Glove is protected by Allowed and Pending Patent Claims

FOR YOU and the Whole Train Crew

Railroad men know a good thing as far away as they can see it.

That's why we count among Firemen, Engineers, Brakemen and Railroad men in general the firmest friends of Grinnell "Rist-fit" Gloves.

There's cool comfort in the ventilated back feature, which prevents sweaty, slippery hands by letting in a constant air current.

"Rist-fit" gloves will not work down over the hand. Notice how the strap is placed across the wrist. By pulling this strap closely a snug, tight fit is secured, which prevents dirt and cinders working down into the glove. The most durable of all working gloves.

Made of the same material as our famous Reindeere Gloves, may be washed as often as desired and will dry as soft and pliable as new.

How to Get a Pair Free

Ask your dealer for "Grinnell" Gloves. If he does not sell them send us his name and address and size of glove you wear, and we will have him take a stock, and will send a pair along for you free with first order to him, providing you are the first fireman to send in his name.

Morrison, McIntosh & Company, Makers
Grinnell, Iowa

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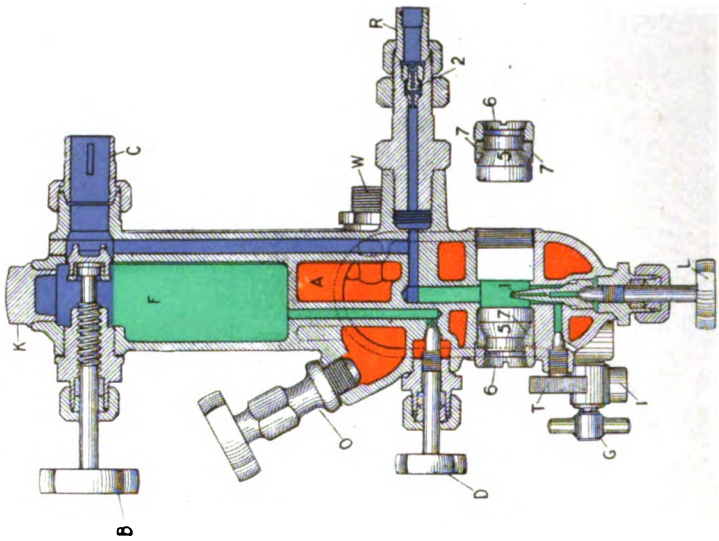

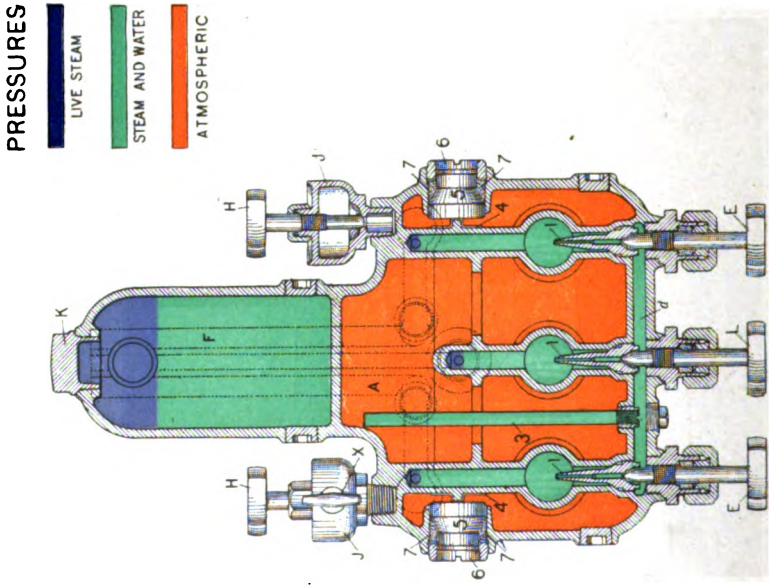

Locomotive Firemen and Enginemen's Magazine Educational Charts

LOCOMOTIVE APPLIANCE SERIES

PLATE XIII.—DETROIT No. 21 TRIPLE FEED LOCOMOTIVE LUBRICATOR (Reservoir Drained)

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BROTHERHOOD OF
Locomotive Firemen and Enginemen's Magazine.
TECHNICAL DEPARTMENT
JOHN F. McNAMEE
EDITOR AND MANAGER
SUBSCRIPTION PRICE
$1.50 PER YEAR.

PUBLISHED MONTHLY BY THE BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN

Entered as Second-class Matter December 27, 1906, at the Post Office at Indianapolis, Ind., under the Act of Congress of March 3, 1879

VOL. 43 NO. 4 INDIANAPOLIS, IND. OCTOBER 1907

Plate XIII—Detroit No. 21 Triple Feed Locomotive Lubricator (Reservoir Drained).

Plate XIII of the Locomotive Appliance Series of the Locomotive Firemen and Enginemen's Magazine Educational Charts shows sectional views of the Detroit No. 21 Lubricator in which the oil reservoir *A* has been drained.

In Plate XII the lubricator was shown with the oil expanded and condensation having fully taken place, with a trace of atmospheric pressure in the expansion chamber, oil tube *3*, oil feed chamber *d* and feed nozzles *1*, but, as explained in the previous article, this atmospheric pressure would quickly disappear upon opening the feeds *E L E* and be followed by solid drops of oil.

In order that we may study another condition we will assume that the lubricator has again run empty, that is, that all the oil which was contained in the oil reservoir *A* has fed out. The water valve *D* and the feed regulating stems *E L E* are closed, but steam valve *B* remains open and full boiler pressure is on the surface of the water in condensing chamber *F* as well as on that contained in the sight feed chambers. (The writer here wishes to emphasize the fact that if the water valve *D* has an absolutely perfect seat the lubricator can be filled, regardless of whether the locomotive is working or at rest, or that full boiler pressure is on the condensing chamber *F*.)

Assuming that five minutes has been allowed for the lubricator to cool down, or that it is to be filled by the outgoing crew, this condition would be represented as shown in Plate IX, April, 1907, Magazine, from which the reader will see that condensation occupies every portion of the oil reservoir *A*, oil tube *3*, oil feed chamber *d* and the oil ways above the sight feed chambers, but he will also note that there is full boiler pressure on the surface of the water in condensing chamber *F* and in the sight feed chambers. In order to again fill the lubricator with oil the condensation contained in the oil reservoir *A* must be drained off.

Plate XIII shows the lubricator with oil reservoir drained, but it will be seen that the oil tube *3*, oil feed chamber *d* and oil ways above the sight feed chambers still contain water—in Plates X and XI they contain atmospheric pressure, but this time it is water. It is desired to emphasize the fact that this is a condition common to all types of lubricators, as no provision is made whereby

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this water can be drawn off. In fact there is no occasion to provide a drain to the feed chamber *d*, as when desired this chamber, as well as oil tube *3* and the sight feed chambers, may be blown out as explained in connection with Plate IX and shown in Plate X, April and June, 1907, Magazines, respectively, and thereby cleansed of all sediment they may contain. If the water valve *D* has a perfect seat, as before mentioned, the filler plug *O* may now be removed and the oil reservoir *A* be again filled with oil.

Gasoline Motor Car of the Union Pacific.

Running as the second section of the Overland Limited between Omaha and Julesburg, on August 22, one of the new gasoline motor cars of the Union Pacific covered a distance of 570 miles in forty minutes less than the regular schedule time, the running time of the Limited being 17 hours and 15 minutes, whereas the motor car consumed but 16 hours and 34 minutes. This was a most successful trial and shows well for the capabilities of this type of motor car for both speed and endurance. The system has other cars of the same type in daily service which are said to be making perfect schedules on a run of about 172 miles per day, in addition to which others are in various stages of construction.

Rifled Pipe Line for Conveying Oil.

Advices state that a contract has been let by the Southern Pacific Company for the building of a rifled oil pipe line 256 miles long, from oil properties in Kern county, in the southern part of California, to tidewater on San Francisco bay.

A new and interesting feature of the line is the character of the pipe used, its "rifled" construction being a somewhat radical departure from that of lines now in use for conveying oil. Spiral indentations accomplished in the rolling of the pipe constitute the rifling.

An exhaustive series of experiments has demonstrated that after a small per cent. of water has been added to the oil, and the necessary pressure applied, that the whole will develop a whirling motion, and that the water being the heavier will seek the outside of the pipe, thereby enveloping the oil in a thin film or shell of water, this shell or film of water acting as a lubricant between the oil and the pipe, and thereby greatly reducing the friction and allowing the core of oil to glide through the pipe readily.

Throughout the length of 256 miles of pipe there will be twenty-three pumping stations, the equipment of each station being in duplicate, so that in the event of a breakage of any part of the machinery of one pump, the other may immediately be put into service.

With the size of the pipe, which is 8 inches, and the high pressure carried and improved facilities in every way, a rapid transmission of the oil has been shown to be possible, and it is estimated that at least 23,000 barrels of fuel oil can be delivered every twenty-four hours.

The Locomotive Appliance Company.

At the annual meeting of the stockholders of the Locomotive Appliance Company, which was held at its offices in the Old Colony building, Chicago, Ill., August 15, last, the following directors were elected for the ensuing year: Mr. Frank W. Furry, Chicago, Ill.; Mr. J. F. Allfree, Chicago, Ill.; Mr. Willis C. Squire, Chicago, Ill.; Mr. J. J. McCarthy, Chicago, Ill.; Mr. E. H. Allfree, Chicago, Ill.; Mr. Ira C. Hubbell, Chicago, Ill.; Mr. Clarence H. Howard, St. Louis, Mo., Mr. C. A. Thompson, St. Louis, Mo.; Mr. Ira B. Kegler, St. Louis, Mo.; Mr. F. B. Olney, Ludington, Mich.; Mr. H. S. Gray, Benton Harbor, Mich.

New Feed-Water Heater for Locomotives.

F. H. Trevethick, general manager of the Egyptian State Railroads, has adopted a new method of heating the feed-water for locomotives working between Cairo and Alexandria, which is described in a recent issue of the Revue Industrielle. The water is heated by the exhaust steam in combination with the waste heat of the smokebox gases.

The feed water is forced into the boiler by a horizontal motor pump placed on the left-hand side of the firebox, and using steam at full boiler pressure. The water passes from the pump through the first heater, which is formed of a cylinder set vertically between the frames below the

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feed pump. It is 36 inches high and contains 90 steel tubes 7-16-inch in diameter, about which the exhaust steam is made to circulate. The steam condensed by the cold feed water is collected in the bottom of the cylinder and is removed by a pipe and cock. The feed water is taken from this first heater and sent on through a pipe 2½ inches in diameter to second and third heaters which are set horizontally outside the cylinders in such a way as to receive a part of the exhaust steam on its way to the stack. The condensing surface, which is the same in the three, is formed of 42 tubes 7-16 inches in diameter and 5 feet 6 inches long, set in a cylindrical box. The second heater, which is on the right-hand side, is divided by a partition in such a way that the water traverses it twice in going through; in the third heater there is no such partition. The water passes from the third heater into a fourth heater, formed of an annular chamber placed in the smokebox and containing 265 water tubes of 1 inch inside diameter and 18 inches long, arranged in three concentric rings, which finally deliver to the boiler on its center line directly back of the smokebox.

The successive temperatures attained by the water in the course of its circulation through the four heaters are as follows:

Initial temperature on leaving tender.....	68 deg. F.
Temperature on leaving first heater.....	82 "
Temperature on leaving second heater 171	"
Temperature on leaving third heater.....203	"
Temperature on leaving fourth heater.....280	"

The estimated saving of fuel, under ordinary working conditions, is about 16 per cent.; but compared with the ordinary methods of operation, using injectors, the saving is more than 17 per cent. The averages of the results obtained in eight runs with heaters and eight without the heaters are given in the following table:

Heaters.	No. of trips.	Coal.	Weight of train (net).
Used.....	8	2,887.5 lbs.	251.08 tons
Not used.....	8	3,722.4 lbs.	254.10 tons

Heaters.	Speed per hour.	Temperature of feedwater.	Point of cut-off of stroke.
Used.....	48.11 miles	252 deg. F.	23.6 per ct.
Not used....	46.62 miles	.....	25.1 per ct.

The distance from Cairo to Alexandria is about 129 miles, and is covered by express trains making four stops in three hours and five minutes; the longest run without a stop being 74.4 miles. The coal consumption on the run from Cairo to Alexandria is about 12 per cent. more than in the opposite direction, during the summer months, because of the continual northwest winds that prevail and to which the line is especially exposed. This increase is quite marked in the detailed record of coal consumption for the several trips of the test and obtains both with and without the use of the heaters.

The consumption of coal per ton of weight hauled was 10.45 lbs. when the heaters were used and 13.30 lbs. when they were cut out, showing that the heaters effected a saving of 21.4 per cent., or that it was necessary to burn 27.3 per cent. more coal when they were not in use. The price of coal in Alexandria is about $5 per ton, and the cost of installing the heaters was about $1,250 per engine, representing an annual charge of about $187.50 for interest and depreciation, while the annual saving effected in 720 trips would be about 300 tons, or a net gain of about $1,300, which would be more than sufficient to pay for the equipment in a year. In an engine of this character exhibited at Milan especial provision was made in the arrangement of the smokebox heater, so that it could be used as a superheater for the steam, in case it should be desired either to cut out the heaters or use an injector instead of the pump.—The Railroad Gazette.

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The Smoke Nuisance.

It is currently reported that a campaign is on foot in Chicago for the electrification of the railways entering that city, with a view to eliminating as far as possible the smoke nuisance, Mayor Busse having headed a party on a tour of inspection of the terminal electrifications in New York City recently. The Railway and Engineering Review, in commenting on the situation, among other things says:

"We doubt very much if the electrification of every railway in the Chicago district would effect any noticeable clearance of the Chicago atmosphere. As a matter of fact, the locomotives in and about Chicago burden the atmosphere with an exceedingly small percentage of the amount of smoke noticeable. It is the office buildings, department stores, hotels, factories, power plants, tugs, dredges and steamships that cloud the at-

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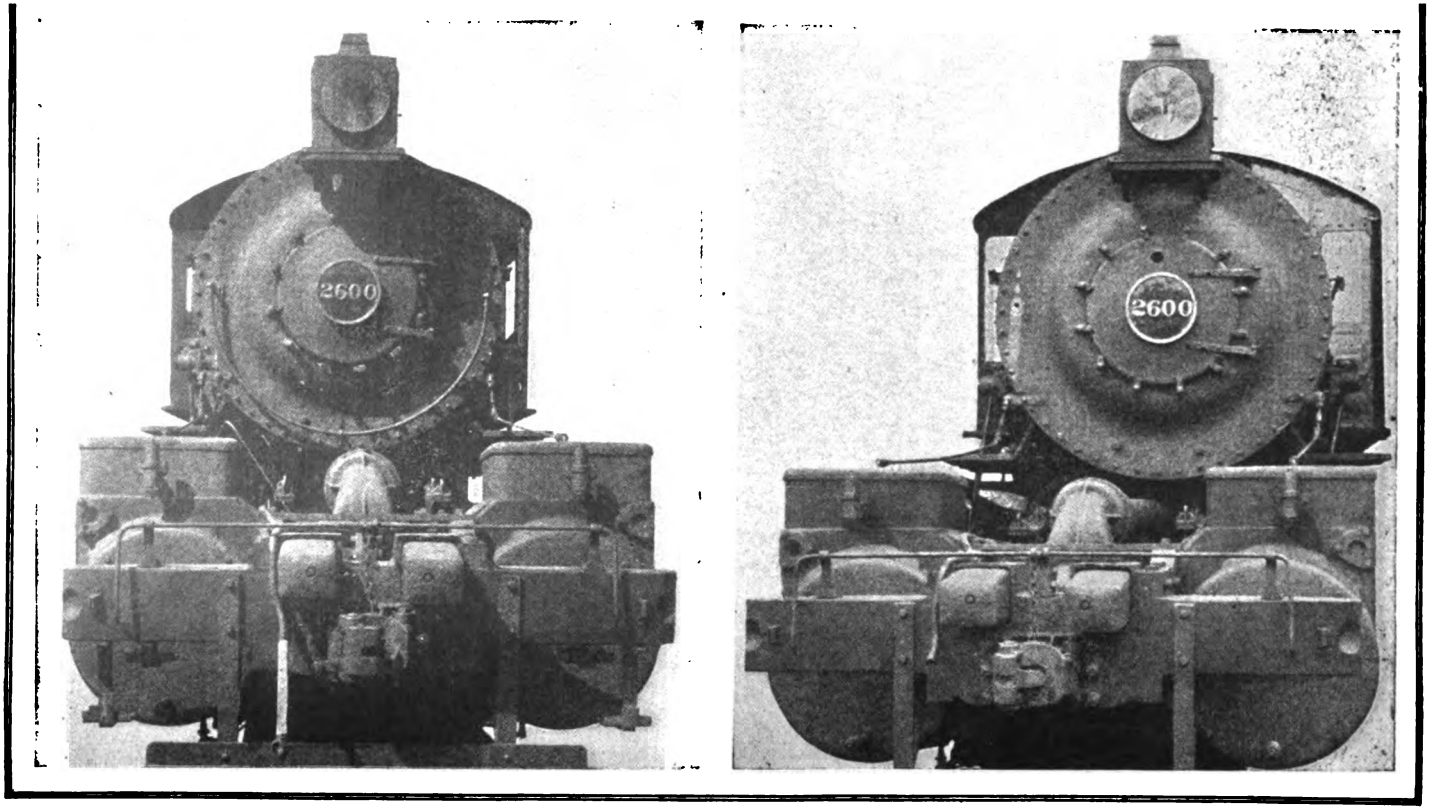

Front View as it Appears on Straight Track

Front View as it Appears on Curved Track

MALLET ARTICULATED COMPOUND LOCOMOTIVE FOR THE ERIE

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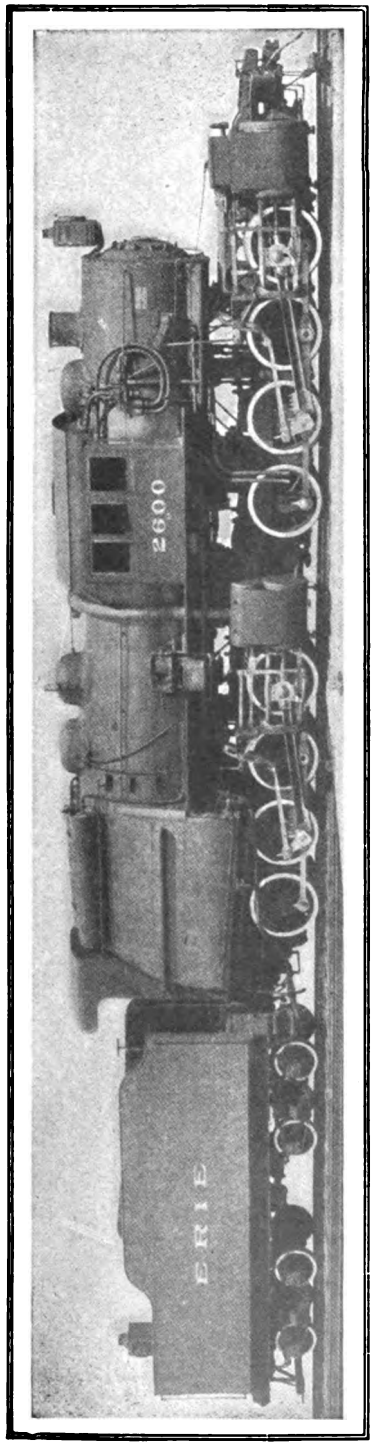

MALLET ARTICULATED COMPOUND LOCOMOTIVE FOR THE ERIE

mosphere. This is clearly observable from any high building in the city. And it will be ample time to take up the smoke evil with the railways after some much more feasible efforts have been expended among the greater offenders mentioned, not omitting the conspicuously flagrant city dredges working on the lake front of the city. As pointed out before in these columns, the substitution of the gas producer for the boiler plant in the power plants of the larger buildings is entirely practicable and would be of far more real effect on the smoke nuisance than abolishment of every locomotive in the city."

● ● ●

Mallet Articulated Compound Locomotive for the Erie.

There has recently been completed at the Schenectady works of the American Locomotive Company for the Erie Railroad, the first of an order for three Mallet articulated compound locomotives, which breaks all records in locomotive construction. Three years ago the first example of this type of locomotive for service on a railroad in the United States was that constructed by the American Locomotive Company for the Baltimore & Ohio Railroad, which astonished the world by its enormous size and great weight. At the time it was looked upon as a freak and predictions were made that trouble and failures would result from its operation. However, its success in pusher service on the mountainous grades of that road has fully demonstrated its practicability and the advantages of this type of construction for very heavy units. Its efficiency, both in economy of operation and maintenance, was so pronounced that the Great Northern Railroad later had several locomotives of the same general type constructed by the Baldwin Locomotive Works. The Great Northern locomotives, while somewhat heavier and larger than the B. & O. engine, are exceeded in size and weight by this latest production for the Erie. The essential features of the B. & O. engine, such as flexible joints to the high and low pressure cylinders, receiver and exhaust pipes, articulated connection between frames, boiler, bearings, power reversing gear, etc., are reproduced in the Erie engines and are practically the same. These new engines for the Erie are to be used in pusher service on a 1.3 per cent. grade betwen Susquehanna and

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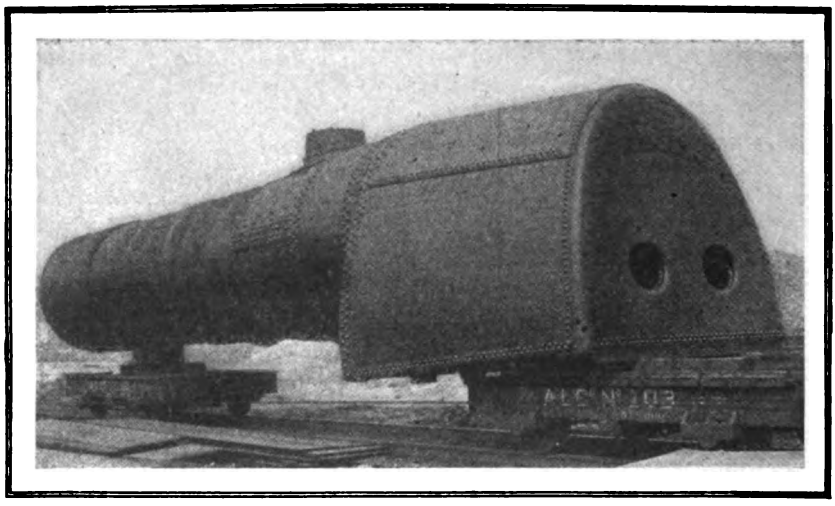
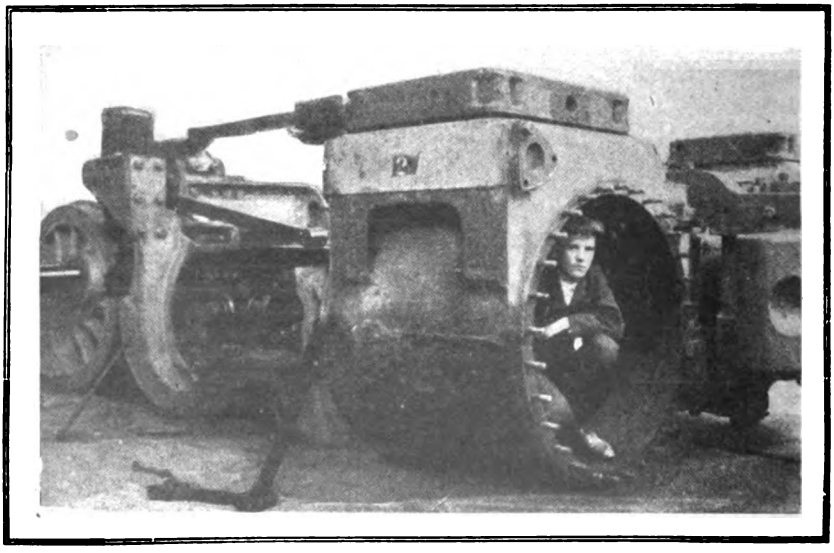


Mallet Articulated Compound Locomotive for the Erie—Boiler

Gulf Summit. It is expected that with a consolidation type locomotive at the head of the train they will be capable of successfully handling 2,660 tons over this grade.

The boiler, which is of the radial stayed type, with conical connection, is the largest ever built for locomotive service, the smallest course being 82 inches inside diameter, while the largest course has an inside diameter of 96 inches. There are 404 flues, 2¼ inches outside diameter and 21 feet in length, which weigh 23,700 pounds. The total weight of the boiler with water is given as 139,900 pounds. The firebox, which is of the Wooten type, is 120⅛ inches in length and 114¼ inches in width, with a grate area of 100 square feet. There is 5 inches of water space at the mud ring on all sides. Radially stayed to the shell of the boiler is a combustion chamber 4



Mallet Articulated Compound Locomotive for the Erie—Low-Pressure Cylinder

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feet in length. The valves for the high-pressure cylinders are of the piston type, while the low-pressure cylinders are provided with Richardson slide valves. The valves for both high and low pressure cylinders are operated by the Walschaert valve gear. The reversing gear is so arranged that the weights of the two valve motions counterbalance each other. In forward motion the valves of the front, or leading engine (external admission), are operated by the lower end of the link, while the valves of the rear engine (internal admission) are operated by the upper end of the link. It will thus be seen that the two motions operating in conjunction with each other have a tendency through the weights of their parts to counterbalance each other. In addition to this feature the reversing gear is provided with pneumatic reversing cylinders, which permit of positive automatic locking in any desired position, and render the operation of the locomotive much easier than that of the ordinary road engine.

Mallet Articulated Compound Locomotive for the Erie—Smokebox

Steam from the boiler leads from the throttle and dry pipes to a T head on top of the boiler, from whence it passes through the steam pipes outside of the boiler to the high-pressure steam chests. The exhaust steam from the high-pressure cylinders passes through an intercepting valve to a 9-inch receiver pipe which extends forward and between the frames to the low-pressure steam chests. From the low-pressure cylinders the exhaust passes through an elbow to the exhaust pipe in the smokebox. Both the receiver and exhaust pipes are provided with universal and slip joints which permit the free movement of the front frames in all directions, allowing the locomotive to traverse curves of 16 degrees.

This locomotive, as well as the one in use on the Baltimore & Ohio Railroad, is compounded on the Mellin system. By means of the automatic intercepting and reducing valve employed, live steam at a reduced pressure is admitted to the low-pressure cylinders in starting and may be employed to increase the pressure in those cylinders at any time desired,

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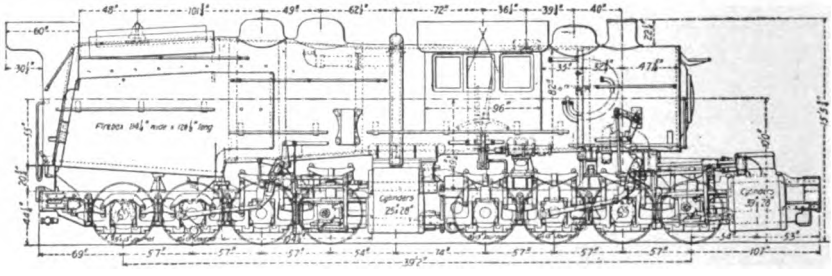
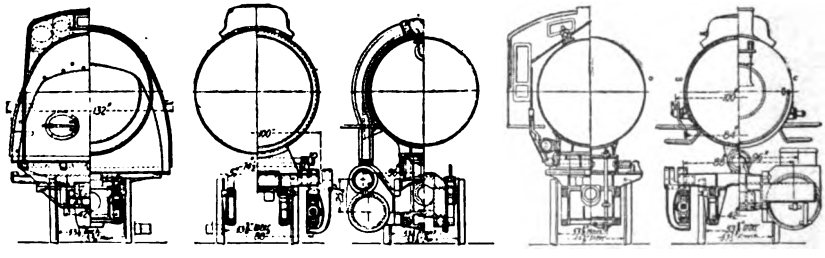
thereby proportionally increasing the tractive effort. The Great Northern locomotives, however, are not provided with this feature, but instead have a pipe connection between the boiler and receiver pipe by means of which the engineer may at his discretion admit live steam to the low-pressure cylinders.

The following comparisons between the three locomotives mentioned will prove interesting:

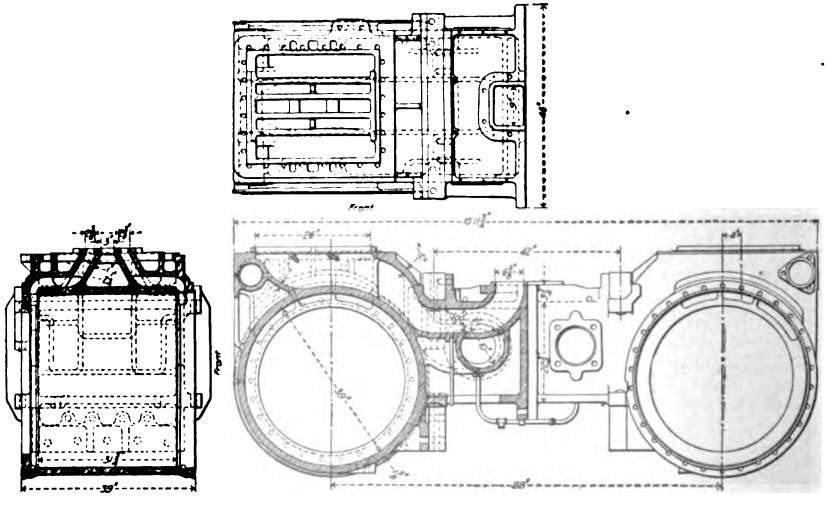
Type—B. & O., 0-6-6-0; G. N., 2-6-6-2; Erie, 0-8-8-0. Builder—B. & O., American Locomotive Company; G. N., Baldwin Locomotive Works; Erie, American Locomotive Company. Total weight in



Mallet Articulated Compound Locomotive for the Erie—Side Elevation



Mallet Articulated Compound Locomotive for the Erie—Cross Sections



Mallet Articulated Compound Locomotive for the Erie—Low-Pressure Cylinders

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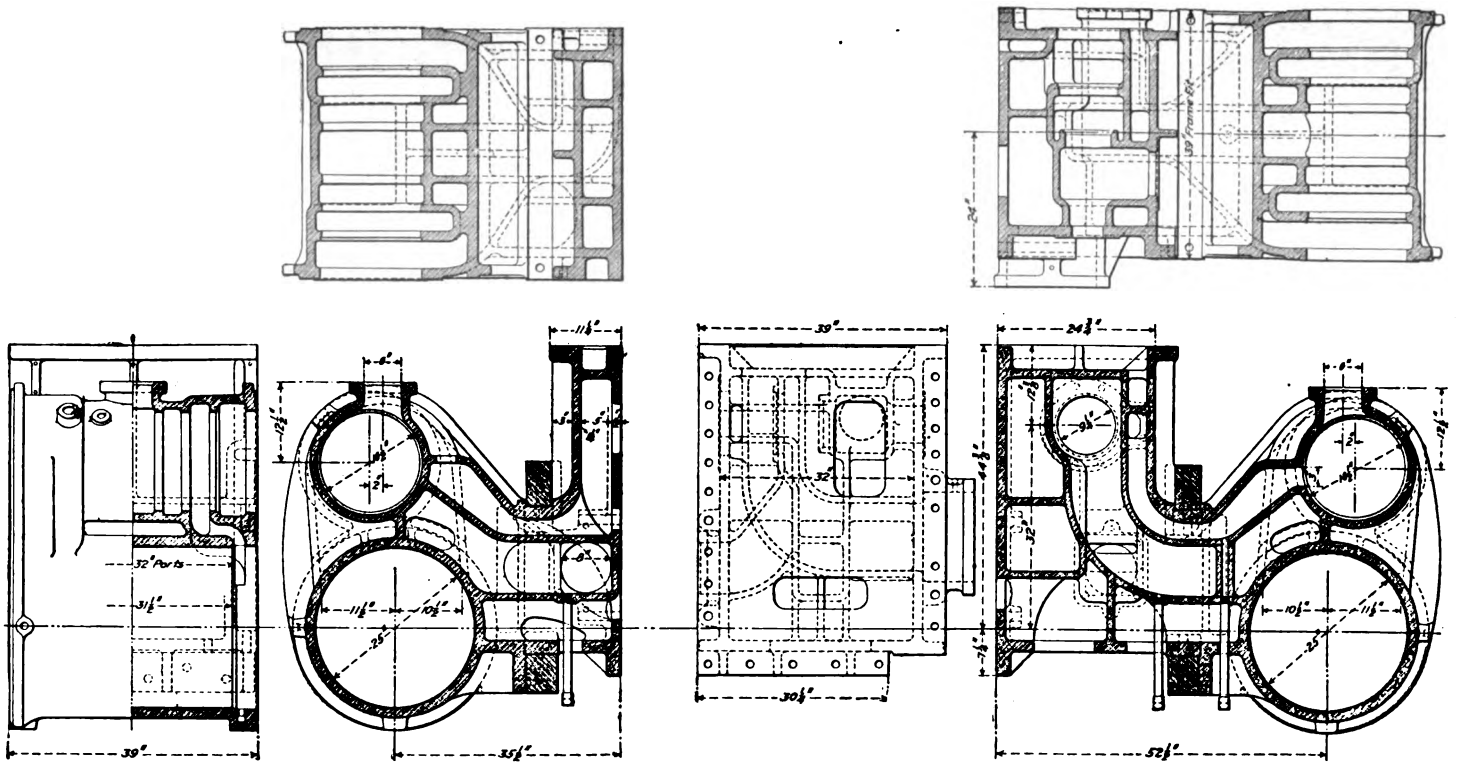

Right-hand High-Pressure Cylinder

Left-hand High-Pressure Cylinder.

Mallet Articulated Compound Locomotive for the Erie

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pounds—B. & O., 334,500; G. N., 355,000; Erie, 409,000. Weight on drivers in pounds—B. & O., 334,500; G. N., 316,000; Erie, 409,000. Tractive effort in pounds—B. & O., 70,000; G. N., 71,600; Erie, 94,800. Diameter of cylinders—B. & O., 20 and 32 inches; G. N., 21½ and 33 inches; Erie, 25 and 39 inches. Stroke—B. & O., 32 inches; G. N., 32 inches; Erie, 28 inches. Diameter of boiler—B. & O., 84 inches; G. N., 84 inches; Erie, 84 inches. Steam pressure—B. & O., 235 pounds; G. N., 215 pounds; Erie, 215 pounds. Diameter of drivers—B. & O., 56 inches; G. N., 55 inches; Erie, 51 inches. Total heating surface—B. & O., 5,600 square feet; G. N., 5,703 square feet; Erie, 5,313.7 square feet. Total wheel base—B. & O., 30 feet 8 inches; G. N., 44 feet 10 inches; Erie, 39 feet 2 inches Driving wheel base, rigid—B. & O., 10 feet; G. N., 10 feet; Erie, 14 feet 3 inches.

For the benefit of those of our readers to whom the application of the word "articulated," as used in connection with the Mallet type of compound locomotive, may not be clear, will say that the definition of the word "articulate," as given by the Century Dictionary and Cyclopedia, is to divide into joints or members; to joint; unite by means of a joint: as two pieces loosely articulated together. The same authority defines the word "articulation" as the act of putting together so as to form a joint or joints. In other words, articulated is the synonym for jointed. In the case of the Mallet articulated compound locomotive the rear end of the front engine frame is pinned or pivoted to the front end of the main, or rear, engine frame by means of a hinged joint. In addition to this are numerous other universal and slip joints rendered necessary by this form of construction. Hence the name "articulated."

*Water-Gauge Glasses.**

The topical discussion of the Master Mechanics' Association on the question, "Is it desirable to eliminate water-gauge glasses on locomotives to enforce the use of gauge-cocks?" was opened by F. F. Gaines (Cent. of Ga.), as follows:

The wording of this subject is such as to pre-suppose the superiority of the water-glass over the gauge-cock, and from a personal standpoint I agree with that supposition. We have, however, to consider the effect of eliminating the water-glass from two standpoints. I might say the first will be decided by what might be termed a legal standpoint, and the second by the effect on operating. We will suppose, for the sake of argument, an accident occurs on some railroad on which the water-glass has been removed, due to low water. What effect is it going to have on a jury to remove an admitted safety appliance? Is it going to have an effect that is undesirable or is it going to have any effect at all? The other point is the effect on operation. I have been connected with one railroad where we had no water-glasses whatever, but used the gauge-cocks entirely, and with another road where we were partly equipped with water-glasses and gauge-cocks, and both roads had occasional low water and occasional boiler explosions. The road I am now connected with I found equipped both with gauge-cocks and water-glasses. Recently, one of our engineers lost an eye through the breaking of a water-glass at a terminal, while waiting to go out on a train. I looked into the whole matter of the desirability of doing away entirely with the water-glasses. I found, when I got into the subject, that probably about 50 per cent. of our engineers depended either entirely on the gauge-cocks, or were sufficiently familiar with their use to handle their engine, and that of the other 50 per cent. some of them knew a little about using gauge-cocks, but the majority of them depended entirely on the water-glass. Under that condition of affairs, I decided, at the time, to let the matter stand, and not make any change. I think, however, there is a desirability of doing away with this, but that we ought to have something back of it to justify us in doing it. My idea is that the matter should be very fully discussed, and later put to a vote of the association as either a recommended practice or not, as the association sees fit. In this connection I understand that one of our members, Mr. Gibbs, has been making a considerable investigation into this matter, and it is possible that he would be willing to speak upon the question, as he has some very important information to bring out that he has gathered in the course of his investigation.

A. W. GIBBS (Penn.)—I think, with Mr. Gaines, that the water-glass is un-

*Topical discussion at the annual convention of the American Railway Master Mechanics' Association at Atlantic City, N. J., June, 1907.—From The Daily Railway Age.

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satisfactory, because of the liability to breaks, but I am not yet ready to take it off. Most men are not skilled enough to see whether the thing is moving, so that the indication of a full glass is an indication of a full boiler, which in many cases is not the fact. In New York state I believe there has recently been a law passed enforcing the use of the water-glass. Of all the divisions we have, I think the one in New York is the one that does not happen to have them. I do not know why they happened to pass the law there. They might just as well have passed a law where we had them on, but that is the way it works. My observation of boilers has been that the gauge-cock alone, where you are obliged to use it because you have nothing else, is the more reliable appliance. I have been on railroads both with them and without them.

E. A. MILLER (N. Y. C. & St. L.)—I might say, in regard to our experience with gauge-cocks and water-gauge glasses, that I have found that enginemen who were trained up to handle a locomotive by the use of the gauge-cocks only, preferred them, and I have had that class of enginemen ask that the water-gauge glass be removed from the engine to which they are assigned. I have found, on the other hand, that men who were educated to running with the gauge-cocks and the water-gauge glass were just as strenuous in their protest against doing away with the water-gauge glass; so that I think the preference one way or the other is very largely a matter of education on the part of the men. I might say, for the benefit of any that should or may have the experience that we went through, that some months ago we developed an epidemic of broken pistons, caused, as we believed, by men working water through their cylinders, or, rather, carrying their water too high in the boilers on the class of heavy compound engines that we had, and which all our men, especially the younger men, were not familiar in handling. We were very much exercised about that for some time. We got out of all that trouble by changing the shield that covers the water-glass gauge—that is, taking the space from the center of the lower to the center of the highest gauge-cock as five inches, we found that the water-gauge glasses were eight inches, and that the variation of three additional inches in the space that the water could be carried in the boiler just made the water level in the boiler high enough to give us the trouble. We changed our shields on those glasses, bringing them down to five inches, so that five inches of the water-gauge glass would show instead of eight inches, and immediately our trouble with broken pistons ceased, and where we were having I suppose as high as five or six broken piston heads on one class of engines in a single month, in the five or six months since the change was made we have had only two cases.

WILLIAM MCINTOSH (C. of N. J.)—I have been coming to these conventions for a number of years, and many others will remember that this is a subject that crops up periodically. It has been disposed of quite effectually on several occasions. For instance, I will refer to the convention of 1893, when the following resolution prevailed:

"*Resolved*, That while the Master Mechanics' Association regards the water-glass as a convenience and an additional precaution against low water, we do not regard it as absolutely necessary to the safe running of locomotives."

Now, there is no question at all by any man who has had practical experience in the handling of locomotives that the water-glass is an additional precaution, and it is also an additional advantage in regulating the position of the water in the boiler to the best possible location. In cases where they have been extended too high, as Mr. Miller cites, it is simply a matter of detail that should have been understood and attended to. We have had to adopt the same precautions that he mentions in instances where carrying too much water was a disadvantage. But it is an additional precaution and it is an additional convenience to the engineer, and it seems to me we are wasting time in considering the idea of doing away with it. A glass will break occasionally, but there are now glasses of different construction that, although they break, they will not fly. These are available, and my experience in handling and being in charge of locomotives of nearly all classes, and extending pretty well across the continent, is that with its use a great many cases of low water are avoided.

DAVID BROWN (D. L. & W.)—. . . . Mr. Miller made a change in his glass something similar to the one I am in favor of, although, instead of having a shield on the glass, I favor cutting the glass down. We know that a short glass

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will stand for a greater time than a long one, and is not so apt to break. Now then, if we have the bottom in line with our bottom gauge-cock, and the top end of the glass in line with the third gauge-cock, that will give us the distance between the bottom and the third cock. Now, that is sufficient. It is not necessary to have this long glass there for this high pressure we are using at the present time to operate on. Short ones would be better.

There is another thing about it. We can make a better fitting of our frames. I know of some people that adjust these frames by the glass. That, in my opinion, is not correct. They should use the piece of iron turned down larger than the glass, and have two bushes on it suited to the stem, as we call it, and set the frames to that, taking that out and putting the smaller glass in; it is more liable to stand than if they are set with the glass.

There is one more thing I am in favor of. I have tried it and I know it works well. If you put the glass frame upside down from what it is at the present time, —in other words, instead of blowing the water out and having the steam follow down through, let the water go up—it will never go out of the glass. There will be water all the time. You can clean the glass better, scour it, and it is in better condition to observe the water. Furthermore, the temperature, in my judgment, is kept better in that way, by the hot water being in it the whole time. You have not got to change from steam to water. Besides, any scale that would lodge on the glass otherwise, is not allowed to do so. It passes off in solution, whereas with the steam passing down through it, it dries, and a certain portion adheres to the glass. I recently saw a glass that was taken from an engine scaled on the inside so that you couldn't see the water, and to all appearances it looked as if it had been painted with aluminum. That was about the color of it. I think if that was put the other way, with water passing through it, it would not have coated the glass as it did.

G. L. FOWLER—There is one matter that is suggested to me here, and that is the fact that it is quite possible that an engineer who had been running on an engine provided both with the water-glass and the gauges, and had been depending upon the glass for some time, the gauges might be absolutely useless to him, and, in fact, he would not know how to use them. An engineer that has been depending entirely upon sound as to whether it is water or steam that is coming from his gauges—and I know, in my own experience, that it took me a long time before I felt absolutely certain, in listening to the noise from the water-gauge, whether it was steam or water—I can readily understand that an engineer who had been depending upon the glass might have forgotten the sound of steam and water coming from the water-gauges, and might not really know which it was.

Mr. GAINES—Referring to Mr. Fowler's remarks about the testing of water by sound, I would like to say that on the road I formerly spoke of, where they had no water-glasses whatever, I found at one time, in riding with some engineers at night time, that they almost invariably carried a white lantern down in a little box in their cab, and picked it up when they wanted to see where the water was. After I became aware of the reason why they carried that lantern and the trouble it was too look after it, I got up what you might call a gauge light that would shine directly on the gauge-glasses, so as to do away with the necessity of carrying the lantern, and while an average engineer can tell the difference between steam and water by sound, I think very few of them like to rely on it when they are running an engine, and most of them will provide other means to get a light on it in some way.

W. G. WALLACE (Ann Arbor)—I knew an engineer at one time that carried a tin-cup and opened the gauge-cock and held the cup under it and got water. Then at night he had to have a light to find out whether he had water or steam in the cup.

This discussion has arisen often on the use of a water-glass on a boiler. Now I believe the trouble we have had that it is claimed is due to the water-glass is simply due to its location; that with the different construction of boilers they are putting on water-glasses which give the engineer a higher water level than he should carry in that particular kind of a boiler. As an engineer, I believe that a boiler glass should be left on the boiler. There is no objection to using the gauge-cock. The engineer has so much to do now that many of them allow the firemen to pump the engine. That is a practice which should be discontinued, and I favor placing the injectors in such a position on the cab and on the boiler-head that

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they will be operated by the engineer. I think the advantage is gained by the economy in fuel; that we should retain or leave it optional with the roads in the different localities to use or discontinue the use of the water-glass. I can readily appreciate Mr. Emerson's remarks that in a bad water country, where, as soon as you open the throttle, the water goes, it will drive an engineer insane, where, if he has good water, it is a decided advantage to have a water-glass; and in a bad water country, then, he has and must rely on the gauge-cock. I think we are taking up valuable time of this association, and move that the discussion be closed.

Discussion closed.

* * *

*Duplex Air Pumps.**

The Duplex air pumps, manufactured by the New York Air Brake Company for locomotive service, are of four different sizes, and are known as the Nos. 1, 2, 5 and 6. The dimensions of these pumps are as follows:

Pump No.	Diameter of Steam Cylinders.	Diameter of L. P. Air Cylinders.	Diameter of H. P. Air Cylinders.	Stroke.
1....	5 inches	7 inches	5 inches	9 inches
2....	7 "	10 "	7 "	9 "
5....	8 "	12 "	8 "	12 "
6....	7 "	11 "	7 "	10 "

The Nos. 1 and 2 differ somewhat from the Nos. 5 and 6 in design as well as in size, although the principle of operation is practically the same.

Some years ago the No. 1 pump was large enough to furnish all the air necessary to operate the air brakes on all trains equipped with them. The number of air-braked cars gradually increased until it was necessary to manufacture a larger pump to fill the requirements. The No. 2 pump was designed, and for several years its capacity was considered equal to the task. However, during the past few years the operating of from 75 per cent. to 100 per cent. of the brakes in freight trains, the fact that nearly all freight cars are equipped with air brakes, the greater length of freight trains, and the increase in the size of passenger and freight equipment, together with bell ringers, track sanders, the water raising system, water scoops, and greater tendency to leakage, due to a frequent combination of the foregoing, have increased the work of the No. 2 pump far beyond what it was designed to perform, with the ever-present possibility of failure due to overwork.

To meet the demand for a pump that would furnish air for a freight train of 100 cars, and still be sufficiently within its capacity to reduce the liability of failure to a minimum, the No. 5 pump was designed and perfected, and such structural changes made as to materially improve the design and increase the efficiency and economy of the duplex air pump.

The valve gear of the duplex air pump is exceedingly simple, consisting of two ordinary D slide valves, similar to the same type of valve used in locomotives, actuated by valve stems which extend into the hollow piston rods, and are moved by contact with the tappet plates bolted on the steam piston heads. The valve on one side controls the admission of steam to, and exhaust from, the opposite cylinder, as shown, so that while one of the pistons is moving the other is at rest. This feature also allows the air valves to seat by gravity.

The air cylinders are known as the low-pressure and high-pressure cylinders, and in each type of the pumps covered by this pamphlet the difference in the areas of the air cylinders is in the same proportion, the low-pressure piston having twice the area of the high, and the high-pressure the same area as the steam cylinders. Thus three measures of air are compressed with two measures of steam.

The operation of all the duplex pumps is practically the same, the difference being in the arrangement of the air valves. The No. 1 and No. 2 have six air valves, viz.: upper and lower receiving, upper and lower intermediate and upper and lower discharge valves, and the same air inlets for both cylinders. The No. 5 and No. 6 have separate air inlets for each cylinder and eight air valves, viz.: upper and lower receiving for low-pressure cylinder, upper and lower intermediate, upper and lower receiving for high-pressure cylinder and upper and lower discharge. All air valves of the No. 5 pump are the same size and are interchangeable. This is also the case with those of the No. 6.

The No. 5 and No. 6 pumps are identical except in size, and as this type of pump is the later one, we will describe the operation of the No. 5.

*Courtesy of New York Air Brake Company.

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By referring to the plates Nos. 1, 2, 3 and 4, it will be seen that each part has a reference letter and the pump pistons are shown in different positions. We will use these letters in the description of the operation, so that the movements can be easily followed, by referring to the plates when reading the explanation.

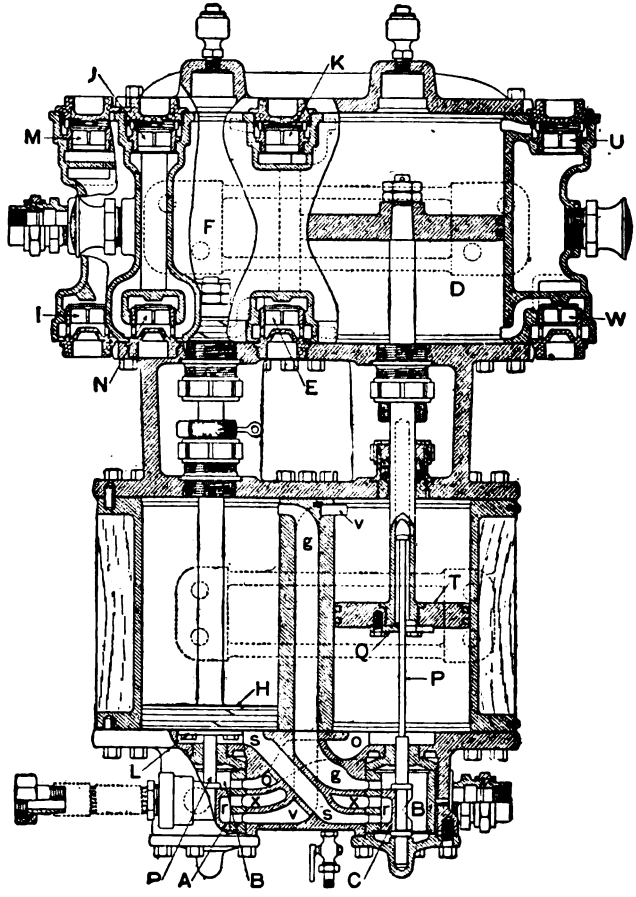

Plate 1

Operation.

Before the pump has been started both pistons will naturally be at the bottoms of the cylinders, due to their own weight, or, if not completely down, will at least have dropped enough to permit the slide valves to fall to the bottom of the steam chests.

Assuming for convenience of explanation that the pistons are both down, when the pump throttle is opened, live steam flows into both steam chests *B*, and is always present in them when the pump is taking steam. In this instance only, steam is admitted to both cylinders at once through port *g*, to the upper side of piston *H*, which being at the bottom is merely held in that position, and through port *o*, to the under side of piston *T* (Plate 1). Piston *T* now moves upward and in doing so forces the air that is above the piston in low-pressure cylinder *D*, through intermediate valve *K*, into the high-pressure cylinder *F*. At the same time, the low-pressure piston tends to create under it a vacuum, which is filled with air at atmospheric pressure through the air inlet at the right and receiving valve *W*. Just before piston *T* reaches the end of its upward stroke the

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tappet plate *Q* engages the button on the end of the valve stem *P*, which moves the slide valve *C* to its highest position, allowing the steam above piston *H* to pass through port *g*, cavity *r* in slide valve *C*, and the exhaust *X* to the atmosphere, and live steam through port *s* to the under side of piston *H*. As piston *H* moves upward (Plate 2), the high-pressure piston in cylinder *F* forces the air above it, which may be said to be under the first stage of compression, through discharge valve *M* to the main reservoir, while its upward movement tends to create a vacuum under it in the high-pressure cylinder *F*, which is filled with air at atmospheric pressure through high-pressure receiving valve *N*.

Just before piston *H* completes its upward stroke, tappet plate *L* engages with the button on the valve stem, raising it with the slide valve *A*, exhausting the steam under piston *T* through port *o*, cavity *r* in slide valve *A*, and the exhaust *X* to the atmosphere, and admitting steam through port *v* to the upper side of piston *T*, moving it downward (Plate 3). During the downward movement of piston *T*, the low-pressure piston in cylinder *D* forces the air under it, which was taken in on its upward stroke, through the intermediate valve *E* to the under side of the piston in high-pressure cylinder *F*, and at the same time cylinder *D* is filled with air at atmospheric pressure through the air inlet and upper receiving valve *U*. Just before the piston *T* completes its downward stroke the

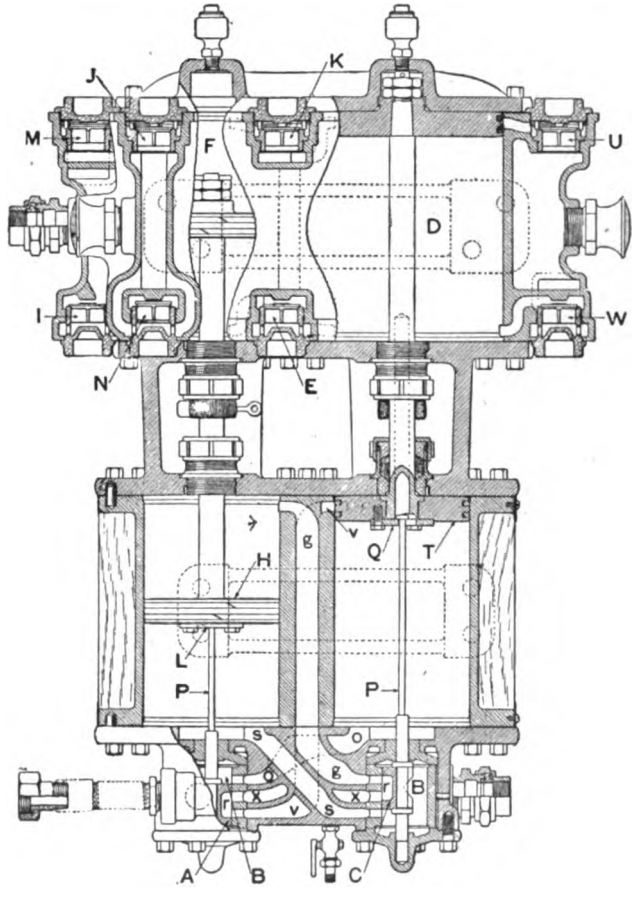

Plate 2

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tappet plate *Q*, coming in contact with the lower tappet or shoulder on the valve stem *P*, moves the slide valve *C* to its lowest position, allowing the steam under the piston *H* to exhaust to the atmosphere through port *s*, cavity *r* in slide valve *C*, and the exhaust *X*, and admitting live steam to the upper side of piston

ments described are repeated through each succeeding cycle.

The air valves through which air is being received or discharged during the movements of the pistons are shown in the illustrations as being raised from their seats.

Before starting a pump open the drain

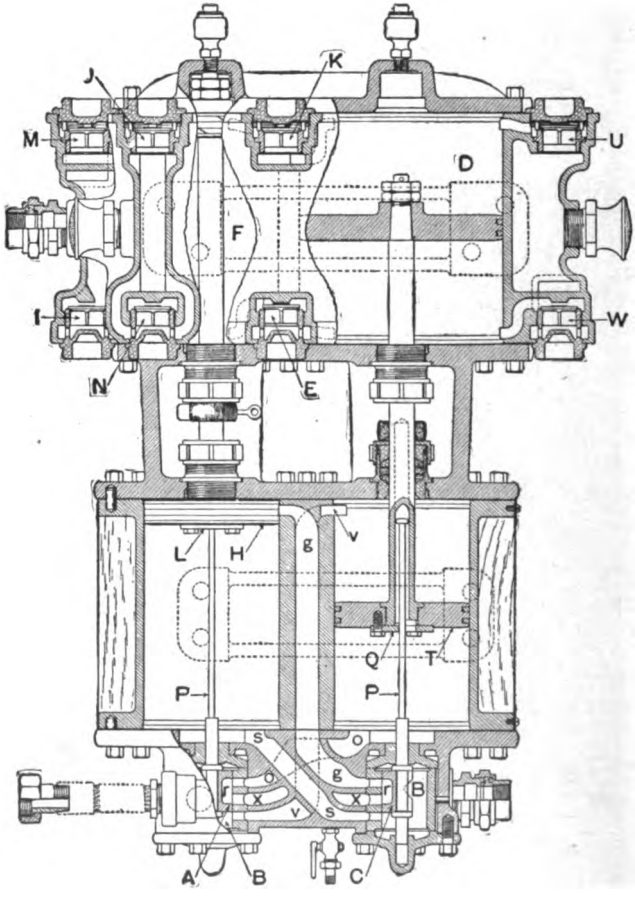

Plate 3

H through port *g*, moving it downward (Plate 4). As piston *H* moves downward, the high-pressure piston forces the air under it through the lower discharge valve *I* into the main reservoir, while the cylinder is filled above with air at atmospheric pressure through the air inlet at the left and receiving valve *J*.

The completion of this stroke completes one cycle of the pump. The movecocks in the steam and exhaust passages. Open the steam valve slightly at first, and run the pump very slowly until all the condensation has been worked out of the steam cylinders. Then the steam valve may be opened a little more, but the pump should be run slowly until a pressure of 50 or 60 pounds has been accumulated in the main reservoir. It should be run just fast enough to prompt-

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ly restore the pressure in brake system, but never raced.

The steam cylinders should receive a constant supply of oil from the lubricator (about one drop a minute), and it is necessary to keep all joints between the lubricator and pump perfectly tight, so that no oil will be wasted. Oil can ally be located by watching the action of the pistons. Leaky piston-packing rings will also reduce the efficiency of the pump and cause an uneven stroke. To detect them, pump up about 90 pounds in the main reservoir and stop the pump. Remove the oil cup. If there is a continuous blow, it denotes a leaky dis-

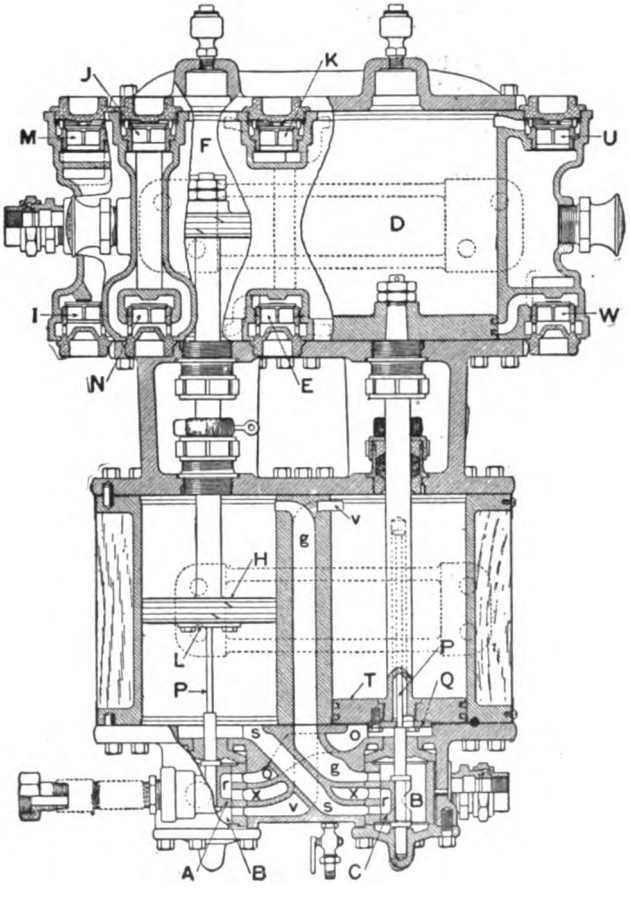

Plate 4

leak away at the steam joints, where there is little or no indication of steam leakage.

The piston rods should be kept well packed, and good clean swabs well oiled should be maintained on them.

Broken or stuck air valves or seats will materially reduce the efficiency of the pump. They almost invariably cause the pump to work unevenly, and can usu- charge valve. If not, the discharge valve is tight. Start the pump again and note if there is a blow from the oil-cup hole on the down stroke; if so, it denotes leaky packing rings. However, most roads have their air pumps tested in the roundhouse, and they are supposed to maintain the standard pressure against a certain size orifice, the failure to perform which results in their removal for repairs.

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Should the pump stop and refuse to go to work again, first see that the governor is working properly, and that the pump is getting a full supply of steam, by opening the drain cock in the steam passage. Sometimes a pump will stop on account of insufficient lubrication and may be started by shutting off the steam for a few moments, opening the drain cock in the steam passage and again turning on the steam, letting the lubricator feed a few extra drops of oil. If it will not then go to work it will undoubtedly be due to a breakdown, which would have to be repaired in the shop or roundhouse, as engines are not usually equipped with the tools and parts necessary to make such repairs on the road.

* * *

*How Daylight Reaches the Earth.**

I.—Waves of Light.

When we consider for a moment that we habitually speak of a ray of light, or a beam of light, it must seem strange to talk about waves of light in the same way as we talk about the waves of the sea.

It was Newton—to whom the world owes the discovery of the law of gravity—who went a step beyond the prevailing ideas of his time, and propounded the theory that light consisted of elastic particles, so small as to be absolutely incapable of measurement by any apparatus which human ingenuity could devise, and that these particles were shot with equally immeasurable rapidity by the bodies which produce light, in much the same way as an arrow is shot from a bow. He even went so far as to believe that on approaching the earth these particles traveled more quickly than before, in just the same way as he had noticed the apple fall with increased velocity as it left the parent stem and came towards the ground.

Newton believed that when these particles of light fell on smooth surfaces they were reflected in accordance with the ordinary laws of elastic collision, the most popular explanation of which is seen in the striking of billiard balls on a billiard table. As the late Professor Tyndall said, "The fact of optical reflection certainly occurred as if light consisted of such particles, and this was Newton's sole justification for introducing them."

II.—What Makes the Light.

As it is impossible to conceive a given number of particles all of the same size, Newton thought the difference in color which we notice might be due to the difference in the size of the particles, one size producing red, another green, a third blue, a fourth yellow, and so on. These theories modified the view which the great French scientist, Descartes, had propounded, that space was full of something which transmitted light instantaneously. The substance which fills space has been called, as most people now know, ether; and in due course the theory was propounded that light was not transmitted by particles shooting out, but was the result of a motion like the waves of the sea.

The great scientific fact that light proceeds in waves was first propounded by an Englishman whose name ought to be known to every human being to whom the blessing of sight has been vouchsafed, although it is safe to say that probably few people have ever heard of his existence. He was named Thomas Young, and he was born at Milverton, in Somersetshire, in 1773. Educated as a doctor, he took up the study of natural philosophy, and became one of its greatest masters.

III.—Young's Discoveries.

He was a scholar of great attainments, and, to quote his epitaph, "He first penetrated the obscurity which had veiled for ages the hieroglyphics of Egypt." He discovered facts in connection with the science of optics which Newton's theory was not sufficient to explain. To him the science of sound was an open book, as were the phenomena connected with wave motion; and in the course of time he deducted the resemblance between the "phenomena of light and those of wave motion." Yet this man and his discoveries, which led to the formation of the undulatory theory of light, were ridiculed by a writer in the Edinburgh Review, Mr. Henry Brougham, afterwards Lord Brougham, whose name is preserved from obscurity not by the fact that he afterwards became Lord Chancellor of England, but from a carriage having been named after him.

From early times the idea that sound traveled in waves was known. It was mentioned by Aristotle. Waves of sound were compared with the waves of the sea by Vitruvius, the famous architect of antiquity. The great difficulty, which was

*From The Ancient Forester, London, Ont.

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not explained until the time of Newton, was to distinguish between the motion of the wave and the motion of the particles by which it is produced. If one watches a wave, it is seen to consist of two parts—a front and a back; and closer observation shows that the water in front is rising while the water at the back is sinking.

IV.—First Ideas.

As soon as the particles reach the bottom they begin to rise again. In other words, the water does not advance, but simply rises and falls, proof of which is seen in watching a cork bob up and down on the water; or, if one is swimming, then, leaving off and letting oneself go, one notices that one is not carried forward, but is literally rocked, as it were, "in the cradle of the deep," provided, of course, the experiment is not made just close to the land when the tide is running either way.

The length of a wave is the distance from one crest to the next, and it is important to remember this in order to appreciate the wonderful mechanism of light when the number of waves which go to make up the various divisions of the spectrum has to be considered. If two waves start from different places, when their crests join the wave is lifted to a double height; but, on the other hand, when the crest of one wave joins the furrow of the other the one counteracts the other, and the water becomes still at that point. This action is appropriately called "interference," and it also occurs both with sound and with light, thus showing that they have a common explanation. If two exactly similar organ pipes are placed on the same windchest and each pipe is blown separately, they will give the same fundamental note.

V.—Later Theories.

If, however, both pipes are sounded together, instead of the intensity of the note being increased, as one would expect, it is found to be so greatly weakened that at a short distance it is not even audible. So that sound added to sound produces silence under certain circumstances, impossible as it appears. The explanation is that the top of the wave of sound produced by one pipe is counteracted by falling exactly on the bottom of the furrow of the wave produced by the other pipe, and the two neutralize each other, like the waves of water.

This "interference" was Young's fundamental discovery in light, though he was not the first to notice that light added to light does, under certain circumstances, produce darkness. This has been proved by a simple experiment where a beam of light is allowed to fall on two mirrors placed close together, but slightly inclined to each other, so as to get a very wide angle between their faces. From the mirrors the light is reflected on to a screen, and in the middle of the bright patch a series of dark lines is perceived, but they vanish if one of the mirrors is covered up, and the whole surface appears to be illuminated.

The fact that light added to light produces darkness, in just the same way as sound added to sound produces silence, and waves added to waves produce stillness, is the most perfect proof possible that light is transmitted by an "undulatory movement" as it is called—that is to say, by a vibratory movement propagated from one particle moving from its original position, at all events, to any considerable extent, and not by the transference or motion of the luminous matter itself, like the passage of a projectile from the cannon to the object it strikes.

There is, however, a difference, for when air is set in motion by sound, the air, as a famous writer has expressed it, "is parceled out into spaces in which the air is condensed, followed by other spaces in which the air is rarefied. These condensations and rarefactions constitute what we call waves of sound. You can imagine the air of a room traversed by a series of such waves, and you can imagine a second series sent through the same air and so related to the first that condensation coincides with condensation, and rarefaction with rarefaction.

VI.—Curious Coincidence.

"The consequence of this coincidence would be a louder sound than that produced by either system of waves taken singly. But you can also imagine a state of things where the condensations of the one system fall upon the rarefactions of the other system. In this case the two systems would completely neutralize each other. Each of them singly produces sound; both of them taken together produce no sound."

One, at least, of our senses derives its impressions from the motion of the object itself which produces the impression, or of parts of it, through space. This

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is the sense of smell. The fact may easily be demonstrated by opening a bottle of smelling-salts in a room. The people who are near it will smell the ammonia first, while those who are farthest off will perceive it after some time. With light, as with hearing, however, this is different, though the velocity of the former greatly exceeds the latter. So swift is the velocity of light that, even as far apart as sixty miles, no difference of time can be observed by ordinary means between the moment it leaves the luminous body and the time it arrives at a given spot.

VII.—190,000 Miles a Second.

The velocity of light, however, is well known, for it has been measured by astronomical observations, as well as by physical experiments. In round numbers, light moves at the rate of 190,000 miles a second.

It is difficult to imagine such a speed as 190,000 miles a second; but it becomes comprehensible if we recollect that the distance between London and Edinburgh is, roughly, four hundred miles, and that it takes an express train ten hours to cover the distance. Now, 190,000 miles is exactly 475 times the distance between London and Edinburgh, yet in one second light will travel the distance which it would take a train 475 journeys of ten hours to accomplish; so that, if it were to do the double journey every day, it would be over seven months doing what light does in a second.

Everyone knows that ordinary light does not consist of one color, but of all the colors of the spectrum—red, orange, yellow, green, blue, indigo, and violet, all being mixed together to produce white. Everyone knows, too, that in the ocean some waves are longer than others. The same thing happens with light. The shortest light waves are those at the extreme end of the violet side of the spectrum, while the longest waves are those at the extreme red.

VIII.—Strange Facts.

Taking round numbers, the length of a red wave is such that 37,000 of them would have to be placed end to end to cover an inch, while 65,000 violet ones would be required to cover the same distance.

In order that we may see these colors as colors, all the waves composing them must enter the eye and strike the nervous prolongation of the brain, which lies at the back of the organ, and is called the retina, in a second. If we reduce 190,000 miles to inches, and multiply by 37,000 we get the number of waves of red in 190,000 miles; and in order to see the red the retina must receive four hundred and fifty millions of millions of shocks in a second. In order to express it in figures, it must be written 450,000,000,000,000—figures which, while they convey no sense of number to the mind, as they simply stagger it with their immensity, cannot fail to stimulate interest in a subject which still occupies the attention of some of the greatest brains in the world.

* * *

Smokeless Combustion of Soft Coal.

The engineering experiment station of the University of Illinois has for the past year been conducting a series of experiments relating to the methods of burning Illinois coal with economy and also without smoke. These tests have been made under a water tube boiler of 210-horsepower capacity. The furnace consisted of a chain grate stoker. The lower tubes of the boiler have been covered, for two-thirds their length, with special tile, making a tile roof furnace. The draft has been furnished by a fan drawing the air through the fire, the usual induced draft system. With this equipment over 100 tests have been made of from eight to ten hours' duration, soft coal being used entirely. With this setting no smoke has been made during the operation of the boiler after the fires were well started.

A series of tests is now in progress with two types of house heating boilers. In these tests different fuels are being compared, such as anthracite and bituminous coal, coke and briquetted coals from the government testing plant. The United States geological survey, through its technologic branch, is co-operating with the Illinois experiment station in these experiments.

As a result of the work already done the following conclusions have been drawn:

Soft coal can be burned without the dense black smoke which usually is seen issuing from chimneys where it is used.

For 90 per cent. of the time there should be no black smoke.

Large plants are more easily made smokeless than small ones of 100 horsepower or less.

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The proper construction of furnaces for smokeless combustion is a subject familiar to the leading mechanical engineers of the country, and local engineers are more likely to suggest correct remedies than are engineers from a distance.

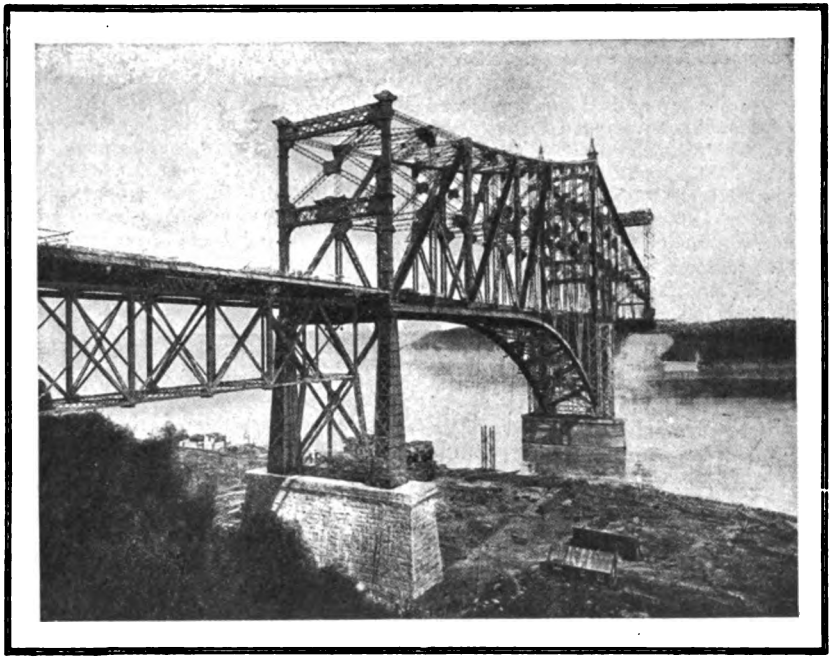
The smoke nuisance will be mostly cured by the use of mechanical stokers suited to cheap coals of each locality, but the stoker must be combined with the proper furnace details to fit the coal used.

Uniformity in the size of coal will help to solve the problem. Careful firing, which is unusual, can avoid one-half the smoke in the ordinary hand-fired furnace.

The results of the smoke tests, together with complete description of several standard boiler settings that have been operating smokelessly in the general university plant for more than two years—using soft coal for fuel—will be published soon in a bulletin of the engineering experiment station.—The Railway Age.

The Quebec Bridge Disaster.

One of the greatest engineering disasters that history records occurred when the arm of the great cantilever bridge in the course of erection at Quebec collapsed on the afternoon of August 29, and carried with it to death in the waters below, seventy-four of the men who were working on it—between forty-five and fifty of whom were members of the Bridge and Structural Iron Workers' Association. The spanning of the St. Lawrence River at Quebec constitutes a colossal problem, demanding the very highest order of engineering skill.



THE QUEBEC BRIDGE DISASTER

South Approach Span, Anchor Arm and South Cantilever as they appeared June 12, 1907

For 731 feet and 3 inches out over the river's depths the massive structure reared an arch 150 feet above the water, with no support save what it derived from its anchor span, which extended from the main pier to the shore. This arch consisted of the entire completed south cantilever arm of 562½ feet and three panels (168 feet and 9 inches)

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of the suspended span. At the point where the bridge is being erected the St. Lawrence is very wide and deep enough for navigation by ocean liners.

Workmen Become Alarmed.

The story of the tragedy properly begins with the date of August 28, when a number of the men becoming alarmed at what they regarded as the unsafe condition of the structure, left their work, and, running to the shore, declared that the bridge was going to fall and that they would work on it no longer. They declared that they had heard rivets creak, and that they had noticed some of the tension members (or supporting chords) sway under the awful weight they held. They were, however, used to danger, and their fears becoming quieted they went to work the next morning as cheerfully as ever. With waving handkerchiefs they hailed their fellow workmen on the north shore (the Sillery side), who were working on the first or anchor span of the other half of the bridge, which is now well under way, and soon the clangor of the sledge hammer, the resounding of the riveting machinery and the bellowing of the forge announced the beginning of what, for so many of them, was their last day's work.

The Collapse.

The cantilever arm fell at exactly 5:37 p. m. The end of the great half arch bent down slightly and immediately the entire stupendous fabric began to give way, at first slowly, then with a terrific crash which was plainly heard at Quebec, seven miles off, and which shook the whole country side so that the people rushed out of their houses, thinking there was an earthquake. The snapping girders and cables sounded like the thundering of artillery.

The whistle signal to quit work for the day had blown at 5:30 p. m., just seven minutes before the bridge fell. The men had already started to leave. At the first indications of the disaster they made a rush towards the shore and a few of those who were nearest to it escaped, but for the others the distance was too great and they went down in the awful wreck.

A locomotive and several freight cars loaded with steel girders were moving out upon the structure just before it fell. Engineer Jess and Fireman Davis were in charge of the engine. Upon noticing that the steel work had commenced to give, the engineer reversed his engine and endeavored to back off. It was too late, however, the locomotive and cars kept moving towards the end of the falling arm and a moment later plunged into the river. Engineer Jess in some way got free of the immersed wreckage and was picked up three hundred feet below the bridge site. He has since fully recovered from the effects of his experience. Fireman Davis, however, went down to death with the engine.

As the wreckage of the bridge which fell near the shore did not sink below the surface of the river, a number of workmen were caught in it above the water. Eight of these were rescued and taken to the hospital at Levis, but the others could not be reached and their groans and cries for help amidst the darkness, which soon enveloped the scene, added to the horrors of the awful catastrophe, particularly as the men on shore, being without search lights and other facilities, were unable to render them any immediate assistance.

The entire force employed in the building of the bridge numbered about 200, of which 92 were working on the projecting cantilever arm, or half arch, when it collapsed. The steamer "Glenmont" had just passed when the first section fell and the water thrown up by the debris went clear over her bridge. The captain ordered boats lowered immediately to save those whom it was still possible to rescue.

Canadian Government Financially Interested in Bridge.

The Quebec bridge was intended to form a very important link in the railroad system of Canada. Several railroad lines were to connect with each other and the Grand Trunk Pacific—the government railroad, at present in course of construction—to cross the St. Lawrence over it. The bridge is the enterprise of the Quebec Bridge Company. Its chief engineer is Mr. E. A. Hoare, of Quebec, and consulting engineer, Mr. Theodore Cooper, of New York City. The sub-structure was built by Mr. M. P. Davis, of Ottawa—the design and erection of the steel superstructure having been let to the Phoenix Bridge Company, of Phoenixville, Pa. (a town of about 10,000 inhabitants), of which Mr. John Sterling Deans is chief engineer and Mr. P. L. Szlapka the engineer who designed the steel work. The

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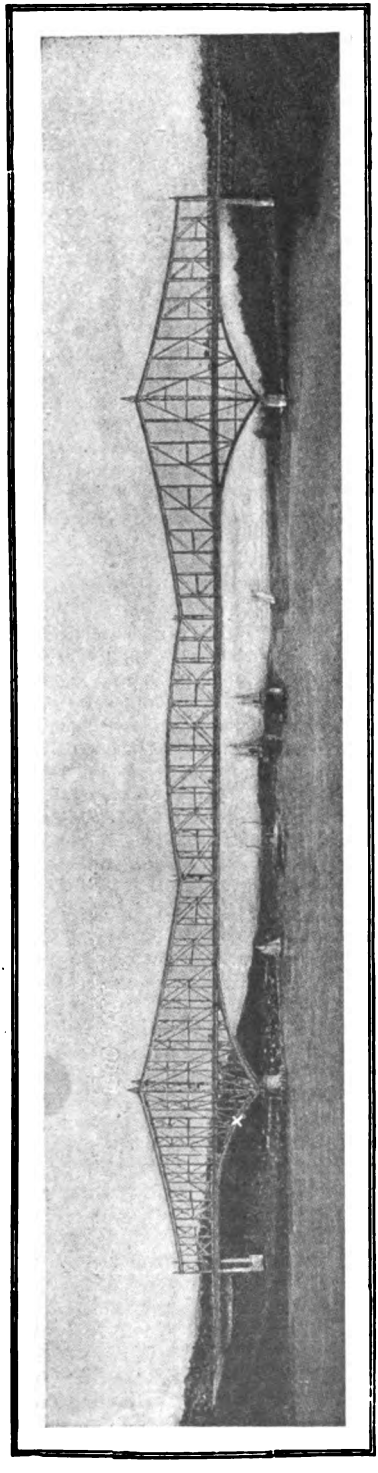

THE QUEBEC BRIDGE DISASTER

The Bridge as Designed. Center Span, 1,800 feet. Anchor Arms, each 500 feet. Depth Over Piers, 315 feet. Weight, 38,500 tons. Bridge failed in lower chord at point shown by cross. The 1,300 feet, as marked above, is now in the river. (From Scientific American)

bridge was being built at Phoenixville and bolted together at Quebec. It was begun in 1900 and was to have been finished in 1909. Nearly all the iron workers employed on it were citizens of the United States.

The project of building this great structure was started by a private company which raised $650,000. This was exhausted in the building of the foundation work which took two years to complete. To this sum was added a subsidy of $1,000,000 by the Dominion Government; $350,000 by the Government of the Province of Quebec and a grant of $300,000 by the city of Quebec. The original estimate of the cost was about $3,500,000, but this amount was found to be entirely too small. The contracting company found itself in difficulties and the Dominion Government needing the bridge for its National Transcontinental Railroad, and desiring a better entrance into Quebec, agreed to guarantee the bonds of the company up to $7,000,000. It was ultimately estimated that the cost of the bridge would amount to ten million dollars and of that amount over half has been already expended. The Government being, therefore, much interested in the successful prosecution of the enterprise, one of its first official acts after the collapse of the structure was the appointment of a commission of engineers to investigate the disaster and report on the technical questions involved. This commission consists of Messrs. Henry Holgate and J. G. G. Kerry, of Montreal, and Professor J. Galbraith, of Toronto.

Every effort will be made to fix the blame for the disaster. If it is found that any person or persons are criminally responsible, prosecutions will follow. The railroad commission has full power to conduct an investigation on its own account and to institute court action should conditions justify such a course.

The fact that the work has not progressed more rapidly in the seven years that have elapsed since its commencement is due chiefly to the severity of Canadian winters and the consequent impossibility to conduct operations during that season—from four to five months being lost each year on that account.

Cantilever Bridges.

The term cantilever means a projecting arm, either secured in some permanent fixture at the end or supported

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at a point between there and its outer end, and when applied to bridge construction means that a cantilever span consists of two great arms or brackets projecting towards each other from opposite banks or piers and serving to form a bridge when united directly or by a girder, the weight of each arm being secured by what is known as the anchor span, or the span between the shore and the first pier on each side, and which is securely fastened down or anchored in the masonry work of its piers. The cantilever type of bridge has many advantages, not the least of which is the possibility of its being erected without putting false work in the main channel. Inasmuch as even temporary interference with navigation is now prohibited by law, this type of bridge has become almost mandatory for long spans.

The cantilever bridge represents the highest development and the closest approach to perfection—if not perfection itself—in the art of bridge building. It combines in one structure the strength-giving principles of the beam bridge, the suspension bridge and the arch bridge, and in addition thereto a principle of its own, viz., the balancing of the arms on each side of the main piers.

Operations will not be resumed on the Quebec bridge until next spring, when the work of clearing away the wreckage and reconstructing the great fabric will begin. When completed this bridge will be the largest cantilever bridge in the world.

The largest bridge of this type at present in existence is that which spans the Firth of Forth in Scotland. Its cantilever span is 1,710 feet long, while the plans of the Quebec bridge call for a cantilever span of 1,800 feet, 90 feet longer than the Firth of Forth bridge—a distance equal to the length of about six city blocks.

Dimensions of Bridge.

The cantilever span of the Quebec bridge is to consist of two cantilever arms each 562½ feet long, projecting from each side and connected in the center by a suspended span 675 feet in length, this suspended span depending solely for its support on the cantilever arms. The plans of the Quebec bridge also provide for two deck truss approach spans, each 210 feet long, and two anchor spans 500 feet long. Pin connected type of trusses, width from center to center of trusses, 67 feet. Depth of trusses to vary from 97 feet at the portals to 315 feet over the main piers; 150 feet clear headway over high tide for a width of 1,200 feet. Height of main post peaks above the river, 400 feet; capacity, two railroad tracks, two electric railway tracks, two roadways and two foot walks, all on same level; total weight of steel to be used in bridge, 38,500 tons, 100 tons being the weight of the heaviest single pieces handled, and 105 feet being the length of the longest single section shipped to bridge site. The eye bars on the Quebec bridge are the largest yet used, the maximum on one pin being 56; pins used running from 9 to 24 inches in diameter, and up to 10 feet in length; the number of field rivets necessary to build the bridge is estimated at 550,000.

The main shoes occasioned the most complicated shop work of any part of the structure. They weigh 73¾ tons each, and to complete the detailed drawings for them required six months of the time of one draftsman. The main piers are built of concrete, faced with massive rock-faced granite. They were sunk with pneumatic caissons. The tops of the main piers measure 133 by 30 feet, and contain 35,000 cubic yards of masonry. The anchor piers are built of concrete faced with granite, and measure 30 by 111 feet at the base, and 24 by 105 feet at the coping. They contain 14,400 cubic yards of masonry. The abutments are built of concrete, faced with granite. They are 80 feet wide, 40 feet deep and contain 4,000 cubic yards of masonry.

The Traveler.

The traveler used in erecting the anchor and cantilever arms is of the Cauntry type, running on tracks outside of trusses at about floor level and spanning highest point of bridge.

In the illustration accompanying this article it looks like a tower at the extreme end of the cantilever arm projecting over the river, and its appearance would indicate that it is a part of the structure, the elevated frame work distinguishable from the structure proper being the head of the immense traveler. This "traveler" is a traveling crane used for hoisting and placing in position material used in the construction of the bridge, the name "traveler" being that by which it is known in bridge building. It is 215 feet high and straddles the structure, its tracks being supported on girders slung

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from the main pins of the lower chords. It was being operated with electrical power generated at Chandler Falls.

The weight of the traveler, fully rigged with all accessories, is 1,000 tons. Part of its equipment consists of seven miles of ⅞-inch steel wire cable, and 13 miles of 1-inch, 1½-inch, 1¾-inch and 2-inch manila rope.

It was the intention to discontinue the use of this 1,000 ton traveler and thus relieve the overhang of its weight when the cantilever arm was completed, and a subsidiary traveler weighing about 100 tons, which was intended to substitute it, had already been put in place for use in the building of the suspended span. For some reason, however, the use of the 1,000 ton traveler was continued until three panels of that span had been completed, but was being dismantled for removal when the accident happened. In addition to this a locomotive and several freight cars loaded with steel girders, as well as much other building material piled on the floor of the structure, rested on the tip of the great overhanging arm. The simple conclusion at which the average layman naturally arrives irrespective of the technical calculations of experts, viz., that more weight rested on the end of the structure than it could support, will, in the final analysis, prove without a doubt to have been the correct cause of the disaster.

Fatal Delay of Telegram.

Had the object sought by a telegram sent from New York by Mr. Theodore Cooper, the consulting engineer in charge of the work, been attained, every life lost in the wreck of the bridge might have been saved. Mr. Cooper is one of the most distinguished and experienced engineers in the country. He is sixty-eight years old and served in the United States Navy during the Civil War. He was associated with James B. Eads in the construction of the St. Louis arch bridge over the Mississippi River, from 1872 to 1875. He was superintendent of the Delaware Bridge Works and has long been regarded as a bridge expert throughout the United States, Canada and Mexico. He is the author of "Cooper's Specifications for the Superstructure of Railroad and Highway Bridges," besides a number of valuable engineering papers and other works on subjects connected with his profession. He has twice received the Norman medal given by the American Society of Civil Engineers. Mr. Cooper has been in ill-health for some time, which has compelled him to keep close to New York. Notwithstanding this, however, he reproaches himself for not having visited the bridge in a period of two years, and feels the accident most keenly. In discussing the catastrophe he stated that his inspector came to his office on the morning of August 29 and told him that things did not look well for the bridge, and that in his opinion it should be looked after immediately, and that on learning this he (Mr. Cooper) promptly wired instructions to the man in charge on the ground to abandon all further operations at once, and to keep every one off the bridge until it had been examined. Mr. Cooper could not then explain just why the instructions in his telegram had not been carried out.

Continuing his interview, Mr. Cooper said:

"Some two years ago I found that my failing health would not permit me to visit this important work as much as I thought it ought to be visited by a consulting engineer, and I asked to be released. The builders would not listen to this, and so I retained the position. I sent an inspector to look after the work from my point of view. I haven't seen the bridge for two years."

On being asked if it had ever been intimated to him prior to the day of the accident that the bridge as being constructed was dangerous, Mr. Cooper said, "Well, you know, this was the biggest cantilever bridge ever attempted, and there are always some people to doubt and fear about a big and new work while it is going on."

Mr. Cooper went on to explain that the type of bridge was like that now going across to Long Island by way of Blackwell's Island, New York. The steel work suspended over the waters of the East River on both sides of Blackwell's Island has been a wonder of urban New Yorkers, as well as of sight-seeing people from the rural districts. The Quebec bridge was planned on a much larger scale, 1,800 feet being the proposed length of its chief span. Mr. Cooper explained that a miscalculation as to the strength of the suspended steel work, or some fault in building—indeed a dozen or more different kinds of mistakes—might cause a big lot of hanging steel work, such as that over the St. Lawrence River, to collapse.

"Of course we believed the work as

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planned was absolutely safe," continued Mr. Cooper, "though in dealing with even an old type of work on a hitherto unparalleled scale, new and unexpected problems now and then arise. One can not prophesy with infallibility about something one never knew before."

From statements subsequently made at the Phoenix Iron Works, of Phoenixville, Pa., it would appear that the failure of the message sent by Mr. Cooper to accomplish the all-important end sought through its transmission, was due more to a combination of deplorable circumstances than to any wilful neglect on the part of any of the company's officers. The message which was sent to the Phoenix Bridge Company was referred to Chief Engineer John Sterling Deans on its arrival. Mr. Wm. Reeves, general superintendent of the company, stated that although sent from New York in the forenoon, it did not reach its destination until the middle of the afternoon. The delay is no doubt attributable to the starvation wage system of the telegraph company and the consequent strike of its operators. As Mr. Deans was absent from the office, the message was laid to one side to await his return. He came back at 5 p. m. and read it, it then being two hours after its receipt, and too late to get a message through to the men employed on the bridge before time to quit work for the night, as the accident happened between 5 and 6 p. m. General Superintendent Reeves stated that the message was not considered an urgent one at all, and that had there been any thought that the lives of the men working on the bridge were in the slightest danger, every effort would have been made to have had operations stopped immediately. The work, he said, had been under the closest supervision all along and an engineer had just returned about the same time the message arrived, with a favorable report.

Designer Still Has Confidence in Plans.

Mr. L. Szlapka, the designing engineer of the Phoenix Bridge Company, declares that there is no truth in the report that the wreck resulted from a broken rib, nor is there any foundation for the statement which has appeared that some of the material was injured in a railroad wreck. He said whatever the cause of the disaster, it could not be charged to defective material. The bridge he said will be reconstructed under the old plans unless it is otherwise decided by the Canadian Government, which has appointed experts to make an investigation.

He states that while some of the specifications might be changed, the general plans will stand, unless this commission of experts recommends otherwise. Mr. Szlapka spent ten years in preparing plans and specifications for the great structure, so much of which now lies in the St. Lawrence River a mass of tangled wreckage, while the whole engineering world has been shocked by the catastrophe. He, however, reiterates his faith in the original design and has no hesitancy in saying that the Phoenix Bridge Company believed that the plans were all right. He declares that while it is difficult to say how soon the work will be resumed, as there must necessarily be considerable delay, the company is able and ready to complete the contract whenever the Canadian Government orders them to do so. He states further that it will take two years to reach the stage of completion to which the bridge had attained at the time of the accident.

Referring to an article by Professor H. M. McKay, of the McGill University, of Montreal, in which that gentleman raised a question as to whether or not the lattice angles on some of the great chords and posts were as heavy as they should be, Mr. Szlapka said "he has a right to his opinion, and so have we to ours" and that it is impossible for such a matter to be determined by a coroner's examination, as it must be done by the most careful calculations. Prof. McKay, in the article referred to, stated that he found upon examination, that the anchorage of the bridge was in almost perfect condition, indicating that the failure had occurred in the superstructure. He also stated that no sign of failure could be seen in the eye bars in any part of the wreck. He asserted that several of the bottom chord splices had failed; that the cause could not be separated from the effect. He said, further, that probability was lent to the supposition that original failure took place in the anchor arm by the position of the main tower post, which had buckled and festooned over the river pier. This statement by Mr. McKay corresponds with the testimony given by Chief Engineer Hoare of the Quebec Bridge Company, at the coroner's inquest, to the effect that it had been reported to him before the accident that the ninth lower chord in the left side of the anchor arm was bent.

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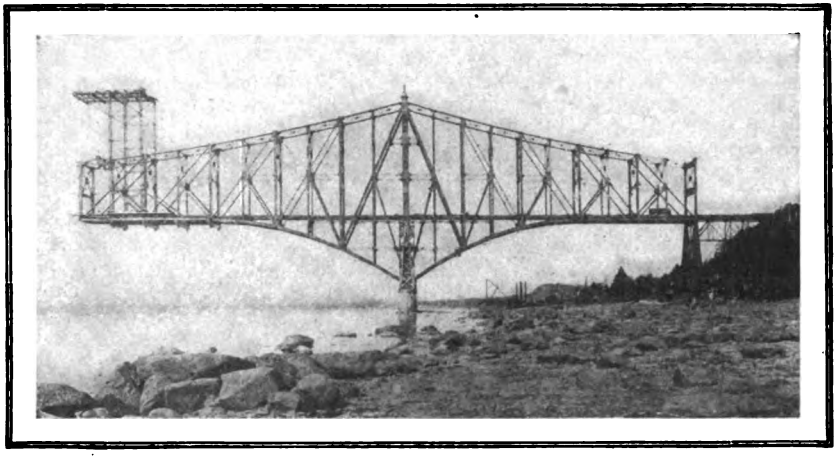
Forewarned.

Mr. McClure, the inspector who notified Mr. Cooper of the unsafe condition of the bridge, was sent on his mission as a result of a conference consisting of Mr. Birks, the resident engineer on the work, Mr. Hoare, chief engineer of the Quebec Bridge Company, and other members of the engineering staff on the ground and inspectors McClure and Kinloch, the latter being the Government's inspector on the work. The conference was held as a result of the discovery —made three days before the collapse —that a lower chord designated as A9L was bowed or bent. Owing to this the bend was of recent occurrence and meant that the massive column was giving premonitory signals of distress. Opinions were expressed to the effect that there was too much weight on the tip of the great cantilever arm, but it is said the impression prevailed that the dismantling and removal of the great 1,000 ton traveler then in progress was reducing the weight on the structure as fast as the addition of the suspended span was adding to it.

Inasmuch as Mr. Milliken, superintendent of erection, was absent, having left Quebec the day before the bend in chord A9L was discovered, and that Mr.



THE QUEBEC BRIDGE DISASTER

Anchor Arm and Cantilever as they appeared before the collapse

it is evident in the light of subsequent events that the condition of this particular chord constituted a danger signal of the gravest significance and that immediate suspension of all operations should have followed its discovery, but such absolute confidence had the engineers in the integrity of the structure and the superiority of its design and construction that they no doubt thought it incredible that this huge chord could be in any condition to cause alarm when the load upon it was so much less than that which it was originally designed to carry safely. Differences of opinion arose; Mr. Birks, one of the men killed in the disaster, was firmly of the opinion that the chord had always had that bend in it, while other members of the conference believed that Birks was the only engineer on the ground possessing authority to order a discontinuance of the work, and that it was his opinion that the bend was of no significance, operations were continued, but it was decided to notify the Bridge Company and Mr. Cooper at once by special messenger, so Mr. McClure was sent by first train to New York for the purpose. It is a subject of much speculation in the engineering world and one which is receiving much attention in the editorial columns of engineering publications, as to what course the builders would have taken to have remedied the defect had its enormous significance been discovered prior to the accident. "How this huge chord could have been straightened while carrying its enormous load

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is," says Engineering News, "a problem which would have been without precedent in engineering." Mr. Birk's confidence in the integrity of the structure is best demonstrated by the fact that he staked his life on it, although he lost, but the great error of his judgment in contending that a bend was in this particular member when put in place in the bridge is evident from the fact that a deflection of two inches in a 57-foot column must have necessarily been perceptible to the practiced eye of the experienced men who handled it, particularly on account of their realization of the enormous load it was designed to carry.

The fact of the discovery of the bend by Mr. Kinloch in this particular chord—in which he had no more reason to watch for signs of breaking than in any of the others—suggests that the past history of the member had put him on guard and also demonstrates that it was straight when originally placed.

A careful study of the wreck has brought engineering experts to the conclusion that when this particular lower chord A9L in the left truss was at the point of failure that some compression member in the opposite truss was in a similar condition.

Coroner's Inquest.

On September 12 the coroner's jury rendered its verdict to the effect that Zephirin La France, one of the victims of the disaster, died from wounds and nervous shock occasioned by the fall of the bridge. The verdict says that the jury can not fix the real cause or causes of the catastrophe, but expressed a belief that as a matter of duty it should declare that according to the evidence adduced, all precautions were taken necessary to insure the building of the bridge without danger. The verdict has met with much varying criticism. In some quarters it is held that tne coroner ought to have had the members of the government investigating commission to testify. They, however, in anticipation of four or five months' further inquiry before a decision could be reached, declined to express any opinion. By others the view was expressed that the coroner's jury should have adjourned until expert authority had determined whether due precautions for the safety of the bridge had been taken.

Mr. Milliken, superintendent of erection for the Phoenix Bridge Company, and Mr. McClure, assistant to Mr. Hoare, chief engineer of the Quebec Bridge Company, were the two last witnesses examined. Mr. McClure testified to the effect that the chord which it had been claimed was damaged by a fall in the yard had been repaired subject, he believed, to the approval of Mr. Cooper, consulting engineer. Mr. McClure said that the bridge posts carried but 74 per cent. of what they had been figured to stand at the time of the accident. The total weight, he said, of the superstructure of the south side completed would be 18,000 tons, but that including the two travelers there were only about 17,000 tons at the time of the collapse. From the testimony, however, given before the Canadian Government Investigating Commission, it would appear—the verdict of the coroner's jury to the contrary notwithstanding—that for some time prior to the accident there existed sufficient knowledge, or at least ample evidence of defects so serious as to have justified a suspension of the work far enough ahead of the date on which it was really ordered, to have prevented the awful loss of life which characterized the catastrophe.

Canadian Government Investigation.

Mr. Hoare in testifying before the Government Commission, said it was true that the company's expert bridge authority, Mr. Cooper, resided in New York during the progress of the work, but it never, he claimed, had been suggested that an expert should be present on the scene. In response to an inquiry as to whose duty it would have been to propose such an appointment, he said that it would have been his, but that he never saw any necessity for it.

C. L. Curlbert stated that he was not working at the time of the collapse, but was standing on the shore nearby. He first noticed what appeared like a flash of electricity on the west chord of the main tower across the center of the anchor arm; the anchor arm seemed to rise and rumble and roll. He ran towards the bridge and saw the cantilever strike the water. There was, he said, much fire and smoke when the bridge fell, due to electric wiring.

Richard Case stated that he saw the train shoot off the bridge and the towers tip forward about thirty feet to the north and topple over, the lower part of both towers kicking back and falling. At

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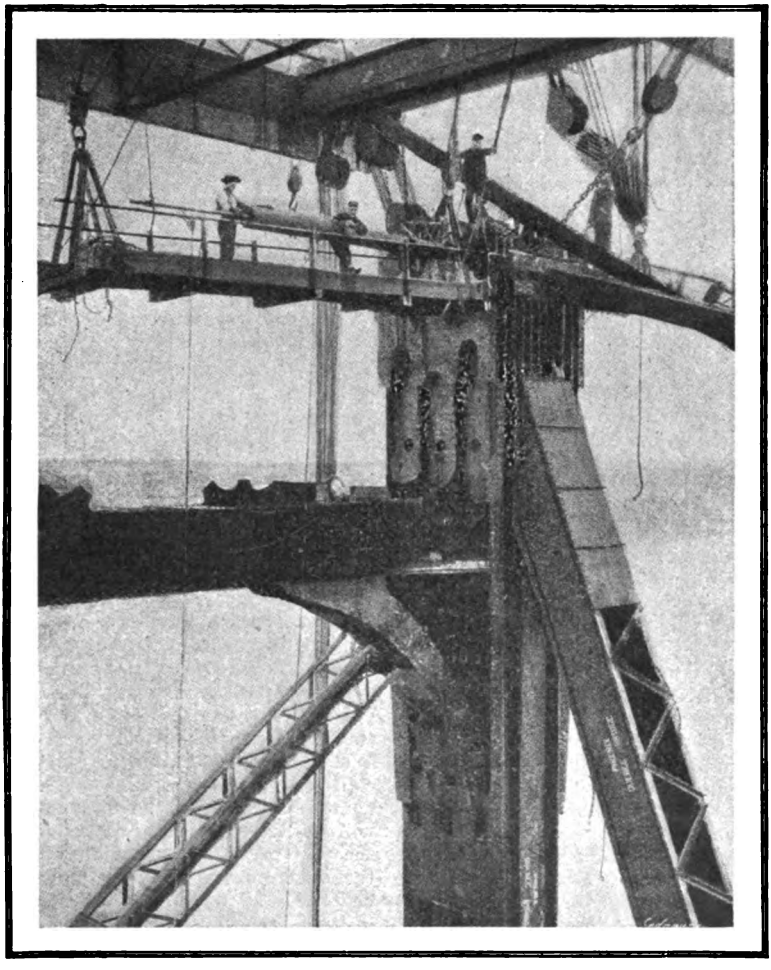
first the motion was slow and then became very rapid. The cantilever, he said, seemed to maintain its full length. His sight, he said, was fixed on the tower and bottom chord of the cantilever arm for about two or three panel lengths, and 26 it had been inspected, and that four members of the chord were bent, but he saw no cracks in them.

D. H. Haley, who was on the extreme end of the traveler at the time of the accident, stated that the first intimation



THE QUEBEC BRIDGE DISASTER

Showing the massive construction. The men seen in the picture are engaged in driving a 12-inch top center pin

it was probably four seconds from the time he noticed the movement of the bridge until it was in the water.

Eugene Lajeunnesse, after describing the fall, testified that on the previous Monday he had seen the defective chord and had bolted it, and that on August he had of the disaster was when he felt himself going with the bridge. Before he could realize what was happening he was in the water. He seized a plank and was soon rescued by a boat. He stated that on August 29 he and his partner went down after the whistle

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blew to look at a defect, and that they viewed it and saw several other defects, also. On a plan of the structure prepared by Mr. McClure, assistant to Mr. Hoare, chief engineer of the Quebec Bridge Company, he marked the location of the defects to which he referred, specifying the panels of the chord which he said were bent and which he had seen when standing on the third panel of chord nine. He also noticed, he said, that the lacing was bent on chord eight. On chord nine both center lacings were bulged. There were also, he declared, two or three bends in the rib in panel nine, two or three feet in length. At the splice where the chord in question joined the other he could see, although the cover plate was there, that the joint had never been properly riveted. The first rivet he noticed raised was marked. He reported the matter to three of the foremen. He did not report it to Mr. Yenser, as he would only have laughed at him (Mr. B. A. Yenser, general foreman, and one of those who met death in the depths of the St. Lawrence). That Mr. Yenser understood his work was, he said, evidenced by the fact that he (Mr. Yenser) was much opposed to the carrying of the traveler further out on the bridge, and the fact that this was permitted against his best judgment. Witness testified that he heard Mr. Yenser say to Mr. Birks, "Why don't they let me take down this traveler and get the load off?" Haley further stated that when Birks was spoken to of the deflected chord he said, "You fellows are getting prematurely alarmed—the thing is perfectly safe."

Dominique McCumber testified that he worked on the bridge until 2 o'clock on the day of the collapse; that he saw a defect in the sixth joint from the pier on the down stream side, and quit work.

Edward Britton, electrician on the bridge, who did not work on August 29, said that while in the office he heard Messrs. Yenser and McClure say that one of the chords had been bent in the storage yard.

Insurance on Property.

It is stated that the Ocean Accident and Guaranty Corporation Limited, of London, Eng., will bear a large share, if not the total of the loss caused by the collapse of the partially constructed Quebec cantilever bridge. This company has insured all the work of the Phoenix Iron Company in the United States and Canada. It is said that the Ocean Insurance Company is the largest of its kind in England. The amount of insurance it will give is limited only by the amount of premiums that the insured company is willing to pay, its rates being, of course, guaranteed according to the risk it takes. While the opinion has been expressed that the Phoenix Company's loss is fully covered, insurance experts doubt that the Ocean Company has taken a larger risk on the Quebec bridge than $1,000,000, which has probably been reinsured in several other English companies. Some of them assert that a policy limited at even one-fourth of the cost of the Quebec bridge is an unusually high risk, particularly when it is considered that American companies decline risks of that kind altogether, as far as material loss is concerned, taking contractors' risks on liability policies only in the amount of $5,000 for personal injury to a person, or $10,000 for personal loss to several persons in one accident. They say that there are rare exceptions in which the contractors secure a double limited policy for $20,000, which is then reinsured.

Many Theories.

Much has been said as to the particular point of weakness that constituted the initial failure of the bridge. It should be understood that the upper chords from which the bridge seemed to hang, are called tension members, and those underneath the bridge, running from the pier to the floor of the bridge, compression members.

The supposition is that when the compression chord on the cantilever side of the bridge gave way, a chord on the anchor side was also in condition of collapse. Many theories are advanced as to the cause of the disaster, but it will require a searching investigation on the part of the most capable experts in the engineering profession to determine definitely the real cause of the collapse of this stupendous work.

The Greatest Engineering Disaster.

Under the foregoing heading, the Engineering News, a periodical which is recognized as one of the leading authorities on engineering subjects, in discussing the matter editorially, has the following to say:

It is with the keenest regret that we record the collapse on August 29 of the great cantilever bridge under construction over the St. Lawrence River at Quebec. We are sure this regret is shared

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THE QUEBEC BRIDGE DISASTER

General View of the Wreck, showing how the trusses fell in their own vertical planes. Note the two lines of the top-chord eyebars, still pinned together, and stretching continuously across the mass of wreckage (From Scientific American)

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by every engineer who takes the least pride in his profession and its achievements. And the feeling is even deeper than regret. When the newspapers of last Friday morning spread the news of the terrible disaster at Quebec to every corner of the country, thousands of engineers, as they read the story, were grieved and sick at heart. They felt not only the horror at the fearful loss of life, sorrow and sympathy for their brothers whose professional and business reputations were dealt a cruel blow when that huge steel structure fell into the St. Lawrence, but also a sense of personal loss as well.

It could not be otherwise. Public confidence in engineers and engineering constructors and in the safety and reliability of their works is an asset of the whole engineering profession. To have this public confidence receive such a blow as this at Quebec is a loss almost incalculable. For decades to come, the Quebec disaster will be quoted, in public and in private, as an unanswerable proof of the unreliability of engineers and their works —of even the best engineers.

For it can not be said in this case that the disaster was due to the work of incompetent men who posed as engineers. Often it has happened, where an engineering work has failed, that the failure has been traced to the blunders of some quack wearing the professional garb. But at Quebec the work was in charge of men of long experience and the highest professional standing, so much the more, therefore, must the profession bear the responsibility.

There is another fact which makes this disaster a peculiarly heavy blow to the engineering profession. Of all bridge structures in the country which were expected to be built with absolute safety and certainty, we take it, the Quebec bridge is foremost. We know of no engineering structure anywhere whose failure would have been a greater surprise to the profession than this collapse at Quebec.

Of course, as our readers know, the structure surpassed in magnitude any bridge ever erected; but the problems involved in its design were, after all, simple, and, what is more important, they were accurately determinate.

The work of erection, where ordinarily many chances enter, was in this case subjected to predetermination and calculation as elaborate and painstaking as that required in the design itself. The possibilities of mischance which affect ordinary erection work were eliminated. Each manipulation of every piece had been studied, and the appliances and methods therefor had been prescribed in detail. The magnitude of the weights to be handled compelled this. And the general course of the erection was so laid out that at every stage the structure was fully as safe as the finished bridge. Altogether the erection work at Quebec has been carried on more scientifically, more accurately and more safely than in any other bridge structure ever erected. The collapse of the bridge, notwithstanding this care, overthrows every certainty.

And the surprise of the profession, we take it, is well matched by its mystification as to the probable cause. It often happens, when news comes of an engineering accident, that one well versed as to the general conditions can form some idea as to what must have happened to bring it about. But the early newspaper reports of the Quebec collapse gave no clue whatever on which one could hang a theory of the cause of failure. What could have happened to this towering fabric of steel to send it crashing into the river?

One rapidly canvasses the possible causes of accident to bridges under construction. Traveler failures are a prolific source of disaster to bridges under construction; but the traveler on this huge structure was as much a matter of anxiously careful construction and handling as the bridge itself. Connections left partially riveted or otherwise unsecured are another prolific source of erection accidents; but in building this great pin-connected cantilever all the main members had to be erected complete as the work progressed; and there was no reason whatever for delaying full wind and sway bracing—as, indeed, it was not delayed. In some types of bridge structure there is chance for doubt as to actual stresses; braced arches, continuous girders, and suspension bridges are examples. But in a simple cantilever there is absolutely no chance for doubt as to stresses. Failures of hoisting apparatus, with fall of main members, have occurred in bridge erection; but they seldom wreck the whole structure and least of all would they be expected to do so on the outer arm of a cantilever bridge, nor at all in a structure of such massive proportions as that at Quebec.

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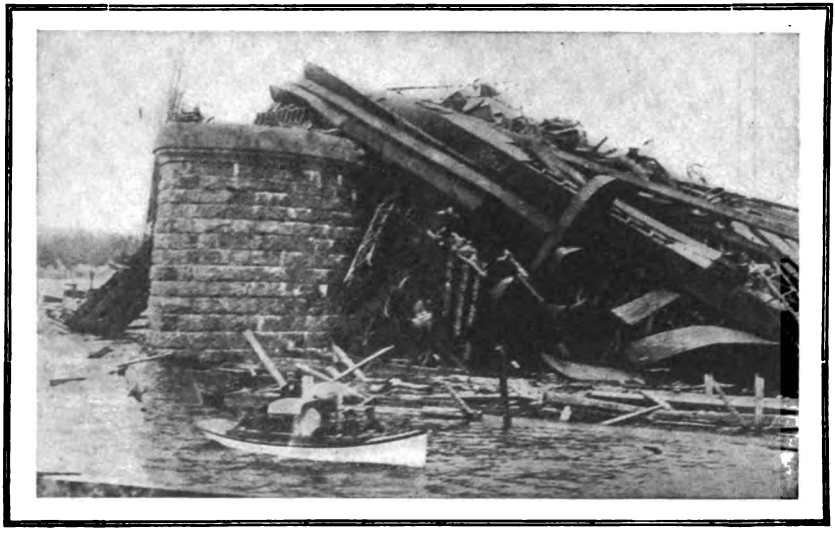
Failing pier foundations wrecked a great bridge over the St. Lawrence at Cornwall, Ont., not many years ago, but at Quebec the piers supporting the huge cantilevers were founded in moderate depth of water and the supporting material was tested with diamond drills to remove the last fraction of doubt as to its reliability at great depth. The piers themselves were of high-class masonry; there was no reason in that region of Laurentian rock for using any but the soundest stone. Even if considerable settlement of a main pier were to occur while the cantilever was under erection, it seems inconceivable that it should set



THE QUEBEC BRIDGE DISASTER

Wreckage at the Main Pier

up such stresses in the superstructure as to cause its complete collapse without a moment's warning.

The usual causes of disaster in bridge erection seem, therefore, improbable as causes of the wreck at Quebec. We are led, therefore, to turn to other causes peculiar to the structure itself. The Quebec bridge was to consist of two great cantilevers, with their river arms connected by a suspended span 675 feet long. In erecting this suspended span stresses are, of course, produced in the cantilever greater than those due to the dead load of the span after it is connected. These erection stresses are, of course, accurately computable; but it is natural to wonder whether sufficient provision was made to sustain them. An error was made somewhere, of course, or the bridge would now be standing, and an error at this point may seem less improbable than an error of some other sort.

Again, this bridge exceeded all structures heretofore erected in the size of its main members. It did this, necessarily, because of the length of the span. So far as the eyebars are concerned, equally large bars have been used on some other great bridges, and the heavier stresses in the Quebec bridge were provided for by using a larger number. In compression members, however, all previous sizes were necessarily exceeded. With the disaster at Quebec facing the profession, it is well to confess that our knowledge of the actual limits of safe stress on long steel columns of exceptional size is by no means perfect.

No one can doubt that the designers of this immense structure used the best data at their command in proportioning both tension and compression members to the loads upon them; but in using experience on lesser structures for the design of greater there is always a chance that some element unimportant in the small work will become important in the larger

It may occur to some critical reader

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that in this review of the possible causes of failure we are leaving out of account possible defects in workmanship or quality of material. We have done this, however, advisedly. In so huge a structure as the Quebec bridge, a defective eyebar, or plate, or even an ingot of burned steel worked into the material are less of a menace to the structure than would be the case in a structure one-tenth or one-twentieth as large. In a small bridge a single weak eyebar may cause disaster. In the Quebec bridge, where some members are made up of fifty or more eyebars, the weakness of one would be relatively unimportant. Besides this, we risk little in saying that the importance of the structure must have made every one concerned in its building feel the responsibility of securing, not only perfect design and excellent workmanship, but also material of perfect reliability.

And now, following this rapid survey of the possible causes of the Quebec bridge collapse, made without knowledge of the circumstances attending it or of the condition of the wreck, let us see what clearer light is shed upon the cause by studying these circumstances and examining that terrible pile of scrap on the St. Lawrence shore.

It may seem to the reader that it should be an easy matter to promptly settle, beyond possibility of doubt, what caused the wreck by an examination made on the spot. The first sight of that gigantic heap of torn and twisted steel promptly negatives such an idea. Only the most careful expert analysis can determine the hidden cause of the wreck. Elsewhere in this issue we have endeavored to record the chief superficially available facts regarding the disaster; such as are needed to enable an engineer to form in some degree his own opinion. Here we shall try to set down the deductions which the facts seem to permit. We make no pretense that the analysis is complete. Time has been insufficient and the data have been incomplete.

At the time this is written, at Quebec, on the fourth day after the wreck, *the initial cause of the wreck appears to be the failure of some compression member in the anchor arm of the cantilever.*

It is important to trace the analysis leading to this conclusion, an analysis independent of what we recount, in our descriptive article, about the curiously buckled ninth bottom chord of the west truss.

(1) Neither the main pier nor the anchor pier show the slightest sign of settlement or failure. They are monumental examples of high-class masonry, and, except for a few coping stones displaced or broken by the falling superstructure, both piers are, to all appearance, absolutely uninjured. It is possible that the impact of the superincumbent mass may have loosened the bond of the cement in places, but this can not yet be determined. But it is certain that the piers still stand in place, with the truss bars on the main pier and the anchorage in the anchor pier still there. The piers did not cause the fall.

(2) *The initial failure was not in a tension member.* This is so important that we deem it well to show the proof in detail as follows:

a. Had a tension member failed first it would have snapped with a loud, sharp report or a series of reports as successive eyebars in a panel parted, which would have impressed every eye-witness. All accounts agree that the very first yielding was silent. The first warning was when the men felt the floor sinking beneath them.

b. Had a tension member failed, especially one of the top-chord members, the structure would have dropped instantly, like a falling body. The failure did not occur in this way. The hazy accounts given by eye-witnesses agree in the one fact that the collapse was rather gradual, at least in its first stages. A time of 10 to 15 seconds is indicated. The time-keeper, who was near the anchor end and had to run up-hill to safety, must have occupied at least this much time before he turned around. This man, by the way, does not report jumping a gap at the anchorage, although a gap must have opened there at once if the anchor arm was the seat of the failure. But there are now hanging from the approach span three long strings of track rail, about 75 feet long, which pulled away from the rest of the track on the bridge; these doubtless carried their ties with them for a time and bridged a gap, if a gap did form. The absence of a gap, therefore, argues neither for nor against compression failure or anchor-arm failure. But the slowness of the fall points to a compression member as the one to give way. The gradual fall could not possibly occur in the case of sudden snapping of an eyebar, or, rather, a panel of eyebars.

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c. The eyebars of the upper chords of the anchor arm are intact, unbroken and still joined in a continuous chain, from the bottom of the anchor pier clear across the pile of wreckage, over the top of the main pier until they disappear in the waters of the St. Lawrence. In all that pile of torn and twisted and wrenched steel there is only one single broken eyebar thus far discovered, and that is but one bar out of 26 composing that particular top-chord member. It is true the top anchor chain fell on top of the pile of wreckage, and, naturally, suffered much less than the members at the bottom; yet there are places where eyebars received terrible punishment, were bent, twisted and distorted, and in spite of this, during a whole day's examination by two of the editors of this journal, not one eyebar, with the single exception noted, was found with even a crack across its edge. The importance of this fact to the art of bridge engineering we shall enlarge upon at another time. Its bearing on the question whether a tension or compression member caused the wreck is the point we would emphasize now.

(3) The failure did not occur in a compression member of the river cantilever arm.

If a strut had collapsed somewhere near the end of the river cantilever, the rest of the structure shoreward would have remained standing, or, at least, would have very slowly collapsed progressively and probably not far toward shore. All accounts agree with the appearance of the anchor-arm wreckage in showing that the failure did not occur in this way. There is, indeed, a bare possibility that a failing member on the river side of the main pier and near the pier might have buckled the towering main post over this pier and so caused the wreck of the structure; but everything indicates that this is not a correct record of the failure. As the wreck lies, the members, with the exception of some members of the bottom chord, have all been dragged over toward the river, due, it is believed, to the fall of the river arm

THE QUEBEC BRIDGE DISASTER

Wreckage of South Anchor Arm, seen from the bluff west of the Approach Span

(From Engineering News)

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as a whole, dragging the top chord and its attached members with it, when the failure in the anchor arm deprived the river arm of support. The main tower posts are bent and broken, it is true; and very badly broken. But this would have been caused both by the collapse of the web members attached to them on the shore side and by the riverward pull of the eyebar chain over their tops. The survivors agree, moreover, in the opinion that failure began in the anchor arm.

(4) The failure was in a main truss member and not in any of the cross bracing.

All the wind and sway bracing was in place and fully connected, and there was no wind of any account when the bridge fell. Further, the trusses fell quite generally in the plane of their original position. The evidence of witnesses, moreover, speaks of no sidewise swinging, but only of the downward motion.

(5) The probabilities are against the failure beginning in a main post above the floor level. The time-keeper, who was facing the probable point of failure, had his first warning by feeling the floor yielding beneath him. A buckling upper post within a hundred feet or so of him would almost certainly have been seen.

(6) No indication as to the probable point of failure is to be seen in the fact that the wreck of the anchor arm on the foreshore lies slightly to the east of its original position. The center of gravity may be 8 to 10 feet, more or less, east of its location when the span was in position on the piers. But when the great height of fall is considered, it is impossible to conclude anything but that the structure, or its anchor arm at least, went down in perfect verticality.

Thus the probability is established, we think, that a compression member in the anchor arm, and that member not a post, but a section of the bottom chord, was the seat of initial failure.

It may be thought that the next step, locating the actual responsible member, would be easy; that one need only go to the site, examine the wreck, and point to the weak link. The facts set forth in our descriptive article as to the buckling tendency noticed in the ninth left bottom chord section may seem to the reader to put the matter practically on the basis of a certainty. This would be far from warrantable. Not what went before, but what happened at the time, is called for. This must rest wholly on the evidence of the wreckage. The task of constructing herefrom an explanation is not an easy one.

But at present the explanation of greatest probability is the failure of this ninth left-hand bottom chord. This explanation rests on one most weighty fact: Of all the bottom-chord sections of the anchor arm (all of which have been fairly well traced) there is only one that exhibits characteristic buckling distortion, and that is this ninth chord. All the others are bent and crushed, broken at the splices, cracked across, burst open, and most variously battered, but none has a well-defined buckle. The ninth of the left truss, however, is not merely buckled in indisputable manner, but it is doubly bent in a closely folded S-shape, and both its ends still lie practically in their original direction. Did this chord crush as a *result* of the fall. That event happened to all the posts, as our photographic views show strikingly, but not to the chords. The posts had the crushing endwise impact of the fall to withstand, but the chords only fell laterally. A chord member swung forward against the pier masonry might well be buckled. On the left side a tendency in this direction is indeed observable in the eighth chord. But the ninth chord lies far from the pier, in place, as it were, and can hardly be conceived to have returned after striking the stonework; especially is this obvious as chord 10 lies not far out of place as compared with its original position relative to the ninth, being on the pier side of chord 9.

We believe that the most thorough study of all that relates to the present and past state of chord A9L must be among the first things to engage the attention of those charged with the investigation of the disaster.

We have already alluded above to the lack of absolute knowledge as to the strength of steel columns of enormous size, such as were of necessity used here. These compression members were designed for a unit stress under full dead, live and wind loads of 24,000 lbs. per square inch, about two-thirds of the elastic limit of the metal. They were carrying at the time of failure not more than two-thirds of this amount. Were these compression members able to safely carry this stress? Were the plates and angles of which they were built up so thoroughly braced and connected together as to make the whole member act as a

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unit? Their design was made and approved by the ablest engineers in the profession. No one has dreamed of doubting their strength; but now, with the testimony of that gigantic collapse, every engineer must long to know, by absolute trial, what such huge columns can safely bear.

For, it is not proper to say that the history of several slight injuries to the buckled chord member relieves the weight of doubt in this matter by furnishing the explanation of abnormality. It can not be said that a member is abnormal which is straight and sound enough to be per se acceptable under careful inspection. Is it at all certain that the undiscoverable variations of manufacture may not produce, in regular process, undisturbed by mishap, a column identical with this one? If inspection can not differentiate it, what surety have we on this point?

No. the doubt lies farther back. We step up from the ordinary columns of ordinary construction, tried out in multiplied practice, to enormous, heavy, thick-plated pillars of steel, and we apply the same rules. Have we the confirmation of experiment as a warranty? Except in the light of theory, these structures are virtually unknown. We know the material that goes into their make-up, but we do not know the composite, the structure.

It is at exactly this point that the Quebec bridge failure becomes of importance to the whole engineering profession. Until the cause is absolutely determined —if indeed it can ever be—or until the profession has actual results of tests of huge columns at its command, a cloud of doubt rests upon us as to the margin of safety in every great bridge structure; at any rate when the unit stresses are forced up to the point deemed safe by the designers of this bridge.

Long and careful inspection of the wreck shows that the material was of excellent quality; that the workmanship was remarkably good. The end connections of the compression members were remarkably massive and well wrought together. The doubt all centers around the design of those enormous long columns of which the lower chord and the vertical posts were made up. Did one of them fall under a load only one-half the elastic limit of the material in it? That is the question which must, for the present at least, be left unanswered.

Book Review.

Questions and Answers on the Standard Code of Train Rules.—The sixth edition of this standard work on train rules, by G. E. Collingwood, has just been published, and is a most valuable book of instruction and reference on that subject. It has been greatly enlarged and improved over former editions, and should be in the possession of all who have to do with the movement of trains. It contains all the rulings of the American Railway Association on train rules and train orders; all questions on train rules and train orders used in examinations, together with their correct answers; gives valuable points on train rules and train orders, and authentic rulings on same.

The growing tendency on the part of railroad companies toward a more rigid examination of trainmen—which is a good one—not only for the benefit of the service but of the public as well, has created a demand among trainmen and others for an authentic book of instruction and reference on train rules and train orders. Mr. Collingwood, who is an experienced railroad man and an acknowledged authority on train rules and train orders, has supplied just such a book as is needed by those who are entrusted with the execution of train orders and the proper observance of train rules. The questions and answers pertaining to the Standard Code of Train Rules and Train Orders cover the complete examnation of trainmen. Questions which were submitted to the American Railway Association, together with their answers, are included in the book, as well as that body's rulings on doubtful points. The knowledge imparted by this book is clear and definite, helping its possessor to form good habits in the performance of his duties, and laying a foundation which is sure. The book contains 128 pages, 5x7 inches, and is nicely bound in cloth. Price $1.50, postpaid. Published by Train Dispatchers' Bulletin, Toledo, Ohio.

Specifications for Locomotive Fuel.

Coal is one of the few materials purchased by railroads in large quantities which is not subject to inspection under rigid specifications. In the past there has been some excuse for this apparent neglect to secure definite value for money expended. New railroads were interested

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in developing the natural resources along the line and were glad to have a cheap and convenient fuel supply of any grade. In many cases the railroads owned the coal properties and the price charged per ton was a nominal one, based on the cost of production. It has also been a common practice for the officers of railroads, high and low, to own stock in the coal companies which supplied their locomotive fuel, and they were not naturally interested in any movement which would tend to reduce their dividends from this source. Because of recent legislation these conditions can no longer exist, and there are now no good reasons why the coal supply for railroads should not be purchased to specifications which will secure a definite return in heat value for each dollar expended.

In addition to the large saving made possible by such a practice there is the further advantage of securing coal of much more uniform quality, which is of special importance in the fuel supply for locomotives. One of the most frequent reasons given by enginemen for delayed trains is "poor coal." Locomotive boilers are forced to maximum capacity more than any other type and their satisfactory steaming depends upon a delicate balance of conditions, so that the rate of steam production is easily reduced by the use of inferior grades of fuel. The grates become clogged with clinkers because of excess ash and sulphur and it is then impossible to force the draft to proper pressure. When grates and draft appliances are designed for one grade of fuel frequently they will not burn other grades with equal success. As it is necessary for the locomotive to haul its own fuel any possible saving in this bulk and weight is important. Modern tenders have a capacity as large as sixteen tons, and they are as high as the roof of the cab. Coal with less ash and more carbon per pound would require less capacity for the production of a given weight of steam.

The requirements for coal used on locomotives are similar to those for the navy, where the greatest steaming radius should be accompanied by a minimum of storage capacity.

The importance of the subject will be realized when it is found that the amount expended for locomotive fuel annually by the Lake Shore is three million dollars; by the Union Pacific and auxiliary companies, four millions; by the Chicago & Northwestern, five millions; and by the New York Central road, nearly seven million dollars. The average cost of fuel per engine-mile on a large system is 10 cents. The expenditure of such large sums for material, which is so variable in quality and the poor quality of which seriously affects locomotive performance, warrants more careful inspection, and a more scientific specification, than that which has been in use heretofore. Corporations owning some of the largest central power stations, and manufacturing concerns using large quantities of coal, have adopted as a basis of coal purchase specifications involving the thermal value of the fuel. The work which has been done in this country in the preparation of such specifications and the experience in the use of them has resulted in the general recognition of the necessity of the British thermal unit rating as a contract standard.

It is within the province of the mechanical engineer to design furnace equipment which will utilize certain grades of coal in obtaining the greatest return in heat units for the net cost. When the kind of coal has been decided upon it should be the duty of the purchasing agent to contract for that fuel under explicit terms which will be fair both to the producer or dealer and the consumer. The successful use of a specification based on thermal units depends upon this co-operation between producer and consumer so that the former may receive benefit from a product of high quality and accept the loss due to shipment of inferior coal. It depends also in a large measure upon the mine operators' knowledge of the characteristics of the coal handled and upon the ability to control the variations in quality caused by the methods of mining and cleaning.

That the plan is entirely feasible when entered into by both parties with full understanding of the conditions is evidenced by the large number of government contracts which have recently been made under rigid specifications, and in which the nominal price per ton does not exceed that charged for coal bought in the ordinary manner without specifications. The preparation of these specifications and the inspection of the government coal supply have been made under the direction of the fuel testing division of the United States geological survey, and the work is now in such excellent shape that it could be followed with

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little modification by railroads and with the prospect of much larger savings, since the coal bill of the New York Central road alone is larger than that of the United States government. The government specification is based upon the principle that the economic value of a fuel is affected by the actual amount of combustible matter it contains as determined by its heating value shown in British thermal units per pound of fuel, and also by other factors, among which is its ash content. The ash content not only lowers the heating value and decreases the capacity of the furnace, but also materially increases the cost of handling the coal, the labor of firing, and the cost of removing ashes. The specification gives careful directions in regard to sampling, and requires a total of 100 pounds selected proportionally from lump and fine coal. In order to minimize the loss in the original moisture content the sample is crushed to maximum lumps ½-inch in diameter and this is repeatedly quartered and the final sample placed in a shipping jar and sealed air tight. The sample is analyzed and tested by the government chemists following the method adopted by the American Chemical Society, December, 1899, and using a Mahler bomb calorimeter.

Coals containing more than specified limits in percentage of ash, volatile matter, sulphur, dust and fine coal are rejected. Payment for coal is made on the basis of the price named, corrected for variation in heating value and ash. The correction for the former is directly proportional to the variation in British thermal units from the established standard. The correction for percentage of ash is a premium of one cent per ton for each whole per cent. less ash, and an increase in the ash content of 2 per cent. over the standard is allowed without exacting a penalty. When such excess is more than 2 per cent. above standard, deductions are made from the price paid per ton in accordance with a table which shows directly the reduction in price for various percentages of ash as established in the contract.

The necessity of such a system is shown by the government experience in the application of the specification, where an average deficiency of 3½ per cent. in heating value was found on contracts aggregating $200,000, representing $7,000, of which not more than $1,000 was charged for testing. Individual deliveries have shown as high as 47 per cent. ash on a contract standard of 6 per cent., and less than one-half the required heating value.

From the reports of tests of coal used by the government buildings in Washington it is found that furnace anthracite coal containing 10 per cent. ash, with a value of 13,300 British thermal units, costing $5.50 per ton, will return about 54,000 British thermal units for one cent. Buckwheat coal containing 18 per cent. ash, 11,485 British thermal units, costing $3.02 per ton, returns 85,190 British thermal units for one cent. And bituminous coal containing 8.4 per cent. ash, 13,925 British thermal units, costing $2.93, returns 106,450 British thermal units for one cent. This shows the superior economy of soft coal when it is burned without smoke.—The Railway Age.

*Western Railroad Activities.**

No Time Being Wasted.—A large force of men are now engaged in grading the roadbed from Redwood City to the southern arm of San Francisco Bay at Newark. This is on the Southern Pacific's new Dumbarton Point cut-off. Already the grade has reached the water's edge, and pile drivers have commenced preliminary operations on the big Dumbarton bridge, which will be about one mile in length. From appearances it looks as if there will be no time lost on the construction of this important cut-off line.

A "Perpendicular" Canyon Railway.—The officials of the Santa Fe Railway Company have about completed arrangements with a company in Ohio for the construction of an unique railroad that is to extend from the brink of the great Colorado River Grand Canyon, to the bottom.

The grade will be so very steep that it may almost be called a "perpendicular" road. This road will be about three miles long and it is estimated that the total cost will not be less than $100,000 a mile, or $300,000.

This will be a cog road, with a rack rail, which will form a continuous double ladder, into which the toothed wheels of the locomotive will work. The locomotives are to be provided with two double steel cogwheels, through which the power

*By J. Mayne Baltimore, special correspondent to the Locomotive Firemen and Enginemen's Magazine.

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is applied. Extending from the sides of these wheels will be four corrugated surfaces, upon which the powerful steam and hand brakes are to do their work. Either of these brakes is sufficiently powerful to stop the locomotive and train.

The steam cylinders of the locomotives will also be fitted with water brakes on the downward journey. The locomotives will push the cars in ascending, and precede the train on the downward trip, thus giving, it is claimed, perfect control over the cars at all times.

All arrangements are about completed, and active operations, it is expected, will very soon be commenced upon this very unique "Canyon Railway."

Rapid Road Building.—From the offices of the San Joaquin Valley Western Railroad come reports of rapid progress from the several corps of surveyors now in the field. Over 100 miles of road have been definitely located and the right of way acquired. The remaining portions of the road through the San Joaquin Valley will be surveyed before January 1, 1908, and the construction of the road will then begin and be rapidly pushed. This road starts at Watsonville and will extend on to Fresno, Handford and other points in the San Joaquin Valley. A branch will also extend to Coalinga. The total length of this road, including branches, will be 220 miles and will cost upwards of $6,000,000. Bonds have been issued, and it is officially announced that ample funds are on hand to carry out the project.

Material for Western Pacific.—Chief Engineer V. G. Bogue, of the Western Pacific, is now on a thorough tour of inspection of the line, and will inspect grades, track-laying points, tunnels, bridges, etc., before his return to San Francisco. There are vast quantities of material piled up at Stockton and Marysville, and 40 per cent. of 5,000 tons of steel ordered for the use of the bridges has already been received, and the balance is on the way from the east. Many thousands of ties are also at the different yards of the Western Pacific, and the work is so well advanced that the officials of the Gould line feel confident that the road from Salt Lake to San Francisco will be opened by the 1st of September, 1908.

Operating a Track-Laying Machine.—The work of track-laying from Stockton to Sacramento, Cal., is now being crowded forward with all possible speed by the Western Pacific. The grade between these two cities is completed, and track-laying can proceed without any unnecessary delay. This work is being greatly facilitated by the use of a large and powerful track-laying machine which the railway company is using. This machine will lay from 4,000 feet to a mile per day under favorable conditions, and to accomplish this work requires from 90 to 100 men. The accompanying photo shows this track-laying machine in operation. The machine, though quite simple in its construction, operates rapidly and effectively. When the track has been laid to Sacramento, work will be commenced from the latter city toward Oakland via Niles Canyon. The Western Pacific expects soon to have several track-laying machines in operation along the line between Salt Lake and the Pacific. The purpose of the company is to push the track-laying as rapidly as the grade can be prepared for the reception of rails.

May Build Parallel Lines.—It is stated on good authority that if the proposition of the Southern Pacific to the Phelps-Dodge interests to buy the Nacozari road from Nacozari, Mexico, to Douglas, Arizona, is not soon accepted, the Southern Pacific will construct a parallel line. In anticipation of a rejection of its offer, the latter company is already preparing to put in the field a force of engineers.

Repairs to Santa Fe's Tunnel Completed.—Repairs to the big Franklin tunnel, on the line of the Santa Fe between Antioch and Richmond, Cal., have been completed at last, and trains are running regularly through it. For a long time the Santa Fe's schedule has been disrupted by reason of the necessity of going around the caved tunnel. Last winter the tunnel, which is one and one-third miles long, caught fire, and, as the timbers burned, the earth caved in. The work of excavating the debris and replacing the tunnel was long delayed on account of the passage being filled with poisonous gases. At one time the Santa Fe engineers almost despaired of being able to repair the big Franklin tunnel, and it was feared that the railway company would be compelled to abandon it after all the money that had been expended in boring it. The pent-up noxious gases rendered it almost impossible to work, so great was the risk. However, with great labor and heavy expense, the

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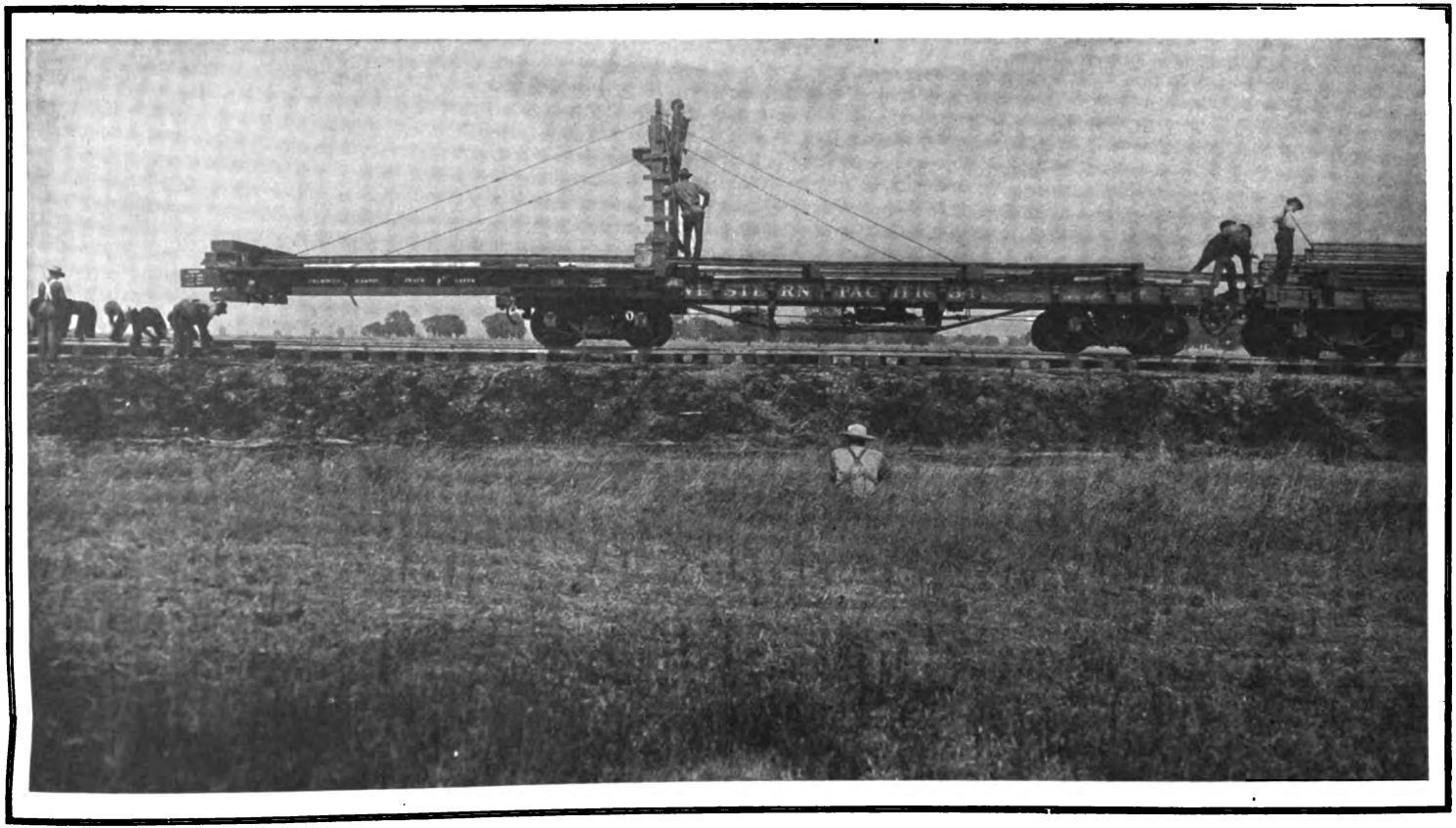

TRACK-LAYING MACHINE ON THE WESTERN PACIFIC

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tunnel has been re-excavated, and then lined with solid masonry and concrete. The Franklin tunnel is now considered one of the safest and most permanent on the entire Santa Fe system.

Work on the Boise Cut-Off.—Southern Pacific surveyors are now going over the ground from Boise, Idaho, southwesterly to Redding, Cal., and there is no question but that a cut-off, giving Idaho and Montana cities a shorter route to San Francisco, is only a question of a few years. With the completion of the Oregon Eastern Railroad, which is to meet the California Northeastern at Klamath, Ore., the Southern Pacific will have a new route for half the distance between Portland and San Francisco. The building of these lines is significant of the scale on which the remaking of the Pacific lines is being carried out under the Harriman regime. In the place of the present heavy grades of the Shasta route through the Siskiyou Mountains, there will be opened a line located east of the Cascades, with a grade of only one-third of the present line and forty miles shorter. Locomotives now pulling freight over the older route will be able to pull trains about twice as heavy over the new line.

To Be Considered "At Home."—A movement has been set on foot by western railroads to consider freight cars "at home" wherever they may happen to be. They want it made possible for one road, at the end of its line, to transfer for delivery to its destination a carload of goods to another road and have it sent through to its destination, and without transfer of the cargo. It is also maintained that if freight cars were made "at home" wherever they might happen to be, a saving of at least 50 per cent. in equipment would be effected by the roads. This movement which has been set on foot also contemplates the compulsory reloading of cars immediately upon their arrival at destination.

To Issue a Bond of Twenty Million Dollars.—One of the most important features that President Harriman will have to consider while he is in California, is the plan of refunding the entire bonded indebtedness of the Los Angeles Pacific Railway, the electric line from Los Angeles to Santa Monica and other beach towns, which Mr. Harriman acquired more than a year ago. From authentic financial sources it is learned that a plan is being considered to float a new bond issue of $20,000,000 with which to retire all the existing bonds of the road, and to provide a fund sufficient to rehabilitate the system thoroughly. Plans for the betterment of the line include the construction of tunnels which will cost several millions of dollars, and which will give the road a direct route to the ocean over broad gauge tracks. Provision will have to be made for new rolling stock and for various extensions, which will increase the mileage of the system and place it in first-class condition. The question of the Union Depot for the Southern Pacific and the Salt Lake railroads at Los Angeles will also be definitely settled by Mr. Harriman before he shall have left for the East.

Saves a Day to Chicago.—The new Santa Fe's cut-off on the California overland line has been completed and that part of the line has been opened to freight traffic, though passenger trains will not use the new route until more ballasting has been done. This new route is known as the "Belen cut-off," and is 268 miles long. It runs from Rio Puerco, New Mexico, on the present main line, thirty miles west of Albuquerque, to Texico, on the western state line of Texas; there it connects with the Pecos Valley system of the Santa Fe. The cut-off proper will save only eleven miles in distance, but the importance of the new route is that the heavy grades of the Albuquerque route are eliminated. The old route crosses two summits, one at Raton pass, 7,608 feet above sea level, and the other at Glorieta, 7,421 feet high. Between the summits the altitude is 6,911 feet, which makes the grades as steep as 3.5 per cent. On the cut-off the highest point reached is 6,492 feet, and the maximum grade is 1.26 per cent. Freight trains are expected to save by the new route at least a day's time between Chicago, Los Angeles and San Francisco. The present fast passenger time between the same points will also be materially decreased.

To Run the First Train.—The Western Pacific expects to establish a railway yard sometime the coming fall at Winnemucca, Nevada, where the Western Pacific diverges northwest from the Southern Pacific's line. Early in September the Western Pacific officials will start their first train service with a line running between Salt Lake City and a point westward now called Shafter (in honor of the late General Shafter). This town is the crossing place of the road

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and the Nevada Northern Railroad, which is running between Salt Lake and the Guggenheim properties at Ely, Nevada. The line to Shafter will be 146 miles long.

To Bore a Long Tunnel.—J. D. Tarrell, vice-president and general manager of the Oregon and Washington Railroad, has officially announced that the Harriman extension to Puget Sound will begin work immediately on the long tunnel through St. John peninsula, just north of Portland. This tunnel, which will provide the exit for the Puget Sound extension from Portland, is to be 4,200 feet long. It begins at a point between Albina and St. John, and after cutting through the extension emerges south of Oregon Slough on the Columbia River. Most of the work will be easy, for the tunnel pierces a gravel and soft clay formation.

Salt Lake Railway Shops.—The shops for which the Salt Lake Railroad Company (Clark's road) has appropriated $350,000, will be located near the town of Las Vegas, in Lincoln County, Nevada. Three thousand acres of land at the head of the Muddy River Valley have been purchased. It is the plan of the buyers to colonize the tract and arrangements have been made for bringing in sixty families for settlement during the winter. The land is all situated west of the railroad. An irrigation system will be installed and the farmers will endeavor to supply the southern part of Nevada with agricultural products. Work on the immense railroad shops will be commenced at once and pushed rapidly forward to an early completion.

Sick Passengers to Have Stopover.—By instructions of Traffic Director J. C. Stubbs, the Southern and Union Pacific roads are hereafter to grant stopovers on account of sickness. A circular letter has been sent to all agents instructing them to this effect. Where necessary, extension of the limits of the ticket will be granted, or an exchange of ticket will be made. Railroad officials throughout the whole country are much pleased with the ruling of the Interstate Commission, holding that it is lawful for a road to charge more than the usual rate, or usual fare, for added services. This is especially gratifying in the East, where rates are fixed by speed made by trains, the regular rates being increased on trains that make specially rapid time.

More Engines for Harriman's Lines.—Julius Kruttschnitt, director of operation and maintenance for all of the Harriman system, officially states that the Southern Pacific lines will have 265 more locomotives this year than was the case last year. All, he says, have already been delivered but fifty, a fact which is more important than an increase in cars. Director Kruttschnitt also adds: "When the last of our 16,000-car order is received, we think we will have enough equipment to keep us going for a while. We have received 4,700 of the 6,000 refrigerating cars purchased, and the others are coming in at the rate of thirty-five to forty per day. They are about four months late. Our passenger cars are also arriving four to five months late. The remainder of the equipment is coming along fairly well."

Ocean Shore Road Has Not Changed Hands.—Very recently newspaper statements were published to the effect that the Western Pacific had taken over the Ocean Shore Line, or had made arrangements to finance that road through to its completion. J. Downey Harvey, president of the Ocean Shore Line, declares that he and his associates own the property the same as ever, and they have not made any arrangements with the Western Pacific Railway people, or any other company, to finance their road, or to be connected with it in any manner. President Harvey said: "We are regularly paying stock assessments for the purpose of raising money to complete the company's line south along the ocean shore from San Francisco to Santa Cruz. The portion of the road between San Francisco and Halfmoon Bay will soon be ready for operation. Once the line is completed to Santa Cruz, an extension will be built on to Watsonville. At the latter place connection will be made with the San Joaquin Western, which is a projected line between Fresno and Watsonville, with branches to Hanford and Coalinga."

Block Signal Work Progressing.—A prominent official of the Harriman system states that the block signal work is progressing rapidly from the Missouri River to San Francisco and Los Angeles, and south to Colton. It was the company's purpose to complete this work during the calendar year (1907), and it is expected it will be on time. On July 1 the Union Pacific had completed 292 miles of double track between the Missouri River and the Green River, and 640

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block signals were in that section. This takes in all of the double-tracking. Orders were given for 450 miles of double-tracking altogether, and all but fifty miles will be finished before January 1, 1908.

Western Pacific's Heavy Operation.—That it costs immense sums of money to construct railroads out west is shown by the work of the Western Pacific. According to the figures of that company, it now has: Laborers on grade, 6,577; teamsters, 500; tracklayers and ballasters, 801; engineer's department, 420; total men employed, 8,298; their daily food (pounds), 24,894; company's monthly expenses, $2,000,000; additional men wanted, 7,000. Chief Engineer Virgil G. Bogue is now kept constantly employed in inspecting the road, as work is being scattered along a stretch of over 700 miles. He finds it necessary to use an automobile, a horse and buggy, a horse to ride, and also has to do much walking in order to cover the great distance. Great efforts are being made to secure more men, principally graders, so as to push the work forward with all possible speed. Common laborers are paid $2 per day, and the men are charged $5 per week for meals. In addition to the men employed, the company and its contractors are using forty-two large and powerful shovels. At the present rate of progress, the officials feel confident that the road will be completed at the time originally fixed upon—the end of September, 1908.

The Harriman Mexican Line.—Five thousand men are now working on the Harriman Mexican extension to Guadalara. They consist of 200 Russians, 900 Chinese and 100 Japanese; the balance are natives. The natives are declared to be easily the best workmen, the Chinese being next, the Russians third and the much-vaunted Japanese being at the very bottom of the list in efficiency. The contractors are Grant Brothers, and they state that they will soon add 5,000 teams, thus doubling the force. Most of the teams are mules. In speaking of the construction work, Southern Pacific officials state that connection will be made with Stillwell's Orient road very shortly. San Blas will be reached in October. On the branch from Navojoa to Alamos, forty miles of grading has been completed and track-laying waits for the finishing of the concrete bridges. The entire branch is to be finished by November 1. In the month of last July ninety miles of road were laid on all lines.

Building Very Expensive Road.—Julius Kruttschnitt, who has charge of the general construction and maintenance of all the roads of the great Harriman system, is now on an inspection tour of the lines on the Pacific Coast. He says he has just given orders to complete the Southern Pacific road that is being constructed between Baton Rouge and Lafayette, La. This new line will be a very expensive one.

E. B. Cushing, general superintendent, says that it will cost about five times as much to build as does the average railroad in that state. An immense amount of filling has to be done, and this will prevent operating the line for about eighteen months. Twelve miles of temporary trestle has been already built, and this will be filled in with about 1,000,000 cubic yards of earth, or about 100,000 carloads. Considerable delay has also been caused as a result of high water in the Atchafalaya river, and in the swamps of the same name. A drawbridge has been built at Opelousas and another bridge is being erected over the Atchafalaya river. Orders have been issued to rush all of this work.

Tacoma to Have Harriman Road.—Official announcement has been made that the Oregon & Washington road will commence at once on the construction of the big tunnel to be cut under the city of Tacoma. This tunnel will be about one mile long, and will cost in the vicinity of $1,000,000. It will be much more difficult and expensive than the tunnel that is to be bored on the St. John Peninsula, just north of Portland, Oregon, on the south side of the Columbia river. With the completion of the Tacoma bore, the Harriman road will be able to lay its tracks as far north as Seattle. It is an absolute fact that the Harriman line will construct the tunnel under Tacoma as formerly announced. The report that Mr. Harriman would call off his tunnel work and share with the Northern Pacific route out of Tacoma by way of Point Defiance, is without any foundation —so officials declare.

Various Roads in Alaska.—In Alaska half a dozen lines are now in course of construction. The Copper River Company has just finished twenty miles of road from Cordova. Much of its heavy rock work was completed last fall. The Valdez and Yukon railway has completed its wharf and offices. The Solomon River Railway has extended its line to Casa-

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depaga and is pushing its construction to reach Council.

The Nome and Arctic Railway has purchased the Wild Goose railroad and are pushing the line toward Kougarok. The most of these lines are very anxious to build into the Rayak coal fields, where coal is plentiful and of high grade for cooking and general use.

In the Susitna Valley, the Alaska Central Railway last year had forty-seven miles of standard gauge track in operation north from Seward. The series of tunnels and heavy grade work for the next seven miles were 90 per cent. completed last year, and are now about to be opened. The line will, when completed, go through Fairbanks, the Monastuska coal fields, and on to the Yukon, 400 miles distant northward.

A Railroad College.—President E. P. Ripley of the Santa Fe system is one of the number of prominent railway men who are interested in a new school in the East which is to turn out a needed supply of men for the railroads of the country. Arrangements have been made whereby deserving students may be taught free, and those who pay their tuition may have it refunded if they "make good" and remain with any railroad company for the space of one year.

In carrying out the plan the railroads are to spend several hundred thousand dollars annually and their sole hope is that the supply in the railroad labor market eventually may be made nearly commensurate with the demand. An effort has been made also to co-operate with the labor organizations. This is sought to be accomplished by rules which will give the organizations the right to assist in the examination of graduates of the school before they are marked "O. K." and sent to some railroad.

From the standpoint of the young man who desires to enter the railroad service this is said to present an assured future, for, if he passes his examination with the mark of 75 or better, he will be guaranteed an instant trial for ten days by one of the railroads, and an indefinite position if the trial proves satisfactory.

Work on Giant Freight Yards.—At least three months will be required to complete the giant freight yards now being built out at Visitacion Valley, in South San Francisco, by the Southern Pacific. Chief Engineer William Hood, in speaking of the vast reclamation of the land in Visitacion Valley, and building there one of the greatest freight yards in America, said:

"We have between 160 and 170 acres of land out there—something more than forty city blocks. Visitacion Valley is roughly a "V"-shaped area opening eastward toward the bay and walled on both sides by hills—those to southward being very high. By driving down thousands of piles and filling in we are reclaiming all of the tide land.

"The cut-off track runs straight across the outer edge of the valley and into a big tunnel at the southward. In the angle inland, not far from the immense California Gas and Electric Company's power house station, we are to build a roundhouse that will hold forty locomotives at one time, and it will be able to accommodate more when needed, as it can be enlarged.

"Stretching along the west side from the roundhouse, back toward San Francisco, will be the various shops. Those that the company are now constructing are a machine shop 130 by 446 feet; a car repair shop 185 by 270 feet, with a planing mill in one end and a freight car repair building 110 by 450 feet. We are also erecting a number of supplementary buildings.

"All of the buildings will be of brick, with steel roofs and concrete foundations. The buildings will have steel roof trusses, and all of the concrete foundations will rest upon piles driven deep into the earth. These are only the first buildings. We expect to put up others as the business grows.

"We are also to put down sixty miles of switching track and space will be available for thirty-five miles of additional switching tracks whenever they may be required."

Santa Fe Changes.—The Santa Fe railway officials have placed into effect an order dividing its California overland east of Albuquerque, together with connecting lines owned by the company. The new division, which will be known as the Central Grand, will be composed of the Middle, Oklahoma, Western and Panhandle Divisions, and will include all of the main lines from California and Dodge City and all the north and south branches.

Immense Railway Bridge-Building Task.—The Western Pacific has just commenced the very extensive work upon its big series of river and creek bridges. There are seventy-five bridges to be built

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along the 929-mile road between San Francisco and Salt Lake City, but all of them west of Wells, Nevada, which is a town 700 miles from San Francisco, and the location of the last bridge to the eastward.

Wells is near the head of the Humboldt river, which the Western Pacific will have to bridge no less than thirty-three times. But, after passing Wells, and on eastward to Salt Lake, a run of 229 miles, there will not be even one bridge on the road.

These seventy-five railway bridges make an aggregate length of almost three miles, and the Western Pacific engineers say they will require the enormous total of 20,000 tons of structural steel. An order for 2,000 tons has just been placed in the East.

The location and length of the principal bridges are: Modelumne bridge, 162 feet; Cosumnes, 200; American, 560; Yuba, 400; Middle Fork Feather river, 442; North Fork Feather, 448; North Fork Feather, 260; Chandler Creek, 640; Willow Creek, 1,000. Chandler Creek, away up in the wilderness of the mountain slopes, is really to be crossed by a trestle instead of a standard bridge. The trestle is to be built on six steel towers—70, 105, 110, 80 and 40 feet high, and across the level top of these towers there will be six spans of 60 feet each, two spans of 50 feet each and six spans of 30 feet each.

Willow Creek, a tributary of the Feather river, still farther up the Sierra slopes, is to be spanned near the little town of Clairville with a structure resting on ten steel towers—65, 80, 110, 150, 165, 165, 150, 110, 80 and 45 feet high, and covered by eleven spans of 60 feet each, four spans of 40 feet each, and six spans of 30 feet each.

As yet not a single bridge has been built by the Western Pacific, but this great work has just been commenced and will be rushed through with all possible speed to the end. The work will be crowded just as rapidly as money, material and men can be secured. As the road is to be completed within two years it will be necessary to rush all of the bridge work with the utmost haste. The thirty-three bridges across the Humboldt river in Nevada will all range from 125 to 150 feet in length.

Engineers estimate that the total cost of all these seventy-five bridges will aggregate not less than ten millions of dollars, including all the preliminary work. It will be the largest task of railway bridge building ever previously undertaken by any system on the Pacific Coast.

Will Build a New Station.—The Southern Pacific has completed plans for a new depot at the foot of Grant avenue, San Francisco. W. J. Martin, president of the South San Francisco Land Company, says that the contract has already been signed, and that the new depot will be located at the intersection of Grand avenue and the Bay Shore tracks. Double tracking between South San Francisco and San Bruno has commenced, and will be very soon completed. A large force of men are now engaged on that work.

Rushing the Work to Completion.—The Northern Railway Company, which is now directing its energies toward completing its new line to Sacramento at the earliest possible date, has just filed deeds for lands secured in Shasta county from the Molinas Land Company, by which it promises to be operating its system into Red Bluff, its northern terminus, by July 1, 1908. The road will then extend from Sacramento to Marysville, Chico, Oroville, Hamilton City, Tehama, Corning and Red Bluff, with a branch to Colusa. With connections made at Marysville with the California Midland Line, to Auburn and Grass Valley, and with the Central Traction Company at Sacramento, it will be possible to cover the entire Sacramento Valley and the San Joaquin as far south as Modesto by trains.

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Heisler Geared Locomotive.

We present herewith an illustration of a heavy geared locomotive recently completed by the Heisler Locomotive Works, Erie, Pa., for the Mining, Logging and Timber Company, Tacoma, Washington, and which is intended to pull a train of 2,500 tons on level track at a speed of seven to twelve miles per hour. In the design of this locomotive the number of gears employed has been reduced to a minimum with a corresponding reduction in the loss of power. Motion is transmitted through a central driving shaft and the gears are enclosed in cases containing the lubricant, thereby protecting them from undue wear. This type of locomotive is specially designed for heavy hauling on steep grades, around sharp curves and over uneven tracks. In its construction simplicity has been one of

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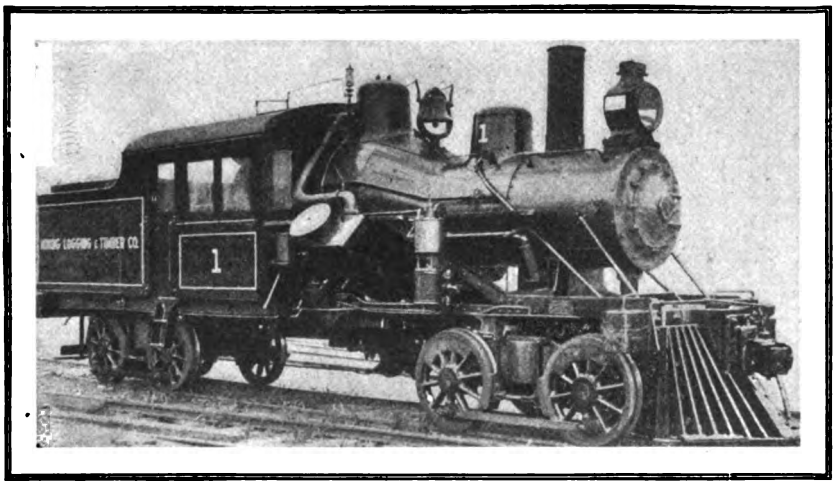
the principal objects aimed at. The locomotive here shown is for use on standard gauge track having curves of 100 feet radius. The principal dimensions are as follows: Weight in working order, 104,000 pounds; total wheel base, 27 feet 11 inches; rigid wheel base, 66 inches; length over all, 36 feet 2 inches; height over all, 12 feet; width over all, 12 feet; height to center of boiler, 7 feet 2 inches; diameter of drivers, 40 inches; diameter of boiler shell, 44 inches; tubes 173, diameter 2 inches, length 108 inches; firebox, 49x59 inches; tank capacity, 1,700 gallons; working pressure, 160 pounds.



HEISLER GEARED LOCOMOTIVE

The Question of Two Engineers in the Cab.

There have been of late so many cases of the sudden disablement of the engineer at the throttle, thereby leaving the train without control, as to lead to a renewed discussion of the question of placing two engineers in the cab, at least on the more important fast trains. Cases have occurred where a train, after the disabling of the engineer, has run for many miles before the accident was discovered. The peril of such conditions is too obvious to call for any comment. That the danger is not so infrequent as to be negligible, is suggested by the fact that our esteemed contemporary, the Railway and Engineering Review, in a recent editorial drew attention to three serious cases of this kind, which had occurred within the previous two or three weeks. The first of these was a collision on the Mobile & Ohio Railroad, caused by the engineer of a passenger train falling unconscious at his post. The train ran past a station where a stop should have been made, and the fireman did not discover what had happened in time to stop the train before it collided with a switch engine. Another case was that of the engineer of a passenger train on the Lake Shore & Michigan Southern Railway, who was overcome by heat and fell unconscious as the train was approaching Cleveland. Fortunately, in this case, the fireman observed the engineer's condition in time to prevent an accident. Mention is also made of the case of an engineer on a freight train on the Chicago, Rock Island & Pacific Railway, who became suddenly insane and persisted in running his train at full speed in spite of the efforts of the fireman to prevent it. The above cases are only typical of many which are continually recorded in the daily press. There was a time, in the days of smaller locomotives, when the fireman had more leisure than now for general observation, both of the signals and of conditions in the cab. He was in closer touch with the engineer. Today, however, the locomotives have increased to such large dimensions that the attention and energy of the fireman are fully occupied in keeping the huge furnaces fully

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supplied with fuel, and the boiler with water. Not so very many years ago 2,000 square feet of heating surface was the maximum to be found on most of even the largest engines; but today the standard express passenger engine will have from 2,500 to 3,500 square feet of surface, and the most powerful freight locomotives from 4,500 to 5,500 square feet. From personal experience when riding in the cab of fast and heavy passenger trains, we know that what time the fireman is not shoveling coal, he is attending to his injector or peering ahead for the first glimpse of the signals. It is our conviction that locomotives have grown to such a size that the railroad management should give careful consideration to the question of placing a third person in the cab of the largest engines for purposes of observation, and this is particularly necessary on those locomotives in which the engineer's cab is separate from that of the fireman.—Scientific American.

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White Light? Danger.

Under the above caption, a special to the Chicago Record-Herald, dated Washington, August 17, and appearing in that publication of August 18, 1907, constitutes, in the opinion of the Magazine, an official endorsement of the contentions set forth in the contribution by Will W. Wood in our August issue, entitled "The Weak Point in the Signal System." Through the courtesy of the Record-Herald, the article, which is both interesting and instructive, is reproduced herewith. It is as follows:

The board of experts appointed to investigate the signal system of the railroads of the United States will be confronted at the outset with the fact that there has been a complete and more or less startling revolution in block signal practice during recent years. This is nothing less than changing the universal and time-honored white light from a safety to a danger signal.

Ever since block signaling went into effect on American railways, and even before that time, the white light at night has been the notice of safety to the men on the "head end." It still is so on the majority of the lines, but the general managers throughout the country have decided almost without exception that the best signal practice discards the white lights as a sign of "clear ahead" and transforms its meaning to "something wrong. Stop immediately." The revised language has become such because of the fact that it has been discarded from the signal lexicon by the best authorities and by many of the largest railway systems in the United States.

White Light's New Meaning.

On the line where the white light no longer has a place, its appearance denotes that something has gone wrong with the regular signal and therefore the engine crew are unable to say whether there is safety ahead or ruin and disaster if they proceed. Accordingly there is only one thing to do and that is to stop until the doubt can be removed. The greatest value, therefore, in discarding the white light lies in the fact that it appears always when there has been a broken signal glass and it denotes the further important fact that no signal is being shown.

In the old signal lexicon there were three colors for the road which used the "permissive" block signal system—that is the system that permitted an engineer to enter a "block" of from half a mile to seven miles in length with caution and with his train under control and running at no higher rate of speed than thirty miles an hour, thus being prepared to find the "block" ahead occupied and to stop immediately.

The three lights formerly in universal use were, red for danger, green for caution and white for safety. Now the most approved signal code calls for red for danger; yellow, or preferably orange, for caution, and green for safety. W. E. Chamberlain, formerly a general manager for the New York, New Haven and Hartford road, was the originator of this code and it is said to have been suggested by an interesting fact. At a certain point on that road a house was located at such an angle to the railroad track that the light from one window used to strike the engineer's line of vision at the same time that he was expected to distinguish the light of the block signal he was approaching. Several times the white light from the house was mistaken for the "clear" signal and disaster was narrowly averted. This possibility soon became known to all engineers and all accordingly slowed their trains on approaching this "block" until they became certain of their ground. The house afterward was bought by the railroad company and torn down.

White Light's Peril Seen.

The engineers' trouble caused Mr. Chamberlain to ask why, if a white light thus easily could become a source of danger, the safety signal of the railroad also could not become such. Then it occurred to him that whenever a glass in a danger or caution signal lamp should be broken a red or a green lamp would at once be transformed into white, denoting safety. Accordingly, the New Haven discarded the white light in 1901, and this set all the railroad magnates in the country to thinking over the accidents that had

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been caused by the breaking of signal lamps.

The use of green for safety is not altogether devoid of liability to failure. Instances have been recorded where an accident occurred through an engineer's running by a danger signal and then swearing that he had seen a green light. In one case, which happened on the Rock Island and was investigated thoroughly by the management, the engineer was proved to have been right. On the night in question there was a heavy fog and the lamp was shown to have smoked.

Red Turns to Green.

A noted scientist was called into the case, as President B. L. Winchell was anxious to learn whether the engineer was right. The scientist demonstrated that the engineer really had seen a green light, despite the fact that the red signal had been exposed by the tower man. It was explained that it takes a combination of red, white and black to produce green. The red was furnished by the danger signal, the white by the fog and the black by the smoked glass in the lamp. But such a combination of circumstances would be as rare as a load of dynamite being struck by lightning at the very moment that a passenger train was passing the car containing the explosive, which has happened once in the history of railroading.

The abolition of white also insures the engineer being better able to be sure of his signals. Often he is called on to pass through a bewildering array of white lights, and to distinguish his own from among the many is difficult, while to mistake one of the host for the signal of safety is easy. With the white light eliminated the worst that can happen to him is a mistake that will be on the side of safety and cause him to stop.

Orange As a Caution.

Signal lamp manufacturers have made many attempts to secure a satisfactory yellow glass, but in vain. Accordingly, many of the roads prefer the orange for caution, as that color is likely to show a tinge of red, which will cause the engineer again to err on the side of safety if it changes its tinge. Not a few of the roads, however, do not believe in the "permissive" system of block signaling, and therefore have no bother with a third color. Notable among such is the St. Paul, which has only two block signals—"stop" and "proceed." It does not believe that the engineer should be given any discretion, but that his right to proceed and his commands to do otherwise should be absolute.

The Northwestern was one of the first roads in the middle West to adopt the new signal-light code, and the officials of that road would not go back to the old system for anything, so superior do they believe the new to be.

Problems To Be Solved.

The problems the new board will have to solve will be the same that the American Railway Association has been trying to decipher for many years. One of them will be the making of lexicons for the semaphores by day and for the signal lamps and their positions by night. A new system being tried on the Pennsylvania gives the semaphore at least twelve expressions. Many expert signal and operating men look askant at this, for they believe that the language of the semaphore should be made as simple and brief as possible, as is the case in England, where traffic density is much greater than here. They hold that the language of the semaphore should be confined to three words—"stop," "proceed" and "caution." Any additions to these multiplies the danger of mistake. . . . Nevertheless, the growing density of traffic makes some radical changes necessary.

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*Experiments With Steel Ties.**

Some of the objections which are being urged against the use of steel ties these days will probably look queer after larger experience has been had with such materials in years to come. It has only been a short time since a design of steel tie was brought out in this country which could properly support the track. A shorter period of time has elapsed since any of the steel manufacturers could be induced to undertake the manufacture of these ties on a commercial scale. As usual, the popular estimate of the importance of the industry became at once exaggerated, and all sorts of ideas concerning the prospect of the substitution of metal ties for wooden ones became current in the newspapers.

Last winter there was a derailment wreck on a stretch of track of the Pennsylvania raiload laid with steel ties, and although the steel ties could not be connected as the responsible cause for the derailment, the committee appointed to investigate the accident recommended their removal from the track, giving as a reason the impression that the ties did not hold up as well under derailed wheels as wooden ties might have done. This action gave the ever-ready critics an opportunity to change their tune, which was promptly done, and for several months lately the steel tie has afforded abundant opportunity for the space writers of the daily papers. It now seems

*From The Railway and Engineering Review.

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the discovery has been made that no possible success can result from the use of these ties, and as a consequence the popular condemnation of them is being sounded far and loudly. It happened that last week one of the metropolitan dailies had a "special dispatch" to the effect that experiments with steel ties on the Pennsylvania railroad had been abandoned, as being too solid, whereas it was not so very many years ago that reasonable doubt existed as to whether steel ties could be made and applied which would support the track solidly enough.

As nearly as we can gather from the gossip a commission of engineers has decided that further experiments with the steel ties will not be made, at least for the present, but the statements which the reporter claims to have quoted from the report of this commission would seem to have undergone some measure of reconstruction, as the reader will see from the following:

"There is too much rigid surface to the locomotives in use to allow the steel tie to be used. By rigid surface is meant something akin to wheel base. In other words, the distance covered by the wheels of a locomotive from first pony wheel to the wheel under the cab is 87 feet. This presents 78 feet which is inflexible, made so by the weight resting on the wheels, and there is not a particle of 'give' to these wheels, save at the axles or centers. Something must give when an engine is passing around a curve. The engine can not be built to create this resiliency, hence the track and the steel ties have to yield sufficiently to permit the engine to run around the curve."

In this case the trouble seems to have been largely in the "wheels," but rather with the wheels in the reporter's head than with those which are intended to run upon the track. The statement seems to be in line with a popular misunderstanding that when large bodies are involved in any mechanical movement "something must give." Broadly speaking, it is our opinion that steel ties which will hold are to be preferred to those which will "give," but the reporter has probably come as near to the facts as should be expected from a hasty interview with an engineer on a technical subject. Seriously, however, some careful and competent observers of track on steel ties are impressed that metal ties in frozen ballast hold the rails too rigidly, but that no condition of this sort obtains when the frost is out of the ground. While conclusive evidence on this point does not seem to have been brought out, the idea is, nevertheless, deserving of careful consideration. At any rate, experiments have been under way for some time with track wherein the rails are supported upon steel ties through a wooden cushion which interposes the same character of support as is afforded by wooden ties. It is not unreasonable to suppose that a secure form of rail seat or fastening might be introduced which would render the resilience of steel ties equal to that of wooden ties. Whatever the result, it is our opinion that the interest in steel ties among railway men has now reached such a point that the use of the same will not be abandoned without thorough and conclusive trials of some means to secure a bearing for the rail which is as satisfactory in every way as that to be had with wooden ties.

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Echoes from the Firing Line

The Railroad Fireman.

With tireless hands he feeds the coal in
the thundering monster's maw,
And hour by hour consigns his soul to
the God of nature's law;
And hour by hour his life depends on the
care of the other man,
Who, scanning the track where it slopes
or bends, keeps vigil as best he can.

Swiftly the miles go flitting away as the
tireless monster speeds,
And bravely he labors as best he may,
giving the food it needs,
And if dangers rise while his eyes are
dim, as he looks in the fiery glare,
He must trust to the skill and care of
him who watches beside him there.

He may not sit with his arms at rest and
watch for the danger sign;
He may only hope that they do their best
who are guarding along the line.
Hour by hour his work is done, and hour
by hour his fate
Depends on the care and call of one who
may give the word too late.

The hiss of steam is the sweetest song
that ever he hears or knows,
And in every throb as they rush along
the worth of his toiling shows.
With tireless hands he feeds the coal in
the thundering monster's maw,
And hour by hour he trusts his soul to
the God of nature's law.

IRVING L. OSLER.

Switch-Closing Devices and Switch Protection on Main Tracks.

In your issue for August I read with much interest the article from "Engineering News" under the above heading.

As I am one of the inventors who have worked along the lines of protection for facing point switches, I crave a little of your space and patience on this very important subject.

The number of accidents from open switches in 1906 was about 350 in the United States and Canada. The average for 1907 is about the same. Many of them are not serious enough to be accorded widespread notice, but nearly all bring *death and sorrow to some railroad employe's family*, and damage, delay and annoyance to the railroads themselves.

A device which will make it an impossibility to run into an "open switch;" with rigid connections; that never opens the switch; that is entirely and absolutely automatic; that will close and lock securely for the main line any switch, even though locked open at the stand; that result being attained by the approaching train, at any speed and without the attention of the engineer or other trainman; which can be applied to any of the present style switches and stands; can be installed on the busiest tracks without delaying traffic; will work at any distance from 15 to 300 feet at highest speeds; will last a lifetime, except under extraordinary abuse, and, finally, which no railroad man has demonstrated will make a switch any more dangerous when installed than without. Surely this is superior to a signal which may not be set, or may be set after the engine has passed, or may escape the engineer's observation, or, in fact, which depends upon fallible man to observe and act. Machines have no brains, no nerves, no will power, no family troubles to think about, no manifold duties as has the engineer.

When a perfect automatic machine is evolved, it is always the same; it does not forget, become faint, become ill or be doing one of several other things at the precise moment when it should see a signal or target of an "open switch."

Block signals are a grand improvement and have saved unnumbered lives, and the automatic stop *must come*. But all "signals" are what the term implies and require some mortal man to observe and obey them, and, mark you, he must have time to observe and obey, which means about 1,500 feet from switch to distant signal where heavy trains are run at high speeds. A switch can be, and has been thrown many times after the distant signal has shown "clear" to the engineer.

The contention of many railroad superintendents and others that "we don't run over thirty-five to forty miles an hour on our road and a closer signal is practicable" is silly in the extreme. There is no way to prevent a train crew from "making time" and no one finds any fault until the accident happens.

An incident which occurred on a cer-

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tain road some years ago, and within the writer's knowledge, well illustrates the average railroad employe's idea regarding orders. The general manager of that road had promulgated an order prohibiting "flying switches" under any circumstances. The evening of the day on which the order was bulletined and commented on by our night shift switching crew (I was firing the switch engine) was a nasty, rainy one. The general manager's car came in about 11 p. m. and was cut off the express at this point to lay over until the next day. The yardmaster personally directed the operation of making a flying switch with that private car, on a slippery track, into a switch with a very short lead; knowing that the general manager was asleep in the car at that time, we all laughed about making the "flying switch" with the "Old Man's" car.

The writer in "Engineering News" favors a device that will always close the switch when the train taking the siding (or leaving it?) shall have cleared the switch. Surely he should know that with such a device trainmen would give the closing of switches very little attention. Open the switch and pull out, it will close itself, but will it be fully and properly closed in all cases?

On the other hand, the safety device, or emergency device, if you prefer, which I can name, will positively close and lock the switch in emergency and does not relieve the crew of responsibility for the "open switch;" on the contrary, it will *place the responsibility* for that "open switch" where it belongs, after it has *first*, prevented the accident, as it can be provided with a positive lock which will not permit of opening it for the siding until the proper official unlocks it and makes his investigation and report.

The writer does not contend that "trains may be properly or safely run against facing switches under protection," etc., but he does contend that if it is possible to prevent "open switch" accidents caused by carelessness, thoughtlessness or rattled operatives, by the use of an automatic device, the idea of what is "consistent with good railway practice," condemning the use of such devices is not only silly but criminal.

Do engineers, firemen, conductors, trainmen and mail clerks, not to mention the traveling public, *prefer to die* that "principles consistent with good railroading" shall not be violated, or prefer to live, even should the engineer, etc., be relieved of the haunting fear of the "open switch" by the installation of the device in question?

Progress is the word. When automatic machines shall have been invented that will prevent any of the horrible wrecks, shall the use of them be condemned for fear of making it easier for the men who run the train, or of violating the "principles" established by some chief engineers or other officials?

The cost of the wreck of the Twentieth Century Limited at Mentor, or the Sunset Limited at Colton, Cal., would *equip a whole system*, making it impossible to run into an "open facing point switch."

AN EX-FIREMAN.

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Technical Contributions

THE OPERATION OF THE ET EQUIPMENT IN PASSENGER SERVICE

BY WILL W. WOOD

(Continued from September Number.)

"Baldy" Reagan, a freight engineer who does a good deal of extra passenger running, was next on the list of inquisition, and he was on the road, on passenger, at the time or would have been at the Air Car. His fireman, Daly, however, volunteered to give the details of Baldy's regular movements in making two-application station stops.

"Now say, Boss," he began, "f'um what I just hear, I size it up 'at Baldy's been makin' a good record—nit—in de same way as dese oder guys—but he don't land 'em dat way every time; it's dis way; he makes his first application, an' releases in de release posish'; an' 'en when he goes inta de service notch dey s nuttin doin' but a *s-s-s-s-s-* f'om de preliminary exhaus' port, an' dat ain't detainin' de train none; when de train line air does show up she's a gusher, but *den* de brakes don't take holt yet fer some time, an' Baldy's gettin' anxious, an' all dis time de station's comin' closer an' he gets nex' to de fact dat he's a goin' to make a good stop fer de nex' station but one; so old Baldy' he jus' shoves her over fer about two cents' worth of de goods f'om de big hole—an' stops at de specified; an' de push back dere gets a jolt; what?

"Baldy useta make dem two-time stops all right an' he ain't agoin' to lay down on de schedule," Daly continued, "but he's got a jolt comin' fer 'em every shake outa de box; if he gets action soon enough in de slow hole an' t'inks he's makin' a fine stop, de Gran' Duke comes over wit' a bad face an' says de passengers a knockin' about de rough bus'ness; but if he t'inks he's a gona run by he takes her by de neck—an' dey're up in de air again. So it's a box o' lemons fer Baldy eider way. I've filled out his blank," Daly concluded, "an furder I ain't sayin' nuttin.'"

"The whole trouble," said the instructor, "comes, as you see, from making the pre-release—the release while running, in the two-application stop—in the full release position. I have advanced a theory as to why the shock occurs at the second application, with the engine and tender brakes already applied,—and there is no question but what it does occur, nor as to the reason; but Fireman Daly has brought out another undesirable result from the use of the release position when another immediate application is to follow: The ports in the H5 brake valve, through which main reservoir air flows to the train line in the release position are, in effect, much larger than in the older types of brake valves; and the supply of main reservoir pressure to chamber *D* is also faster in full release position—haven't you noticed that in releasing the brakes on the light engine and tender with the new H5 valve there is seldom any flash of train line air from the equalizing discharge valve, while with the old style the *poppyty-pop* was quite annoying?" And the instructor paused to welcome the entrance of Engineer McGinniss to the Air Car. "High Pockets" came in somewhat hurriedly.

"Now, in making a passenger train station stop," the instructor went on, "you make a rather heavy first application; you are getting close to your objective stopping point when you first release the brakes; if you then use the full release position of the brake valve it throws such a heavy volume of air into the train line that its pressure is made very much higher than that of the auxiliary reservoirs; and chamber *D* pressure is charged up higher by a good deal than the train line. At the time of this pre-release brake valve operation must be rapid, for you are nearing the station rapidly, and although the speed has been greatly reduced you are covering a good many feet each second. From release position back to lap (it's foolish to think of halting the handle in running posi-

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tion *then* long enough to allow the engine and tender brakes to release), and you can't tarry on lap, either; so when you get the brake valve handle in the service notch—as Daly said—there is no immediate result except the reduction of chamber *D*, until finally when its pressure has become lower than that of the train line the equalizing valve will begin to discharge the latter pressure;—but still no brake action. Now, right then an engineer must often decide quick, between waiting for the delayed service action with the possibility of running by, or a further push of the brake valve with possible—probable—quick action; and the passengers get bumped in either case."

"Evidently I have arrived at an opportune moment," observed Engineer McGinniss, "having hastened, somewhat, as the result of a conference with the S. M. P., in which he intimated strongly that the discomfort reported as having frequently been experienced by passengers and servants of this company when riding behind the engine that I run, was due to imperfect operation on my part of the H5 brake valve in making station stops. Now, I have listened to your explanation of the cause of shocks at stopping points, and, as I do not use the release position of my engineer's valve following the first application, and as my methods of braking are beyond criticism or idle discussion, I would appreciate, if you—ah—please, a certificate, or clearance, and I shall withdraw."

"There are quite a number of indictments against you, Mr. McGinniss," replied the instructor, "and, admitting your skill, those shocks accredited to you are yet to be explained; in what position, may I ask, do you place your brake valve to effect the pre-release?"

"I avoid all of this trouble," High Pockets began to explain. "When I begin my second application the preliminary exhaust is followed instantly by the discharge of brake pipe pressure, and brake action is immediate."

"And there are other immediate results, too," remarked the instructor; "but what position of the brake valve do you use for the running release?"

"Why, *the holding position*, of course," was McGinniss' unexpected answer. And there was uproar then, and a "funny house."

Then the instructor had to go over the whole foregoing discussion for McGinniss' enlightenment. He admitted that releasing in the holding position—same as running position—would prevent the excessive overcharge of chamber *D* and the train line, and the resultant delay in brake action at the following application as related by Daly; but McGinniss didn't know the dire results from holding on the locomotive brakes, and that brought, then, the instructions that we were there to hear.

"With passenger trains of ordinary length," the instructor began, "and in connection with the ET equipment, make, as a general rule, two-application station stops, but, after slowing the train down by the first application *release all brakes on train and engine* by using the *running position* of the engineer's valve. This would not have been practicable with the older types of brake valves, because the feed ports through rotary valve and seat were too small to give quick enough results; but in the H5 (which is the symbol of the automatic brake valve that is a part of the ET equipment), the flow of pressure from main reservoir to train line in running position is through ports of the same size, exactly, as in full release position, and the supply *is through greater area* than is permitted in the release position of the older types of brake valves; in fact, the supply of air to the brake pipe in running position of our new brake valve is strictured nowhere beyond the feed-valve ports; and with the ordinary, heavy passenger train—the triple valves of which are kept in pretty fair condition, and piston packing rings renewed when necessary—it is perfectly safe and advisable, and hereat recommended, to release the brakes by the running position of the H5 brake valve whenever it is the intention to follow that release by an immediate re-application. You will be surprised to note how quickly the brakes will begin to take hold, then, at the second application.

"In freight service, of course, the necessity for this never arises; if you release the brakes of a freight train while running there is lots of time for equalization of forces before another application is required—usually there is none; you are releasing the brakes expecting to go on to the next station.

"After stopping your passenger train it is advisable to use the release notch before returning the handle to its normal position. And another thing: the old instructions need not now be obeyed about releasing the brakes of a passen-

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ger train *just before the wheels stop turning*, for the heavy strain on the trucks and draft springs is relieved at the pre-release of the brakes, and as the last application is with comparatively light cylinder pressure, and particularly on account of the brake beams of all passenger equipment cars now being hung between the wheels and so much nearer the center bearing of the truck, there will be scarcely any perceptible recoil if you hold the train and engine brakes on until you have completely stopped.

"The Superintendent of Motive Power's instructions to you are, further, in passenger service (except on the second engine in double-heading), forget that you have the holding position in all ordinary brake valve operation, and don't set the locomotive brakes by the independent valve, *alone*, with a passenger train while running.

"With extra long passenger trains I wouldn't advise making two-application station stops. Begin your braking a little bit earlier than common and with but one application try to reduce the train line pressure as little as possible in making the stop.

"When there is trouble running loose *an alibi* is a pretty handy thing to have at hand; the idea may be applied in various ways. For instance, passenger trains are experiencing severe shocks during brake applications; now, if you can make it appear that whenever you set your brakes *you apply them all* on engine, tender and train, so far as you are able, and in the accepted manner: and if when you release brakes you release them all—engine, tender and coach brakes—so far as the necessary restoration of pressure to the main brake pipe and the discharge of application chamber pressure from the distributing valve is concerned—there, then, is your *alibi;* and having done it this way, if shocks continue to occur you can hardly be blamed, and—"

"Dey'll have to look in anodder pocket," concluded Daly.

ELECTRICITY—THE STREET CAR EQUIPMENT

BY ELWOOD GRISSINGER

An essential feature of all controllers used for the purpose of starting and stopping street car motors is the magnetic blow-out. This arrangement is based upon the discovery some years ago that an electric arc can not maintain itself in a magnetic field, if the lines of force of the magnetic field are sufficient in number and are caused to exert their influence in the proper direction. Such a magnetic field can be obtained by winding a coil of copper wire around an iron core. In the case of a controller, the same current of electricity that passes into the motors for their operation also passes through the coil of wire around the iron core that creates the magnetic field which acts as a blow-out for any arcing that may attempt to form at the controller contacts. The shape of the iron core referred to is such that the lines of force gathered by it are forced across and around the controller contacts. Consequently, when any circuit is opened or contact broken by a shifting of the controller handle, the arc, which would otherwise tend to form at the controller contacts, is immediately snuffed out.

To the inexperienced, it might not be amiss to state that an arc formed and maintained with a 500 volt direct current is one of the most vicious and destructive flashes imaginable. It will instantly vaporize a metal or almost anything else in its path. Its flash is blinding in its intensity and heat, the greatest of artificial heats. Exhaustive experiments had to be made, therefore, to develop detail apparatus that would rupture an arc when attempting to form and thereby protect other apparatus. The magnetic blow-out in a controller occupies just such a position.

It was not an uncommon sight in early days to see a motorman enveloped in flame from a controller, a car load of panic-stricken people and a crippled car. Such occurrences are rare nowadays, although we now and then read of flames making their appearance in or about an electric car, generally due to causes other than a defective controller.

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There are a number of terminals within a controller case to which the wires are fastened when the apparatus is installed upon a car. These terminals are stamped so as to show what wires are to be fastened to them. The motor terminals are similarly stamped, as well as the diverter terminals and those of the cut-outs or circuit breakers. The lead wires used in interconnecting controllers, motors and diverters are carried in what is termed a drum hose. These wires carry tags which indicate to which terminals they are to be attached. Such tags should never be removed. A plus sign (+) signifies a positive terminal, a minus sign (—) a negative terminal; *F*, a field terminal; *A*, an armature terminal; *G*, a ground terminal; *T*, a trolley terminal; *R*, a resistance or diverter terminal; *B*, a brake terminal. When the letter *F* or *A* is followed by the figure *1* or *2*, etc., the number of the motor of the car equipment is referred to; that is, *F2+* and *A1—* mean respectively positive field terminal of motor No. 2, and negative terminal of armature on motor No. 1. When the letters *F* and *A* are not followed by figures, they are understood as referring to all of the motors. Diverter or resistance terminals are marked to distinguish them apart, as *R1*, *R2*, etc.

The greater number of controllers in use today are known as the series-parallel type. Such controllers have two handles on the top, one of which handles is used in turning the current on and off, and the other, the smaller one, for reversing the direction of rotation of the motor armatures and consequently the direction of movement of the car. Each of the handles are removable from the controller case. The larger handle, for operating the car, is provided with a pointer or index that travels with it, and which points to the notch on top of the controller case, indicating the position of the controller drum with respect to its contacts. Controllers of different makes and sizes will differ as to the number of notches which they might have, the number varying perhaps from five to nine. Whatever may be the number of the notches, there are usually but two running positions for the handle to assume; at the last notch and one intermediate. The running notches are those wherein the diverter resistance is not in use. This condition exists when the motors are in series with one another and the line, or when the motors are in parallel with one another and the line. The first condition will be found when the controller handle occupies an intermediate position, and the last named condition will be found when the controller handle is on as far as it will go. No part of the resistance of the diverter should be cut in when the motors are operating continuously, as diverters, not being constructed for that purpose, will not stand it, and, moreover, it is not economical.

When it is desired to start a car for the first time, it is, of course, necessary to observe that the controller handles are in the off position. The trolley can then be placed in contact with the trolley wire and the main switch closed in the cut-out box. The smaller handle of the controller can then be moved into the position desired, either forward or backward, depending upon the direction in which it is intended that the car shall travel. In general, for a forward movement of the car, the reversing handle should be moved forward and vice versa. The above precautions having been exercised, the operating handle of the controller can be moved into the first position. In this position the car should start and move slowly. The use of but the one notch is good practice in running cars through crowded streets.

The controller handle having been thrown to the first notch, and the motors having acquired good motion, the controller handle can then be passed to the next notch and so on along the range. The movement of the controller handle from one notch to another should be positive; that is, the handle of the controller should not be permitted to leave a notch and then hesitate between notches, but the pass from one notch to another should be made quickly and positively. In moving from the first notch to the last, however, care should be exercised so as not to go too rapidly, for the safety of the equipment and for the comfort of the passengers. The speed of movement of the controller handle depends altogether upon the speed of the motor at the time a movement of the controller handle is made, the more slowly the motor is running, the more gradual must be the movement of the controller handle. Motors can be made to acquire speed much more rapidly than steam engines, with the result that careless handling in the starting of them may produce very unpleasant effects.

The stopping of a car is accomplished

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by bringing the main controller handle to the off position. This is done with a continuous movement or sweep, and as quickly as circumstances warrant. When the controller handle has been brought to the off position, the brakes can be applied. It is unwise, however, to attempt to make any use of the reversing handle for the purpose of bringing the car to rest, unless in dire circumstances when the brakes might fail to operate quickly or to take hold satisfactorily, when a quick resort to the tractive effort of the wheels on the rails might be made use of. If, however, the reversing lever must be made use of for the purpose in mind, it can be done only by bringing the controller handle to the off position, throwing over the reversing handle and moving the controller handle to the first notch, or farther if it is deemed absolutely necessary to do so. An occasion of this kind is rarely ever a necessity, unless it is to avoid an imminent collision or to save a life.

The danger to an equipment is great when an effort is made to reverse a car's direction when in motion, and should be experimented with by tried, experienced and cool-headed men only.

Controllers are also provided with plugs by means of which any motor of an equipment can be cut out of service by reason of defect. These plugs can be seen by removing the front of the controller case. The plugs are marked, and it will be seen that a plug can be inserted so as to cut out one motor or another of a multiple equipment.

There are also a number of composite controllers in use combining the features of a starting device and a braking mechanism, the braking being accomplished by means of an electric current energizing a pair of magnets in juxtaposition to one another and fastened upon the truck axle. Some forms of these last mentioned controllers operate the brakes with the same handle that is used for the operation of the motors. With the single handle type of brake controller, when the handle is brought to the off position, if the motion of the same handle is continued backward, there will be approximately five additional notches that can be covered. These additional notches regulate the amount of current that passes into the braking circuits just as the forward motion of the same handle controls the amount of current going into the motors.

The action of the electric brake combination is such that when the current is cut off from the motors, the latter then act as series direct current generators, and the current generated by them passes through the same system of diverters or resistances belonging to the equipment, and thence into the brake energizing coil, which is stationary. The core of the brake coil is magnetized by the action of this current, and exerts a powerful pull upon an armature fastened to the car axle and traveling in front of the coil. The amount of pull is regulated by the current flowing, which, in turn, depends upon the position of the controller handle and speed of car. Electric brakes will not operate when the car is not in motion, and the faster a car may be moving, the more powerful the braking action can be made. The reason is, that the motor armatures must revolve to generate a current, and the more rapidly such armatures revolve, the higher will be the voltage generated and consequently a stronger current will be pushed through the brake coils. Similar reasoning will show that a car equipped with electric brakes can not be made to skid, for the moment it begins to skid, just that soon the motor armatures cease to revolve and no current is generated for use in the brake coils. Other forms of electric brake controllers are equipped with three handles, one for starting and stopping the motors, one for reversing the direction of same and one for controlling the operation of the electric brake circuits.

The lightning arrester, choke coil and fuse block of a direct current street car motor equipment are usually connected together as shown diagrammatically in the drawing reproduced herewith.

The fuse block is usually a block of lignum vitae, upon which two metallic terminals are securely mounted. Between these terminals the fuse is fastened, which in some cases may be copper wire and in others a lead or soft metallic alloy strip. Suitable binding posts are provided for clamping the fuse. The wire leading direct from the trolley is brought to one of the terminals of the fuse block and the other terminal of the fuse block leads direct to the choke coil.

The choke coil is inserted for the purpose of protecting the electrical equipment from lightning discharges, and it has been termed a choke coil for the reason that it has a choking effect and tends to prevent the passage of lightning dis-

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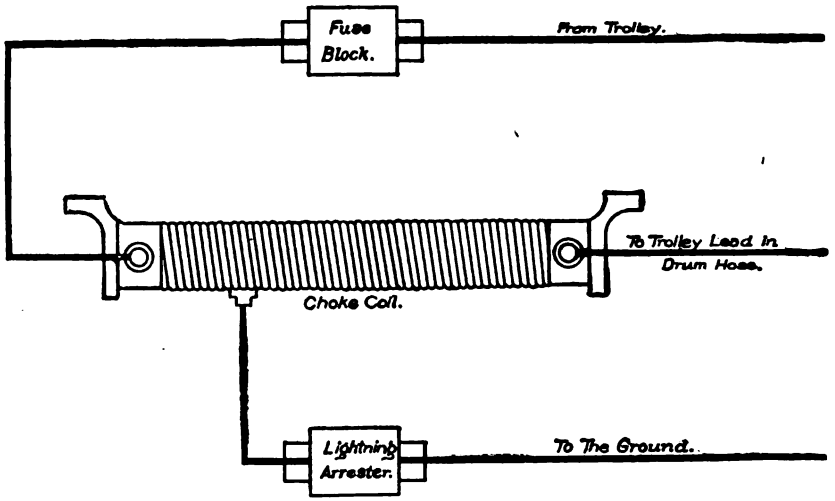
charges beyond it. The choke coil in this case is made up of heavy insulated copper wire connected in series with the motor and the trolley, so that all of the current from the trolley passes through it, but it will choke lightning and force it to pass along another path provided for it, and a path, moreover, through which the regular working current of the motors can not pass.

Near the trolley end of the choke coil a terminal is fastened to which is connected one side of the lightning arrester, the other side of the arrester being connected to the truck of the car and therefore with the ground. The lightning arresters provided for this purpose comprise in some cases merely an air gap enclosed in porcelain, while other forms are built up of lignum vitae. The lightning will jump across this gap in preference to passing through the coil of wire constituting the choke coil, but a current at an electrical pressure of but 500 volts can not pass across the same gap. Therefore, if lightning traverses the trolley wire to a car, the tendency will be for it to pass down the trolley pole to the fuse box, thence to the choke coil and from there through the lightning arrester to the ground, leaving the car equipment uninjured.

The canopy switch which has been referred to may be either in the form of a switch or a combined switch and circuit breaker. The last named combination is more modern and certainly more desirable. There should be two of these, one mounted overhead on each platform of a car. They are connected in series with the trolley wire and the controller at the same end of the car.

A circuit breaker is virtually an automatic switch. It can be opened and closed manually, and will open automatically. They are so set upon each car that when a certain current value is established, they will open automatically and thus protect the motors. They are better than fuses for motor protection, because they act more quickly. The same circuit breaker can also be set to take care of different limiting values of current.



Showing diagrammatically the arrangement of the lightning arrester, choke coil and fuse block of a direct current street car motor equipment

The lighting circuit of a car will usually comprise a circuit of five or ten lamps, or several circuits of the same relative number of lamps per circuit. In the case of a 500-volt system of railway service, if the car lamp circuits are split up into five units per circuit, then the voltage of each lamp should be approximately 100, but if there should be ten lamps per circuit then the voltage of each lamp should be approximately 50. Since these lamps comprising each individual circuit are connected in series with one another, it follows that when any lamp in such a circuit burns out, the entire circuit becomes dead and remains so un-

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til a new lamp is inserted in place of the one that is defective, for the turning of the current into one must do the same to the others in the same series circuit. A low efficiency lamp should be employed, because of the variations in voltage of the circuits supplying the lamps with current, a variation which can not be corrected on account of the very variable demand for power. A small switch is mounted in each end of the car so as to facilitate the lighting of the car.

General instructions for operation are very similar to what might be said of any form of traction. Surface railways are so built that very slow speed can only be maintained in running around curves, crossing streets and railroads, and when passing over rough track. The current should be cut off at the controller when passing under an overhead switch. The passing of such a switch can be detected by the sound of the trolley wheel. It is advisable to run slowly through any flooded places. When examining the motors, water should not be allowed to drop upon them from wet clothing or other source. Electrical trouble that might arise and persist can be stopped quickly by opening the canopy switch or circuit breaker, or by pulling the trolley pole down.

In going down a grade, great care should be exercised to keep the car under perfect control; also to keep the trolley upon the wire, as it may be necessary in an emergency to stop suddenly, when, if the brakes fail, the motors can be reversed. If the power is shut off from the trolley wire from any cause whatsoever, the controller should at once be brought to the off position, and the car lighting switch turned on, when the lighting of the car will indicate the return of power to the line.

The trolley should never be placed to the trolley wire unless both of the car controllers are at the off position. If from any cause the trolley pole leaves the wire the car should be brought to a stop as quickly as possible and trolley replaced, the controller in the meantime having been brought to the off position. If the trolley pole leaves the wire frequently, if loose motion is noticed, or if there be flashing at the trolley wheel when running, the facts should be reported at once, because such defects are very destructive to the overhead construction.

A car should not be run with the trolley pole in the wrong direction, as there is great danger of bending the pole or of tearing down overhead construction. When a car is run into the barn the canopy switch should be opened and, if possible, trolley pole should be thrown up so as to relieve the springs of tension. When handling any of the car equipment it is always good policy to pull the trolley pole down from the wire, and in this way avoid a possible unpleasant contact with the electrical circuit. The lamps in a car may sometimes refuse to light, due perhaps to a burned out lamp, poor connection between one of the lamps and its socket, poor connections in the lamp switch, a loose or broken wire or a broken fuse. In attempting to repair such defects, care should be exercised that current is not on the circuit at the time. A lamp should never be removed from a street car circuit when current is on, as an arc might be formed, burning out the socket and injuring the workman.

LOCOMOTIVE BOILERS

BY W. L. FRENCH

The advance made in the size of locomotive boilers and the methods of construction since their construction was first commenced is something remarkable. No better illustration of this can be had than to note the boiler dimensions of "Old Ironsides," the first Baldwin engine, and one of the modern battleships. The boiler of "Old Ironsides" had a diameter of 30 inches; number of tubes, 73; material of flues, copper; diameter of flues, 1½ inches; length of flues, 7 feet. Copper entered largely into early boiler construction, so far as the fireboxes and flues were involved.

Now note the boiler dimensions of the modern locomotive, with a diameter of shell, 78 inches; number of flues, 350; diameter of flues, 2¼ inches; length of flues, 20 feet; material, iron; heating surface, 4,800 feet.

The demand for the movement of larger

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trains made the building of large engines necessary. Very large steam cylinders with high steam pressure to force the pistons back and forth in them, demanded an enormous steam storage capacity to supply their wants, and this in turn required increased heating surface and grate area in the firebox, and so the large boiler with its extended wagon-top and the wide, shallow firebox grew to their present proportions. That they can grow to any greater extent is not probable, as with the present width of roadbed it would seem that the limit in height has been reached.

As it is at present, the modern locomotive looks top heavy, although care has been taken to keep the balance of weight below the center of gravity. In case of derailment the large engine is more liable to turn over, but this is due both to its greater weight and the high speed of present-day trains.

The growth from the small to the large boiler has been gradual, and is marked with a number of experiments, many of which proved of no success, yet each one conveyed a lesson.

From a tank holding a few gallons of water, the tank has grown to one holding 8,000 gallons of water, and lessening the cost of train operation by reducing the number of stops for water.

Steel is the metal used in this day for boiler construction. Sheets of the required size are shaped, punched and turned to the required form. Often some of the future trouble for the mechanical department of the railroad purchasing the engine is started. The dies for punching holes in the sheets, if dull, cause small fractures that do not show at the time, but later develop into cracks and leaks around rivets; crown bar bolts and staybolts is the result. Drilling these holes would be certain not to injure the sheet, but it is slow when compared with punching.

The crown sheet is often braced by crown bars across its top and bolts through crown sheet. Where this form of bracing is employed the crown sheet is more flat than where radial stays are employed. Where crown bars are used the crownsheet is said to be sling-stayed. When the stays extend from the dome head to the crown sheet, no crown bars being used, the boiler is said to be radial stayed. The crown sheet of such a boiler is more easily kept free from mud or scales than are those with crown bars, as the crown bars tend to hold the mud and scales against the action of the water to wash them away.

Too much care can not be given to the testing for broken crown bar braces. As they are out of sight and difficult to get at, there is often a tendency to neglect them on the part of those responsible for their being properly tested. Brace pins should also come in for careful inspection.

Hydraulic testing should not always be taken as an indication of a boiler's strength. The test itself may weaken the boiler, so that a similar pressure would cause a giving away of some part of the boiler. The hammer test of staybolts in the hands of an experienced boilermaker is a good staybolt test.

With steel sheets in good condition, and crown bars, braces and staybolts in good shape, the danger of a boiler explosion is reduced to a very small one, for the strength is in the metal to resist the pressure and that is all that is necessary to avoid explosions.

A sheet might be burned or the staybolt heads be melted off, so that there would be a giving away, but if there is the condition of the steel will speak for itself; there will be no mystery about the cause of the explosion. Breakage of staybolts is a matter of frequent occurrence, but, as most of them are drilled in the end through the sheet, when one breaks it immediately gives warning of that fact without any test and should at once be replaced.

Too narrow a water space in water legs is hard on both staybolts and side sheets, as when working hard the water is liable to be all boiled away from the inner sheet, and the sheet and staybolts, too, become overheated. This is the point of greatest pressure in boiler, also, as there both the pressure of the steam and the weight of the water are united in force against the sheets and mud ring.

Mud in water leg will cause bulging and cracking of the sheets, and mud should not be allowed to accumulate there, or, in fact, anywhere else in a boiler.

With the use of soda ash to soften the water, by a frequent use of the automatic blow-off cock a great deal can be done by the engineer to keep the boiler clean. The automatic blow-off cock should not be used when engine is working, as it removes the water from the lower part of the boiler, where there is none too much

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anyway when engine is using steam. At this time the sediment in the boiler is raised up and mixed with the water, and blowing out the boiler does not remove it as it does when throttle is closed and sediment has settled down in the boiler.

Better results will also be obtained by using the blow-off cock with injectors shut off. Cold water settles to the bottom of the boiler, and if blow-off cock is open it is immediately blown out again.

Scale or mud causes leaks. This calls for frequent caulking, and soon the sheet along the crack is worn thin, the head is gone from the staybolt or the bead from the flue, and then caulking ceases to do good and the leak is continuous.

Side sheets have been known to blister. This is caused by the sheet not being a solid piece. The side next the fire becoming the hottest, expands toward the fire and leaves the inner part of the sheet, causing a space between the two parts. This is the fault of the metal, caused by its not uniting properly when rolled at the mill.

When an engine is fired up the temperature should be brought up gradually to the required point and then maintained there as near as possible when in service on the road.

A boiler that is inclined to leak should be kept hot all the time when in service, even at the expense of blowing off steam occasionally. The waste even then will not be as great as that caused by a leaky boiler, let alone the annoyance and delay that is almost certain to accrue, with the possibility of an engine failure in addition to all the rest.

The extended wagon-top is now the type of boiler most commonly built. In this form the wagon-top which formerly extended only over the crown sheet, continues on in a diminishing degree, usually to the front ring of the boiler. This gives a much larger dry steam supply to draw from and lessens the danger of an engine working water.

In many new engines a flare is given to the back firebox sheet at the door, which gives a greater water space at that point, and the sheet is overlapped in such a manner as to do away with the old style of door ring. The result has been very satisfactory in doing away with cracks in the door rings and consequent leaks therefrom. The reason the sheets do not crack so readily in the door with increased water space is that they do not cool so quickly under the action of the air when the fire door is opened as they do with the smaller water space.

Holding the fire door open is not very good for either the door ring, flues or the side sheets, and should be avoided. It is better to let the pops take care of the surplus steam than to do this, although that should be avoided also, but in another manner, by keeping down the coal supply to the fire.

Too much care can not be given the boiler of a locomotive to keep it in good shape, and this care should commence when the boiler comes new from the shop, but with the higher steam pressure, larger sheets and longer flues, and the increased tendency to leak from these causes, there has been, as a rule, less care given to them.

Heavy fires form in the firebox because it is hard to clean them on the road; when the terminal is reached the fire is hurriedly cleaned, green coal shoveled in, and away they go with the blower shrieking a forced draft through the flues, clinkering the fire and spoiling the firebox. When a fire is being cleaned or knocked out an injector should not be worked; the firebox will cool fast enough without doing that. If an engine must go right out, knock out all the fire and put in a fresh wood fire, using plenty of wood. It will be cheaper in the long run and an engine failure may be avoided. These look like small matters, but they all count in the life of the boiler.

The pressure applied to a boiler is as a rule only about one-fifth of what it is supposed to be able to stand with safety; this is on account of the plate being weakened by hand-hole plates, wash-out plugs and various boiler connections. But neglect and abuse will soon weaken the best boiler until it is not only a source of trouble on the road, but also becomes a menace to safety. Natural wear and tear is expected, but neglect and abuse should be avoided, which often is the result of orders from those in authority who are ignorant of results or do not care so long as the responsibility falls on some other department or person.

The long flue in the large engine, with its increased vibration over the shorter flue of the small engine, has a greater tendency to cause leaks, as has the larger flue sheet necessary in the large engine. Bracing has helped the large flue sheet, but a satisfactory manner of bracing the long flues has not yet been evolved.

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The wide firebox extending out over the frame provides the required heating surface, and permits the fireman to cover all the grate surface with coal without the severe exertion required to shovel coal successfully in a firebox 11 or 12 feet long, as was necessary before the day of the wide, sloping box. With the wide box the trailing wheels came into use to carry the weight of the rear of the boiler, and allow, at the same time, of the wide firebox.

The free circulation of the water in a boiler is an important matter, as it promotes an even temperature in the boiler, and also makes it a better steaming one. When the water in a boiler is cold it stands still, but when the boiler is fired up the hot water raises, while the cold water settles down in its place, and the hotter the fire becomes the more the water expands, and the circulation in the boiler increases. When the engine is working hard and the injector is putting water into the boiler, the water circulation is at its highest point.

Mud rings should be heavy and double riveted, as the great pressure exerted on them renders them very liable to breakage.

WRECK ON THE FRISCO, FEBRUARY 10, 1907, NEAR DAVIDSON, OKLA.—VIEW FROM REAR

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MOVEMENT OF TRAINS

BY H. A. DALBY

A Little Tale With a Few Morals.

Engine 234, with her 60 cars, pulled into the siding at Highfly to meet No. 28, a local passenger train. Highfly siding was built a long time ago, to hold two big freight trains, so that now about 10 cars out of the 60 stood out on the main track. No. 28 came along and stopped at the station while the 234 strained and puffed and finally got the drag to rolling, but just as the caboose cleared the main track the old girl burst one of her bronchial tubes or something else, we never knew exactly what, and old Rube Runslow found he could handle only half his train. No. 29, another passenger train, was due behind them in 20 minutes, for they met No. 28 at Lalo, the next station in the rear. There was just the one siding at Highfly, that is, except a little spur, so Rube conferred with the conductor, Johnny Onspot, and they decided that the only thing to do was to take what they could and run to Homeville, which was the end of their run, and only five miles away. Rube was for starting right off, without waiting to say good-bye, but Johnny asked him how and when he was going to get back for the rear of the train. Rube said he didn't care a ding how he got back, he didn't have to start back until he got there, and he never crossed bridges until he got to them. He thought the present crisis demanded a hike out ahead of 29. Johnny remarked that that was a fairly good policy under some circumstances, but just at present he was agitated over the question of whether, when they got to Homeville they had a right to come back after the balance of their train in the face of 29 or whether when 29 saw their tail end on the siding, with the green bugs staring them in the face, they would wait for them or not. There was no telegraph office at Highfly and they could not tell their troubles to the dispatcher, so Johnny thought the quickest way out of it would be to take the markers off the caboose and put up a red light or two on the last car they could haul, call that the train and get to Homeville as quick as kind Providence would let them. Rube agreed to this and Johnny went back and arranged it so. They started along, met 98, the local freight, at another blind siding, and when they got into clear in Homeville yard Rube called out to Johnny and said he bet two five-cent cigars that when 29 saw that tail end on the siding at Highfly they would think the front end was coming back and would stay there till there was ice on a place where it does not usually grow, waiting for them. Johnny told him not to worry about that, for he had told Buck Bannister, the rear signal officer, to watch for 29 and tell them all about it. Rube said that was a good stunt, but he was afraid Pete Pettis would get along there with the local, and if he happened to have a car to fly in on the spur that leads off the passing track he'd be apt to crack his headlight and scratch the varnish off his pilot on the head end of that string of cars. Johnny told him to stop his fretting about that tail end, for Buck was onto his job and would see that nothing happened to it until they got back. Rube remarked that Johnny was all right and it was a good thing he had thought to do that, and Johnny said he knew Rube would think of those things some time, even if he didn't when they started.

Dan Dinkirun, the conductor on the branch, heard them talking and he had to butt in and told Johnny and Rube he had his doubts about their having a right to come along as they did and carry markers. What they ought to have done was to bring part of the train to Homeville and then go back and get the rest of it. They could do that without orders, anyway, and now they would have to get a whole lot of orders to go back. Sam Scooper, the fireman, said he did not know where you found any rule that would allow you to run half way over the road and back again without any orders. You might go back a little way if you broke in two, but that was another proposition. Dan said it wasn't another proposition, it was the very same proposition, and Rule 101 would let them run anywhere and back again if they did not have their tail end. Sam said Rule 101 was to be used "if a train should part while in motion," and that meant if it should break in two. Dan told Sam he was too narrow in his views, and he

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would have to broaden out his theology a little before he would be fit to run an engine. Sam said he wanted to learn and he thought a good way to do it was to dispute something that somebody said. Dan told him Rule 101 was a good one whenever you had to handle your train in two pieces, or whenever you had to cut off part of it and go back and get the rest. Sam wanted to know how it would be if you had to cut off your engine and run for water, and Dan told him he had done it hundreds of times, because Dan was an old timer and had done most everything that could be done. Sam asked him how it would be if you had to run the engine by a station or maybe two stations, and Dan told him the rule was good if you had to run by a dozen stations. You did not have your whole train unless you had your markers and you could go back and get the rest of your train without looking out for anything but your own tail end.

Johnny asked Dan what he would do about 29. Would he keep 29 there at Highfly until the engine got back? Dan said he rather thought not. He would arrange to let 29 come along and he would wait for them at Homeville. Johnny asked how he would notify 29 and Dan said by the flagman he left with the caboose. The yardmaster said if he was running 29 he would want something better than a brakeman's word if he passed the tail end of a train with the markers up. Dan said he didn't know any other way and the yard master said the conductor could write out a note to be handed to 29. Dan said that would take too all-fired much time and a good flagman was all that was necessary, but Y. M. wanted to know what Rule 103 means, when it says that messages or orders about the movement of trains must be in writing. Dan said he didn't know, he hadn't done much writing, for he had always had a good man that he could depend on.

Sam Scooper said he would like to know a little more about this cutting off and running ahead business. Is it always necessary to leave a man with the rear of the train if it is clear of the main track? Dan said it was, and Rube Runslow asked why. The markers were up and Rule 101 says a rear end must not be moved or passed. Johnny Onspot observed, you bet he would leave a man, and if he did not have a good one he would stay himself. Sam asked what for, and Johnny remarked that markers do not always stay where you put them, and he wanted a man with a good red flag and a red lamp. He would not trust the best pair of markers that ever marked if he was going to run back with the engine.

Rube and Johnny got their orders to run extra Homeville to Highfly and return. Johnny remarked to Rube that there was one thing he wanted to say to Dan, but he didn't have the chance. Rube observed there were several ideas he wanted to ventilate if he had had the vocabulary to do it with. What Johnny wanted to call attention to was that it was better to run to Homeville as they did than to try to keep part of themselves back at Highfly. He would have had to make that arrangement for 29 to come along behind them and no telling whether that would have panned out well or not; then there was the local in on Cucumber siding, and they would have had to stop and tell them all about it, for fear they would not notice that they did not carry markers, and anybody with half an eye could see that it was best to fill their own schedule with what cars they had and go ahead. Rube said that was a sure thing and now he wanted to ask Johnny something. Suppose they had been on 29 and came along to Highfly and found that caboose and string of cars on the siding with no lights and no man, and no nothing around there to tell the tale, what should they have done? Johnny said he didn't believe there was any rule that would hold them or require them to do anything about it. Rube said he thought he would be a little suspicious and would want to find out something about it if he could. Johnny said that would be the safest course to take, but if he couldn't find out anything he would go along about his business. Rube said he thought they ought to have some definite instructions about a few things, so they would know where they were at. There ought to be more telegraph offices, anyway. Now if there had been an operator at Highfly they could have told the dispatcher what was up and let him look out for the rest. It took a lot of time for Johnny to go and tell Buck Bannister all about it and stop 29 and explain it all to them, and it is a wonder they got into Homeville without stopping them. Johnny said that was all right about the telegraph offices, and he would sure tell the dispatcher all about it if he had

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the chance, but he would do just exactly as he did do unless he got orders to the contrary. It is a good thing to tell the dispatcher, but you can not depend on those fellows to do any protecting for you unless you get it in black and white. Rube remarked that black and yellow was better than black and white, any day.

Rube said he wanted to know just one thing more, and that was, if they had managed that affair according to the ideas of Mister Daniel Dinkirun, and had left the tail end of their train at Highfly, would they be flagging themselves back from Homeville or not? Johnny said they certainly would and Rube asked how they would be doing it, if they would be walking a man ahead of them from Homeville to Highfly? Johnny told him that's the way it would be done if it was necessary, but in this case it wouldn't be necessary. Faithful Buck was looking out for their interests at the hind end and no bloomin' Eagle-eye would run by him if it was in his power to prevent. Rube asked if he would write out these things for Buck, so that he would know what trains to hold and what to let go, and Johnny said he didn't know as he would, for Buck had never failed him yet and he did not think he would. But Rube kept at him and wanted to know *if he should fail* who would be in the hole, and Johnny did not answer. Rube continued that he thought that that was pretty near true what Y. M. said about Rule 103. He believed it was a pretty good thing to write things out.

At last accounts Johnny was still thinking it over. We are kind of curious to know what his conclusion is; also the conclusion of any one else. What does Rule 103 mean? Who will tell us more about it?

Questions and Answers

Locomotive Running and Repairs.

Answers by F. P. Roesch.

521. First and Third Class Locomotives.—"What would you call a first-class locomotive, and how do the classes run? How would you detect a first from a third class locomotive? What is the difference in the construction of a first class and a third class locomotive boiler which carries the same steam pressure—180 pounds? Is not the metal of the same material? Are crank pins, so far as first, second and third class locomotives go, not made of the same class of steel? If not, why not? What should be the horsepower of a locomotive boiler, engine 17x24 inches? What is the greatest horsepower locomotive boiler built? What is the actual horsepower of a locomotive 17x24 inches? I understand the greater the speed the higher the horsepower developed, say, for instance, a locomotive with six cars running at the rate of 45 miles per hour would develop a high indicated horsepower. Now attach 40 cars at that rate of speed; the speed would soon be reduced very low and also the horsepower. What would be the average horsepower? All railroads rate their locomotives to haul a certain tonnage. I have worked on roads where the maximum tonnage was 15,000 tons per locomotive. I should think if there was a speed indicator on the engines, and engines rated according to speed, that the tonnage would be more exact and the machinery would not be abused. I have handled tonnage trains on the lines mentioned, and where one day I could make 20 miles per hour, the next day with the same engine and same tonnage I could make but 10 to 12 miles per hour, and often with the same tonnage and engine I would stall. Why is that?"—*G. O. F.*

Answer.—We will treat the questions of our correspondent in the order in which they are given:

First—What is a first class locomotive?

A first-class locomotive is one built to first-class specifications and in a first-class, workmanlike manner. One in which the strength of materials as well as design has been carefully worked out, and the designer's ideas carried out by the builder to the letter. Appearances are often deceptive. It would be necessary to go through every detail of design, construction and material to be assured of a first class (from our correspondent's

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point of view) locomotive, as paint, like the mantle of charity, can hide a multitude of sins.

Second—How do classes run?

As all standard locomotive builders are old, established and reputable firms, the locomotives they build—if left to them—are first class in all respects; the difference in price would be governed by the finish, etc. The writer has no knowledge of any firm of locomotive builders who build first, second and third class locomotives unless so specified by the purchaser, and, even then, the writer feels confident that no inferior material would be employed without protest from the builders.

Third—How would you tell a first from a third class locomotive?

You could tell the difference between the two in general design by observation, structural weakness being apparent. If both engines were of the same design, then the difference betwen the two would be in material. as in a modern engine steel is now being used in place of cast iron, as for instance in driving boxes, crossheads, deck plates and other castings.

Fourth—Difference in boilers.

Boilers to carry the same pressure must have the same factor of safety regardless of whether iron or steel is used in the construction. Therefore a boiler is either safe or unsafe. You cannot purchase a locomotive from a builder with an unsafe boiler, that is, a boiler that is not safe for the pressure it is designed to carry, as all are tested before leaving the works. For this reason we can not see how boilers can well be divided into classes so far as safety is concerned, and as for wearing qualities this is governed by the service, water used, care, etc.

Fifth—Metal in crank pins.

Steel is most generally used in modern construction, although some few designers still specify iron. The quality of the steel depends on specifications; there is, however, very little variation.

Sixth—Horsepower of boiler.

An engine with 17x24-inch cylinders should have a boiler containing about 1,300 square feet of heating surface, which at its maximum would be equal to about 520 horsepower.

Seventh—Largest locomotive boiler.

Figured in terms of heating surface, the largest locomotive boiler built is that of the Mallet compound built for the B. & O. Ry., which has a total heating surface of 5585.7 square feet, and is, therefore, at its maximum equal to about 2200 horsepower.

Eighth—Actual horsepower of a locomotive.

As you state, the indicated horsepower of the locomotive varies as its speed. As all the dimensions of the locomotive referred to are not given, we can not give you its actual horsepower. However, by the following formula it is easily calculated: First, find the tractive power by the formula

$$\frac{d^2 \times S \times 85 \text{ B. P.}}{D} = T.$$

in which

d=Diameter of cylinders in inches.
S=Stroke of piston in inches.
D=Diameter of drivers in inches.
B.P.=Boiler pressure.
T=Tractive power.

After finding the tractive power, to find the horsepower, multiply the tractive power by the speed in miles per hour and divide by 375 as per formula:

$$\frac{T \times S}{375} = \text{H. P.}$$

in which

T=Tractive power.
S=Speed in miles per hour.
H.P.=Indicated horsepower.

Ninth—Tonnage rating of locomotives.

Locomotives are not rated by horsepower but by tractive power, for the very reason which you set forth in your letter, namely, horsepower varies with the speed. Tractive power, however, is a constant, and is therefore the only correct basis on which to calculate the tonnage. The reason you can haul a train of what is presumed to be the same tonnage at 20 miles per hour one day and stall with the same tonnage the next, is probably because the cars are not weighed, but the weight estimated; that is, a loaded car of 60,000 pounds capacity and 30,000 pounds light weight is called 90,000 pounds total, when, in fact, the car may contain 70,000 pounds or more. Then, again, you may have a greater proportion of empties one day and no allowance made for the increased length of train, and again weather conditions may change, or you may have new and stiff cars one day and old cars the next. In fact, there are so many factors entering into the tonnage rating of a locomotive that we cannot adopt any fixed tonnage, but must adopt a sort of sliding scale in

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which the tonnage varies according to the speed desired, the weather, length of train, number of empty cars in proportion to loads, etc. The manner in which the engine is handled has also quite an effect on its hauling capacity. A poorly lubricated valve is often as bad as two or three more cars. The next time you stall, have the conductor figure up your tonnage again, and see if you are not overloaded.

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522. Pressure in Boiler.—"Where is the greatest pressure in a boiler with 180 pounds of steam, in the 'leg' or in the 'dome?' Why?"—*L. D. S.*

Answer.—The pressure is equal in all parts of the boiler. The question has been raised: "Will not the weight of the water cause an increase of pressure in the leg of the boiler?" A moment's study, however, will show you that the registered pressure on the gauge is due to the pressure of the steam, and this pressure must be equal, regardless of whether its pressure is exerted against the shell of the boiler direct, as in the dome, or against the water contained in the leg. Of course, if the boiler had no steam on, but had three gauges of water, then a gauge attached to the leg would register a pressure equal to the weight of the column of water, while a gauge at the dome would register zero.

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523. Length of Rods on Engine.—"An engine gets disconnected on the road. The liners get mixed up. What is the most expeditious way of lining up the rods, without moving the engine? Of course, when the engine can be moved the problem becomes quite simple, but, as it stands, where there is no time to move the locomotive, how is the exact connection and line-up to be determined?"—*M. L. McE.*

Answer.—Assuming that all rods have been taken down, side rods and main rods, the first rods to apply will be the side rods. We all know that the distances between the centers of the crank pins must be the same as the centers of the axles. As we are not supposed to have access to trams on the road, we must obtain our centers by other means. We, therefore, take a stick or piece of board, and holding it against the wheels, mark off the centers of the axles on it. Then if the centers of the crank pins coincide with the marks on the board we can put up the rods as the engine stands, regardless as to whether the pins are on the dead center or not, being careful, however, not to line them up too tight. Of course, if the pin centers do not coincide with the axle centers it will be necessary to move the wheels (slip them) until the pin centers come right. If the pins are of unequal length, as, for instance, on 10-wheel or consolidation engines, the pin centers and axle centers would not coincide, as in this case the axle centers would be equal to the base of a right-angle triangle whose base is the distance between the centers of the axles measured, the height being equal to the difference between the length of the crank pins, and therefore the crank pin centers, or distance, would be equal to the hypotenuse of this angle. As on the road it is not always possible to obtain a straight board wide enough on which this angle could be projected, it would be easier to lay the rods on the ground, couple them up temporarily, put centers into the brasses on a small block of wood, and then, using your board or measuring stick as a tram, get the distances between axle centers and line up your rods (while lying on the ground) to suit. Then uncouple your rods and, being careful not to mix the liners again, connect them to the pins as you had them lined up.

To get the correct length of the main rods, shove the crosshead forward hard until it strikes, or the piston strikes the front cylinder head. This will give you the striking point, if none be marked on the guides. Now pull the crosshead back about one-quarter of an inch, for clearance, take your measuring stick and measure the distance from the center of the wrist or crosshead pin to the center of the main axle. This measurement should be taken from the inside face of the crosshead, if possible (next to the wheel), so as to reduce the error due to the angle at which it is necessary to take the measurement, as we assume you have no square by which the axle center could be projected out flush with the face of the crosshead. If the inside face of the crosshead is only about 6 inches from the face of the wheel, the measurement found from the center of the wrist pin to the center of the main axle will be but slightly, say ⅛-inch, too long; therefore the length of the main rod measured from the centers of the brasses would be equal to the distance from the center of the wrist pin to the center of the main axle, less ⅛ inch, or you can allow for this in the first place by pulling the crosshead back ⅜-inch instead of ¼-inch from the striking point.

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This method is the most expeditious under the conditions mentioned, and, while not exactly accurate, is sufficiently so to carry you to your terminal without trouble.

524. Difference Between Compound and Simple Engine.—"Wherein do compound locomotives differ from the ordinary or simple one?"—*W. J. O'B.*

Answer.—They differ in the fact that in the simple locomotive the steam is expanded but once, while in the compound locomotive it is expanded twice. For instance, while in the simple locomotive the exhaust steam passes directly to the stack, in the compound it passes to another and larger cylinder wherein the remainder of its expansive qualities is utilized.

525. Advantages Claimed for Compound Locomotives.—"What are the principal advantages claimed for compound locomotives?"—*W. J. O'B.*

Answer—Advantages claimed are economy in fuel, water and boiler repairs.

526. Principal Types of Compounds.—"Name and describe the principal types of compounds used in the United States."—*W. J. O'B.*

Answer.—There are in use in the United States three principal types, viz., the cross-compound or two-cylinder, such as the Schenectady, Richmond, Pittsburg, Cooke, Rogers, Rhode Island, etc., which have the high-pressure cylinder on one side and the low-pressure on the other; the four-cylinder, such as the Vauclain, having the high-pressure cylinders set either over or under the low-pressure cylinders, and the tandem, having the high-pressure cylinders ahead of and bolted to the low-pressure cylinders. Then there is the Mallet articulated, which really consists of two engines under one boiler, the rear engine being fitted with the high-pressure cylinders and the forward engine having low-pressure cylinders; the four-cylinder balanced compound of the DeGlehn and Von Borries type as modified in the United States and known as the Vauclain balanced compound built by the Baldwin Locomotive Works, and the Cole balanced compound, built by the American Locomotive Company, in which the four cylinders are practically ranged side by side in the same plane, the high-pressure cylinders being usually placed under the cylinder saddle, or central, while the low-pressure cylinders are usually outside.

527. Advantages Claimed for Vauclain System.—"What advantages are claimed for the Vauclain system?"—*W. J. O'B.*

Answer.—Same as for any other system, economy in fuel, water and repairs.

528. Direct Acting Valve.—"What is a direct acting valve, and in what class of compound is it generally used?"—*W. J. O'B.*

Answer.—A direct acting valve is one in which the motion imparted to the link by the eccentric is not reversed by means of a rocker arm—generally used in the Vauclain four-cylinder balanced type.

529. Starting Valve.—"What is the starting valve, and how should it be used?"—*W. J. O'B.*

Answer.—The starting valve is an arrangement wherewith the pressure of the steam in the low-pressure cylinder can be augmented by introducing or admitting a small amount of live steam direct. It should only be used when starting a very heavy train, or as a last resort to avoid stalling on a hard pull.

530. Air Valves.—"What are the air valves and their use?"—*W. J. O'B.*

Answer.—The air, or relief, valves on Vauclain compounds are placed on the end of the hollow valve stem and are, as the name implies, an air relief valve to admit air to the cylinders when drifting.

531. Water Relief Valves.—"What are the water relief valves and how used?"—*W. J. O'B.*

Answer.—The water relief valves are similar in construction to an ordinary pop valve. They are tapped into the cylinder heads and are set at the maximum pressure desired in the low-pressure cylinder. Their use and purpose is to relieve the cylinder of any excess pressure, be it due to either water or steam.

532. Starting Compound Engine.—"How should a compound engine be started with a train?"—*W. J. O'B.*

Answer.—With reverse lever in full gear and engine cut into simple is the usual practice, although some recommend starting with engine in compound position until all the slack has been taken up, and then cut into simple until train is under headway.

533. Economical Point of Cut-off.—"What is the most economical point of cut-off with the Vauclain compound?"—*W. J. O'B.*

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Answer.—Between half and one-third stroke. For instance, in an engine of 24 inches stroke, about 10 inches.

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534. Lining Crossheads.—"Why is it especially important with Vauclain compounds to keep the crossheads well lined up?"—*W. J. O'B.*

Answer.—Not more so than with any other engine. A loose crosshead is liable to cause fractures in piston rods, wear out piston packing, cylinders, etc.

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535. Piston Valve.—"Describe the piston valve and state how it differs from the ordinary slide valve."—*W. J. O'B.*

Answer.—The piston valve is circular in form, resembling an ordinary thread spool. The slide valve is rectangular. See answer to this question, Number 430, page 53, January, 1907, Magazine.

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536. Economy of Compound Locomotive.—"What percentage of economy is claimed for compound locomotives?"—*W. J. O'B.*

Answer.—Claims differ. From 12 to 31 per cent. Fifteen to twenty per cent. is a good average.

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537. Best Results Obtained.—"What were the best results obtained with a compound locomotive?"—*W. J. O'B.*

Answer.—See answer to question above.

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538. Running Down Grade.—"How should a compound locomotive be run down grade?"—*W. J. O'B.*

Answer.—Lever nearly in full gear, starting valve open.

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539. Running Up Grade.—"How should a compound locomotive be operated up grade?"—*W. J. O'B.*

Answer.—In compound position always, except when necessary to cut into simple to prevent stalling.

The above questions on compound locomotives are not answered at length, as it would take up entirely too much space in this column, especially as all the above questions were explained fully and in detail in the articles covering the compound locomotive, entitled "The Compound Locomotive—Its Virtues and Its Failings," beginning with the February, 1906, number of the Magazine and ending with the September, 1906, issue, to which our correspondent is referred.

Train Rules and Train Practice.

Answers by H. A. Dalby.

234. Rule 4 (A).—"We are working under the Standard Code. A new timetable goes into effect at 4 a. m. and there is a train on the new timetable due to leave its initial station at 4 a. m. Can this train run on the day the timetable goes into effect? Rule 4 (A) is in effect here."—*J. H. J.*

Answer.—Probably but few of our readers are familiar with Standard Code Rule 4 (A), so we quote it herewith:

Each timetable, from the moment it takes effect, supersedes the preceding timetable.

A train of the preceding timetable thereupon loses both right and class, and can thereafter proceed only by train order.

No train of the new timetable shall run on any division until it is due to start from its initial station, on that division, after the timetable takes effect.

According to this form of the rule the old timetable dies completely and any schedules that are in effect at the time of change are annulled. There are then no trains due on the road until they become due to leave their initial stations. It would seem that in this case the new timetable takes effect just one minute too late for the train in question to run that day. The rule says that no train of the timetable can run until it is due to start *after* the timetable takes effect. If the timetable takes effect at 4 o'clock the train must be due to leave some time after 4 o'clock in order to run that day. The first time it is due after the timetable takes effect is 4 a. m. the next day. A situation of this kind should be avoided by making the change at a time prior to 4 a. m. If it were at 3:59 a. m. there would be no question as to whether the train could run that day.

This question comes from one of the very few roads using old Standard Code Rule 4 (A). This form of the rule was entirely omitted from the revised Code as there are now but few that favor it. We have always maintained that it was the simplest and easiest to understand of any rule yet devised, but it makes a great amount of work for the dispatcher if there are many trains on the road when the change takes place, and there is also great danger of delay, as all trains must be run extra until the schedules begin to be effective.

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235. Double Heading Question.—"We are taking a light engine over the division and get the following order: 'Engine

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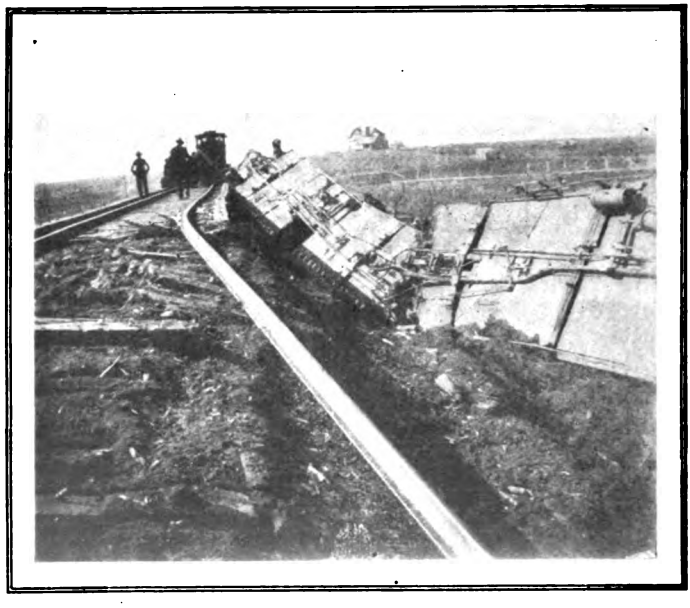
292 will run extra Corliss to Corfu.' After running about 60 miles we are stopped by the order board and get a message which reads: 'Engine 292 will wait and double head No. 6 Morton to Portage.' What should we do with our white flags and markers? I claim that as a message does not annul any train orders, that we should keep them up and that we would be extra 292 helping No. 6. Others claim that the classification signals and the markers should be taken down and that we could not double head without doing this, because the rules say that when there are two engines the leading engine only will display signals. If we kept up our white signals the train would be an extra and not No. 6."—*W. C. G.*

Answer.—It is true that the message you received did not annul your order to run extra, but when you couple in with No. 6 you become a part of that train and must be governed by the rules relating to it. Your order to run extra is simply unfulfilled; you do not use it while you are double heading No. 6.

This seems to us the only logical way to consider such an arrangement, although we think it would have been better for the dispatcher to annul your order to run extra. Of course it is not impossible for two distinct trains to run over the road coupled, but in this case the incongruity would be so apparent that it would be extremely inappropriate, even if no rules were actually violated.



WRECK ON THE FRISCO, FEBRUARY 10, 1907, NEAR DAVIDSON, OKLA.—VIEW FROM REAR, LOOKING TOWARD ENGINE

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Railway Club Proceedings

Engine Failures and Their Report.*

MR. W. E. SYMONS—It is pretty generally conceded that we are all, more or less, the product of our environment. It is also equally true that many of us have a great deal to do with shaping our environment.

It is also pretty generally known that "engine failures" is a rather ambiguous or flexible term in its application and meaning, so much so, that when in the hands of certain railway officials it can be and is sometimes used in a manner to cover a multitude of sins, the sum total of which might, in justice to all departments and brancnes thereof, be sub-divided, making quite a conspicuous change in the ledger account.

I am fully in accord with my friend, DeVoy, who, I believe, has left the room. I do not like to quote a speaker after he has retired, as he might want to answer, if criticized. However, I do not challenge anything he has said in reference to the train dispatcher, but quite agree with him on this particular point.

It has been the speaker's lot to mingle and work with all classes of officers and employes of railways, also steamships, industrial concerns and commercial men; I have associated with train dispatchers, both in a social and business way, worked with them, shared their troubles and joys, ate with them, slept with them, solved difficult problems with them, and always with equally as satisfactory results as when dealing with anyone else. Generally speaking, my observation of railway men is that they are all molded out of about the same kind of clay, it being rather a question of our own environment as to what particular value or importance we attach either to ourselves or the other fellow.

The train dispatcher, however, is quite an important factor in the matter of engine failures on most railways, and on roads where the train dispatchers and enginemen, or, I might say, the transportation and mechanical branches of the operating department are not friendly and working in harmony, as they should be, engine failures are, as a rule, rather excessive, according to the records, and in the investigations as to the cause, and the explanations offered, there are many criminations and recriminations. It, therefore, follows, that an investigation of a report showing on its face an engine failure for every one or two thousand miles on a certain railway is not conclusive evidence in all cases that the motive power is in bad condition; also a report from another road, showing twenty-four to forty thousand miles per engine failure may not be proof or evidence of the machinery being in good condition. Either or both reports may reflect a condition which does not apply to the locomotives at all, but rather to the efficiency of the men, character of organization, discipline, etc., and either the harmonious relations or opposite conditions that may exist between employer and officers, all of which, it will be found, when properly analyzed, can yield only to a thorough, systematic reorganization.

All of the remedies offered here this evening, together with others, that any practical, sensible man would offer for the solution or prevention of engine failures, are predicated upon the assumption that the officer in charge of that particular branch of the service is supplied with the means, and clothed with the authority essential, either to prevention, or remedy; therefore, a roundhouse foreman, division master mechanic, or even superintendent of machinery, who may have evolved in his mind and reduced to a definite conclusion a system, or method, whereby engine failures would be as completely eliminated as is practical in the operation of a railway, might at the same time find himself restricted financially, or confronted by a feature of the organization adverse to his department which would preclude the possibility of his system, or method, being applied, to the end that desirable results be obtained. Therefore, if my reasoning is sound, I would suggest that, following in the line of the remarks of our president, it would be an excellent thing to formulate some method by which the question of engine failures could not only be uniformly and intelligently compiled for comparison, but that the subject be taken up with the Master Mechanics' Association. Its presentation, however,

*Paper by Mr. W. E. Dunham, M. M., C. & N. W. Ry. Discussion continued from September, 1907, Magazine.

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should be on the ground that all items entering into or having any bearing on an engine failure should be included in the report, with full explanation in detail from each road. The statement should show, among other things, the kind of engine, their dimensions, age, heating surface, grate surface, tractive power, profile of line over which they operated, speed maintained, amount of money expended on each engine each year, kind of water used, details of firebox and fuel renewals, company's facilities for repairing engines in the way of shops, roundhouses, etc.; this for the reason that on some roads a cost of 8 or 8½ cents per mile looks very economical, while on another road, a cost of 12 or 15 cents looks high, when in reality sometimes the road showing the lower cost is not as economically handled as the one showing the higher; this is sometimes a matter of bookkeeping. The matter of facilities exerts quite an influence, not only on cost items, but on the number of engine failures.

Engines in first-class condition sometimes on their arrival at a terminal point, when stood outdoors in zero weather, get to leaking about the time they are needed by the transportation department, and an engine failure is reported, when as a matter of justice, the general passenger agent, auditor, or treasurer of the road is just as much to blame for the engine failing as is the superintendent of machinery; therefore, any general report of the different roads compiled for comparison must be made on the same basis containing the same items of expense and other conditions, so that it will be susceptible to the same method of analysis, thereby giving results that are reliable and can be quoted, even if the engines are maintained under different conditions.

The comparative statements showing the cost of maintaining locomotives on a number of prominent railways, that were published for a number of years in Mr. M. N. Forney's very valuable paper, were finally discontinued, for the reason that the comparisons reflected adversely on some of the best managed roads, and, on account of the different systems used of arriving at the expense charged to repairs on different roads, together with the other local conditions pertaining to the operation of locomotives, it was decided that these comparative figures were valueless.

The ambiguity or flexibility of the term "engine failure" is made very clear and apparent by the perusal of Mr. Dunham's paper, and any one not familiar with the Northwestern Railroad, with the high character and ability of its officers and the discipline maintained, could see very clearly by reading this paper that the management was very liberal, broad-gauged, progressive and disposed to co-operate with and throw every precaution around the mechanical department that would assist them in furnishing power to move their trains with the least possible delay. All men are not as pleasantly situated; the club is to be congratulated on Mr. Dunham's paper, and he is to be congratulated on being associated with a railroad where the management will authorize them to put into force and effect as liberal an interpretation of engine failures as is shown in this very valuable paper.

MR. A. L. BEARDSLEY (A., T. & S. F. Ry.)—In my limited experience in railroading I have not had a great deal of trouble with engine failures; in fact, we have very few of them.

MR. G. W. FARMER, (A., T. & S. F. Ry.)—I simply wish to bring out one point in connection with engines which have passed from the roundhouse to the back shop for light repairs, and that is, that the roundhouse foreman should always get a report from the engineer of the most necessary work to be done on the locomotive while it is in the back shop. I speak about that from the roundhouse foreman's side and I also speak from the back shop foreman's side. I have always made it a point in cases like that, if such report was not promptly forthcoming, to go after it.

PRESIDENT BENTLEY—For your information I will say that we have a printed report which passes through the hands of the roundhouse foreman who has been in touch with the engine, and through him to the master mechanic, showing the various parts of the engine requiring repairs, so that the work can be done without tearing everything apart.

MR. J. A. CARNEY (S. S., C., B. & Q Ry.)—Reports of delays, whether from the dispatcher or from the engineer, should be made with the intention of being absolutely correct, so that any investigation which may follow from such reports will be made with the idea of finding out what is wrong and what can be

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remedied, rather than implying a censure on any particular person. I have known of cases where engineers would not report work on their engines, and would not report engine failures with absolute correctness, for the simple reason that they thought by shading the truth they could escape censure. All of the reports that a railroad company asks for are for improvement of the service, and if these reports are made intelligently and honestly the conclusions may be drawn accordingly and the necessary corrections made without necessarily making a personal censure. I think that Mr. Dunham's paper is leading up to that line of argument, and if we want to know the exact truth, we must start with the truth.

MR. E. R. WEBB (M. M., Mich. Central R. R.)—Mr. President, unlike our friend Beardlsey, we have engine failures. We have them in all their phases, and any time an engine stops for any reason that can be attributed to the engine it is accounted an engine failure, and the matter is watched very closely by myself on the division where I am. . . . . In regard to the engine dispatcher, I have been fortunate in working among men who do business on the square. I ran an engine a great many years and have yet to find any time when I thought I got the worst of it from the train dispatcher. My. Symons expressed it just right; we are all built of much the same kind of clay, and the train dispatcher, I have found, uniformly, to be a very good sort of a fellow, and if given a fair show he will be fair with the other man, too. The train dispatcher's office is very close to mine, and one of my first visits on my morning rounds is to inquire of the train dispatcher how things went during the night, and I head off numerous failures and get in touch with failures just through that office, not by being a good fellow with the train dispatcher, but because he is able to give me information that is valuable to the locomotive department.

Engine failures, speaking broadly, are simply the result of a condition imposed upon machinery that it is not capable of standing up under. The roundnouse foreman is, I believe, the keynote to the situation. With a first-class man as a roundhouse foreman, with facilities, with adequate help, the engine failures may be reduced as well as could be expected. The tacking on of the engine failure to the locomotive engineer certainly should be a thing of the past. With us practically all the locomotive engineer has to do is to run the engine; roundhouse men clean the headlights, fill the grease cups and set up wedges; we do expect that a reasonable inspection shall be given by the engineer on arrival at the terminal and also on taking the engine out. However, I have found that by inspecting the engine carefully, insisting that the work be done, and by keeping in close touch or keeping the department in close touch with the division superintendent, we are able to send the engines out in a condition that will insure a safe journey over the road. The division superintendent does not want the engines sent out unless they are washed and cared for and unless we can reasonably guarantee to him that the engine will make a round trip. The result is that the engines are kept washed, and the washing of our boilers is a great factor in eliminating flue failures. The roundhouse foreman must be such a man as will adopt what the engineers have been allowed to cast off. We do not hold them responsible for many things. A failure that looks like a man failure is certainly followed up, but it is not followed up with maliciousness nor vindictiveness; it is followed up for the purpose of educating the man, and we find it very successful.

Speaking of engine failures, we have about 200 miles on this division that I am responsible for, and we run anywhere from 20,000 to 40,000 miles per month per failure, but the roundhouse work must be attended to. Referring to what Mr. DeVoy said about losing an air pump, one of our young men nearly lost an air pump, but not quite. Over in the Stock Yards district an air pump broke away from its fastenings, but he got a chain and chained it. The engine was of the extended wagontop type and the air pump was right beside the dome and the engine came in with a train of stock (there was no delay to the train) with the air pump chained to the boiler. I was so struck with the practical idea that I brought some of the old heads around to see what one of the young heads had done.

There is no use in attempting to fasten an engine failure on an engineer when the condition of the engine is such that it can be plainly seen by a practical man that it belongs to the engine. The pooling of engines is practiced by many rail-

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roads and it is in full force with us this winter. There are a few of the passenger trains that have regularly assigned engines, but the freight business between Chicago and Buffalo and the Straits of Mackinaw is handled entirely by engines and engineers and firemen in a pool service, which is quicker and the only way to handle freight today, and handle it successfully with a limited number of engines and a maximum volume of business. As I have previously mentioned, the roundhouse foreman should feel an interest in the engines similar, as much as can be, to the interest which we formerly had as engineers in our individual engines. Of course he has a great many children to look after, but he must be just such a man, and he must be given good facilities, and in the end it is not so expensive after all, and while, perhaps, it does look as though the expense could be less, or that a burden is put upon the roundhouse force that the engineers and firemen in part should take, yet it is one of the things that has come with the times; one of those conditions, which, while it does cost money, is simply the price one has to pay for the things one has to have.

In regard to men being long hours on duty, I would say that our management does not permit a crew to go out that has not had a sufficient amount of rest, and we keep men enough so that we are able to do that. A crew that has been on duty seventeen consecutive hours is not even permitted to go out, and we have a space on the register book where the crews ask for the amount of rest they require, and it is given to them regardless of how long the train may lie in the yard. Our friend, Mr. Peck, spoke of engines being run "First in and first out" in the summer and "First in and right out" in the winter. We are all up to that condition and situation; we canont help it. Ordinarily our engines run through from Jackson to Chicago on the passenger run. This afternoon our second No. 17's engine was cut off and the engine from train No. 10 put on the run at Michigan City in order to get an engine for the horse train tonight, and yet, with those conditions, if we follow the thing up closely, watch the engines, back up the roundhouse foreman, give him the things to do with, and when he says, "I cannot give you the engine until such a time," be satisfied with that, and with a superintendent who will be satisfied that the mechanical department is doing all that man can do, the freight and passenger trains can be moved successfully.

MR. BOURNE—I would like to call attention to the fact that twelve years ago two minutes to a passenger train and five minutes to a freight train was an engine failure and the same condition remains today. In those days engineers had small engines and small trains; today his engine is twice and three times the size of engines used in those days. Is it not a pretty scant chance for a man to get out of engine failures with the same five minutes today that he had twelve years ago under different conditions?

MR. BEARDSLEY—I would like to ask Mr. Webb if he charged the engineer who came in with the air pump chained to the boiler with an engine failure?

MR. WEBB—The man was not charged with a failure because while we were loading the stock he chained the pump.

PRESIDENT BENTLEY—I want to endorse every word you said on the subject of boiler washing. We know from experience that as we neglect our boiler washing we increase our boiler force.

MR. E. H. DEGROOT, JR. (Supt. C. & E. I. R. R.)—Mr. Webb has well said that when the locomotive stops, everything stops. That answers the question as to why these engine failures have been followed up with such vigor. They must be. Even the revenue stops when the engine stops. Mr. Peck suggested that everything nowadays is made to pound, and evidently that includes the dispatcher, who is not present to speak for himself. I believe, however, that these men intend to be fair; I should regret to think that they did not. Mention was made of the desirability of having every train dispatcher qualified as an engine man. We cannot get train dispatchers at a salary of from $125 to $145 per month whose training will enable them to earn anywhere from $175 to $200 per month on a locomotive.

It seems to me that we should approach this subject from the judicial rather than from the departmental standpoint. These departments ought to get together. A railroad company pays for all the friction there is, whether it is mechanical or departmental. The departments should get together and avoid friction.

Now, just a word with reference to the

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education of the engine man in order that he may make the intelligent report that is demanded. There is a great deal for the traveling engineer to do in this respect. The dispatcher gets a message that reads like this: "Engine leaking, please advise." No further particulars. I believe comment is unnecessary. These men must be educated, these engine failures must be followed up, and the traveling engineer has both clearly within his province. He is not earning us any money in his office; he is not earning us any money with a stenographer or with a typewriter. We have been too liberal with typewriters on railroads. If we could cut most of the typewriters out and do away with one-half the correspondence with which we are called upon to contend, we would make money for the company.

I like this paper of Mr. Dunham's because, in a clear manner, he provides a way for following engine failures up with one thing in view, overcoming engine failures. His plan is reasonable and progressive. By successive steps the investigation is passed along from the engine man to the roundhouse foreman and then to the master mechanic; from the master mechanic to the assistant superintendent of motive power, and from that official to the mechanical engineer, all with a view of preventing the next engine failure. Followed up, this will surely produce results.

MR. J. H. TINKER (M. M., Chicago & Eastern Illinois R. R.)—I wish to say a few words in favor of the dispatcher. Although I want to speak from the motive power side, the road with which I am connected has had a great many engine failures these past few months. Talking the matter over with the road foreman of engines, we did not think we were getting a square deal from the transportation department, so we took the subject up with the superintendent; he assured us he would do everything in his power to help us, and he suggested that we meet him again a week later. A week elapsed and we were all very busy and postponed it until the next day. I went down to talk to him the next day, but the road foreman of engines could not go with me. The first meeting we had the train dispatchers were not there, but the second time they were present and the next day we had a blank sheet; no failures at all. I have not had an opportunity to see the next sheet, but I think it was blank, too, and I merely wish to show that the dispatcher sometimes is a pretty good fellow after all, if you take him in the right way.

MR. B. F. SIPP—The dispatcher seems to be a pretty big man here tonight. As I said at the last meeting he has a great many troubles. He endeavors to keep his trains on schedule time, he must attend to all wrecks, he must see that the trains handle their maximum tonnage over the road and he must explain to the superintendent next day why they did not handle the maximum tonnage. The dispatcher has a great many things to contend with, because he handles the details of the transportation department both day and night. He does not want to find fault; his object is to get the traffic over the road promptly, because behind him the traffic department is pushing him and the contracting man back of them is after the transportation department to get the freight over the road. I feel that the dispatcher wants to co-operate not only with the mechanical department, but also with the traffic department. It has been brought out here tonight that eternal vigilance and co-operation on the part of the transportation department and the motive power department is very desirable to reduce engine failures.

PRESIDENT BENTLEY—There is no doubt about it, Mr. Sipp; the train dispatcher has a hard game to play. We recognize that and the only way to do is to help him as much as possible. I have known a great number of train dispatchers, and I have the first trouble to have with any of them. It all depends on how you handle them. I think a train dispatcher is human like the rest of us, and if you handle him in the proper manner he will be square with you if you will be square with him.

MR. WALLACE—A speaker mentioned the fact that the engineer had the engine failure put onto him. I hardly think that applies to the majority of cases, and I think that the assistance that you get from your enginemen will assist in eliminating failures in proportion to the ability of the men who are on the locomotive, just as much as an efficient roundhouse force will eliminate failures of engines, and I think that possibly Mr. Webb complimented that engineer on preventing a failure; if he did not, I am a little bit disappointed. The engine failure that was mentioned where

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an engineer would be delayed two minutes after taking water could be avoided by the engineer; all he had to do was just to drill that fireman to leave the spout in the tank until he got through with his work. The engineer would have prevented that engine failure, and that is just one example of many cases where an engineer could prevent engine failure.

MR. WEBB—I would like to say in reply to Mr. Wallace that I did compliment that engineer, and I brought all the engineers around the engine that morning to show what the young man had done.

In regard to the co-operation of the enginemen, we have the enginemen and we have their co-operation, and just as an illustration of that: I knew that one of our engines on a passenger train had had a disabled driver brake; the train was not very far out of Chicago when the brake crank broke right off. I did not find any report or statement from the engineer, and the next day I met him and asked him where his statement was in regard to the engine failure. He said: "I did not have any engine failure. They did not know a thing about it. The traveling engineer was running the engine, and I took it off, and before we started I had the broken part on the back of the tank, and the result was no delay." The transportation department did not know anything about it, and would not have cared if they had, because it did not delay the traffic.

PRESIDENT BENTLEY—This is one of the most interesting meetings we have had for a long time and I hope we will continue to have meetings of this character. I note with a great deal of pleasure the improved attendance at the meetings, and I feel sure that the interesting subjects we have had have been responsible to a great extent for the improvement in attendance. Mr. Dunham, unfortunately, is not here, but we will give him the privilege, of course, of replying to any remarks that have been made, as I think it is only fair, and his answers will be printed in the proceedings. The hour is getting a little late, and if there is not any further discussion, I will be glad to have the motion to adjourn.

MR. W. E. DUNHAM (M. M., C. & N.-W. Ry.)—The true function of any system of failure reports is to give absolute facts upon which can be based the actions taken to avoid a repetition of the same or similar failures. If every one concerned in the matter of train service would keep this forcibly in mind there would be no friction between the departments, nor would the engineman think that he was having it "put onto him." As regards charging an engineman with a failure, personally I do not look first of all to see if I can find fault with him. First, I want to know if the engine was in proper condition for service. If the roundhouse is not at fault I then want to know if the engine was treated right. If the engineman or the train dispatcher is at fault, I want to know that. And finally, if the engine was all right and it was treated all right, I want to know if the design or the arrangement of the detail was correct for the service that it had to peform. Now the only way to get such infomation is to have each report honest and without any equivocation. A train dispatcher, an engineman, a roundhouse foreman, a master mechanic, a mechanical engineer or a superintendent should stand for just what censure is due him, for each of them can also learn something from each failure which will be of use in their daily work and thus be of value to the company employing them.

I have had enginemen, when called up for the purpose of giving information, begin to tell how very much abused they had been and how badly they had beeen treated by the train dispatcher, etc. Usually the facts were that the only fellow abused was the inanimate engine, and the engineman needed all that was coming to him. When a fellow begins to complain or whine I usually look out for him, no matter what position he may hold.

Some of the speakers seemed to think that I had it in for the train dispatcher. Far from it. My only endeavor was to show up some of the practices that have come under my observation that have given reports not fair to the train or the motive power department. The roundhouse foreman, the engineman and the master mechanic are all human, and they all have the human instinct to try and put it on to the other fellow. On that account I thoroughly believe in a set of rules governing the reporting of engine failures. If the actual facts of the case are given every time there can be no chance for any argument or wrangling between the departments. If we all had the drainage canal as handy as

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Mr. Peck has to dispose of our engine failure reports we would be relieved of a great deal of worry. But if the study and time that is put on a square report of failures results in showing up needed improvements in shop and roundhouse practices and facilities, I believe that each railway master mechanic should welcome all the failures that can be charged. The motive power department is created solely to keep engines going over the road and in condition to pull tonnage. If they cannot do that we ought to want to know why. The knowledge that I get from these reports, if a standard set of rules could be adopted, would be of great value if I should be furnished with the same class of power that I have been accustomed to handle and vice versa.

The rules presented in the paper are not infallible, but they have shown themselves to be very practical. Mr. Wilson, however, presents two rules especially that are good. I refer to his No. 5 and No. 11 covering delays to switching power and work done by enginemen while he is waiting for train crews or orders.

Mr. Buchanan writes that they do not accept failures where "fuel only is responsible." We do, and I think we should. For Mr. McIntosh's information would say that it comes in as a cause for not steaming. It is not itemized in the list, but it is clearly a cause for trouble and it is so considered. Poor fuel will cause more boiler trouble than a large force of men can repair, and I believe that the fuel agent should know the results of his purchase of inferior fuel. Mr. Buchanan covers the field where he says that "there are few failures . . . which cannot be avoided if proper inspection is given the manufacture, application and maintenance of material." And I believe there is no better way to know if the proper inspection is being made than to have the other fellow tell you where you are not producing results.

Mr. Tonge refers to having dispatchers familiar with the working of an engine. It seems to me that Mr. Webb has that subject well in hand when he says that he calls on the train dispatcher and helps him line up things the first thing in the morning, thereby heading off many probable failures and in return receiving valuable information for his department. The closer the master mechanic and the operating officers can get together the better will be the results. If I was superintendent, and my dispatcher knew all about the working of an engine, I would dispense with the services of the master mechanic and also look for another job myself. I cannot say that I believe in these "know it all" fellows; I prefer a "community of interests."

Mr. Wallace mentions the matter of education of enginemen. This is of the utmost importance, as it is upon them that we depend to get all there is to be obtained from our engines on the road. A man interested in his work, and also a student of it, will get results with an engine having a slight defect that a simple "throttle opener" can not. And a man is not in the latter class always of his own choice. We have usually made him and we have no one to blame but ourselves. I find that a failure report shows up just where we need to strengthen this man and that man and in the end make good enginemen out of them. And right here let me say to the engineman, don't be afraid to tell the dispatcher what you think should be done or ask him to help you out when in trouble. He will look to you some day and will want your advice. On the other hand, if you insist on going it alone and independently he will surely let you.—January 15, 1907, meeting Western Railway Club.

* * *

*Balance Valves for Locomotives.**

For years the superintendents of motive power, general managers and master mechanics have been endeavoring to increase the efficiency of the American railway locomotive, and at the same time to increase the speed and power and also economize by way of fuel, oil and water.

Some twenty-three years ago the different railway companies of the country, in endeavoring to secure a balance valve, on account of the increased pressure in the boilers, began the use of what was then known as the Allen-Richardson valve, which they considered, at that time, a great improvement over the Stevenson valve. In the course of time they fully demonstrated that the Allen-Richardson valve was a great improvement over the old style slide valve.

Later, in order to further economize and increase the efficiency above de-

*By W. W. Arnold, General Foreman C., B. & Q. Railway.

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scribed, railway managers began the use of the piston valve. But the companies are still reaching out, searching for new inventions to be applied to locomotives, that would be economical and increase the power and speed of locomotives.

Mr. Gould, being a locomotive engineer, knowing the necessity and the advantage of new improvements, has invented what is known as the Gould balance valve. There are many points in this Gould valve that should be well considered by the officials of the various railways; points of advantage over other valves now in use.

Economy in valve oil.

The saving in fuel and water.

Increase of power and speed.

Less friction on valves, valve gear, links, and eccentrics, making engine more easy to handle. Utilizing the power hitherto absorbed by friction of engine, and using it for car tonnage instead of to propel engine.

Among the many points in the Gould valve that have been demonstrated by experience on stationary engines, we desire to call your attention especially to economy in valve oil. Where this valve has been used, it has shown a decrease of fully 50 per cent, caused by less friction; showing beyond a doubt in my mind, and also fully demonstrated by those that have used the valve, that the same will wear or run longer, thereby showing that the resistance is less, which is bound to demonstrate the use of less oil than any other balance valve now made.

I might say that it has been my privilege to examine on two separate occasions the valves now in use on the Des Moines Union engine No. 4, and though this valve had been in daily use fully five months, day and night, which is equal to ten months' daily use, the wear upon the face of the valve was scarcely noticeable; in fact, the friction upon the rings was so light that even the tool marks were visible to the naked eye, thus showing that the friction is so light that only enough oil need be run through the valves to take care of the cylinder.

Too much stress cannot be laid today upon the economy in coal. The amount of coal consumed by the railway companies of the United States is something appalling, when we take into consideration the visible coal supply. Any movement along this line has always been welcomed and always will be by the railway managers, for the amount of fuel that is now being daily consumed is bound to have its effect sooner or later upon the market value of this essential element of railway operation.

A saving of 2 per cent. in the amount of coal daily consumed would mean millions of dollars to the railways of America. If a saving of 5 per cent. can be effected, it would mean much more. My investigation on this line has convinced me that there is no question but that the Gould valve is bound to be a saving in fuel. I am reliably informed by the users of traction engines, where this valve has been used during the last two years, that they have made a saving of from 18 to 35 per cent.

This, of course, could not as readily be done in railway work, for the railway locomotive of today is considerably in advance of the average stationary or traction engine, but as compared with the use of the present piston or Richardson valve there is no doubt in my mind but that a saving of from 5 to 10 per cent. can be effected, and when you take into consideration the amount of coal that is burned by each railroad engine, this would mean an immense saving on railroad operation. My reasons are based on the fact that the power hitherto used in driving the valve can be utilized in increased efficiency at the drawbar of the engine.

The amount of friction on a piston valve and on a Richardson valve can be readily determined by any engineer by taking hold of the reverse lever while the throttle is open; in other words, in attempting to reverse an engine under full head of steam, though the engineer has one of the strongest leverages at his hand known to mechanics, it is almost impossible to reverse an engine, excepting by an extraordinary and almost impossible effort. You can thus see that the energy developed by the piston is severely taxed in driving the valve, and if this unnecessary friction can be eradicated, the coal that is used to develop that energy can be either saved to the railroad companies or utilized for increased tonnage.

As for increasing the power, as we have stated before, there is no question about the amount of power wasted in driving a valve that is not perfectly balanced, and if that power wasted in driving the valve can be used at the drawbar for increased tonnage, the results of the Gould balance valve in that

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respect will amount to much in railroad operation.

As you are all aware, on the great trunk lines of the country watering stations have been placed farther apart, and increased capacity has been added to all locomotives for the purpose of enabling them to cover greater space between watering stations.

Economy in the use of water enables the engine to cover greater distances between watering stations, which, together with decreased amount of coal consumed, enables better time to be made.

I am satisfied in my own mind, and I say it unhesitatingly, that when the Gould valve is known to the railroad managers of the United States, and its use has been demonstrated by the superintendents of motive power of the different railroads, that this valve will as surely supersede the piston valve as the piston valve superseded the Allen-Richardson and as the Allen-Richardson before that time superseded the common slide valve.

Its simplicity and durability, and the ease with which it can be applied to locomotives, must certainly appeal to every railroad man.

MR. DALLAS—I wish to say that the valve is giving perfect satisfaction, but, as you know, in the switching service the service is so intermittent it is impossible to get an actual line on the fuel consumption. In the matter of using valve oil we started the first of January to keep an accurate account of this particular engine. Prior to that we didn't give it very much attention, as we wanted the engineer to become familiar with the valve. We have run as high as 252 miles to a pint of oil. Usually with that class of engine, seventy-five to eighty miles is considered good. The handling of the valve, the engineer states, is about a hundred per cent. easier than the Richardson valve in the same engine and it is his opinion that the efficiency of the engine is increased two cars. We have made no practical test and I would not say anything affirmatively on that point. I would prefer a test made with that engine with its mate in like service. I believe the construction of the valve is familiar to most all of us as explained by Mr. Gould. The main feature of it is that it is balanced by the cylinder pressure, that about three per cent. of the valve has steam chest pressure, for that reason it is a more perfectly balanced valve than the Richardson or any other valve on a locomotive to my knowledge.

PRESIDENT WENTWORTH—Is Mr. McCarthy, the engineer, as enthusiastic as he was the meeting he was here and talked about the valve?

MR. DALLAS—Yes, I believe he is. I believe he is more so since we prodded him up on the oil and coal question. I believe he has taken a little more interest on these points than before. The valve is working smoothly and nice.

MR. LYNCH—Mr. President and Gentlemen: I have made the piston valve quite a study. The reason I made this valve such a study was the amount of broken frames we had on the engines that had the piston valves; and after going into the matter thoroughly I came to the conclusion that the trouble with the piston valve was that the rings being applied to the piston valve so the valve would rotate through the seat freely, and after the valve had run some short time, the rings would become weak and when the steam was shut off the rings would close on the valve and when the steam was given and the throttle opened inside admission, the steam from the admission would leak by the rings down into the cylinder and it would lock until such a time as there was enough pressure to expand the rings. If you notice in working a piston valve starting at a dead center the train lots of times you pull the throttle wide open and the engine won't move because in the throttle being open the steam has leaked by and you have to open the cylinder cocks, open the throttle, close the cylinder cocks, and let the back pressure escape. I have noticed when new rings would be applied we would have very little trouble starting a train and that is why in starting it we have that back pressure never rode behind a piston valve engine that didn't cause a jerking and [illegible] of the train when starting, that is, [illegible] the rings had been worn slightly. [illegible] ing that it causes a disturbance of the water in the boiler and also a disturbance of the fuel in the firebox. Most piston valve engines when you start out of a station, the fireman has got to be prepared with a good heavy fire to protect the fire from being torn and disturbed, and therefore you have an unnecessary amount of fuel consumed through that defect. The Pennsylvania Railroad Com-

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pany is paying $28,000,000 for fuel. The Illinois Central is paying between seven and ten millions. The Milwaukee road close on to five millions. The Northern Pacific and Great Northern about the same amount. The Great Western about a million and a half to two million dollars. Eleven per cent. of the gross earnings is being paid for fuel on the roads of this country. If the piston valve is the cause of consuming so much fuel, or a part of it, if the slide valve is another factor in burning too much fuel, and this valve here is economical in fuel, I would say this is a good valve. I have made numerous tests of different devices to see if I could not reduce the consumption of fuel. If this valve can do what Mr. Gould claims it can and what Mr. Dallas and Mr. Arnold say, it certainly is a great valve.—March 8, 1907, meeting Iowa Railway Club.

Telegraphone on Canadian Railroads

The telegraphone (combined telegraph and telephone service) has proved so successful in the operation of railways, that according to the Western Electrician both the Canadian Pacific and Canadian Northern railroads have installed systems. The principal purpose is to minimize the time spent in securing help after an accident has occurred. However, the Canadian Northern finds other uses for it and already has its wire between Winnipeg and Brandon connected with one of the Brandon newspapers so that at night news is transmitted between the two cities by this line, saving the cost of a night operator at Brandon, as the ordinary commercial business does not warrant such an expense. It is the intention of this company to install a number of similar lines in Manitoba, where the circuits will not be more than 150 miles. Where the line exceeds this, a metallic circuit will be needed, though in the former case the single Morse circuit is used. The great use of the device is at the time of an accident on the road, as on the western lines it is always possible this may happen fifteen miles from the nearest station in telegraphic communication with a working crew. This distance would in all probability have to be walked; meanwhile the track would be blocked. When the instruments are installed along the system and an accident happens the conductor takes the instrument, gets connection with the wires and calls up the nearest station. A jointed conducting pole connected to the instrument, is arranged to be hooked over the dispatcher wires along the track. The other wire from the instrument is fitted with a small clamp, which may be screwed tightly to the rail, completing the circuit. The machine is arranged with two jacks, so that if the conductor wishes to talk to the station west of him he inserts a plug in one jack or to east in the other. In this way he can get in almost immediate communication with a station, call help and receive orders from the dispatcher.

One other system of this kind is in operation in Western Canada at the present time, that on the main line of the Canadian Pacific Railroad, between Fort William and Winnipeg, but the company is making preparations to equip the rest of its main line and a number of its branch roads.—Telegraph Age.

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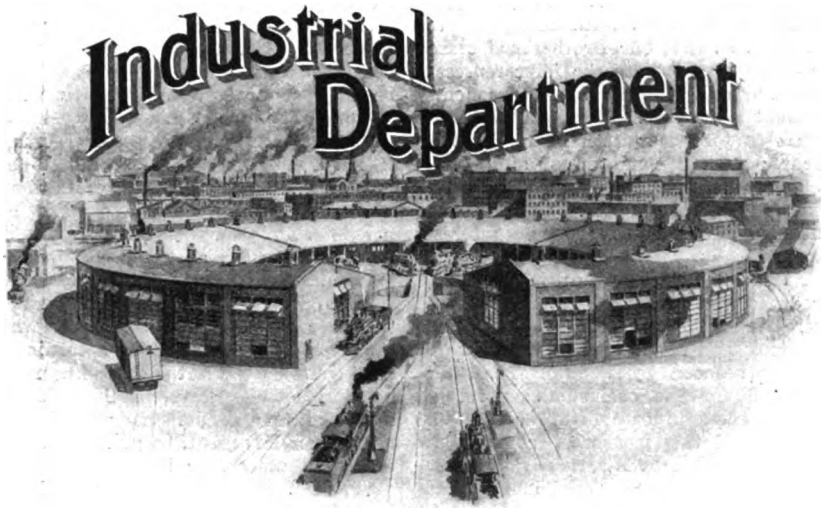

DISCUSSION OF CURRENT TOPICS

Canadian Legislative Board.

A legislative board has been organized in Canada representing fifty-nine lodges of the B. of L. F. and E.—our Brotherhood being the first of the railway labor organizations to form a board representing the entire membership of the Dominion.

A few words regarding the character of Canadian governments and their methods of conducting their affairs may not be out of place here.

The Dominion Parliament consists of a senate and house of commons, the cabinet embracing the following departments: Justice, Customs, Inland Revenue, Finance, Public Works, Postoffice, Railways and Canals, Labor, Militia and Defense, Interior, Geological Survey, Indian Affairs, Public Printing and Stationery, Secretary of State of Canada, Marine and Fisheries, Agriculture, Trade and Commerce and the General Auditing Department.

The Dominion is divided into nine provinces, each having a legislative assembly and such other governmental departments as are deemed necessary to meet its requirements. While the Dominion Parliament has power to enact laws throughout and affecting the entire Dominion, these provincial legislative assemblies have no jurisdiction outside of the province in which they are located, and cannot enact laws to conflict with those passed by the Dominion Parliament. All the principal railroads are working under Dominion charters and the provincial governments consequently have no power to enact laws affecting them.

A few years ago a board of railway commissioners was appointed by the government and a number of inspectors named to investigate the causes and effects of accidents, and to make inquiries into matters generally pertaining to railway operation, such as the condition of rolling stock, roadbed, etc. Considerable power and authority has been given this board, and railroad employes have already had some experience with it. Its members have shown themselves to be gentlemen who are fair and reasonable, and who are desirous of knowing the truth and placing the blame for accidents where it rightly belongs. The work of this board is destined to bring about much more desirable conditions for railroad wage earners than have heretofore existed in the Dominion.

For several years the five railroad labor organizations, viz., the B. of L. E., O. R. C., B. R. T., O. R. T., and the B. of L. F. and E., were represented jointly before the Dominion House of

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Parliament at Ottawa, but a few years ago a condition arose regarding the joint representation so unsatisfactory to the B. of L. F. that our Brotherhood ceased to become a party to the joint representation arrangement and was consequently without a representative to look after its interests for several sessions of parliament. Such a condition of affairs was found to be unsafe, as frequently antagonistic bills were introduced and in some instances laws hostile to our interests enacted.

Amongst the prominent measures introduced at the last session of the house were the McMullin Bill F and the Lemieux Bill No. 36; the former, which was introduced by Senator McMullin, provided for the exclusion of foreign labor leaders in case of trouble or dispute. Had this measure become a law it would have proven seriously detrimental to all the international labor organizations in Canada; but, fortunately, the majority of the members of the senate were fair-minded enough to listen to the pleas of labor representatives, and its further consideration was postponed for six months. It remains to be seen whether or not it will again be brought forth. The latter of the two measures, Bill No. 36, was introduced by the Hon. Rodolphe Lemieux, minister of labor, and notwithstanding that it was strenuously opposed by all the railroad labor organizations, except the Maintenance of Way employes, it became a law and is now cited as "The Industrial Disputes Investigation Act, 1907," It provides for compulsory investigation by a board appointed by the parties to the dispute or by the government.

While the finding of the board acting under the authority of the above bill is not necessarily binding, and while the sentiment of railroad men generally is to invite court investigation, yet when investigation becomes compulsory, as is the case under the operation of this law, the delay and consequent expense necessarily incurred pending such investigation after negotiations have failed, will, without question, work a hardship on organizations in Canada identified with the operation of public utilities.

The following is a quotation from the Dominion Railway Act 415:

"Every officer or servant of any company and every person employed by the company who wilfully or negligently violates any by-law, rule or regulation of the company or its directors lawfully made such in force, or any order or notice of the minister, or of the board, or of an inspecting engineer, of which a copy has been delivered to him, or which has been posted up or open to his inspection in some place where his work or his duties, or any of them, are to be performed, if such violation causes injury to any person or to any property, or, although no actual injury occurs, exposes any person or any property to the risk of such injury, or renders such risk greater than it would have been without such violation, is guilty of an offense, and shall, in the discretion of the court, before which the conviction is had, and according as such court considers the offense proved to be more or less grave, or the injury or risk of injury to person or property to be more or less great, be punished by fine or imprisonment, or both.

"2. No such fine shall exceed four hundred dollars, and no such imprisonment shall exceed the term of five years.

"3. The company may, in all cases under this section, pay the amount of the penalty and costs and recover the same from the offender, or deduct it from his salary or pay." 3E. VII, C. 58, S. 296.

Under the operation of the provisions of this law, several railroad employes have been arrested and placed behind prison bars—notably the case of Conductor Jos. Thompson, of Guelph, Ontario, who was sentenced to the penitentiary for three years on being found guilty of the charge of responsibility for a collision which occurred on the Grand Trunk at Gourock several months ago and in which three lives were lost. Conductor Thompson was in charge of a fruit special which should have taken siding for a passenger train, but which owing—it is alleged—to his failure to give the engineer his orders held the main track, as a consequence of which the collision resulted.

Thus it can very readily be seen how necessary it is that an active legislative board be maintained at the seat of the Dominion government at all times to guard the interests of the members.

The officers of the Canadian Legislative Board are as follows: Bros. Geo. K. Wark, Lodge 262, chairman and legislative representative; L. E. W. Bailey, Lodge 521, secretary-treasurer. Grand executive board—George E. Crowhurst, Lodge 67, chairman; F. R. Mitchell,

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OFFICERS AND MEMBERS OF CANADIAN LEGISLATIVE BOARD, AND THIRD VICE GRAND MASTER E. A. BALL

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Lodge 341, secretary, and T. B. Skelly, Lodge 81, treasurer. Members—Bros. G. J. Graham, Lodge 38; M. T. Rowden, Lodge 127; O. E. Harrison, Lodge 134; R. H. Phinney, Lodge 171; Geo. Fraser, Lodge 172; T. F. Carey, Lodge 233; Thos. Gravelle, Lodge 234; Geo. Kidd, Lodge 305; F. W. Henderson, Lodge 357; W. R. McAdam, Lodge 521; W. R. King, Lodge 476; Frank Diprose, Lodge 479; Alex Devine, Lodge 469; T. M. Spooner, Lodge 593; H. Hague, Lodge 596; Jas. H. Baird, Lodge 597; T. L. Bloomer, Lodge 631; F. C. Butters, Lodge 648.

In the case of Conductor Thompson, above referred to, the address delivered by the judge (Mr. Justice Riddell) in sentencing him is so full of the judicial pomposity and bombast of the thirteenth and fourteenth centuries that as a unique utterance suggestive of a vision of the far distant past, it is so interesting that we reproduce it herewith in full. Were the defendant a hardened criminal, universally recognized as a menace to society and deliberately and premeditatedly guilty of every crime on the calendar, this grandiloquent jurist could not have "spread" himself with more "preponderant" elaborateness or detailed effusion. In the face of the tendency which such an address indicates the action of the Canadian lodges in forming upon a solid rock basis a national legislative board for the protection and promotion of the legislative interests of their members is certainly most commendable. The address of Mr. Justice Riddell is as follows:

The Judge's Address.

"Prisoner at the bar, you have been found guilty of a very serious offense, and it now becomes my painful duty to direct punishment for this offense. The duty is no less difficult than painful, since so many matters are to receive consideration.

"The crown, in its clemency and with the full approbation of the court, determined not to put you upon trial for the more serious crime of manslaughter, for which a true bill was found against you at a previous sitting of the court of assize, but to proceed against you upon the minor, though grave, charge upon which you have been convicted.

"Had the charge of manslaughter been pressed," said his lordship, "it must, upon the evidence adduced at the present trial, have succeeded. The maximum punishment for manslaughter is imprisonment for life, the punishment for the crime of which you have been convicted is limited to five years, and a fine of $400. I must then consider if there are any circumstances in this case which would justify me in reducing the punishment below what the law has provided as a maximum; and in doing so, I must bear in mind the various objects, with which in view the law has affixed punishment to a crime. They are the reformation of the criminal, and the prevention of similar offenses by him and others. The law does not look upon a punishment as being in revenge for the transgression of its commands, and of course this is a prosecution by and at the sole instance of the crown with which your employer had nothing to do.

Ingratitude to the Crown.

"As to the first, I was shocked to see that instead of the leniency of the crown being regarded with gratitude, it was made a ground of complaint as though you were being persecuted, and, instead of admitting the violation of the rules laid down with the approval of the governor-general-in-council for your guidance, a violation which was proved by yourself more than once, you attempted to bolster up a defense by statements which nobody believed; and you apparently hoped that the jury might, through prejudice against the railway company, be false to their oaths and to their duty to their country. Your defense was brilliantly conducted along that line, and it might have succeeded with a less conscientious and intelligent jury. This is not the first time that I have been proud of my fellow countrymen in the jury box. The jury in your case listened to the call of duty alone, and disregarding the appeal to sympathy, brushed aside this defense, which was no defense in law or in morals. They thereby showed themselves worthy custodians of the honor of our common land.

No Sign of Repentance.

"I am unable to see the slightest sign of repentance on your part. Instead of repentance for your own crime you seek to cast all the blame upon others. For your own sake, then, I must cause some substantial punishment to be inflicted.

"But there is also to be considered the prevention of such offenses—crimes—in the future. It is appalling to consider

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the number of persons whose lives are sacrificed every year on the lines of railway. I do not mean those who are slain upon the level crossing, though the list of these is terrible enough, but those upon the car or brakeman, sent to death or life-long suffering through the criminal neglect of those whose duty it is to protect them. More men are killed in Canada upon the railways every year through preventable causes, by reason of sheer negligence, than Canada lost in the Boer war. Day after day we hear of collision, pitch-in, starting without consideration as whether there may not be some poor fellow in a place of danger. Day after day the butchery is going on and young and sturdy Canadians are lost to their country, killed or maimed.

Slaughter Due to Sheer Neglect.

"If this were the fault of the rules or regulations of the railway companies, then terrible were the guilt of those responsible for such rules and regulations, president, director, general manager, or whoever they may be. Much of the slaughter, however, is due to the sheer neglect, downright and inexcusable carelessness, of those who are entrusted with the carrying out of these rules and regulations; and if you and your fellow trainmen had used even ordinary care, the three men now lying in the grave as the result of your act might now be happy and useful citizens. Every legitimate means should be used to stop, as far as possible, the continuance of the present insufferable condition of affairs. It has been said that this is due in large measure to a widespread lack of discipline. If so, this must be improved.

"Looking now to the facts in your case, what do we find?

"You were a conductor of very long experience, a capable man in every sense of the word so far as it indicates mental and physical power. You were on a choice route, which realized for you a rate at which conductors on freight trains are paid (your remuneration was about $40 per week). Your hours were long—too long—though you had two clear days in the week to rest, the hours of the other five were nineteen to twenty per day, and sometimes more.

Money Rather Than Rest.

"You knew that you had the right, under the rules, to a rest of eight hours, once you had worked sixteen hours; and there can be no doubt that you continued on the route because of its remunerative character. You knew that if you desired you would be put upon a run involving fewer hours of continuous work; but that if you did so, your pay would be less. You stoutly asserted that you had plenty of sleep, that you, by many years' practice, had trained yourself to be content with a few hours per day, and no responsible officer of the company ever heard any complaint from you that you wanted your hours of work reduced. You were permitted to continue on the long route.

"To my mind, the persons who ever permitted you to work nineteen to twenty hours per day, day after day, five days in the week, were guilty of a gross wrong; the persons who made rules and regulations under which this was possible, are themselves almost or quite as guilty, morally, perhaps legally, as yourself of the death of these three poor victims. And I shall cause to be sent to the crown authorities a copy of the proceedings at this trial, with a recommendation that all proper investigations be made and that the persons responsible, no matter what their position may be, be proceeded against, so far as the criminal law permits. It were wrong to punish an employe and allow the employer to go scot free, where both are at fault.

Negligence Not Excused.

"But, however that may be, the defect, if there is one, in the rules under which you were working, does not excuse you for the gross negligence you displayed. Your negligence began before you fell asleep, if you did fall asleep. At Harrisburg you received orders to run to Guelph Junction special. You knew that a train carrying passengers was coming in the opposite direction, and that you must keep out of her way. At Harrisburg you told the engineer that you would be able to make Guelph Junction. Being delayed, you knew before leaving Harrisburg that you must meet this train before your arrival at Guelph Junction. You did not change your direction—if it could be called a direction—given to the engineer; and when you left Harrisburg you knew what to fear. True, the engineer knew, or should have known this also, but you told him nothing about it.

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Didn't Believe His Story.

"The jury did not believe, and I do not believe, your story told for the first time at the trial inconsistent with your signed statement at a previous time, that you indicated to the engineer that you would not do more than reach Hespeler. You left Harrisburg without giving any orders to the engineer to take the siding at any station on the way, and without any understanding with him as to what, if any, station he should stop at, to meet the coming train.

"Your train stopped at Galt, the engineer took water, you gave the signal to go forward without saying a word to the engineer that he must take the siding at Hespeler, and without arranging that he should do so. You caused the train to go on, knowing that unless the engineer did put in at Hespeler, a collision was inevitable, and the lives of many passengers and employes would be endangered. You were wide awake then; and your conduct there and then was simply without excuse. The engineer upon whom you try to throw the blame, knew, or might have known, as well as you the danger, but his negligence, if he was negligent—and that has yet to be tried—does not in the least relieve you.

Fell Asleep in the Van.

"Then you are going forward with a full knowledge of the danger, when you sit down in your van, and, as you say, fell asleep. Had you remained awake you would, or might have, prevented the effect of your previous conduct—that is your plea—but you say you fell asleep. The sentry in front of an army set there to watch over the safety of his comrades is in no more responsible a position than you, who were placed in charge that you might guard the safety of passengers and the two train crews. If the sentry sleep, no excuse is accepted. The penalty is death. What is to be said of you? You have caused the death of three men, and your only excuse is that you fell asleep, and so were not able to see to it that the engineer did put in at Hespeler. According to your story, you were awakened from sleep by a crash which told of death to your fellow-workmen. Providentially no passenger was injured, but that was due to no care of yours.

Request of Fellow-Employes.

"I have reserved judgment thus long that I might carefully consider what the penalty is to be. I invited representations from all quarters, and I have been waited upon by several of your former fellow-employes and by those on behalf of organizations of men in like employment. Some have advanced an argument which is, in effect, that accidents will happen, that men will be careless, and that no punishment, even the most severe, inflicted upon you would prevent the like recurring again. That argument, to my mind, defeats its own object. The railways must, perhaps, by inevitable accident, produce casualties; dangerous they are, dangerous they must, to some extent, continue to be; but it is the duty of all to reduce to the very lowest the fearful toll of life and limb exacted. And I am of the opinion that if men in charge of dangerous engines are taught that if negligence on their part result in death or injury, punishment must inexorably follow, we shall cease to hear of so many horrors which could, and therefore should, have been prevented. The people must be protected. Men doing their duty in reliance upon their safety being secured by those placed on guard must be protected, and the sentinel must recognize his responsibility.

"I have been told that I may exact a fine. I refuse even to consider the exaction of a fine or to do anything which could even suggest that the stain of the blood that is on your hands can be washed out with money. And this is no prosecution with which the railway company has anything to do, so that I should consider their loss in even the slightest way. You were prosecuted by the crown for the protection of life.

Directs His Imprisonment.

"I shall direct your imprisonment. The length of that imprisonment will depend to a certain extent upon your own conduct. The term of imprisonment could in no case have been merely nominal—it would be intolerable if men in your position should think such negligence, resulting as this did, a mere trifle. I have again and again considered the facts, and have given much thought to the representations made to me, as well as to the recommendation of many of the jury. It is hard to see any circumstances of mitigation, to discover anything which justifies me in reducing the punishment below the term mentioned in the act, but I am inclined to be merciful. I remember that you have not be-

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fore been guilty (so far as appears) of any similar offense, and I may be wrong, but I think it sufficient, both as regards yourself and as a warning to others, to inflict the punishment I am about to award. I can only trust that it may have some effect in checking the carnage which is horrifying our country at large.

"The sentence of the court is that you be imprisoned in the provincial penitentiary for the term of three years, and that you be then discharged."

* * *

The Passing of the Typothetae.

Two years ago at Niagara Falls, the United Typothetae of America—consisting of the employing printers of the United States and Canada—at that time a large and powerful organization, held its annual convention. President James M. Lynch, of the typographical union, sent a communication to the gathering, requesting that he be permitted to appear before it in convention assembled and submit the demands of his union for an eight-hour workday and an increase in wages. This courtesy that body imperiously denied him.

In the fall of the same year the strike of the union printers began, with the result that their wages have been increased and eight hours established as the standard work day for men of that occupation. But there is another sequel to the struggle—the disruption of the typothetae—which is best described in an official circular issued by President Lynch, which is as follows:

Indianapolis, Ind., Sept. 12, 1907.

To the Membership of the International Typographical Union:

The United Typothetae of America was in convention in Niagara Falls, Canada, on the 10th and 11th of this month.

I am in a position to state positively that not more than thirty delegates were in attendance upon this convention.

The sessions covered only two days, approximately a total of only twelve hours.

President Berry, of the International Printing Pressmen and Assistants' Union, appeared before the convention and requested a modification of the contract between the International Printing Pressmen and Assistants' Union and the United Typothetae of America on the closed-shop question. His request was turned down by the remnant of the typothetae. I understand that President Berry will recommend to his organization, on a referendum proposition, that immediate demand be made for the eight-hour day and closed shop.

My information is also to the effect that a more disconsolate, disgusted and utterly routed relic of a once great organization never met in convention than the United Typothetae of America in its Niagara Falls session this week.

Claim was made in the newspapers in an inconspicuous item that 150 delegates were in attendance at the typothetae convention. But I reiterate, and I am prepared with evidence to sustain the statement that not more than thirty delegates were in attendance, and that the convention was an absolute, abject failure.

If any further evidence were needed that we have won the greatest industrial battle of modern times, that beyond peradventure we have established the eight-hour day, that we have contributed most materially to the universal shorter workday, it was furnished by the pitiful exhibition of the United Typothetae of America in annual session in Niagara Falls this week.

* * *

A National Agency.

Secretary Strauss of the Department of Commerce and Labor has announced his purpose of establishing "A National Agency," with Mr. T. V. Powderly—formerly Grand Master Workman of the Knights of Labor, and at present head of the Information Bureau of the Department of Commerce and Labor—in charge.

In announcing the establishment of the new department Secretary Strauss is quoted as having said: "Here is where capital and labor may join hands to their mutual benefit. We will tell just where labor is needed; what classes are in demand and what wages are offered. We will also inform the people where labor is to be obtained, the classes and prices."

The advantages of such a bureau, conducted under the auspices of the national government, will be great indeed. It is, of course, unnecessary to say that there is no possible danger of same being used as a medium in furnishing strike breakers to take the places of strikers vacated during industrial disturbances.

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The establishment of this bureau as a department of the government is certainly a step in the right direction. Mr. Strauss, who is to be highly commended for his action in the matter, is fully entitled to the hearty co-operation of wage-earners and well-meaning employers in making the National Employment Agency a grand success.

Scab Protectors Leave for Other Fields of Activity.

Press dispatches state that after being on strike for nineteen days the meat wagon drivers, employed by the Wholesale Butchers' Employers' Association of New York returned to work September 10th. The terms on which they go back are a sixty-five-hour working week, the wages they received before the strike, and no discrimination for or against union or nonunion men, no competent man to be discharged to make room for strikers.

A number of special policemen who were detailed to the strike have left the city for New Orleans, where they will be detailed on a strike of freight handlers.

Concerted Movement of Lines East of Chicago.

The very important announcement is made that a meeting of the general chairmen of the lines east of Chicago will be held at Buffalo, N. Y., on October 15, 1907, for the purpose of entering into a concerted movement with a view to the improvement of conditions on those lines. It is hoped that every chairman entitled to representation in the gathering will be present, as the meeting is of the utmost importance to the membership of the lines interested.

Facts Worth Knowing.

To prospective purchasers of pianos, organs or other musical instruments, the following facts, gleaned from the officials of the Piano, Organ and Musical Instrument Workers' International Union of America, may prove of great value:

1. All union-made pianos, organs, and musical instruments bear the label of the Piano, Organ and Musical Instrument Workers' International Union.

2. Dealers representing instruments minus the union label as union-made are seeking to deceive.

3. Any responsible dealer, no matter where located, can secure union-label instruments.

4. The label of the Piano, Organ and Musical Instrument Workers' Union is granted free of charge to all manufacturers operating union factories.

5. Union label instruments are guaranteed by the organization to be superior to those not bearing the label.

The officials assure us that any additional information desired will be cheerfully furnished upon application. Address 40 Seminary avenue, Chicago, Ill.

Union Printers' Convention—Old-Age Pension Proposed.

The International Typographical Union held its fifty-third annual convention August 12th to 17th at Hot Springs, Ark., and as characteristic of the organization it was a harmonious and progressive gathering.

The report of the Home board, as well as that of the superintendent and Doctor Christopher, is extremely interesting. It clearly demonstrates the possibility of homes being maintained by labor organizations, wherein their aged and disabled members may be cared for. During the past year there were 103 petitions for admission filed with the board, fourteen of which were disapproved, one was withdrawn and two were canceled by the deaths of the applicants—making a total of eighty-six petitions approved.

Among the important measures to be referred to the membership for referendum vote is a proposition to relinquish jurisdiction over the newspaper writers, to raise the bond of the general secretary-treasurer from $20,000 to $50,000 and to increase the salaries of both the president and the general secretary. It is also proposd to increase the burial benefit of the I. T. U. from $70 to $75.

There is also on foot a plan to establish an old-age pension system for the membership of the union, which embraces the following: Age of eligible applicants, 60 years; continuous membership in the International Typographical Union, twenty years; amount of weekly pension, $4; source of revenue for fund, one-half of 1 per cent. weekly assessment on earnings of membership. Qualifications of applicants are based on twenty years'

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continuous membership for members 60 years of age, who earn less than $4 per week in any one week, and who have no other income or means of support. It is further provided that the old age pension fund shall not be established—even though receiving favorable consideration by the referendum—until such time as the assessment now in effect has been abolished.

The typographical union has demonstrated what may be accomplished in labor struggles by the sound principle of a good defense fund and fighting money with money, in that it has won for its members the practically universal eight-hour working day, those who were working under the favorable conditions each contributing their quota to those engaged in the fight, and bearing their share of the burden in the battle for the shorter working day. That their fight was successful is demonstrated by the fact that nearly the entire membership is now working but eight hours in each twenty-four, thus giving the wage worker an opportunity to study the problems of life without depriving himself of necessary rest and sleep. The union is to be congratulated upon its wonderful achievements in the labor world, and particularly on what it has accomplished in recent years.

A Well-Deserved Honor.

Dispatches from Austin, Texas, announce the appointment of Brother Joseph S. Myers, of Lodge 382, to the position of state librarian, with headquarters at Austin.

Bro. Myers has for several years been secretary of the Federated Legislative Board of the State of Texas, and has also held the office of chairman of the legislative board of the B. of L. F. and E., and since his election to that office has done splendid work in the interests of the wage earners of his State in general and of railroad employes in particular. Brother Myers, who has been ever active and untiring in his duties at the capitol of the "Lone Star State," is well and favorably known throughout the length and breadth of that vast commonwealth. Through judicious study and edifying example he has forged to the front, having won the confidence of all with whom he came in contact. He richly deserves the honor that has been conferred upon him. He has always been an ardent advocate of the principles of organized labor, and has stood firmly for a "square deal" for the wage-working classes of the State of Texas. The governor of Texas is to be congratulated on the excellent judgment he has displayed in appointing Brother Myers to the responsible position he now holds. The Magazine extends its congratulations to Brother Myers, with the sincere wish that his merit and conscientious devotion to duty may receive the practical recognition of advancement to still higher places of honor and responsibility.

Sickness of Eugene V. Debs.

It is with deep regret we announce that former Grand Secretary and Treasurer Eugene V. Debs has been for a month confined to his room with a severe cold contracted while filling Chautauqua engagements. Although somewhat improved, he has not, up to the time of going to press, been able to resume his usual occupations, but it is hoped that another two or three weeks will find him as well as ever again.

The following poem to him by James Whitcomb Riley, America's great dialect poet, is vividly expressive of the cheering influence flowers have upon the sick, but there are no flowers that could be more cheering to "'Gene" in his sickness than the consciousness of the existence of that sentiment towards him which prompted the composing of these lines and which will spring responsive from thousands of hearts when they are read:

Them Flowers.

(To my good friend, Eugene V. Debs.)

Take a feller 'ats sick, and laid up on the shelf,
All shaky, and ga'nted and pore,
And all so knocked out he can't handle hisself
With a stiff upper-lip any more;
Shet him up all alone in the gloom of a room,
As dark as the tomb, and as grim,
And then take and send him some roses in bloom,
And you can have fun out o' him!

You've seed him, 'fore now, when his liver was sound,
And his appetite notched like a saw,
A chaffin' you, mebby, for romancin' round
With a big posey bunch in yer paw:

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But you ketch him, say, when his health is away,
And he's flat on his back in distress,
And then you can trot out your little bokay
And not be insulted, I guess!

You see, it's like this, what his weaknesses is,
Them flowers make him think of the days
Of his innocent youth, and that mother o' his,
And the roses she used to raise;
So here all alone with the roses you send,
Bein' sick and all trimbly and faint;
My eyes is—my eyes is—my eyes is—old friend,
Is a—leakin'—I'm blamed ef they ain't!

—James Whitcomb Riley.

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The Initiative and Referendum.

The National Federation of People's Rule has for its objects: First, "To help extend the peoples' rule in place of machine rule and thereby put an end to political corruption and open the way to political and legislative reforms;" and, second, "to help apply the direct vote system as rapidly as it is established."

The federation is doing excellent work in support of the "Initiative and Referendum." Through its efforts, in co-operation with the American Federation of Labor, there were secured pledges to the number of one hundred and ten from the present members of Congress to support the immediate establishment of a direct vote system for national questions.

In referring to a declaration made by Hon. Wm. H. Taft, secretary of war, in one of his recent speeches, to the effect that our present system of government is "representative government and that it has served us well for one hundred and thirty years," the federation, through its president, Mr. George H. Shibley, replies as follows:

We submit that the existing system in this country is not representative government, but machine rule; and that it has not existed for 130 years. We claim:

1. That the system of government established in this country in 1776 was the People's Rule; namely, a system in which the voters possessed an option to vote direct on public questions, the will of the majority being an instruction to representatives, which they carefully observed. And representatives in the legislatures were pledged by districts instead of by machine-rule state and national conventions.

2. That through this People's Rule system the War of the Revolution was successfully fought.

3. That when the constitutional convention of 1787 submitted to the several states the system in which the voters were to be shorn of the power to instruct representatives the proposal was about to be rejected when some of the Federalist leaders agreed that if the state conventions would adopt the proposed system of government they, the Federalists, would co-operate in the first congress to submit constitutional amendments for a bill of rights and other limitations on the Federal government. This agreement was carried out, resulting in amendments I to X inclusive, the IXth and Xth of which are as follows:

"The enumeration in the constitution of certain rights shall not be construed to deny or disparage others retained by the people."

"The powers not delegated to the United States by the constitution nor prohibited by it to the states, are reserved to the states respectively, or to the people."

(The constitution prescribes the powers of the general government and limits its authority to such specifications, while it simply prohibits the various states from exercising certain powers, such as the issuance of letters of marque and reprisal, the coinage of money, the declaration of war, etc., and leaves them free to exercise the functions of sovereign government in all other matters.—Editor.)

Among the rights and powers reserved to the people was that of instructing representatives, as is evidenced by debates in the first congress, also by the continued instruction of representatives and their obedience, except that most of the Federalists refused.

4. Our next claim is that the Federalist party overthrew the People's Rule system of government in 1798. That year it gained control of the national house in addition to its control in the senate and White House, and ruled against the people's will. It passed the iniquitous and unconstitutional alien and sedition laws and other unconstitutional acts. This caused such a revolution of feeling that at the next election the peo-

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ple restored their sovereignty. They elected men who were pledged to majority rule and the Federal constitution.

5. The restored People's Rule was so successful that the Federalist party died, and thenceforth every one seeking public office acknowledged the justice of majority rule.

6. During the People's Rule era there was remarkable progress. Primogeniture was abolished at the outset, thereby resulting in equal rights within the family. Entails were carefully restricted, thus giving in successive generations a greater equality between individuals. Church and state were separated, thus restoring equal rights between the churches and establishing religious freedom. Public schools were installed, thereby promoting the welfare of the state by educating all its citizens. In short, there was applied the doctrine of equal rights to all, special privileges to none, resulting in the greatest progress that the world has ever witnessed. By the year 1800 property qualifications for voting began to be discarded and during the first quarter of the century the system of manhood suffrage within the white race was quite generally completed. Along with this general advance there perished the party that advocated the rule of the few. When De Tocqueville visited America about 1830, his investigations enabled him to say:

"The democratic principle has gained so much strength by time, by events, and by legislation, as to have become not only predominant, but all-powerful. Men are seen on a greater equality of fortunes and intellect, or, in other words, more equal in their strength than in any other country of the world, or in any age of which history has preserved the remembrance. . . . Americans are the first nation who have been allowed by their circumstances, their origin, their intelligence, and especially by their morals, to establish and maintain the sovereignty of the people." (Vol. I, pp. 67-68.)

7. After the disintegration of the Federalist party there was but one great organization in the field, the Republican party, and the system whereby candidates for state and national offices were nominated underwent a vital change. During 1823 to 1832 state and national conventions were established. At first this was an improvement in the People's Rule system and the voters ceased to instruct the elected representatives.

8. But soon the state and national committees began to alter the convention system. In place of delegates elected direct, or nearly so, it was provided that delegates should be elected by delegates and that these should elect other delegates, the aim being to terminate the People's Rule. By 1844 the machine rule system was so fully established that John C. Calhoun, a leading presidential candidate within the Democratic party, withdrew, and in an address exposed it. In conclusion he said:

"I hold it impossible to form a scheme more perfectly calculated to annihilate the control of the people over the presidential election and vest it in those who make politics a trade, and who live, or expect to live, on the government."—(Benton's Thirty Years' View, Vol. II, p. 596.)

When the Democratic national convention of 1844 assembled, a majority of the delegates were pledged to Van Buren, the former Democratic President, but he was not nominated. Polk was nominated, whom the people scarcely knew, says Benton, in discussing this (and political conventions generally): "These assemblages now (1853) perpetuate themselves, through a committee of their own, ramified into each state, sitting permanently, and working incessantly to govern the election that is to come, after having governed the one that is past."—(Thirty Years' View, Vol. II, p. 595.)

9. Under this machine rule system the Mexican War was brought on, followed by the other excesses of the slave power, in which there were compromises by the Whig leaders which quickly killed their party.

10. The new party—the party opposed to the spread of chattel slavery and which championed the settlement of issues by majority rule—won the election and the few who were in power in the South seceded. All would have been different under majority rule. The great Civil War was a direct result of the people's loss of self-government.

11. After President Lincoln's assassination and death the machine rule system was continued.

12. Gradually our people have learned how to restore their sovereignty. The movement for the optional direct-vote system for public questions is far advanced, as is pointed out in an earlier paragraph. The movement is far along or is completed in twenty-nine states,

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while nationally more than one-fourth the members of the House are pledged to vote for a Federal statute for the immediate establishment of a national system of advisory initiative and advisory referendum, and have agreed to obey instructions from their constituents when given by referendum vote.

13. This People's Rule movement is non-partisan. It is the systematic questioning of the nominees of both the great parties, followed by the publication of replies.

14. The situation today is that the people in the Republican states of Oregon, Montana, South Dakota, North Dakota, Ohio, Maine and Delaware have tasted the benefits of self-government and will not turn back. Along with all this is a mighty growth of the non-partisan movement for majority rule. Every candidate who is to come before the primaries or local conventions will be questioned, and his reply will be published to the voters, after which the nominees will all be questioned. For the first time since the Declaration of Independence the people's right to self-government is a live national issue.

The statements of fact in these fourteen paragraphs are indisputable.

Necessarily these facts square with other historical facts. For example, they explain the presence of swollen fortunes. The gigantic centralization of wealth is noted by you, Mr. Taft, and in another place you claim that the existing system of government has "served us well."

How is it that since De Tocqueville noted the wonderful equality of fortune in America, which had become more and more equal, the tendency has been reversed? The explanation is the change to the rule of the few, pointed out in paragraphs eight to eleven.

You say "If it is difficult for the people to use proper judgment in the concrete question of the personality of the representatives they are to select to carry on their national government, how much more difficult for them to give sufficient attention to the settlement of the many questions of policy and procedure in complicated statutes which the people have always been willing to leave to the decision of their representatives, skilled in the science of legislation, whose general views on the main political issues of the day are well understood. Think of the possibility of securing a vote of fourteen million of electors on the four thousand items of a tariff bill. The opportunity to retire a representative who fails to be truly representative is all that the people wish and need to enforce their will."

Our answer is that if a majority of the voters desire to veto a proposed tariff law they should possess that right. Unquestionably if a tariff bill should be vetoed the revised bill when passed would more surely promote the public welfare. The existing and long-continued evils in our tariff and railroad systems completely demonstrate that it is not enough that we, the people, shall "possess the opportunity to retire a representative who fails to be truly representative." We have only a choice between party machines. If what you state were true, there would exist none of the crying evils which you yourself have described. The people most certainly wish for more than a choice between the rule of one or the other of the party machines, and it is our belief that at the 1908 election more than a majority of the voters will so register their will.

* * *

I. T. U. Convention Resolution.

The following resolution was adopted at the fifty-third convention of the International Typographical Union, recently held at Hot Springs, Ark.:

Whereas, The Los Angeles Times, having secured the unlimited financial backing of the American Manufacturers' Association, and other kindred organizations of capital, is today not only the leading exponent of the so-called "open shop," but is the most unfair, unscrupulous and malignant enemy of organized labor in America, and

Whereas, The Times has succeeded in practically disrupting many of the unions of Los Angeles and, unless strenuously opposed, will eventually make that city thoroughly non-union, thereby creating a breeding place for strikebreakers of all crafts and trades, and

Whereas, If unionism is crushed in Los Angeles it will be but a short time before the same methods are applied to other cities, and

Whereas, The International Typographical Union, having spent more than fifty thousand dollars in an effort to unionize the Times, believes the struggle in Los Angeles has become national in its scope, vitally affecting all organized

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labor, and should therefore be financed and prosecuted by the great American labor movement through its recognized head, the American Federation of Labor, and

Whereas, We believe that if this course is pursued it will mean not only the unionizing of the Los Angeles Times but the winning of a victory that will be of incalculable benefit to the cause of unionism; therefore

Resolved, That the Executive Council be instructed to prepare resolutions to be presented to the next convention of the American Federation of Labor to the effect that a per capita tax of one cent per month be levied on all members of the Federation, the money raised thereby to be expended by a representative appointed by, and under the immediate supervision of, the president of the American Federation of Labor; and be it further

Resolved, That the Executive Council be instructed to appoint one or more representatives to attend the conventions of national and international organizations and endeavor to get similar resolutions adopted and in every way to further this movement.—*Resolutions presented by Los Angeles Delegates to I. T. U. Convention.*

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Strikes and Lockouts in the United States, 1881 to 1905.

The Department of Commerce and Labor, Bureau of Labor, 1907, in a bulletin recently issued gives the following interesting statistical information on labor conditions in the United States during the years 1881 to 1905:

The industries of the United States suffered less from strikes during the year 1905 than in any year since 1892, if the number of employes thrown out of work by strikes and the duration of the strikes be taken as a measure. In that year 221,686 employes were thrown out of work by 2,077 strikes undertaken by 176,337 strikers in 8,292 establishments, and lasting an average of 23.1 days in each establishment involved.

These favorable industrial conditions as regards strikes during 1905 were apparently exceptional, and can not be assumed to indicate any lasting tendency toward industrial peace, for the preceding period of six years (1899 to 1904) was a period of extraordinary industrial strife, and the number of employes thrown out of work by strikes in each of the four years (1901 to 1904) exceeded the number thrown out of work in any year on record save 1894.

The year 1894 stands out in the history of the country as the year most notable for the great number of workers thrown out of work by strikes, over 660,000 employes being thrown out of work by 1,349 strikes undertaken by 505,049 strikers in 8,196 establishments, and lasting an average of 32.4 days in each establishment involved. In both 1902 and 1903 the number of employes thrown out of work by strikes was slightly less and the average duration somewhat shorter, although the number of establishments involved in 1903 was 6,000 greater than ever before, reaching 20,248.

These facts are brought out in the twenty-first annual report of the Bureau of Labor of the Department of Commerce and Labor, devoted to strikes and lockouts in the United States during the twenty-five year period 1881 to 1905, just issued.

The total number of strikes in the United States during this period of twenty-five years was 36,757 and of lockouts 1,546 or 38,303 labor disturbances of both kinds. Strikes occurred in 181,407 establishments and lockouts in 18,547 establishments, making a total of 199,954 establishments in which these interruptions of work occurred.

The total number of persons who went out on strike during the twenty-five years was 6,728,048, and the number of persons locked out was 716,231, making a total of 7,444,279 employes striking and locked out.

Employes Thrown Out of Work.

Because of the dependence of one occupation upon another in the same establishment, the stopping of work by strikers and employes locked out in one or more occupations often makes it impossible for fellow-employes in other occupations to continue work. The total number of employes, including strikers, thrown out of work by strikes was 8,703,824, and the number thrown out of work by lockouts was 825,610, or a total of 9,529,434 employes thrown out of work in the establishments immediately involved in strikes and lockouts. These figures do not include any employes thrown out of work in the many establishments not immediately involved in the strikes and lockouts, but dependent in one way or an-

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other on the establishments involved, as for material, power, etc.

Over 90 per cent. of all those thrown out of work by strikes were males and only 9.43 per cent. females. In lockouts 84.18 per cent. of the employes thrown out of work were males and 15.82 per cent. females.

Duration of Strikes.

The average duration of strikes per establishment was 25.4 days and of lockouts 84.6 days. The strike or lockout does not, of course, always result in the closing of the establishments involved, but 61.38 per cent. of all establishments involved, or 111,343, were closed an average of 20.1 days. In lockouts 68.25 per cent. of all establishments involved, or 12,658, were closed an average of 40.4 days.

Industries Most Affected.

The greatest number of strikes in any one industry was in the building trades, which had 26.02 per cent. of all strikes and 38.53 per cent. of all the establishments involved in strikes. In the coal and coke industry were 9.08 per cent. of all strikes and 9.39 per cent. of all establishments involved in strikes. This latter industry had more strikers and more employes thrown out of work by strikes than any other industry. The building trades were second in order in both these respects, with the men's clothing and iron and steel industries next. In lockouts the building trades led all other industries, having 16.49 per cent. of all lockouts, more than one-half of all the establishments involved, and about 30 per cent. of all the employes locked out and of persons thrown out of work.

States Most Affected.

Employes and employers who are concentrated in the great industrial States are more prone to engage in strikes and lockouts than those throughout the country generally. Thus the five States—New York, Pennsylvania, Illinois, Massachusetts, and Ohio—had 63.46 per cent. of all strikes and 69.44 per cent. of all the establishments involved in strikes, 56.22 per cent of all lockouts and 77.99 per cent. of all establishments involved in lockouts, although these five States had only 45 per cent. of all the manufacturing establishments of the country in 1900.

Strikes of Organized Labor.

The importance of the part that organized labor plays in strikes is indicated by the fact that of the total number of strikes in twenty-five years 68.99 per cent. were ordered by labor organizations, and the strikes so ordered included 90.34 per cent. of all establishments involved in strikes, 79.69 per cent. of all strikers, and 77.45 per cent. of all employes thrown out of work in establishments involved in strikes.

More Strikes Succeed Than Fail.

Employes who went on strike succeeded more often than they failed. They succeeded in winning all the demands for which the strikes were undertaken in 47.94 per cent. of the establishments, succeeded partly in 15.28 per cent., and in only 36.78 per cent. of the establishments did they fail entirely to win any of their demands. On the other hand, the employers, when they took the initiative and locked out their employes, succeeded more often than they failed. Lockouts resulted wholly in favor of employers in 57.20 per cent. of the establishments involved, succeeded partly in 10.71 per cent., and failed entirely in 32.09 per cent. of the establishments.

Strikes of Organized Labor Most Successful.

The strikes which were ordered by labor organizations were much more generally successful than those not so ordered. Thus, strikes ordered by labor organizations were wholly successful in 49.48 per cent. of the establishments involved, partly successful in 15.87 per cent. and failed entirely in only 34.65 per cent. of the establishments. On the other hand, strikes not ordered by labor organizations were wholly successful in but 33.86 per cent. of the establishments involved, partly successful in 9.83 per cent. and failed entirely in 56.31 per cent. of the establishments.

Leading Causes.

During the twenty-five year period covered by the investigation of the Bureau of Labor 40.72 per cent. of all strikes were undertaken for increase of wages, either alone or in combination with some other cause, and 32.24 per cent. were for increase of wages alone. Disputes concerning the recognition of union and union rules, either alone or in combination with some other cause,

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produced 23.35 per cent. of all strikes and were the sole cause of 18.84 per cent. A reduction of wages was the cause, wholly or in part, of 11.90 per cent. of the strikes, and 9.78 per cent. were to enforce demands for a reduction of hours. Only 3.74 per cent. of the strikes were sympathetic.

Of the total number of establishments involved in strikes 57.91 per cent. were involved in strikes undertaken wholly or in part to enforce demands for increase of wages.

The most important cause of lockouts was disputes concerning recognition of union and union rules and employers' organization, which alone and combined with other causes produced nearly one-half of all lockouts and included more than one-half of all establishments involved in lockouts.

The percentage of strikes for each of the leading causes has varied largely from year to year, but in every year save 1884 and 1904 strikes for increase of wages have outnumbered those for any other one cause. In 1884 a greater number (38.15 per cent.) were undertaken wholly or in part against reduction of wages, and in 1904, 38.92 per cent. were for recognition of union and union rules. In recent years the percentage of strikes against reduction of wages has shown a notable decrease, as is of course natural in a period of advancing wages. On the other hand, the percentage of strikes concerning recognition of union and union rules has shown a remarkable increase, for while they constituted less than 9 per cent. of all strikes between 1881 and 1885, and never reached 20 per cent. in any single year prior to 1896, yet during the five-year period 1901 to 1905 they constituted more than one-third of all strikes. The sympathetic strike, which in the early eighties was comparatively rare, but between 1889 and 1894 became of considerable importance, since 1894 has not constituted as much as 3 per cent. of all strikes in any year except 1904.

Strikes for increase of wages have been more successful than those for any other cause, having entirely failed in only 31.36 per cent. of the establishments involved in strikes for that cause, while the next most successful, those against increase of hours, entirely failed in 37.09 per cent. of the establishments involved. Strikes concerning recognition of union and union rules entirely failed in 42.88 per cent. of the establishments involved, and sympathetic strikes, the most unsuccessful of all, entirely failed in 76.53 per cent. of the establishments involved.

Settlement of Strikes.

Within recent years the effort to bring about the settlement of strikes and lockouts by joint agreement of organizations representing the parties or by arbitration by a disinterested third party has been attended with considerable success. During the five-year period 1901 to 1905, 5.75 per cent. of all strikes and 12.20 per cent. of all lockouts were settled by joint agreement and 1.60 per cent. of the strikes and 2.03 per cent. of the lockouts were settled by arbitration. These methods of settlement have been thus far largely confined to a few industries, practically one-half of the strikes and two-thirds of the lockouts settled by joint agreement being in the building trades, and about 14 per cent. in the coal and coke industry. Of the strikes settled by arbitration more than one-fourth were in the building trades and 13 per cent. in the coal and coke industry. These figures do not fully represent the progress of these methods of settlement of disputes between employer and employe, for both methods are being used to a large and increasing extent to settle disputes before a stoppage of work occurs.

* * *

In Other Lands.

Belgium.—Belgium is a land of low wages. In Ghent the minimum pay an hour for printers, roofers, glaziers, painters and boilermakers is 7 cents—70 cents for ten hours—and of blacksmiths, locksmiths, carpenters, masons, plumbers and electricians 80 cents.

Germany.—The second ordinary general meeting of the South German Railway Men's Society, which was held in Nuremberg some time ago, has, based upon the reports, established the following minimum program: The minimum wages shall be as follows: For workmen, 3.50 marks; for experienced workmen of a certain trade, 4 marks. The individual districts are authorized to establish their own wage scales according to the local conditions on the basis of these minimum wages. Vacations shall be granted as follows: After one year, 3 days; after three years, 5 days; after five years, 8 days, and after ten years, 14 days, with

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full pay. All the laborers are to be granted the same rights regarding free circulation tickets as are granted to the officials. Full pay of the wage in times of illness. In case of infirmity or lasting disability the same pension scales shall apply as have been taken as a basis for the laws for the officials. Furthermore, a rent allowance shall be granted according to the rules of the law for the officials. It is furthermore the duty of the general committee to use all efforts in order to have meetings of labor boards arranged regularly under the chairmanship of the general manager. The administration offices have to accept the propositions to be presented to these meetings: (a) The unlimited right to co-operate in the establishment of wages; (b) the right to co-operate in social or sanitary questions; (c) the right to co-operate when punishments are inflicted; (d) the right to co-operate in all questions referring to the working agreement.

Holland.—The Nederlandsche Vereeniging van Spoor-en Tramwegpersoneel (Railway Men in Holland) held a conference in Zwolle on the 30th of June last. The membership increased from 700 to 800 during the year 1904, and to 1,474 this year. Bro. Harms, who was present as delegate at the International Convention in Milan, has resigned and Bro. Rosenveldt has been appointed to take his place as editor. Bro. Harms has quit the railway service altogether and is going to The Hague, where he has accepted another employ. However, our fellow-workers must not believe that Bro. Harms is going to withdraw from the organization, or that he is going to co-operate at The Hague with the universal peace makers who meet there; this is not the case; our friend Harms is too fond of a nice battle. The meeting adopted a motion, presented by Amsterdam, "to work more energetically than heretofore for an immediate increase in wage and to have same granted at once." A decision in the matter of dispute of jurisdiction with the Bond van Tramwegpersoneel (street railway men) is kept in suspension until the next conference upon a proposition from Leeuwarden. The contribution is settled as follows: At least 8 cents per week for a wage of 500 fl., from 500 to 800 fl. at least 10 cents, and for more than 800 fl., at least 12 cents per week. Seven-tenths of these contributions are to be credited to the general funds. The income and the expenditure amounted to 4,550 fl.

Denmark.—The "Dansk Jernbaneforbund" (Danish Railway Men's Society) decided at its convention, held in Fredericia, on June 23d and 24th, that the contribution shall be paid to the funds of the society in advance, and that the contribution shall be increased from 1.80 cr. to 3.80 cr. per year. The newspaper shall be published twice a month. The society has at present 5,000 members.

Russia.—As to the laborers employed in the principal trades in Russia, out of the 7,000,000 laborers there are only 245,335, or 3.5 per cent., organized. To this must still be added two enormous groups of workers; the transport workers (715,000), of whom the railway men are organized to a certain extent (0.9 per cent.) and the laborers in the country (2,722,000), whose organizations exist under the most favorable circumstances, perhaps, during the summer, without, however, securing any standing of importance. The organization of the last named groups is rendered especially difficult by the imprisonment laws of December 15, 1905, and April 28, 1906, under which laws, strikes and organizations of transport workers or country laborers are liable to very severe punishments.

Switzerland.—The Swiss Train Staff's Society (Zugpersonalverein) had 2,803 members on June 30, 1907. The total capital of this society amounts to 192,637 francs. Since the establishment of the society in 1885 till the end of the fiscal year, 1906-07, the society has paid 244,901 francs for death benefits; 46,852 francs for disability benefits; 103,519 francs for sickness benefits; 16,511 francs for extraordinary benefits; 2,517 francs for legal protection, making a total of 414,301 francs.

* * *

*Labor Interests in the Courts.**

Relief Department.—In an action for the recovery of damages for personal injury brought by James Cannaday against the Atlantic Coast Line Railroad Company, in the courts of North Carolina, the jury found, upon issue submitted to them, that the plaintiff was injured by negligence of the defendant and that he did

*Prepared for the Locomotive Firemen and Enginemen's Magazine by Geo. H. Murdoch, Jr., St. Louis, Mo.

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not by his own negligence contribute thereto. By way of defense defendant alleged that prior to his employment plaintiff entered into a contract pursuant to which he became a member of the relief department, an organization formed by the several companies constituting the Atlantic Coast Line Railroad Company, for the purpose of establishing and managing a fund for the payment of definite amounts to the employes contributing thereto, entitling them, when disabled by accident or sickness, or their families in case of death, to certain amounts, the basis of which was fixed in said contracts. The said contract, among other provisions, contains the following: "I also agree that, in consideration of the amounts paid and to be paid by said company for the maintenance of said relief department, and of the guaranty by said company of the payment of said benefits, the acceptance by me of benefits for injury shall operate as a release and satisfaction of all claims against said company, and all other companies associated therewith in the administration of their relief departments, for damages arising from or growing out of said injury; and, further, in the event of my death, no part of said death benefit or unpaid disability benefit, shall be due or payable unless and until good and sufficient releases shall be delivered to the superintendent of said relief department of all claims against said relief department, as well as against said company, and all other companies associated therewith as aforesaid, arising from or growing out of my death, said releases have been duly executed by all who might legally assert such claims; and, further, if any suit shall be brought against said company, or any other company associated therewith as aforesaid, for damages arising from or growing out of injury or death occurring to me, the benefits otherwise payable and all obligations of said relief department and of said company, created by my membership in said relief fund, shall thereupon be forfeited, without any declaration or other act by said relief department or said company." It was further alleged that after the injuries sustained plaintiff received benefits pursuant to the said contract.

In answer to special interrogatories, the jury found that Cannaday, at the time of the injury, was a member of the relief department and had agreed to be bound by its rules and regulations, and that he had received benefits from said department for his injury.

It was admitted that the contract of employment was made in South Carolina, as well as the contract by which plaintiff became a member of the relief department, and that the injury for which the action was brought occurred in that state, where also the benefits paid were received. A judgment in favor of plaintiff has been reversed by the Supreme Court of North Carolina on the ground that comity between states requires the North Carolina courts to construe the contract in accordance with South Carolina decisions. The court says, in concluding its opinion:

"It may not be improper to say that the contract does not commend itself to our judgment. In this case it appears that the plaintiff paid into the relief department $72, and received by way of benefits $68. We must, in obedience to the well-settled law of comity, declare that the plaintiff, having no cause of action in South Carolina, has none in this forum."

Chief Justice Clark filed a dissenting opinion as follows:

"It is established by the verdict in this case that the defendant was guilty of negligence in allowing a collision of two trains in South Carolina, resulting in injuries to plaintiff, causing damages to him to the amount of $1,800, and that he was not guilty of contributory negligence. There is no exception calling in question the correctness of the trial in these respects. The defendant relies upon a discharge of release by reason of benefits received from the 'Atlantic Coast Line Relief Department.' When the action is upon a contract made or a tort committed in another state, the laws of that state must be taken into consideration in passing upon the liability of the defendant. But when liability is established without question, as in this case, the matter of a discharge, whether by payment, release, or statute of limitations, is governed by the lex fori—the law of the place where the case is tried and where such defense is to be allowed or disallowed. If a contract made in North Carolina, on which the statute of limitations is three years, is sued on in New York, where the limitation upon that class of contracts is six years, the defense is governed by the latter limitation; and vice versa, when a suit is

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brought in this state on a cause of action accruing in New York. In the same way, if this plea of payment or release is one which can not be sustained in good conscience, or is against the public policy of the state where the case is tried, the courts thereof will not hold it a valid defense to defeat a valid liability which the defendant has incurred elsewhere. The release here set up is by virtue of a transaction by which the plaintiff, who has paid in $72, has received back $68, and the defendant is insisting that that is a release of a liability for $1,800 damages, legally ascertained, which the plaintiff has sustained by the wrongful act of the defendant. Such a defense is not good in foro conscientiæ, and in that matter the courts here are to be governed by their own rules of equity. There has been no consideration for the release, and, such being the case, the judge properly entered judgment in favor of the plaintiff upon the verdict.

"It is strenuously argued by the able and learned counsel for the plaintiff that the 'Atlantic Coast Line Relief Department' is an ingeniously devised plan to cause the employes of that company, at their own expense and by means of deductions from their wages, to insure the railroad company from liability for injuries sustained in its service, notwithstanding the provisions of the fellow-servant act, new Revisal 1905, Sec. 2646. It is not necessary to go into that matter, as it is apparent that there was no consideration for the release here set up. But the act in question affects a most meritorious class of our citizens, engaged in hazardous quasi-public service. They are deeply and vitally interested that judicial construction shall in no way impair the just protection afforded them by that section, and especially by the last paragraph thereof: 'Any contract or agreement, expressed or implied, made by any employe of such company to waive the benefit of this section, shall be null and void.'"

55 S. E. 836.

Fellow-Servant Doctrine.—While a train of the Atchison, Topeka & Santa Fe Railway Company was proceeding through Arizona with a locomotive in front and another behind it, it stopped for a short time at the station of Williams, and Thomas Seeger, a fireman on the rear locomotive, went under his engine for the purpose of cleaning the ash box, and while in this situation the engineer of the locomotive in front moved same four feet, causing the whole train, as well as the rear locomotive, to move likewise, and the back driving wheel of the engine under which Seeger was working ran against and along his left arm from the wrist nearly to the shoulder, and injured his arm so as to render it useless. Seeger sued for damages in the Texas court, alleging negligence on the part of the company, in that the front locomotive had a throttle which was in a leaky condition, and which permitted steam to escape and get into the steam chest and then from the steam chest into the cylinder, which was unknown to the engineer in charge. Seeger testified that before going under his engine he notified his engineer, and also R. C. Hoehn, in charge of the front engine, that he was going to do so, and requested them not to move the train. The fireman on the front engine testified that Seeger borrowed his ash hoe and told him to be careful and not move the engine, as he was going under the engine to hoe the pan, and that he later told his engineer that Seeger was under the pan and not to move, but Hoehn had already blown three blasts of the whistle and started to back up. The engineer in the rear blew one blast of the whistle as a warning and the train stopped.

Hoehn himself testified that he did not know that Seeger was under the engine, and neither did he know that his engine was in a leaky condition; that if he had known where Seeger was he would have taken unusual precautions, and that even though the throttle leaked he could have kept it at a standstill. He also testified that later he examined his engine and found that there was a leakage of steam somewhere, but that he did not go into the boiler to examine it and find where the leakage was.

Seeger recovered a verdict of $7,500 damages, but this has been reversed and the cause remanded, as the evidence on the trial left it to be inferred that the act of Hoehn was the proximate cause of the injury, and the common law being in force in the territory of Arizona at the time, and the engineer and fireman being fellow-servants, the one way for plaintiff to recover was by showing that the proximate cause of the injury was really the leaky condition of the throttle.

98 S. W. 892.

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General Labor News.

In China wages of women operatives are nearly at the vanishing point. It is said that in the silk mills at Shanghai there are 20,000 workers, among whom are children that work at 3 cents a day and women at 5 cents. The highest paid get 26 cents for a thirteen-hour day.

Because of the liability of the employers for all injuries more attention is given to the protection of workmen in France and other European countries than in America.

Information has reached Washington that Japanese are getting into this country in large numbers, via British Columba, by payment of what amounts practically to a $25 head tax to the Canadian government.

The total immigration to the United States during the last fiscal year was 1,285,394; for the previous year, 1,100,000.

The Isthmian Canal Commission has recently purchased four libraries for the use of the recreation buildings at Cristobal, Gorgona, Emprie and Culebra, Panama.

The demand of the International Association of Machinists in behalf of 15,000 machinists in New York and vicinity for an increase of 25 cents a day in wages went into effect recently.

The Iron Molders' Union of North America, which has 90,000 members, 25,000 of whom have agreements with the Stove Founders' National Defense Association as to wages and conditions of work, reports that it has obtained a number of advances in wages without strikes.

The convention of the International Brotherhood of Blacksmiths and Helpers will begin in Milwaukee, beginning October 7th.

Beginning July 1, the ten-hour labor law affecting the cotton mills of South Carolina went into partial effect, for a sixty-two hour schedule a week was adopted January 1. Next the sixty-hour schedule a week will be adopted.

Danger of a spread of the strike of railway trainmen employed by the Colorado Southern has been removed by an agreement whereby all differences between the trainmen of all the roads entering Denver and the employers will be arbitrated by representatives of the employers and switchmen, yardmen and trainmen.

A strike of the blast furnace men at Pittsburg, Pa., which, it is said, will affect between 10,000 and 15,000 men, is possible in the near future. The difficulty is over the eight-hour day.

The highest accident death rate among industrial workers in Great Britain is among seamen (53 per 10,000), and the death rate of seamen in sailing vessels is three times as great as even this ratio.

Premier Louis Botha of the Transvaal announces that 16,759 Chinese "miners" in the Rand mines will be sent back to their native country this year.

Eighty-two per cent. of the workers engaged in the paper box industry of the United States are women. Among tobacco and cigar operators two-thirds are women and of the bookbinders more than half.

All the road roller engineers are now in the Hoisting and Portable Engineers' Union by an international decision.

The managers of all the railroads in England and the entire United Kingdom have refused to recognize the Amalgamated Society of Railroad Servants, which is composed of railroad employes of every class, and a strike may result.

The official call has been issued for the eleventh biennial convention of the International Brotherhood of Blacksmiths and Helpers, which will meet in Milwaukee, beginning October 7.

In England the bakers' movement for higher wages, fewer hours of labor, and better conditions of employment, appears to have had considerable success.

The Brotherhood of Railway Carmen now has 455 lodges, with a total membership of 30,451, and a cash balance of $27,868.94.

In order that all metal molders may become members of the organization, the Ironmolders' Union of North America has changed its name to the International Molders' Union.

The Associated Blacksmiths' Society of Great Britain was established on its present basis in August, 1857, so that this is its jubilee year.

Gov. Patterson of Tennessee issued a call for a conference of textile manufacturers and labor representatives in all Southern States, to be held in Nashville on October 14, to consider the question of woman and child labor in shops and factories, with a view of adopting uniform laws that will be agreeable and just to the respective parties interested.

The central committee of German trades unions has published a statistical

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table showing the wages earned in each of the sixty-six organized trades of the empire. The most remarkable thing about the table is the evidence it brings that in twenty-seven of these trades the average daily wage is less than 75 cents.

More than 1,000 persons were killed last year in the coal mines of Pennsylvania, according to the annual report just issued by the Department of Mines.

The flax spinners of Belfast, Ireland, have notified their employes that their engagements will terminate September 1. This action involves about 30,000 workers.

Mattress makers recently organized in St. Paul and Minneapolis.

Street railway men of Toronto, Canada, have signed a three-year agreement with the companies.

Workers in the oil fields about Beaumont, Texas, are planning to reorganize the oil and gas workers' union.

The municipality of Nicheroy, Brazil, has called for bids for the construction of model workmen's dwellings.

Of the 37,730,000 population of France, statistics record a working population of 19,750,075, of whom 6,805,510 are women and girls.

Labor organizations in New York State have a membership of more than one-fourth of the total number of votes. The aggregate membership of the 2,459 unions is 414,718, including 12,515 women members.

Average wages in Canada have increased 27 per cent. in five years, according to the census report.

The Farmers' Union of Georgia, with a membership of 80,000, has gone on record as being opposed to plans for bringing foreign immigrants into the South.

The trade union of garment workers and the masters employing trade union labor in England have favorably considered the suggestion to fight the sweating system by a union label to be affixed to all garments made under fair conditions.

The Brotherhood of Railroad Clerks has decided to affiliate with the American Federation of Labor.

The next national convention of machinists of the United States, Canada and Mexico is to be held in St. Louis, commencing September 9. This organization has a membership of more than 100,000 and is considered one of the strongest strictly trade organizations of this country. There will be nearly 500 delegates at the convention.

British boilermakers and iron shipbuilders, according to the annual report, had a total membership at the close of 1906 of 52,056, an increase of 2,426 in the year.

In France all mechanics are required to serve an apprenticeship of from two to three years. During the half of that period they are required to board themselves and are not paid any wages.

Trenton, N. J., is threatened with a strike in the pottery trade.

It is reported from Denver, Colo., that John Mitchell, president of the United Mine Workers of America, and William D. Haywood, secretary and treasurer of the Western Federation of Miners, have reached a formal agreement for an interchange of cards between the two organizations.

Drug clerks throughout the Atlantic States are forming unions and joining the Retail Clerks' International Union.

Arrangements are being completed between the American Federation of Labor and national trade unions of England, Scotland, Germany, Denmark, Austria, Belgium, Norway, Netherlands and other foreign countries to interchange union cards between the organized wage workers of the world. The American Federation of Labor and the American Society of Equity (the farmers' union of the United States) have formed an alliance. The organized wage workers of the world represent more than 50,000,000 people. The more advanced leaders propose an international convention of all craft unions.

That organized labor in Great Britain will remain in British politics and exert a cumulative influence is evidenced by the proceedings of the Trades Union Congress in session. Over 500 delegates, at least forty of them members of parliament, participated. They represent every organized craft of the working world.

For the first time in the history of the labor movement in New Orleans, La., the Central Trades and Labor Council will recognize the "colored brother" to the extent of meeting him on terms of equality.

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Miscellany

*The New Higher Education—What One State University Is Doing for the People.**

It is some two score years ago since the founder of a great eastern university proclaimed that he "would found an institution where any person could find instruction in any study." And when that great institution of higher learning opened its doors, its entrance examination rooms were crowded with eager applicants for admission. From teamster and laborer to college indoctrinated students they ranged—these applicants who desired to avail themselves of the opportunities for a higher education. Bitter was the disappointment of many when they were barred from the privileges of studying in this new and wonderful institution, because they lacked the "required preparation."

It has taken another generation of men and of milling to grind out a grist of educators who could grasp the full significance encompassed in plain, hard-headed Ezra Cornell's ideal for democratic education.

Progressive Ideas.

President Van Hise, of the University of Wisconsin, besides being a scholar among scholars, is also a man among men. Not only has he declared that the university should be "the instrument of the state," but he has furthermore proclaimed that "in Wisconsin there should be no occasion for any mute, inglorious Milton."

Thus, the University of Wisconsin has set about to reorganize its extension work. Instead of merely perfunctory university lectures, delivered in university lingo to those who affect a certain manner of culture, the extension work is being vitalized. It is to become a mes-

MAIN HALL—UNIVERSITY OF WISCONSIN

Surmounting the "University Hill" in the main group of colleges on the upper campus, executive offices, among which is University extension teaching

*Courtesy Correspondence Study Department, University of Wisconsin.

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sage and a force in the state; it is to afford opportunity to the thousands of men and women who had never been and never hoped to be students at the State University; in short, it is to relate more intimately the work of the school to the business of life. It has been determined that the university is now to go to such people as can not come to it.

"Step by step the university has broadened its field. In 1866 women were admitted. In 1885 farmers' institutes were established, in connection with the College of Agriculture. A little later a short course in agriculture was provided. In 1898 a summer session was opened for the admission of those who had not time or means to enter as resident students for the long term. To this was added in 1900 the summer school for artisans and apprentices. And now, in 1906, was established the correspondence-study department." No longer shall the university confine its energies to imparting instruction only to the students who come to its doors, or to the active and learned investigations which increase the sum of knowledge, but it proposes also to be a center for the general, practical, and even popular distribution of such knowledge as may be applied to the vocations of life and the enterprises of man. It will continue to supply those forms of culture which embellish life, but it also proposes to give that educational and industrial training which affords the very means of life.

Education for All.

A most wholesome regulation stands among the faculty statutes which says: Any student twenty-one or more years of age, not seeking a university degree, may enter the university without passing the entrance requirements, and pursue such studies as he can undertake with profit. At Wisconsin a mature man is supposed to possess some judgment as to what is good and profitable for him.

In the round year at Wisconsin University there mingle more types of students than may perhaps be found in any other institution for higher learning in the world. The conventional Piccadilly youth, often with larger wallet than head, is there "doing his conventional four years;" the boy "who works his way through" is there; the graduate student, the special student, the instructor student, the professional student, the business man student, the farmer boy student, even the farmer himself for a term of two weeks, is there. Last winter six hundred farmers spent two weeks at the university in their great cowskin coats and high top boots, mingling with the young regulars, all together presenting a picturesque and democratic scene, which can perhaps be duplicated nowhere else in the world. During the summer, for a period of six weeks, engine men, machinists, electricians, draftsmen, clerks, and artisans and apprentices from the numerous crafts come together in the shops and laboratories of the engineering school. All of these, on their leaves of absence from regular employment, mingle with the conventional student types of all classes in an ideal and democratic manner, which is as remarkable as it is unique.

Taking College to the Home.

Already all classes of people have come to the university for the benefits it offers. But thousands can not come. To these the university now goes through the mail in its home-study courses. Lessons are assigned, typewritten lectures sent, questions asked, and recitations written. Thus goes on the instruction in every range of subject from arithmetic and grammar to engineering and philosophy. Every citizen can now be a student in the great State University. No entrance examinations, no entrance requirements, no esoterics, no educational aristocracy. All are encouraged and all are afforded the best that the university can offer, if they choose to work and study. It is not a royal road, but it is a big, broad, public highway, upon which all alike can travel. The privilege is even granted to residents of other states, and forsooth of foreign lands, upon equal terms. This, therefore, is not only a democratic, but a generous program.

Spirit of Co-operation.

The co-operating agencies for carrying forward this great, democratic, educational work in Wisconsin are interesting. In no sense does the university intend to dominate or duplicate educational efforts of established institutions. Its purposes are co-operation. Where practicable and desirable, it will co-operate with the normal schools, high schools, and night schools; with Christian associations, institutional churches, improvement asso-

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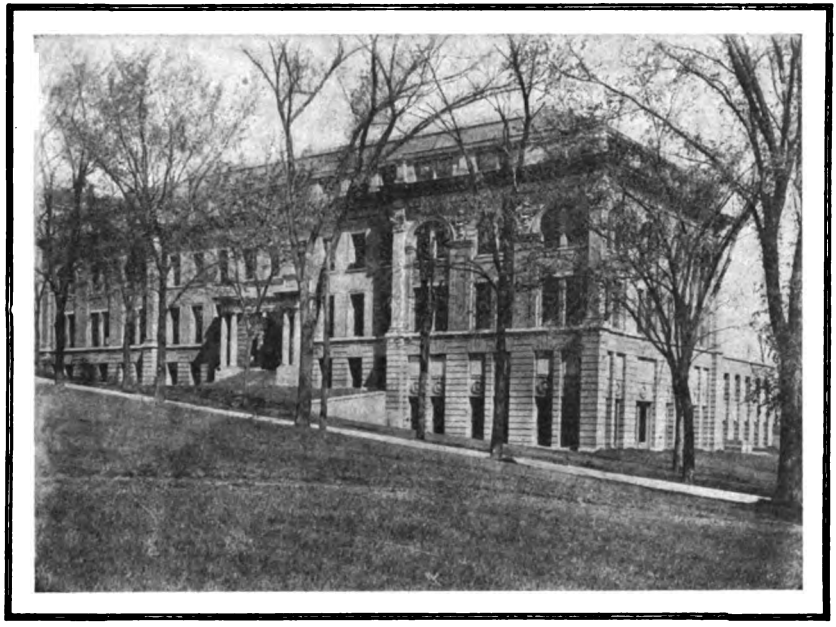
ciations, study-clubs; with business men's associations, labor unions, office men, shop men—and, in fact, with all classes of men who have common interests and ambitions for which they unite and strive. When these groups in which men have identical interests meet together, the university teaches the groups as it does single individuals. The Wisconsin State Library Commission is in co-operation, furnishing collections of books for each line of study.

life and to the resources of wealth, which means greater happiness and greater prosperity for all. Through its ennobling extension in agriculture, it has for years added great resources to the happiness and prosperity of the farmers. Wisconsin now probably ranks first in dairy interests, because of its great and far-reaching agricultural, educational work. It can do as much, if not more, for business through its school of commerce, for industry through its engineering college.



COLLEGE OF ENGINEERING—UNIVERSITY OF WISCONSIN

Half way up "College Hill," overlooking one of the four beautiful lakes about Madison

Thus is made possible in any local community, or even in any shop or business establishment, a study-group of earnest, studious men who seek to make themselves worth more to themselves and to society. Every village can have its educational or industrial study-group, and thus a great industrial university may extend state wide with its local centers everywhere, and affect every citizen and every human interest.

By a broad and inclusive system of adjustment and adaptation, the university can reach out to every interest and every citizen. It can add to the resources of

Twentieth Century Methods.

How can it do this? Largely by a combination of home-study and short and concentrated periods of attendance at the university for shop and laboratory instruction and practices. Correspondence even alone is wholly complete; perhaps an example of practical work for physicians in connection with this new extension program will serve to illustrate the methods employed in the Wisconsin University.

An Example.

In connection with an announcement recently made of the home-study courses

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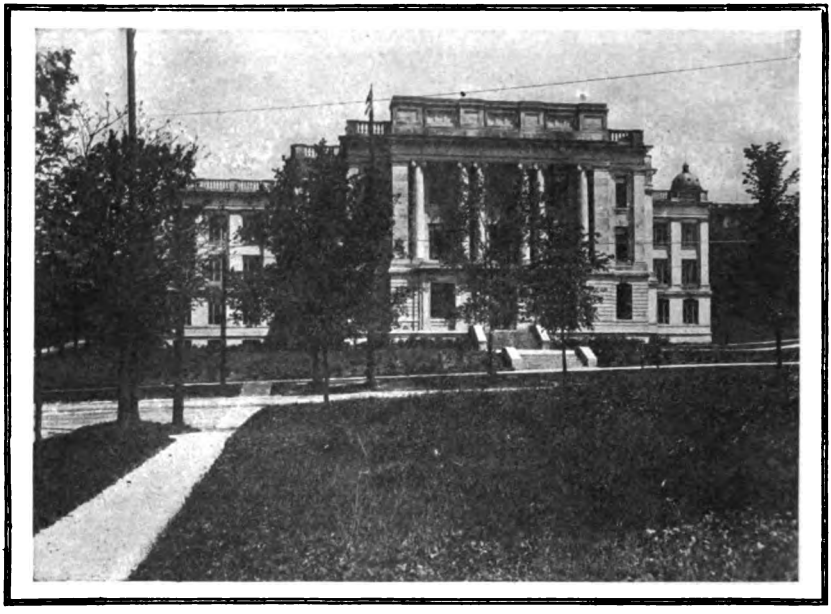
in bacteriology, a special work is proposed for practicing physicians. The study of germ life is new. New knowledge is constantly added through the labors of investigators. The practicing physician, especiallly if isolated, finds it difficult to keep abreast of his profession in his busy life. The university is, therefore, preparing to offer a course of reading and study in the newer things relating to germ life, e. g., blood cultures and the opsonin treatments, by which physicians can isolate germs and determine with a certainty troubles which, because of their complexity, make diagnosis by ordinary methods extremely difficult or impossible. Once determined, treatment similar to the familiar antitoxin treatment for diphtheria makes the physician's services at once intelligent and effective. The technique of these things must be learned at the university, where laboratory facilities and demonstrations are possible, but all the preliminary studies may be done at home. These laboratory studies at the university may be done in a week—a period short enough for any physician to provide for. What does this mean to medical practice? What may it, indeed, mean for human suffering? Applying this to one's own occupation or profession you have in concrete form the general plans and ideals of the new university extension work at Wisconsin. Similar adjustments exist for the clergy, the teachers, the business men, the various craftsmen, and for all classes of workers who seek to advance themselves in their own professions or trades, or for any reason seek to change their occupation.



CHEMICAL BUILDING—UNIVERSITY OF WISCONSIN

One of the newer buildings in the group developing beyond "University Hill." The dome of Main Hall is seen in the distance.

This is the highest conception of higher education—to give the highest education possible to every citizen, and to make the university of greatest possible service to the individual and the state.

* * *

Rules for Long Life Fixed.

These rules for prolonging life have been laid down before the Royal College of Physicians, London, by Dr. Herman Weber:

Moderation in eating, drinking and physical indulgence.

Pure air, out of the house and within.

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Keep every vital organ in constant working order.

Regular exercise every day in all weathers.

Sleep only from six to seven hours, going to bed early and rising early.

Daily baths, warm one day, cold the next.

Regular work and mental occupation.

Cultivate placidity, cheerfulness, hopefulness.

Control passion and nervous fear.

Strengthen the will in carrying out whatever is useful.

Check the craving for stimulants and anodynes.—Chicago Record-Herald.

Let Us Thaw Out.

Under the above caption the following, which appears in a recent issue of the Altoona Times, is painfully and truthfully descriptive of conditions as they really exist:

The world hungers today as never before for human sympathy.

The struggling masses of humanity shiver and starve on the bleak, frozen shores of selfishness and greed.

The sunshine of brotherhood, love, friendship, kindness, good fellowship shines on our bleak, frozen social world.

It doesn't thaw out. The atmosphere is too chilly. No sympathy.

Of course most of us would pull an unfortunate out of the water if he were drowning, advise him to get some dry clothes on and be more careful in the future, says the Toledo Press. But the barbarian would do that. And he would pass on and leave the victim to his fate. He would have no sympathy.

The chief difference between us—all of us—and the barbarian is that we know better. We live in an age of higher ideals. We know that the child that burns with fever, suffers for fresh air and nourishing food in that nauseous tenement, has the same rights that we enjoy.

We know that the fond mother who sees the life of her loved one dying out for want of the help and care that she is powerless to give it, has the same love for that child that our own mother had for us.

Do we sympathize with her? Do we even care, or give a thought to the social tragedy enacted and which we could prevent? Certainly not. If we did, we would do something.

Last week nearly 1,700 babes under five years died in the tenements of New York City—nearly all for want of care, fresh air, food, sanitary surroundings. At least 500 of these could have been saved at a small expense, but small as would be the expense, the poor mothers could not incur it.

The money spent in that same city during the week by a half-dozen fashionable women on unnecessary things, would have saved the lives of half these babes and made as many mothers happy.

And yet these fashionable women are not barbarians. Most of them would do much and undergo sacrifices to save a life. But their circle is circumscribed and their sympathy frozen.

They would gladly contribute money and they do contribute money, but a word, a visit, a personal kindness, a life current between hearts—these are worth vastly more than money. A word, a kind action, a look even of sympathy, will do more at times than a bag of gold.

The world is hungry for sympathy, for kindness, for a thawing out of the artificial social barriers, the icebergs that freeze humanity.

The first step is the difficult one, yet it is easy. It is easier and pleasanter and healthier to love than to hate.

Love is plentiful everywhere if we would only let it thaw out. It is the one thing that we can give and keep, and the more we give the greater our supply. We can't give it all away, for it returns with compound interest.

We all need sympathy and love—the rich as well as the poor. We can't buy the genuine thing. We can get it only by giving in kind. We can't misplace it, for it will disarm the most bitter enemy. Thaw out. Try it. It will improve your health anyway.

Important Conference to Consider Trusts.

A conference, national in its scope, will be held under the auspices of the National Civic Federation in Chicago on October 22, 23, 24 and 25, for the purpose of considering important questions bearing on the relations between state and national governments and corporations. The matter of the immense fine recently imposed by Judge Landis upon the Standard Oil Company of Indiana, and the

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conflict between the Federal judiciary and the state authorities in the North Carolina railroad cases, as well as other matters of general public interest, will be discussed on the occasion.

It is announced that forty-one governors of states and the commissioners of the District of Columbia have appointed delegates to attend the gathering and that many governors will be there in person.

The topics chosen for discussion are:

"First: Government power over corporations engaged in interstate commerce; the division of power under the constitution between the nation and the state; power concurrent in nation and state.

"Second: How should the corporation be constructed; should there be national corporations as well as state; the basis of capitalization of corporations; their internal control; provisions looking to the protection of investors and the stockholders, as well as fair dealing with the public; distinction between public service and other corporations.

"Third: The just and practicable limits of the restriction and regulation, Federal and state, of combinations in transportation, production, distribution and labor."

Members of the interstate commerce commission and of the committees on interstate commerce of the Senate and House, as well as delegates from the American Federation of Labor, the National Grange, the American Publishers' Association, the American Bar Association, the National Board of Trade, the American Economic Association, and from various other organizations representing commercial, manufacturing and shipping interests are expected to take part, as are also a large number of men of national prominence in their respective spheres. Just what the effect of the conference will be is, of course, conjectural. It is to be hoped, however, that it will make its influence felt in behalf of a cleaner, healthier and more equitable economic system.

* * *

*Notes on Alaska-Yukon-Pacific Exposition.**

John C. Olmstead, a landscape architect of national reputation, has laid out the grounds of the Alaska-Yukon-Pacific Exposition. Mr. Olmstead was landscape architect for the expositions held in Chicago and Portland.

The State of Washington appropriated $1,000,000 for the Alaska-Yukon-Pacific Exposition.

The Alaska-Yukon-Pacific Expostion, the next world's fair after Jamestown, will open at Seattle June 1, and continue till October 15, 1909.

The administration building of the Alaska-Yukon-Pacific Exposition is now under construction and will be completed by the middle of August.

Seattle, where the Alaska-Yukon-Pacific Exposition will be held in 1909, now has a population of 241,000. At the rate the city is growing it will have fully 350,000 by 1909.

Mt. Rainier, the highest peak in the United States proper, is in plain view from the grounds of the Alaska-Yukon-Pacific Exposition. Mt. Baker, another formidable snow-clad peak, may also be seen.

The grounds of the Alaska-Yukon-Pacific Exposition occupy 250 acres of the campus of the University of Washington, a state institution.

Ground was broken for the Alaska-Yukon-Pacific Exposition before a crowd of 15,000 persons on June 1. Work has already been started on the grounds and buildings.

Oregon and California have each appropriated $100,000 for the Alaska-Yukon-Pacific Exposition, with the assurance that additional amounts will be authorized at their next legislatures.

Miss Adelaide Hanscom, a Seattle artist, won the $500 prize offered for the official emblem of the Alaska-Yukon-Pacific Expostion. The design is artistic and fully typifies the purpose of the Exposition.

Exposition clubs are being formed in different parts of the country. The members of the clubs are saving one, two or three dollars each week in order that by the time of the Alaska-Yukon-Pacific Exposition opens at Seattle, June 1, 1909, they will have sufficient funds to pay for

*From Department of Publicity.

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a trip to the world's fair. A treasurer is elected who collects and keeps the money.

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Freedom of the Press.

This is the name of a little booklet, from the pen of Mr. Wilmer Atkinson, editor of the Farm Journal. The argument advanced by Mr. Atkinson is well expressed in the title of his work. He advocates the abridgement of the power of postoffice department officials in restricting the use of the mails for publications which do not offend against the constitutional provisions of the United States, and sets forth in glowing colors the possibility of harm being worked upon a tolerant people by persons high in authority in that department who are disposed to be overbearing and autocratic. A wide circulation of the booklet will doubtless result in helping to bring to bear on congress such influence as will have the desired effect. The address of the author is 1024 Race street, Philadelphia, Pa.

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Our Happy Land!

Reynolds' Newspaper, a weekly of London, England, and one of the most vigorous and influential journalistic advocates of human liberty in the world today, has been running "parallels" under the above caption in each issue representing the extreme in living conditions made possible through our present deplorable economic system, of which the following are samples:

In the new Drury Lane drama, which will deal with the foibles of modern society, a luxurious repast, at which pet dogs are the guests of honor, will be represented on the stage. A dozen members of the "smart set" will be seen sitting round a table, with pet dogs under their arms, on their laps, and on the cloth. — Daily Paper.

At Kettering Police Court, Susan Coulson was charged with stealing a leg of mutton. She said she could get no help from the parish, and could not see her children starve. She was sentenced to one month's hard labor.

According to the fiftieth report of the Inland Revenue Commissioners just issued, no fewer than twenty-one persons in England have to eke out existence on beggarly incomes of £50,000 a year! — Daily Paper.

As Maud Grace has no home and no money, the Grantham Bench has sent her to prison for six weeks "for being an idle and disorderly person by sleeping out."

According to the daily papers, London is to have a dress exhibition next February, at which dresses, furs and laces to the value of £100,000 will be displayed. The Parisian method of showrooms will be adopted; luxuriant drawing-rooms will be arranged, and in these the most beautiful mannequins from the Rue de la Paix will show off the costly "creations."

At Romford Petty Sessions a man who was charged under the poaching prevention act with being in the possession of seven rabbits, was fined £5.

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Locked in a Boiler.

One of the most thrilling experiences which it has ever been the lot of a boilermaker, or for that matter of any other member of the human family, to undergo, is graphically described by a special correspondent in a recent issue of the Cincinnati Enquirer. The account of the awful incident is as follows:

Arthur McDonald, a boilermaker, aged 24, will leave the hospital at Pine Bluff, Ark., this week, a nervous wreck. His hair, which at one time was coal black, now hangs over his forehead a soft, glistening white. He will never again be able to return to his calling, and, in fact, will not be able to do work of any kind for several years. He leaves, accompanied by his brother, for Colorado, where he hopes, in a measure, to rebuild his shattered nervous system.

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When seen at the hospital McDonald told the remarkable story of the circumstances which brought about his present condition.

"I am 24 years of age," he began, "and for the past three years have been employed as a boilermaker, principally in railroad shops. I learned my trade when quite young, and, although fully aware of the dangers of a boilermaker's life, I never once dreamed of the awful experience I would go through, or I should never have attempted to drive a rivet.

"The experience to which I refer occurred three months ago at a sawmill below Hope, Ark. A new set of boilers had been put in and negro firemen were relied upon to attend them. They soon got out of order and the foreman sent all the way to Pine Bluff to get a boilermaker. There were none available then except those in the railway shops there. As a pretty good sum was offered I laid off from my regular work and decided to make a few extra dollars. This try came near being the end of me.

"When I reached the sawmill I found the boilers in a bad fix. The flues were choked and needed reaming badly. In addition they were caked on the inside, and as there was not enough help present I decided to go into the boiler myself and chisel off some of the cake matter while the negroes were reaming out the flues.

Manhole Was Closed.

"This worked all right on the first boiler, and I soon had it in good shape. I then went to the second boiler and told the negroes as soon as they had finished reaming out the second boiler to replace the manhole on the first, fill it with water and fire up for a test.

"I went down on the inside and found the second boiler's flues in an especially bad condition. I must have worked for an hour, and so intent was I that I did not notice the noise of the reaming cease until I was nearly through. My first intimation that anything was wrong came when the candle began to burn dim and the boiler seemed full of the candle gas and smoke. I turned around to see what was the matter, and, to my horror, saw that the man-hole cover had been replaced.

"I crawled along the flues as fast as I could until I reached the spot and attempted to push it up, but I was too late —the negroes had it screwed down firmly. I struck the side of the boiler with my hammer and called several times. The sound was almost deafening to me, but I am sure it was hardly heard on the outside. It then flashed over me that the negroes had misunderstood me and were preparing to make a fire under the second boiler instead of the first.

"The horror of my situation caused me to feel sick for a moment, but I realized that if there was anything to be done it must be done at once, so I crawled along the rust-covered flues to the end of the boiler. In doing this I accidentally knocked over my candle and put it out. With a cry of anguish I reached for it, but it had fallen down among the flues and was out of my reach for good.

"Following close upon this I heard the rush of water through the injector and knew the negroes were filling the boiler. Now was the time to act, I thought, if I intended to get out alive, but my candle was gone and never before have I seen such darkness as filled that boiler.

Over the Fire.

"I had not calculated correctly on the time, for the water had been coming in several minutes before I noticed it. I could feel it creeping up among the flues. For a moment I stopped, and, I am not ashamed to admit it, prayed earnestly for deliverance from the awful fate that now confronted me.

"After an agony of suspense I heard the water shut off with a gurgle that to me sounded like the voice of some demon bent upon devouring me. I attempted to jump up, but struck my head a severe blow upon the top of the boiler and cut a gash in my scalp, but I hardly felt it, so alarmed was I at the thought of the next step the negroes would take. The fire!

"Had I been fortunate enough to have possessed a revolver or even a pocket knife, I would have ended it all there, but I was unable to do a thing except yell and beat the sides of the boiler with all my might and main. I was forced to sit and know that under me the negroes were building the fire than would slowly roast me to death.

"I cannot describe my feelings or agony during the following moments. I imagined I could feel the heat under me already. The atmosphere was suffocating and cold beads of perspiration stood out upon my forehead and trickled down my spine. To me every minute was an hour.

"It was through sheer exhaustion that

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I ceased beating and panting and leaned back against the side of my iron tomb. I was not long spared this rest, for I could now distinctly feel the air growing warmer. The flues upon which I was seated were above water, and as I reached down and touched one I started with a gasp. It was warm, ever so slightly, but warm, nevertheless. Again I began pounding and calling frantically, until my lungs felt as if they were lacerated.

Voice from the Dead.

"The close atmosphere and heat had started a raging headache, and my temples throbbed as if they would burst. I had torn my hands until they were bleeding freely, and my eyes seemed to bulge in their sockets. The thing that stood out grim and gaunt before me was the fire in the furnace that would slowly roast me to death.

"I thought of my old mother, of home and of thousands of things, it seemed to me. The flues were now becoming warmer. I could feel their heat through my clothing, and once more I pounded and yelled. Back and forth like a hyena I crawled, panting, praying and moaning. The flues were now so hot they burned my bare hands, and my head swam from the heat.

"In a moment of desperation I seized my hammer and dealt myself a severe blow upon the head to try and stun myself in order that the last pangs might not be so terrible. The blow only burst the skin and caused me additional pain. Hotter and hotter grew the flues, until I felt that I could no longer stand the agony. Strange and weird figures appeared before my vision.

"At last, more dead than alive, with every nerve racking with agony, I threw myself down upon the burning pipes to hasten the end. My teeth ground together like a vise as the heated iron burned my flesh. I could not have remained there over three seconds, though to me it seemed a lifetime, before I heard, as plain as I ever did during his life, the voice of a brother who died years ago. Somehow the voice sounded perfectly natural. I recognized it in an instant and felt not the slightest surprise. It said quickly, 'Cut the flue, Arthur.'

Rescued Just in Time.

"In an instant I was on my hands and knees. The last ray of hope had dawned before me, now, I knew, a dying man, and with more strength than I ever before commanded or ever shall again, I placed the point of my chisel on a flue just under the water and dealt it a terrific blow. I missed and struck my little finger." He held up the stump. "I pledge my word that I did not feel the pain. The second blow fell true and the third and fourth, and with the fifth I felt the chisel give. I caught sight of a fiery fork of flame in the flue and the next instant heard the water hissing and popping as it rushed through the leak into the furnace below.

"The negroes heard the water when it struck the fire and knew there was a leak somewhere. They, of course, opened the water plug and raked out the fire.

"Realizing that I was fast losing consciousness I dragged myself under the manhole that I might be found as soon as the boiler was opened. I have a faint recollection of seeing a round patch of daylight, darkened by the head of a negro and for the following five days I knew nothing.

"I have been in the hospital here for the past three months and am afraid I am about all in for good. However, the doctors say the mountains and rest will do wonders for me, so I am going to try it out in Colorado for a while."

"If you had your health and strength back again would you return to your old occupation?" was asked. The white head rested for a moment upon a wasted hand and then the speaker replied:

"Yes, I think I would; I like it somehow, but there is one thing certain, I would never again enter a boiler without first seeing that the manhole cover was locked up safely in some closet and I had the key in my inside coat pocket."

* * *

The Serum Diphtheria Treatment in Germany.

Consul-General A. W. Tahackara, in a letter written supplementary to an article on the subject by Consul-General Guenther, gives some very interesting information relative to the new treatment of diphtheria in Germany and the manufacture of the serum, etc. His reference to the matter is as follows:

The manufacture of serum in Germany is under government control, in order to prevent adulteration. Since Behring's discovery of the diphtheria serum, and

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the establishment of this treatment about ten years ago, the production of serum has become a most important branch of industry. The researches on the subject of the power of resistance or immunity of living creatures to the bacili of disease have been developed into the science of experimental therapeutics, and their most important result is the treatment of serum. In addition to curing a disease already broken out, serum is used for the prevention of disease, and in this direction great success has been obtained in the Fatherland, particularly in the case of diphtheria.

Before any serum for diphtheria can be sold by chemists it must be tested and stamped by the government official designated for the purpose, the testing being carried out on principles resulting from the researches of Ehrlich and other German scientists, regarding the effects of antitoxic and bactericidal sera on contagious germs and their poisons. The substances used for these tests (so-called test poisons, test sera, etc.) are kept in the testing house under conditions guaranteeing their immutability.

During the years 1892 and 1893, there died in ten states in the German Empire, before a healing serum had been discovered, 113,259 children between the ages of one and fifteen years from diphtheria. During 1896 and 1897, after the pretty general treatment with diphtheria serum had been introduced, there were registered in the above-mentioned ten German states, only 45,942 deaths from diphtheria among children between one and fifteen years of age, notwithstanding the fact that the population had considerably increased.

SECURING THE SERUM.

The diphtheria remedy, liquid and solid, is obtained from the blood of horses which have been rendered immune by gradually increasing doses of bacteria-freed diphtheria toxin. The diphtheria remedy is tested by government officials for its antitoxin potency and freedom from germs, at the Royal Institute for Experimental Therapy. The diphtheria-serum horses are made immune by subcutaneous injections of diphtheria poison in gradually increasing quantities. Their blood yields, after separating from it the corpuscles, the diphtheria serum, which at the end of the manufacturing process is examined concerning its strength and which is afterwards sent for re-examination to the control station.

When the horse has been made immune, a small quantity of blood is taken from it. The blood is left in a cylinder for twenty-four hours until it coagulates, afterwards with the aid of the "égouteur" the serum is separated from the blood corpuscles, the latter remaining in the sieve. A certificate is given after re-examination. The filling of the serum into bottles and the bottling for export is done with a "bourette," which is in direct connection with the glass in which the serum is kept, and it is supplied in the strengths of 300, 500, and 1,000 units of "immunization." Diphtheria serum can only be obtained by the public under a physician's prescription, through an apothecary, it being sold at the retail prices of 16.6, 35.7, 53.5, 73.8, and 45.2 cents, and $1.19 per dose, according to the strength of the dose; that is, in strengths of from 200 to 2,000 units of "immunization" per cubic centimeter.

Consul-General F. H. Mason, of Paris, reports that the price at which diphtheria antitoxin and other serums are sold in France by the Pasteur Institute, to apothecaries and to the agents of other governments who apply directly to the institute for supplies, is 48 cents per flacon, containing 10 cubic centimeters (or 10 grams), comprising 2,500 units. The retail price in Paris is 58 cents per flacon of 10 grams, so that the retail profit is 10 cents per vial.

* * *

Barber's Jest.

"Do you know, sir," chuckled the buffoon barber, as he reached for the tonic bottle, "that your hair reminds me of the setting sun?"

"Quit your nonsense," snapped the busy man. "How could my hair remind you of the setting sun? It is not golden, is it?"

"No, sir."

"Nor variegated in color."

"No."

"Then why do you say it reminds you of the setting sun?"

"Because it is so rapidly disappearing, sir."

And the buffoon barber started to use the tonic bottle as if it were a fire extinguisher.—Exchange.

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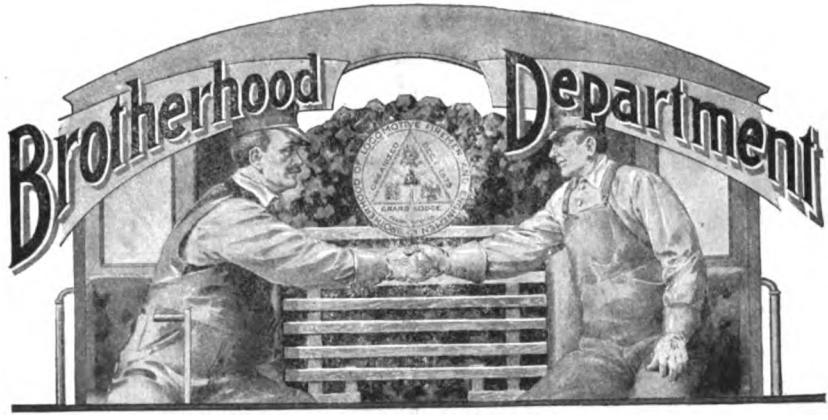

UNION MEETINGS

Detroit Union Meeting—Governor of Michigan to Be in Attendance.

A Grand Union Meeting is projected for October 9, 10 and 11, 1907, to be held in the city of Detroit, and ere this issue is in the hands of our readers there will doubtless be hundreds looking forward in happy anticipation to the pleasures those dates have in store for them. It will be the aim of Lodges 158, 508 and 532 of the Brotherhood and Lodge 11 of the Ladies Society to make the event one of the most enjoyable ever experienced by the visitors and their relatives and friends, and to send them back to their homes with memories of Detroit that will always make them happy to recall.

The members of the local lodges have endeavored to leave no stone unturned in their efforts to make the meeting an event long to be remembered. The Grand Lodge will be represented by the Grand Master, possibly one or two Vice Grand Masters and the Grand Secretary and Treasurer. Among the men of note who have promised to address the meeting are Hon. Fred Warner, Governor of Michigan; Hon. Wm. B. Thompson, Mayor of Detroit; Hon. Wm. Alden Smith, United States Senator; Hon. C. E. Townsend, Congressman; Hon. Edwin Denby, Congressman, and Hon. Wm. C. Maybury, ex-Mayor of Detroit; also Judges James Phelan and Alfred Murphy.

The meeting will extend over three days and an outline of the program is as follows:

Wednesday, October 9th.

2:00 p. m.—Secret meeting.
3:00 to 5:00 p. m.—Reception by Ladies Society to visiting sisters.
8:00 p. m.—Public reception.

Thursday, October 10th.

9:00 a. m.—Secret meeting.
2:00 to 5:00 p. m.—Reception at Carhartt's.
Evening—Everybody see the city.

Friday, October 11th.

9:00 a. m.—Open meeting to be attended by governor, congressmen and United States senators.
2:00 p. m.—Secret meeting.
8:00 p. m.—Grand ball at Light Infantry Armory.

A most commendable characteristic of Detroit, and one of which its people as a whole are justly proud, is the extent to which union labor conditions predominate amongst its industries, the eight-hour day being now recognized as the standard. The principles of organized labor prevail and are respected to such an extent that Detroit is classed amongst the strong union cities of the continent. It stands tenth in population in the United States and is an ideal union meeting city.

It might be well to add that while Detroit is considered by many as a summer resort, yet in reality its most beautiful season is when, in the early fall, the trees lining the broad avenues are robed in their cloaks of vari-colored

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foliage. During the month of October the beautiful Belle Isle Park appears to special advantage, and the various buildings, aquarium, and the herds of deer, elk, buffalo and other wild animals of the American forest can be seen at their very best.

Many will be pleased to learn that in that section of Michigan October is the very best fishing season of the year, and those who feel inclined may indulge in this sport to their heart's content. The expansive territory of the Dominion of Canada lies just across the river, and the Canadian boys of Lodge 421 will be delighted to receive visits from their American brothers.

Indianapolis Joint Union Meeting Postponed.

Owing to unforeseen impediments the Joint Union meeting scheduled to take place in Indianapolis on the third Sunday of October has been postponed until the second Sunday in November. A more definite announcement as to arrangements will be made in our November issue; it is hoped that all members of the Railroad Brotherhoods who can be present at that meeting will attend, as it promises to be one of the best of its kind ever held in the Central States.

THE DELAWARE & HUDSON DELEGATION AT THE CANADIAN UNION MEETING, HAMILTON, ONT., AUGUST 5-9, 1907

The reception committee will be composed of Brothers Ralph Rust (532), Melvin Crawford (158) and J. V. Harcourt (508), who will attend to the work of meeting visitors at the trains and guiding them to the various hotels.

Headquarters will be maintained at the Hotel Normandie, which is situated within one block of the hall where the meetings will be held, and in addition to this hostelry there are upwards of a score of other good hotels where visitors may be accommodated at reasonable rates. Those desirous of securing hotel accommodations in advance should address Brother J. V. Harcourt, secretary, 87 Romeyn street, Detroit, Mich. Great good has ensued from former union meetings and the Magazine hopes that the labors of the committee on arrangements will be rewarded with a good attendance from all over the State of Michigan and the territory contiguous thereto.

The Delaware and Hudson Delegation at the Hamilton Union Meeting.

Our brothers of the Delaware and Hudson system, accompanied by their ladies, constituted one of the happiest parties that attended the Hamilton Grand Union Meeting. As in former years the management of the company, with its compliments, placed at the disposal of the

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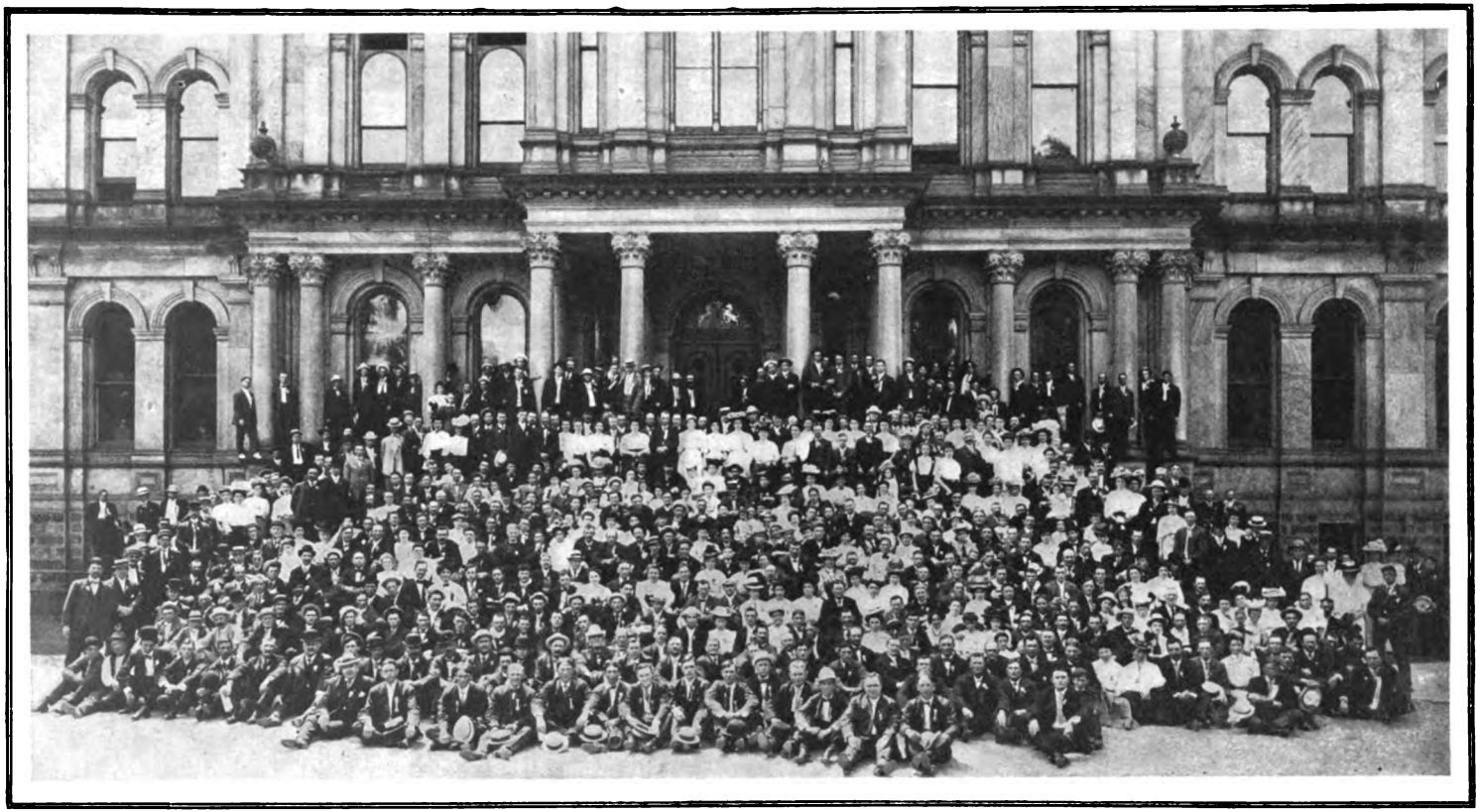

DELEGATES AND VISITORS CANADIAN UNION MEETING, HAMILTON, ONT., AUGUST 5-9, 1907

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delegation an elegantly equipped, modern car in which the party traveled to Hamilton and return—a courtesy that was deeply appreciated by all.

After having tasted the pleasures of attending the big Canadian Union Meeting held at Ottawa in 1906, the boys of the Delaware & Hudson system became enthusiastic over the proposed trip to Hamilton this year, and they turned out in goodly numbers, as is evidenced by the accompanying photograph of the car and party.

As usual, Bro. T. E. Ryan, chairman of the New York State Legislative Board, and general chairman of the D. & H. system, chaperoned the party, and was unfailingly attentive in seeing to it that all whose comfort was entrusted to his care enjoyed themselves thoroughly. Many were the expressions of appreciation and goodwill in which the members of the party referred to the kind and hospitable treatment accorded them by their Hamilton brothers, and it is already freely predicted that the Delaware & Hudson delegation to the Canadian Union Meeting to be held in Winnipeg in 1909 will be the largest yet.

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The Indianapolis Union Meeting.

Arrangements are already under way for a monster union meeting of our Brotherhood, to be held in the city of Indianapolis late in December or early in January next. Owing to the central location of Indianapolis and its excellent transportation facilities, it is expected that this union meeting will probably be the largest that has ever been held under the auspices of the Brotherhood, for, while it is projected for the benefit of the membership in the Central States, it is expected that brothers from all over the United States and Canada will be in attendance.

Arrangements are under way to secure as speakers for the occasion public men of national and international reputation. No effort will be spared to make the gathering a thorough success from every standpoint. Definite arrangements will be announced in the next issue of the Magazine.

❁ ❁ ❁

August Supplement.

The demand for extra copies of Supplement to the August issue has been so great that we have found it necessary to have several thousand copies printed in addition to the regular supply. We, therefore, beg to announce that "Blue Books" will be sent to brothers desiring extra copies as long as the present supply lasts. Orders for more than two copies must, however, come through the secretary of a lodge. Two copies will be sent to any individual member, or as many as twenty-five, or, if necessary, more, to any lodge free of charge.

❁ ❁ ❁

A Weak Response.

Reliable information has reached us to the effect that the Grand Chief of the B. of L. E. has issued a circular to the members of his organization in an attempt to explain the position of that order in the Bangor & Aroostook trouble, as set forth in the supplement to our August issue. The defense which he seeks to establish is so miserable and flimsy and so characteristic of the guilty, stammering, quibbling, equivocating schoolboy that we regard it as entirely unworthy of any specific attention at our hands. We would not now refer to it only to say that every statement contained in the supplement to the August issue (Blue Book) is absolutely true in every particular and that we challenge their denial or controversion; also that they will find us ready to establish the truth of every assertion made.

❁ ❁ ❁

The General Chairmen's Association.

The following is the circular letter which accompanies the copies of the proceedings of the seventh annual meeting of the General Chairmen's Association sent to its members. As it is of the utmost importance to every member of the Brotherhood that the General Chairmen's Association should be a success in every particular, this letter is published with a view to the better familiarizing them with the work of that body:

Sedalia, Mo., Sept. 1, 1907.

To the Secretaries of all Subordinate Lodges B. of L. F. and E.:

Dear Sirs and Brothers—Herewith attached please find copy of the proceedings of the seventh annual meeting of the General Chairmen's Association, which you are requested to place before the membership of your lodge either by read-

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ing same at several meetings or allowing the members to read the contents at their leisure. The idea of the association is to familiarize the membership at large with the good that will come to them by having their general chairman affiliate with an association of men engaged in like work. We believe that it is to the interest of every individual member of the Brotherhood to have the chairman of the Joint Protective Board of the railway upon which he works to identify himself with the General Chairmen's Association, for by so doing he will come in contact with men who have been engaged in grievance work for a number of years, whose experience and ideas will be of great benefit to him. At these meetings talks on all phases of grievance work will bring out many interesting features, and in the exchange of ideas that will necessarily follow much valuable information will be gained by those present. The working conditions in all parts of the country will be discussed; the rates of pay; hours of work; overtime features; class of engines; quality of coal, in fact, everything that will be of interest to the membership at large will be taken up and considered with the object in view of endeavoring to solve some method that will enable us to improve on these conditions as they exist in different sections. It is very necessary that the chairmen come together in meetings of this nature and go over their work and devise means of bringing about better working conditions. Most of us know that in almost every state are found like associations of the employing powers whose business it is to keep the day's wage as low as possible while they tax human endurance to the utmost in their efforts to get all the work they can for the wage paid. All of us know of the existence of the General Managers' Association, organized for the sole purpose of protecting the interests of the railroad corporations. Every time you go up for a change in your schedule governing the rate of pay, etc., you are required to combat against the centralization of interests represented by these general managers, for it has been demonstrated time and again that they aid one another in all ways possible for them to do so. In view of these facts it is conclusively proven that it is absolutely necessary that we merge our interests if we expect to cope with these men and get for the firemen of this country a reasonable and just compensation for the work they are required to perform.

At the present time we have represented on the roll of membership of the association twenty-nine lines of railway, and we would like to have every system of railway in the United States, Canada and Mexico identified with the movement before the next annual meeting. We can do this if the rank and file of the membership will wake up to the importance attached to this work. We want you to watch the columns of the Magazine for information regarding this work, as it is our intention to have articles appear from time to time that will acquaint you more fully with the objects and aims of the association.

Our next annual meeting promises to be the best in the history of the organization and we hope that you will become sufficiently interested in the good work to have a representative present.

We also request that the Joint Boards who have not yet filed a copy of their schedule with the secretary-treasurer of the association would do so at their earliest convenience.

Sincerely and fraternally yours,

WALTER D. MOORE,
Secretary-Treasurer General Chairmen's Association.

* * *

Sparks.

Proclaim your membership in the only live, progressive and up-to-date organization of locomotive enginemen on the North American continent by displaying on the lapel of your coat one of the official emblematic buttons of the B. of L. F. and E.

We no longer have to disappoint our members by saying the "Blue Book" (supplement to the August issue) is out of print, as we have made arrangements to supply them in any quantity that may meet the requirements of subordinate lodges. The "Blue Book" has created quite a stirring interest and as it sets forth incontrovertible facts, it is very much in demand.

Those who have not yet purchased a copy of the "Catechism of the Electric Headlight" should do so at once, or they may regret it later on, for the supply is getting scarce and there is no question but what it is the best book on the

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subject now on the market. Study and gain promotion. Get into the band wagon. The price of this valuable little book is only fifty cents a copy. Write John F. McNamee, Editor and Manager, 806-807 Traction Terminal building, Indianapolis Ind., for particulars, and he will tell you all about it; send in the fifty cents and he will send you the book by first mail.

The possessor of one of the official emblematic buttons of the B. of L. F. and E. has something to be proud of. The design is distinctive and appropriate, and attracts much favorable comment. The price is one dollar. Orders should be placed through the secretary or other officer of your lodge.

We have had numerous requests from brothers wishing to be supplied with additional copies of the August supplement, the "Blue Book," and to those still desiring them we wish to announce that we have replenished the stock and can now supply them upon application to Bro. John F. McNamee, Editor and Manager, 806-7 Traction Terminal building, Indianapolis, Ind. We will send not more than two each to individual members desiring them. Large quantities must be ordered through lodge secretaries.

Remember that the advertisements are carried in the Magazine for your benefit. If you read them regularly every month they will undoubtedly keep you posted on market values and make it possible for you to get best value for your money in purchasing those things that you have to buy, and that is the principal reason why the advertisements appear in the Magazine from month to month.

The best Brotherhood man is he who reads and thinks for himself, attends lodge meetings regularly and is actively interested in his own welfare; no need watching him, he is able to care for himself. Those who are inclined to be drones should try to benefit from his example.

A brother, writing from down in Mississippi, complains bitterly of the seeming indifference displayed by the members of his lodge in not attending meetings regularly. It is to be regretted that some of our Brothers are apparently so indifferent in this all-important particular. Every member should feel that the success of the Brotherhood depends on his own personal effort and should always bear in mind that the order is no stronger than its individual members make it. Members who are careless about attending lodge meetings do an injustice to themselves and their loved ones, for the Brotherhood is their protection. Brothers, be true to your obligation and to the duty you owe those dependent on you. Attend your lodge meetings as regularly as possible and make your presence felt by the good you can accomplish.

Any one desiring to secure back numbers of the Magazine will do well to correspond with Bro. F. C. Beindorf, 717 Blanchard street, Flat C, Seattle, Wash. He has a complete file from 1898 to 1907.

Bro. M. L. Houlihan, collector of Lodge 577, Galesburg, Ill., has submitted to us an excellently arranged loose leaf for collector's account book for local lodge accounts. It is so arranged as to provide the entire brotherhood history of the member, showing date of admission, street address, number and class of beneficiary certificate, and the accounts are shown in such a manner as to make it extremely simple yet thoroughly efficient.

So as to be able to supply our members with such additional copies of the ("Blue Book") supplement to the August issue of the Magazine as have been ordered, we decided to have an additional supply printed in order to meet the demand. We are prepared to supply them in any reasonable numbers to subordinate lodges that may desire them, and to individuals not to exceed two each.

We have received an anonymous communication over the signature "Kindly answer and oblige, A Subscriber." The letter was mailed at San Francisco, August 16th, and contains questions concerning time card rules. If the writer will acknowledge the authorship of the letter we will be pleased to give it attention, but until we know the name of

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the author—not necessarily for publication—we can not do so.

On one point you can rest assured, and that is, if you wish to be posted on the workings and parts of the modern headlight you must study it. The knowledge will not come to you voluntarily. We have the acknowledged standard authority on that appliance in our Catechism of the Electric Headlight. This valuable little book sells at fifty cents per copy and may be had by forwarding that amount to John F. McNamee, Editor and Manager, 806-7 Traction Terminal building, Indianapolis.

On account of so many changes in the office of treasurers of subordinate lodges, the Grand Lodge is experiencing the same difficulties regarding the remittances for Joint Protective Board assessments as was experienced during the months of January, February and March of this year, and in order to acquaint the new treasurers with the method concerning the forwarding of Joint Protective Board remittances to the Grand Lodge, we are herewith reproducing a part of the article on the above, which appeared in the April Magazine:

Remitting Joint Protective Board Assessments.

Again treasurers are requested to not send Joint Protective Board money in the same remittance with money for the Grand Lodge. Letters have been written, circulars have been issued and "bulletins" have been published on this subject, yet treasurers continue to tie up the money of their lodges with money of their Joint Protective Boards.

The Grand Secretary and Treasurer deposits all remittances in the bank in the exact form in which they are received. Postoffice money orders, express money orders, bank drafts and cash are delivered to the bank. The bank "cashes" these orders and drafts and places the amount deposited to the credit of the Brotherhood. The Brotherhood's money is kept in one bank and the money belonging to the Joint Protective Boards is deposited in another bank. When a treasurer sends a draft for $100 and says that $50 is for beneficiary assessments and $50 is for the Joint Protective Board assessments the Grand Secretary and Treasurer is obliged to return the draft for $100 to the treasurer and request him to please send two drafts of $50 each in order that same can be receipted for. This causes a delay in placing the amounts where they properly belong.

Communications have been received from the treasurers whose lodges have been notified of their delinquency for beneficiary assessment, to the effect that they have received no official notice of said assessment and therefore were not aware of such an assessment having been levied. For the benefit of the treasurers of all lodges, Section No. 80 is herewith given below, and all treasurers will note that the assessment notice printed in the Magazine is the official notice to treasurers of such assessment.

Assessments—Notice of.

Section 80. Notice of all assessments levied or made under the provisions pertaining to the Beneficiary Department shall be published in the Brotherhood of Locomotive Firemen and Enginemen's Magazine, and whenever an assessment is not required, notice to that effect shall likewise be published.

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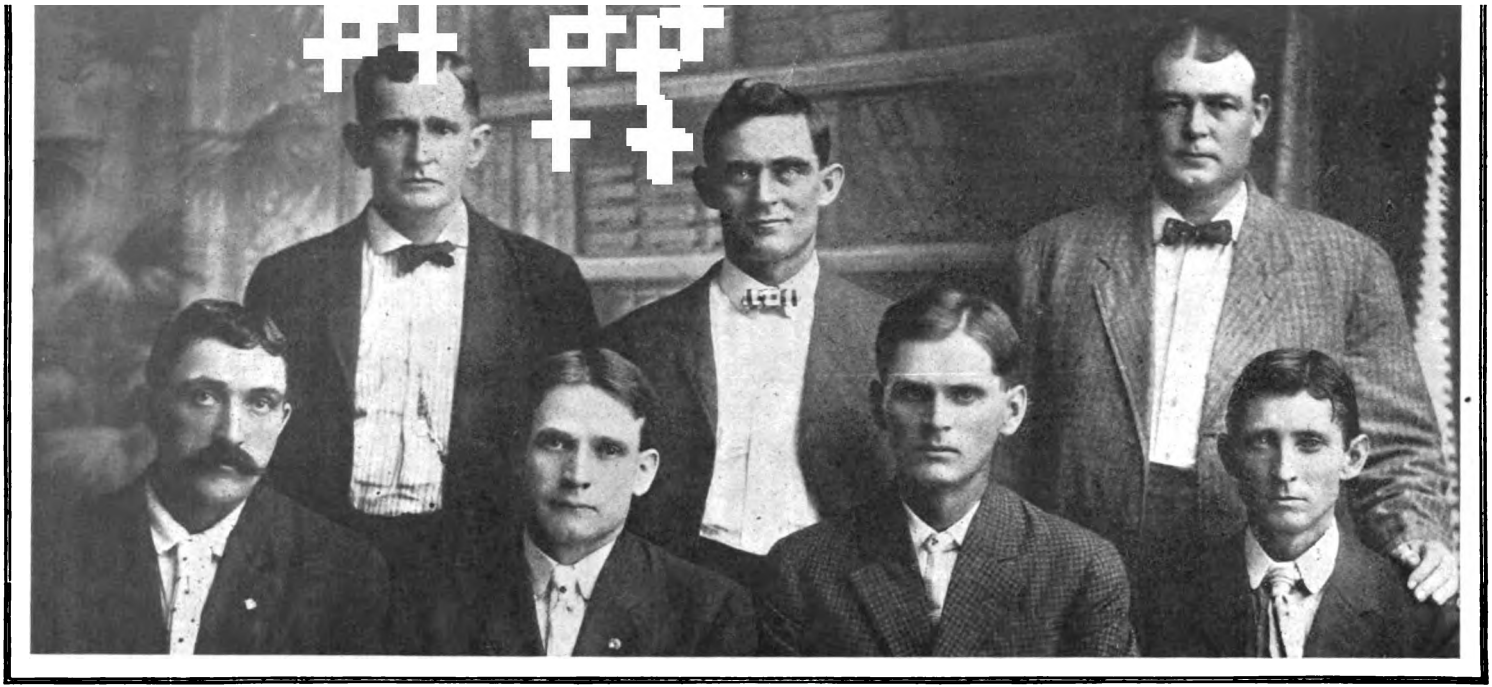

M. W. Curry, 492 — E. O. Johnson, 8, Sec.-Treas. — J. B. Duncan, 24

C. Bestgen, 78, Vice-Chairman — Walter D. Moore, 78, Chairman — T. H. Taylor, 422 — J. H. Burford, 164

JOINT PROTECTIVE BOARD, MISSOURI, KANSAS & TEXAS RAILWAY SYSTEM

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Forum

Perfidy of a Labor (?) Organization.

After reading the insolent literature issued by the Grand Chief of the B. of L. E., antagonistic to the welfare of our own Brotherhood, I cannot refrain from having something to say on the subject.

Whenever the executive of a labor organization stoops to deceit, either by professed inference or innuendo, in order to blast the reputation of a sister organization, and leave the false impression that the order to which he belongs has loaned another Brotherhood any sum of money which was not returned, and knowing at the time of making such statement that it was given out for the purpose of deceiving the people and prejudicing the public mind, he should lose the respect of his associates and stand branded as a traitor to the cause of organized labor. Such is the position the Grand Chief Engineer of the B. of L. E. occupies today with reference to the loan made by the B. of L. E. to the B. of L. F. and E. during the C., B. & Q. strike, and which the latter organization paid back promptly.

We recognize the fact that this deceptive statement was made to misrepresent and injure our own organization and also to induce our lukewarm engineer members to desert the old ship and join the B. of L. E. This stigma of dishonesty which Stone sought to cast upon the Brotherhood of Locomotive Firemen and Enginemen has prevented many joining his celebrated band of strike breakers who might otherwise have become members of it. However, the jolly band of "wheel turners" are not following tactics which are calculated to infatuate honest-minded men with their stability in the labor world. It certainly, under the present regime, is a grand, brotherly (?) organization—one which instead of nurturing the flush of honest manhood has sent the blush of shame to the cheeks of many of its honest thinking members. For five years past I have been following the calling of an engineer and have been vainly importuned to join the B. of L. E., but had I been one of the company of that craft when the members of the B. of L. F. and E. were striking, and Stone and his satellites had ordered me or tried to induce me to scab by taking the place of a member of the B. of L. F. and E., I should have torn the emblem of that order from my breast, consigned it to the dirt and trampled it in the mire. But then, after what has happened, a man with the slightest pretense to entertaining union labor principles could never affiliate with an organization that would countenance the stooping down and taking the bread and butter from the mouths of the families of a sister organization which was merely standing out for its rights.

No more defiling prostitution of the great principles of organized labor could be conceived of than that to which, through the scaly tactics of the B. of L. E., they have been subjected during the trouble on the S. P. and preparatory to the anticipated trouble on the Bangor & Aroostook railroads. Verily its name should be changed from the Brotherhood of Locomotive Engineers to that of the A. of W. T. and S. B.—meaning Association of Wheel Turners and Strike Breakers—a most appropriate appellation for an organization following its tactics.

Now a word to our engineer members: Boys, read carefully the supplement to the August issue, reflect upon the course that the B. of L. E. has pursued since you have become acquainted with labor matters and have been an active member of your own Brotherhood, and then you will stand loyally by the Brotherhood that shielded you in your railroad infancy, upheld you when in trouble, educated you from a green railroad man and placed you safely on the much coveted right hand side of the cab, and all the time extended over you a strong arm that protected both yourself and your family in time of danger and in sickness, accident or death. It has played the part that a foster mother plays when she takes the infant, watches over it during sickness, smoothes its little mental ruffles and guides its feet along the pathway of life until maturity is reached. Now then, brothers, just think of the action of such a child who, when grown,

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would leave that foster parent which has always taught it cleanliness of character and body and educated and cared for it in every way, and go to abide with strangers hostile to her—strangers that are apparently unable to distinguish between honor and principle on the one hand and inconsistency and degradation on the other, and who have never turned a hand to help it through life, but rather looked upon it with scorn and contempt.

Brothers, that is just what a man does when he leaves the B. of L. F. and E. under present conditions and joins the B. of L. E. Usually when a person reaches maturity he is permitted to enjoy legal freedom, but supposing he voluntarily joins an organization which says you must not do as you wish in the matter of belonging to any other organization, but you must follow the dictates of our moss-covered intellects and withdraw from all others you may now belong to and join only such as we may designate. What sort of a man is he who will willingly, meekly and submissively subordinate his manhood to a compliance with the requirements of such insolent mandates? Particularly when to do so he must be guilty of an act of such ingratitude and inappreciation as withdrawing from such an organization as the B. of L. F. and E. Picture the attitude of a man in cowardly submission responding to such a proclamation of conditions. Yes, I will obey. I will leave the Brotherhood that has protected me all these years; I will abandon my interests in that Order; I will abandon my citizenship rights; I will bind myself to join no other organization; I will identify myself with the name of your Order which has dragged the grand word "Brotherhood" through the mire of scabism; I will—yes, I will leave my family if you say so, for great indeed is your munificence. In solemn reverence I bow before thee. O, most Worthy Grand Chief! What, brothers, can be the condition of a man's mind who, understanding the situation in its true light—viewing things as they really are—will join the B. of L. E. and leave the B. of L. F. and E.?

For myself I am an American citizen with a free and undisputed right to belong to any labor organization I choose and to hold membership in which I may be eligible, and never will I sign away such rights in order to gain membership in any order, particularly one that is desecrating the great principles of organized labor. I have been a member of the Brotherhood of Locomotive Firemen and Enginemen many years, and so long as I retain my normal reasoning powers I shall stay by the good old ship, and nothing short of insanity will drive me into the ranks of any order whose actuating motives are chiefly based on hostility towards a sister organization. There are many cases where subdivisions have offered to pay the initiation fees of young runners in order to entice them within the fold. Permit me to say that when an organization has become so demoralized that it has to thus purchase its membership, its days are numbered, as disgust for such unmanly and questionable practices will build a barrier around it that will isolate it as surely as day follows night.

So much has been said concerning the perfidy of the B. of L. E. in the C., B. & Q., S. P. and Bangor & Aroostook troubles that nothing need be added to it to demonstrate its real character. We have seen the firemen giving up their jobs to help the B. of L. E., and the latter holding out their hands in supplication for the jobs vacated by the former in order to assert their rights. What a beautiful (?) picture of manly reciprocity! When Patrick Henry was confronted with such treachery it is no wonder he exclaimed, "Give me liberty or give me death!"

MEMBER 302.

* * *

As Regards Consolidation.

Being a member of that noble organization, the B. of L. F. and E., although out of railway service for over three years, but a constant reader of our faithful Magazine, have carefully followed with deep regret the relations existing between this organization and the B. of L. E. And I am really sorry for the thousands of its members who, notwithstanding the undesirable identity their membership in that order attaches to them, are worthy in every respect to be called "Brothers."

The time for which the railway companies have eagerly looked is now at hand, for it was said by one of the magnates that as long as he could keep more than one order in engine service he was satisfied, as they would fight each other and thus help the company. One of our

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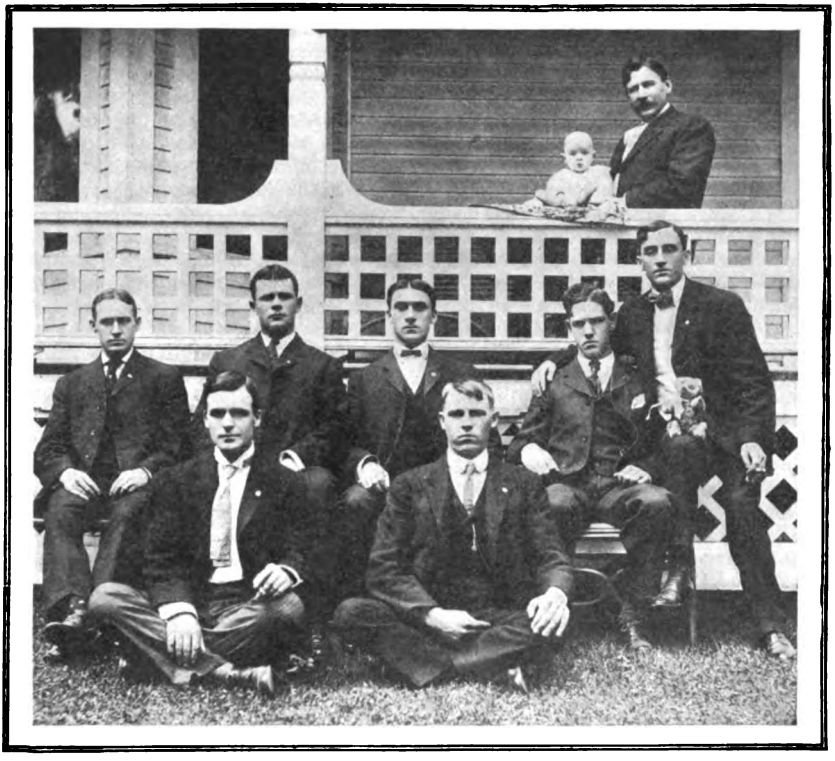
brothers asks why can not the question of consolidation of the two orders be submitted to a referendum vote? This brother must be congratulated upon his charity to overlook their many transgressions and the laws antagonistic to our order which have been enacted by the delegates of the B. of L. E. during its past conventions. Again I will ask, is this brother's charity so strong as to extend his hand of welcome to the gentlemen who were so kind as to give their services to the Southern Pacific Company during the recent trouble? If so, his charity is beyond human comprehension. A scab who has accepted his position in order to satisfy the hunger of loved ones may be forgiven, as in ten cases out of twenty he does not realize the enormity of his transgression. But these men who are so loyal to their superior officers in railroad service, and forgetful of every law of decency and morality, as to deliberately fill positions long ago vacated by themselves, in order to defeat a noble craft to which they probably once belonged, have no right to ever ask to become our brother members again, and I for one would never vote in favor of admitting such individuals to associate with us in the same order as long as I live.



P. H. Traynor, Chairman — E. R. Gorman — W. M. Haley, Sec.-Treas. — F. J. Reilly — J. Scanlon

F. F. McManus — C. M. Sjaholm

JOINT PROTECTIVE BOARD, C., ST. P. M., & O. RY., WITH THE GRAND MASTER AND JOHN J., JR., AS GUESTS

I have been a member of the B. of L. F. and E. for eight years and a half and after becoming a member have with pleasant anticipation looked forward to the day when I also could belong to the other order. But behold, its constitution says that I must leave the B. of L. F. and E. in order to belong to them. This

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has decided my course and I made no hesitation in giving my views upon this question long before I was eligible to join their ranks, for which reason I was never asked to do so, although a small percentage of my comrades, fearful of their future, took that step, not because they wanted to, but because of lack of manhood to uphold the noble principle of independence for which the flag of this country stands, and today, ashamed to right the wrong then committed, they are willing to uphold their order for the same reason.

From all accounts, it appears to me as though that august gentleman, "Mr. Stone," were mentally unbalanced. I would, indeed, like to see a recent likeness of himself and some of his assistants. Of course, as long as he remains in executive authority, we cannot hope to improve the situation, for the weapons they use against us we can never use in our defense (I mean to scab) and that would be the only means to bring them to a halt, since they do not only threaten to scab, but have actually done so and made agreements to do so in future with at least one company, that of the Bangor & Aroostook. Let them have their way. They are only heaping coals on their heads. We have a record to be proud of, brothers, and let us keep it. "Every dog has its day." So there is lots of hope for us, and maybe when next their (the B. of L. E.) convention assembles, Mr. Stone will hear a thing or two that will not only cause him to retire from office, but will also make him an ex-member. There are still many noble souls in the ranks of the B. of L. E.—men of good principle and opposed to Stone's tactics. They realize that there is hard work ahead of them to rebuild the order which is now, as a result of his leadership, trembling to its foundations. I sincerely hope they will succeeed in making a labor organization out of it. in the real sense of the term, and this hope springs from my love for that peace, harmony and co-operation so essential to the well-being of both orders.

J. C. MUECKE.

An Aggravated Case of Imposition.

On the morning of August 20, 1907, a woman giving her name as Mrs. W. J. Garsen, claiming to be the widow of a deceased member of the Brotherhood of Locomotive Firemen and Enginemen, and being in possesson of an up-to-date O. R. C. Division Card, came to Grand Junction, and on the strength of this showing sought relief in the shape of transportation to Ogden, Utah. She also had a letter supposedly emanating from the J. P. B. of the Coast Lines of the S. P., introducing a man claiming to be her husband, to the Los Angeles lodge, as well, also, as a newspaper clipping showing that her husband had died. The brother to whom this party applied for relief hunted up the masters of Lodges 475 and 594, and after having a talk with her they decided to give her twenty dollars, although the fare was only in the neighborhood of $13.00. Subsequently it was learned that she had tried to secure money from the engineers on the same pretenses, but failed. This seems to be her mode of obtaining a living, and we make this statement so that members in other localities may be prepared for her when she shows up and seeks to secure aid from other lodges.

J. A. BARBOUR,
Master 475.

W. A. STEVENS,
Secretary 475.

An Echo from the Rocky Mountains.

To the Editor of the Magazine—

I hope that every brother has read the August issue of the Magazine and the supplement thereto, containing the "facts in the case." It seems that every member of the B. of L. E. that one meets can tell what "Stone said," but ask a fireman about some current topic and many of them will say: "Why, I haven't read my Magazine yet." They wait for some one to tell them about it when they could easily have read every word, and had a better understanding of it thereby. Brothers! the Magazine is our official paper, and if you would keep posted you can be prepared at all times to challenge any false statement, and at the same time have the satisfaction of knowing where to tell a member of the B. of L. E. to "head in" when he tells you what his Order (?) and Grand Chief have done.

Our watchword should be KEEP POSTED, and the best way to do it is to read. Don't wait for some brother to tell you what he has read, but read for yourself. On the division where I have been working (having since resigned) the mem-

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bers of our sister organization are using every means at their command to influence our engineer members to join their ranks, even going so far as to tell one brother that he would not be required to withdraw his membership from our lodge. In another instance they offered to admit one free, etc., and one of their number, who, at one time, was one of our most active members, and who at the present time is suffering from an overdose of big head, told a brother that had been running but a short time that if he expected to run an engine on the ——— division, he had *better* put in his application for membership in the B. of L. E. Such tactics as these are indeed low and despicable, the last mentioned being nothing short of an insult, and an expression which cannot possibly reflect any credit upon the organization of which he is a member.

Brothers, ours is a Brotherhood of Firemen and Enginemen, and when one of their members approaches you with an application, to try and induce you to leave the "Tried and True," you should refuse, and at the same time extend to him a cordial invitation to return to the fold—the order that made him a locomotive engineer.

Their Order is compelled to seek recruits amongst the members of our Brotherhood, notwithstanding which fact they freely misrepresent things to suit their own purposes, mistreat us as a labor organization, and after all they can do against us, they still have the impudence to approach an honorable man, a member of our Order, and ask him to join them.

Brother, do you think you could join Farley's bunch of strike breakers and feel like a man? You don't think so. Haven't the B. of L. E. people shown themselves to be no better than Farley's crowd? I believe that their Grand Chief and Farley would compare very favorably. There are some excellent men members of that Order and they should not be condemned for the actions of their officials; some have joined it in the belief that they should support the Order that claims to represent engineers exclusively. It is to be hoped, however, that they will soon come to a realization of their position and seek membership where they belong. Has it not been amply demonstrated that our Brotherhood can secure adequate protection for all its members? On the division of which I write, the management recently reinstated a young runner for us, although a majority of the engineers on that division were members of the Big E.

MEMBER.

* * *

Brotherhood Prosperity in Altoona and Vicinity.

A Union Meeting and a Union Picnic are two events of comparatively recent occurrence standing to the credit of Altoona Lodge No. 287, which are preeminently entitled to special mention, not only because of the brilliant success attending each of them, but as well on account of the general interest attaching to them by virtue of the many lodges in that section of the country represented on each occasion.

Being from a state where Brotherhood affairs, while prosperous and successful, are not yet up to that standard which can be attained only as a result of untiring effort on the part of each individual member, I am in all the better position to recognize and appreciate the magnificent results in behalf of our Order and in support of its principles that are being accomplished by 287 and other lodges within a radius of three or four hundred miles from Altoona. These lodges are strongly suggestive of families on the warmest terms of friendship. They love to "neighbor" and visit back and forth. Never does an event of special interest take place under the auspices of one lodge but what a goodly representation from all other lodges in that particular territory is present, their members being as active in working for the success of the occasion as though it were their own. Never in my life have I seen a more pronounced harmony and a more genuine sentiment of true fraternalism, or a more vigorous determination to stand by noble principles and high ideals on the part of any body of men, as is shown by the members of the B. of L. F. and E. in that section of the country. The intensity of interest displayed in Brotherhood affairs by these brothers is such as to demonstrate a full realization on their part of the fact that upon a healthy condition of organization amongst men having common interests and engaged in a common occupation depends so much their success in life and consequently the well-being and comfort of their families and themselves.

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The work incident to holding Union Meetings and other "union" events has been by them so systematized as to have become almost an art. On such occasions everything moves like clock work. The annihilation of time and space by the perfection to which travel has attained in that section contributes materially to the success of their many gatherings and constitutes an advantage which is certainly availed of by them to the fullest degree.

What I have said in this particular relative to the Brotherhood members is equally applicable to the sisters constituting the membership of the Ladies Society in that district; constantly working hand in hand with the various lodges, always ready and active in rendering every assistance that is calculated to insure success to the various events given under their auspices, these subordinate lodges of the Ladies Society are certainly attaining to a degree unsurpassed by any other ladies' organization, the noble purposes for the accomplishment of which they are banded together. Untiring in their efforts and regardless of any self-sacrifice that may be involved, they work early and late in our Order's household, giving that assistance and encouragement to the Brotherhood lodges which in the individual family it is the mission of the wife and mother to render.

The lodges in this vicinity have attained to such a degree of proficiency in the real work of the Brotherhood as to make one's heart throb responsive to the great principles of protection, charity, sobriety and industry as they can be here seen exemplified in such a high stage of development, if not of perfection itself. But it is Altoona Lodge and its work to which I particularly wish to refer, and as I have no desire to speak by comparisons, my reference thereto must not be taken as a criticism of any other lodge, but rather as being impelled by an experience which inspires me to urge emulation where such conditions of proficiency do not prevail.

The two events which I desire to mention, and in the pleasures of which I participated, viz., the Union Meeting and the Union Picnic, occurred some weeks apart, the latter taking place August 20th. The Union Meeting was one of the most enthusiastic and successful it has ever been my good fortune to attend. Over 300 members greeted the Grand Officers as they entered the lodge room. One of the purposes for which these brothers were assembled was to assist in the initiation of forty-six candidates who were ready to take their place amongst the "tried and true." Let me digress sufficiently in this particular to explain that on the Pennsylvania Lines East of Pittsburg firemen do not, as a firmly established and carefully observed rule, remain outside the Brotherhood after the necessary time required for them to become eligible to membership has expired. The Brotherhood's influence for good and the perfect condition of organization which characterizes the Order on that system, together with the watchful care ever exercised by its members to see that new firemen are never neglected in the matter of being supplied with applications at the proper time and fully informed as to the advantages of the organization, has resulted in classes consisting of scores of applicants knocking at its door for admission with periodical regularity as the time comes to hand when the laws of the organization will permit them to enter. Forty-six such men were initiated on the occasion to which I refer, and such an event, fraught as it was wth impressive ceremony, interspersed with deeply interesting and entertaining incidents constituting features of the initiation I have never in my life before witnessed, although I have been informed it is an experience of comparatively frequent occurrence in 287.

For two days a session in the afternoon followed one in the morning, the attendance at each being such as to put the seating capacity of the spacious lodge room to a severe test. The sessions from beginning to end were marked by an interest deep and intense, and true and warm fraternal fellowship mingled at times with that mirth and enthusiasm characteristic of assemblages of honest men with light and brave hearts and clear consciences. One point which I observed with much clearness was the fact that No. 287 is supplied with initiation apparatus calculated to forcibly impress the candidate and imprint on his mind rather indelibly the lesson taught him on entering the fold of the "Tried and True."

In the evening of the second day a beautiful entertainment was given under the auspices of the Ladies Society—an event devoted entirely to pleasure, the first number on the program being a cake

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walk. Bro. Tom Yost of Harrisburg Lodge No. 673 winning the cake. Following this, addresses appropriate to the occasion were delivered by Grand Lodge officers and members, and a most entertaining and highly efficient musical program was then rendered by the children of the members present, being also participated in by young ladies—wives and daughters and sweethearts of our members. The next day was almost an hour old when the brothers and sisters separated for their homes, carrying with them the happy memories of the occasion and the pleasure incident to new friendships made and old ones renewed.

The membership of 287 has reached and passed the 600 mark, being now about 620. Of this number a little over 300 are engineers, and the proportion of the men of the right side is being constantly increased by promotions as well as by admissions from the ranks of the B. of L. E., this meaning, of course, that owing to the narrow and proscriptive laws of that organization, those B. of L. E. men thus seeing the true light of the B. of L. F. and E.'s progress and deciding to follow it, must surrender their membership in the "big E"—a step they gladly take in preference to remaining out of our Brotherhood. Altoona lodge has a record of but three final withdrawals during the past two years and a half, and not only these men, but many times that number, have since returned to the true fold. All of the inducements, blandishments and false pretenses of the B. of L. E. are unavailing in tempting any of the boys of Altoona lodge and of other lodges in that section, to think for a moment of abandoning the good old ship to go aboard a craft that is fast falling to decay. On the contrary, the magnificent condition of the organization on the Pennsylvania lines, its success in negotiating with the officials and the consequent good feeling which characterizes the relations existing between its members and their employers is of itself sufficient to show every thinking man—every man having the intellect and capability requisite to success in engine service—to which organization it is to his interests to belong.

Bro. Charles A. Wilson is the Vice Grand Master in charge of the district embracing this section of the country, and it is no exaggeration to say that Napoleon himself was never more loved by the men whom he led than is Brother Wilson by the membership of our Order in this district, and I might add, incidentally, by all of our brothers, as well, with whom he comes in contact outside of its confines. True, honest, sincere and untiring in his work, he labors day after day, and I might add, night after night, having but one object in view, viz., the well-being of the Brotherhood and its attainment to the highest possible standard of success and perfection in carrying out its grand mission on earth. In Brother Wilson's work self-comfort and self-interest is subordinated absolutely to the advancement of the interests of the Brotherhood, which is proud to number him in its list of Grand Officers.

To make mention of all of the officers and members of Lodge 287 that are entitled to special recognition on account of faithful services, and earnest and unremitting effort put forth in behalf of the Brotherhood in general, and of their lodge in particular, would require more space and time than is at my disposal, but there is one—an old war horse—without referring to whom I cannot close this communication—one whose constant care is the welfare of his lodge, whose leisure moments are devoted to its work, a man zealous and vigilant in advancing the great cause in every particular, whose unfailing presence in the homes of sick and distressed members always brings aid and consolation, and whose vigorous defense of our Brotherhood and its principles has constituted a strong factor in maintaining its supremacy wherever his influence is felt. Such a man is Bro. Frank A. Davis, treasurer of Lodge 287, whose noble qualities of head and heart are so fully recognized and thoroughly appreciated by his fellow lodge members that for years he has been honored by them with the position of delegate and other offices of great responsibility and trust.

Of the second event, viz., the Union Picnic, I will now speak. I would not refer to a picnic in a communication to the Magazine, understanding that events of a purely *local* nature are, by a law enacted at the Milwaukee convention, excluded from its columns, but inasmuch as the gathering to which I am about to refer is, on account of the number of lodges interested, of widespread interest and productive of effects that are *generally* beneficial, I feel that in making reference to it I am not transgressing.

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Events of this character under the auspices of our Brotherhood in that part of the country attract such general public attention as to interest the people at large, and probably the best description of it I can give is that along the lines appearing in the Altoona papers, as follows:

Never before has there been a more successful picnic held than that which was yesterday given under the auspices of the Brotherhood of Locomotive Firemen and Enginemen at Port Royal. Fully five thousand members, with their families and friends, enjoyed the pleasures of the occasion as per the excellent program arranged by a wide-awake committee.

Altoona was represented by about one-fifth of the total number, the balance consisting of delegations from Harrisburg, Baltimore, Pittsburg and other surrounding cities. During the day an elaborate program was rendered and much spirit and enthusiasm was evinced by the assembled railroad men and their wives and children in contesting for the prizes offered. One of the principal attractions of the day was the presence of first Vice Grand Master C. A. Wilson, of Phillipsburg, N. J. During the afternoon several of the railroad men secured a donkey and cart and Mr. Wilson was given a ride through the crowd, and then, being introduced, delivered a most interesting, humorous and entertaining address.

The Altoona and Harrisburg railroad men were rivals in a baseball game played during the forenoon. The Altoonans showed that their skill at the bat was better than that of their opponents, for fifteen runs were tallied for them, while the Harrisburgers had but one run.

With honors won from the Harrisburg team, the Altoonans went down to defeat at the hands of the Port Royal team of railroad men, the score being 10 to 5. In the fat men's race, D. H. Klineyoung, of Harrisburg, crossed the line first, followed by J. L. Groninger, of Port Royal, second; and E. C. Yetter, of Harrisburg, third.

The wheelbarrow and stake race for ladies was an interesting contest, Mrs. H. C. Baker, of Harrisburg, winning; Mrs. A. B. Homan, of Altoona, was second, and Mrs. W. W. Roath, of Harrisburg, third.

The shoe race for boys between 8 and 12 years was won by John Yoeder, of Tuscarora; Loudon Leaward, of Port Royal, was second; John Allen, of Mifflin, third, and R. M. Smith, of Altoona, fourth.

The foot race for girls between the ages of 10 and 15 years was won by Naoma Redmond, of Harrisburg; Eva Smith, of Altoona, second; Rosella Taylor, of Altoona, third, and Ruth Groninger, of Port Royal, fourth.

In the girls' race between 6 and 10 years, Jeannette Jenkins, of Newport, was the winner; Irene Kepner, of Altoona, second; Annie Reynolds, of Harrisburg, third, and Hazel Borring, fourth.

The sack race for boys between 18 and 21 years was won by Robert Banks, of Mifflin; Edward Taylor, of East Altoona, second; John Kreps, of Huntingdon, third, and James Morning, of Port Royal, fourth.

In the wheelbarrow and stake race for women over twenty-one years Mrs. A. E. Williamson, of Harrisburg, was the winner, with Mrs. W. E. Powell, of Altoona, second; Mrs. W. W. Roath, of Harrisburg, third; Mrs. F. A. Davis, of Altoona, fourth, and Mrs. Shaeffer, of Altoona, fifth.

Many boys from 10 to 15 years were entered in the race, and Robert Burns of Mifflin, was the winner; James Horning, of Port Royal, second; John Davis, of Altoona, third; R. Penny, of Port Royal, fourth, and Fred Brenholtz, of Tuscarora, fifth.

The foot race for boys between the ages of 15 and 21 years was won by C. B. Redmond, of Harrisburg; C. F. Allen, of Altoona, second; A. F. Markley, of Altoona, third, and Barren Smith, of Altoona, fourth.

The race for men over 21 years was won by P. F. Books, of Altoona; G. F. McConnell, of Altoona, second; W. W. Roath, of Harrisburg, third; W. L. Zeiders, of Altoona, fourth; J. C. Peightal, of Harrisburg, fifth, and Mr. Geesey, of Harrisburg, sixth.

One of the features of the afternoon was a waltz, held in the pavilion at the picnic grounds. An orchestra from Harrisburg furnished the music. Mr. F. W. Barefoot and wife, and Mr. Harry Frank and wife, of Harrisburg, were the successful contestants.

The members of the picnic party did not forget the brethren who were compelled to work during the day, while they were enjoying themselves in the woods, a substantial purse being made up and distributed amongst the crews of the different trains. The picnic constituted a formidable lesson in temperance and demonstrated that amongst railroad men the "flowing bowl" or the "bumper fair" is by no means essential to genuine enjoyment, for it was most edifying to note that in that vast assemblage there was not a man to be seen in the slightest degree under the influence of liquor or giving any evidence of having indulged at all in the use of intoxicating beverages.

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In this particular railroad men are setting a noble example. Thus we see how these brothers keep up the true Brotherhood's spirit, using pleasure itself as a medium for cementing fraternal ties and advancing the interests of the organization.

WESTERN MEMBER.

Duluth Union Meeting.

On the evening of August 24, 1907, Duluth, Minn., was the scene of a very successful union meeting, held under the auspices of Lodge 519. The meeting was well attended by members of the lodges in Duluth and those located in the nearby towns.

The Grand Lodge was represented by our Worthy Grand Master, Bro. John J. Hannahan, and Vice Grand Masters Timothy Shea and E. A. Ball.

The meeting was presided over by Second Vice Grand Master Shea, who beautifully exemplified the secret work of the Brotherhood. All in attendance were deeply interested and the speakers were frequently interrupted by vociferous applause. Grand Master Hannahan, who made the principal speech of the evening, was well received. He eloquently dwelt upon the principles for which our Brotherhood stands, and in reviewing the history of the organization he showed very plainly where its platform was in the labor field. Every word that fell from his lips was caught with that eagerness which characterizes the intense feelings of those who know they are listening to new truths as well as those who enjoy the recitation of old ones. One of the most gratifying features of this meeting was that Brother Hannahan's audience was composed, for the greater part, of engineers, who are standing nobly and fearlessly by the colors of the old "tried and true," and they were all well pleased with the Grand Master's talk on the subject of our Brotherhood.

Brother Ball gave one of his characteristic speeches on Union Meetings, setting forth the benefits to be derived from frequent interchange of ideas by the members of the various lodges in different sections of the country, and it is safe to assert that every one present was convinced of the truth and wisdom of his words by the time he got through with his address. One brother, in fact, seemed to voice the sentiments of the entire meeting when he said: "No wonder we are so prosperous when we have leaders such as they are; men of rare ability and sterling worth."

The inner-man was well cared for—a bounteous repast having been served by the Ladies Societies of Duluth and Superior. Every one seems anxious for another meeting of the same kind, and if possible a little bigger. They are events that certainly count.

THOMAS BERRIGAN, 401.

Correspondence

LODGE 120—(*Member Syracuse, N. Y.*) On August 30, Lodge 120 held a joint meeting with Lodge 109 of the Ladies Society, and there was a large attendance from both the B. of L. F. and E. and the Ladies of 109. These joint meetings are of great benefit to the members of our organization, and if they do nothing else they are certainly an incentive for the members to get out on that occasion and become acquainted. The meeting in question was extremely interesting from start to finish, and it is hoped that our brothers will turn out for our regular meetings as they did on that occasion.

We have a good set of officers and there is nothing more encouraging to a lodge officer than to have the members turn out and give him their assistance in running the affairs of the Brotherhood in that particular lodge, and I hope, now that the warm weather is about over, that our members will turn out and fill the lodge room at every meeting; that is what strengthens our Brotherhood and gives encouragement to those to whom we look for advice and aid in times of trouble.

Let us remember that our Brotherhood is only what its membership makes

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it, and the better members we are the better will be our Brotherhood and the stronger the protection we will give the little ladies who are so faithful to us. Come to lodge often, brothers, and come in big numbers, so we can have some interesting meetings during the winter months. There is nothing that builds up a lodge better than a keen, active membership.

LODGE 296—(*Arthur Fuller, Superior, Wis.*) I have not seen anything in the Magazine for some time from Lodge 296, and I write to inform the brothers that we are still in the field and adding new members at every meeting. While our meetings are not as well attended as we could wish, yet when we take into consideration the fact that the boys are all busy and the members are scattered during the ore season we can realize that it would be impossible to have much better meetings until the season closes and the boys are where they can attend lodge meetings.

There was a successful union meeting held in Duluth August 24, and it was well attended by members of lodges in this vicinity, and one and all were repaid for their attendance by the eloquent addresses made by the Grand Master and Vice-Grand Masters Shea and Ball, who were also with us. When we saw what had been done on such short notice in the way of getting the members together, we regretted that the committees did not have more time in which to send out notices.

As it is from exchange of ideas that we learn what others think, these meetings are doing wondrous work amongst our membership, and it is to be hoped that the lodges will get together oftener and enjoy the pleasure of each other's company.

The boys were delighted with the manner in which everything was carried out and all look forward to another such meeting. In conclusion, permit me to admonish our young runners to look before they leap, and they will assuredly not leap out of the old "Tried and True."

LODGE 577—(*Member, Chicago, Ill.*) We seldom if ever find anything in the columns of the Magazine concerning Lodge 577. We are still alive and our membership is increasing rapidly, but we suffer considerably from either indifference or inattention, as we do not seem to be able to induce our members to come to lodge meetings. Out of sixty or seventy members we seldom have more than seven or eight to do business with; just about enough to form a quorum, and that's all. Will some brother give us a little advice and a pointer or two how to get our membership out to meetings? We have a nice hall on Halstead and Fifty-fifth streets, and meet on the second and fourth Sunday of each month at 2:30 p. m., and all visiting brothers are cordially welcome.

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Official

Addresses Wanted.

Persons requiring the address or any information concerning another will please communicate with the Secretary of the lodge located nearest the residence of the person making such request. Upon receipt of a communication from the Secretary of such lodge requesting that a notice be published in the Magazine inquiring for such address or other information same will be complied with. However, the Magazine can not undertake the office of a collecting agency and must decline to lend itself to such purpose. The following requests have reached this office since the last issue. Information should be sent to the persons specified in the notice.

John P. Stewart.—Originally from Evanston, Ill. Employed at one time by the C., M. & St. P. Ry., and when last heard from was working on the Grand Trunk R. R. at Durand, Mich. He is about twenty-nine years of age and has an uncle by the name of Charles Pitz living at Williamston, Mich. There are some valuable papers for him if he will correspond with O. E. Wynoble, 728 Superior street, St. Paul, Minn.

George Elliott.—Formerly a member of the Brotherhood at Argentine, Kan., and last heard from at San Luis Potosi, Mexico; anyone knowing his present whereabouts will please notify Mr. J. M. Elliott, box 96, Monett, Mo.

H. M. Thurston.—Member of Lodge 96; was last heard from about June 1, 1907, from New Orleans, La. His description is: Weight, 250 pounds; eyes, blue; hair, light brown; he wore a dark gray suit with a black stripe in it; age, 35 years; he has a smooth shaven face. Anyone knowing his present whereabouts will please correspond with R. B. Russell, Collector of Lodge 96, 1710 Clark avenue, Wellsville, Ohio, or Mrs. H. M. Thurston, 1233 Main street, Wheeling, W. Va.

W. E. McGane, alias W. E. McClure.—Anyone knowing the whereabouts of this party will confer a favor upon Mrs. Mattie G. Fitzgerald, Ruffin, N. C., if they will advise her in the premises. He was firing the engine on which this lady's husband was killed, and she is extremely anxious to find him. Any brother knowing his whereabouts will please notify the lady, or call his attention to the fact that she desires to get into communication with him on particular business pertaining to the recent death of her husband.

A. Miller.—Was formerly a fireman on the Philadelphia and Reading Railway, and left Philadelphia on July 1, 1907. Any information relative to his whereabouts will be appreciated by M. Davis, 2559 East Somerset street, Philadelphia, Pa.

* * *

Lost Traveling Cards, Etc.

This office has been notified of the loss of the following traveling cards, receipts, etc., and the request is made that all members be on the lookout for them. Should they be discovered in the possession of persons not entitled to them they should be retained and forwarded to the owner or to the Secretary of the lodge which issued same:

Traveling card No. 13385, issued by Lodge 44 to Bro. Otto Rogge, was lost in Tucson on the night of August 17, 1907. Should anyone present same, the brothers will please take up and send to Bro. Rogge, general delivery, Tucson, Ariz.

Traveling card No. 11779 and receipts for quarter ending September 30, in favor of V. B. Perry, evidently went astray in the mails; should any brother learn of their whereabouts, please secure them and forward to the Secretary of Lodge 105, or to Bro. J. R. Latimer, master, at Dalhart, Texas.

Traveling card No. 18201 and quarterly receipts for past three quarters, belonging to Bro. Ed. Roat of Lodge 538, were lost in the vicinity of Adams and Dearborn streets, Chicago. Anyone finding same will please return them to Bro. G. J. Marquardt, secretary, 8021 Manistee street, South Chicago, Ill.

Bro. H. H. Battig, of Lodge 82, reports that on August 17, 1907, there was stolen from him his receipts for $9.75, $4.00 and $5.00, respectively, and that at the same time the parties took $520 in cash. A suitable reward will be paid by Bro. Battig to anyone who can give him information that will lead to the arrest

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of the perpetrator of the crime. Anyone learning anything concerning this matter will please advise Bro. Ed. E. Sheasgreen, secretary Lodge 82, the Iron Trail, Minneapolis, Minn.

Acknowledgments.

Mr. and Mrs. V. M. Shear of Danville, Ky., desire to extend thanks to the Brotherhood in general for the prompt settlement of the insurance claim of their son, and wish particularly to thank those brothers who accompanied the remains and bestowed attention and kindnesses upon them during their sad bereavement.

Mr. and Mrs. Cooper, the parents of our deceased brother, J. H. Cooper, desire to extend to the Brotherhood in general their profound thanks for the prompt manner in which his insurance was paid; also particularly do they wish to thank the officers and members of Lodge 426 for the several kindnesses and courtesies extended to them during their sad bereavement, as well, also, for the beautiful floral tributes which were proffered.

Bro. L. H. Bloom, of Lodge 381, desires to thank the Brotherhood in general for the prompt payment of his disability claim, and the members of 381 in particular, for the many kindnesses he received at their hands during his affliction and period of suffering.

The Home Account.

The following donations were received at the Home for Aged and Disabled Railway Employes for the month of August, 1907:

B. of L. F. and E. Lodges 52, $5; 115, $30; 145, $5; 162, $10; 261, $10; 274, $5; 282, $5; 300, $5; 432, $5; 576, $5; 601, $5; 621, $10.....	$100 00
L. S. to B. of L. F. and E. Lodges 23, $5; 35, $5; 43, $5; 83, $2; 96, $5; 101, $2; 107, $5; 109, $5; 134, $2; 135, $1; 142, $5; 160, $5; 195, $5; 207, $5; 214, $5..	62 00
O. R. C. Divisions.....	164 10
B. of R. T. Lodges.....	267 80
B. of L. E. Divisions.....	245 75
L. A. C. Divisions.....	88 40
L. A. T. Lodges.....	167 55
G. I. A. Divisions.....	61 50
James Costello, O. R. C. Div. 270	1 00
Alfred S. Lunt, B. of R. T. Lodge 456	1 00
W. M. Hulburd, O. R. C. Div. 298	1 00
Proceeds of a picnic given at the Home by Division 100, L. A. C.....	15 73
Rebate on freight.....	43 29
Grand Lodge, Ladies Auxiliary to the Brotherhood of Railroad Trainmen at five cents per member.....	855 75
Total	$2,074 84

Miscellaneous.—Twelve towels from L. A. T. Lodge 235.

Respectfully submitted,

JOHN O'KEEFE,
Sec. and Treas. R. R. M. H.

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Beneficiary Statement

OFFICE OF GRAND SECRETARY AND TREASURER,
PEORIA, ILL., September 1, 1907.

TO SUBORDINATE LODGES:

The following is a statement of receipts in the Beneficiary Department for the month of August, 1907:

RECEIPTS.

Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.
1	449 50	74	160 50	147	212 00	220	618 00	293	135 75	366	192 00	439	161 00	512	149 25	585	90 75	658	100 00
2	41 25	75	472 00	148	273 25	221	239 25	294	131 50	367	207 75	440	210 75	513	99 75	586	186 75	659	181 25
3	949 50	76	20 25	149	471 00	222	126 00	295	312 75	368	114 00	441	199 75	514	126 00	587	.....	660	108 75
4	277 50	77	409 50	150	351 25	223	249 00	296	299 25	369	176 50	442	.....	515	186 50	588	.....	661	8 50
5	324 75	78	167 25	151	118 50	224	82 75	297	241 50	370	48 00	443	401 00	516	159 75	589	62 25	662	61 00
6	397 75	79	63 00	152	272 00	225	97 50	298	174 50	371	.....	444	392 75	517	48 25	590	351 50	663	145 25
7	232 25	80	87 25	153	146 25	226	290 75	299	125 50	372	140 75	445	249 75	518	41 25	591	253 75	664	.....
8	499 75	81	125 50	154	153 25	227	.....	300	227 25	373	180 75	446	276 25	519	201 00	592	133 75	665	77 50
9	321 25	82	201 75	155	84 00	228	401 25	301	132 75	374	252 00	447	94 00	520	38 25	593	64 75	666	251 25
10	890 00	83	323 00	156	256 50	229	262 75	302	448 00	375	91 50	448	711 50	521	174 50	594	154 50	667	80 50
11	249 75	84	131 25	157	91 50	230	1079 00	303	102 75	376	.....	449	316 50	522	250 25	595	53 25	668	153 75
12	237 00	85	281 50	158	97 50	231	473 25	304	252 75	377	202 50	450	342 75	523	85 50	596	124 50	669	81 75
13	278 25	86	249 50	159	191 50	232	203 25	305	251 25	378	556 50	451	160 50	524	29 50	597	200 75	670	240 75
14	483 50	87	177 75	160	192 00	233	416 25	306	242 25	379	355 75	452	145 00	525	155 50	598	89 25	671	95 50
15	105 75	88	196 00	161	59 25	234	.....	307	375 50	380	68 25	453	51 75	526	45 75	599	94 75	672	105 50
16	483 50	89	44 25	162	493 75	235	234 75	308	62 75	381	399 00	454	171 75	527	118 50	600	163 00	673	831 00
17	206 50	90	99 75	163	206 50	236	480 00	309	329 50	382	316 50	455	380 50	528	....	601	276 00	674	33 00
18	171 00	91	318 50	164	90 25	237	398 00	310	274 25	383	208 00	456	159 25	529	165 75	602	177 00	675	.....
19	237 25	92	172 50	165	71 50	238	255 25	311	100 50	384	185 25	457	.....	530	98 25	603	115 25	676	.....
20	42 00	93	.....	166	440 75	239	78 25	312	190 25	385	81 75	458	63 75	531	109 00	604	.....	677	111 25
21	247 00	94	701 75	167	144 25	240	352 25	313	146 75	386	59 25	459	78 75	532	....	605	.....	678	69 25
22	107 25	95	59 50	168	240 75	241	.....	314	.....	387	78 00	460	90 00	533	121 50	606	30 25	679	96 25
23	90 25	96	412 25	169	400 00	242	304 75	315	193 00	388	252 00	461	118 50	534	244 00	607	73 75	680	65 25
24	367 75	97	402 00	170	207 00	243	129 75	316	215 50	389	115 25	462	207 50	535	194 50	608	176 50	681	142 00
25	.....	98	254 50	171	132 75	244	206 25	317	170 75	390	159 75	463	171 75	536	117 00	609	54 75	682	111 75
26	224 25	99	592 25	172	78 75	245	132 00	318	342 00	391	160 00	464	146 75	537	104 75	610	57 75	683	137 00
27	242 25	100	130 25	173	294 75	246	521 25	319	162 25	392	170 50	465	273 75	538	184 50	611	85 75	684	.....
28	173 50	101	453 00	174	701 75	247	375 25	320	72 75	393	219 75	466	138 25	539	258 00	612	98 50	685	89 50
29	104 50	102	160 25	175	370 75	248	318 00	321	124 75	394	24 75	467	105 00	540	..	613	38 25	686	36 00
30	177 25	103	59 00	176	180 00	249	164 50	322	87 75	395	132 00	468	30 00	541	172 25	614	302 00	687	84 50
31	132 00	104	179 25	177	195 25	250	192 25	323	39 75	396	229 25	469	132 00	542	204 75	615	108 75	688	63 00
32	171 25	105	145 00	178	215 00	251	336 00	324	144 75	397	83 75	470	241 75	543	280 50	616	63 00	689	124 25
33	.....	106	89 25	179	111 75	252	378 75	325	80 75	398	141 50	471	33 75	544	.....	617	140 50	690	77 25
34	200 50	107	249 25	180	9 00	253	252 75	326	197 00	399	111 00	472	416 75	545	102 00	618	86 00	691	25 50
35	130 00	108	391 25	181	59 75	254	111 50	327	374 75	400	199 25	473	68 75	546	.....	619	132 00	692	38 75
36	146 25	109	219 25	182	608 00	255	74 25	328	178 50	401	265 50	474	128 25	547	99 75	620	86 50	693	.....
37	187 00	110	168 00	183	248 50	256	.....	329	59 25	402	254 50	475	277 75	548	77 00	621	81 50	694	97 75
38	217 50	111	209 00	184	73 50	257	109 00	330	288 25	403	54 00	476	87 50	549	145 25	622	211 25	695	.....
39	130 25	112	68 25	185	96 00	258	55 00	331	173 50	404	109 00	477	414 75	550	.....	623	228 00	696	53 50
40	353 00	113	.....	186	86 50	259	95 50	332	121 50	405	226 50	478	186 50	551	203 25	624	.....	697	57 25
41	.....	114	58 50	187	122 75	260	250 00	333	290 50	406	82 50	479	90 25	552	207 00	625	90 75	698	129 75
42	39 00	115	125 50	188	434 25	261	.....	334	258 25	407	240 00	480	49 50	553	261 25	626	259 00	699	84 25
43	182 00	116	.....	189	254 75	262	303 75	335	47 25	408	227 50	481	227 00	554	103 50	627	79 50	700	42 00
44	275 75	117	120 75	190	59 25	263	190 75	336	101 25	409	217 00	482	150 00	555	103 50	628	90 75	701	163 25
45	.....	118	60 00	191	338 50	264	112 75	337	361 50	410	159 75	483	.....	556	67 50	629	33 50	702	.....
46	48 00	119	265 50	192	...	265	430 75	338	153 00	411	286 75	484	167 25	557	.....	630	147 25	703	70 50
47	281 00	120	218 00	193	115 75	266	299 25	339	107 25	412	184 75	485	891 00	558	193 50	631	99 00	704	138 75
48	376 00	121	317 00	194	449 50	267	115 50	340	127 00	413	37 50	486	99 00	559	110 50	632	49 50	705	62 25
49	.....	122	73 00	195	100 75	268	40 50	341	220 75	414	.....	487	.....	560	78 00	633	147 75	706	28 50
50	.....	123	326 25	196	.....	269	145 00	342	.....	415	159 00	488	69 75	561	185 25	634	218 75	707	61 75
51	171 00	124	153 00	197	90 00	270	279 25	343	.....	416	209 00	489	.....	562	378 75	635	141 00	708	82 50
52	339 50	125	57 75	198	409 25	271	124 75	344	161 00	417	79 50	490	284 75	563	240 00	636	51 75	709	52 75
53	122 25	126	152 50	199	187 50	272	60 00	345	193 75	418	221 25	491	60 00	564	228 00	637	.....	710	79 00
54	461 75	127	212 00	200	104 25	273	217 00	346	33 75	419	124 25	492	275 00	565	53 50	638	127 75	711	27 75
55	60 75	128	130 25	201	335 25	274	130 75	347	106 50	420	76 50	493	52 50	566	356 75	639	52 00	712	35 25
56	195 00	129	328 50	202	222 00	275	341 25	348	177 75	421	81 00	494	119 00	567	164 75	640	.....	713	71 25
57	526 75	130	463 00	203	331 25	276	224 00	349	351 75	422	73 50	495	54 25	568	161 50	641	118 25	714	16 50
58	230 50	131	40 00	204	266 75	277	132 75	350	108 50	423	51 25	496	176 00	569	165 50	642	.....	715	21 25
59	466 00	132	123 75	205	103 50	278	28 50	351	45 25	424	174 25	497	112 75	570	89 50	643	28 50	716	37 00
60	346 00	133	.....	206	99 75	279	93 75	352	84 25	425	204 50	498	249 00	571	199 00	644	98 75	717	55 50
61	137 25	134	111 75	207	306 50	280	105 25	353	172 50	426	272 75	499	41 25	572	.	645	71 00	718	31 50
62	108 00	135	193 75	208	80 25	281	206 00	354	242 25	427	45 50	500	117 00	573	177 00	646	295 50	719	.....
63	.....	136	60 00	209	.....	282	33 75	355	173 50	428	102 75	501	236 75	574	162 75	647	102 50	720	.....
64	247 25	137	123 25	210	84 00	283	117 75	356	210 25	429	126 75	502	230 50	575	81 00	648	40 50	731	18 00
65	198 75	138	356 75	211	274 25	284	700 75	357	83 25	430	132 75	503	172 00	576	69 75	649	39 75	722	.....
66	132 00	139	348 25	212	172 00	285	442 50	358	164 50	431	75 75	504	63 00	577	.	650	51 75	723	.....
67	144 75	140	404 50	213	197 25	286	156 25	359	...	432	228 00	505	.....	578	305 25	651	116 25	724	.....
68	119 50	141	663 25	214	502 00	287	1273 25	360	108 00	433	140 00	506	141 75	579	52 00	652	111 25	725	.....
69	75 00	142	227 25	215	429 75	288	106 75	361	136 50	434	208 00	507	141 00	580	.....	653	132 75	726	.....
70	216 75	143	297 25	216	129 75	289	236 75	362	87 75	435	172 25	508	305 50	581	89 50	654	81 25	727	.....
71	308 75	144	40 50	217	193 25	290	158 75	363	422 25	436	260 25	509	73 50	582	89 25	655	83 50	728	.....
72	333 75	145	212 00	218	253 50	291	96 00	364	268 50	437	40 50	510	190 25	583	.....	656	122 25	729	.....
73	299 75	146	294 50	219	297 00	29	48 00	365	55 50	438	126 25	511	229 25	584	.....	657	170 75	730	.....

Received during month of August $124,509.75

Respectfully submitted, W. S. CARTER, G. S. and T.

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Statement of Death and Disability Claims

PAID BY THE GRAND SECRETARY AND TREASURER, FROM JULY 31 TO AUGUST 31, 1907.

Claim No.	NAMES.	Lodge No.	Death or Disability.	Date.	Am't. of Ins.	Cause.
382	George E. Mansfield..	284	Death	June 1, 1907	$1,500	Peritonitis.
211	Victor L. Dynes.....	127	"	Mar. 27, "	1,500	Typhoid fever.
362	E. W. Flesher.....	33	Disability	Aug. 5, "	1,500	Paralysis.
377	Clyde Cahail.....	501	Death	June 3, "	1,000	Derailing of engine.
394	William West.....	312	"	May 18, "	1,500	Falling from engine.
595	William West.....	637	"	June 10, "	1,500	Run over by cars.
397	Albert C. Wall.....	494	"	May 4, "	1,000	Striking tell-tale post.
398	Paul J. Radke.....	443	"	June 13, "	1,500	Drowning.
399	Benjamin F. Miller...	673	"	" 14, "	1,500	Bright's disease.
401	Matthew J. Maher....	213	"	" 16, "	1,500	Collision.
402	William C. Cotton....	122	"	" 7, "	500	Heart disease.
403	Woodward A. Miller..	557	"	" 14, "	1,500	Collision.
407	Will D. Baldwin.....	242	"	" 21, "	1,500	Struck by train.
409	Vere Milbury	335	"	" 10, "	500	Typhoid fever.
410	Royal A. Gibbons.....	413	"	May 27, "	1,500	Derailing of engine.
412	Michael G. O'Brien...	59	"	June 19, "	1,500	Boiler explosion.
413	John W. Opeck.....	56	"	" 19, "	1,500	Run over by engine.
415	Garret Lowham.....	88	"	" 13, "	1,500	Crushed between engine and R. H.
416	John Meinta.....	623	Disability	May 27, "	1,500	Amputation of foot.
417	John C. Munkhoff....	27	Death	June 23, "	1,500	Appendicitis.
418	William Connelly....	60	Disability	July 31, "	1,000	Consumption of lungs.
419	James E. Williams....	694	Death	June 4, "	1,500	Run over by cars.
420	Samuel E. Phillips...	641	Disability	May 17, "	1,500	Amputation of foot.
421	John M. Burns.....	129	Death	June 24, "	1,500	Heart disease.
422	Theodore O. Bair.....	204	"	" 24, "	1,500	Gunshot wound.
424	James H. Cooper.....	426	"	" 24, "	1,500	Collision.
425	Edward Baiersky.....	638	"	" 2, "	1,500	Intestinal obstruction.
426	Guy E. Kennedy.....	669	"	" 7, "	1,500	Derailing of engine
427	G. W. Yencer.....	372	"	" 24, "	1,500	Derailing of engine.
429	Fred'h W. Wenninger	107	"	" 25, "	1,500	Drowning.
431	Frank J. McEvilla....	220	"	July 2, "	1,500	Collision.
432	John L. Eberle.....	393	"	June 28, "	1,500	Blood disease.
433	George W. Remmet..	75	"	" 27, "	1,500	Collision.
434	George C. Ziegler.....	252	"	" 25, "	1,500	Diabetes.
435	Clyde E. Wilson.....	153	"	" 24, "	1,500	Consumption.
436	Duncan McEwene....	559	Disability	" 25, "	1,000	Amputation of foot.
439	Leon S. Ross.....	240	"	" 17, "	1,500	Amputation of foot.
440	Frederick Howes.....	485	"	" 3, "	1,500	Amputation of foot.
441	Lewis H. Bloom	381	"	" 27, "	1,500	Amputation of foot.
443	Samuel J. Beddow....	584	Death.....	July 6, "	1,500	Falling from engine.
448	James Rooney	634	Disability	" 11, "	1,500	Consumption of lungs.
444	Thom. L. Nance	677	Death.....	" 4, "	1,500	Run over by car.
445	Carlton J. Henderson	677	"	" 2, "	1,500	Struck by engine.
449	Albert Giguire.....	144	"	June 13, "	1,000	Typhoid fever.
450	John E. O'Leary.....	233	"	" 13, "	1,500	Consumption.
451	James S. Stanley.....	426	"	July 9, "	1,500	Collision.
454	Edward Ruddick.....	172	"	June 21, "	1,500	Collision.
458	William N. Evans....	115	"	July 11, "	1,500	Typhoid fever.
460	James G. Willmott..	442	"	June 3, "	500	Typhoid fever.
459	Frank P. Combs.....	48	"	July 14, "	500	Heart disease.
852	Edward J. Veandry...	387	"	Apr. 29, "	1,000	Derailing of engine.
288	Edward H. Swafford..	602	"	Apr. 25, "	1,500	Typhoid fever.
396	John A. Haystead....	81	"	May 29, "	1,000	Typhoid fever.
427	James Fanning.....	518	"	June 14, "	500	Derailing of engine.

Death Claims Paid.		Disability Claims Paid.		
35—A	$52,500	7—A	$10,500	54 death and disability claims paid, aggregating $72,500.00
5—B	5,000	2—B	2,000	
5—C	2,500			
45	$60,000	9	$12,500	

Pending Claims August 31, 1907.

83 death claims aggregating	$108,500
21 disability claims aggregating	32,500
Total of 104 claims aggregating	$141,000

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Statement of Death and Disability Claims

FILED WITH THE GRAND SECRETARY AND TREASURER DURING THE MONTH ENDING SEPTEMBER 15, 1907.

Claim No.	NAMES.	Lodge No.	Date of Filing.	Death or Disability.	Alleged Cause of Death or Disability.	Am't of Ins.
512	Lewis, Asa B.	294	Aug. 16, 1907	Death	Consumption	$2,000
513	Murphy, Charles	400	" 17, "	Disability	Amputation of foot	1,500
514	Wilshire, Wm. G	188	" 19, "	Death	Epilepsy	1,500
515	Fitzpatrick, John	215	" 19, "	"	Struck by chain	1,500
516	Wasnidge, John	149	" 19, "	"	Bright's disease	1,500
517	Carl, Charles B.	192	" 20, "	"	Collision	1,500
518	Wilson, Harry M	366	" 22, "	"		1,500
519	Scranton, Thomas J	536	" 22, "	"	Derailing of engine	1,500
520	O'Leary, John T.	286	" 22, "	"	Collision	500
521	Cawley, Michael J.	440	" 23, "	"	Typhoid fever	1,500
522	Benz, Christian W	440	" 26, "	"	Collision	1,500
523	Cross, Joseph	225	" 26, "	Disability	Amputation of foot	500
524	Munson, Martin	543	" 26, "	Death	Appendicitis	1,500
525	Horning, S F	152	" 26, "	Disability	Amputation of foot	3,000
526	Kreke, George A.	16	" 27, "	Death	Blood poisoning	1,500
527	Cantillon, Charley S.	634	" 28, "	"	Crushed between cars	500
528	Woerner, William	60	" 28, "	"	Collision	1,500
529	Platt, John B.	275	" 28, "	Disability	Amputation of arm	1,500
530	Mack, Charles E.	51	" 29, "	Death	Collision	500
531	Heilshorn, Daniel H.	203	" 29, "	"	Collision	1,500
532	Ellsworth, Samuel	213	" 29, "	"	Consumption	1,500
533	Kirkwood, Frank J	182	" 30, "	Disability	Amputation of foot	1,500
534	Sells, Charles F	273	" 30, "	Death		1,500
535	Dansreau, George J.	61	" 31, "	Disability	Bright's disease	1,000
536	Allen, George E.	171	" 31, "	Death	Run over by train	1,500
537	Kleist, Reinert	296	" 31, "	"	Falling into an ore pocket	1,500
538	Shields, Joseph M.	192	Sept. 3, "	"	Striking a standpipe	1,500
539	Swanson, Alfred	129	" 5, "	Disability	Consumption of lungs	1,500
540	Borders, John H.	289	" 5, "	Death	Boiler explosion	1,500
541	Talley, Harry W.	284	" 6, "	Disability	Consumption of lungs	1,500
542	Williams, John L.	298	" 7, "	"	Amputation of arm	1,500
543	Hitchens, W. G.	677	" 7, "	"	Bright's disease	500
544	Holmes, Ivan W	179	" 9, "	"	Locomotor ataxia	1,000
545	O'Connell, Joseph P	260	" 9, "	Death	Abdominal abscess	1,500
546	Millerke, Charles A.	293	" 10, "	Disability	Consumption of lungs	1,500
547	Walker, William L.	309	" 11, "	"	Epilepsy	750
548	Bailey, Frank C.	240	" 11, "	Death	Derailing of engine	1,500
549	Allen, L. C	137	" 12, "	"	Bright's disease	1,500
550	Pulman, Charles H	248	" 12, "	"	Consumption	1,000
551	Stecher, George H.	482	" 13, "	"		2,000
552	Wylie, Leonard O	663	" 13, "	"	Boiler explosion	1,500
553	Bailey, Claude	663	" 13, "	"	Boiler explosion	1,500
554	Scott, George T	26	" 13, "	"	Heart disease	1,500
555	Borg, Gustaf	539	" 13, "	"	Jumping from engine	1,000

Respectfully submitted,
W. S. CARTER,
G. S. and T.

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Beneficiary Assessment Notice No. 7.

SERIES H.

GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., October 1, 1907.

To the Treasurers of Subordinate Lodges:

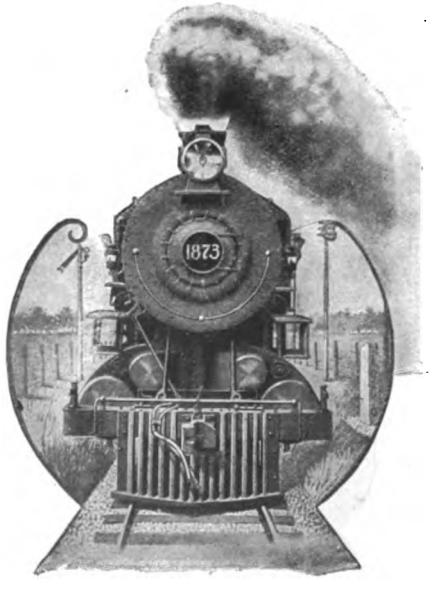
Sirs and Brothers:—You are hereby notified that assessments for death and disability claims are hereby levied as follows: For each beneficiary member whose name appears on the rolls of membership on October 1, 1907 (also for all beneficiary members transferred after October 1), carrying a Beneficiary Certificate of THREE THOUSAND ($3,000) DOLLARS, you are required to forward the sum of SIX DOLLARS ($6.00) For those carrying a Certificate of TWO THOUSAND ($2,000) DOLLARS, you are required to forward the sum of FOUR DOLLARS ($4.00). For those carrying a Certificate of FIFTEEN HUNDRED ($1,500) DOLLARS, you are required to forward the sum of TWO DOLLARS AND TWENTY-FIVE ($2.25) CENTS. For those carrying a Certificate of ONE THOUSAND ($1,000) DOLLARS, you are required to forward the sum of ONE DOLLAR AND FIFTY ($1.50) CENTS, and for each member carrying a Certificate of FIVE HUNDRED ($500) DOLLARS, you are required to forward the sum of SEVENTY-FIVE ($0.75) CENTS. Said remittances to reach the Grand Lodge not later than October 20, 1907, as provided in Section 82 of the Constitution.

Yours fraternally,

J. J. HANNAHAN, G. M.

W. S. CARTER, G. S. and T.

SPECIAL NOTICE.—All remittances must be made by BANK DRAFT, MONEY ORDER, OR EXPRESS ORDER. Beneficiary members initiated after October 1st are not liable for this assessment.



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Notice.

Communications intended for publication in the Ladies Department of the Magazine should in all cases be addressed to the Editress, Mrs. Agnes G. Strong, 527 Green street, Boone, Iowa.

* * *

The Hamilton, Ont., Union Meeting.

One of the most successful union meetings it has been our privilege to attend was held under the auspices of the brothers of Maple Leaf Lodge No. 151, of Hamilton, Ont., August 5 to 9, 1907. Nothing was left undone by the brothers to provide for the comfort and to anticipate the desires of their guests. The welcome was of the kind that one always receives when visiting the Canadian brothers and sisters. While the Ladies Society is not as yet represented by a lodge in Hamilton, the brothers, notwithstanding the many details in connection with their own meeting, did not overlook the possible needs of the sisters, in the way of providing them with a hall in which to hold their meetings.

It is not believed that a more representative meeting of the Ladies Society, with the exception of the biennial meetings of the Grand Lodge, was ever held. Representatives were present from the following cities: Albany, N. Y., 18; Bangor, Me., 1; Binghamton, N. Y., 2; Blairsville, Pa., 1; Brandon, Man., 1; Brantford, Ont., 1; Rockville, Ont., 1; Chicago, Ill., 1; Creston, Iowa, 1; Concord, N. H., 1; Eagle Grove, Iowa, 1; Fond du Lac, Wis., 1; Henderson, Maine, 1; Harrisburg, Pa., 2; Lyndonville, Vt., 1; Minneapolis, Minn., 1; North Bay, Ont., 1; Oldtown, Maine, 1; Oshkosh, Wis., 1; Palmerston, Ont., 1; Rensselaer, N. Y., 4; St. Paul, Minn., 1; St. Thomas, Ont., 3; Stratford, Ont., 2; Sunbury, Pa., 1; Syracuse, N. Y., 3; Toronto, Ont., 2; Trenton, Mo., 1; Washington, D. C., 6; Water Valley, Miss., 1; West Lebanon, N. H., 1, and Woodstock, N. B., 1.

A series of meetings were held, during which the secret work was exemplified, with the assistance of the sisters from Albany, Rensselaer, Sunbury and Syracuse. In addition thereto, an opportunity was afforded for the discussion of matters of interest, as well as instructing the members in the details incident to lodge duties. During the discussion it developed that there was some opposition to the present laws governing the Insurance Department, it being believed, as expressed by some, that the said laws should be modified. It was suggested that the matter be fully discussed at the lodge meeting, and that where a lodge, not one or two members, held the same opinion, that is, modification of laws, it should instruct its delegates to bring the matter to the attention of the next biennial meeting of the Grand Lodge, with a view to bringing about the desired modification.

A special meeting was held for the

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benefit of those who are eligible to admission, but who have as yet failed to avail themselves of the shelter of the mantle of Friendship and Charity. It is hoped that as a result of this meeting the benefits arising therefrom will be mutual, and that the ladies will soon be enrolled as sisters.

On behalf of the Ladies Society, and especially the members who were fortunate to be the guests of the brothers of Maple Leaf Lodge, No. 151, we desire to express our sincere thanks and appreciation for the many courtesies shown to us by the said brothers. Everything possible was done by them to show in a practical manner their belief in the usefulness of the Society as an auxiliary to the Brotherhood. We do not hesitate to predict that within a very short time there will be organized and established in Hamilton a flourishing lodge of the Ladies Society. We hope that the sisters who attended this meeting received an inspiration therefrom, which will cause them to work all the harder to spread the gospel of Friendship and Charity and use their influence in enlisting the co-operation of the brothers in their efforts. As yet there are many eligibles still outside the fold. Let us see what can be accomplished by a united effort to bring them in.

We send greetings to the newly-elected officers, and we wish for them a most successful administration. The attention of the various officers is respectfully invited to the laws governing their duties in particular and the members in general. The president should familiarize herself with the laws as a whole. It is not necessary that she memorize the entire Constitution. The well-read person is not necessarily the one who can quote in full every book she may have read, but, on the other hand, is the one who knows where to look for what is wanted. It is for this reason that the presiding officer should know just where to turn to determine all points relating to the laws of the Society. In the drafting of the Constitution an effort was made to cover all essential and practical points in the most simple and comprehensive language, with as little ambiguity as possible, so that she who might read would understand. Law must govern all of us. We cannot read into a law language which it does not contain: neither can we construe a law to suit individual ideas or special occasions. Before assuming to decide a matter, the president, or the presiding officer, should first ascertain, by referring to the Constitution, if she is vested with the necessary authority, or if the proposed action of the lodge is in conformity with law. If the foregoing suggestions are adopted by all, it is believed that friction and misunderstanding will be avoided.

G. M. SARGENT, G. P.

Santa Claus' Message.

Away in the north, in the snow and ice,
Sits "Santa" at work with his toys;
For these are the busy days for him,
When he toils for his girls and boys.

He chuckles and beams on his happy task,
As he hurries his work along;
He paints, and he weaves, and fashions fast,
While his heart keeps time with song.

He jingles the strings of silver bells
A stout old clown is to wear;
Then he tacks on the nose and stuffs in the eyes
Of a soft little Teddy Bear.

He toots the horn of an automobile,
And dances about in glee
As an airship circles 'round and 'round
Like a sea-gull over the sea.

He softly pats Miss Dolly's cheek,
And smiles at her handsome gown;
Then over his heart a sadness steals
And over his brow a frown.

He is thinking how little hearts will ache,
On the Christ child's natal day,
Over empty stockings, in cheerless homes,
Where never the sunbeams stray.

But not for long is this gay little man
Of the far northland downcast,
When he's up and about and this "wireless" sends,
While his happy heart beats fast:

"To my girls and boys, and their elders, too—
This year, with your Christmas joy,
Just brighten the path of some lonely child,
By giving an extra toy.

"Seek out some lonely little man,
Or a sad-faced baby girl;
There's joy for them in the top and drum,
Or the doll with the golden curl.

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"Never mind that they come from life's
dark side,
Nor anticipate future years,
For Christ, who died for one and all,
Will wipe away their tears."

His message gone, by the "wireless" sent,
Old "Santa" resumes his toys,
For these are the busy days for him,
When he toils for his girls and boys.

He knows in the hearts of all mankind
A baby's soft fingers cling;
That under the thoughtless whirl of life
Parental echoes ring.

IMOGENE BATES,
Member of No. 83.

Oneonta, N. Y.

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The Big Ten.

Below is given the membership of the ten largest lodges in the Ladies Society, reported September 1, 1907:

1. No. 142, Empire, Buffalo, N. Y.—120.
2. No. 70, Holly, Buffalo, N. Y.—105.
3. No. 3, Hazel, Peoria, Ill.—101.
4. No. 60, Pride, Harrisburg, Pa.—91.
5. No. 125. Charity, Jackson, Mich.—78.
6. No. 51, Grayson, Denison, Texas.—78.
7. No. 151, Missouri, St. Louis, Mo.—75.
8. No. 10, Helpmate, Elkhart, Ind.—74.
9. No. 58. Sisters of 99, Rochester, N. Y.—73.
10. No. 146, Virginia, Chicago, Ill.—71.

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Oregon Rose Lodge No. 228.

We were organized April 27, 1907, with twelve charter members, by Sister Rose M. Farren, of Lodge No. 98, Fresno, Cal. We have initiated several candidates and have several prospective ones in view. We have fairly good attendance and much interest is manifested in this new lodge.

We are indeed grateful to our good brothers of No. 542 for their kind assistance and financial aid in having paid all of the expenses of organizing this new lodge and for paying our hall rent for one year in advance.

August 5th the sisters invited the brothers to witness the installation of officers, after which a delightful luncheon was served and a general good time had. Dancing was indulged in by those who cared for the pastime.

We will try to let you hear from us often in the future and hope in this new year that we shall accomplish much for our Society. Fraternally,

ORA RUSSELL.

Roseburg, Oregon.

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Duty and Results.

Never mind whereabouts your work is. Never mind whether it be visible or not. Never mind whether your name is associated with it. You may never see the issues of your toils. You are working for eternity. If you cannot see results here in the hot working day, the cool evening hours are drawing near, when you may rest from your labors, and they may follow you. So do your duty and trust God to give the seed you sow "a body as it hath pleased him."—Alexander Maclaren.

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New Lodge.

California Poppy Lodge No. 231 was organized August 7, 1907, at Sacramento, Cal., with seven charter members. Organized by Sister Jennie Ford of Rocklin, Cal.

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A Contrast.

Over in Palestine there are two little seas—the Dead Sea and the Sea of Galilee. Both are made by the same stream, the River Jordan. The waters of the Dead Sea are bitter and destructive, not fit to drink, not suitable for bathing, and no fish can live in its waters and no flowers bloom around its shores. It has been said that a bird flying over it will sicken and fall and die. The Sea of Galilee is like a gem of sapphire among the hills. Its waters are pleasant for bathing, good to drink, and multitudes of fishes live and thrive in its clear depths. Upon its banks lovely flowers bloom and the birds sing merrily in the branches of the trees.

Why the difference? The Dead Sea has no outlet. It receives and holds, receives and holds. It only gives up its vapors under the inexorable demand of the burning sun. The Sea of Galilee receives and gives. The Jordan comes in on one side, and is received and held

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in the warm bosom of the lake for a little time, then poured out in a copious stream to bless all the valleys below. This is the idea. Receive and give. He lives most who gives most of all that he has and all that he is. Would you live, give.--Selected.

Air Castles.

Long, long ago, in Fatherland,
I sat me down upon the sand,
One sunny morn, so bright and fair,
And built me castles in the air.

Castles grand, with turrets high,
The topmost vane near touched the sky;
Castles of wondrous glittering gold,
To shelter me when I grew old.

Old? Ah! that time seemed ever so far;
Surely no wrinkles ever could mar
The smooth, soft skin upon my face,
None ever there should sorrow trace.

I built my castles on the sand,
Believing that some friendly hand
Would save, should danger dare assail,
Or threat'ning winds blow up a gale.

Alas! my faith is sadly shaken,
And now, I find I was mistaken;
The sand gave way—there was a fall,
Down came my castles, one and all.

No friendly aid was e'er bestowed,
None from the busy bustling crowd
E'er to my castle gave a thought,
Or grieved to find what wreck was wrought.

So now, in place of my castle fair,
There stands a hovel, rough and bare,
Old age creeps on, it is coming fast,
The hovel must shelter me at last.

But the walls are firm, foundation strong,
None dare approach to do me a wrong.
So I find a hut, firm on the land,
Outdoes a castle of air and sand.

MRS. HENRY B. JONES.
Washington, Ind.

Don't Betray Confidences.

How few people there are who know how to keep a confidence made to them in the true sense of the word! They frequently forget the fundamental principle of the whole idea, which is this: Have no desire to tell it to another person. So much can be done to betray a confidence by a person dropping hints and innuendoes without once deliberately breaking his compact to the letter, but only in the spirit, says "Home Notes." What a valuable point to have in your reputation—that you are a perfectly safe person to whom to intrust a secret! Remember, when you are inclined to pass a confidence to a bosom friend, however much she may want to hear it, she will remember the fact against you when she wants to confide in you that, as you are capable of breaking your bond with one friend, so you can do it with another, perhaps herself, next time.—McCall's Magazine.

More Courtship After Marriage.

Some men seem to consider their marriage certificate as a sort of fully paid-up policy of happiness. They act as if the courtship days were those of paying premiums of compliments, cheerfulness, courtesy, consideration and chivalry, and that marriage cuts off all these premiums of lover-like attention. The only way to get an absolutely guaranteed insurance on matrimony is to keep paying the premiums. Many first-class matrimonial policies lapse just because of these suspended payments.

There is a tendency to assume that this love is known and recognized, so why speak of it? This is a dangerous taking for granted of what should be made real, pulsing and vital in thought, word and deed. There is little danger of overtelling this story; it is often the wine of life and inspiration to one hungering and thirsting for the little tendernesses of affection. There are more people on this great, big, rolling earth hungering for sweetness, tenderness and words of appreciation, genial confidence and generous affection than are starving for bread. With husband and wife these delicate messengers of affection cost so little—sometimes only a thought, but it is the thought, that is all.

Continued courtship after marriage preserves the lover in the husband and the sweetheart in the wife. But courtship is not solitaire; like a quarrel, it takes two to make it a success. It is not the wife alone who needs the gracious sweetness of concentrated comradeship, for husbands who are built on the right lines have the same hunger for loving kindness and kindly loving,

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Courtship is a vessel of promise that is often wrecked on the shoals of matrimony. Courtship means two mates without a captain; marriage sometimes becomes two captai. . without a mate.—October Delineator.

* * *

From L. S. 221.

When first told to write for the Ladies Department, I exclaimed: "But what shall I write about?" When told to write just our "lodge doings," I thought, "But can that be of interest to others so far away?" But, having the dignity of lodge correspondent to maintain, I began preparation by a careful perusal of the Ladies Corner of the Magazine for not only the current month, but every back number that I could find as well, and I soon found that one can be very much interested in the "doings" of our sister lodges "so far away." Judging others by my own experience, I am taking it for granted that our sisters will be glad to hear from No. 221 again.

To begin, I will tell you of our "Poppy Social." The idea was conceived in the height of the season when our State flower puts forth her happiest effort to maintain her right to represent the Golden State, and all our hills and fields are golden with her gorgeous decorations. "Man proposes and God disposes." In this case it was the women of No. 221 who proposed to decorate the home of our Sister Meyers with golden poppies. Providence being represented by a severe wind and rainstorm that swept our immediate vicinity, on the morning of the social scarcely a poppy could be found. But the ladies of No. 221 were not to be daunted; elaborate decorations of poppies was the order of the day and poppies must be produced. So with right good will they set to work to manufacture golden paper poppies. Honest effort always brings its full measure of success, for while the poppies of the field might close their pretty eyes at sunset, our paper poppies stayed awake the whole night through to witness the unqualified success of our Poppy Social. Tea from three to five o'clock; coffee and entertainment from eight to eleven. Admission ten cents, and, of course, refreshments. Indeed, everybody had such a good time, and we did so well financially, that there has been some talk of making the Poppy Social an annual affair—but that is of the future.

Our next social venture was a social dance. It is a good maxim to always give credit where credit is due, and, socially, our success was attributable to the hard work of both the sisters and brothers; financially, our very gratifying success was scored by the good will and hard work of the Mt. Whitney boys, who all took hold of the affair with a spirit very gratifying to the ladies of No. 221. Special effort deserves special mention, and Brothers Sullivan and Spier were especially untiring in their efforts to make the dance a financial success.

Since writing to the Magazine the stork has visited the home of our Brother and Sister Ammerman and left with them the dearest baby boy that ever completely dislocated the nose of an adoring little sister, who, in spite of all protests to the contrary, insisted that his name should be "Elwood," and when ever did our babies insist otherwise than successfully? Congratulations to Brother and Sister Ammerman, and most earnest wishes for the welfare of our baby Elwood. When he has reached a man's estate, in twenty years from now, what power, I wonder, will he find the man behind the throttle controlling; will the dear old B. of L. F. and E. boys still be contending about "poor fuel," or will the engine crew of the future be merely electric automatons? One thing we can well be confident of finding—that the B. of L. F. and E. have discharged their full duty in the arena of progress and that their escutcheon will have remained unsullied.

Election of officers caused scarcely a ripple in our lodge affairs. We congratulate ourselves that we have re-elected Sister Sullivan as worthy president and Sister Spier as secretary for the coming term, but, indeed, all our officers, old and new, are deserving of the highest eulogiums. If we could only persuade each individual member that her attendance at every lodge meeting was indispensable to the welfare of our lodge we would feel in working trim to accomplish almost anything, even to attempting to some day place the name of Golden Poppy Lodge among the "Big Ten." As a beginning in the right direction, Sister Fassett of Graipon Lodge No. 51 has attended a number of our meetings, and, we hope, is a prospective member, and our Sister Nannie M. Brier of the Needles has already cast in her lot with us. We extend

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sympathy to our sister lodges who have lost such worthy and helpful members, but as we are so much the gainer we cannot be expected to say we are sorry.

And, now, dear sisters, I have written you of the brighter side of our lodge affairs while all the time my heart has ached with the knowledge that I must tell you that which will dim each eye and fill each heart with sorrow, for God, in His infinite wisdom, has called home the beloved husband of our dear Sister Mettie Vaughn. On the morning of April 9, in a boiler explosion on the Tehachapi Grade, Frank Vaughn answered to the call that sooner or later all of us must obey. The Master found him in the full strength of his youth and manhood, and at his post of duty. Our charters are draped; his chair in Mt. Whitney Lodge is vacant, and the loving heart of his wife is desolate. "To her who's left, life gives the gall to drink," but till Time shall be no more, we leave him with the highest praise that can be said of mortal man: "He died in the performance of his duty." To his bereaved wife we can offer no consolation; that, God alone, in His infinite wisdom, can bestow. But we send her all our loving sympathy and hope.

There is no death. The stars go down
To rise upon some fairer shore;
And bright in Heaven's jeweled crown
They shine—forevermore.

There is no death. An angel form
Walks o'er the earth with silent tread,
And bears our best loved things away,
And then we call them "*dead.*"

But, ever near us, though unseen,
The dear, immortal spirits tread;
For all the boundless universe
Is life. *There are no dead.*

Yours in Friendship and Charity,
BERTHA L. FORD.

Aerial Lodge No. 230.

Under the instructions of our worthy Grand President, Sister Georgie M. Sargent, and with the assistance of the officers of Banner Lodge No. 92, the writer organized Aerial Lodge No. 230 at Duluth, Minn., on July 23d, with thirteen names on its charter. After the organization was completed and all officers elected and duly installed, we had a short recess to partake of refreshments, consisting of ices and cake, which the new sisters had so kindly prepared for us, and which were very much enjoyed, after which we again held a short meeting to illustrate the work as best we could to the new lodge. While this new sister lodge starts out with but few names on its charter, I can safely predict a bright future, for each member is interested, and they have a bright, intelligent set of officers who seem only too willing and anxious to perform their respective duties.

In regard to our own little lodge (Banner No. 92), we are still holding our meetings regularly, with fairly good attendances, and have a picnic planned for the 9th of August, which is the sixth anniversary of the organization of our lodge.

As I have been appointed magazine correspondent for this year, I hope to have something of interest in the future to write and tell you about. We all so enjoy reading the letters from our sister lodges. With good wishes for all L. S. and our worthy grand officers, I am, yours in F. and C.,

MAGGIE FULLER.

Superior, Wis.

"The Blue Danube Waltz."

Where the strains of "The Blue Danube" rise and fall,
And fuse in the greeting of soulful eyes;
From "windows of the soul"
Where dreamland lies.

'Mid dreamland wild, 'mid Ocean's guiles,
'Mid moonlit shades, 'mid Echo's waves,
'Mid smiles sublime, and oft divine;
These memories' leaves her fantasies in dreams.

Here soul and art in counterpart
Mingle and blend to harmonies of mine,
Here raptures meet and repeat
In Muse's swell a symphony of soul.

Here rythm of poise and grace combined,
Float to measure of music rare,
Here shadows dance o'er moonlit braves,
Meet and retreat to soulful lays.

Such meetings and such partings;
Such soulful grace in either case,
Leaves regrets and longings
For other endings born of such belongings.

"VALK-AËYRIE."

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These lines were written based upon incidents, scenes and otherwise, growing out of two balls of the Railway Master Mechanics and Car Builders, at Atlantic City, N. J., June 13 and 18, 1907. The keynote to their success, following the "Grand March," was Strauss' "Blue Danube Waltz," and it is so treated here accordingly.

"VALK-AËYRIE."

* * *

Letter from No. 80.

I don't remember who wrote

"The melancholy days have come,
The saddest of the year,
With wailing winds and naked woods
And meadows brown and sear,"

but I believe if he could see the beautiful hills of "Capitol View," with the holy radiance of an autumn sunlight over them, and watch the leaves flutter to the ground with every cold breeze, thus turning the bran new green carpet Mother Nature laid so carefully last spring to one of russet brown and gold, he would acknowledge that he had made a mistake to consider autumn other than absolutely charming.

I suppose "Laugh and the world laughs with you, weep and you weep alone," is applicable to many other issues in life, as well as to its joys and sorrows. For instance, we get out of life only what we put into it. Who is it says, "To the educator, the world is only a schoolroom; to the student it is a study hall; to the workman it is only a shop, and to the insane it is an asylum, and one and all of its inhabitants babbling lunatics?" In order to get the best out of life we must be willing to bring to it our truest and best thoughts, words and deeds. I wonder, as I sit alone tonight (when the little clock on the mantle shows the midnight hour long past) what is the best definition of happiness? To some "Society" spells and defines the word; to others it must come hand in hand with fame to be recognized, and to a few wise ones home and its sacred ties constitute it all.

Looking backward tonight over a long life, with its many mistakes and lost opportunities for doing good, I can truthfully say I have found "giving pleasure to others" is what brings life's richest harvest and heaven's truest blessing. Speaking of the pleasures of others brings to my mind a most enjoyable entertainment given the lodge, August 27, by one of our most highly honored and competent members, Sister Mary Foulkes, who also bears the distinction of being a charter member of No. 80.

Being the first to arrive, I shall never forget the beautiful picture this cozy, vine-clad cottage presented, nestling as it does against a beautiful hillside, which seems to have grown up among the sunny glades and shady vales "a purpose" for a foundation for this home. Sister Foulkes was assisted in receiving and entertaining her guests by her accomplished daughter, Miss Rose, and among the visitors to this happy "lodge entertainment" we had the pleasure of meeting two married daughters of Sister Foulkes, Mesdames Blanz and Heiden. Although Brother Foulkes had just come in and was entitled to a rest, he added much to the enjoyment of the occasion by assisting our hostess in entertaining instead. Among other interesting pictures and treasures of different kinds from different countries, we were shown a photograph of Brother and Sister Foulkes' early home in far-away Wales. Picturesque it was, indeed, although in nowise superior to the one that has sheltered their noble and useful lives in Sunny Arkansas.

Refreshments were served at an appropriate hour, and after a stroll with Brother Foulkes through the beautiful grounds, we all said "Goodby," and as I wended my way homeward an earnest prayer went up from my heart that this loving young (old) couple might ever

"Together sweetly live,
Together also die,
And each a starry crown receive
In that bright world on high."

But all has not been brightness and sunshine for us either, and it is with great sadness that we are called upon to record the death of our beloved sister, Sister Catherine King, whose noble, useful and happy life came to a close July 10, at Colorado Springs, where she and her family were spending the summer. Sister King was born in Mattoon, Ill., in 1875. Was educated there, and in 1897 became the wife of Brother H. T. King. Three precious little ones were sent to bless their home. Death, though always sad, is never so hard as when it takes from a home and a family the presiding genius, a faithful wife and loving mother.

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Yet we, who have experienced sorrow even as great as this, sincerely hope the stricken ones, whose hearts are aching, will remember

"There is no Death! What seems so is transition;
This life of mortal breath
Is but a suburb of the life elysian,
Whose portal we call Death.

In that great cloister's stillness and seclusion,
By guardian angels led,
Safe from temptation, safe from sin's pollution,
She lives whom we call dead.

Thus do we walk with her, and keep unbroken,
The bond which nature gives,
Thinking that our remembrance, though unspoken,
May reach her where she lives.

And though, at times, impetuous with emotion
And anguish long suppressed,
The swelling heart heaves, moaning like the ocean,
That cannot be at rest.

We will be patient, and assuage the feeling
We may not wholly stay;
By silence sanctifying, not concealing,
The grief that must have way.

In another poem called "Resignation," Longfellow tells us:

"These severe afflictions
Do not from the ground arise,
But ofttimes celestial benedictions
Assume this dark disguise.

We see but dimly through the mists and vapors;
Amid these earthly damps;
What seem to us but sad, funereal tapers,
May be heaven's distant lamps."

ORA BOON,
Primrose Lodge No. 80.
Little Rock, Ark.

Letters from Friends.

FROM L. S. 146—(*Mrs. M. L. Prowley, Chicago, Ill.*) It has been so very long since we've seen any news of our lodge in the Magazine that some may think we are not alive, but I wish to assure you we are very much alive and slowly but surely growing. We have had "good times" too numerous to mention, but we desire to let our brothers and sisters know of the grand success of our anniversary social, given on May 6, 1907. Our hall was packed to overflowing. There was a fine program, including solos, vocal and instrumental; a dramatic reading by Mrs. Margaret Powley, and several comic readings by Miss Lulu Mason. A number of addresses were given by visiting brothers, to which Brother George Goding most ably responded. Refreshments were served, and dancing finished a most pleasant evening.

On the 5th of August we held a sale for the benefit of one of our sisters who had been ill for many weeks and realized quite a handsome sum.

Each meeting seems to become more interesting, as our last meeting, held September 2d, proved. We had ice cream and cake and the jolliest kind of a time, and we anticipate great things for the winter.

FROM L. S. 223.—(*Jennie Bench Mansfield, Ottumwa, Iowa.*) Once more No. 223 must come out in the "limelight." As we are all "wimens," we just can't keep still any longer.

We are doing very well, or we think so at any rate.

On April 10th we gave our first grand ball and it was a success both financially and socially and put quite a goodly sum into our treasury.

The brothers cleaned house, papered and painted the hall, and then we sisters put up long lace curtains, and we now have the coziest meeting place one could wish for.

Our monthly coffees have been a source of much pleasure and profit for us, and we certainly have a good time, "if we could only coax the secretary of No. 293 to tell you about them; but he is so bashful, he is."

On April 27th we gave a reception, complimentary to Maggie May Harper, at Sister Mansfield's home. Sister Harper had been our inside guard ever since we were organized, and was a willing worker, too, so you can imagine how we hated to lose her. Her home is now at No. 311 East Eighth street, Muscatine, Iowa, and as she isn't so far away the lodge is going to go over in a body some night this summer and make them a call.

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Sister Harper was presented with a very pretty dish as a slight token of the great esteem and love we have for her and all expressed regrets at her removal from our city.

On July 11th, Winifred No. 223 entertained the brothers of Lafayette Lodge No. 293 at our hall and everyone had a jolly good time. Cake and ice cream were served and a pleasant evening was spent. Our hall looked very pretty in its decorations of dark red and purple and white crepe paper, and as these are our lodge colors, and they add so much to the beauty of the hall, we have decided to leave the decorations up. To Sisters Giltner, Beckner and Exceen must go the credit for the success of this entertainment, as they certainly did work hard.

We are taking in new members at nearly every meeting, but not as fast as we should like to.

We have not held any joint meetings as yet, but look forward to the time when we will have one once a month with the brothers.

Our Conductor was with us at our last meeting for the first time since March 14th, and words cannot express how glad we were, for she is another of our willing workers.

Our Editress' talk in the July Magazine was just splendid and to the point.

Wishing you all abundance of success, yours in F. and C.

FROM L. S. 201.—(*M. A. Dixon, Chicago, Ill.*) It has been some time since I have written to the Magazine. I suppose you think we are not attending to business, but such is not the case. There have been quite a number of our members arranging for or gone on their annual vacations, so you see it keeps us pretty busy, although we do not forget to attend our lodge meetings as regularly as we can possibly do so. We have some very interesting meetings, too, and it does one good to attend.

We held a joint meeting with the brothers of S. S. Merrill Lodge No. 188, and the boys made a very poor showing. I am sure that the boys don't mean to do this, and they will be forgiven if they will only awaken and lend a helping hand as they did in our infancy. We are only two years old and just able to walk hand in hand, with thirty-four members on our roster; so I presume the brothers thought we were about old enough to try it alone.

We are, it is safe to say, in a flourishing condition. We have grown in numbers and strength in the two years since organized, and there is no reason why we cannot be the banner lodge of the country. All that we need is the hearty co-operation of the brothers. I am sure if they would ask their wives, mothers, daughters and sisters to join us it would do wonders to increase our membership, and I know that should one sister of them find her way into our society, and find what a pleasure it is to belong to such a grand organization, the brothers would be severely reprimanded for not having spoken to them kind words of the L. S. before.

We think that we have as grand and noble a set of boys in No. 188 as any other lodge in the country, and if they will only ask those eligible in their families to join us we could be one of the largest societies in the country. Won't you help us, brothers, to do this? We also want our sisters to labor as never before for the good and welfare of our noble order. Let us try harder than ever before to get new members and to be more regular in attendance at every meeting.

I will not take any more of your valuable space, but with best wishes and many thanks to our retiring president, Sister Burton, for her excellent work during her term of office. Also wish the best of success to our newly elected president, Sister M. Metzinger; also the other officers elected for the ensuing year.

FROM L. S. 203.—(*Elizabeth Wau, Ottumwa, Iowa.*) As I have been installed Magazine correspondent for the coming year, I will endeavor to tell the other members of the L. S. what the sisters of No. 41 have been doing.

Friday afternoon, July 5th, marked the date of our installation of officers for the coming year. We had a good meeting, with nearly all of the members present. The out-of-town members were Sister Amanda Botham of Galesburg, Ill.; Sister Lydia B. Rowles of Albia, and Elizabeth Wau of Belknap. In the past year we have nearly doubled our membership. We will endeavor to do so again this year. I think the prospects look favorable, as we expect to exercise our "goat" at the next meeting. Let us en-

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courage Sister Jennings all we can by assisting her in her duties as President of our lodge, and also give our hearty thanks to our past president, Sister May Ware, for the good work she did when she was our president.

With best wishes for all members of the L. S. and to the B. of L. F. and E., I am, yours in Friendship and Charity.

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FROM L. S. 31.—(*Mrs. Grace Royster, Minneapolis, Minn.*) Having been appointed Magazine correspondent, I want to write just a short letter at this time and tell you about the good times we are having, and especially about our joint installation, which took place on Tuesday evening, July 9th. Sister May Henderson was our installing officer, and we are proud to say that she is also a member of our lodge, Queen of 510 Lodge No. 31. After the ceremonies of installation were concluded by the L. S., Brother Payne, assisted by Brother Rochelle as marshal, installed the new officers for the brother's lodge. We then enjoyed a short program, and remarks from the brothers and sisters were in order.

The new master, Brother McInness, was called upon, and he did justice to the occasion, and we are looking forward to a very prosperous year, as Brother McInness is so much in favor of joint meetings and social times, and in that way we expect to secure many new applicants for membership.

Brother Payne afforded much laughter by his comic sayings and wit; also the singing by Brothers Coulter, Payne and Leenan was much enjoyed. We then had refreshments, and after a few oldtime squares we all returned home, thinking how lucky we were to be members of the L. S. of the B. of L. F. and E.

Although we have had much sunshine in our lodge during the past year, a gloom overshadowed it all a few days ago—on July 20th. Death entered the home of one of our members and took a loving sister, Miss Inga Nerwich. She was a loyal lodge member and will be greatly missed from her place, where, on meeting nights, you would always find her. She leaves to mourn her death a sister and two brothers, and they have our heartfelt sympathy in this, their great sorrow. Hoping that I have not taken up too much space; with best wishes to all brother and sister lodges from the Queen of No. 510 Lodge No. 31,

FROM L. S. 8.—(*Mrs. Grace Iler, Garrett, Ind.*) Having again been elected Magazine correspondent for the next six months, I take this opportunity to inform the Sisters that we are still among the living and enjoying good times.

While our lodge is not often heard from, we are still up and doing, and are always pleased to hear from others through the columns of the Ladies Department. But kindly do not think that the sisters of No. 8 are all asleep because you do not hear from us oftener. We are still getting new members. They are a little slow, but sure.

But say! What is the matter with Garfield Lodge No. 203, B. of L. F. and E.? We have never read a contribution from them. Wake up, brothers, and do not let the other brother lodges get ahead of you. I can assure you that the boys of No. 203 are not backward in showing us a good time.

Our lodge is prospering and getting along nicely. All seem to work in perfect harmony and peace.

Our last regular meeting was our annual election of officers, and I feel that a wise selection was made, and I am sure each one will do their part, and thus we look forward to a prosperous year.

Now, sisters, let us try harder than ever before to get new members. Be more regular in attendance at meetings and more prompt in your payment of dues. A little neglect here may make a great difference to your loved ones some day.

With best wishes to our Editress and all sister societies, I am, yours in F. and C.

♣ ♣ ♣

FROM L. S. 184.—(*Rose Hammond, Pt. Morris, N. J.*) As Violet Lodge No. 184 has never been heard from in the columns of the Ladies Department, and wishing to be identified with the other L. S. Lodges of our state and country, we venture this letter to the Magazine, which will partially detail its brief history.

Our lodge meets every first and third Thursday of each month. We have interesting meetings and are still actively engaged in the work of securing new members. We had a candidate at our last regular meeting and hope for more in the very near future.

We feel very proud of our brothers of No. 271. They are a great help and inspiration to us. They also always pay

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our hall rent, and that is appreciated by us.

We feel that when the year closes we can truly say that it has been pleasant to be a member of the L. S., and the good fellowship we now enjoy, we trust, will last long—that the little circle may remain unbroken, and that the chain may be strengthened by the addition of strong new links.

FROM L. S. 81.—(*Eva Cogley, Logansport, Ind.*) As the sisters have not heard from No. 81 for quite a while, we will tell you of a few of our good times since last we wrote.

At the beginning of our last quarter we had a class of thirteen candidates to initiate into the mysteries of our Order. On that date we also had the pleasure of entertaining Sister Sadie Schonell, the chairman of our Grand Board of Trustees, of Huntington, Ind., and Sister Clara Canaan, of Indianapolis, Ind., and several sisters from Peru, Ind. We certainly had a most delightful time.

We have had our annual election of officers and have them all duly installed. Some of our old officers were retained and we now call them new.

On July 23d the sisters met at the home of Sister Jenners and spent a very pleasant evening. Sister Jenners will soon depart for her new home at Lake Park, Minnesota. We are very sorry, indeed, to lose this sister, for she has been a faithful lodge member.

The evening's pleasure was greatly enhanced by the sweet singing of Sister Marsh. The sisters presented Sister Jenners with an emblematic pin of the L. S.

FROM L. S. 227.—(*Katherine Andes, President, Meadville, Pa.*) On June 12, 1907, a new lodge of the L. S. was organized in Meadville, Pa., known as Myrtle Lodge No. 227. Mrs. Jennie Creagh of Cleveland, Ohio, had the honor of organizing this new lodge. We came among you with twelve charter members, and after being thoroughly instructed by Sister Creagh we locked up the "goat" and gave ourselves up to a social evening and eating ice cream and cake.

Three of the brothers surprised us by coming in for a share of the refreshments, and needless to say they were made heartily welcome.

At our first regular meeting, after our organization, we voted to get busy at once and decided to give an ice cream social on July 8th, which we did with success.

The Worthy Master of Loyal Lodge No. 207 was present and expressed himself as expectant of many pleasant social evenings through the joint co-operation of the L. S. and the Brotherhood.

At our second regular meeting the "goat" was again brought out and two candidates were initiated into the mysteries of our Order.

With a bright outlook for many more new members in the near future, I am, yours in F. and C.

FROM L. S. 42.—(*Mrs. Mable E. Briggs, Conneaut, Ohio.*) The brothers of No. 377 and the Ladies' Auxiliary to same held a joint installation of officers in their hall Tuesday evening, July 2d. Both lodges were well represented, and after the ritualistic ceremonies were gone through with, a pleasant evening was spent with music and dancing. Refreshments, consisting of ice cream and cake, were served and each and every one reported a good time.

Our lodge is growing steadily and all are taking a renewed interest in the work. We hope to soon have a large lodge.

FROM L. S. 191.—(*Grace T. Ahrens, New Haven, Conn.*) Just a few words from Catherine Hannahan Lodge No. 119. Being appointed correspondent for the next quarter, I will try to keep you well informed of our good times and good work.

We are still actively engaged in the work of our Order and doing our best to swell our membership. During the last quarter we added several new names to our roster, and have had several fine social gatherings, which not only helped to replenish our treasury, but which were greatly enjoyed by our brothers of No. 284, who have always kindly lent us a helping hand.

One of our pleasant social evenings was a necktie and apron party. All kinds and styles of ties, which were sold at auction and brought from fifteen to forty cents. The brothers, of course, bought the ties, and had to find the sister whose apron corresponded in material and color to their tie. In this way they secured partners for supper. It is hardly neces-

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sary to say that a thoroughly good time was had by all, for we always have good times.

We also had a basket party, which was a great success.

We take every other meeting for a social one and invite the brothers, which is always much enjoyed by them, for they are sure to find something good to eat.

We are now planning for a trip to the seashore, where we go every summer and have such good times.

Wishing for even greater success this year, and with best wishes for all sister lodges.

FROM L. S. 53.—(*Edna Ashley, Trinidad, Colo.*) Being the newly elected Magazine correspondent, I will endeavor to let you know that No. 53 is very much alive at the present time. We have a membership of thirty-two and several more that are eligible that we hope to have numbered with us soon.

Sunday, July 14th, we held a joint installation with the brothers of No. 344 and we had a very enjoyable time together. After the installation ceremonies were gone through with, we were ushered into the banquet hall, where a delightful banquet was served us by the sisters. Much credit is due the committee, Sisters Lulu Hammer, Anna Coppers and Lillian Smith, for the splendid repast.

Last week one of the brothers was called upon to give up his beloved wife of one year. Brother Ledbetter has the sympathy of all the sisters. Although his wife was not numbered with us, yet it was her intention to have joined us in a very short time. She leaves a dear little daughter just one month old.

Sorrow came to us again. Our sister, Mrs. Spillanes, has been called upon to mourn the death of her devoted husband, who was killed last month. We sympathize with her and her two little children in this their dark hour, and commend them to Him, who, for love of man, daily gave Himself to die.

Our little circle will soon be six years old and we have only four of our charter members left, three in our city and one that has moved away. We often think of the dear sisters that have moved to other places and wish it were possible for them to meet with us, and we hope that the time may come soon when we will all meet in our own lodge room again with all present.

I will say goodby, with the best of wishes for our Editress.

FROM L. S. 115.—(*Viola Ricks, Cleburne, Texas.*) As only one letter has appeared from No. 115 in quite a while, I will try and let our sister lodges know how we are progressing. On the first day of January we gave our fourth annual ball. It was a decided success from every standpoint, and especially financially. Every one, as they left for their homes, expressed themselves as having had the best time of their lives.

We hold our joint meetings with the brothers every third Wednesday. At the next to the last joint meeting that we held it was given in the nature of a surprise for the brothers. We had a nice little program arranged, consisting of vocal and instrumental music and recitations. After the program was disposed of all were invited into the dining room to partake of the most delicious cream and cake. Concerning our last joint meeting I have sent you a clipping from a daily paper, which will appear in another part of this issue, and can tell you all about our good time better than I could, and perhaps will help some one else to do likewise.

I am indeed sorry to report several of our sisters as ill. We hope that they will have a speedy recovery and soon be back with us in the lodge room.

The condition of our lodge is very good. We have thirty-two names on our roster and some new applications on the table and have our eye on several more.

We are sorry that a few of our members have seemingly lost interest in our meetings. I wish some sister lodge would suggest something to arouse interest in such members. An exchange of ideas of how to create interest in lodge meetings would be a great benefit to many lodges, and I hope that we may hear from a great many of the different lodges.

I shall wait now and see if this letter finds the waste-paper basket, and if not, you will hear from me soon again. Best wishes for all.

Death Report.

Viola B. Clark, Lodge 48; died August 1, 1907; cause, catarrh of lungs, following la grippe. Insurance, $400.

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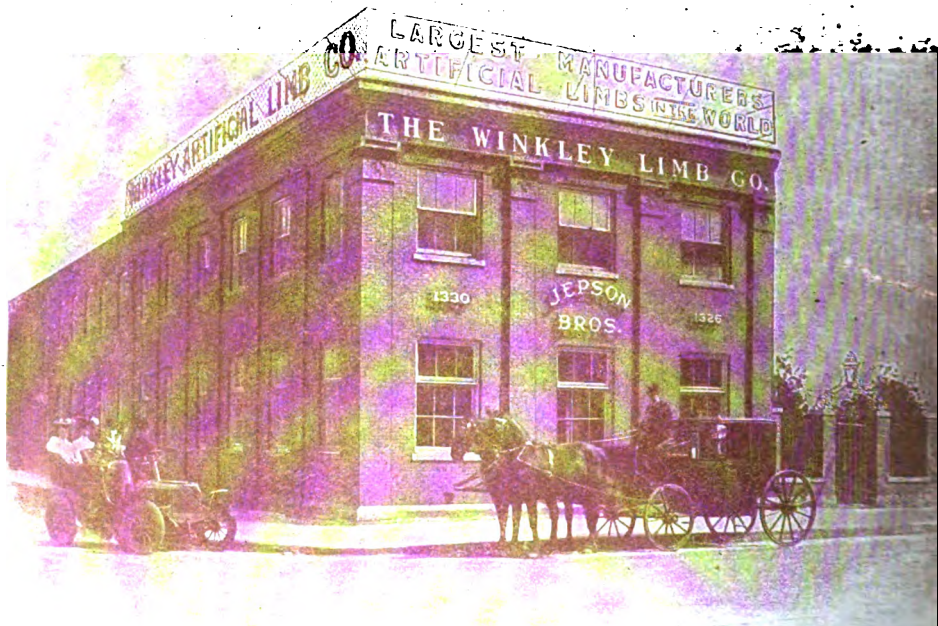

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BROTHERHOOD OF

Locomotive Firemen and Enginemen's Magazine

Published at INDIANAPOLIS, IND.
by the
Brotherhood of LOCOMOTIVE FIREMEN AND ENGINEMEN

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MADE ESPECIALLY
for Engineers, Firemen, Brakemen and Other Railroad Men

(Patent Allowed)

The Grinnell "Rist-Fit" Glove

The "Reindeere" leather used in these gloves is tanned by a special process. Chromic acid is the basic principle. This is a **mineral** substance which shrinks the leather and causes the fibre of the leather to knit very closely together.

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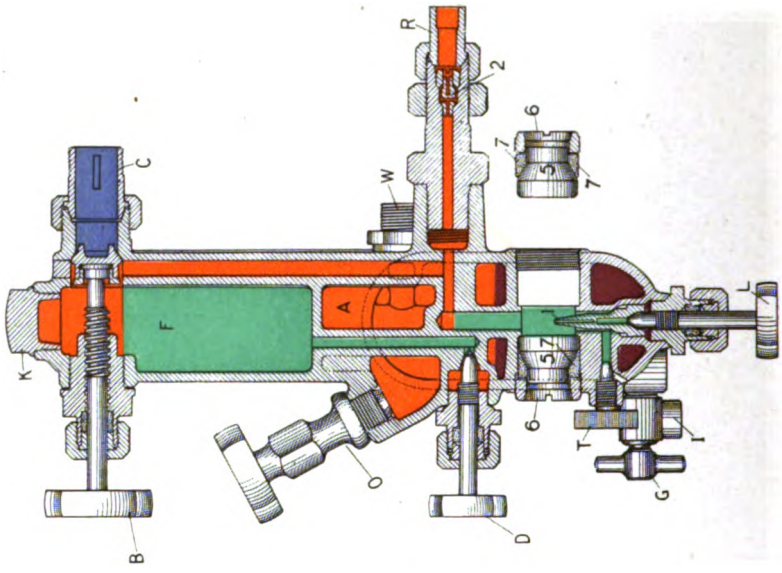


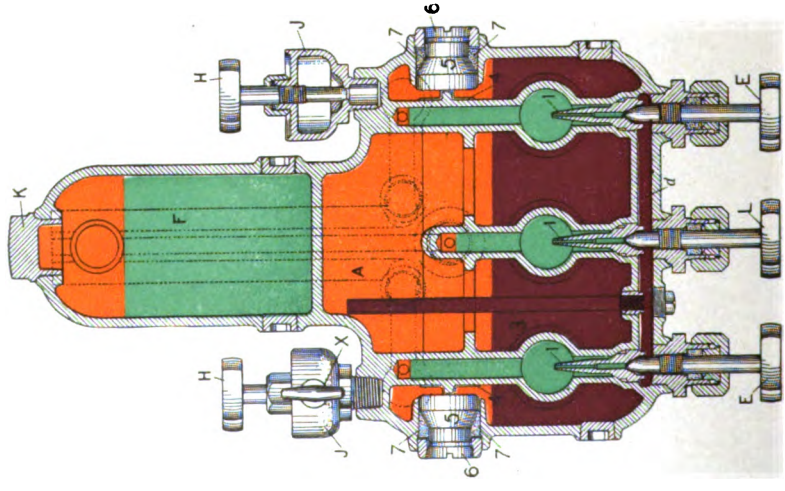
PRESSURES

LIVE STEAM

STEAM AND WATER

ATMOSPHERIC

OIL



Locomotive Firemen and Enginemen's Magazine Educational Charts

LOCOMOTIVE APPLIANCE SERIES

PLATE XIV.—DETROIT No. 21 TRIPLE FEED LOCOMOTIVE LUBRICATOR (Half Filled With Oil)

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BROTHERHOOD OF
Locomotive Firemen and Enginemen's Magazine.
TECHNICAL DEPARTMENT

JOHN F. McNAMEE
EDITOR AND MANAGER

SUBSCRIPTION PRICE
$1.50 PER YEAR

PUBLISHED MONTHLY BY THE BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN

Entered as Second class Matter December 27, 1906, at the Post Office at Indianapolis, Ind., under the Act of Congress of March 3, 1879

VOL. 43 NO. 5 INDIANAPOLIS, IND. NOVEMBER 1907

Plate XIV—Detroit No. 21 Triple Feed Locomotive Lubricator (Half Filled With Oil).

Plate XIV of the Locomotive Appliance Series of the Locomotive Firemen and Enginemen's Magazine Educational Charts shows sectional views of the Detroit No. 21 Lubricator half-filled with oil.

In order to fully explain another condition of the lubricator it will be necessary for the reader to refer to Plate VIII, which appeared in the February issue of the Magazine, and in which the oil reservoir was represented as being about half fed out.

To prepare the lubricator for the condition shown in Plate XIV, we will assume that the locomotive has reached a terminal and that all pressure and feeds have been closed off. The outgoing crew finds upon draining the lubricator that it contains oil. The reader will note by referring to Plate XIV that steam valve *B* and the oil feeds *E L E* have been closed. The water which was shown as occupying the lower half of the oil reservoir in Plate VIII has been drawn off and the oil remaining in the reservoir now fills the space formerly occupied by the water, while the upper half of the oil reservoir contains atmospheric pressure. Note also that atmospheric pressure now fills the space above the water in condensing chamber *F* and the passage leading to the oil tube *R*.

By comparing Plates XI, XIII and XIV together, it will be seen that in Plate XI the oil tube *3* and oil feed chamber *d* contained atmospheric pressure, in Plate XIII they contained water, but in Plate XIV they contain solid oil.

The lubricator as shown in Plate XIV is now in condition that the filler plug *O* may be removed and the reservoir refilled with oil, after which the pressure may be turned on and the feeds started.

The Traveling Engineers' Association.

The Traveling Engineers' Association met in fifteenth annual convention in the city of Chicago, Ill., September 3, 1907, the sessions being held at the Auditorium Hotel. Mr. E. J. Brundage, corporation counsel of Chicago, representing Mayor Frederick A. Busse, welcomed the association to the city. An interesting address was also made by Mr. W. A. Gardner, vice-president of the Chicago & Northwestern Railway. Among other

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things, Mr. Gardner is quoted as saying that the supply of men from which to draw railroad officials was small, and that men in the humblest ranks had opportunity to advance to much higher positions than those to which they ordinarily aspired. The membership of the association as reported by the secretary, is 632. Many interesting committee reports and individual papers were presented for discussion. The convention was in session four days, closing on September 6th. The officers for the ensuing year are as follows:

A. M. Bickel (L. S. & M. S.), president; J. A. Talty (D., L. & W.), first vice-president; C. F. Richardson (St. L. & S. F.), second vice-president; F. C. Thayer (Southern), third vice-president; W. O. Thompson (N. Y. C.), secretary; C. B. Conger (I. C. S.), treasurer.

* * *

Development of The Locomotive Engine (A Complete History of The Locomotive) by Angus Sinclair.

One of the most interesting books yet written on the locomotive has been recently published by Mr. Angus Sinclair. It is, without question, the most exhaustive work on the development of the steam locomotive that has yet been placed before the public. It treats of this powerful factor in the world's progress from the first device in which steam was used as a motive power—exhibited in Egypt two hundred years before the beginning of the Christian era—down to the most modern type of locomotive. Each step in the development of the steam engine, as well as of its various parts and appliances, is handled in a manner that is clear, simple and intensely interesting—and is illustrated in a way that leaves nothing to be desired.

The illustrations are clear and perfect in detail. They include not only all the various forms and styles of locomotives from that built by Trevithick in 1803—the first constructed to run on rails—down to the very latest type, and separate cuts of their parts and appliances, but as well portraits of the "eminent engineers and inventors who nursed it on its way to the perfected form of today."

The title of Mr. Sinclair's book is "The Development of the Locomotive Engine." It dwells also, however, on the various stages in the growth of railroading and touches on the popular prejudice and other obstacles which that great industry had to surmount in becoming established and recognized as the most effective method of transportation.

Outside of railroad circles this work, treating as it does so fully of the great machine which has had so much to do with the world's advancement, is most highly entertaining, but to the railroad man, of whose life the locomotive steam engine constitutes such an important feature, it is not only of the deepest interest, but of the greatest value as well.

An idea of the completeness of the work can be gained from the following, which constitutes the first paragraph of the author's preface: "My purpose in writing this book was based on the belief that all intelligent railway men and hosts of others are sufficiently interested in the locomotive to desire a book giving a comprehensive history of the growth of this form of engine. The first moving cause for the determination to write this book originated about thirty years ago when I read an article in a popular magazine professing to give a condensed history of the locomotive engine that was full of misstatements and errors. I wrote to the editor, pointing out some of the most glaring mistakes, such as one stating that the first portion of the New York Central Railroad was opened wth an engine called the 'John Bull,' which had an upright boiler. The editor replied that the article was written by a person who was an authority on such matters, and that there was no doubt that the statements made were correct. On reading the editor's letter I determined to write a history of the locomotive, and I have been collecting material for it ever since."

Mr. Sinclair's character is a sufficient guarantee as to the reliability of the foregoing. This honest, sturdy and progressive son of Scotia has been a prominent figure in the American railroad world since long before many men now having years of passenger service to their credit ever fired a locomotive. For over a quarter of a century he has been a recognized and respected authority on matters pertaining to locomotive engine construction and operation. The fact that the compilation of this new work covers such a lengthy stretch (thirty years) of his useful and energetic career, and has received the care at his hands which such a period of attention

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would indicate, is of itself sufficient assurance as to its high standard and authenticity.

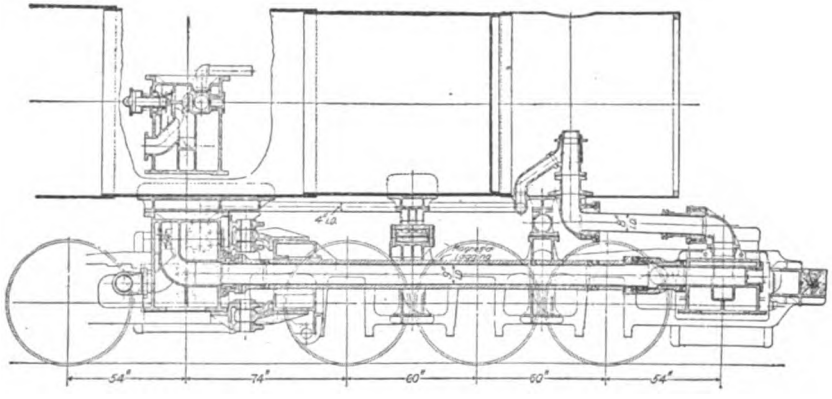
All enginemen imbued with a pride to master the history of the great machine they operate (and there are indeed but few of them who are not) will have in Mr. Sinclair's new book what is, without question, the most complete and reliable work of such a character that has yet been published.

Its various chapters cover the following subjects: Origin and Growth of the Steam Engine, Early Attempts at Locomotive Construction, Development of Locomotives in Great Britain, Genesis of American Railways, Connecting the Ocean with Western Rivers, First Links of the Pennsylvania Railroad, the Philadelpha & Columbia Railroad, How the United States Worked Into Locomotive Building. Triumphs of Baldwin, Sellers and Other Philadelphia Pioneers, First Links of the New York Central Railroad, First Railroad Construction in New England, Locomotive Building in New England, Work of New England Pioneer Master Mechanics, Troublous Times in Railway and Locomotive Construction, Locomotive Building in New Forms of Locomotives, Locomotive Accessories, Locomotive Works Still in Business, Railway Development in Canada, The Locomotive of Today.

The book, which is bound in half leather, consists of 680 pages, size 6x8¾ inches. It contains, all told, 300 illustrations, and a thorough and complete index; the type is large, pleasing and restful to the eye. The work, which the author dedicates to George Westinghouse, is bound to meet with that success to which its high standard of merit, as well as the standing of its author, both as an authority and a man, entitle it. It sells at $5 per copy and can be secured by addressing The Angus Sinclair Publishing Company, 136 Liberty street, New York City.

Details of Mallet Articulated Compound Locomotive.

In the October issue of the Magazine there was published an illustrated and descriptive article relating to the Mallet articulated compound locomotive for the Erie Railroad, the largest locomotive in the world, and which was recently com-



Steam Piping Mallet Articulated Compound Locomotive, B. & O. Railroad

pleted at the Schenectady works of the American Locomotive Company. The Railroad Gazette, in its issue of October 4, 1907, illustrates and describes in detail a number of special features of this locomotive from which, considering the great interest attaching to same and its importance to locomotive enginemen, we gladly reproduce the following extracts, together with illustrations:

". . . . In an engine of this character

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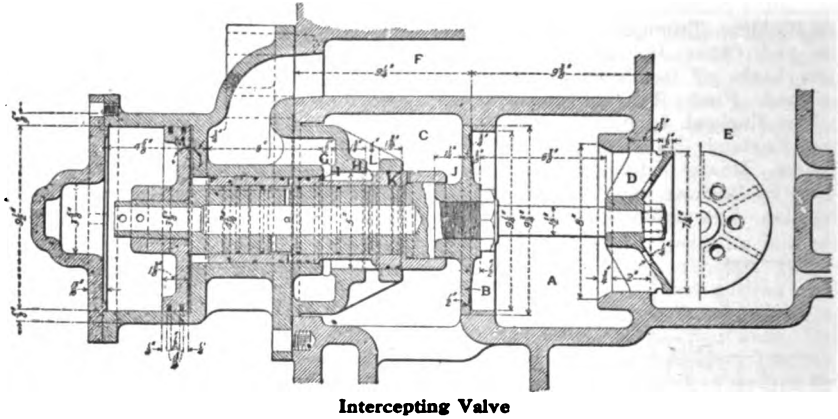
one of the difficulties that will appeal to the designer will be that of conveying the steam from the throttle to the exhaust of the low-pressure cylinders without leaks or joints that are liable to leak and yet compensate for the varying relative positions of boiler and cylinders. Here there are three movable parts changing their relative positions not only in angularity but in linear distances, and the steam must flow through the three sides of the varying triangle that they may be considered to represent, starting from one as its source and returning to the same for the exhaust.

"Up to the point where the steam is discharged from the high pressure cylinders there is no essential change from conditions obtaining on ordinary locomotives. The special throttle is placed in the dome with a dry-pipe leading forward. This dry-pipe, however, instead of extending on to the front tube-sheet, stops short at 62½ inches in front of the dome and turns up through the shell to a tee upon the outside, from which the steam pipes are led down on either side to the tops of the steam chests of the high-pressure cylinders. . . . . It is, however, as the steam leaves the high-pressure cylinders that the real interest in the steam passages begins.

"It will be remembered that, in the general description of the locomotive, it was shown that the two high-pressure cylinders were not joined on the center line of the boiler but that the half saddle of the one on the left-hand side extended 8½ inches over to the right in order that it might contain the intercepting valve and have the outlet to the receiver in the axis of the engine. By referring to the engravings of the high-pressure cylinders . . . . it will be seen that the exhaust passage of the one at the right leads back to an 8-inch opening in the rear of the half saddle, and that there is a similar opening in the left-hand cylinder casting to the large exhaust passage leading up to the intercepting valve chamber 9½ inches in diameter near the top of the saddle. These two openings are connected at the rear of the saddles by a cast-iron return bend, with a clear circular opening 8 inches in diameter and spaced 23½ inches from center to center. It is held to each half saddle by four 1-inch bolts, and the joints are made tight by the ordinary ground cast-iron rings with ball joints in the main casting turned on 6 inch radii and with flat faces on the return bend. As there is no motion here the whole passage is rigid.



Intercepting Valve

"The steam from both sides is thus discharged into the exhaust passage of the left-hand cylinder and then rises to the intercepting valve. This is of the Mellin type, first used and developed in the two-cylinder compounds built by the Richmond Locomotive Works, but differs from that valve in some of the details of its mechanism and in its location on the engine. In the Richmond two-cylinder compound locomotive, the high-pressure exhaust was delivered direct into the smokebox receiver pipe passing in an arch from one side of the cylinder to the other, and the intercepting valve was placed in the low-pressure side. That is to say, the intercepting valve was placed between the receiver and the low-pressure steam chest. In operation live steam was automatically

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admitted at a reduced pressure to the low-pressure cylinder until the high-pressure exhaust had banked up sufficient pressure in the receiver to open the intercepting valve; when that event occurred, and the flow of direct steam to the low-pressure cylinder was cut off, the receiver steam admitted and the engine thrown into compound action.

"In the Mallet compound the order of events is the same, but the arrangement of parts is different. Instead of placing the intercepting valve at the low-pressure end of the receiver pipe it is placed, as already stated, in the saddle of one of the high-pressure cylinders and receives the exhaust direct from both of those cylinders. This exhaust steam enters the space *A* beneath the main valve *B*, which is held normally closed by the reduced pressure live steam admitted back of it into the space *C*. Attached to the stem of the main valve and moving with it is the wing piston *D*. This latter part serves to guide the stem of main valve, and, through the holes in its face and the opening about its rim, permits the high-pressure exhaust to pass on to the passage *E*, whence it has direct access to the emergency exhaust valve.

"In the original Richmond compound the emergency exhaust was in a line and concentric with the axis of a main valve. In this modification for the Mallet compound it is a separate mechanism. By referring to the horizontal section of the left-hand cylinder . . . . it will be seen that there is an opening on the outside face of the saddle that connects directly wth the intercepting valve chamber. The flange (*1*) of the emergency exhaust casing is bolted to the side of the saddle so that its opening is put in communication with the chamber (*2*), which is closed by the wing valve (*3*) held normally against its seat by the spring acting on its stem and located outside the casing. Also attached to the stem of this valve is the piston (*4*) that is fitted with spring rings and moves in the short cylinder bored in the casing to receive it. When it is desired to work the engine in single expansion for all four of the cylinders, a cock is opened in the cab and live steam admitted through the opening (*5*) to the space back of the piston, moving the latter ahead, and opening the valve (*3*) through which the exhaust is allowed to pass forward through the small pipe shown in the engraving of the steam pipes, to the main exhaust, the details of which will be considered later.

"When this emergency exhaust valve is open there is no tendency to raise the pressure beneath the main valve *B* of the intercepting valve, and the whole locomotive works in single expansion. If, on the other hand, steam is not admitted to hold the emergency exhaust valve open, the spring closes it and holds it there, which it is arranged to do because the valve is partially balanced by the pressure against the face of the piston, and the unbalanced force tending to open it is only that represented by a ring ⅛-inch wide and 5½ inches outside diameter, the difference between the exposed areas of the valve and the piston.

"With the emergency valve closed and the intercepting valve in its normally closed position, which is that existing at starting, the sequence of events at that time is as follows: When the throttle is opened, live steam is admitted to the passage *F* outside the valve case and passes down through the port *G* and, filling the grooved opening in the reducing valve *K*, presses with equal intensity against the shoulders *H* and *I*. As the area of the shoulder *H* is the larger of the two, because of its larger outside diameter, the valve *K*, which is merely a sleeve fitted with packing rings for its bearing surfaces, is moved to the right and the live steam flows freely into the chamber *C*. As the pressure rises in this chamber, it acts upon the whole of the end of the sleeve *K*, and as this end area combined with that of the shoulder *I* is greater than that of the shoulder *H*, it follows that before the pressure in *C* has risen to the full boiler pressure exerted on *H*, there will be enough of an effort exerted on *J* to push the sleeve toward the left and thus close the opening made by the passage of the shoulder *H* past the port *L*. The ratios of these areas are so adjusted that, when the pressure in the chamber *C* has risen to the point at which it is desired that the initial pressure in the low-pressure cylinders should stand, the sleeve will close the port *L*.

"Steam admitted to the chamber *C* has free access to the receiver and the low-pressure steam chests; so that as soon as the throttle is opened steam is admitted to all four of the cylinders and the normal tractive effort is exerted.

"Then the first exhaust of the high-pressure cylinders passes into the space

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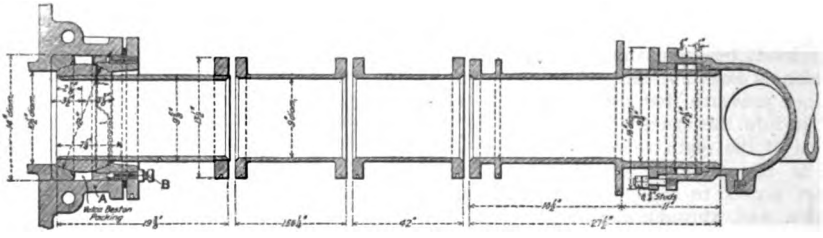
A and fills the passage *E* and the chamber (*2*) of the emergency exhaust valve, and when the pressure in these cavities has risen to a point slightly above that existing in the chamber *C*, the main intercepting valve *B* is opened by being moved to the left and the high-pressure exhaust is thus given a clear passage to the receiver and the steam chests of the low-pressure cylinders.

"As the main valve *B* is moved to the left it strikes the end of the sleeve *K* and, carrying it with it, closes the port *L* and thus prevents the admission of any more live steam to the chamber *C* and the receiver, and the engine enters upon its compound working. But if, at any time, the additional tractive power that can be obtained in single expansion action is desired, the opening of the emergency exhaust valve from the cab will bring that condition about.

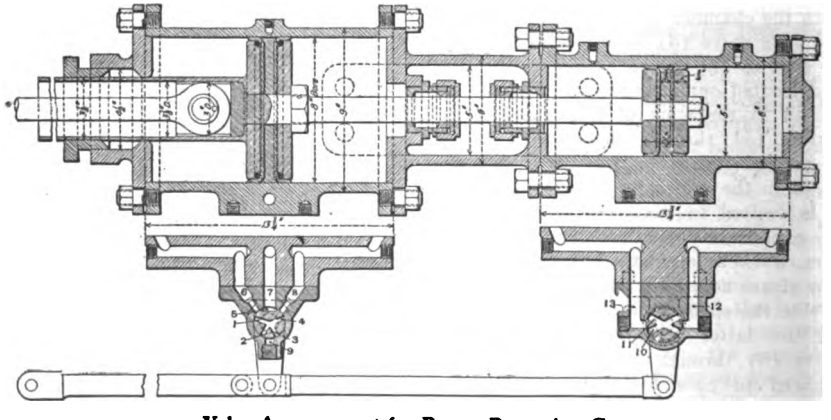
"At the rear the stem of the main valve is fitted with a piston *M* that moves in a cylinder forming a dashpot and thus preventing any approach to slamming. The surface where the stem is in contact with the inside of the sleeve is fitted with packing rings sprung into place so that leakage of steam is prevented.

"When the steam leaves the chamber *C* of the intercepting valve, it passes out through a passage cored in the saddle to the receiver pipe. As will be seen by referring to the assembled engraving of the steam pipes the passage from the intercepting valve drops down and curves to the front for the receiver pipe connection. Up to this point there has been no necessity for any flexibility in the joints, as all parts have been attached to and move in unison with the boiler. With the connection of the receiver pipe this is changed, for not only must there be a possibility of an angular displacement due to the relative positions of the two trucks, but there must be an extension due to the motion that must exist between the frames. The detail of the receiver pipe shows how these requirements are met.

"There is an extension *A* on the front of the high-pressure saddle that is bored out to receive two glands turned to a spherical inside fit and which can be



Receiver Pipe



Valve Arrangement for Power Reversing Gear

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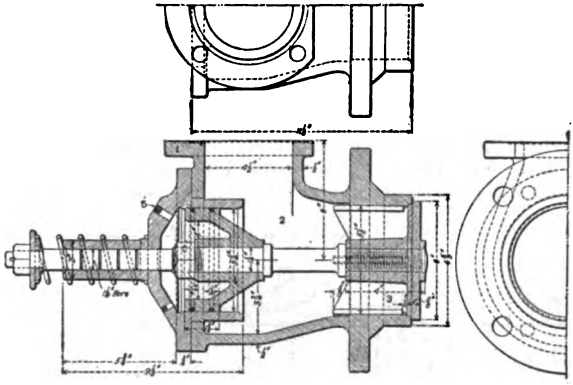
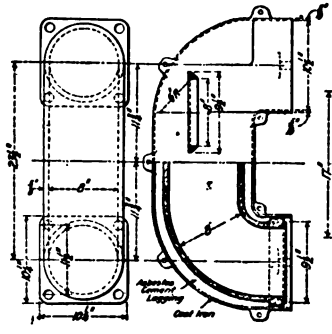
adjusted against the ball-bearing on the pipe by the studs *B*, so that lost motion occasioned by wear can be taken up and leakage of steam prevented. This is the only flexible joint in the receiver pipe, and is the only one that is necessary because the center line of the pins coupling the two frames nearly coincides with the center of the ball joint, so that the whole of the front truck, with its cylinders, iron casting with branches to mate with the admission openings in the back of the low-pressure saddles, and the joint between the two parts is made tight with the usual ground ball joint.

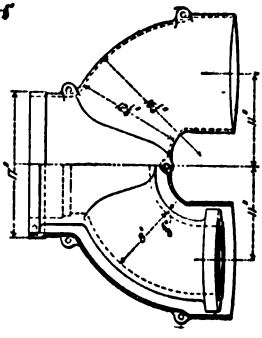
"The steam passes through the low-pressure cylinders, doing its work in the usual way, and issues from the top through exhaust openings set near the center line of the engine and spaced



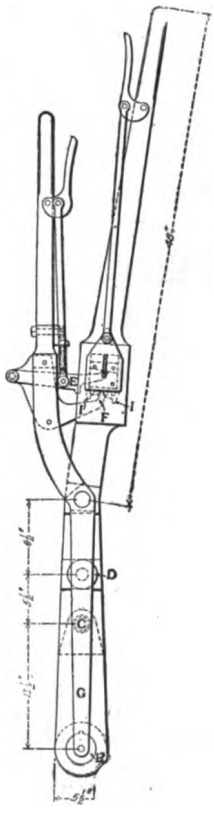
Emergency Exhaust Valve



Exhaust Passage Connection; High Pressure Cylinder



Dry Pipe Tee



Reverse Lever

swings around this point and the angular displacement is nearly the same.

"The receiver pipe is made in three sections merely for convenience in erecting, and at the front end it passes through an ordinary stuffing box in a tee, in which it has a fore and aft motion by which the variations in length can be made. The joints between the sections are made tight by the insertion of cast rings of V section turned to fit the recesses shown in the ends of the pipe. The tee at the front is a simple 7⅝ inches apart from center to center on the two saddles. An exhaust pipe elbow is bolted on to cover both openings and to turn the exhaust back towards the smokebox. This elbow is fitted not only with a universal ball joint by which the exhaust pipe is enabled to swing and keep in line with the corresponding elbow on the smokebox, but also contains a stuffing box and slip joint by which the variations in distance between the centers of the two elbows are taken care of. At the rear the exhaust

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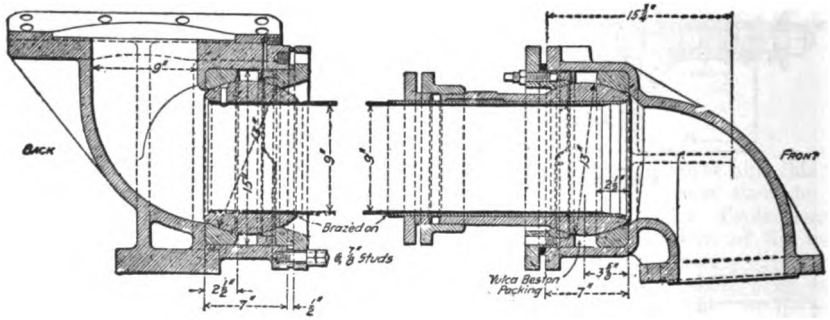
pipe terminates in another universal ball joint set in the smokebox elbow, so that the exhaust pipe can adjust itself to any and all variations in the relative positions and alignment of the low-pressure cylinders and the smokebox.

"The hole above the smokebox elbow is 16½ inches ahead of the center of the stack, so that the interior exhaust pipe is given an offset of that amount in order to bring it in line. In addition to this it has the added peculiarity of an attachment for the emergency exhaust. This exhaust pipe is led forward from the outlet of the emergency exhaust valve to a point just ahead of the front tube-sheet. Here it turns into the axis of the boiler and thence through another elbow enters the smokebox and connects with the auxiliary exhaust pipe back of the main



Exhaust Pipe

one. The main casting is made with a flange and short connecting pipe leading to an annular space like a steam jacket about the exhaust passage from the low-pressure cylinders. The exit from this annular space is through a contracted annular nozzle about the main one. With this arrangement there is no interference with the integrity of the low-pressure exhaust at any time, either when starting or when running the engine in single expansion. As the emergency exhaust pipe is connected rigidly to the boiler or parts moving with it at each end there are no flexible joints required in it.

"Closely allied to the required flexibility of the steam piping are the connections between the frames and the boiler. The boiler is necessarily supported by both front and rear frames, but it is rigidly attached to the rear one only, sliding supports being provided for the front. The connection between the two frames is by means of pivot pins and is of such a character that the whole tractive effort of the forward cylinders is transmitted to the rear frame through this connection and thence back to the drawbar connecting the tender.

"The general arrangement of the connection between the two frames is clearly shown by the assembled engraving of the steam pipes. which is that of the Baltimore & Ohio engine but is the same as that of the Erie. At the rear end of the forward frame heavy crosstie castings are attached to both the top and bottom rails, and these in turn carry the male sections of a pivotal connection, the female being bolted across the front face of the saddle of high pressure cylinder and attached to the frames. Two heavy pins complete the connection.

"The boiler is fastened to the rear frame at the high-pressure saddle and at three points beneath the firebox, the one at the extreme back end taking the form of the usual buckle plate. This holds the boiler in line with the rear frames at all times and causes a large range of lateral displacement over the front truck; a displacement that increases toward the front end of the machine and at the cylinders is at the extreme. . . . . The boiler is therefore carried on two sliding supports by the front frame. Of these one is placed about midway between the high-pressure cylinders and the front tube-sheet which is intended to carry the whole of the load of the front end of the boiler. The second is intended to serve merely as a guide and centering device to bring the boiler back central with the front frame when it runs out of a curve. It is provided with bearing surfaces but it is expected that the lifting springs with which it is provided will relieve these surfaces of all load.

"The general arrangement of this cen-

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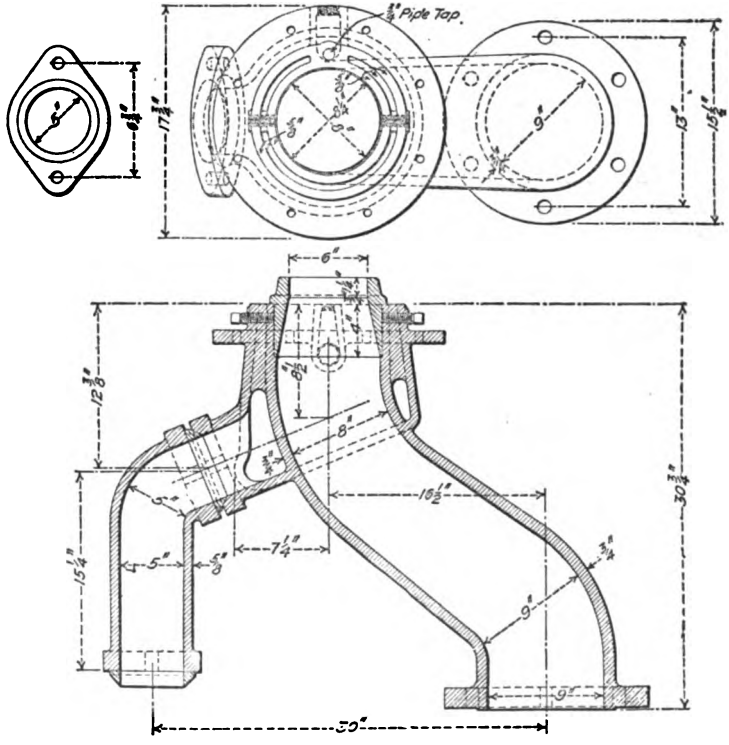
tering device is shown in the engraving of the assembled parts. The casting *A* is attached to the boiler and has the spring case *D* bolted to its lower face. The lower face of this spring case is planed smooth and is fitted with a wearing surface provided with oil grooves, so as to move easily to and fro across the top face of the heavy frame cross-tie *F* that is bolted to the frames *G G*. The spring case contains two nests of helical springs provided with thimbles in whose sockets the stems *E E* have a bearing. These stems are pivoted in the brackets *D* which are bolted to the cross-tie *F*. At the center the two springs have a bearing on the spring case *B*. It is evident that when the boiler swings to one side or the other of the center lines of the frame and carries the spring case with it, the spring at one end or the other is compressed and tends to push the case, and with it the boiler, back to the central position.

"In order to relieve the bearing surfaces between the spring case and the frame cross-tie *F* of that part of the weight of the boiler that would naturally come upon it and, at the same time, render the centering action of the springs more effective, an upward thrust is exerted against the main casting *A*. Near the lower edge of this casting there are two hemispherical sockets in which the ends of the relief stems *I I* are fitted. The lower ends of these relief stems rest in sockets attached to the swinging seats *J*. These seats are pivoted to a cross-tie *H* that rests upon the lower rails of the frame. They are held up against the lower ends of the relief stems *I* by U bolts *K K*, and these are, in turn, supported by springs which rest upon the cross-tie. These springs are put in position under a tension sufficient to sustain that portion of the weight of the boiler of which it is desired that the surfaces between *B* and *F* should be relieved. They also serve to compensate for any angularity that the relief stems may as-



Exhaust Nozzle

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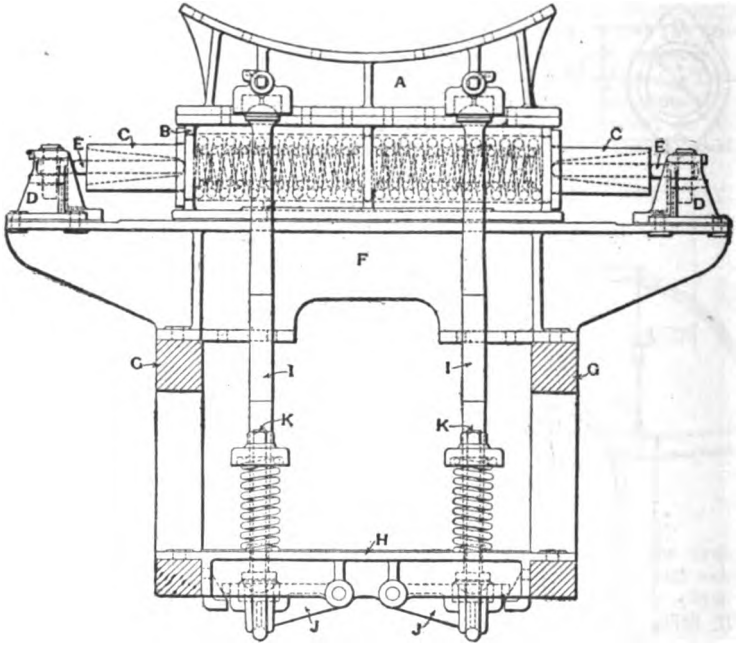
sume due to the lateral motion of the boiler.

"By this arrangement the boiler is free to move to and fro across the supporting surfaces without exerting an undue frictional thrust upon the frames and without being raised above its normal position by the auxiliary supports. There is a support back of the centering device upon which the weight of the forward part of the boiler rests and to which attention has been called. This consists simply of castings fastened to the boiler shell and frames and fitted with suitable wearing surfaces that are properly lubricated and with stops so adjusted that the desired fore and aft movement due to the play between the two frames is allowed.

"Owing to the fact that there are two sets of valve motions to be moved by the reverse lever an air-operated reversing gear is used. In the cab there is the usual reverse lever attached to the reach rod in the ordinary way and fitted with the regular latch engaging in the teeth of the quadrant. In addition to this the reverse lever is also coupled to the piston rod of the air gear. Back of the main reverse lever and pivoted upon it there is what looks like an auxiliary lever. This is used for the handling of the motion when air is worked. The engraving of the two levers show the relative proportions and their connection with each other. The main lever is pivoted to the reverse lever stand at *B;* is connected to the piston of the air cylinder at *C* and to the reach rod at *D*. It is fitted with the usual latch engaging in notches cut in the quadrant and is also provided with a special latch for locking and limiting the motion of the auxiliary lever.



Centering Device for Front Frame Section, Mallet Articulated Compound Locomotive

"The auxiliary lever is pivoted on the main one at *A*, and when a change of cutoff is to be made the latch handle of the auxiliary lever is pressed in and this lifts the main latch by means of the lifting bar *E*. The lifting of the main latch also frees the auxiliary latch finger *F* and gives it a freedom of movement between the two lugs 1_1 1_1. The movement of the auxiliary lever to or from the main lever by the distance permitted by the lugs 1_1 1_1 swings the lower end *G* so that its center is out of line with that of the lower end of the reverse lever at *B*. As both levers turn about this point the offset thus obtained is prac-

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tically constant and is utilized to operate the valves of the air and oil cylinders, as will be described later.

"There are two cylinders set tandem for the reversing gear. Air is used as a motive power and it is worked in a double-acting cylinder of 8-inch bore. The other, or oil cylinder, is 5-inch diameter. Both pistons are packed with leather cup packing, that for the oil being held by the follower only, while that on the air piston is held out by a spring ring. Packing boxes for the rod are placed between the cylinders and for the trunk piston rod at the air end, where there is a short connecting rod leading to the reverse lever. In operation, whenever the auxiliary reverse lever is in its normal position, the valves of both oil and air cylinders are blanked. This locks the gear, for, with the oil cylinder filled, no motion can take place when the by-pass is closed. The connections show the operation of the valve. The valves are simply tapered plug valves; that for the air has a four-way opening in addition to an exhaust cavity and that for oil has crossed passages so that the two ends of the cylinder are put in communication whenever the auxiliary reverse lever is pushed forward or back. For example, when the auxiliary lever is pushed forward the lower end of the arm *G* is drawn back turning the air cock so that the port *1* is opened to the passage *6*; *3* is open to the air inlet *9* and the exhaust cavity *5* opens the passage *8* to the exhaust 7. Air is thus admitted to the rear of its cylinder and the motion is moved forward. At the same time the cross passage *10* is turned to allow oil to pass from *12* to *13*. For reversing, the air is admitted to the front passage *8* through the port *4* and the by-pass of the oil cylinder is opened by *10*.

"By giving the auxiliary lever a slight angular position the passage of oil from one end of the cylinder can be checked to any extent and the moving of the gear be made slowly or rapidly as may be desired. When the gear is to be moved the auxiliary lever must be kept in motion as long as it is desired that the gear shall move, and when the desired notch in the quadrant has been reached, the lever is brought to its normal position relatively to the main lever, the movement stops at once, the ports are covered and the pistons locked.

"These are the principal items of interest connected with the locomotive in that they are the details that are essential to permit the proper relative position of the frames on curves. The great size of the machine made it necessary to give close attention to every item of its construction in order that suitable proportions might be obtained, and as such each part of the engine is deserving of close study."

* * *

The Quebec Bridge Disaster.

When it is understood that the great cantilever bridge designed to span the St. Lawrence River at Quebec was to have been the largest of its kind in the world and that the plans and calculations from which it was being constructed were regarded as infallible, it is not to be wondered at that the engineering profession, and engineering and scientific publications generally, should continue to evince an intense interest in its collapse, for that awful disaster is evidently regarded by them as being in a sense a reflection upon the art and science of modern engineering. These publications are advancing every possible theory as to the cause of the catastrophe. Minute calculations are being made, the positions of the various posts and members as they lie in the wreckage having been closely observed by expert engineering authorities in the hope that the real cause of the bridge failure may be discovered for the benefit of science.

It is doubtful if history records the failure of a greater engineering enterprise. Not only is bridge building one of the oldest of mechanical arts and inseparably identified with the advance of progress in all lands and in all ages, but in it is to be found as well in our present day the greatest economic development in the use of structural steel and iron—the modern material which now constitutes the framework of all great building enterprises. The cantilever bridge represents the highest development, if not perfection, in the art of bridge building. It combines in one structure the strength-giving principles of all other forms of bridges besides, in addition thereto, a principle of its own, viz., the balancing of the parts through which the arms on one side of each main pier are made to equalize the weight of those on the other side of the same pier. That the world's greatest attempt at this form of bridge building should have met wth temporary failure does not in

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any sense condemn the cantilever type of construction, for it has been repeatedly tested in smaller bridges and has proven a thorough success.

It has been suggested that possibly the builders were too ambitious, that they planned too magnificently; but in the face of the success attending other structures of the kind, and of the fact that the proportion of the weight and strength of the material used, to the added length of the cantilever span, was maintained, there is no justification for such an hypothesis. The conclusion at which the layman would naturally arrive is probably the correct one. viz., that with the weight of a 1,000-ton traveler, a locomotive and several cars loaded with steel girders, besides a large quantity of heavy building material lying on the floor of the bridge and all this weight concentrated at the tip of the great arm, the overhang was overweighted, and the result thus made inevitable—viz., the collapse of the structure—naturally ensued.

Well may structural engineers everywhere be keenly interested in the outcome of the investigation as to why a closer scrutiny was not exercised in watching the work as section after section was added to the great overhanging framework of steel. Other bridges of the same type with scores of workingmen employed on them are under way, and whatever the result of the investigation may be, it is safe to predict that it will not only in no sense discourage the future use of the cantilever type of bridge, but will rather have the effect of adding to the safety of their construction hereafter.

The Scientific American, in its issue of October 12th, discusses this all-important subject editorially as follows:

Why the Quebec Bridge Failed.

The Quebec bridge fell because of the buckling of the bottom chords, and the bottom chords buckled because the four ribs or webs of which each was built up were not sufficiently braced together to enable them to act as a whole.

In a previous issue we stated that the first failure occurred in the left-hand bottom chord of the anchor arm in the second panel out from the main pier. Subsequent detailed examinations of the wreck show that, simultaneously with the failure of the left-hand chord, the corresponding right-hand chord collapsed in a similar manner, being buckled into the form of the letter S. Furthermore, the later investigations have revealed the fact that the whole of the bottom chord members had shown signs of weakness which were sufficiently disconcerting to cause comment and considerable anxiety among the workmen on the bridge. Of this there seems now to be no doubt whatever. Evidently, at the time of the disaster, the various struts, posts, and chords throughout the whole bridge, but particularly the chords, were suffering from over-strain and were trembling on the verge of collapse. It was merely some local action that caused the break to happen just where it did. Probably there were a score of other compressive members which might have failed as readily as this one.

At the same time we are confronted with the significant fact that, regarding the tension members, that is the eye-bars, there had never been any anxiety whatever on the part of the erecting gangs; everybody connected with the bridge, from riveters up to chief engineer, being perfectly satisfied that these members were standing well up to their work. Furthermore, the tension members passed through the terrific ordeal of the final collapse of the bridge with a really marvelous immunity from fracture, only one single bar out of the many hundred in the bridge being ruptured. The conclusion to which practically every engineer who has examined the fallen bridge, and made a careful study of the strain sheets, etc., has arrived is, that there was something radically wrong with the design of the large compression members, and particularly the bottom chords. In this opinion we entirely concur, and for the reasons which are given below.

The general public has but a faint idea of the enormous stresses to which the members of a cantilever of the size of the Quebec bridge are subjected. The chord member which failed was supposed to have a safe strength of 9,312 tons; that is to say, it could be subjected to an end pressure of this enormous amount without any signs whatever of deflection or buckling. In order to illustrate just what this means, our artist has prepared the accompanying drawing showing this member, 57 feet in length and measuring 5 feet 7 inches by 4 feet 6 inches in section, stood on end on a suitable pedestal, and carrying the United States armored cruiser "Brooklyn," whose weight is 9,215 tons. Now, according to the calculations of the engineers, this member should not only be capable of carrying the load of the "Brooklyn" without failure, but it should be possible to add as an additional load, say, the cruiser "Marblehead," of 2,100 tons weight, before the column would begin to show signs of distress, the total load of over 11,000 tons representing close to the elastic limit of the material, or the point at which the steel would begin to yield without recovery. Now, 11,320 tons represents the maximum possible load which it was estimated could come upon this member, due to the weight of the bridge itself, plus the weight of the live load,

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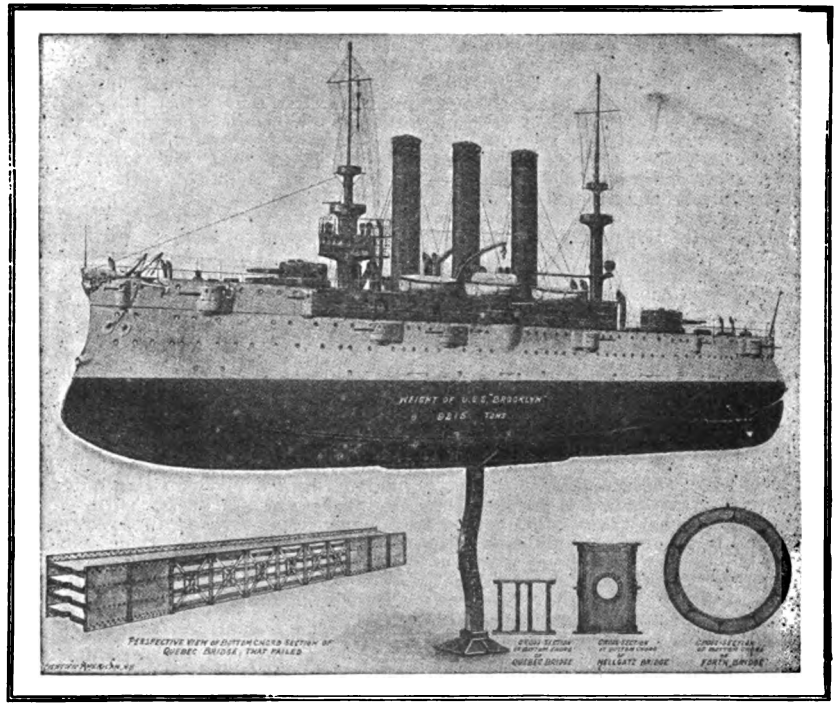
that is trains, vehicles, foot passengers, etc., plus the load due to a heavy wind storm. And, right here, we cannot but express our surprise that this member should have been made so light that, in the event of the maximum live load and the maximum wind pressure occurring at the same moment, the metal would be strained almost to the elastic limit. This possible that a full-loaded bridge may, without warning, be subjected to a gale of wind or even a tornado.

However, as a matter of fact, this compression member failed under a load of about 8,000 tons, or less, this being the calculated load which was upon the bottom chord at this point, when the bridge went down. How comes it then,



GRAPHIC REPRESENTATION OF THE ENORMOUS LOAD WHICH THE COLLAPSED QUEBEC BRIDGE BOTTOM CHORD WAS SUPPOSED TO CARRY WITH A MARGIN OF SAFETY

The vertical post, which is shown in the act of breaking down under the load of the cruiser "Brooklyn," is drawn to scale and represents the lower chord member of the Quebec bridge which failed by buckling through the rupture of the latticing. Theoretically this member should have carried 11,320 tons; actually it failed under 8,000 tons

(From Scientific American)

is cutting matters down to a fine point with a vengeance. We understand that those who are responsible for the design claim that the probability of the conjunction of a maximum live load and a maximum wind storm was considered to be so remote as to be negligible in the computations. They considered, furthermore, that this contingency was preventable, since it would be possible in the event of a heavy windstorm to prevent more than a limited amount of traffic on the bridge. This was certainly a most astounding presumption; for it is always that failure should have taken place when the chord was strained to only about two-thirds of its calculated strength? An examination of the drawing of this member, as here given, and of the direction in which it yielded, affords conclusive evidence that it gave way because the latticing which is supposed to hold its parts in true line was utterly inadequate to do so.

The member consisted of four deep parallel webs, or ribs, 4 feet 6½ inches in depth, each built up of four thicknesses of steel plate riveted together,

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and having a total thickness of about 3½ inches. Now the veriest tyro can understand that these four plates, 57 feet in length and 4 feet 6½ inches in width, if stood up on end, parallel with each other, would be capable of carrying but a very small load before they began to buckle out of shape. To render them capable of load carrying, they would have to be braced firmly together with a view to keeping them in true line. This fact can be illustrated in a homely way by taking an ordinary walking cane and leaning upon it. Before much pressure was applied it would begin to spring out of line. If it were held at its middle point, it would carry a much greater weight before deflecting, and if it were supported at three points, a greater load yet, and so on. Now the method adopted for preventing deflection of the ribs of the Quebec bridge chords, transversely to their planes, was to tie them together at their edges with a latticing of diagonal angles, each measuring 4 inches by 3 inches and ⅜ inch in thickness, and transverse struts consisting of angles 3½ inches by 3 inches by ⅜ inch in thickness. This latticing, or trussing, as it might be called, was riveted to the tops of the webs by ⅞ rivets, there being two rivets at each point of contact. *Theoretically*, these angles should have been sufficent to hold the webs in true line, that is, to hold them exactly parallel with the longitudinal axis of the chord member. *Theoretically*, if the ribs were absolutely true, and if the load of 9,000 or more tons was applied concentrically and in an absolute axial line with the member, there would be no stress on the latticing. As a matter of fact, not even the most careful manufacture can insure such mathematical exactness. The individual plates, and the columns as a whole, are certain to be somewhat out of line. Moreover, because of slight and unavoidable inaccuracies in manufacture, the load might be applied somewhat eccentrically; that is to say, it might bear more heavily on one edge of the column than the other. This might be further aggravated by the fact that the rivets of the latticing did not entirely fill the rivet holes, allowing a slight deflection of the whole column, until the angles of the latticing were under stress. Then there would be a tendency to tear the latticing apart, either by the rupture of the lattice angles, or, what is more likely, by the shearing off of the rivets. Undoubtedly this is what occurred in this member. In fact, two or three days before the disaster, the inspector had observed that the webs had actually sprung out of line from an inch and a half to two inches, and before the warning had been heeded and load taken off the bridge, the latticing tore asunder, and the thin and now unbraced web plates buckled like the walking cane above referred to, and twisted into the S form in which they now lie beneath the pile of wreckage.

It is our belief that not only was the lattice reinforcement absurdly light for the work it had to do, but that the outside dimensions of this member, which measured only 4½ feet by 5½ feet, were altogether too slight for the chords of a bridge of this enormous size. This criticism is borne out by a comparison with the sections, shown in our engraving, of the bottom chords of two other notable bridges, one the 1,000-foot, steel, arch bridge about to be built at Hell Gate across the East River, and the other the celebrated Forth bridge, whose cantilevers have a span a little less than that of the Quebec bridge. In the case of the Hell Gate bridge the bottom chord measures 7 feet by 8 feet 6 inches; and, although the total combined dead, live, temperature, and wind loads have a total of only 8,420 tons, the total area of metal at any point of section is 811 square inches, as against 735 square inches in the Quebec bridge, whose total load, as we have seen, is estimated at 11,320 tons. Moreover, the metal of the Hell Gate chords is distributed around the circumference, instead of across the whole member; and in place of light angle latticing it is stiffened throughout with solid cover plates, and has three one-half inch diaphragms, with stiffening angles, extending across it at three points of its length. The Forth bridge bottom chord is an even stiffer construction than this. It consists of a tube 12 feet in diameter, built up of ten 12-inch longitudinal I-beams, riveted to an outer shell 1¼ inches in thickness, with circular stiffening webs worked in at 8-foot intervals throughout the whole length of the tube.

The Formula and the Testing Machine.

The Quebec bridge was the victim of a too blind faith in the formula. This primarily. Possibly it was the victim of the unwise practice of permitting the successful contractor for a bridge to work out the details of the design himself. We understand that the contract for this bridge was taken for a fixed sum. If so, this obviously imposed upon the engineer who developed the plans, the task of keeping down the sum total of material in the bridge to the lowest possible figure compatible with safety. The obvious way to reduce the total weight was to use a high unit of stress, and in the Quebec bridge, and particularly in the compression member which failed, a unit stress was used which, to put it mildly, simply staggered the engineering world when the strain sheet of this bridge was made public. And yet, it is a fact that even with the high unit stress employed, if the formula used in calculating the compression members had been as reliable in these abnormally large sections as it had proved to be in smaller sections, the bridge should not have gone down, even when completed and loaded; and certainly it should not have fallen when loaded as it was at the

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time of the collapse, with only one-half of the calculated maximum load which might be imposed when the bridge was in operation.

Among the many lessons taught by this catastrophe, the one which stands out pre-eminently is that some of our bridge engineers have been placing an altogether too implicit faith in the commonly accepted formula for compression members, and also that they have been too anxious to practice economy of materials. In proof of this we direct attention to the comparative sections on another page, drawn to the same scale, of the chord member of the Quebec bridge and that of the Forth bridge. The strain sheets of the Forth bridge have never been published, but presumably the load on the corresponding members of the two bridges was about the same. If so, one or the other of the two engineers responsible for these designs was woefully in the wrong. Either Baker's enormous and rigid tubes are absurdly big, heavy, and costly, or the curious assemblage of flexible plates in the Quebec bridge member is ridiculously light and inadequate. A prominent engineer, since connected with the Quebec design, some sixteen years ago stated that an American engineer could have taken the money subscribed for the Forth bridge, and after building the structure have turned back fifty per cent. to the owners, instead of having to collect, as was done, forty per cent. in excess of the estimate. We have now seen the experiment made with a cantilever bridge of slightly larger dimensions; and the result of the attempt to build such a structure by the more economical method of using flat pieces, pin connections, and high unit stresses, is shown in the 17,000 tons of steel junk which now encumbers the bed of the St. Lawrence river.

And yet, in all fairness it must be admitted that, according to the formula used for the compression members, they should easily have stood up under the load under which they collapsed. Some modification of the formula for built-up rectangular compression members is evidently necessary, when it is applied to such large sizes as those in the Quebec bridge; and we think it can not be disputed that the only satisfactory way to determine the actual strength of the largest rectangular columns of the character almost universally used in American bridge practice, is to put up a testing plant sufficiently powerful to make the required tests.

Does it not look as though the time has arrived when, in view of the enormous interests involved, Congress should appropriate funds for the institution of such a plant, in which tests, even as costly as these, could be carried out? The testing of large-sized bridge members would form only a part of the work which such a plant would accomplish. The rapid development of concrete construction, for instance, has brought in its train a number of problems which call for immediate investigation. Evidence of this is afforded by the many failures of armored concrete which are continually occurring. It is positively appalling to think of the number of buildings, factory chimneys, bridges, etc., which are being rushed up all over the country, and contemplate the fact that no small percentage of them embody inherent weakness either of design or construction, which may bring about their ultimate collapse. In the field of concrete-steel alone, a government plant of this kind would yield invaluable results. It is true that the government is doing, and has done, a large amount of work of this character in plants of limited capacity, but the plan we advocate would call for a thoroughly comprehensive, well-equipped plant, presided over by a corps of civil engineers, permanently assigned to their positions, who would thus acquire that store of cumulative knowledge and proficiency which continued service in a special line such as this can alone insure.

* * *

*Electric Locomotives of the Pennsylvania Railroad.**

With a view to determining the type best adapted to pulling its heavy passenger trains through the New York tunnels, the Pennsylvania Railroad has in progress a series of experiments upon electric locomotives. Through the experiments, which are being conducted on its West Jersey & Seashore division and the Long Island Railroad, the company intends to determine some of the general characteristics of the electric locomotive and to secure operating data based on actual service.

Of the two direct-current locomotives now undergoing tests, one is equipped with four 350-horsepower geared motors, and the other with four gearless motors in order that the relative merits of the two types may be determined.

The locomotive with gearless motors has one of its trucks equipped with two 320-horsepower motors supported by springs from the main journals and wholly independent of the truck frame, while the other truck has two 300-horsepower motors rigidly fastened to the truck frame. This arrangement will demonstrate the advantages of the two methods of motor suspension under the same conditions of service.

In exterior appearance the two locomotives are almost identical. They resemble somewhat a short truck passenger

*From the Railroad Gazette.

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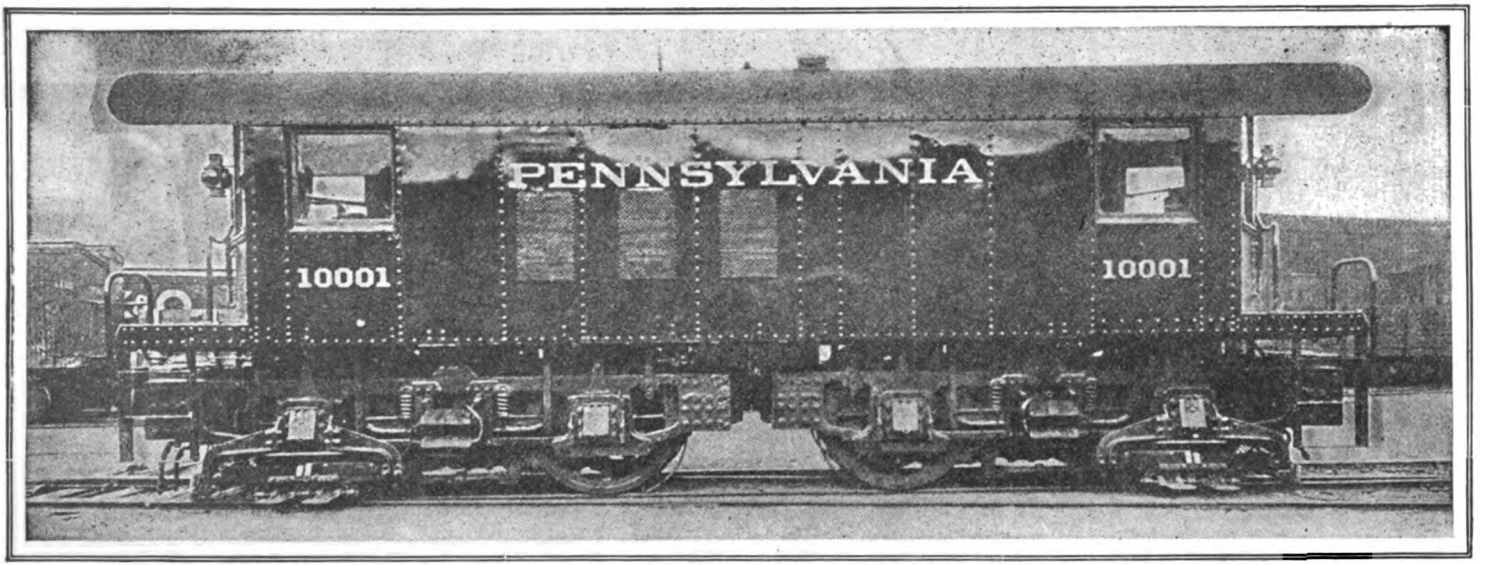

ELECTRIC LOCOMOTIVE OF THE PENNSYLVANIA RAILROAD - SIDE VIEW

(From The Railroad Gazette

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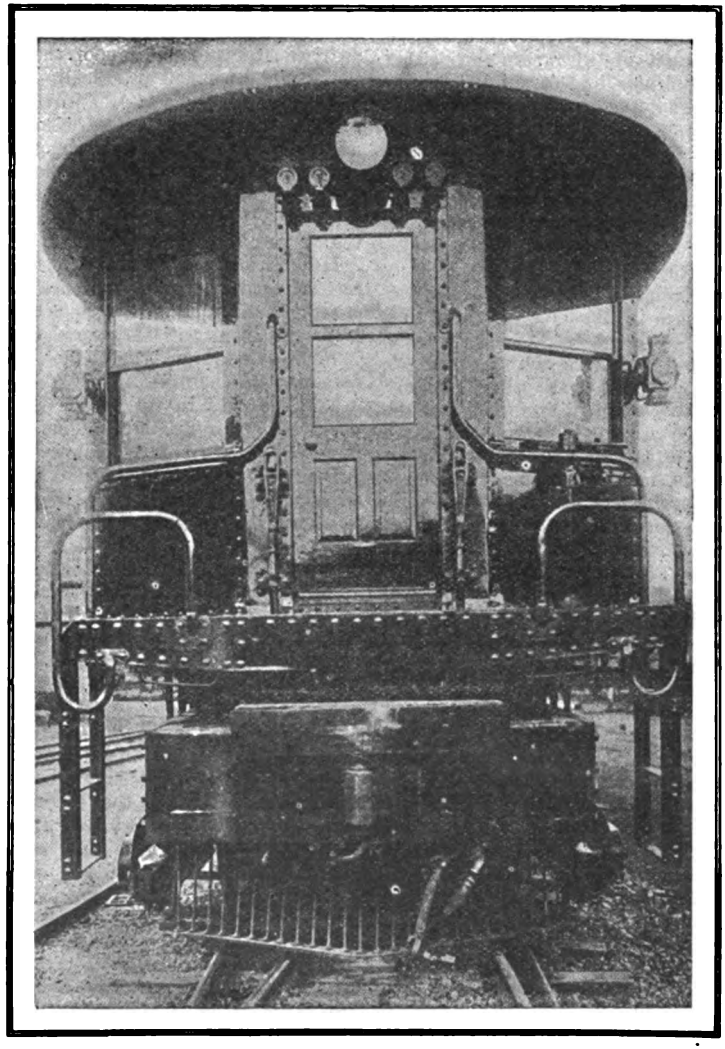
car with few windows and large wheels. The trucks are of the four-wheel type, having frames placed outside the wheels, with pedestal boxes and adjustable wedges similar to those used in locomotive practice. On account of their short wheel base the trucks have a tendency to tilt in operation, and thereby shift a portion of the effective load from one pair of wheels to the other. By an ingenious automatic switching mechanism the power delivered by the motor on the heavily loaded axle is increased and the power delivered by the motor on the lightly loaded axles diminished in proportion to the difference in axle loads. By this expedient the pulling power of the locomotive is increased.



ELECTRIC LOCOMOTIVE OF THE PENNSYLVANIA RAILROAD—END VIEW

(From The Railroad Gazette)

The outer-end casting of each truck carries the coupler, draft spring and buffer arrangement, so that strains caused by pushing, pulling and buffing

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are taken directly by the truck frames and do not come upon the underframe of the cab, except as they are transmitted between bolsters through the center sill. In order to allow sufficient lateral play when the locomotive is coupled to a long passenger car with a considerable overhang, the coupler head has a free movement of 15 inches on either side of the center line of the truck. To facilitate coupling and uncoupling on curves, the coupler can be swung sideways and its uncoupling pin raised by means of levers at the end of the cab, which can be operated from the platform.

Driving wheels are 56 inches in diameter, with removable tires secured by retaining rings. They are carried by axles 8 inches in diameter at the center, provided with 6-inch by 11-inch journals.

The spring rigging is of the locomotive type, with semi-elliptical springs over the journal boxes, and equalizers between the springs. To prevent teetering, the equalizer beam is not provided with a fixed fulcrum, but instead supports two nests of helical springs, which in turn help to support the truck frame.

The collector shoes are attached to the four end journal boxes, and are made of two castings forming a spring hinge, with one wing lying in a horizontal plane, and sliding on top of the third rail. The current passes from the third rail through the collector shoes and the heavy cables connected thereto to the fuse-boxes fixed near the shoes.

The cab is entirely of metal, its underframe composed of a center sill, built of two 10-inch channels, side sills of 7-inch by 3½-inch angles, plate bolsters and end sills. Within the cab the apparatus is distributed along the sides, leaving a passageway through the middle. The equipment on one side of the cab consists of three main reservoirs, a sand-box with electro-pneumatic valves underneath, a switch group two line switches, a case of diverters and two sets of storage batteries. That on the other side consists of a compressor, a compressed air cooler, a fan and motor, a reservoir for control apparatus, a sand-box, two line switches, a whistle reservoir, a motor cut out, a switch group and a case of diverters.

The locomotive control mechanism is in duplicate, and placed in diagonally opposite corners of the cab, so that the motorman can operate a locomotive, or group of locomotives, from either end of the cab, in either direction. By means of a special grouping of switches it is possible to obtain a constant flow of current without a break, when changing from series to series parallel, and from series parallel to full-multiple. The preliminary tests made with the locomotive proved that by means of this system of grouping switches, the acceleration of the locomotive could be made practically uniform. Both ends of the cab are provided with sockets, so that when two or more locomotives are coupled together connections can be made by means of these sockets, and the group of locomotives can be simultaneously operated and controlled by the motorman of one locomotive.

Hung from the ceiling in the center of the cab are two plug switches and another ammeter shunt. The conductors from the third rail shoes are connected to one switch, and the trolley cable is connected to the other.

The switches in the switch group are operated by air pressure. The air valve is actuated by a control magnet on a 14-volt circuit. When current flows through, the magnet armature opens the air valve, admitting air behind the piston, which closes the switch through which the main current flows. By breaking the control circuit the armature of the magnet is released, which closes the air passage from the reservoir and prevents the egress of air from the cylinder. A spring under the piston pushes it up, and thus opens the main circuit. The line switches are actuated in a similar manner, and also open when an excess of current flows through them by the air valve, admitting air behind the piston, which closes the switch through which the main current flows. By breaking the control circuit the armature of the magnet is released, which closes the air passage from the reservoir and prevents the egress of air from the cylinder. A spring under the piston pushes it up and thus opens the main circuit. The line switches are actuated in a similar manner, and also open when an excess of current flows through them.

The cab can be lighted by three lamps, which are in series with the lamps with the headlights; but normally these lamps are to be concealed. Five more lamps, which are in series, are distributed over the ceiling, to assist in lighting the cab when repairs are under way, but are not used when the locomotive is in service.

The storage batteries are in two sets

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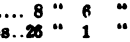
so that they can be charged alternately by being placed in series with the motor of the air compressor, one set being charged while the other set is in service, the alternation being made each day.

Locomotives are equipped with hand, straight air, automatic and high-speed brakes. The principal dimensions, which are the same for both locomotives, are:

Number of pairs of driving wheels		4
Diameter of driving wheels		56 in.
Axles	diameter, 8 in.; journals,	6x11 "
Length, inside couplers	37 ft.	10¼ "
Length over platforms	35 "	8 "
Wheel base of trucks	8 "	6 "
Total wheel base of locomotives	26 "	1 "
Width, cab	10 "	1¾ "
Width, body	9 "	11¾ "
Height, rail to top platform	5 "	5 "
" " " roof	13 "	4 "
" " " bell (extreme)	14 "	5⅝ "
Weight: Locomotive No. 1001 (geared motors)		175,100 lbs.
Weight: Locomotive No. 1002 (gearless motors)		195,200 "



The Technical World Magazine.

The publishers of our esteemed contemporary, The Technical World Magazine, are at present engaged in a special effort to bring that excellent publication to the attention of railroad men in all branches of service. Judging from the character of its work, its name is certainly well chosen, for in the technical field its scope is world-wide and covers every branch that can be properly classed within its confines.

The subjects of which it treats are handled by an expert staff of editorial writers, each a specialist in his line, and is presented to the reader in such a way that "he who reads can understand." It is profusely illustrated, its half-tones being clear and perfect in detail and many of them printed in colors. Its publishers state that special arrangements have been made with many more of the best writers located in all parts of the world—right on the ground—to tell all about distant happenings, and that they are sending photographers abroad to secure photographs otherwise unobtainable; also that they are going to cover thoroughly such fields as electrical, mechanical, steam, sanitary, textile and architectural engineering in their many phases, treating of such recent developments as reinforced concrete, gas producers, electric steel smelting, high-speed steel, wireless telegraphy, flying machines, automobiles, etc. They declare that they propose to spare neither expense, time nor energy in making The Technical World Magazine a publication that will command its own welcome wherever it has been once a visitor. The Technical World Magazine has long been amongst the most valued of our exchanges. It is a bright and attractive monthly periodical. Its subscription rate is $1.50 per year, and for those interested in any of the wide range of subjects it so ably discusses, this trifling amount will be indeed a most profitable investment. The subscriber's choice of a text-book on one of the many subjects treated therein goes with each subscription.

Relative to the question of union labor in the manufacture of their publication, the publishers say, "Should the question of union labor be brought up by any one, it should be known that The Technical World Magazine is constructed throughout by the W. P. Dunn Company, of Chicago, which is recognized as one of the finest union shops in the Middle West."

Persons desiring to subscribe should address The Technical World Magazine, Chicago, Ill.

The Deadly Mail Crane—An Invention to Supersede It.

The deadly mail crane has long been a menace to the safety of engineers and firemen; it has sent many of them to their graves and seriously injured many others. For some years the necessity has been forcibly recognized of substituting it with a device devoid of its dangerous features that will successfully perform its work. Long have our legislative boards sought the enactment of legislation looking to the removal of the evil, but in nearly every instance have their efforts been met with strenuous opposition on the part of representatives of railroad companies, while in some cases they have been put off with the assurance that "the company was then experimenting with an invention which they thought would be a success," but the old style mail crane still remains, adding as time goes by to its already long, long list of victims, its chief danger consisting in its close proximity to the engine cab, which unfortunately is essential to its successful operation.

While railroad men on the one hand are demanding the adoption of a mail-

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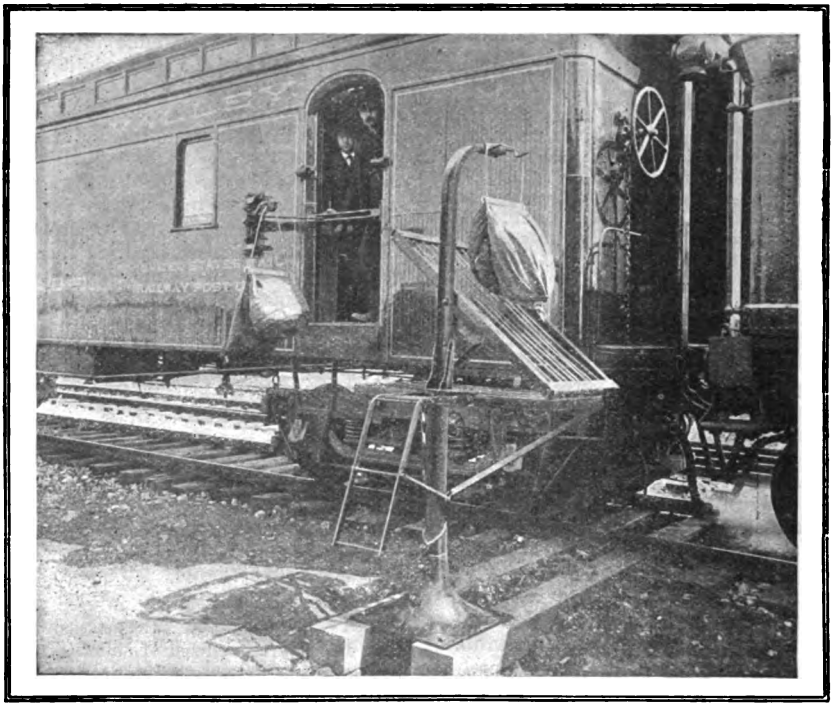
catching device that will not endanger their lives, the Government is especially anxious to secure a device that will not only permit of the safe catching of mail bags by swiftly moving trains, but as well of their safe delivery from trains running at a high rate of speed without damage to their contents, as it happens occasionally that the bags in being thrown from the flying train are forced under its wheels and much of the mail destroyed or scattered to the winds.



THE CUMMINGS AUTOMATIC MAIL BAG CATCHER AND DELIVERER—READY TO DELIVER AND TAKE ON MAIL

It is believed that a device invented by Mr. Mont D. Cummings, of Columbus, Ohio, will fill both of these wants. The invention of Mr. Cummings is described by him as follows:

"This device performs the work of both mail catcher and deliverer and consists of two parts shown in the accompanying illustrations, one of which is attached on each side of the postal car, and the other located at each station along the road where it is desirable to exchange the mails. These devices are easily reversed to catch and deliver mail from trains going in an opposite direction, as on single track roads, etc. To operate the devices the mail pouches are attached to a simple holder and hung on to each device before the train reaches the station. When the train passes the station the pouches from the train will be put off in the station receiver, while the pouches from the station device will be caught by the steel arm of the car device and turned into the car, and the momentum of the pouches delivered at the station into the receiver will cause the receiver to revolve away from the side of the train entirely out of reach of any trainman or passenger who might be looking or leaning out from the train.

"The station device is at such a distance out from the side of the train and so far below the windows of the engine-cab or the coach, that it is impossible to cause an accident while the train is passing. This device has been thoroughly tested by the Hocking Valley Railway Company at Columbus, Ohio, and its operations witnessed by many prominent

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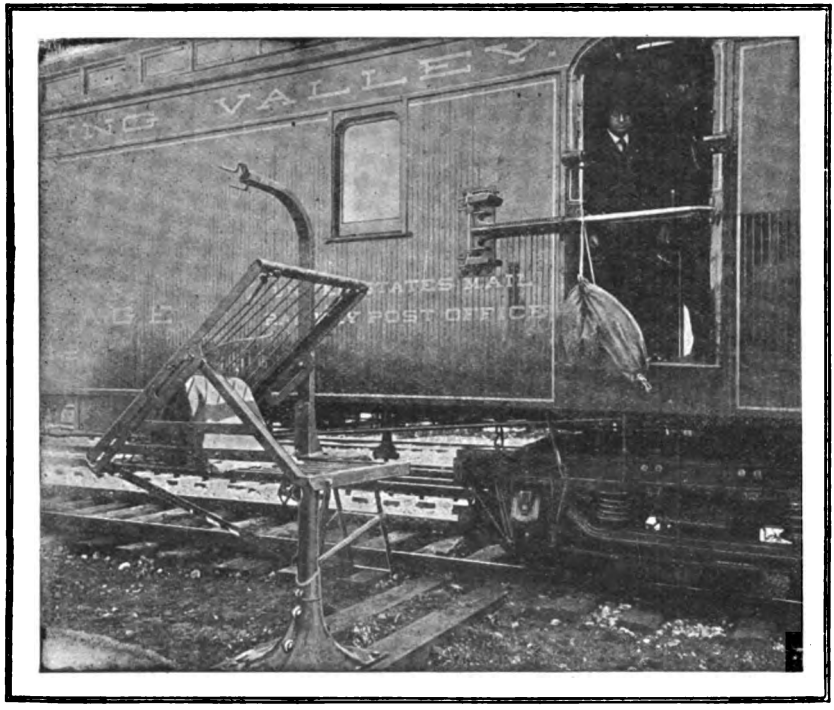
railway officials, all of whom have expressed themselves as most favorably impressed with its efficient workings.

"In one of the many tests this device has made, a live rooster was put in a mail bag and delivered at a speed of sixty miles an hour without injuring the rooster. As much as 150 pounds of mail have been handled by this device at speeds of from five to seventy-five miles an hour successfully. The device is now before the postoffice department for consideration, and it is believed that if it is adopted by the department it will save many thousands of dollars worth of equipment and valuable mail matter, besides the saving of many lives of trainmen and the public generally, as well as facilitating the rapid handling of the mails, as it works equally well at high speed or slow and is very positive in all its operations. The devices are constructed entirely of iron and steel; they are neat and strong and easy to operate, not liable to get out of order, and will meet the requirements of the department."



THE CUMMINGS AUTOMATIC MAIL BAG CATCHER AND DELIVERER—MAIL DELIVERED AND TAKEN ON

*Adjusting the Exhaust Pipe.**

The success that attended the efforts of George Stephenson in his early experiments in improving the locomotive was largely owing to the use of the exhaust steam as a means of creating an artificial draft on the fire and so making it possible to generate the volume of steam necessarily used in moving the pistons of a locomotive. Without this stimulation of combustion it would be impossible to maintain steam at a high pressure.

The relation of the exhaust pipe to the smokestack is very important and although their dimensions are necessarily the work of the constructor their proper adjustment is in the hands of the mechanics. Not only should the exhaust pipe point exactly to the center of the smokestack, but it should be set perfectly plumb when the engine is leveled. In new work the exhaust pipe should first

*From Railway and Locomotive Engineering.

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be placed in proper position and the smokestack adjusted so as to be exactly over the center of the exhaust pipe. It will be noted that the volume of exhaust in locomotive running is not always alike and whether the draft on the fire is induced by a compact volume of steam filling the smokestack and producing a vacuum into which the air rushes like water following a pump plunger or whether the steam is merely a jet occupying only a limited portion of the circle of the smokestack and so inducing draft largely by friction of the particles of air, it is in either case of the utmost importance that the blast or jet should be in the exact center. If the exhaust steam expands in its upward passage sufficient to fill the stack at its base a low pressure of exhaust steam will create a strong vacuum which will be equally felt in every part of the fire. On the other hand, if the exhaust steam strikes unevenly in the stack, leaving a portion of the stack untouched by the expanding jet of steam, the effect on the fire is of the most pernicious kind. The evil is increased if a portion of the exhaust jet strikes outside of the stack. This is often the case where low nozzles are used and also in the case of double nozzles

Sometimes the form of the exhaust pipe is the cause of much trouble. Pipes that have a bend or set in them in order to bring the nozzles in line with the center of the stack invariably injuriously affect the steaming qualities of the engine. It has been repeatedly demonstrated that a straight exhaust pipe will cause the jet to retain a straight direction, whereas pipes of a bending form, even if straight for some short distance at the nozzle, have the effect of causing the exhaust steam to flare or spread. These defects are sometimes so radical that the outer side of the smokestack will bear witness to the unevenness of the exhaust. The rapid condensation of the exhaust steam into water will show itself on one side of the stack, and when this is the case an uneven condition of the fire and consequent lack of good firing qualities may also be looked for.

Indeed, the proper adjustment of the exhaust pipe may be looked upon as of vital importance in locomotive construction, and in investigating the causes of defective steaming qualities it is well to begin by testing the alignment of the smokestack and exhaust pipe.

*How to Best Locate the Fault of An Engine Not Steaming, Without Moving the Draft Appliances.**

Before interfering with the draft arrangements, after being applied according to blue-print or by standard, there should be a thorough examination made of the amount of air that passes to the fire through grates and ash-pan opening, and to be reasonably certain that not only the proper amount of air is obtained to properly ignite the gases, but also properly distributed. Next, be certain that the flues are clean, as when flues and grates are choked at different places in fire-box it has the appearance on the fire of an improper draft from front end, caused by the improperly arranged draft appliance.

We also suggest that the draft appliance, when so arranged as to burn an even fire, should not be tampered with or same allowed to be, at the suggestion of the ordinary engineer. We recommend that all engines when turned out of the shop be ridden by the Traveling Engineer, and he should pass on the draft on the fire, that is, as to whether the draft appliances are properly arranged so as to burn an even fire, and he should recommend any other changes that might be necessary in order to get the proper combustion and to insure the steaming of the engine. We think that under such conditions, if a Traveling Engineer would be furnished with the information relative to the amount of air passing to the fire through grates and ash-pan, he should be able to determine just how much draft would be necessary to be added from this source, or whether or not there would be too much. Also he should be furnished with the size of nozzle tip, in order that he might be better enabled to determine the pull on the fire coming from that source. If it is not practicable for him to recommend changes, we think he should at least be required to give the shop or roundhouse forces such information as will enable them to determine just how much to change draft appliances or the necessity of making any other changes.

We also think it necessary for the road foreman to take into consideration the effect on the fire by different blows.

*Abstract of Committee Report, fifteenth annual meeting of the Traveling Engineers' Association, held at Chicago, Ill., September 3-6, 1907.

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With the different blows, the draft is not distributed alike on the fire. It is a practice with many men running engines to report engines not drafted right, when the fire has the appearance of burning more at one end than at the other; at times the middle of the fire-box seems to be the only place where the fire is burning, and the ordinary engineer will, of course, report to change draft sheet or pipe one way or the other, when this really could not be the trouble. On the other hand, the trouble would undoubtedly be due to the choked grates, flues, or improper distribution of draft from the ash-pan.

The following should also be noticed:

1. See that exhaust pipe is tight and not leaking.

2. See that steam pipes and T-head are not leaking.

3. See that front end door, frame, spark hopper and hand holes are tight and not drawing air.

4. See that exhaust jet strikes inside petticoat pipe or stack when engine is in action.

5. See that all nettings are clean and not clogged.

6. Observe action of exhaust on fire and see if fire is worked evenly over the entire grate surface.

7. See that the exhaust and stack are in line by plumbing, as an offset stack will very frequently spoil the draft and prevent steaming. At the same time the interior of the stack should be thoroughly examined to see that no fins, lumps, etc., are on the inside surface. Very frequently in cast iron stacks at the point where the pattern is parted there is an offset or groove left on the casting; this in all cases should be removed and the stack made perfectly smooth and free.

In arranging the draft rigging, we think it best to calculate mathematically what the distance of the draft sheet should be from the flues and from the bottom of the smoke-box. Also the exhaust pipe should be calculated mathematically as to the distance the tip of same should be from the base of stack or from the barrel of petticoat pipe or extended stack, as the case may be, so as to be reasonably certain that the exhaust strikes at the right point to create a proper vacuum; which, in our opinion, should be of such a distance for the spread of the exhaust to not strike at all until it has passed the basis of the stack. We think this would insure a proper vacuum from this source.

We also suggest that the front end draft appliances be so arranged as to cause a natural draft, strong enough to draw the gases through the flues when engine is standing still. When this is accomplished, a larger opening through the exhaust can be had, which will produce a saving in coal and a better mileage by the engine in the way of running repairs.

In our opinion, the quickest method should be employed to make an engine steam in order to get it back to the shop without delay; but when the engine is in the shop, we think it is economy to locate the trouble, caused by improper drafting and too frequently by bad blows, and permanent repairs should be made, without bothering the nozzle tip. We also think that the opening should be calculated mathematically, and then every effort should be made to make the engine steam by properly regulating the draft, before reducing the size of nozzle tip.

This report was signed by J. F. Emerson, chairman; H. A. Flynn, W. A. Buckbee, Wm. Daze, J. W. Fogg, committee.

Supplemental to the above, Mr. J. W. Fogg, a member of the committee, reported as follows:

Gentlemen—As a member of the committee I have signed the report, because it is good and reflects credit on the author; however, I would offer a few thoughts that have occurred to me in connection with the subject.

The manner of locating quickly the causes of an engine steaming poorly without changing the draft arrangement, has been the subject of careful research and study among railway men, especially in the Mechanical Department.

This subject has been discussed time and again, but since there are many causes which may make an engine a poor steaming one, we have not arrived much nearer to a solution.

In my opinion, there are three principal causes for an engine steaming poorly, affiliated with many others. Therefore, to arrive quickly at a conclusion why an engine is steaming poorly, I will divide the three principal causes into three classes, namely:

1. The quality of fuel.
2. The amount of air or draft.
3. The kind of water.

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Each of these classes may again be divided into many causes. I will not try to name all the causes except the three principal classes and some causes dependent on them.

I am taking into consideration that the heating and grate surface are in proportion to the amount of steam expected and that the engine has been steaming right, but has failed for some cause or other.

To the first class belongs the quality of coal or fuel. The fuel could most readily be seen, or if there had been a change of fuel recently it can be found out by asking the enginemen. As all coal does not for the same amount of fuel give the same heat to be transformed into work and as with different grades of fuel different amounts of grate surface would be essential, but as for every change of fuel the changing of the grate surface would be out of the question or an impossibility it can readily be seen that the quality of fuel is quite an item to consider in the steaming qualities of an engine.

The second class would be the amount of air or draft, which goes hand in hand with the fuel, for without air the fuel will not burn, and without heat we do not get steam. To this class or the drafting of locomotives may be listed quite a number of causes that make an engine a poor steaming one. The subject of drafting of locomotives has been taken up at our last annual convention by Mr. Hartenstein, and you will note he gives a number of causes that will interfere with the draft of an engine. I will recall some of these to keep us in line here, for I stated before that there are a number of causes dependent on the three classes.

The steam and exhaust pipe joints must be perfectly tight; the smoke-stack set centrally over the exhaust; the draft-pipe, if used, located so that the proper opening at top and bottom is obtained to give a uniformity of draft on the fire and is set in line with the smoke stack; that there is sufficient exhaust clearance so that the back pressure from exhaust steam is reduced to the lowest minimum; the exhaust box should be at such height as to permit the exhaust steam to spread before reaching the top of the smoke-stack in order to get the desired draft.

I have now taken up the front end arrangement, and, as we will have noted, there are a number of causes here. We cannot see the faults in the front end, so I will speak of the draft where it can more readily be seen.

By opening the fire-box door it can be seen if there is a good draft by the glow of the fuel and also by the smoke that collects in the fire-box. Here in the fire-box it may be a cause of poor firing, the coal or fuel being laid so thick that the air cannot readily pass through. The spaces between the bars of the grates may be too small or may be clinkered. The engine flues may be stopped up, which may have been caused by the flues leaking, cinders and dirt having collected around it and forming a thick paste and hardening by the heat, thus stopping up the flues.

Third and last of the three principal classes, but just as important, is the kind of water. The water should not contain too much alkali or foreign matter. The matter of scale from the water is quite a factor in the economy and also in the heating effect of the boiler. The conductive power of heat comparing scale with iron is as 1 to 35.5, iron being 1. The conducting power of scale being small compared with iron, it takes more coal, more air and more draft to raise the same amount of steam; but since the engine was at first designed for a certain amount of steam and this scale has a retarding effect the engine will fail in making steam. One-sixteenth inch of scale uses fifteen per cent. more fuel; one-fourth inch thick, sixty per cent.; one-half inch thick, 150 per cent., and so on. From this it can be seen that the matter of scale cannot be overlooked. Having to use more fuel to get the water to the same temperature, also more air for the draft (and then it is a question to get the water to the previous temperature), interferes with the qualities that the engine was designed for in the first place. It can be found out easily when an engine is washed or cleaned what kind of water is used, and if the cause is in neither of the two foregoing classes it must be in this. I have given the three principal classes of causes, with several ones dependent or incidental to them, and you will note I have divided them into classes, which, I think, makes it easier and much quicker to arrive at a conclusion.

It has been my aim not to go into the matter too far and name all the causes, but in a general way to arrive at the fundamental principles of a good steam-

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ing engine and in this way to arrive at the cause more quickly than by taking all the causes separate. I have, as I stated before, taken it for granted that the engine has enough heating and grate surface or that the heat is not wasted in the atmosphere. We have arrived at the causes by observation without changing the draft arrangement. I think each one of these causes gives every one of us more or less trouble. Some of you might differ with me, but it is the object of these questions or papers to have a difference of opinion, giving a chance for argument. I think out of each argument, hearing the different opinions, we will each learn something, however small it may be. It also keeps us in touch with the problems of today, which are not problems of yesterday, for the world has made rapid strides in the last few years, especially in mechanics.

Rider Electro-Automatic Controlling-Signal and Train-Stopping System.

Various devices have been invented and patented with a view to safer railroad operations in the United States, several of them having for their object the automatic stopping of trains entirely independent of the action of the crew. Some of these latter have recently been described and illustrated in the columns of the Magazine. In view of the fact that at the last session of Congress a joint resolution was approved directing the Interstate Commerce Commission to investigate and report on the use of and necessity for block signal systems and appliances for the automatic control of railway trains in the United States, and in accordance with which resolution the commission appointed a board known as the Block Signal and Train Control Board, the invention of Mr. Harry L. Rider, of Oil City, Pa., and which is shown in the diagrams herewith, is especially interesting at this time. It is best described by him as follows:

General.

The great need of the hour from a public standpoint is safer transportation, absolutely free from possibility of collision. The great need of the hour from the railroad standpoint is that of a device which will, independent of the engineman, act automatically to stop trains rushing toward destruction by collision when beyond all power of present forms of mechanical arrangements or any human agency to save.

Every great wreck is followed by a strong public demand for the introduction of some automatic or electrical stopping device. Railroad managers, appreciating their inability to cope with the question of collisions, and feeling the necessity, cry out for some device that will effectually reduce or absolutely abolish these disasters. The Railway Age, January 11, 1907, a recognized authority on the subject, voices this managerial cry, as follows: "If a signal can be made to reach up or reach down and apply the air brakes in spite of the engineman and thus bring the train to a stop, the automatic control of trains through the medium of signals will be accomplished." The Locomotive Firemen and Enginemen's Magazine, April, 1907, says: "Our own opinion is that the most practical—if not absolutely safe—device is one which will electrically and automatically bring the train to a full stop."

The Interstate Commerce Commission, after a thorough investigation of the causes of the many wrecks, the apparatus and methods of control and signaling of trains, advises Congress "there is no escape from the conclusion that the block system is the best instrumentality for the prevention of collision, notwithstanding its imperfection." The Automatic Signal will eventually become the ideal form of apparatus, and the highest standard, both of public requirement and expert railroad opinion, calls for its general use. It seems clear, then, that the Automatic Signal, to provide for all contingencies, *should be absolute.* And, if railroad managers were sincerely anxious to absolutely do away with even the possibility of accidents, *an automatic stop apparatus should be installed in connection with every danger signal, and no engineer would dare or could run past such a danger signal. Every accident hastens the day when compulsory use of the most approved form of absolute block signal will become the law of the land.*

A system so greatly needed, one which is at once practical, dependable and inexpensive, has just been patented in the United States by the inventor, Harry L. Rider, of Oil City, Pa.

This system is adaptable quickly and at low cost to railroads under any form of signalling, utilizing the present signals,

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as they stand, thus preventing their loss and without changing their locations, or to roads having no form of signals. The track stops and the signals (in the same circuit) can be operated either by electricity or by the power already in use by any railroad operating automatic semaphores, to either pull the signals and stops to clear or to pull them to danger, allowing them to return by gravity in the reverse movement. It is also adaptable to electrified railroads or to trolley systems.

This new system operates a signal as the indication of danger for the rear protection of a train, and, as a new departure, operates in addition, a signal as the indication of danger for the protection of a train in advance thereof.

While the present form of signals only indicate danger, this new system, or the automatic stopping arrangement, operates near the signal post a device which causes the train to be automatically stopped, irrespective of the action of the engineman.

On the locomotive is carried a small cylinder or equalizing valve. A piston rod from a piston in the cylinder extends downward and rests upon the head of a trip handle, which is pinioned inside a small bulb. The trip handle extends downward from the bulb and is carried along in this position in a line central to the rails. The feed port of the cylinder is connected into the train air pipe. The piston closes the outlet port until it is permitted to move downward, when the air from the train pipe enters, setting the brakes.

Near the signal post the stopping device is situated. It consists of a magnet or solenoid in a box or housing, attached to the ties, having attached to the plunger of the solenoid a small plate, called the "stop-plate." This plate stands in a vertical position and is movable upwards in guides, the top portion of the plate extending through a slot in the roof of the box slightly above the top of the casing. When actuated by the stop-current the plate is elevated, and is then directly in the path of the trip handle carried by the engine. The solenoid of the stopping device and the magnet of the signal are connected together in the stop circuit, and both move in unison, the semaphore giving the indication, and stop plate ready to perform its work of enforcing a stop of the train if the engineman makes no effort to stop when the signal is reached.

The movement of a train over any section of track thus sets the danger visual signal and the track stop, located one mile back of the rear end of the occupied section, and the advance signal and track stop one mile in advance of the forward end of the occupied section. Thus this system not only indicates the danger, but if unheeded will absolutely and automatically, independent of the engineman, bring the train intruding to a full and easy stop, with no sudden jerking or danger of injury to passengers, and without alarm as to the otherwise close proximity to death. In such action it is a positive protection, an impenetrable obstacle both in front and behind a train, and no other can approach nearer than one mile.

An engine passing the stop-plate, or stopping device, will cause the stop-plate and the trip handle to come in contact with each other, when the trip handle will be displaced. This displacement allows the piston in the cylinder to move downward, which allows the train air to flow through the cylinder of the valve to the space above the upper piston in the cylinder. When sufficient air has been withdrawn from the train pipe to start the brakes setting, the air pressure above the upper piston and that between the pistons equalizes, causing the upper piston to move downward, closing the inlet port against the further ingress of air to the cylinder and the train stops.

The air can then leak out slowly to allow the mechanism to return to running position. If it is not returned to this position air will leak by way of another port and reset the brakes, requiring that the mechanism be in operative position before running.

This gradual stopping is a good feature of the system, because in time of danger enginemen throw the full pressure of air on for the use of the emergency valves, which at such times is notorious for "failing to work" and collision is the result. With this system the brakes can be set by three speeds, emergency, quick-service or ordinary service. The latter, alone, is sufficient, there being plenty of space in which to stop, and it causes no jerking, no danger of injury from sudden stopping and gives no alarm to passengers.

Another feature of advantage is that the stop signal and stopping device is one mile and a half away from a train (when such train is in the center of a

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section) instead of at the rear end of the train, as is the present practice.

The display of the automatic signal as at present on roads using such signal, at the immediate end of the section occupied by a train, is a serious mistake. The stop signal is then no farther back than the rear end of the train itself, and a following train would be right upon a preceding train before being able to see the danger signal, when it would be too close for safe stopping. On the other hand, the rules require a flagman to travel back of his train one-half mile to flag a following train.

Under the high speed of modern express trains a flagman would not have time to go so far, and the result is generally a collision with serious results and the flagman must bear the blame. It is, therefore, unjust to the flagman to say that "he has long been unworthy of being considered a safe form of protection." The fault lies not with the flagman, but with the erroneous position of the automatic danger signal, or the too close running of trains under the telegraph and block systems.

This system is most opportune in its appearance at this time, when railroad managers are calling for just such a device; the Government delving into the causes of the great wrecks for a basis for compulsory legislation requiring the adoption of such a practical yet inexpensive automatic train stopping device; and this system should at once command the attention of managers alive to their interests, and also of the Government in its formulations of Federal law and recommendations on the subject.

The records of the great railroad collisions in America show the serious lack of such a device. During the year ending June 30, 1906, 624 persons were killed and 11,027 injured on the open line, an average of nearly 31 persons injured and nearly two killed every day in the year.

That automatic signals have not kept pace with the increase of passenger mileage is shown by the fact that there are in the United States 110,981 miles of passenger tracks, 46 per cent. or 48,743 miles of which are governed by various forms of signals, telegraph block systems and train dispatching; 48 per cent. or 55,411 miles are worked by manual signals, while only 6 per cent. or 6,828 miles are equipped with automatic indicating signals, and none at all governed by any class of automatic stopping device such as this new system.

In the last quarter of 1906, there were 391 collisions, in which 474 persons were killed, averaging 130 collisions and 158 deaths every month, or just over four collisions and five deaths every day. The property loss alone amounted to $3,099,228, or $1,033,676 each month, or $3,443 each day. The Federal Employers' Liability law would compel the payment by railroads at a low sum of $1,000 for the killed and injured in 1906, the sum of $1,896,000, or at the end of the year for property loss and killed the sum of $14,292,912. Why, then, should the roads go on paying for the killed, when such amounts could be saved by the use of such a practical device at an expenditure of a small fraction thereof?

The heavy cost of the present form of automatic visual signal, which simply indicates danger to an engineman, but can not make him stop, has been the cause of postponement of appropriations for signals until necessity will admit of no further delay. The expense is augmented by the contemplation of the erection of the costly air-compressing plants and the miles of pipe lines and the delicate air-valve mechanism.

The Interstate Commerce Commission says the automatic block system is the best instrumentality for the prevention of collision. This, it must be remembered, applies only when the engineman is alert to his duty, watchful of the appearance of a danger signal and is active in operating the air brake valve, that he may stop without collision. The air brake operates only when the engineman manipulates, and it is absolutely useless for the purpose without his guiding hand. The automatic signal is only a signal, having no power to stop the train should the engineman do nothing; it can not of itself forcibly draw his attention to its silent indication of the danger of further progress. In a heavy fog or blinding snowstorm, or the signal light being extinct, the train would rush past to certain destruction. This system will act in itself to enforce a stop, irrespective of the engineman, whether able to see the signal or not, regardless of the light.

Under the telegraph block system, errors of enginemen and conductors in overlooking telegraphic orders as to the time and place at which they shall meet and pass another train are very frequent and cause serious wrecks. The collision

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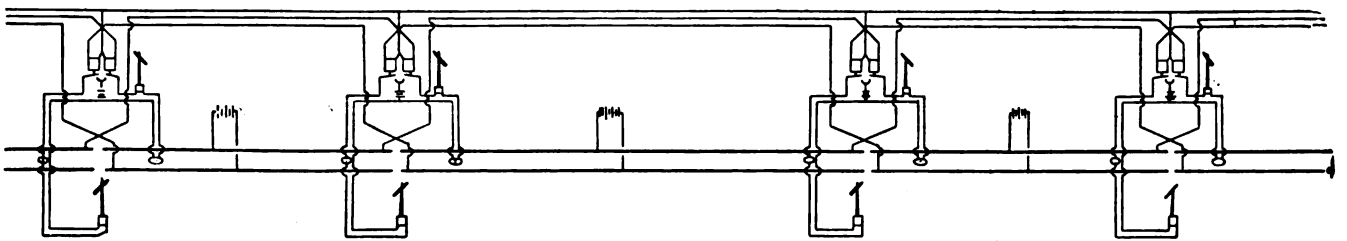

Fig. 1

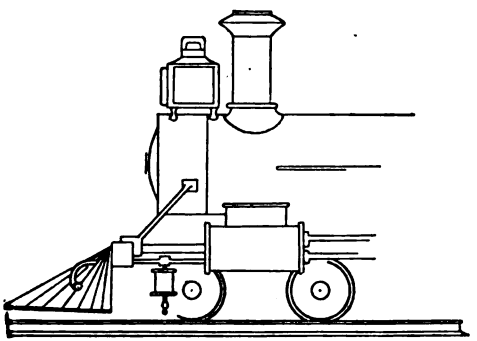

Fig. 4

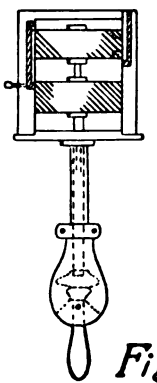

Fig. 9

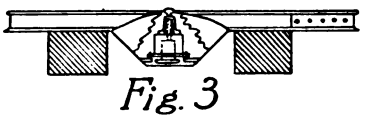

Fig. 3

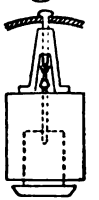

Fig. 5

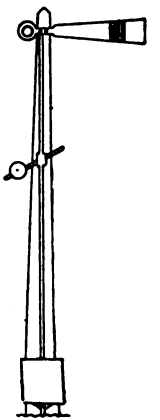

Fig. 2

Rider Electro-Automatic Controlling-Signal and Train-Stopping System

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at Woodville, Ind., on the Baltimore & Ohio Railroad, November 12, 1906, in which 47 were killed and 38 injured, resulted from this cause. This new system would have stopped both trains while yet one mile apart.

Operators at the telegraph stations fail to stop and hold trains to be passed by another, or make errors in the train orders, resulting in disastrous wrecks. Such was the result of the collision at Volland, Kans., January 2, 1907, on the C. R. I. & P. R. R., in which 34 persons were killed and several injured.

The horrible catastrophe at Salem, Mich., July 20 last, on the Pere Marquette Railroad, was caused by the overlooking of the time of an excursion train, the freight train passing the meeting point and crashing into the passenger train, splintering seven of its eleven coaches, killing 51 persons and injuring 70 others, and destroying both engines and several freight cars. Such accidents could have been avoided by the use of the system in question, and the awful burden of death and injury and property loss averted.

Trains running past danger signals form a very frequent cause of collision, passing even two and three flagmen with red lanterns. The terrible wreck on the C. R. R. of New Jersey, at Westfield, N. J., in 1893, resulting in the death of 35 persons and injury of 25, resulted from this cause. Under this new system a train could not possibly run past a danger signal.

So, also, the running past a caution signal to save a few minutes otherwise lost by slowing down, caused the rear-end collision at Eddington, Pa., in October, 1906, on the Pennsylvania Railroad main line, aided by the wrongful location of the stop siganl. Had the stop signal been located one mile back of the stalled train the following train could have stopped, or by the use of this new system the train would have been automatically stopped before reaching the obstructing train.

The Interstate Commerce Commission says "The danger from rear-end collisions is alarmingly great. So serious that *there is an urgent demand for some adequate means of rear-end protection. Unless a block system is absolute it is worse than useless*, for it takes away the sense of responsibility from the engineer. Most of our accidents are caused by enginemen habitually taking dangerous chances. Day after day they run past signals to save time. If railroad officials were sincerely anxious to absolutely do away with even the possibility of accidents *an automatic stop apparatus should be installed in connection with every danger signal.*"

This new system can be installed at an average of $50 per signal and maintained at a much lower figure than the present form of signals, by reason of the absence of complicated mechanism. Present signals cost from $75 to $125 per signal, and require the expenditure of $1,000 to $1,500 per mile for maintenance.

This would appear a very propitious time for railroad managers to make an early introduction of this new device before being burdened by compulsory adoption of such an arrangement.

Automatic signals require the space interval between moving trains of a fraction over two miles. The time interval between trains under the telegraph block system requires trains to run from five to ten minutes apart, or opposing trains to wait until another passes before it can use the track. This new system gives the advantage of permitting trains to run as close together as a fraction over one mile. This increases the capacity of the road for the more frequent movement of trains 50 per cent. over roads operated by the automatic signal, and 75 per cent. over those operated by the telegraph block system.

The use of this system would increase the prestige of the line adopting and using it, as it would result in the enhancement of its reputation for safe carriage of passengers and thus attract a larger patronage from the public, who, knowing that the device was in use, would travel by such line.

The field for this character of device is large. Managers will undoubtedly be attracted by it, and it would seem that it must become the ideal form of signalling, and the high speed of American express trains will ultimately demand this unique and inexpensive automatic signalling and stopping system.

Technical—Specifications.

This invention relates to electric signalling system for railways and its primary means for protecting trains from collision by means of electrically-operated signals located both in front and rear of a train.

A further object of this invention is

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to prevent the possibility of collision by reason of the failure of the engineer to observe or obey a danger signal bv providing means for automatically applying the brakes and stopping the train in case the latter is not stopped by the engineer in obedience to signal.

The invention comprises means for effecting these objects, including track instruments of novel construction and various details of construction and combination and combinations of devices, all of which will be fully described hereinafter in connection with the accompanying drawing which forms part of the specifications.

Fig. 1 is a diagram illustrating the electrical connections employed with the improved system. Fig. 2 is a side elevation of one of the signal posts and semaphore arms. Fig. 3 is a vertical sectional view of one of the track stop-plates employed. Fig. 4 is a side view of a locomotive carrying my improved valve and contact device. Fig. 5 is a side elevation partly in section of the track stop-plate and its connections. Fig. 9 is a view partly in side elevation and partly in vertical section of the valve mechanism carried on the locomotive and adapted to be operated by the track stop-plate.

I employ a track-stop at the entrance and exit ends of each section. The stop-plates are adapted to be struck by a lever depending from a valve casing carried by the locomotive at any convenient point, to automatically operate the air brake and stop the train.

The track is arranged in mile blocks or sections, as shown in first illustration, but may be arranged in any fraction or any number of miles.

The signals are operated by electric batteries, or can be operated by electric power from a central station conveyed on feed wires.

The track-stops are operated by batteries in circuit with the magnet of the signal, both moving in unison and being governed by the impulses of the track circuit.

Fig. 3 designates a housing or frame supported between the ties of the track and enclosing a frame serving as a guide for the vertically movable stop-plate formed with a head.

The plate is connected by a rod to the core of a solenoid, the latter being connected in the signal circuit as explained. The rod connection is threaded and adjustably connected to an internally threaded sleeve, thus permitting the throw or movement of the track stop-plate to be varied.

At any convenient point upon the locomotive is arranged a valve casing, from which depends a bulb carrving a lever formed with a semi-circular head bearing against a similar semi-circular head on the end of a piston rod extending into the bulb and having a coil spring arranged thereon between suitable collars.

The train pipe is cut at some convenient point on the engine, preferably under the cab floor, and a valve casing is connected into the train pipe.

Within the casing are two pistons, the lower one being connected to the rod, while a rod extends centrally through the upper piston into a central guide opening formed in the lower piston. A coil spring encircles the rod of the upper piston.

The casing is formed on one side with an air passage to convey air from the train pipe to the space between the pistons, and the lower piston is formed with a port communicating with the space above the upper piston.

In the upper right-hand side of the upper piston is a leak port extending out at the right side directly opposite the exit to the atmosphere, and just above the bottom of the upper piston is another exit to the atmosphere for commencing the leak.

The operation is as follows:

The train air pressure is between the two pistons. When the trip lever strikes the track stop-plate said lever is turned backward or forward, inversely, as the movement of the engine, permitting the pressure of the spring just above on the rod, together with the weight of the piston and the expansive power of the compressed air, to lower the piston to the bottom of the casing. This allows the compressed air between the pistons to escape through the port to the left when it is opposite the air passage and thence upward into the space above the upper piston, forcing down said upper piston, thus closing the lower end of the train air passage and preventing any further ingress of air. The brake will set by the quantity of air permitted to flow around through the top of the casing, and the expansion of the air moves the upper piston down as the air equalizes in pressure. When it is down it rests upon the lower piston with the leak port in the upper

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right-hand side of the upper piston just opposite the port.

When the air leaks out sufficiently to reduce the pressure the engineman can turn the trip handle or lever back to vertical position, thus raising the lower piston, compressing the upper spring, which in turn starts the upper piston, permitting the air from the pump in recharging the train pipe with its normal pressure to force one piston down and the other up to their normal positions.

At and opposite the entrance to port, at the bottom of said port on the left, is a screw plug inserted and extending through the casing and entering the air passage to regulate the speed of the flow of air from the space through said port in order to produce as may be deemed advisable either ordinary service application, a quick-service or emergency application of the brakes, the service application being sufficient at all times with this system.

It will be apparent from the foregoing description that the improvement not only affords effective signal protection for both the front and rear of a train, but the further security of automatically stopping the train in case the signals are not seen or are ignored by the engineer.

This device also affords protection against collision with a train on a siding by running into the switch should it have been left open by the train standing thereon; also prevents destruction of a train by running into an open drawbridge; also prevents side-swiping of a train standing on a side track, but not in sufficiently far to clear a passing train. This arrangement or device also affords protection against a train being derailed and wrecked by running into an open main line switch. The main line switches are so arranged in connection with the circuit that they will set the signals and track stops one mile on each side of the section in which the open switch is located.

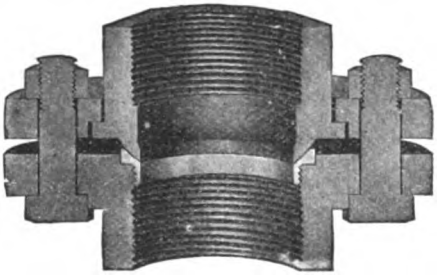
This arrangement or device is applicable to both single and double track service.

This device will prevent the forward portion of a train broken in two from running away and leaving the rear portion unprotected on the main line, as the rear portion will cause the signal and track-stop ahead of the train on the next section to be set at danger and stop the runaway section when the engine reaches said track-stop; similarly the rear portion will cause a danger signal and the track-stop to be set back of said portion of train on the next adjoining section, stopping any train following approaching nearer to the dead portion of preceding train than one mile.

* * *

The "Kewanee" Flange Unions.

Engineers and others who have to do with the operation of steam lines know what an annoyance it is, to say nothing of the trouble often occasioned, when a gasket in one of the connections blows out, sometimes resulting in the complete "shut down" of an entire plant. An entirely new type of flange union, and one which will obviate these difficulties, is the "Kewanee" flange union having a brass and malleable iron self-seating ball joint, and which *doesn't need any gasket.*



The "Kewanee" Flange Union

The illustration herewith shows one of the new type of flange unions.

The joint is brass to iron, insuring a tight connection. The union has a ball-bearing surface, thus adapting itself to any slight changes in the alignment of the pipe caused by sagging, straining, expansion, etc. The flanges, being of malleable iron, can be screwed up tight without cracking, which can not always be done with a cast iron flange union.

Another feature of the "Kewanee" is that one of the malleable flanges is movable, thereby making it possible to screw both ends up tight on the pipe and the ring (or flange) can then be slipped on and the bolts inserted. This does away with the annoying feature of "matching" the holes, for the ring being movable, it is bound to match the holes in whatever position they come.

In addition to the above valuable features is the question of time saving in cutting gaskets, fitting same, etc., by the

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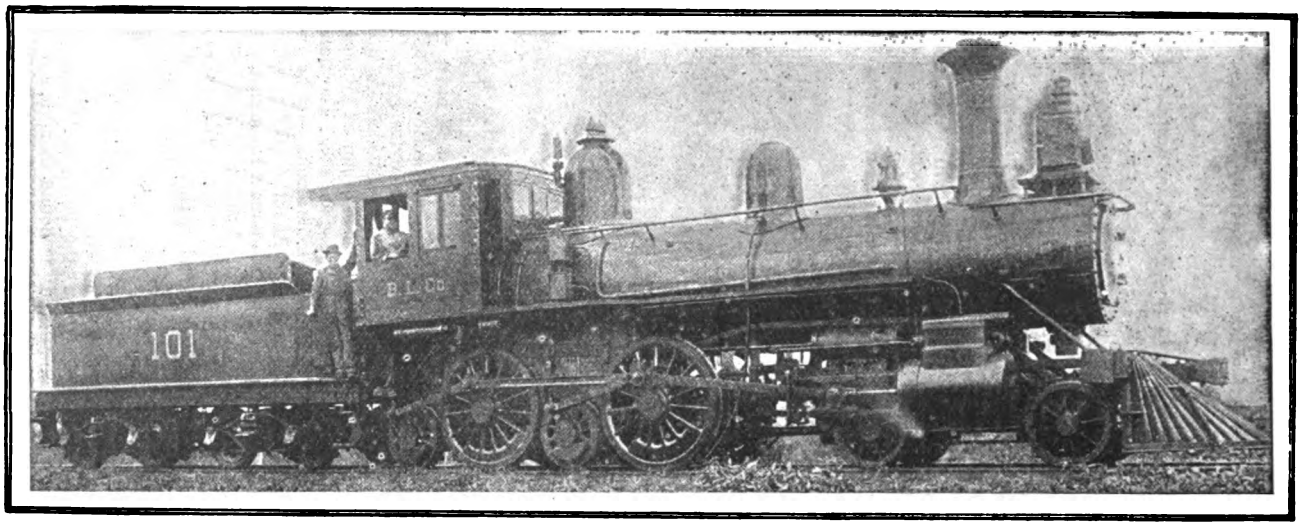

THE BOTHWELL LOCOMOTIVE

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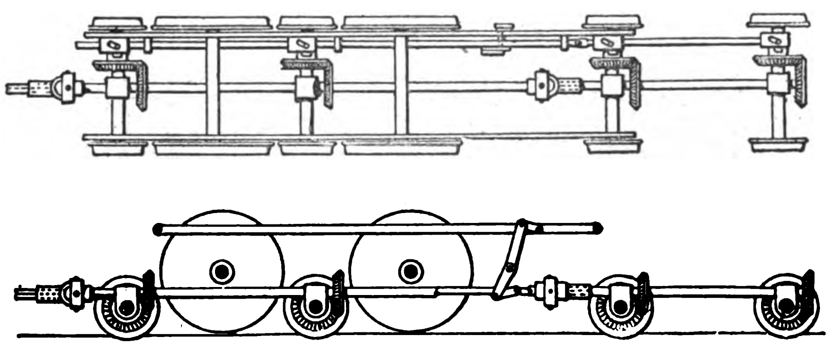
average steam fitter and helper, which is ordinarily lost sight of. The manufacturers state that after numerous tests it has been found that the extra time required to cut and fit a rubber gasket, including the value of rubber packing used, frequently involves more than the difference in price between an ordinary union and the "Kewanee" union, but that even aside from this the advantages are so apparent that a large demand for the new type of union has already been created. This new type of union is the result of careful study and experiment to produce a flange union which can always be made tight and remain so without the use of a gasket. The fitting is very compact and light in weight, while at the same time combining extreme strength with rigidity. The manufacturers state that each fitting is given a severe air pressure test under water, and if not absolutely tight it is rejected. The "Kewanee" flange unions are manufactured by the Western Tube Company, Kewanee, Ill., which has issued a neat circular illustrating and setting forth the merits of same.



The Bothwell Locomotive—Showing Gear Mechanism

❖ ❖ ❖

The Bothwell Locomotive.

Mr. George A. Bothwell, of Owen Sound, Ontario, has devised an ingenious and novel scheme for increasing the tractive power of a locomotive and securing additional adhesion for utilizing same by providing the locomotive with a supplemental set of smaller driving wheels. By means of a shifting mechanism which is operated by a valve in the cab, the engineer is enabled to throw the weight of the engine on either group of driving wheels as desired. One group of drivers only are on the rail at one time, as when the smaller wheels are lowered to the rail for the purpose of increasing the tractive force the larger wheels are lifted clear of the rail, and vica versa. By means of a suitable geared shafting operated from the small drivers the weight on the truck wheels is utilized to obtain the required adhesion. Changes from one system to the other are made by suitable clutches in connection with the mechanism which is operated by either steam or compressed air by means of a cylinder which is shown just above and back of the locomotive cylinder.

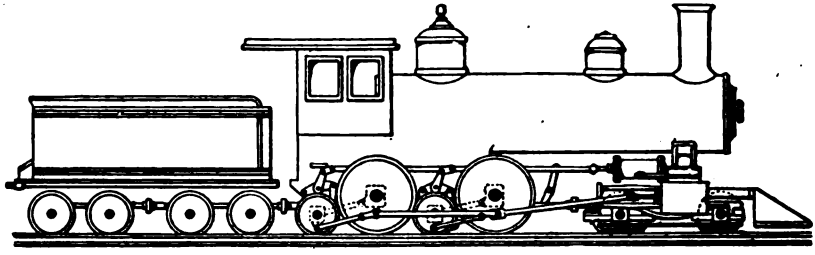
The locomotive shown in the illustrations to which this system has been applied is an old locomotive which was recently rebuilt at the Hicks Locomotive & Car Works, Chicago Heights, Ill., after the designs of Mr. Bothwell, for the purpose of demonstrating its feasibility. Its purpose is to provide a locomotive of maximum hauling capacity with minimum weight, it being the inventor's idea that locomotives of the usual types equipped with this arrangement will be enabled to take trains over ruling grades that otherwise would require the services of helper engines.

In a test recently made on a short grade with this locomotive, it is stated that when running on the large drivers the engine stalled with twenty-five empty cars, but was able to take over the grade twenty-three cars. With the smaller drivers running on the rail and the larger drivers raised the engine went over the grade with forty-seven cars, but stalled with fifty, showing the hauling capacity

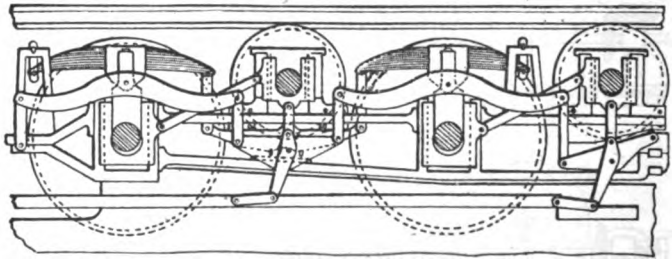
with the smaller wheels to be about double that obtained with the larger wheels. This, it is thought, fully demonstrates the merits and practicability of the design. It is also stated that a company has been formed, known as the Bothwell Locomotive Company, with headquarters at Owen Sound, Ont.

being cut along the right of way, and ballast rock of the best quality is being found in abundance along the route. The highest point on the entire line so far reached is 8,152 feet above sea level. All culverts and bridges are of masonry.

Agent Rider says that President Stilwell is, of course, not certain whether or



Showing Application of the Bothwell Principle to an Eight-Wheel Locomotive



The Bothwell Locomotive—Shifting Mechanism for transferring weight of locomotive from one set of drivers to the other

*Western Railroad Activities.**

Railway Construction in Old Mexico.—It is stated on reliable authority that the report that President Harriman was going to extend California influence in old Mexico by a line from El Paso, seems to be premature. Such a line, it is asserted, would have to directly compete with the Kansas City, Mexico & Orient Line, which is being built by Arthur E. Stilwell from Chihuahua to the port of Topolobampo, and which, when completed, will make probably the shortest railroad between Kansas City and the Pacific.

S. W. Rider, general managing agent of this road, reports it is being very substantially constructed with steel rails of 70 pounds. Ties and telegraph poles are

not there is any truth in the report that Mr. Harriman would parallel his line, but that it would in no way affect his (Stilwell's) plans of the Orient road. The great question, Mr. Stilwell declares, will not be to secure business, but to take care of it, for railroads have the effect in Mexico of awakening a giant traffic. The traffic of Mexico, as well as that of the United States, is expanding far beyond the capacity of existing roads to handle it.

The Orient engineers have spent nearly five years in securing what is considered the best and most feasible route to the Pacific. The construction gangs are now working from the coast as well as from Chihuahua, and they are at present only 150 miles apart. It is expected that within six months Orient trains will be running from Kansas City to Sweetwater, Texas, over 600 miles. President Stilwell is not positive just when his

*By J. Mayne Baltimore, special correspondent to the Locomotive Firemen and Enginemen's Magazine.

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line will be finished through to Pacific tidewater.

Another Transcontinental Line Projected.—San Diego, Cal., is to be made the western terminus of two projected railroads, which are to form a union with the Rock Island System, and thus give to the Pacific Coast another transcontinental line.

Work has already begun on a new railroad being built eastward from San Diego by John D. Spreckels, the prominent San Francisco capitalist and steamship owner. This new road is to reach into a large tributary back country, and to be carried on through the very fertile and productive Imperial Valley, and straight to Yuma. Its total length will be about 150 miles. This projected line to Yuma is really only a western extension to the Phillips-Dodge road, which connects on the east with the Rock Island, and taps an immense intervening mining territory in New Mexico, Arizona, and over the boundary line into Old Mexico.

The Phillips-Dodge railroad, some thousand miles in length, including its branches, was built and is owned by the Phillips-Dodge people, who also own the great Bisbee smelters, and are multi-millionaires. They own the entire road and have not a single bond issue. They are mining operators on an immense scale, and the road is only a part of their great enterprise.

On the east their rails connect with the Rock Island line, and, judging from the manner in which the Rock Island has been expanding during the past few years, little surprise would be expressed at the news that the Rock Island system had acquired, or would acquire, this comparatively little known private system, which is sandwiched between the Santa Fe on the north, and the Southern on the south. The officials of both of these two great systems are very strongly impressed with the belief that the Spreckels road has much more than a local significance for San Diego. They declare that it looks as if Spreckels was reaching out from San Diego for some big thing, for to simply get to Yuma means nothing, unless there is something to be touched there.

The Phillips-Dodge people, with their immense mining interests, and the country reached by their lines, can make use of a vast amount of Oregon pine. That lumber they could get from vessels at San Diego. There is also a wide untraversed strip of country between Benson and San Diego, and also the rich Imperial Valley country. Some of this valley crosses over into Old Mexico. All this, it is claimed, would furnish immense traffic for this road. The Santa Fe and Southern Pacific officials are not asleep over the late move of Spreckels, and are very closely watching developments.

Railway War in the North.—The bitter feud between the Alaska Nome Railroad, a Valdes, Alaska, corporation, and the Guggenheim road, building into the Copper River district from Katalla, has taken an important turn. The Valdes corporation, which has not yet even purchased its rails, has sent the steamer Jeanie over to Katalla, and claims to have taken over 300 men employed by the Guggenheims. The Guggenheims claim that but 160 were enticed away. In any event, the Jeanie is authorized to carry only 56 passengers, and the fact that the steamer exceeded her passenger limit has been brought to the attention of the customs service.

Another blow aimed at the Valdes independent railway scheme is an understanding with E. S. Orr & Co., the operators of the winter stage line between Valdes and Fairbanks, whereby they will make Abercrombie rapids their terminus and avoid the eighty-mile climb over the Coast range of the Chugack mountains. If the Guggenheims are able to operate trains to the rapids by December 1st, when the stage begins this winter, the schedule will be effective after that date. This action will divert the winter travel from Valdes and create a new winter route to Fairbanks by way of Katalla. Such action would be the most serious blow the Guggenheims could give Valdes.

Four Large Systems to Be Developed.—Four large systems of electrical development are under way in the Sierras and are doubtless to be under the control of the Southern Pacific. These systems will be located as follows: One just east of Sacramento; the second in Tuolumne county; the third in Fresno county, and the fourth in Kern county; the latter will supply power for the southern part of California, while the others will furnish power for the northern part of the state, as well as all of the branch lines in the state. Mr. Harriman intends to introduce electricity on many of his lines.

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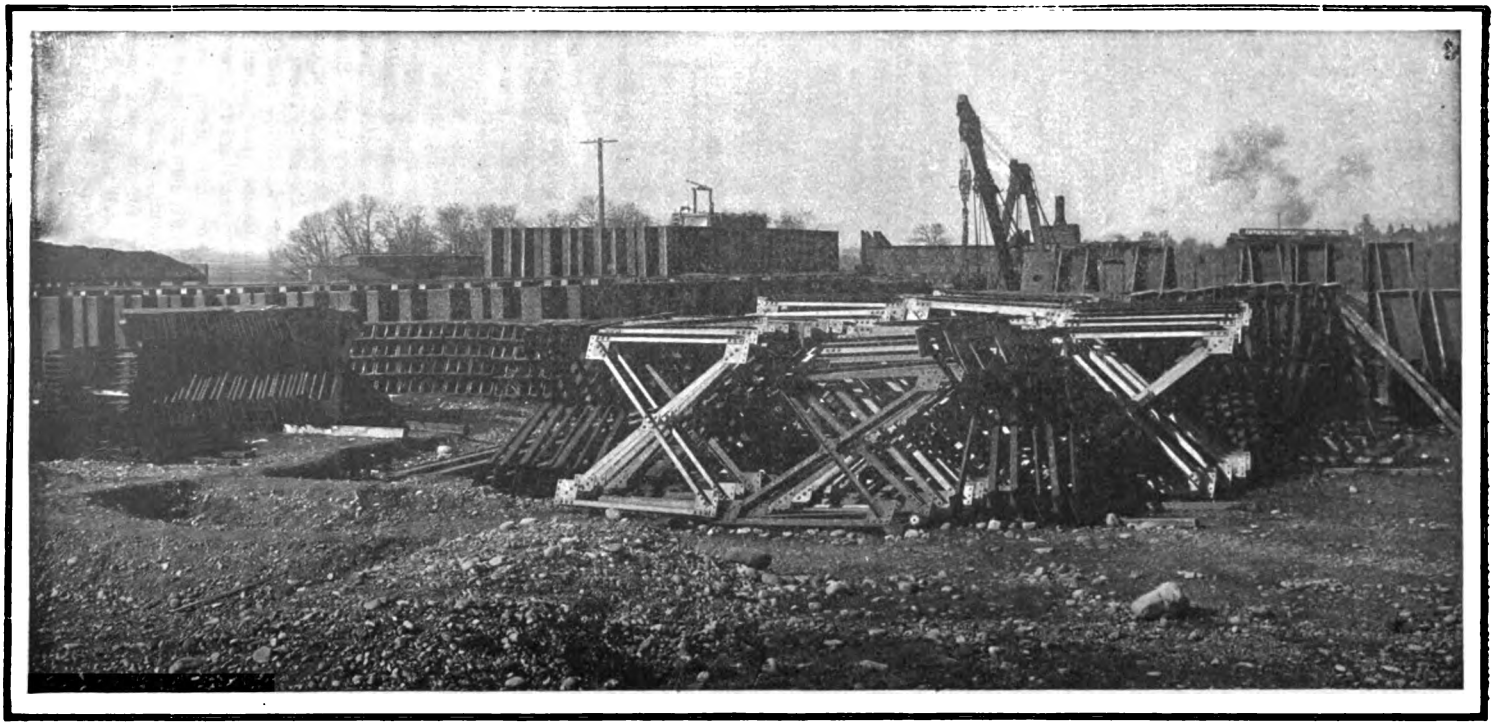

INITIAL WORK OF CONSTRUCTION ON GREAT DOUBLE-TRACK BRIDGE OVER THE COLUMBIA RIVER, PORTLAND & SEATTLE RAILWAY

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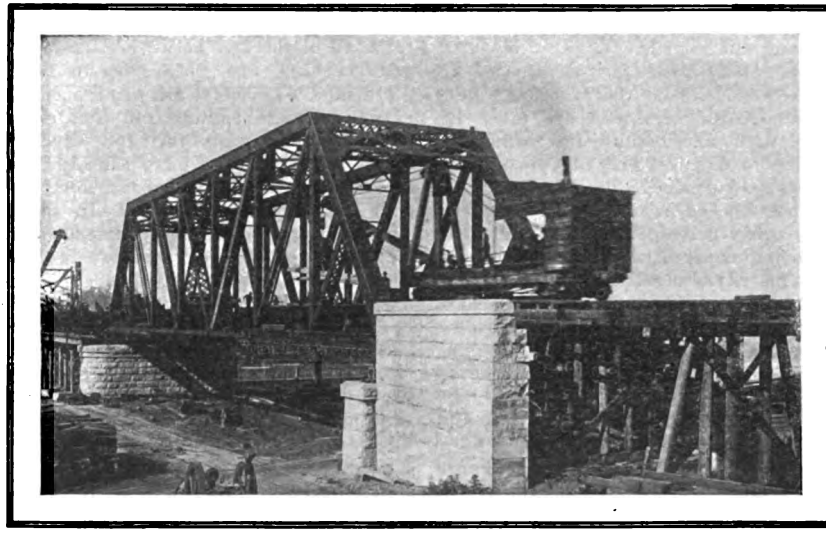
Stirred Into Greater Activity.—By the comparatively recent advent of the Western Pacific in the California railway field, the Southern Pacific has been stirred into greater activity, and a number of important improvements are in progress on that system. Prominent among these is the projected Dumbarton Point cut-off across the southern arm of San Francisco Bay, which will make it possible to run overland trains from the north and east directly to San Francisco without the present change at the Oakland Ferry.

Another development in progress in the Southern Pacific is the broadening of the present narrow gauge road through the Santa Cruz mountains. In connection with this work a new line is now being constructed direct across the country from Los Gatos to Palo Alto. This will make a straight line from San Francisco to Santa Cruz. At present the route is by the way of Santa Clara and San Jose.

To Bore an Immense Tunnel.—What is known as the Continental Tunnel Company, has just been organized in Denver, Colo. The incorporators are Thomas F. Walsh, John W. Springer, Thomas H. Blood, Herbert George and W. O. Temple. This company is organized to build a tunnel through James Peak, for the use of the Denver Northwestern and Pacific Railway (the Moffatt line). Bonds to the amount of $5,000,000, guaranteed by the Moffatt road, will be issued. This tunnel will be about five miles long and will materially lower the general grade of the Moffatt road as originally constructed over the Continental Divide, making it possible to run trains between Denver and Salt Lake, when the road is finished, in about twelve hours.

Work on the Great Columbia Railroad Bridge.—The accompanying illustrations show the initial work of construction on



SHOWING CONSTRUCTION WORK ON GREAT DOUBLE-TRACK BRIDGE OVER THE COLUMBIA RIVER, PORTLAND & SEATTLE RAILWAY

the great railroad bridge which will span the Columbia River between Vancouver, Wash., and the Oregon side. This giant structure is being built by the Portland & Seattle Railway Company. The bridge will be double-tracked, and when completed will be one and one-half miles long (7,920 feet), the longest steel railroad bridge in the world. This work is being crowded forward with all possible vigor and is now well under way.

The total cost of the bridge when finished will reach about $1,000,000, and will be completed early in the coming year. There are forty-eight large piers, built almost entirely of concrete and granite, to support the enormous weight of the superstructure. In the center of the great stream will be a drawbridge

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464 feet long. All the upper bridge work will be of steel, of which there will be 25,000 tons. This enormous weight does not include the double tracks (equal to 31,680 feet of single rail) of heavy steel.

The ten giant piers that cross the main stream range in total length from 100 to 110 feet, the massive foundations of which rest 40 feet below the bed of the river. The floor of this immense bridge, supporting the tracks, will be placed out of the reach of the highest floods, and the massive piers are strong enough to resist the tremendous current during the winter and early summer freshets. The contractors are the Kelley-Atkinson Construction Company, of Portland and Seattle.

Pine Substituted for Redwood.—All the redwood ties on the Harriman lines throughout the southwest are to be replaced with pine, because the former are yielding to dry rot, and the wood is becoming too expensive. The Southern Pacific has stocked in its East Los Angeles yards thirty acres of pine ties, and more are being constantly added. Shiploads from the north are being landed at San Pedro, and millions more are to come. After a large series of experiments, the company's chemist found that soaking the pine ties in a solution of oxide of zinc prevents inroads being made by insects and preserves the wood against dry rot.

The New Electric Cars.—The Southern Pacific's new electric cars for use on the suburban trolley lines in Alameda, Oakland and Berkeley, in connection with the trans-bay service, will be 71 feet 5 inches long, and will have seats for eighty passengers. These cars will be approximately a third longer than those used on the Key Route electric line.

Like the Key Route, the Southern Pacific trolley trains will have a motor car on each end, and these motor cars will have two compartments, one seating sixty-four passengers, and the other being a baggage section. The large cars will cost about $7,000 each, and the motor cars with baggage section at one end, will cost about $12,000 each.

At first, there are to be eight motor cars, costing approximately $96,000, and about sixty-four of the large passenger cars, costing a total of about $450,000. The cars will have reversible seats upholstered in the airy and sanitary woven rattan. The color of the cars has not been adopted yet.

Laying Double Tracks.—By building a double track between Sacramento and Loomis, via Roseville, and doubling the length of twenty different sidings, between Loomis and Truckee, the Southern Pacific officials hope to accommodate traffic over the Sierra Nevada mountain division for the next two or three years, or until such time as President Harriman shall have solved the important problem of converting that division into an electric system. The latter will include the boring of the 36,000-foot tunnel that has so long been planned. Such a tunnel will reduce the present grade over 1,500 feet of elevation; also eliminate many curves and permit of a double track all of the way between Sacramento and Truckee, and thence on to Reno. More than $1,500,000 are being spent in extending these sidings and building a partial double track for the division. Many of the sidings have already been extended so as to accommodate forty-five cars and three locomotives. In places where these sidings are extended in length, the snow sheds have to be widened at great cost to accommodate them.

Beats Work on Panama Canal.—Western Pacific officials are responsible for the statement that that company is excavating more dirt and rock along the route in California and Nevada every month, than is the case on the Panama job. In July, the railroad company excavated 1,372,831 cubic yards, while the Panama Canal report for the same month shows 1,048,776 cubic yards. In August Panama Canal contractors excavated 1,274,444 cubic yards. The work on the Western Pacific road for that month will, the officials declare, amount to fully 1,524,000 cubic yards.

Mr. George J. Gould recently ordered twenty locomotives, 700 flat cars and 500 ballast cars. All of the equipment has been received and is now being used in the construction work. It has been also officially announced that Mr. Gould will shortly place a big order for passenger and freight locomotives.

Discarding the White Light.—Pacific Coast railroad officials are very much interested in the forthcoming work of the board of experts recently appointed by the Interstate Commerce Commission to investigate the signal system of the railroads of the United States. These officials state that it will be confronted at the outset with the fact that there has been a complete and more or less start-

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ling revolution in block signal practice during recent years. This is nothing less than changing the universal and time-honored white light from safety to a danger signal.

Ever since block signaling went into effect on American railways, and even before that time, the white light at night has been the notice of safety to the man "on the head end." It still is so on the majority of the lines, but general managers throughout the country have decided, almost without exception, that best signal practice discards the white light as a sign of "clear ahead," and transforms its meaning to "something wrong; stop immediately."

On the line where the white light no longer has a place, its appearance denotes that something has gone wrong with the regular signal, and therefore the enginemen are unable to say whether there is safety ahead, or ruin and disaster, if they proceed. Accordingly, there is only one thing to do—and that is to stop until the doubt can be removed.

The greatest value, therefore, in discarding the white light lies in the fact that it appears always when a signal glass is broken, and it denotes the further important fact that no signal is being shown.

To Widen Six Tunnels.—President Harriman has issued orders to augment the force on the work of gauging the Southern Pacific Coast route to Santa Cruz. The company desires to make a fast modern line of the narrow gauge road. In order to do so the company has to widen to standard gauge six tunnels. On eighteen miles the widening of tunnels and reducing of grades will cause the company to expend $1,000,000. The lengths of the tunnels to be widened are 6,255 feet, 918 feet, 5,792 feet, 912 feet, 250 feet, and one 326 feet. By making a standard gauge line of the Santa Cruz Southern Pacific road, the company thinks that it will have the fastest route between San Francisco and Santa Cruz.

Concrete Railway Bridges.—In the construction of the various railway lines in the northwest, reinforced concrete is being used very extensively in the building of both bridges and culverts, and that material is very largely supplanting timber. In the construction of the Portland & Seattle Railway, which will connect Portland (Oregon) and Seattle, great quantities of concrete will be used along the line for bridges, culverts, linings for tunnels, etc.

One of these large concrete viaducts will span the Klickatat River, in Washington; the main central span will have an arch 160 feet long. The railway company has retained the Wallace-Coates Engineering Company, of Chicago and Portland, Oregon, to prepare plans and specifications for the Klickatat viaduct and other heavy concrete work to be constructed along the line. This firm are specialists in all such methods of railway construction.

Work on Extensions.—The Oregon Eastern, a line projected by the Southern Pacific from Klamath Falls northward to Natron, a station on the present main line, just south of Eugene City, Oregon, is provided with rights of way for a distance of thirty miles southward from Natron. A large force of surveyors is out on the line, but no road building has been authorized along any part of the stretch of 200 miles.

The California Northeastern line, also part of the Harriman system, running northward from Weed, near Mt. Shasta, and into Oregon, for a terminal at Klamath Falls, is to be eighty-eight miles long. The right of way for this road is practically completed from Weed to Klamath Falls, and there are about 400 men and 400 horses at work on the line. It is built from Weed northward to Bray, beyond Grass Lake, a total distance of about thirty miles. There will be much tunneling on this line, but the company will, for the present, build around the proposed tunnels so as to get the tracks into Klamath Falls as soon as possible.

To Seek for Tie Timber.—E. O. Faulkner, who is manager of the tie and timber department of the Santa Fe Railroad, has sailed for the Orient, his purpose being to study the various species of Eucalipti in Hawaii, Japan and Australia, and to purchase immense consignments of young trees for planting on the company's telegraph pole and tie ranches in Southern California. In its final results, Manager Faulkner's trip is expected to be of much importance to the Southwest, as it will solve the problem of railway material shortage. On thousands of acres belonging to the Santa Fe Railway Company near El Toro, in San Diego county, there are already Eucalipti growing in abundance, and during the past six months the young trees have

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made a remarkable growth. Manager Faulkner believes he can find varieties that will do still better; and if he succeeds it is proposed to devote 50,000 acres to the purpose of Eucalipti cultivation, and large tracts will be planted in Arizona. Tracts of Catalpa and other species of trees were planted by the Santa Fe Company in western Kansas and Colorado, but the growth has not been satisfactory.

The Line in Old Mexico.—Excellent progress is being made in the Pacific Coast extension of the Harriman lines, headed from Guaymas to Guadalajara. For several years the terminal was at Guaymas, 260 miles south of Nogales, on the boundary line between the United States and Mexico. In the last year an extension of 118 miles has been completed to Navajo, and passenger and freight trains are being run as far as that point, or a total of 378 miles south of the Mexican boundary. Guadalajara, which will be reached within the next year, is between 700 and 800 miles south of Guaymas, and Harriman's new line will pass through a country of wonderful fertility and great timber areas.

Work on the Oregon Western.—Construction work on the Southern Pacific extension from Drain to Coos Bay, Oregon, is progressing rapidly. This extension is known as the Oregon Western. Drain is on the trunk line of the Southern Pacific, between San Francisco and Portland, Oregon. This extension gives direct rail connection with the coast and will be an important line. The route will have a water grade from Drain to Coos Bay, and is being constructed with heavy steel, and crosses the Umpqua River in several places in order to save curves. The latest improved bridges of steel and concrete are being put in. It is expected that great progress will be made this fall, so that the line will be finished next year.

Power to Operate Car Shops.—A large electric power plant is to be installed by the Southern Pacific at Dunsmuir, in northern Calfornia, up near the base of Mt. Shasta. This power is, for the present, to be used exclusively for the railroad shops at Dunsmuir. Water is being taken from the upper Sacramento River to develop the power and other improvements are to be made that will cost a large sum of money. These improvements consist of a river dam, a long pipe line, a water wheel and generators. The generators will be placed in the car shops and no power house will be built specially for the purpose.

Steel Bridge Material Delayed.—Owing to unavoidable delay in the arrival of steel bridge material, the Southern Pacific will probably not be able to open the Bay Shore cut-off for traffic before the middle of October or first of November. The fault has not been with the railroad company, but with the eastern firm with whom the company placed the order some time ago. Most of the steel bridge material required for this cut-off has already arrived and has been placed in position. There are only two small bridges that have not been completed yet, and for this work all the rest of the cut-off line must wait. Under all the circumstances, this delay is very vexatious. It has now been more than three years since the work on this short line was commenced and all the grading, tunneling and surfacing, etc., was completed several months ago. This order for steel was placed with the American Bridge Company, of Toledo, Ohio. The latter company states that the work has all been finished, and the material shipped, but that the delay is due to slow freight rail shipments.

Bonds for New Railroad Sold.—President Richard Hotaling, of the Napa, Lakeport & Richardson Bay Railway, who has just returned from the East, officially states that he has disposed of all the bonds for the new road to eastern capitalists. He says that everything is now ready for the formal breaking of the ground, and that the contracts will soon be let. The rights of way have been acquired and all of the surveys completed.

The marshes and creek near Santa Venetia will be spanned by a long bridge, a depot will be erected at Santa Venetia, and a tunnel will be run through the Scheutzen Park hill. A drawbridge will be used over Green Brae creek, and a trestle over a mile in length will extend out into the San Francisco Bay. The tunnel referred to will be 2,200 feet long.

Southern Pacific Places Big Contract.—Southern Pacific officials have received information from Electrical Engineer Babcock, who is at present in New York, that he has placed contracts in the East for the ten great boilers to be used in the giant power plant to be established by the railway company on the Oakland es-

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tuary, to generate power for all its trans-bay interurban system. This great power plant, the designs of which Engineer Babcock took East with him, will have a capacity of generating 15,000 horse power. The most important machinery yet to be contracted for will be the great turbine engines and the powerful generators.

Total Length of Track Laid.—The Western Pacific officials have just announced that there has been laid a total of 234 miles of track on that line: a stretch of 27 miles westward from Stockton to a point within 52 miles of Oakland; a stretch of 26 miles from Stockton northward to the Mokelumne river; a stretch of 27 miles from Marysville northeastward to Oroville, and a stretch of 154 miles from Salt Lake westward to within about eight miles of a little town known as Shafter, which will be the junction of the Western Pacific, and the railroad now running to Ely, Nev.

Work has also just begun on the Western Pacific's 1,600-foot tunnel in South San Francisco—the shaft leading from the Islais Creek district through a range of high hills northward to the southern section of San Francisco. This contract has been let to the Western States Construction Company of San Francisco.

The same company has the contract for doing a great deal of other work in that part of the city—fillings, wharf building, and terminal work—the entire cost of which will reach at least $1,000,000.

Immense Tie-Treating Plant.—Very recently the Southern Pacific Company installed a large tie-treating plant at the Oakland freight yards, and it is now in full operation. The first thing that attracts the attention of the visitor is two giant boilers. Alongside of the boilers stand several huge tanks, while vast piles of railroad ties and large timbers are heaped all around. This plant is known as the "Burnettized Plant," or works, where numberless ties and railroad timbers are treated with a preparation which insures their preservation for many years. The whole plant is "portable" in a measure, though the boilers alone weigh in the neighborhood of 600 tons. This plant has been in operation only a short time, and is the largest one now in operation on the Pacific Coast by any railroad company.

The ties and timbers, however large or small, are loaded on a steel frame truck and are run into the boilers, which are about 300 feet long. A mixture of crude oil, creosote and other wood preservatives is pumped into the great boilers and mixed with steam. For hours the timbers remain thus, pent up until the wood is thoroughly penetrated by this mixture. With the exception of one owned and used by the Santa Fe system, down in Texas, this is the only plant in the West.

Purchasing Large Equipments.—The Southern Pacific and other Harriman roads, the Santa Fe, Tonapah and Goldfield, Northwestern Pacific, and the Wells-Fargo Express Company are ordering many new cars or locomotives. President A. F. Payson, of the Northwestern Pacific, which is jointly owned by the Southern Pacific and the Santa Fe, has just ordered ten passenger coaches, while the Wells-Fargo Company will purchase ten new express cars and a number of poultry and vegetable cars. The Tonapah & Goldfield Railroad has ordered eight new locomotives.

President E. P. Ripley, of the Santa Fe, has placed an order for thirty-five new locomotives to be used in the freight, passenger and switch service. President Harriman is asking manufacturers' prices on 5,000 steel under-frame box cars of a capacity of 100,000 pounds each, 250 steel under-frame box cars of a capacity of 80,000 pounds each, 500 all-steel gondola cars of a capacity of 100,000 pounds each, and 250 steel frame flat cars each with a capacity of 80,000 pounds. Mr. Harriman is to divide this new equipment between the Southern and Union Pacific roads. All this rolling stock is to be delivered between now and the first of the coming year.

Important Railroad Contract Let.—The contract for building the first section of the extension of the Northwestern Pacific Railway line from Willitts, in Mendocino county, to the sea coast town of Eureka, Cal., has been let. The Western Improvement Company of San Francisco were awarded the contract, their bid being the lowest. Work will be commenced at once and rushed with all possible speed to its completion. This will be very necessary on a part of the line, at least, as four miles of the route through the lower end of Little Lake Valley is under water during most of the

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winter months. This fact will compel the contractors to finish this part of the fill before the rainy season sets in.

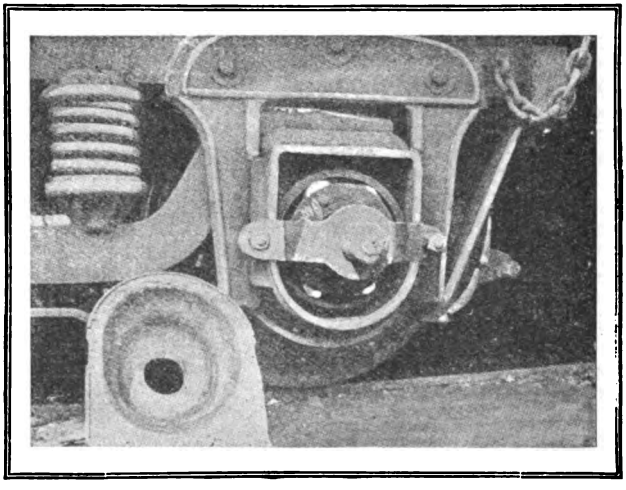
The other part of the road is down the Middle Eel River, and can be worked during the winter. Work is to be rushed from both ends. Willitts, which is the present terminus of the line, will be made the division headquarters, and there will be located the freight and passenger division buildings and repair shops to serve the road between Tiburon, on San Francisco Bay, and Eureka, in Humboldt county.

The total distance between Willitts and Eureka is 210 miles, but this road has been completed to Pepper, fifty miles south of Eureka, and to Sherwood, fifteen miles north of Willitts, leaving 165 miles of the line yet to be constructed. This will be one of the most important extensions in California, as it will traverse a very rich and fertile region for the entire distance. Both the Southern Pacific and Santa Fe systems are interested in this road, an arrangement having been made some time ago to that effect. However, the former system owns the controlling interest. Messrs. Harriman and Ripley concluded it would be cheaper to divide profits than to build two parallel lines.

Remarkable Piece of Railroad Work.—President Ripley, of the Santa Fe system, has just completed the official inspection of the famous Belen cut-off in New Mexico. This work has very recently been completed, and will soon be in operation. Altogether, the Belen cut-off is a remarkable piece of railway work—and costly, too.

This new line is 270 miles long; it cost in the aggregate $11,000,000, and shortened the line eleven miles, and saved 2,036 feet of elevation.

The Belen cut-off is from Texico, on the Texas state line, to Rio Puerco, New Mexico. Raton and Glorietta have been the greatest obstacles in the transcontinental service of the Santa Fe. Though not quite half a mile, the saving of 1,116 feet of elevation at Raton, and 920 feet at Glorietta; also taking into consideration that the approach to these summits involved grades of 3.5 per cent., while the new ruling grade is 0.6 per cent., will effect a material reduction in operating expenses



The Anti-Friction Roller Bearing applied to Passenger Car

(From Railway Master Mechanic)

Heretofore it has been necessary to break up the long trains into sections at each of the passes. When to the benefits derived from the opening of this cut-off are added those that will accrue from the revision of the line from Florence to Texico, via Augusta, Mulvane and Wellington, Kansas, the Santa Fe will have a low grade line to the Pacific Coast somewhat shorter than its present line, and with reduced curvature, which should enable a saving of at least twenty-four hours in its fast freight schedule, and considerable improvement in the time

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of its California limited, should it eventually be decided to make this its main California passenger line.

* * *

An Anti-Friction Roller Bearing for Cars.

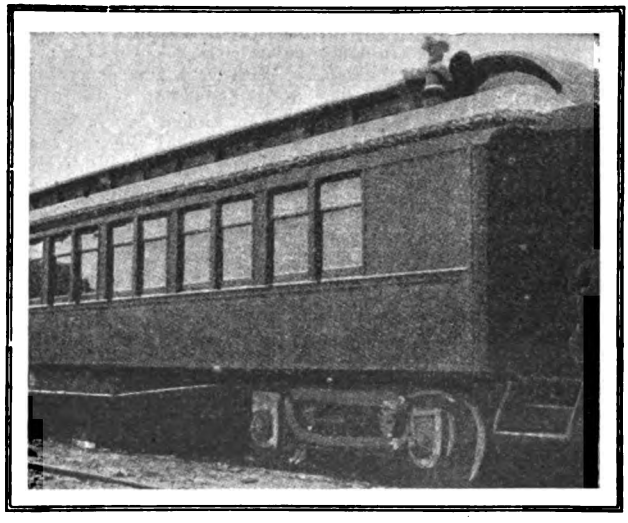
The Railway Master Mechanic, in its issue for June, 1907, describes and illustrates the Sharpneck Roller Bearing, which has been designed and put on the market by the International Anti-Friction Roller Bearing Company of Denver, Colo., and which is intended to obviate the difficulty and expense of maintaining the oil journal box. A good idea of the construction and arrangement of the bearing may be had from the accompanying illustrations. From the aforementioned publication we learn that:

"A special journal box, having an inside circular cage, takes the place of the ordinary journal box. A series of six rollers are placed between the journal and the inside face of the cage, two annular rings holding the rollers in place. In this manner rolling contact is obtained instead of sliding friction with the usual journal and brass.

"The rollers are of hollow or tubular form contracted midway between the ends. In the hollow ends of the rollers are arranged a series of soft, flexible rawhide washers between which are arranged a series of hard inflexible washers. The soft washers absorb enough oil to lubricate the rollers for an indefinite period. After the washers have been arranged in the rollers as described, steel clamping washers are placed in the ends of the rollers.

"By alternating the lubricating and hard washers, a self-lubricating anti-frictional bearing is provided which will wear and remain self-lubricating for an indefinite length of time. The hard washers give rigidity and prevent undue wear and they hold the rollers in perfect line with the axle.

"The car shown in the illustration has made over forty thousand miles, with no expense for lubrication, repairs or brasses and without a delay from hot boxes."



ROCK ISLAND COACH No. 326 EQUIPPED WITH ANTI-FRICTION ROLLER BEARINGS

(From Railway Master Mechanic)

* * *

Magnet Lifts Six Tons.

Electro-magnets are much used in connection with cranes and other conveyors for lifting heavy pieces of iron and steel. The Illinois Steel Company has a magnet weighing 1,200 pounds which lifts six tons. In Belgium magnets are used to lift tons of hot metal in foundries and rolling mills.

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The power of the electro-magnet is regulated by the switch controlling the current, says the Technical World. The magnet is lowered to the object needed with the current turned off. When the switch is closed the magnet becomes active, holding the articles to be lifted while they are raised and transported to their destination. When they are lowered the switch is opened and the magnet immediately releases them. As the operator of the crane controls the action of the magnet through the switch, this one man can attend to all the details of transferring heavy metal objects. No assistant is needed to attach them to the conveyor or to release them when they reach their destination.

Another use to which the electro-magnet is put is in breaking old castings so that they may be melted and utilized. To accomplish this the magnet is made to lift and drop a steel ball weighing from one to six tons.—Telegraph Age.

* * *

*Best Methods of Eliminating the Smoke Nuisance on Soft Coal-Burning Engines.**

A circular letter was sent out to all members of the association requesting answers to eight leading questions, and any other information that would throw light upon the subject. The circular letter read as follows:

"1. Have you made any definite attempt to reduce the smoke nuisance? If so, what?

"2. How do you prepare your coal before putting on tender?

"3. How do you prepare your fire when starting train?

"4. How are your firemen instructed to fire?

"5. What grades of coal do you use?

"6. Have you noticed any difference in the smoke with the different grades of coal?

"7. Have you ever tried combustion chambers in boilers? If so, with what results?

"8. Have you ever tried an auxiliary of variable exhaust appliance to mild exhaust when starting train? If so, with what results? In preventing the smoke nuisance what is the effect upon the firebox, if any?

"Kindly give me as much information as possible on these questions, or any other information you may have."

Less than thirty replies were received from the circular letter, and this report is therefore necessarily based upon the experience and opinion of something over twenty members of the association, in place of many times that number, as it should be.

To add to the clearness of this report the questions presented in the circular and the answers thereto will be taken up in order, after which the general conclusions arrived at by your committee will be stated.

Question 1. Have you made any definite attempt to reduce the smoke nuisance? If so, what?

With very few exceptions, the replies to this question were in the affirmative and in almost every case the statement was made that the first step was to educate the firemen to fire properly, for no matter what the other conditions might be it was impossible to eradicate black smoke without intelligent and faithful work on the part of the firemen and engineers.

In one or two instances the problem was put up to the engine crews entirely, the road holding them responsible for any excess of black smoke and suspending both fireman and engineer in all cases where black smoke was produced and no good excuse for same could be given.

Smoke inspectors are also employed on certain roads, whose duty it is to instruct firemen and to look into cases where too much black smoke was being thrown off, and, if possible, to find first the cause, and then the remedy.

Mechanical devices are also in use on several roads to assist the fireman in his attempts to fire properly, and almost without exception the devices used are showing good results, so much so that the further experimenting with practical devices for assisting the fireman in his exhausting work seems to be a feature that must receive more thoughtful attention on the part of railroad managements, the modern massive power having made the proper firing almost beyond the physical powers of the fireman, no matter how faithful he may be, unless aided by mechanical means.

The pneumatic fire-box door closer was strongly advocated in two instances, while automatic stokers received the endorsement of two correspondents who

*Abstract of Committee Report, fifteenth annual meeting of the Traveling Engineers' Association, held at Chicago, Ill., September 3-6, 1907.

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claimed they not only relieved the fireman, but spread the coal better and did away with the necessity of opening the door and drawing cold air in over the fire.

The use of the hollow brick arch was also advocated, the claim being made that better combustion resulted from its use, and therefore a diminishing of black smoke, although our correspondent maintained that the good results obtained from brick arches did not compensate the cost of maintaining them in wide fireboxes.

Smoke consumers, consisting of a strong blower in the front end and steam jets into the fire through the side sheets, also received recommendation, as they were said to give good results if the engine was fired light.

Answers to question No. 2 showed that only a few roads prepare their coal. Those that do get good results, the general method being to break the large pieces into lumps from four to six inches in diameter.

One method which appears practical and inexpensive is to provide coal sheds with breakers made by placing ¾x3-inch iron bars set on edge about five inches apart. On these breakers the coal is dumped and must be broken into pieces less than five inches in diameter before it will fall through. The value of such practice should not be overlooked by railway companies.

In answer to question No. 3 almost without exception the same plan is advocated for preparing the fire. The fire is built up gradually until a good level bed of coals is secured of sufficient thickness to hold without tearing under heavy exhaust, and thereafter the use of the single scoop system in replenishing the fire. When stops are made the fire should be in such prime condition that it will not be necessary to put on much green coal when starting train, and the engineer should use every effort to assist the fireman in holding his fire by pulling out carefully, and when the stop is to be a short one the fireman should endeavor to have his fire in such condition that no green coal need be added until the train has left the station.

The blower should be used to pull just enough air through the fire to combine with gases, and grates and ash-pan should be kept clean and in good condition. The condition of grates has much to do with the suppression of black smoke.

In answering question No. 4, all replies indicated that firemen were instructed to fire as lightly as possible, from one to four scoops at a time being advocated. The one-scoop system seems to be in universal favor, but in some instances it is deemed impractical on account of the modern heavy power, large fire-boxes, and the limit of human endurance.

However, "fire as light as possible," seems to be the general watchword, and any device that will make the one-scoop system practicable should be tried out by railroad companies, for in no other way can perfect firing be possible. The coal should be well and evenly scattered, first to one side of the fire-box and well into the corners, and then on the other, in order to retain a bright fire on one side of the fire-box to burn the gases swung after each shovelful is applied, to the other side. The door should be swung after each shovelful is applied, and for this purpose, in order to relieve the fireman, the pneumatic door closer has its advocates.

The replies to question No. 5 show that probably the greatest stumbling block in the way of eliminating black smoke is the grade of coal used by the roads and the furnishing of a great many different grades on a single system. The poorest grades of coal seem to be received by most of the roads, and as many as seventeen or eighteen different grades on a single road. Since this is the case, the problem of reducing black smoke is even more troublesome than it should be. A fireman who gets one grade of coal trip after trip so that he can get accustomed to using it to the best advantage, even if it is of the poorest quality, can get better results than the fireman of equal ability who gets a good grade of coal on one trip and a poor grade on the next.

Only one report indicated satisfactory coal conditions. In this instance 50 per cent. of bituminous and 50 per cent. of anthracite coal were used, and little trouble was experienced from smoke, as it could be regulated by increasing the percentage of anthracite at times when excessive smoke was objectionable.

Question No. 6 is supplementary to question No. 5 and the replies only help prove the disadvantage of having several grades of coal to contend with.

Fine coal is found to produce more smoke than lump, as it ignites more rap-

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idly and the smoke and gases formed have less chance of being burned off. This is also true of the lighter grades as compared with the heavier.

Reports show that it is more difficult to prevent smoke with coking coal than with no coking, and still more difficult with slack coal.

On roads where several grades are in use there is no benefit derived from the use of the best grades except in that they produce steam more satisfactorily, and the better the grade of coal the more carbon it contains and the more smoke it will discharge. This is only true, of course, because the fireman does not get the good coal frequently enough to become accustomed to firing it properly. If the better grades were used exclusively and the firemen became acquainted with the right method of handling it, much less smoke would result and lighter firing would be possible.

Question No. 7, in regard to the use of combustion chambers, brought only three replies in the affirmative. In one case combustion chambers were used, but discontinued on account of steam failures and the banking of cinders and fire against the lower flues, causing them to leak. In another case they were said to have given good results in generating steam, but were condemned on account of faulty construction. In another case combustion flues or tubes are being used with good results, but as a rule, little experience has evidently been had in this direction.

Question No. 8, in the matter of auxiliary exhaust devices, also brought out the fact that too little intelligent experimenting had been done with them, which seems strange in face of the fact that such splendid results are being secured by their use in other countries.

One report stated that no noticeable results had been shown, while the other reports from roads where they had been used were very favorable. In two instances the statement was made that considerable experience with auxiliary exhaust devices had demonstrated their value, not only as smoke reducers, but as coal savers, on account of their equalizing the draft through the fire-box, and thereby making lighter and more systematic firing possible. Faulty construction was the only unfavorable comment in another instance, and this is undoubtedly the reason for the hesitancy most roads show in testing out the value of these devices.

In summarizing this report, your committee would earnestly advocate the serious consideration of two things:

First, a campaign to bring about the standardizing of grades of coal furnished for locomotives. That, both in the line of economy and convenience, better grades of coal would be desirable is unquestionable, but if managements cannot be brought to realize the economy of good coal or if it is impossible to obtain it at all times, efforts should be made to insure the furnishing of one particular grade at all times in place of from half a dozen to twenty different varieties. No mechanic on earth could turn out satisfactory work if you changed the style and pattern of his tools daily, and it is just as impossible for the fireman to do himself justice or work for the best interests of his employers if a continual change is being made in the kind of fuel he must use.

Second, a realization of the fact that the present tendency toward still heavier power must necessitate a change in the old methods of handling a locomotive. Mechanical devices to assist the fireman in the duties that now overtax his strength must sooner or later be put in use, both in the interest of economy to the company and in fairness to the engineer. What devices will best accomplish the desired results is still a question, for the reason that the managements of railroads are backward in taking up anything that looks like an additional expense in maintaining power, while the mechanical departments dread the trouble and nuisance of experimenting with new devices. The enginemen themselves are probably as much to blame as any one for blocking changes that are bound to come at no distant date. Any old-timer knows the aversion of the engineman to any new appliance on his engine, and can remember the storm of disapproval that met the invasion of the injector, the lubricator, and the air pump, but these devices stuck because new conditions made them necessary, just as new conditions today are making necessary new devices, and the really progressive railroad man will meet the conditions and do all that he can to discover which are the best means of making it possible for the fireman to fire his engine as it should be fired to pre-

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vent black smoke, to hold his steam and to waste as little coal as possible.

While the answers received by your committee were not great in quantity they were high in quality, and would indicate that this report could safely recommend several things.

The preparation of coal before it is put in the tender (the system mentioned in the early part of this report) is being recommended, because the expense of such preparation is light and coal so prepared can be fired more uniformly and will give better results, and the fireman is saved the additional labor of breaking up big lumps.

The single-scoop system of firing with the closing of door after each scoopful is recommended because in this manner all the gases are given a chance to become properly mixed with the air drawn through the grates and to burn off with the least emission of black smoke, and because more water can be evaporated with a given amount of coal and the fire kept in better condition.

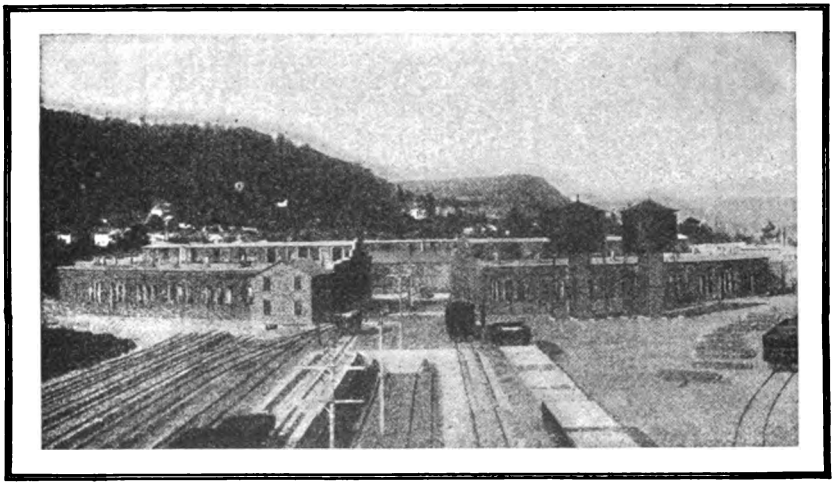
The standardizing of the grades of coal used is approved of because the suppression of black smoke and economical firing is impossible when firemen must contend with a continual change in the quality of the coal they must use.

A more conclusive test of the brick arch is desirable because the tests so far made show that gases and smoke given off by the coal are more thoroughly burned in fire-boxes equipped with brick arches, and less black smoke given off.

A wider investigation of the pneumatic fire-box door closer and the mechanical stoker should be made, because the steady increase in the size of power will in all probability necessitate the adoption of some such devices in the interests of economy and the firemen.

A conclusive test of the auxiliary exhaust is advisable because, with the modern large power with its high steam pressure and great volume of exhaust, light and economical firing is practically impossible without some method of equalizing the draft through the fire-box and softening the exhaust when working in full stroke and under heavy throttle.

The report was signed by Jno. Lynch, chairman, W. H. Bradley, C. L. Brown, Martin Whelan, W. J. Toy, committee.



ROUNDHOUSE OF THE DELAWARE & HUDSON CO., ONEONTA, N. Y.—DIAMETER, 400 FEET. NUMBER OF STALLS, 52

Steel Postal Car for the Pennsylvania Railroad.

It is learned that the Pennsylvania Railroad has placed orders for the construction of 200 all-steel cars for its passenger equipment, which is the result of a long period of inquiry and experiment. We show herewith an illustration of one of the new 70-foot steel pos-

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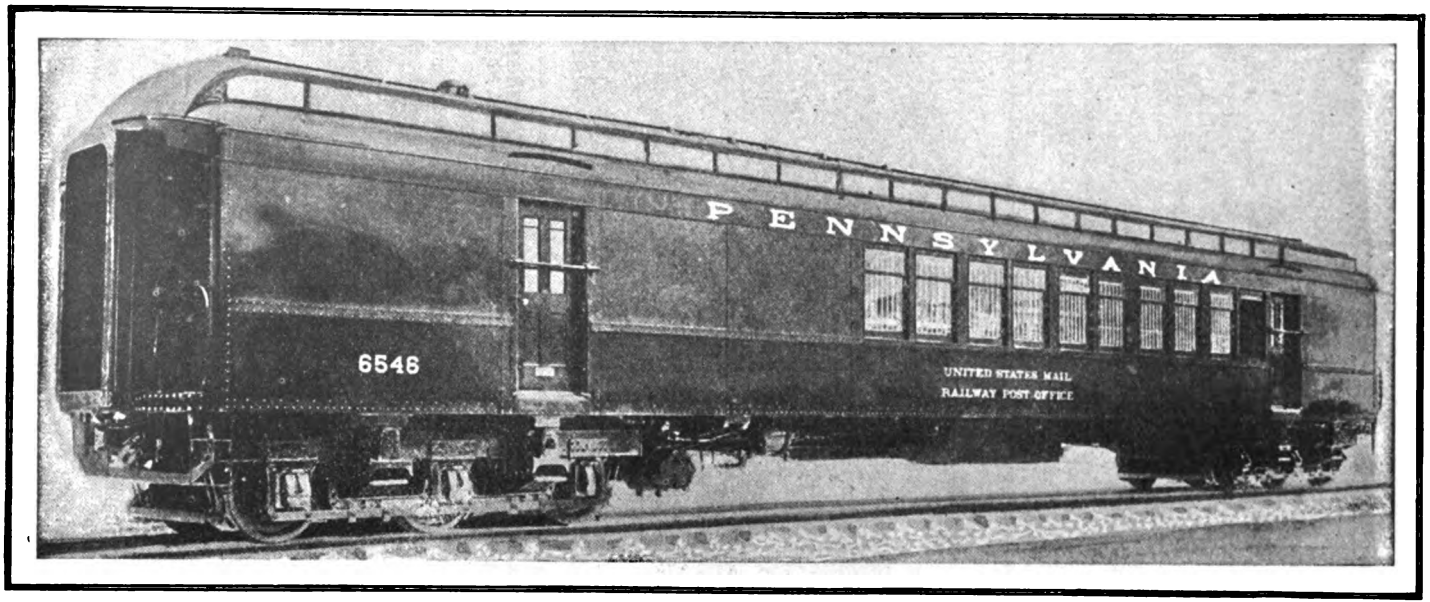

STEEL POSTAL CAR FOR THE PENNSYLVANIA RAILROAD

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tal cars recently completed for this company which, as will be seen, presents little difference in appearance from the ordinary car of wood construction, but is much stronger and better able to resist shocks to which it might be subjected.

* * *

*Locomotive Sanding Devices.**

Since the advent of heavy locomotives and the subsequent tendency toward decreasing the factor of adhesion, the question of proper sanding devices has grown in importance until it is one of the principal factors entering into locomotive operation. Sand is an absolute essential where tonnage trains are handled and locomotives must be provided with appliances which will allow the engineer to put sand on the rail quickly and with little effort.

The gravity sander is the oldest device of the kind and has been a feature of all the early locomotives and its use is still largely continued on modern power. It has proved to be a reliable sander and as applied to the smaller type of locomotives is a convenient arrangement for use of the engineer, but with the large locomotives it is not possible to arrange the levers so they can be operated by the engineer from a sitting posture and the inconvenience resulting from their use has prompted the question as to the advisability of continuing the use of gravity sanders on heavy power.

There are a number of points of interest more or less closely related with the care and operation of the gravity sanders and while it is generally considered that air sanders are more convenient to operate and more economical in the use of sand, there is a strong argument in favor of retaining the gravity sanders as a reserve for the air sander.

In order to secure information of interest on this subject, based on varied and general experience, we have obtained expressions from several practical road men in regard to the sander. The expressions of the several writers are given, the first one as follows:

"Service has taught me that the gravity sander is a very reliable sander, but useless when applied in conjunction with the air sanding device, for unless it is in constant use, sand will pack so hard and tight around valves that it is almost impossible to move lever after engine has made 50 miles. In fact on one or two occasions, I have seen lever and reach rod broken off in the effort to move valves.

"While it is more simple in construction, with no chance of a sand failure when the air pump stops, this occurs so seldom that I would not recommend a gravity sander over a reliable air sanding device.

"I worked on a division at one time of 104 miles; had nothing but the gravity sander for years and it was necessary to take sand many trips, 12 miles out of terminal; then 52 miles, or half way over the division. After the air sander was applied to these same engines, the company did away with two sand stations, and it was possible many trips to take full train over this division on light rail, with one-half box of sand, and I never ran out or heard of any engineer running out of sand after the air sander was applied to all engines. This meant a great saving in sand and delays, not to speak of the worry and manual labor imposed on the engineer. We all know what a hardship the gravity sander works on all engineers; with a bad rail it keeps him constantly tugging at the sand lever, and in most cases standing on his feet to operate same, when his attention is needed elsewhere. The engineer of today is too over-burdened with other duties and responsibilities to even think of going back to the gravity sander. It is true the air sander has its disease, which is the cutting or wearing out of the pipes, caused by the velocity of the sand passing through them. I have used, I think, nearly every air sander there is on the market, and I am sure that all different makes are on this road, and there are only two styles that will work in damp weather. No sanding device can ever be expected to work on a damp night or rainy day, that drops the sand down out of the box into a trap above or below the running board, where it will gather atmospheric dampness. The sand must stay in sand box where it is warm and dry, and when it leaves the sand box, go to the rail direct.

"We have several different sand devices on the road at present, and they would all be more reliable and less expensive if a little more attention was paid to screening the sand. We all know that sand must be shipped to many

*From Railway Master Mechanic.

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points in cars that are not altogether sand tight, and the men who load the cars use straw, rags and paper to stop up holes and cracks. The result is, this is not picked out as it should be when sand is unloaded into sandhouse, and from there into sandbox with same trash in it. This means stopped up sand pipes, then follows a double or reduction of tonnage on account of sand pipes not working. Next is the expense and delay to engine in roundhouse while machinist cleans out sand box or repairs broken parts.

"I would recommend that all sand be screened through a screen placed at about an angle of 45 degrees in sand houses, which will let the good clean sand go through, and the trash roll off, which I am sure from personal experience will cut down sand pipes stopping up."

Following is an expression from a road foreman of engines which shows clearly the value he places on the gravity sander: "There are a number of fairly reliable air sanders but I do not think that any sanding device operative by air is as reliable as the one known as the 'Gravity Sander.' It is only the question of saving of sand, as I understand it, that leads up to the application or the invention of sanders operated by air pressure. Another point, to my mind, is that with any sanding device operative by air, the sand should be blown directly from the box to the rail and not dropped by gravity to some trap above or below the running board. One of the greatest troubles with any sanding device, in my opinion, has been the neglect of making the joints water tight. I believe that a gravity sander could be so constructed, and arranged in the cab, that we could reduce the amount of sand used over the old device very materially, and at the same time could arrange it in a manner that would not work a hardship upon the engineers who operate it."

The opinion of a practical road official is expressed as follows: "I don't believe that an air sander will furnish enough sand for the average big engines that we have, and I believe also that it is not a good plan to do away with the gravity sander, from the fact that there is little expense to maintain them and they will save them a failure in case of air pump failing. Another thing is, that the air sanders do get defects in the construction in the box, so that it is hard to tell just what position to put the valve in the cab, and they use a good deal of air. They are used with a globe valve, and when the engine slips, the first thing the engineer does is to open the valve and where your feed valve is not thoroughly clean, you will have a case of stuck brakes."

The next writer favors the use of the air sander but points out some of the defects in construction which tend to reduce the efficiency of the air sander as follows: "There are probably several forms of air sanders that I have never tried, and I am not in a position to state which I regard as the best, but I believe at the present time, we should regard an air sander as preferable over a gravity sander, but I would be most heartily in favor of maintaining both and having the gravity sander as an auxiliary device should the air sander fail, and I believe that it could be maintained reasonably cheap, using the same pipes, and if necessary give the valves a greater leverage; make them of wrought iron so they might not be used frequently. Regarding the application of pipes to any of the sanding devices that I have seen: I believe that that has been proven one of the chief failures of the old style sanding device—too small pipes. Some that I have seen are ½ inch, a large number of them are ¾ inch. I believe that any of the sand pipes should be larger than that. Another prime feature of the air sander that I consider should receive care, is the nozzle or air outlet. If the nozzle becomes worn and the valves that are used are large, it is quite easy for an engineer to open up the air sander so quickly that he will stick his brakes if his air pump is working anywhere near up to the maximum. Another feature to be considered is putting a screen in the sand box. I would favor a screen protection over the sand pipes and sanding outlet down in the base of the box so that the sand must necessarily filter in through the screen to reach the sanding device. I believe that where sanding device is properly put up and the nozzles are kept central with the pipe, and do not become worn so that unnecessary air is wasted, I am of the opinion that they can be very easily kept in good working order."

The defects of both the air and hand sanders have been pointed out, but the quality of the sand and the condition

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it is in when put on the engine has a great deal to do with the proper operation of either type of sander as shown by the following communication: "I believe that with the sand trap close to the sand box, we get the best results. Where the trap is located below the running board, there is an opportunity for the sand to cake in the pipe and in order to make the sander work best, the less joints we have, the less trouble we will have. There is not attention enough paid in the shop in putting the pipes on, and if it is a little hard to bend a pipe to get it in, they cut it and put in a union, which gives lots of trouble in wet weather. I do not think we can afford to do away with the gravity sander or the air sander. We want both of them on the big engines, so if one gives out, we can use the other. I believe it would improve conditions if the leverage was increased so we could work the gravity sander with more ease. They usually work so hard that the engineer cannot operate them. The greatest trouble we have, is poor quality of sand. There is not enough attention paid to getting first-class quality of sand. We do not realize the money that is spent on a sanding device by having poor quality of sand. I don't think that it really can be figured out. You take a big, heavy engine and let her slip continually going over the division just because the sand won't run—the sanding device may be in good order, and the trouble in the quality of sand. This is something we are giving more attention to, but I do not think we have got it up to a high standard yet. When the engine reaches the division point with poor quality of sand, it means a machinist and helper for an hour or two to get it in shape, and probably it works for 15 minutes and you have the same trouble again. I do not agree with the idea of putting a screen inside of the box. I would suggest using a funnel with a screen in the funnel so that the sand would be screened a second time. I don't know of any one thing that we have to contend with that gives more trouble than getting sand to the rail with a heavy engine on a slippery rail. By locating the traps close to the box, I believe we will improve the condition, and by getting a better quality of sand, will also improve conditions."

The consensus of opinion expressed by the writers above, which may be taken as representative of universal experience in this country, shows that the use of both air and gravity sanders is still considered necessary to successful operation of locomotives. Attention is also directed toward the necessity of a convenient arrangement of hand levers for the gravity sanders and the need of placing the trap of the air sanders close to the sand box. The practical discussion of the question of proper sanding devices for locomotives as presented by the active railroad men quoted, is especially valuable as the information given is founded on results of actual experience.

Echoes from the Firing Line

An Echo from the Rockies.

I have been particularly interested in the accounts given by various brothers who have to use real estate for fuel, and can sympathize with them, as that is what we generally get, especially on our passenger trains, where one would think, considering the immense coal fields within a few miles of this terminal, that we would be supplied with the best grade of fuel; but if you imagine we enjoy the blessings of using good fuel, let me get that idea out of your mind, as we are constantly confronted with a tank of stuff that more nearly resembles the ordinary town lot than it does coal.

I also notice that some of our brothers are blessed with officials in charge who are inclined to be fair and treat their men right. However, I can not say as much here, as the firemen do not have as good treatment all round as they might if the officials were sympathetic with the men who are compelled to work so hard to get the traffic over the road. I do not think they are giving us the coal they ought to, considering they could get excellent fuel within a radius of sixty miles.

A MEMBER OF 59.

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Setting Corliss Valves.

I noticed in the August issue of the Magazine a method of setting the Corliss valves, but am inclined to think that one not experienced would be unable to get the valves right by that method, as a most important point has been omitted. In setting the valves, the dash-pot rods must be hooked up when the wrist plate is put on the center, and the rod should only be lengthened to fit on the wrist plate when the engine is on the center and the eccentric at right angles to the crank. Marks are put on all Corliss valves by the builders and in setting the valves give the steam valves 1/64 of an inch lap for every inch diameter; thus an eight-inch cylinder should have 8/64 lap, which is 1/8 of an inch lap. Corliss valves are given lap so that in case the governor belt breaks and the safety cams are set the engine will get no steam.

I will give you a simple method of setting the Corliss valves, and it is about the easiest way to do it.

Put in safety pin, hook up valves (raise the dash pots to hook in); place wrist pin on the center line; square the valves, giving the steam valves 1/64-inch lap for each inch in diameter of the cylinder; place the exhaust valves line and line. Put engine on head center line; place the eccentric at right angles, drop the hook rod on the wrist pin, which should drop right on without moving the wrist plate; if not, shorten it or lengthen it until it does by the turn buckle. This done, advance the eccentric to give the steam valve lead, and then turn engine to the opposite center and see if the lead is the same. Then put the governor up to its normal position, blocking it there, and bring engine to point of cut-off and adjust the length of governor rods to cut off at that point, at each end of the cylinder. Then remove blocks from governor. Now set the safety cams.

To adjust the length of the dash-pot rods, or to adjust the safety cams, always see that the wrist plate is thrown to its extreme throw on the side of the engine that needs adjustment.

What the governor must do when the valves are set right: When the governor is on the safety pin the valves must pick up but not cut off. When the governor is blocked up to normal position and the engine turned, the valves must pick up and cut off; when governor is at bottom of slot, valves must not pick up at all.

To set the cams, throw the wrist plate to its extreme travel and move cam down to just keep block from entering, and fasten it there. Do the same at the other end.

The lead depends on the work the engine is to do. It should be a trifle more if it is to be run condensing.

JAMES C. STEWART.

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Technical Contributions

PROPER LOCATION FOR CUT-OUT COCKS IN THE ET EQUIPMENT: THE IMPROVED WESTINGHOUSE LOCOMOTIVE BRAKE

BY WILL W. WOOD

Among enginemen who are up against the necessity for an understanding of the new ET engine and tender brake equipment, there are many who seem to find it a difficult problem, and their main criticism is that it is too complicated. Well, resolving all of the work that should have been done by many parts down into actually doing it by fewer parts does really complicate matters, and a brake equipment is brought forth which, if not rightly understood, or improperly handled, or *incorrectly applied*, can be the cause of a great deal of trouble and result in improper train braking. A little close study, and earnest attention to the action of the ET equipment, and constant experiment as to the results obtained from the use of the two engineer's valves in each of their several indicated positions, while the opportunity is at hand, will cause the complicated appearance of this equipment to fade.

Ever since the ET equipment was first put into service its details of construction have been constantly changed as improvements have been suggested. The diagram of piping, with location of cut-out cocks, etc., in the first ET instruction book that was published—the plate most generally used to describe the ET system in the different technical journals and instruction papers—is not standard today. In the edition of the ET instruction book No. 5025, bearing date of October, 1906, this diagram is modified and brought up to date, and is here reproduced in Fig. 1, but a good many enginemen will have to look pretty closely to see where it differs from the arrangement as first applied.

The change is principally in the location of certain cut-out cocks, but there is a great deal of difference in the results due to the alteration, and it is highly important that on every engine in the United States having the ET equipment the piping and position of cut-out cocks should be made to conform by changing, if necessary, to the plan shown here in Fig. 1. It is sometimes hard for motive power officials to understand the importance of having the change made to the present standard arrangement, and where that is the case engineers should use their utmost endeavors to have the change made, as it is to their own personal interests, as well as to the company's.

In the older arrangement there was a cut-out cock in the branch, or "cross-over" pipe, *CR*, that connects the main brake pipe, or *train line*, with the distributing valve; in the now standard arrangement this cut-out cock is absent, and rightly so; if your engine has that cut-out cock have it removed. If anything goes wrong with the driver brake you can cut it out by closing the *individual cut-out cock*, *DB*, in the pipe leading directly to the driver brake cylinders, and still have the use of the tender brake; or, if the tender brake, alone, should have to be cut out there is an individual cut-out cock, *TB*, in that branch of the brake cylinder pressure piping that leads to the tender brake cylinder, and it can be closed, leaving the driver brake operative as usual; or, both the driver and tender brakes may be cut out at the same time by closing their individual cut-out cocks.

So it would seem unnecessary to have placed that cut-out cock in the train line connection, in the first place; it was considered, however, that it might become necessary some time to *cut out everything* —that is, the action of the distributing valve, etc., and by closing the train line cut-out cock no variation of brake pipe pressure could affect any part of the engine and tender brake equipment; but it was found undesirable to use it for that purpose, for, having closed it, if there was any leakage whatever between the cut-out cock and distributing valve the driver and tender brakes would apply and "stick," unless their individual cut-out cocks were also closed.

But here is the worst thing against

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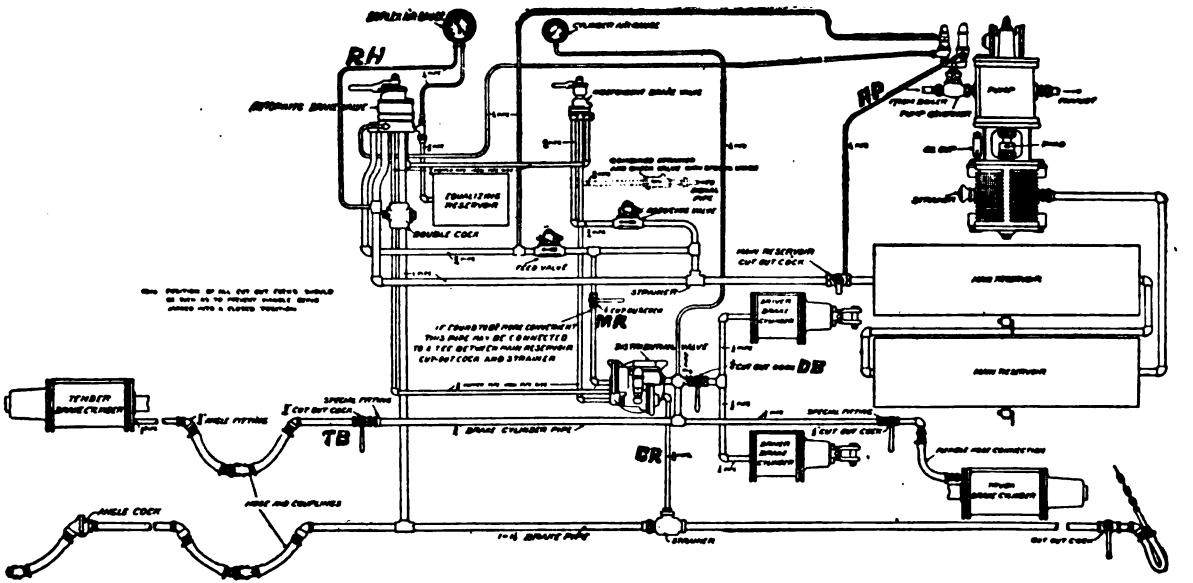

Fig. 1. Standard Arrangement of Piping and Cut-Out Cocks in the ET Engine and Tender Brake Equipment

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that used-to-be cut-out cock *CR*: it was deceptive; closing, it would prevent application of the engine and tender brakes by any reduction of train line pressure, however much or by whatever means it might be made, so long as the reduction was not made by the emergency position of the engineer's valve; a brake pipe reduction through an opened angle-cock heavy enough to cause quick-action of the train brakes would not affect the locomotive brakes with the cut-out cock at *CR* closed. So, in case of any serious defect in the driving wheel brakes, foundation gear or tire, it would seem safe enough to simply close the cut-out cock in the cross-over pipe, *CR*, from the train line to the distributing valve; but *when the engineer's valve is placed in the emergency position*—and usually that is done when the engine speed is high—the closed cock *will not then prevent* the driver and tender brakes from applying, and they will set with a pressure that will raise the pop-valve, and that might pull something down under the engine.

The Westinghouse Air Brake Company has abandoned and omitted that deceitful cut-out cock, *CR*, as the plate shows; yet, it may at some time be necessary to cut out the operation of the distributing valve from any influence of the train line pressure; or the brake cylinder, individual cut-out cocks may leak through when closed—and I have known of ET-equipped engines on which the locomotive builders had omitted to supply individual cut-out cocks in the pipe leading to the driver brake cylinders. So, a cut-out cock is now placed in the main reservoir supply pipe (see *MR*) to the distributing valve, and while the individual brake cylinder cut-out cocks are supposed to be used to locally cut out either the driver or tender brake, when it becomes necessary to *cut out everything* you are expected to close this cock, *MR*; it is a part of the now-standard equipment. But a note of warning as to its use is in order: If *chamber D* and the brake valve equalizing reservoir has not been greatly reduced in pressure, placing the automatic brake valve in emergency position will cause the engine and tender brakes to apply *even with cock MR closed*—and for this reason:

First, though, have you never noticed that while the locomotive brake cylinders are supposed to be supplied with 50 pounds pressure at a full service application from the initial 70 pounds train line—that is, the pressure chamber (*dummy auxiliary reservoir*), and the application chamber (*dummy brake cylinder*), will equalize from 70 pounds in the former to 50 pounds in both, and at a 20-pound train line reduction—and the pop-valve is set to blow off at 52 pounds in the pressure chamber—have you never noticed that even if you have only 30 or 40 pounds, or even less, of train line pressure, a full service application will run the brake cylinder gauge away up to *higher than the train line pressure had been?* Up to 52 pounds, in fact, and the pop-valve will start blowing off. Of course 30 or 40 pounds from the pressure chamber *alone* could not equalize so high, nor raise the actual brake cylinder pressure any higher; but it was explained in the July Magazine—page 47—how, when the train line pressure has been reduced enough to permit the equalizing valve (*dummy triple valve*) of the distributing valve to make its full stroke a small port is then opened through which main reservoir pressure is fed into the pressure chamber, and when that port opens—it doesn't matter how low the *equalized* distributing valve pressure may have been—it is immediately increased to the limit set by the pop-valve, if there is that much in the main reservoir to draw from.

Now, the case in question is just the reverse from the one alluded to in the July number. If the cutout cock, *MR*, is closed no main reservoir pressure can be supplied to the brake cylinders; but when an emergency train line reduction is made by the engineer's valve, as heretofore explained, through ports in the automatic valve the volume of pressure contained in its equalizing reservoir is combined with that of the pressure chamber in the distributing valve, and together represents a considerable volume of air that equalizes not far below 70 pounds; the equalizing valve makes its full stroke and opens up this little port *m* and *n*—the color plate in the July Magazine shows the port connection to perfection—only, instead of the *red* pressure flowing to the *green* as is represented in the plate, when the cock *MR* is closed in the pipe supplying the *red* main reservoir pressure *a*, the *green* pressure-chamber air *flows upward* into *a* and over the valve *5*, and past it down into the passage *c* leading to the brake cylinders of the engine and tender; and the combined volume is enough to give a considerable

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pressure on the locomotive brakes, too, especially if the piston travel is short.

So you see that while the cut-out cock that used to be furnished for the train line connection wasn't effective in preventing locomotive brake applications at the very times when they should most certainly be prevented, the newly specified cock, *MR*, can not be entirely relied upon as an effectual cut-out cock, either, although it is more desirable than the older plan of having the cutting-out feature in the train line connection—which should be discarded—removed.

There should be, however, a cock for cutting out the action of the distributing valve and engine and tender brakes *completely* without reference to the individual cut-out cocks in the pressure pipes to the brake cylinders; and the desired results can be obtained by using a three-way cock instead of the plain cut-out cock *MR*. With the three-way cock in its normal position the flow of main reservoir air through it to the distributing valve would be just the same as with the plain cut-out cock, but when the three-way cock should be turned to shut off the supply of main reservoir pressure the side toward the distributing valve would be opened to the atmosphere, venting the contents of the section of pipe between the three-way cock and distributing valve. Then, with this cock in its "closed" position, if an emergency application should be made of course no main reservoir pressure could pass to the distributing valve, and the combined pressures in the pressure chamber passing up through ports *m* and *n* would exhaust itself at the three-way cock.

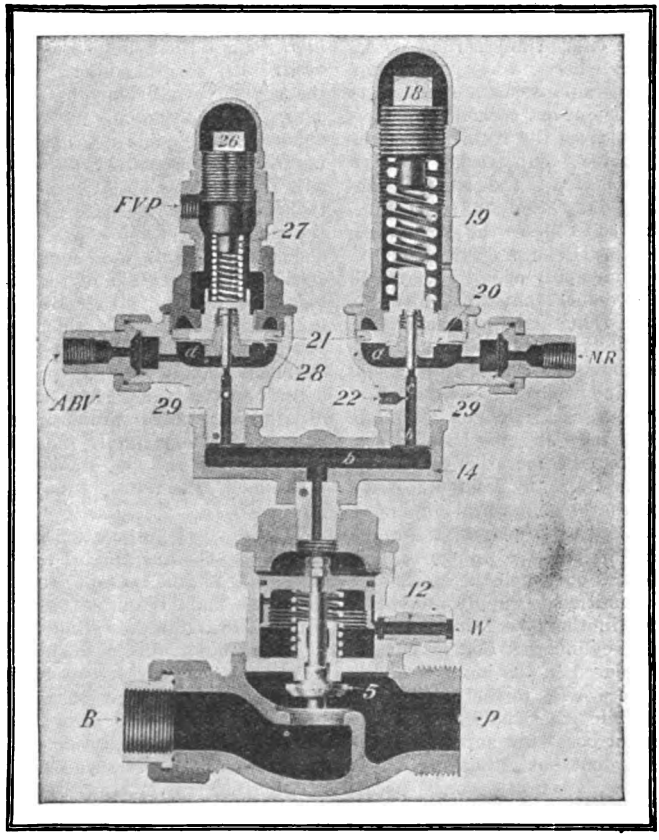

Fig. 2. Improved Low-Pressure Governor Top: ET Equipment

I believe this three-way cock sugges-

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tion to be a good one. Bleeding the pressure chamber permanently would prevent any undue application of the engine brakes, but, just the same as an open bleed-cock on an auxiliary reservoir, would have the effect of a bad leak from the brake pipe—train line. At any rate, the *location of cocks* in the ET equipment should be made to conform to the latest Westinghouse specifications as shown in the plate, Fig. 1, and serious trouble thereby possibly avoided—"a stitch in time," etc.

Another change in construction will be noted in the connection of the *feed-valve-pressure* pipe to the spring case of the low-pressure governor top. Formerly the pipe was connected by a union with the top cap of the spring-box, and when it was desired to alter the tension of the governor spring it was necessary, first, to close the stop-cock in the pipe, and then disconnect it; and of course the readjustment was by guess, for it was not until after re-connecting the pipe and opening the stop-cock that the result of the alteration could be known, and probably the operation would have to be repeated several times before the desired pressure was secured. The improvement, as shown in Fig. 1, and in detail in Fig. 2, consists in a changed pattern of spring-box into the side of which the feed-valve-*pressure* pipe is screwed; the cap-nut, in connection with the adjusting screw-nut, forms an air-tight joint when screwed down, and any readjustment may be quickly and accurately effected without disconnecting the air pipe; obviously the small stop-cock in the pipe is no longer necessary, and is not specified.

Besides the suggested substitution of a three-way cock in place of the plain cut-out cock at *MR*, there is another slight improvement over either the older or the new-standard designs of the ET equipment that I have made when it was convenient to do so, and of marked advantage; and that is, instead of connecting the small air pipe that supplies the pressure that actuates the red gauge hand to the main reservoir pipe near the engineer's valve, as shown in all plates, I have cut that main reservoir connection off from the gauge pipe, and put a *tee* in the pipe *HP*, Fig. 1, to which I connected the pipe to the gauge of the red pointer. With the usual arrangement when it becomes necessary to close the big, main cut-out cock in the main reservoir supply pipe in order to do inspection, or make any disconnections in the line of pressure on the engine, there is no way to tell how much pressure will be pumped up in the main reservoir; the pipe *HP*, of course, will not be cut out from the main reservoir, and if the pump governor—including its high-pressure top—are working correctly, and if you know at what figure the high-pressure top is adjusted, you may have faith that the pump will be stopped when the main reservoir is at that figure. But you can not always be sure of those things; you don't *know*. By connecting the red-hand gauge-pipe as recommended, however, you will always have the main reservoir pressure directly indicated when the pump is working, if every cut-out cock in the whole ET equipment should be closed.

ELECTRICITY—THE STREET CAR EQUIPMENT

BY ELWOOD GRISSINGER

When starting a new car the motors should be tried one at a time to observe whether the revolution of the controller handle will move the car in the same direction with either motor. If it is found that the same movement of the controller handle does not move the car in the same direction for either motor, then it will be necessary to reverse the connections on the armature or field terminals of the motor that causes the car to move backward when the controller handle is in the forward position. Sometimes an open circuit exists in the car wiring and the car can not be started. The wiring of the circuits may be checked by trying each controller. If the car will start from one controller and not from the other, the fault may be found in the second controller. It is scarcely possible that both of the controllers will be crippled at the same time, although the writer has seen

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a parallel instance on a steam locomotive where both injectors were crippled at the same time and in precisely the same manner. The same might happen with electric controllers.

If the controllers do not give evidence of the open circuit the trolley pole should be tied down from the overhead wire. The front of the controller case should be removed and the controller handle turned to the first notch. One terminal of a magneto or testing bell should be placed upon the iron work of the car truck and the other terminal of the same bell should be attached to the terminal of the controller marked *G*. If the bell rings when its handle is turned, it is certain that the ground connection is all right through the controller. In the same manner all the terminals of the controller should be tested out with the marked terminals of the armatures and fields of the motors, until the terminal or terminals are reached where the bell will not ring. This will indicate the location of the fault, which can then be repaired or corrected. If it is found that all of the points ring up from the one controller, bring that controller to the off position and proceed in the same manner for the other controller. If both of the controllers and their circuits are found correct, look for the open circuit between the trolley and the fuse block or the circuit breaker. In doing such testing, the canopy switch or circuit breaker should be kept closed.

Street car motors are not the nicest looking of electrical apparatus, but they are built of the very best materials and in the most substantial manner, so as to withstand the most severe service to which any kind of prime mover is subjected. The one great aim of every street railway company is to keep the cars moving and as regularly as possible; secondary to which is the cost of operation. The cost of operation per car mile used to be very heavy because of the enormous repair account. Such an account will always prove a not inconsiderable item, but it can be kept very low, comparatively speaking, if equipment is regularly inspected by competent inspectors, and if all employes who have anything to do with the operation of the cars will familiarize themselves with the details of the system. Those men are always the most valuable who know the most about the business in which they are engaged. It is not only necessary to know when to turn a controller handle on or off, but just as well to know what happens when you are doing it; and if nothing happens when it should, or the operation be imperfect, it is the desirable man who knows what to do and can do it quickly.

Regular and frequent inspection should include the commutator, brushes, brush holders, controllers and trolley wheel. The commutators of all motors must be kept clean. Their surfaces should be kept as true as possible. As long as a commutator runs smoothly, without sparking, etc., nothing need be done to it, but the moment that sparking evidences itself the commutator and brushes should receive immediate and careful attention. Fine sandpaper may be used to clean the surface of the commutator while it is revolving and if the application of such sandpaper is not effective and it is certain that the brushes have a good and positive contact, it is possible that the armature will need to be removed from the motor and the commutator trued in a lathe. Sometimes an application of a little parafine or commutator compound will be beneficial, but in general commutator compounds are to be avoided.

A very sharp tool must be used when turning down the surface of a commutator and only very thin cuts must be made from the surface. Commutator copper is tough, and unless a very sharp tool is used the metal might be burred somewhat, causing small pieces to lap over from one commutator segment to another. It is much better to make more than one cut than to attempt to make a deep cut. It is also advisable not to run the cutting tool all the way to the edge of the commutator, but to permit a narrow flange to remain at each edge. The turning can be finished by polishing down with fine sandpaper preceded with draw-filing.

The carbon brushes which carry the current to and from the motor armature windings should always make good and positive contact with the commutator. It is only necessary that they bear upon the commutator with sufficient pressure to keep them there at all speeds and over all kinds of track. The brushes are placed within brush-holders and held against the surface of the commutator with springs, the tension of which can be regulated within certain limits. The brushes should be removed from the brush-holders frequently and carefully cleaned removing grit and dirt which may have collected.

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The brush-holder boxes in which the brushes have a sliding fit should also be cleaned at the same time in order that the brushes may be given perfect freedom of movement. The brushes should not be permitted to wear too short, because the springs can not then bear upon their ends properly, and when they are removed from the brush-holders care must be exercised that they are replaced as found, because after running for a time they will not fit the commutator on the opposite side to which they had been running. The brush-holders can be adjusted up and down and within a small arc of a circle, and this adjustment should be effected as the commutator wears down, it being borne in mind that the lower end of a brush-holder should remain at a distance of about one quarter of an inch from the surface of the commutator.

With the controllers, their cases should be removed and all contacts examined and made secure. In fact, wherever there is a contact made by means of a bolt, nut or screw, it should be examined often and made tight. The constant jarring is very likely to loosen them and a loose joint of any kind will make all sorts of trouble. Since the controller is virtually a combination of a number of small switches, it follows that it will consist of a large number of moving contacts. Every time a car is operated these contacts make and break an electrical circuit, which, combined with the friction of movement, cause them to roughen, work hard and heat from sparking, all of which will wear them down rapidly. Such contacts should be cleaned regularly, all rough spots removed, polished and a very small amount of tallow placed on their surfaces to facilitate smoothness of movement and prevent them from becoming dry, harsh and cutting. These small parts require repairs frequently enough and their life can be materially increased with a little care.

At the top of the controller cylinder there is a small ratchet wheel. This should be lubricated, as well as the upper and lower bearings of the controller drum; but such lubrication must be just sufficient for the purpose and not in quantity sufficient to permit of its running down upon the controller cylinder.

Bearings and the proper lubricant to use are a matter of great importance. All street car motor bearings are babbitt lined. In many cases they are self-oiling, using a medium heavy lubricating oil, and in others so-called dope or grease is used in grease boxes above the bearings. To this grease is usually added a small amount of heavy lubricating oil. Bearings should never be allowed to get very warm. It is well after every day's run to add a little oil to the grease; stir it and push it through to the shaft below. At times all grease should be removed and the bearings thoroughly cleaned. In the case of self-oiling bearings it is only necessary to see that the oil chambers are kept filled with oil. Care must be exercised that dirt of every kind is kept out of the bearings and out of the oil chambers. The wearing of the bearings should be watched closely, because as they wear the armature will be lowered and approach the field poles on one side. Such wear can extend sufficiently to permit of the armature rubbing against the pole pieces, and such rubbing may destroy an armature that will cost a great deal to replace, whereas a bearing can be removed and rebabbitted at a small expense.

A gear case upon the side of each motor frame completely encloses the motor pinion and the gear wheel that is attached to the car axle. This gear case is practically water tight and will hold a goodly amount of grease to keep the gears lubricated. These gears as now made are cut steel and will last a long time if a sufficient quantity of the lubricant is kept within the gear casing. An examination should be made frequently to observe the wear of the gears and whether all bolts are tight, for the gear wheel which is mounted upon the car axle is a split-steel gear. Any loose motion of a pinion can be taken up on its own shaft by means of the nuts provided for the purpose. Both pinion and gear must be tight upon shaft and axle. If there be any motion, a worn feather or key may be the cause. Because of the fact that the gears are carefully and accurately cut, and that they revolve in a lubricant, they will run quietly. If they do not, they should not be operated until their faults are remedied. The amount of grease in a gear casing should be enough to keep the gears well oiled at all times. Frequent examination will reveal whether they are running with sufficient lubrication or not. Gear casings must be kept perfectly tight.

It is not presumed necessary to refer to the mechanical details of the handbraking mechanism forming the part of

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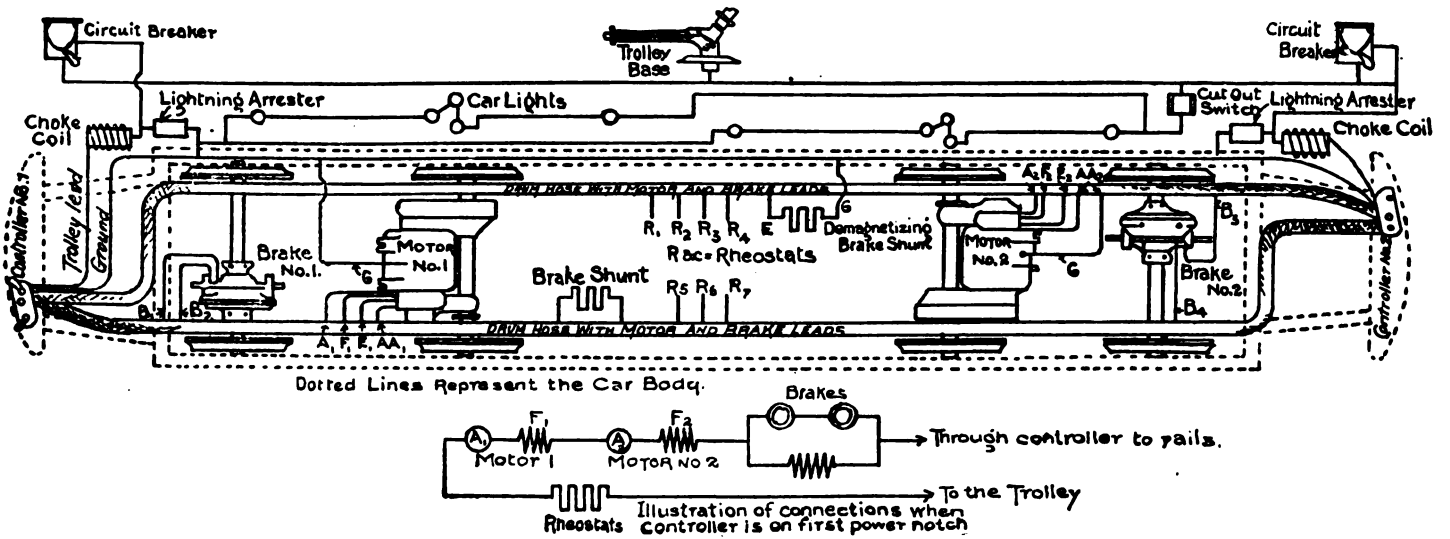

Diagram of Two-Motor Car Equipment with Electric Brakes

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every street car equipment, as the readers are, no doubt, thoroughly familiar with such. What applies to steam railroad practice applies with equal force here. The adjustment of the brakes is practically the same. Hand brakes are found upon every car. Many equipments have the electric brake system, using the hand as an auxiliary. More numerous, perhaps, are those cars which are now equipped with individual air brake outfits. Each car has its own independently driven air compressor, the motor deriving its power from the trolley wire. Its operation is entirely automatic. The motor starts and stops as the air pressure in the main air reservoir falls or rises, the air pressure remaining within five pounds of the required amount constantly. In some very few instances a track brake is employed. This form of brake has been used as a pressure brake pure and simple, whereas other types of the same were magnetic in their nature, the shoe being held tighter and tighter to the rail as the magnetic attraction between it and the rail was caused to increase.

The life of a trolley wheel depends on the quality of the metal of which it is composed, of the care it has had, and of the number of miles it has traveled. Wheels should be oiled daily, and renewed when they are found to rattle and to have roughened materially where they come in contact with the trolley wire. If a wheel flashes badly it may be due to there not being sufficient tension between the wheel and the trolley wire. Such flashing is very injurious to the trolley wire and should be prevented at the earliest possible moment, because trolley wire is expensive.

Much that has been said about dynamos and motors in general applies to street car motors as well. Too much attention can not be given to the details of electrical apparatus and to street car work in particular.

As a part of this paper, a diagram has been prepared showing a system of car wiring in use in connection with a double motor equipment and electric brakes. This diagram will show the path of the current from the trolley wire through the motors to the rail return circuit. The trolley is placed in the center at the top of the car, and from this point the circuit divides, one circuit going to each end of the car. It is to be assumed that controller No. 1 is the controller that is to be used in operating the car and that controller No. 2 is cut out. The current will therefore flow to the left through the circuit breaker and the choke coil to the controller. When the controller is moved to one of the notches current will flow through the wires enclosed in the drum hose to motors Nos. 1 and 2. Now, the amount of current that will reach the motors will depend upon the position of the controller handle, because by means of the controller handle more or less of the resistance, marked *R1*, *R2*, etc., is put in series or parallel with the motors. The controller subdivides this resistance and also places the motors in series or parallel relation with one another, the line and the resistances. The first notch of one type of controller, for instance, places the motors in series with each other and with the resistance. The second notch will halve the resistance. The third notch will cut out the resistance entirely and leave the motors in series with one another and with the line, each motor then getting 250 volts approximately and the same amount of current in amperes, depending upon the work that is being done and whether or not the motors are dividing the load equally between them. The fourth notch will throw the motors in parallel with one another and in series with the resistance; the fifth notch will halve that resistance, and the sixth notch will cut out the resistance and leave the motors in parallel with each other and with the line, and each motor will then be getting the full line pressure or 500 volts. All the while that these controller changes are being made the motors are increasing the power that they develop and, as the motors are variable speed motors, their speed will be increasing—this provided the dead load remains the same. For different conditions different controllers are used, some having more or less than six notches. The more notches the more subdivisions there are, and the easier the car will start.

Each motor has its armature and field terminals connected to each controller through different leads. From the motors the current passes to the rails through the ground connection provided. If, however, as is usually the case, the current flows the other way—that is, comes from the power house through the rails, thence through the car equipment to the trolley wire, thence back to the power house over the overhead feeder circuits—the direction of the current through the car wiring depends upon whether the trolley wire is

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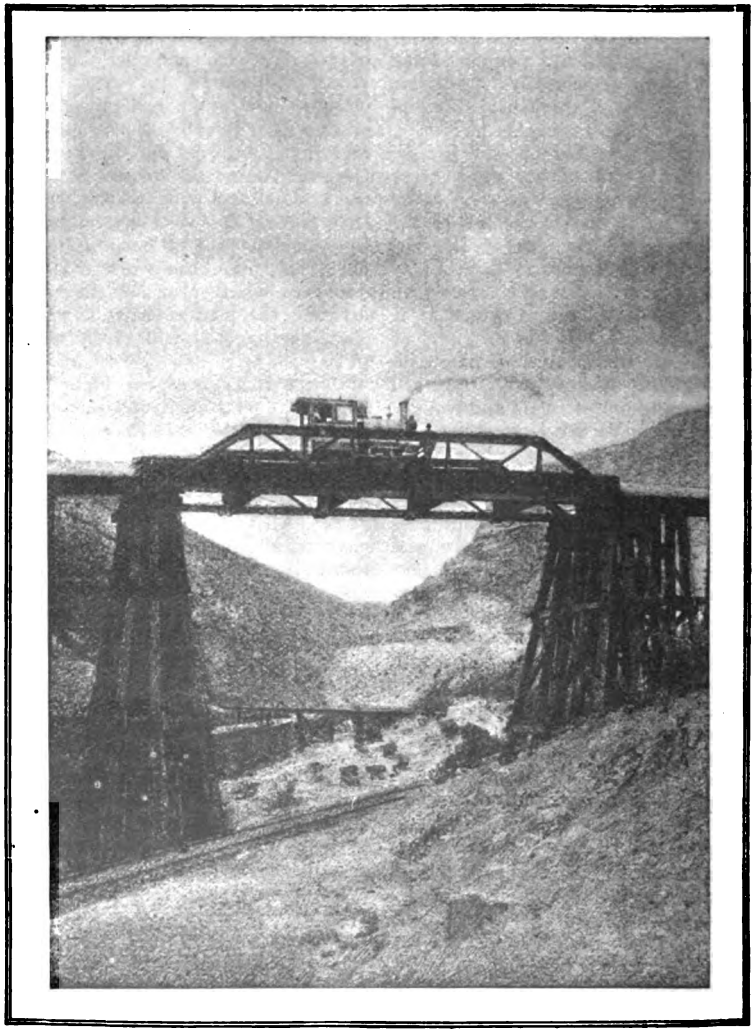
made plus or minus at the power house. If plus, the current will return to the power house through the rails; if minus, vice versa. The reason for making a distinction is. that electrolysis of piping underground is minimized if the current returns to the power house through the overhead conductors. In all systems of electric traction as now used, the rails form one side of the circuit. That is why the rail joints are connected together with heavy bands of copper, and why, still better, rails are sometimes electrically welded together at the joints or their electrical conductivity improved by the Thermite or analogous process.



VIEW ON THE MORENCI SOUTHERN RAILWAY, MORENCI, ARIZONA

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POUNDS IN LOCOMOTIVES

BY W. L. FRENCH

Pounds are generally caused by slack wedges or rod keys, or a loose driving binder. A broken frame or driving-box jaw will cause a pound, but quite often their breakage is due to a neglected pound in a rod or box.

A loose follower bolt or head, a piston loose on piston rod, or a main rod keyed too long and allowing piston to strike cylinder head will cause a pound, and if very bad will result in the breakage of the cylinder head itself. A pound of this kind is more pronounced when steam is shut off and engine drifting, as all the slack in the rod and connections is free to move to the limit, there being no steam pressure in cylinder to cushion and restrain. A pound of this kind is more noticeable when main rod is passing forward center.

If a pound is caused by a main rod being too long have it shortened; if by a loose piston head or any of its parts remove cylinder head and tighten the part.

With a main rod long enough so that packing rings can drop into counter bore, and yet not long enough so that piston will strike cylinder head, the sound will be much the same as a pound and is rather more difficult to locate. The mark will show on the edge of the counter bore if cylinder head is taken off and an examination made.

Little can be done for a pound caused by a broken frame or pedestal jaw except to work the engine lightly to the terminal and have the necessary repairs made there.

Pounds cause nuts to work loose and fall from bolts, binder studs to work out and be lost, and rod straps, pedestal jaws and frames to be broken.

A bad pound at the front end of the main rod is more liable to cause a breakage of a strap than any other pound, as the whole strain is thrown on the strap when the rod is in tension. In keying the front end of a main rod care must be exercised not to get the brasses too tight on the wrist pin, as front end brasses cut out easily if too tight. Key on lower eighth or quarter. The wear is greatest on the front and rear of the wrist pin, owing to the direct pull and push of the piston. In keying, the key should be driven a little at a time and the front end of the rod moved laterally on the wrist pin with a short chisel until the desired tightness of the brass to the pin is secured.

Owing to the peculiar motion of the front end of a main rod, which is a combination of the movement of the crosshead in the guides and the crank pin of the main driver to which the back end of the main rod is connected, the wear on a wrist pin is different than that to which the crank pins are subjected.

The keying of back end of main rods seems to be a matter of opinion or individual experience as to the best position of the crank pin when key is driven. If a pin is round it makes not the slightest difference as to its position when key is driven, or even if the pin is out of round and the man driving the key knows how to key at the position the pin is in, for in the other positions the crank pin will assume in its revolution no bad effects will result.

One large system desires that men being examined for promotion shall answer that they key back ends of main rods on the center. Personally, I key a rod wherever it may chance the position of the pin is when I desire to key it, although I consider the quarter preferable, as a key driven so that the connection can be moved easily back and forth on the pin by the hands will not bind to do any harm or be loose enough to pound unless the pin is notably out of round; then, keying in any position will not obviate these troubles and nothing will except a new pin.

The man who keys the back end of a rod so there will be a thump in it at all—with a pin that is much out of round—when the engine is given steam and thumped will have trouble. Naturally the thump will come where the pin is the smallest, and driving the brasses tight at that point will result in a hot pin.

Where rod grease is used care should be taken to wait until the grease in the brasses is well worn out after screwing cup plugs down before keying rods, for if the brasses are full of rod grease they will not move freely on the pin and one gets the impression that the brasses are tight on the pin, when in fact they are not. In case one starts the babbitt in a

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brass it should all be thrown out before stopping. Babbitt is seldom thrown out where grease cups are used. A pin might become hot from brasses being too loose—that is pound hot. If a pin runs hot it is not advisable to slacken the rod key at that connection unless key has been recently driven and is too tight. Look for some other cause for the trouble.

The side rods should be keyed on the center, as at that point the length of the rods will not be changed so as to interfere with the revolution of the crank pins. Side rod brasses will not pound, but will click if run too loose. If, on keying, a rod is found to be too short or too long, the changing of a liner from the front to the back of the pin, or vice versa, as the case may require, will remedy the trouble. If the side rod is too short the outside brass will get the hottest; if the rod is too long, the end or outside brass will be the hottest. These troubles are not likely to occur unless rods have been down and not put up the proper length.

The keying of a double-keyed middle connection of a ten-wheel engine should be in the following manner:

Place engine on center and drive both keys clear out. Put one key in and drive it clear down, make a scratch on the key along the top of the strap and drive key out. Do the same with the other key. Start both keys and drive them down equally, that is, so that when brasses are keyed satisfactorily the lines on the keys will be equally distant from the top of the strap. The other ends of the side rods can then be keyed. Side rods are often put up with what are known as solid ends. Brass bushings are fitted into the enlarged ends of the rod. When put up they run very nicely, but as they wear, while they do not pound, they rattle and make a great deal of noise, and as there is no way of keying them up snug to the pin they are often allowed to run in this condition a long time before new bushings are substituted for the worn ones.

Properly the wedges should be adjusted before rods are keyed, but on most any engine, except one recently from the shop or one that has been neglected, the wedges will be up and rods keyed, except as to ordinary wear one becoming loose requires them to receive attention. Under the pool system on most railroads the adjusting of wedges and, to a large extent, the keying of rods is left to the roundhouse force, and as a rule these things are not cared for as they should be.

No one can adjust wedges and key rods as successfully as the man running the engine, as he has the opportunity to note anything that is needed and can apply the remedy, but with pooled engines it is not reasonable to expect engineers to do this work, and the roundhouse having assumed it, should look after it more closely than it usually does, for the heavy class of power soon pounds itself to pieces when neglected.

A wedge should be so adjusted that the box can move up and down freely in the pedestal jaws without sticking and, at the same time, not allow room for the box to pound in the jaws. On smooth, well-ballasted track this is not difficult to accomplish, but over very rough track wedges will have to be run a little slack or else the box will stick and the engine ride very hard.

The engine should stand on level, straight track when wedges are being adjusted, as a curve in the track or an inequality in its surface will pinch the box and wedge together, or allow too much slack in the boxes on one side on a curve, and a proper adjustment can not be obtained. The wedge should be forced up as far as it will go and then pulled down a little, say from one-fourth to one-half inch, according to the track the engine runs over and the condition of the wedge. If the wedge is rough or has a shoulder worn on it, more play will be needed. Taking into consideration the gradual taper of the wedge it will be seen that pulling one down one-half inch does not give a very large amount of play to the box.

Where wedges are set up by the roundhouse force, two pinch bars, one in front and one behind the wheel, may be used to pinch it up and down and show whether or not the box has the proper amount of up and down motion in the pedestal jaws.

When it is desired to get all the slack in a box against the shoe before setting up the wedge run the wheel to the box with a pound against a block on the wedge side or the wheel at the opposite end of the journal against a block on the shoe side.

After a wedge is set up it should be well oiled before starting out. If a wedge bolt breaks, block between the binder and bottom of the wedge and between the frame and top of the wedge.

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It may be held in place sometimes by putting washers on the binder and changing the set nut so that it will overlap the break, but blocking will usually be quicker and easier to accomplish.

When a wedge sticks, loosen the set nut on top of the binder and tighten nuts under binder, or run wheel over a good sized nut; this will pull the wedge down. It may be necessary to cool the box down before doing this. If in a hurry, oil the wedge and box good, loosen the set nut and go. This treatment ordinarily will result in the wedge being loosened and coming down without farther trouble.

Stuck wedges are not only hard on the engine, but also on the roadbed, and are particularly liable to do damage to bridges, and an engine should not be run any distance in that condition, and more particularly at a high rate of speed.

Wedges need more oil in dry weather than in damp, as the dust dries up the oil on them the same as on guide bars or other parts of the machinery. The top quarter offers the best opportunity to work at wedges.

A loose driving binder will cause a pound similar to a loose wedge, and may be caused by loose bolts or the binder being poorly fitted to the jaws. The hollow binder with a large bolt through it and the binder jaws is preferable, as it is more easily kept tight than where the binder is fitted to the lower ends of the pedestal jaws and studs are used. These studs are continually working loose and getting lost, and causing extra work and expense to replace them.

MOVEMENT OF TRAINS

BY H. A. DALBY

Upwardly Inclined Semaphores on the Pennsylvania.

A new system of signals has been installed on the Pennsylvania Lines. For a year or more the signal engineers have been working on a plan to overcome the objectionable features of present practices with the result that their recommendations have been put into effect on twelve miles of double track line running west from Philadelphia on the P. W. & B. Division. No road in the country is better fitted to effect improvements in signaling methods, as it has probably used all kinds and colors of signals for almost half a century. To the Pennsylvania, so we are told, belongs the honor of introducing the "space interval" method of operating trains, the result of which is the block system, now universally recognized as the only safe means of preventing rear end collisions, and, by extending its use to single track lines, providing a safeguard against head end collisions also.

History records that about the year 1863 the block system was introduced between Philadelphia and Trenton, N. J., a little later extended northward to New Brunswick and finally to Jersey City. This was followed by its introduction on other parts of the system and it is safe to say that the Pennsylvania has always been in the front rank in the matter of signal equipment.

Doubtless there are many still living who can remember the old style of box signal with a white partition in the middle and a red flag on a frame to slide up and down by means of a rope in the hand of the operator, the flag being hidden in the upper part of the box so that the partition would display white or drop down in front of the glass, showing red to an approaching train. The appearance of the flag or light was not unlike that of the banjo signal now so familiar, though, of course, the case and the manner of operation were entirely different.

The new system retains old forms and practices so far as they are satisfactory and efficient, but some features are entirely new and novel. The movable semaphore arm has proven itself to be the best form, as it can be most clearly seen at the greatest distance; so it is retained as the standard. There is a radical change, however, in the movement of the arm, it being raised above the horizontal to denote caution or clear instead of lowered in the usual way. For this

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reason it is termed the "Upper-Quadrant" semaphore. As in present systems, the arm points to the right of the post as seen from the train it is intended to govern.

The principal advantage claimed for the upper movement is that in stormy weather, when the arm becomes coated with snow and ice, producing a tendency to weigh it down, it will be attracted toward the danger position rather than toward the clear. With the semaphore as ordinarily used there must be a strong

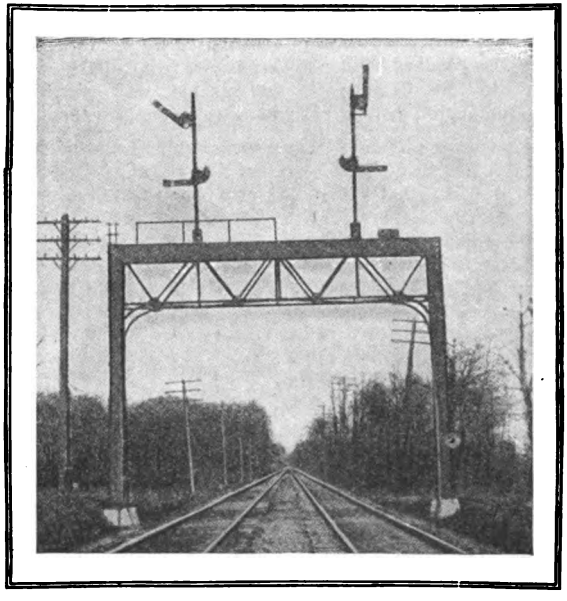

Fig. 1. Three-Position Upper Quadrant Semaphores

counterbalance on the side opposite the arm, in order that the force of gravity may carry it to the danger position. This requires a heavy weight which necessitates considerable force to move it from one position to the other. It is expected that the new form will thus prove an improvement over the old. It is also possible that the arm, if located at the top of the post, will be more plainly seen when in the vertical position.

The system is founded on certain principles which are strictly adhered to under all conditions, and when these principles are learned it will be comparatively easy to apply them so that the meaning of each signal or set of signals will be readily determined. One of these principles is that signals are always in pairs, one above the other on the same post. This enables the engineman to see them in relation to each other. At night, should only one light appear, he will know that the other is extinguished, and, as in the usual practice, this constitutes a "stop" signal. On each post there must be two signals, and never more than two, unless in a few instances there may be an additional one for a slow or unimportant route, but this is always considerably lower than the others, has a shorter arm and a smaller light. For main line movements the principle of two and only two signals on each post is practically unchangeable. If only one signal is required at the point the one not in use is fixed in the horizontal position and at night a red light is always shown. This arrangement may find objectors on the ground of inconsistency in allowing a train to pass a red signal. Such an objection may be correct from a standpoint of logic, but it is not averse to this system, which has its own principles and adheres to them.

The plan of having not more than two signals on a post is intended to be much more simple for the engineman, particularly on a fast train, than the present

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practice of allowing an unlimited number of arms, sometimes as many as five, in which case the memory may be taxed to keep in mind the meaning of each, and there is the possibility of overlooking the fact in case one of the lights should fail. Where there are a number of arms on one post practice differs on different roads, and possibly at different stations on the same road as to the routes governed by each. In some cases the top arm leads to the right and the others to the right or left, in the order in which the various switches are reached. On other roads the top arm may govern the main line or the route of the greatest importance, while the others indicate other routes in the order of their importance. In other cases possibly the top arm indicates permission to run at full speed, while the others refer to routes requiring reduced speed. The last interpretation comes nearest to the principle employed in this system. Indication of speed is made the governing factor rather than indication of route. Of course each arm indicates that the switches are set and the track clear for its own particular route, but the indication of each arm on the post is determined by the fact that the train may or may not run at full speed. The top arm is uniformly used to govern the high speed route and the lower arm the route of reduced or moderate speed. This is easy to remember, and, as has been said, in the majority of cases only two indications are used. Should it be necessary to indicate a slow speed route, a third arm, shorter and very much lower on the post, with a light not nearly so brilliant at night, is used for that purpose. The lowest arm may even be placed on a separate post, which would make it still more distinctive.

It is intended that the high speed indication be used at points where there is an absolutely clear main line without crossovers or other obstruction to the highest permissible speed. The second arm is used when a moderate speed is required, such as through a crossover or where a speed of forty to fifty miles per hour may be maintained. The lowest arm, where it is employed, governs the use of a side track, a crossover of short radius or movement against the current of traffic, or other conditions under which a train must be able to stop within the range of vision.

At some points there is use for but one signal, but the principle of two arms on the post is strictly adhered to. In such cases one of the arms is fixed in the horizontal position, and at night a red light is always displayed in connection with that arm. If a high speed signal is required the lower arm is stationary and the top one used for the indications, and if a moderate speed signal the method is reversed. In either case there is no tax upon the memory of the engineman as to what condition that particular signal is intended to indicate. He is governed at all signals by the same unvarying principle. If both arms are horizontal they mean stop; if the upper arm is cleared he may proceed at full speed, and if the lower arm, at reduced or moderate speed.

The above described principles apply to all signals, but with the new system a problem is faced which has entered into the practice on many roads, that of having some signals which must be obeyed absolutely if in the "stop" position, the train being required to wait until the signal is cleared before it can proceed, while other signals govern points where it is proper and permissible, after waiting a short time (varying from one to three minutes), to proceed with caution, even though the signal be not changed. The former class of signals are usually used in manual blocking, interlocking signals in large yards, at drawbridges and such points as require absolute protection. The same is true of train order signals. Such signals should never be passed while in the stop position, while the latter class applies chiefly to automatic block signals. On roads where both classes are used and where signals are all of the same form and appearance the situation has been confusing if indeed no worse. An attempt has been made to differentiate between them by making the arms of a slightly different shape, but this difference can only be observed in daytime, the appearance at night being the same, which calls for knowledge of the engineman as to the character of each. The problem has been solved in this system by the relative position of the two arms and lights on the post, and is illustrated in Figs. 2 and 3. It will be seen that in Fig. 2 the arms and lights of both semaphores (and in this case the lowest also) are entirely on the right side of the post, while in Fig. 3 the second, or moderate speed, arm projects to the left of the post, and that the light is on the left instead

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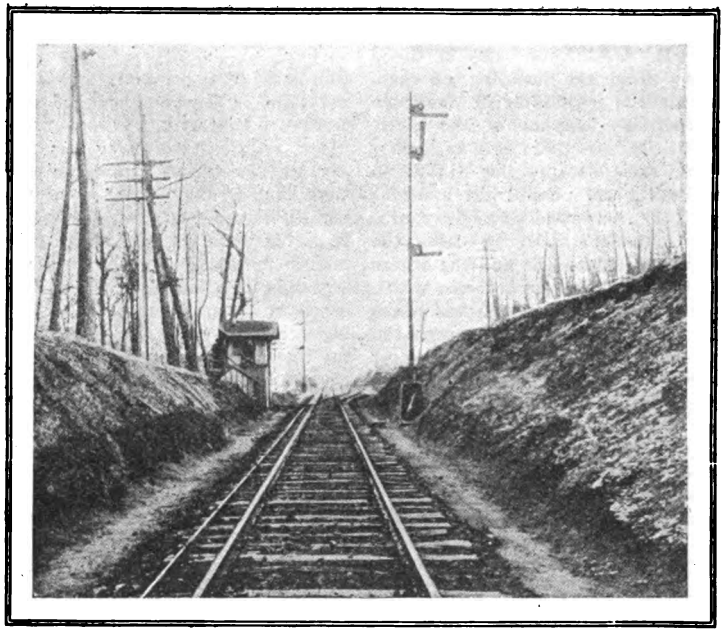

Fig. 2. Stop and Stay Signals

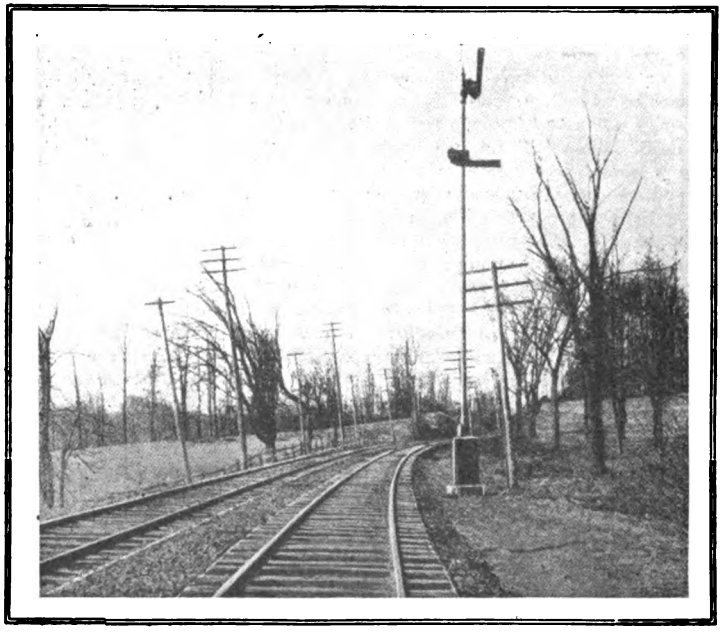

Fig. 3. Stop, Wait-time and Proceed Signals

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of the right of the post. Fig. 1 also illustrates the second class of signals. By this arrangement the lower arm is made to appear shorter than the upper, and at night the light is perceptibly to the left of the vertical as compared with the upper light. These are "staggered" signals, so called, meaning that the lights are out of the vertical in their arrangement on the post. It is claimed that this variation is quite marked, and that the two classes of signals can be readily distinguished. The signals which are placed vertically and must be absolutely obeyed are called "stop and stay" signals, while those which are staggered and may be passed after a certain time if in the stop position are called "stop, wait-time and proceed" signals.

The present colors for night signals are red for stop, corresponding to the horizontal position of the blade, green for caution, with the blade inclined upward at an angle of forty-five degrees, and white for proceed, when the blade is raised to the vertical position, as shown in the illustrations. It is expected, however, that white and green will be replaced by what is now widely accepted as the better practice, green for clear and yellow for caution. White is objectionable as a clear signal for the reason that should a red or green glass be broken it would expose a white light, which would indicate proceed, although the signal might be in the stop position. Several accidents have occurred on different roads in this way, and it is probable that green will eventually supplant white as a proceed signal. Another objection to white is that it is too common and is seen in numerous places other than signals.

In this system there are a number of the best appliances known to modern signaling, the object being to provide a system which will be as safe as human skill can make it. The interlocking home signals are semi-automatic in that they go to the danger position after the train passes whether the operator moves his lever or not. Before the signal can be cleared again he must return his lever to the stop position or, in other words, must follow the automatic change of the signal. This locks his machine so that it can only be unlocked and the signal again cleared by the action of the operator at the next signal in advance or, if not interlocked with another signal, the train must pass over that portion of the track which is electrically equipped for the purpose of keeping the signal at stop when it is occupied by a train. This prevents a train following another past the signal if the operator should forget to return it to the stop position after the passage of the first train.

Another safeguard is an equipment of the track known as "approach locking." This is in connection with manual operated signals and is an arrangement whereby when a route has been set up it cannot be changed if a train is approaching within the distance which is so equipped. This prevents an error which has sometimes occurred, that of throwing a signal to the stop position when a train is so near as to make it impossible for the signal to be obeyed, or to change the switches in such a way as to make a collision or derailment possible.

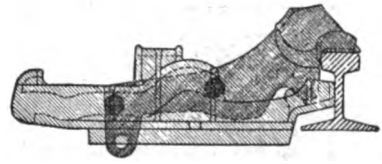

Fig. 4. Lifting Derail set for Derailing

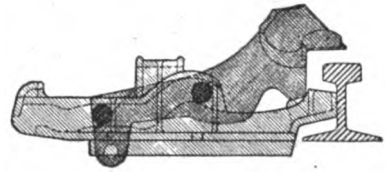

Fig. 5. Derail Block leaving seat

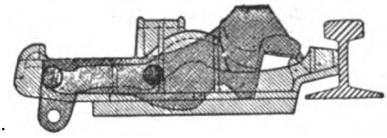

Fig. 6. Lifting Derail clear of track

Another principle of the system that every signal which may indicate stop is provided with a distant signal to warn an approaching train when it is in that position. This makes it possible for a train to actually stop before reaching a stop signal, a condition that is not always possible where there is no distant signal. This lack is especially noticeable in foggy weather or in places where the stop signal cannot be seen for a long distance.

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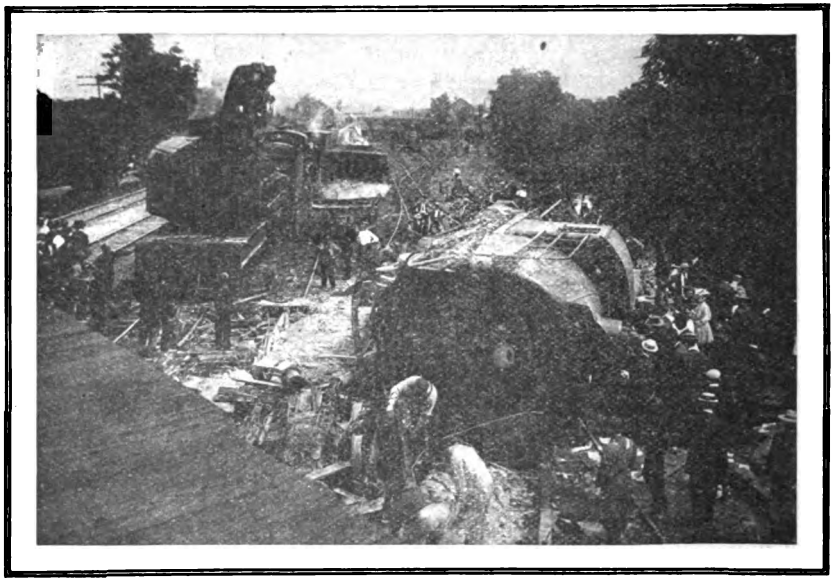
All crossovers between main line tracks are equipped with detector bars and these, together with the switches, are operated by a ground lever located in the middle of the crossover so that it is impossible to close the switches and set the main line signals at clear if there is any part of an engine on the crossover.

All sidings adjoining the main line are equipped with the Hayes derail, it being connected with the main line switch. This style of derail has many advantages over the kind in which the rail is opened. It consists of a movable block which sets on the top of the rail when the switch is closed and slides away at the side when it is opened. Its movement is well illustrated in Figs. 4, 5 and 6.



WRECK IN SAYRE, PA., YARDS OF THE LEHIGH VALLEY RAILROAD, JULY 28, 1907. ENGINEER WAS FAST UNDER WRECKED ENGINE FOR TWO HOURS BEFORE HE WAS RELEASED

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Questions and Answers

Locomotive Running and Repairs.

Answers by F. P. Roesch.

540. Locomotive Mileage.—"How many miles should a locomotive make before being taken into the shop for general repairs?"—*G. O. F.*

Answer—Depends entirely on the type of locomotive and the service. An eight-wheel engine will make more mileage than a consolidation. An engine with large drivers will make more than one with small drivers. The average mileage of a modern consolidation engine is about 65,000 to 70,000 miles, while that of a passenger engine is from 90,000 to 120,000 miles. Instances have been recorded where locomotives made over 200,000 miles between shoppings, while there are many instances where freight engines make but 30,000 miles between shoppings.

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541. Rod and Shay Locomotives.—"Please describe the difference between a rod locomotive and a Shay. Why is it called a Shay?"—*G. O. F.*

Answer—A rod locomotive is one where the power is transmitted from the cylinders to the drivers directly by means of main rods without the intervention of gearing. A Shay locomotive has three upright cylinders bolted to the side of the boiler just ahead of the firebox, the main rods connecting to and driving a cranked shaft on which are keyed spur bevel gears which in turn engage with bevel gears bolted to the wheels, all wheels—both engine and tender—being used as driving wheels, thus utilizing all of the adhesive weight of both engine and tender. In the Shay engine speed is sacrificed for power. It is so called from its inventor.

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542. Pintsch Gas.—"What is Pintsch gas made of? In what way does it differ from other gas, as I notice it requires less oxygen to burn it than other gas?"—*G. O. F.*

Answer—Pintsch gas is made of crude petroleum, and is more thoroughly washed and purified than the ordinary commercial gas which is usually manufactured from coal. Pintsch gas is also compressed to from 12 to 15 atmospheres (176.4 to 220.5 pounds), and during compression gives up much of the hydrocarbons with which all ordinary gases are heavily charged. Being therefore an almost clear gas, less oxygen is required for perfect combustion.

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543. Per Cent. of Grade.—"In specifying elevation of grades the term per cent. is generally used. Now, in speaking of a 3 per cent. or a 9 per cent. grade, what is referred to? Is it to the mile? What is the steepest grade an ordinary locomotive can climb?"—*G. O. F.*

Answer—Yes, in speaking of per cent. of grade it means per mile, that is, the elevation per mile is a certain per cent. of the length of a mile. For instance, a mile is 5,280 feet long; then if the elevation or grade was 3 per cent. it would be—expressed in feet—3 per cent. of 5,280 feet, equal to 158.4 feet rise per mile. A 9 per cent. grade would be 9 per cent. of 5,280 feet, equal to 475.2 feet. The steepest grades over which ordinary locomotives can be operated with any degree of safety are about 6 per cent., unless the grade is short.

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544. Peculiar Action of Locomotive.—"What ailed the locomotive? I. was keying up the main rod. Fireman in cab filling boiler with water. Throttle perfectly steam tight, and closed tight, locked with thumb screw. Engine started off, rolled two car lengths and stopped."—*G. O. F.*

Answer—Am afraid we will have to give it up, but are inclined to believe that the fireman "monkeyed" with the throttle just a little bit. Unless the engine stood on a grade it certainly took steam to move it, and as the throttle was steam tight when closed there was no other way to admit steam to the cylinders except what passed down the oil pipes in case the lubricator steam valve was open, and it is hardly probable that enough steam would be fed to the cylinders from this source to move the engine. Therefore, if the engine was not on a grade, we are inclined to suspect the fireman.

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545. Increase of Lead.—"I have been instructed by several of our men that an engine increased lead running ahead and drawing the lever to the center, and decreased lead running backward and pulling lever toward the center."—*G. E. C.*

Answer—With the Stephenson link the lead is increased as the lever is pulled toward the center, regardless of whether

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the engine is running backward or forward. With the Walschaert gear the lead remains constant, regardless of the position of the lever.

546. Change in Valve Motion.—"Could a piston valve engine having a direct valve motion and an indirect admission be changed to a direct motion and direct admission, and, if so, what positions would the eccentrics have to be placed relative to the crank pins?"—*F. S.*

Answer—In the first place, an engine such as our correspondent mentions, having a direct motion and an indirect admission, must necessarily have inside admission valves, as indirect admission means that the valve is traveling in a direction opposite to the travel of the piston while steam is admitted. This being the case, the eccentrics must follow the crank pins. Now, if we wish to convert this engine into a direct admission valve engine, i. e. with the valve traveling in the same direction as the piston during the beginning of the stroke, it would be necessary to change the position of the eccentrics (if we wish to retain the direct feature of the valve motion) to a point about 90 degrees ahead of its former location, which would throw it ahead of the crank pin. (In speaking of position of eccentrics the go-ahead, or forward, eccentrics only are considered, as the backing eccentrics hold the same relation to the crank pin when engine is backing up). We now have the valve traveling in the same direction as the piston when the piston is beginning its stroke, but as we started with an inside admission piston valve and advanced the eccentric enough to overcome the lap and the lead, we find that instead of opening the forward steam port to the admission of steam we have opened the back port, thus admitting steam behind instead of ahead of the piston, and consequently blocking the engine. Therefore we find that in order to obtain direct admission we must change the valve from an inside to an outside admission type. Here, again, however, we find trouble, as with the valve first in use, viz., the inside admission type, we find that the exhaust and steam passages in the cylinders were cored for this style of valve, and therefore a change in the valve would likewise entail a change in the cylinder passages. Therefore, in answer to our correspondent's question, we can but say that the change he mentions can be made, and that the eccentric would lead the pin, but the change would be impracticable on account of the expense involved.

* * *

The Westinghouse Air Brake.

Answers by F. B. Farmer.

321. Brakes Apply and Release by Feed Valve Action.—"I have something on the air brake and have asked a good many about it, but they can not explain it. We had a 1902 model brake valve with the feed valve and pump governor that are used with the ET equipment. Everything else is the same as is used with the older automatic apparatus. With the engine alone the brakes would apply and release, exhausting through the triple valve. The train pipe hand would go from 110 to 115 pounds and the main reservoir hand from 130 to 135 pounds. The train pipe hand would then drop to 110 pounds, at which times the brakes would apply, and the main reservoir hand would drop to 130 pounds, then both would raise again and the trouble ended. What was the cause of it?"—*H. J. L.*

Answer—The pump governor that is used with the ET equipment, and which is now standard for all, has two air connections to the low-pressure head. With the brake valve referred to (G6) the lower one, which admits air under the diaphragm, is connected to the feed port, the one that carries the main reservoir pressure from the rotary valve, when it is in running position, to the feed valve. Consequently, when the brake valve is in running position there is main reservoir pressure under the diaphragm of the low-pressure governor head, trying to raise it and control the pump. On the upper side the diaphragm is pressed downward by a spring, much lighter than in the high-pressure head, and also by the train pipe air, which is admitted by the upper pipe connection.

The engine referred to was evidently in high-speed service as it carried 110 pounds train pipe pressure, this being regulated by the feed valve. The spring over the low-pressure head diaphragm was set at 20 pounds. This, added to the 110 pounds train pipe pressure, required 130 pounds main reservoir pressure to control the pump. The fault was not in the governor, but this explanation is necessary to understand the complete action described.

The feed valve caused the trouble by not regulating the train pipe pressure accurately. When it opened at 110 pounds it let the train pipe feed up to 115

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pounds before closing. This 115 pounds and the 20-pounds spring over the low-pressure governor head diaphragm, required the main reservoir pressure to increase to 135 pounds before the governor could control the pump. The feed valve then remained shut until the train pipe had leaked down to 110 pounds, and which caused the brakes to apply. The pump was controlled by the governor until main reservoir leakage and the feed valve opening reduced the main reservoir pressure to 130 pounds, equal to 110 pounds train pipe pressure and the 20-pound spring. When the feed valve again allowed the train pipe pressure to increase to 115 pounds the brakes released.

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322. Bad Gasket Affecting Brake Valve Operation.—"Is there any possible way for a crumpled, cracked and burned-out body gasket in a D5 or F6 brake valve preventing the brakes from being applied by the brake valve?"—*L. D. S.*

Answer—If the leather gasket referred to has a fault which connects the main reservoir pressure with chamber *D*, the equalizing piston, the service action will be slow or entirely prevented, depending on the size of the leak across the gasket. If the fault is on the opposite side of the brake valve the equalizing reservoir would be connected with the brake pipe pressure and if the leak were considerable the only discharge of brake pipe pressure would be that out of the very small preliminary exhaust port, too slow to alone make an application with more than one or two cars.

Neither of these leaks would alone have any effect on emergency position of the brake valve, and even if both existed, something the writer never heard of, this position would apply the brakes just the same.

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323. ET Locomotive Brake Equipment Questions.—"I am writing this to seek some information. We are handling ET equipment here altogether; like it very much, but it is troubled with some defects, for instance: *Brake Applies When Cut Out*: I pump up 70 pounds and 90 pounds, close the cut-out cock underneath automatic brake valve and lap valve. The brake will apply. How can I rectify this?"—*G. E. C.*

Answer—This does not indicate a defect other than brake pipe leakage. The position of the handle of the automatic brake valve would have no effect, whether on lap or in any other position. Closing the double-heading cock (cut-out cock under the brake valve) stops all supply to the brake pipe and the leakage from the latter at once applies the brakes. Lap position of the automatic brake-valve will not prevent brake application at this time because the equalizing valve in the distributing valve cuts off communication between the application chamber and the double-heading pipe as soon as the brake pipe leakage starts brake application. Were this not so no application could be made from the leading locomotive on others in the train.

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324. Excess Pressure Varies.—"Another one is, pump and both brake valves are O. K., but sometimes I will have 70 pounds and 90 pounds, and another time it will be 70 pounds and 75 pounds, or 70 pounds and 110 pounds. Adjusting the adjusting nut on low-pressure head governor makes no difference. Where is the trouble?"—*G. E. C.*

Answer—There is an accumulation of gum around the diaphragm valve of the low or excess pressure governor head or the port below the diaphragm valve is partially closed by gum. The diaphragm valve raises when it should, but the gum will not allow the air to pass to the piston. Cleaning the diaphragm valve, the port beneath it and the vent from this port to the atmosphere will remedy the trouble.

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325. Testing Duplex Governor.—"How do you give a duplex air pump governor a standing test?"—*G. E. C.*

Answer—With the automatic brake valve in running position, let the pump run freely until controlled by the governor and then note the pressures shown by the gauge and particularly how much they vary. With the SF type of governor, the one used with ET equipment, any variation in the feed valve regulation will cause a similar one with the governor when the automatic brake valve is in running, holding or release positions as the feed valve pipe pressure at such times aids the spring above the diaphragm of the excess pressure governor head. If the brake pipe pressure varies, remedy the fault in the feed valve, but if not and the main reservoir pressure varies the defect is as explained in the previous answer.

Next, place the handle of the automatic brake valve in lap position, note if the pump increases its speed promptly, as it should, and then to what maximum it raises the main reservoir pressure.

However, before using lap position the

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handle of the automatic brake valve should be moved from running to release position to note whether the two hands of the duplex gauge come together, as they will if the gauge is right. If the gauge is wrong it must be adjusted before the feed valve and the governor can be set correctly.

This excess pressure (running position) is generally 20 pounds, but some roads use but 15 pounds and others 25 pounds. The adjustment of the high-pressure governor head, which regulates the maximum main reservoir pressure, varies on different roads and on the same road in different service, all the way from 100 pounds to 140 pounds.

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326. Test for Leaky Rotary Valve.—"How do you test for a leaky rotary valve with the ET equipment on a light engine? I mean a standing test."—*G. E. C.*

Answer—Test the same as with the G6 automatic brake valve. That is, having fully charged the engine brake (running position) make a 10-pound reduction, move to lap position and note whether the brake pipe pressure increases. If it does either the rotary valve or the leather gasket in the brake valve is leaking.

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327. Tests for Feed and Reducing Valves.—"How do you test the slide valve feed valve to the independent brake valve; also, the one to the train line?"—*G. E. C.*

Answer—With the engine alone and the handle of the automatic brake valve in running position make a brake pipe leak, by slightly opening the tender angle cock, that will be about equal to the brake pipe leakage with the average train handled. The amount of leakage made can be judged by noting the *increase* in pump speed over that with the angle cock closed. The object is to ascertain what the feed valve will do when supplying a train. Now, observe what brake pipe pressure the feed valve gives, whether this varies and, if so, how much. Two pounds or more variation should require repairs.

Next, make a 10-pound service reduction and release in *running* position, repeating this two or three times and noting the regulation of the feed valve. Then, overcharge the brake pipe by using release position, return to running position and note the regulation of the feed valve after the brake pipe pressure has leaked down to where it is being supplied. As before stated, the variation should not exceed two pounds.

Finally, close the angle cock and note what, if any, increase in brake pipe pressure follows. A slight increase requires no repairs, but one of several pounds usually means that the valve controlling the brake pipe port is leaking, or with the slide valve type, that the piston is too loose a fit. The improved valve has a larger regulating valve and can care for more leakage past the piston.

Where this feed valve has the high and low pressure regulation it should be tested on each, and if either is wrong, the stop lugs should be shifted so as to give the desired pressures when the pin of the adjusting nut strikes them.

Test the reducing valve for the independent brake valve by placing handle of latter in application position and noting the pressure shown on the brake cylinder gauge. If the pressure rises quickly to a greater amount than desired the reducing valve is set too high.

If it rises quickly to the desired amount (45 pounds) and then slowly but steadily increases to about 64 pounds, and the safety valve on the distributing valve commences to blow, thus preventing a farther rise, the reducing valve is leaking or there is a leak either past the double cut-out cock or the equalizing valve of the distributing valve, into the application chamber.

There are two ways to test this farther. One is to loosen a union in the pipe between the feed valve and the independent brake valve so as to cause a greater leak than could be occurring at the reducing valve, release and reapply with the independent brake valve. If the pressure does not increase beyond 45 pounds the feed valve is leaking.

The other test is where the pressure again feeds up too high, indicating one of the other defects mentioned. Release the brakes, place the handle of the independent brake valve in running position, the handle of the automatic brake valve in holding position and then quickly disconnect the double-heading pipe from the distributing valve reservoir. It is the middle one of the three pipes on one side. If there is pressure coming out of the loose end the double cut-out cock is leaking from the brake pipe into this pipe. If it is coming out of the reservoir connection the leak is almost certain to be past the equalizing valve. To make sure, connect the double heading

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pipe, disconnect the application chamber pipe, the lower of the three mentioned before, and see whether pressure escapes from the loose end or from its reservoir connection. From the latter means a leaky equalizing valve, but from the former means one or both of the brake valve rotary valves, a defect the writer has never yet observed.

328. Can Not Carry Excess Pressure.—"Will you please advise me why I can't carry excess pressure with Westinghouse G6 brake valve? I will now give you symptoms of this valve. First, I will say that there is no outside leak as the gauge will often show 30 to 40 pounds pressure 10 and 12 hours after shutting off pump; that is, when not coupled to cars. Brake will stay set when valve is left on lap, showing that the brake valve rotary is not leaking. In fact, it has just been faced and ground. All ports of feed valve, such as slide valve, piston, regulating valve, springs and bushings have been thoroughly cleaned with kerosene and slightly oiled; also, the diaphragm. Have put in new piston, slide valve and regulating springs, though the old ones were standard length. Still the trouble is the same. Regulating valve does not leak. Have proved that by plugging up small port leading from diaphragm to train line and then pumping up 100 pounds pressure with brake valve in running position, the diaphragm being removed. A leak could easily be detected in this way, and I am sure it does not leak. Neither does its cap nut nor piston cap nut leak. Piston is free in bushing and slide valve is also free on piston stem; does not bind in any way. Slide valve and seat have been tested with black lead. Neither of them are cut and could not leak. Am sure spring holds valve to seat. I have also tested the two horizontal ports in brake valve body to see if there was a sand hole in casting which would allow air to flow into train line after slide valve was closed. I did this by pumping up full pressure, lapping brake valve, closing cut-out cock, detaching feed valve and plugging up port leading to train line. Equalizing reservoir air would then leak past discharge valve packing ring slowly into train line, which would show a leak of that kind as it would flow out of port leading to rotary. The black pointer will remain stationary after lapping valve at any point on gauge. I might also state that the diaphragm vent hole is open. There can be no leak in lower gasket to connecting main reservoir pressure with small reservoir, as that would release the brakes on engine, and gauge would also show this. Air gauge and pipes are open, too, and found to be all right. Eighty and 100 pounds are the pressures we carry, as we have here as high as 7 per cent. grades.

"So far I have had no trouble releasing the brakes on a train of six cars, but have had to make a heavier reduction at times than otherwise necessary, in order to release. This trouble began suddenly. I hope that you may locate it, as it will be highly appreciated by one who is far back in the mountains and has his own air brake equipment to keep in order."—*J. W. S.*

Answer—Your tests have been very thorough and show an earnest and intelligent effort to locate the fault. Please test farther as follows: Open the driver and tender brake "bleeders" and have the automatic brake valve in service position until no pressure is left except in the main reservoir, air signal not considered. Then remove the feed valve spring box, take out the diaphragm, place handle of automatic brake valve in running position, close the double-heading cock under the brake valve and note whether any air escapes past the regulating valve or out of the brake pipe port near it. The first, as you know, tests the tightness of the regulating valve. The other tests for any and all leakage into the brake pipe, whether in the brake valve, the feed valve or the gasket between them. If neither place shows leakage the cause of the trouble is doubtless due to the diaphragm end of the regulating valve stem being too long, as could result from grinding in the valve. With the valve shut the end of its stem should be in line with the shoulder that the diaphragm is clamped against by its ring and the spring box. A straight edge as long as the diameter of the diaphragm will test this.

See that the diaphragm spindle and the large regulating spring do not bind. Also note whether four short lugs partially encircle the regulating valve opening. They arrest the inward movement of the diaphragm. They are made by turning up a flange or bead around the regulating valve passage and then cutting grooves across the bead. Without the grooves the diaphragm might seal on the bead and cause the trouble you describe.

With the brake valve handle on lap, push the regulating valve open and note whether it returns freely to its seat, as it should.

329. ET Double Heading.—"Will you please explain in the B. of L. F. and E. Magazine now the engineman on second engine would carry independent brake valve after reapplying engine and tender brake, so that head engineman could release them when he released train brake, and how I can help him by moving automatic

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brake valve handle off of lap so I can hold them on second engine without hindering him from releasing when he wants to release? I can't understand. We have to carry automatic on lap with valve cut out at cut-out under brake valve and in that position they look as if there was a direct opening from the distributing valve. Please explain through the columns of the Magazine."—*C. R. F.*

Answer—With the handle of the automatic brake valve on lap, the double cut-out cock closed and brakes released from the head locomotive there is a direct opening from the application chamber, which governs the brake application on engine and tender, under the equalizing slide valve of the distributing valve, and through the double-heading pipe, double cut-out cock and automatic brake valve to the atmosphere. An automatic brake application, whether made from the head locomotive or from any other part of the train will cause the equalizing slide valve to cut off the connection between the application chamber and the atmosphere and thereby hold in the application chamber the air which it and the graduating valve then admit.

Moving the handle of the automatic brake valve to running position and leaving the handle of the independent brake valve in the same position will, by the first, close the double-heading pipe, and by both brake valves and the application chamber pipe, make a direct opening from the application chamber to the atmosphere, thus preventing any application of the brakes on this locomotive. Moving the handle of the automatic brake valve to holding position will prevent the locomotive brakes from being released by the head engineer, but he can apply them. With the handle of the automatic brake valve in the same position the brakes on the second engine can be applied and released by the independent brake valve and irrespective of whether the train brakes are applied or released.

As a rule it is better with other than the head locomotive, to carry the automatic brake valve on lap and the independent brake valve in running position, the double-heading cock being cut out.

* * *

Train Rules and Train Practice.

Answers by H. A. Dalby.

236. Time-Table Question.—"On Sunday, September 15th, at 12:01 a. m. we had a new time-table come into effect, and I was on No. 958, a second class train, north bound, when the change took place. The stations are represented from A to R and it is all single track. On the old time-table we were due to leave A at 6 p. m. and on the new at 12:15 p. m., 5 hours and 45 minutes earlier. We left on time on Saturday, and when passing C the new time-table took effect which made us 5 hours and 45 minutes late, and we kept on going as the train of Saturday. We had a positive meeting point by rules with a south bound train at F by the old time-table and at L by the new. The dispatcher annulled the schedule of the south bound train and ran it extra and gave us a meet with it. When we arrived at U we received an order to run extra U to R, which we did.

"Now, the conductor claims we were dead after 12:01 a. m. Sunday and that we should have stopped at C. and called for orders and also claims dispatcher said so, but I have had no official ruling and still claim that we were right according to the new Standard Code. Please give us your opinion.—*Anxious.*

Answer—You were certainly right according to either the old or new Standard Code. It happens that the road from which the question comes (the N. Y., N. H. & H.) uses the old Standard Code, and the rule relative to change of time-tables is rule 4 (B), which states that "a train of the preceding time-table shall retain its train orders and take the schedule of the train of the same number on the new time-table." It was, therefore, clearly the duty of No. 958 to proceed after 12:01 a. m., being governed by the times and terms of the schedule of the corresponding number.

Note the reference to the positive meeting point by rule with the south bound train. On this road there is no such thing as "right by direction," trains of the same class being required by rule to wait indefinitely for each other at the meeting point shown on the time-table. In this case the meeting point with the south bound train was changed by the new time-table and after it takes effect the new meeting point is often in effect and the train must be governed accordingly.

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237. Time Orders.—"This is a train order issued to a first and second class train on single track. First class is eastward and eastward trains are superior by direction. From A to B is double track and from B to C is single track. No. 10, first class, is at A and is running 20 minutes late A to B, making it due out of A at 9:30. No. 23, second class, is at C and gets this order: 'No. 10 will run 20 minutes late A to B and 15 minutes late B to C.' I would like to know just what time No. 23 must clear No. 10

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at B, or can No. 23 leave C at all and run in the opposite direction? How or where can No. 10 make up 5 minutes lost time between A and C? Does not that order establish her running time? If a second section of a train is reported to run 2 hours and 30 minutes late, or behind the first section, from A to H, she cannot arrive at H earlier than 2 hours and 30 minutes behind the first. Is not that making her running time over the division? This is why I want to know how or where a train can make up 5 minutes lost time from A to C."—*H. S.*

Answer—No. 10 must leave A 20 minutes late and must leave B 15 minutes late. This gives them a chance to make up 5 minutes between the time they leave A and the time they leave B. No. 23 may, of course, be governed by the earliest time No. 10 can leave B, which is 15 minutes behind its schedule. As to the questions whether the order establishes her running time, it does if you care to express it that way. It establishes the time the train may leave A and B as above indicated.

As to the example of a second section running 2 hours and 30 minutes late or behind the first section from A to H, orders are never given for a second section to run a certain time behind the first. They are ordered to run so much late, which is that much behind the schedule time. The first section has nothing to do with it. We do not see the connection between the two questions. In either case the train is instructed as to what time it may leave each station concerned in the order.

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238. Return Running Orders.—"An engine has an order to run extra A to C and return. It gets to B, which is not a telegraph office, and breaks down. Can they return to A without going to C or will they have to flag back to A?"—*F. S.*

Answer—The order must be fulfilled literally. The train must run from A to C and then return to A. It must also respect the telegraph office at C as it would at any other station, reporting for orders before it leaves there. It would not be proper, for instance, to simply go to the edge of the yard and then start back. If the dispatcher wished to run another extra from A to C he would be justified in sending the order to this extra at C and expect that it would be held at that station.

Railway Club Proceedings

*The Stotts Automatic Electric Block Signal System.**

To the Iowa Railway Club, Gentlemen:

I sincerely regret that I am unable to take advantage of this opportunity of addressing you personally. I hope that I may at some future time enjoy that privilege.

It will be my object in this paper to describe very briefly the present conditions and necessities of block signal practice in this country and to describe the application of the electric block signal which I am about to place upon the market. The increased number of accidents and fatalities resulting from higher speeds and more frequent trains is calling the attention of the people and the government to the necessity for better protection of trains and greater facilities for handling the increased business of railroads. The recent action of congress and investigations by the Interstate Commerce Commission are sure to result in many advantages for the block signal systems in general. Many discussions by experienced signal engineers and railroad men are being published and the necessities and desires of railroads are becoming known. One of the grave necessities of the times is the growing need of a new standard position for the semaphore proceed signal. The sixty-degree position, which is the standard with most semaphores in use today, has many faults which would be overcome by the adoption of the vertical position of the blade to indicate clear or proceed. The primary principle of automatic semaphore signaling requires the arm to gravitate to the danger position and it is obvious that the vertical arm is better adapted to this principle than an arm which must be heavily counterweighted to accomplish its

* Paper by E. S. Stotts.

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function. The heavy counterweight adds to expense of manufacture and of maintenance and to the danger of giving false indications because of arms or roundels broken by the fall of the countereight.

To save unnecessary weight the roundels are usually placed on the opposite side of the poles from the blade and the blade made as short as possible, which tends to partially neutralize the indication and is especially so when the arm is in the downward position.

The increased force required to operate the heavy counterweight and to provide against possible accumulation of snow and sleet adds greatly to the expense of maintaining batteries and mechanisms.

On a large majority of the systems of this country the method of handling trains by telegraphic order is being abandoned as inefficient for the handling of the increased traffic. This system stood the test of many years service and its greatest fault was the fallibility of man. But it is also a very expensive system and not adequate to care for the traffic of our very busy railroads.

Many systems of signaling have been devised to expedite the handling of traffic and to endeavor to reduce the great number of fatal accidents constantly increasing.

There are block systems, manual and automatic, which have been used with marked success in reducing accidents and increasing the capacity of roads. Many instances show, however, that the manual block is much more expensive to maintain than the automatic, and that men will still forget a part of their duties sometimes, while the automatic system has been proven to be very reliable when properly installed and maintained and far less expensive.

Many of the signal systems on the market today are well adapted to the handling of traffic upon double track roads, and even with double tracks there are times of the day and seasons of the year when the traffic is excessively large in one direction and one track is almost completely idle. What an added advantage if the dispatcher could send a few of his trains on the second track and be sure of their safety from head-on collisions.

There are many places where double track may be a necessity, but there are many localities where the increase of station facilities and the addition of block signals will handle the traffic easily for many years to come on single track railroads.

The majority of our lines in this country are operated on single track and the double tracking of a long, busy line is a colossal undertaking. It is, therefore, our duty to provide means of increasing the capacity of single lines and at the same time to reduce the liability of accidents.

There is now in use upon many double track roads in the East a system of signaling wherein the block or distance between stations is divided into several intermediate sections. Trains run upon the right hand track and are protected in the rear by a danger board at the end of the intermediate section occupied, and also by a caution board at the end of the next intermediate section to the rear. Thus the engineer of any following train is notified when he is within two sections of a train ahead.

But should one track become inoperative then the remaining track must be used for trains in both directions and no signals are provided for movements in the direction opposite of normal. Again the traffic in one direction may be at its heaviest point and the left hand track lying idle. These conditions are often met with, but there are no signals to be operated by a train in the direction opposite of normal. The Stotts automatic block signal system provides this very protection for single track roads, or when used on double track it provides separate signals for trains running in either direction. In other words, the Stotts system will operate home and distant signals in rear of trains in either direction upon single track and just as many intermediate sections to the block as may be desired.

The home and distant signals which are operated in the rear of a train in one direction are upon the right hand side of the track, while the signals operated by trains in the opposite direction are upon the left hand side of the track, and all signals on the left of the track, excepting the danger signals at the opposite end of the block, are instantly locked from operation when the first train enters the block and remain so until the train has cleared the block.

The writer understands that this contention may be received with doubt and that the system is entirely new to practical railroad men. It would therefore be well to describe in detail the equip-

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ment and operation of signals on a regular block equipped with the Stotts system.

We will consider, for illustration of the Stotts system, a regular block between two stations, subdivided into several intermediate sections and a preliminary section at each end of the block. It is presumed that the preliminary sections will approximate three-quarters of a mile in length, and the intermediate sections two or more miles in length.

Beginning at the station on the right, for illustration, I will describe the number and use of such signals as are provided, after which the operation of same will be described.

Proceeding into the block we find at the conjunction of the first intermediate section with the preliminary section that two signals are provided on the right hand side of the track. One signal, preferably the upper signal, is a stop or danger board, which is operated by trains from the opposite direction. At the station there is also provided a stop or danger board which operates in conjunction with the danger board described above, both boards being released by the same operation and cleared together. All signals are automatically operated by the movement of trains within the block. The lower signal is a permissive or caution board, operated in the rear of trains moving into the block.

At the opposite end of the block where the last intermediate section joins the preliminary section at that end, a set of two signals, the duplicate of the above two, are situated on the left of the track or opposite side from the first two described.

At the dividing point between each intermediate section is placed upon each side of the track a pole with two signals, one a danger and one a caution board. Those upon the right hand side of the track are operated by trains moving into the block and those upon the left hand side of the track operated by trains from the opposite direction.

Thus it is seen that there is a complete set of signals on one side of the track operated by a train in one direction, and another complete set of signals on the other side of the track operated by trains moving in the opposite direction.

The operation of the signals is best described by carrying a train through the block and describing its protection against opposing and following movements.

As the train leaves station "A" and clears the yard it crosses the insulated joints into the preliminary section. At this instant the danger signal on the left hand side of the track at the opposite end of the block and its associate at the station "B" are released and will fall to danger. In falling to danger the signal closes a circuit which locks in their normal positions all other signals on the left of the track and also locks in the clear position the danger arm at the station just left and its associate danger signal at the end of the first preliminary.

Thus when a train enters the preliminary section it sets at danger two stop boards at the opposite end of the block against trains approaching the same block from the other end and also locks all signals which are normally operated by trains entering the block from the other end.

Our train is now protected against head-on collisions. When our train runs to the end of the preliminary it passes the two signals on the right of the track at clear, but the instant that our train crosses the insulated joints into the first intermediate section, then the caution arm at that point falls to danger and remains at danger to protect our train in the rear until we have passed out of the second intermediate section into the third. As we passed from the first into the second section we set at danger the red board on the right of the track at that point, which remains a danger until we clear the second section, thus we are protected by a distant permissive and a danger signal in the rear and by the danger signals first set in front.

As we enter the next section the danger signal at that point is released and set at danger and at the same time the caution board at the rear of section 2 is set, while the two signals which guarded us through the last section are cleared as we leave section 3.

Similar operations take place at each point of division through the block. The last two boards are set in the rear, remaining at danger until the train passes through the preliminary and passes out of the block entirely, when the first two signals set and the last two are all cleared at the same time.

The operation of signals by a train in the opposite direction is exactly the same except that the opposite signals are oper-

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ated. The train being guarded always by two red or danger boards in front and a caution and danger board in the rear.

It will also be noticed that the front protection, a red board on the left hand side of the track, indicates to any approaching movement that a train is coming toward it. Also that the caution board in the rear on the right side of the track indicates that a train is going through the block. These two different indications make it possible to tell the direction of travel of a train within the block, a fact which is true of no other signal system.

The Stotts system can also be applied as permissive protection for blocks with or without the intermediate sections and also as positive or absolute block, a good deal the same as systems now in use except that the Stotts signal indicates the direction of the movements.

This system is also applicable to double track roads, and when it becomes necessary to use only one track or to send trains in one direction on both tracks, the double feature of the Stotts system becomes of immense value. The system would properly be installed on double tracks just as though each track were a separate railroad.

In conclusion I will say that the applications of the Stotts system have been but meagerly described in the preceding pages and that any description would be inadequate to describe the principle of this system, because of its novelty, without the use of a model to actually demonstrate the condition and operations of the signals in the protection of trains.

I hope that some time in the future the opportunity will present itself when each one present will be able to examine the merits of the contentions herein contained.

PRESIDENT WENTWORTH — There is probably nothing that is being given more thought or attention by operating officials than some system that will give practically absolute protection to all train movements. From genetlemen with whom I have conversed as regards this, it seems to me, even if you apply the usual liberal discount to the statements of inventors, that there is a great deal of merit in Mr. Stotts' device.

There is a great field for something of this kind. I am told that this system is very reasonable as regards initial expense and operation as compared with the old systems. I am sorry that when I was in Omaha a month ago I did not take time to look over the working model. Mr. Bentley, how does this appeal to you from what you can gather from the paper and in looking at the diagrams?

MR. BENTLEY—Mr. President and Gentlemen: You remember we discussed that some little time ago and I told you then there were so many discoveries coming up and that in the near future we would perhaps approve of some. This demonstrates to me that we are coming to that point. I should judge from the diagram and what he claims for it, I can't see but what that will overcome all the difficulties and prevent collisions, especially if we can use it on double track with perfect safety. That at the present time is not permissible on account of the danger that is involved. If Mr. Stotts has got it as perfect as he states there it will be a grand thing.—May 10, 1907, meeting, Iowa Railway Club.

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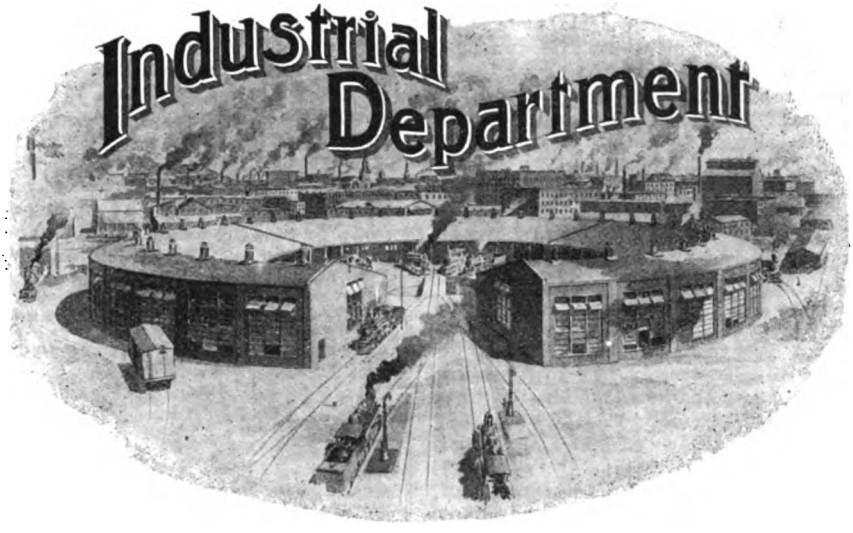

DISCUSSION OF CURRENT TOPICS

President Mitchell's Retirement.

John Mitchell, who, since 1898, has been president of the United Mine Workers of America, has announced that he will not be a candidate to succeed himself in that office at the coming election to be held by that organization during the month of December next.

The United Mine Workers of America elects its national officers by a referendum vote, and its laws require that all nominations reach the headquarters in Indianapolis by November 5th of each year. With a view to giving the members timely notice that he would not be a candidate, he issued the following announcement, which appears in the United Mine Workers' Journal of October 10th, the official publication of the organization:

Indianapolis, Ind., October 7, 1907.

To the Officers and Members of the U. M. W. of A.:

Greeting—Inasmuch as notices calling for nominations are being sent out from the office of the secretary, and in order that all local unions and members thereof may be in position to express their choice for the office of president, I herewith announce that I shall not be a candidate for the presidency of your organization.

I am prompted to arrive at this decision because I believe that I am no longer well enough to give your interests the consideration their importance demands.

I shall explain in greater detail in my annual report to our coming convention the causes which impel me to give up the high office to which you have elected me for so many years.

I thank you for the confidence you have reposed in me and I beg you to believe that the advancement of my craft has been my highest ambition.

JOHN MITCHELL,
President U. M. W. of A.

President Mitchell has been in bad health for practically two years, his trouble being due to an injury he received while lifting a car when he was working in the mines. During the month of May, 1907, he underwent an operation for strangulated hernia, from the effects of which he did not fully recover, his condition necessitating a second operation for the same trouble, and in addition thereto, one for appendicitis, both of which he underwent at St. Mary's Hospital, LaSalle, Ill., on October 14th last. The operations were successful and his condition, as the Magazine goes to press, is as favorable as can be expected.

The work and strain incident to the

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performance of his arduous and responsible duties, has tended to materially weaken his system, which fact, his surgeons state, will somewhat retard his complete recovery.

President Mitchell has been a wise, conservative, conscientious and capable official. Under his leadership the United Mine Workers of America has developed from a few scattered locals aggregating 43,000 members, into a thoroughly organized and harmonious army of 375,000 wage workers.

When he assumed the leadership of the miners' organization President Mitchell was a poor man, and while still poor financially, is wealthy in the possession of a spotless character and in the high esteem in which he is held by the public in general, and members of organized labor in particular. What little he has been able to accumulate—a matter of about two thousand dollars—was swept away in the Devlin bank failure at Spring Valley, Ill., a little over two years ago.

With the one great object of his life's effort in view, Mitchell, a poor man, remained poor that he might prosecute the work he had set out to accomplish, viz., the emancipation of his fellow miners from the deplorable condition of industrial oppression which as a worker in their ranks he shared with them.

Many were the temptations through which it was sought to induce him to abandon the leadership of the great industrial army that has been so fortunate in having him as its general. Flattering propositions, some of them carrying offers of $8,000.00 and $10,000.00 per year in salary, have been rejected by him, and it is well known that at times during great strike emergencies, when one word from his lips would have caused such fluctuations in the stock market as to have permitted his acquiring hundreds of thousands of dollars, he scorned to take advantage of such opportunities—a fact which was widely commented on in the public press at the time.

Viewed from the ethical standards of the average prince of finance and captain of industry, such a coup would have been a master stroke, but to Mitchell it would mean only the annihilation of a sterling character, the sacrifice of a fearless manhood and the pollution of a clear conscience.

His superior qualities of leadership have been demonstrated not only in a general way by the extent to which his organization has grown and solidified under his masterly direction of its affairs, but particularly by the tact he has shown in eradicating strife and dissension from amongst its various component factors.

When he went into the anthracite region in 1899, there were represented amongst the men employed in the mines of that territory, twenty-two separate and distinct nationalities and about seventeen different church demonimations.

JOHN MITCHELL
President United Mine Workers of America

These people had brought from Europe all of the bitterness of race prejudice and sectarian animosities. Personal conflict, often developing into serious riots, were characteristic of the relations prevailing between these discordant elements. Under Mitchell's inspiration, however, they were brought to see their folly in its true light, and soon learned to appreciate the extent to which internal factional strife weakened their power and made them an easy prey to the selfishness of those interested in purchasing their labor at as much below its real value as it was possible to secure it.

Today that heterogeneous mass of humanity stands as one grand, compact and united body welded together by the influence of a great mind, the individuals constituting it acquiring, as they could never have done under unorganized conditions, those qualifications that make

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for a high standard of citizenship. While many great achievements stand to the credit of John Mitchell, this is probably the greatest victory of his career.

His magnanimity towards those antagonistic to him personally or otherwise, constitutes one of his most commendable characteristics. Regardless of how bitterly men within or without his organization may have assailed him, questioned his motives or attacked his private character, he has never permitted any feeling of personal resentment to influence his relations with them as it head executive. Whenever the United Mine Workers of America has been interested in a question which any of these men and himself have had to settle, he has met and negotiated with them and rendered his decisions as though totally oblivious to their ever having entertained an unkind thought towards him.

Although deprived of the advantages of proper schooling in his early days, nature seems to have developed him in a college of her own, augmenting his efforts at self-education with high capabilities of acquisition. His manly and dignified bearing, as well as every expression of his face and every line of his figure, reveal him to be a man, especially adapted to the work of leadership, while glowingly from amongst all these characteristics shines the happy influence of a genial disposition and a warm and kindly heart.

Powerful influences have been brought to bear upon President Mitchell in an effort to induce him to reconsider his determination of declining to be a candidate. This, however, he has positively refused to do, stating that his physical condition will no longer permit him to properly perform the duties of the presidency as he feels that he should perform them, and that he will not therefore undertake to fill that position under such conditions.

He has been urged to continue in office and accept a six months' vacation during which to recuperate, but this proposition he has also declined to consider.

It is to be sincerely hoped that President Mitchell may soon recover from his present illness. His doctors express the belief that while he may be slow in recovering, he will eventually be restored to good health. We earnestly trust that in a few months, at most, he will have resumed his place in life's battle—a well man. Whatever course destiny may have mapped out for him through his coming years, the name of John Mitchell will ever be synonymous with honest, able and victorious leadership in the great battle of the wealth-producers against the wrongs and oppression of an unjust economic system.

Much speculation is naturally being indulged in as to who will succeed John Mitchell in the presidency of the United Mine Workers. Vice-President T. L. Lewis and Secretary-Treasurer W. B. Wilson have announced themselves as candidates for the position. The former has been vice-president of that organization since March, 1899, and the latter secretary-treasurer since May, 1900. Bro. Wilson, in addition to being secretary-treasurer of the United Mine Workers, is also a member of Congress from the Fifteenth Congressional District of Pennsylvania, having been elected to that position through the united support of its wage-earners, in November, 1906. He will take his seat during the coming month—December, 1907.

The United Mine Workers' Journal gives the following outline of President Mitchell's career:

John Mitchell was born, of Irish parentage, in Braidwood, Ill., February 4, 1870. He was left an orphan at an early age and when ten years old went to work on a farm. At thirteen he entered the mines at Braceville, Ill. From that time until his twenty-sixth year, he was employed in the mines of Illinois, and of several of the western States, which his desire to see something of the world led him to visit.

In 1891, Bro. Mitchell returned to Illinois, was married to Miss Katherine O'Rourke, and made his home at Spring Valley, where he still resides.

Bro. Mitchell's education, insofar as it can be measured by actual school attendance, was meagre. He, however, read with interest many of the standard works on sociological questions, and by study at night endeavored to overcome this handicap.

In 1885, Bro. Mitchell joined a local assembly of the Knights of Labor, and from this time on his active sympathies were enlisted in behalf of organized labor. He became president of the local assembly of the K. of L., and in 1895 was elected secretary-treasurer of the Northern Illinois Sub-district of the United Mine Workers of America, which organization had been formed in 1890. Subsequently, Bro. Mitchell served on the legislative committee of the Illinois Miners' organization, was elected a member of the state executive board of Illinois, and was finally—during the bituminous coal strike in 1897—appointed to the position

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of national organizer for the United Mine Workers of America. At the Columbus convention, in January, 1898, he was elected national vice-president, and upon the resignation of the national president, was appointed acting president. The following January, at Pittsburg, bro. Mitchell was elected president and has been unanimously elected to that position at each succeeding convention.

Between the years of 1885 and 1897, Bro. Mitchell was at different times president of athletic associations, independent political reform clubs, and various debating and social societies. For two years he served as president of the Spring Valley Board of Education.

His first official connection with the American Federation of Labor was in 1898, when, at the Kansas City convention, he was elected fourth vice-president. Unanimously re-elected to his position in 1899; in 1900, at Louisville, Bro. Mitchell was elected second vice-president and has served in that capacity ever since.

In 1900 began Bro. Mitchell's connection with the National Civic Federation, at the Chicago meeting held in that year, he having been made one of three committeemen to outline plans for the future work of that organization. Bro. Mitchell is now one of the two chairmen of the department of trade agreements.

When Bro. Mitchell was made acting president of the United Mine Workers of America, that organization consisted of 43,000 members; at the Pittsburg convention in 1899 the membership was 54,000; in 1900 it had grown to 91,000; in 1901, to 187,000. There are now something more than 300,000 members in the organization.

Aside from its enormous increase in membership, the achievements of the organization which Bro. Mitchell regards as of the greatest moment are the advance secured by joint conference with the coal operators in 1900, when wages were increased 21 per cent.; the increase of 24 per cent. in wages for anthracite mine workers secured as a result of the successful strikes of 1900 and 1902; the establishment of the eight hour workday in central and western Pennsylvania, Ohio, Indiana, Illinois, Michigan, Iowa, Kentucky, Alabama, Missouri, Kansas, Arkansas, Indian Territory, and portions of Tennessee and West Virginia.

At present Bro. Mitchell is a member of various non-labor organizations for the promotion of the study of social and industrial conditions and for their betterment, viz.: The National Child Labor Committee, the American Academy of Political and Social Economy, the American Civic Federation, American Association for Labor Legislation, The People's Lobby, etc., and he has been appointed labor trustee of the Nobel Peace Prize Fund, which President Roosevelt intends to devote to the promotion of industrial peace.

Another Unconstitutional Law.

The telegraphers' eight-hour law has been declared unconstitutional by Judge Bradley of the Circuit Court at Harrisonville, Mo. The arguments of the railroad attorneys that the law favored one class of workmen more than others will doubtless be interesting. When we are able to secure a copy of the decision of the court, we hope to be able to make more detailed reference to same; until then we have an opinion that certain influences operated more powerfully on the learned (?) judge than considerations of justice or honesty.

American Federation of Labor.

A call has been made for the twenty-seventh annual convention of the American Federation of Labor, to be held in the city of Norfolk, Va., beginning at 10 o'clock, Monday, November 11th, and to continue until the business of the convention has been completed.

These conventions are always intensely interesting in that they are the legislative assemblies of the Federation, which is practically the pivot on which the major portion of organized labor swings. They, in reality, constitute the foremost labor congresses of the civilized world. At the coming convention there will doubtless be some definite action taken looking towards a vigorous political movement on the part of organized labor throughout the United States. It is about time that the wage worker fully understands what the words "universal suffrage" really mean.

The Telegraphers' Defense Fund.

Special attention is directed to Grand Master Hannahan's official circular appearing in the Brotherhood Department of this issue, which embodies an appeal from Mr. Wesley Russell, general secretary-treasurer of the Commercial Telegraphers' Union. Said appeal comes from a division of the great army of organized labor which is at present engaged in a death struggle in defense of the same principles that it is the mission of our Brotherhood to maintain. It is pleading for that help which is essential to its success in combating the haughty tyranny and arrogant oppression of wage earners which so conspicuously charac-

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terizes the attitude of the Western Union and Postal Telegraph Companies towards their employes.

It is to be hoped that every brother who can afford to do so will make a contribution to the telegraphers' defense fund and aid to that extent in advancing the interest and well-being of organized labor in general.

It would be well if our various lodges would select some officer or member to accept and forward contributions to the Grand Secretary and Treasurer. However, it would of course be better that those brothers who can conveniently do so send their contributions to Brother Carter direct and with as little delay as possible, as the great need of the telegrapher's union now is money. In all other particulars their strike is in excellent shape from an organized labor standpoint.

* * *

Strike of Dallas Cotton Mill Operatives.

Owing to the deplorable working conditions obtaining at the Dallas cotton mills, the members of the Textile Workers of America have declared a strike and seek the moral aid of all organized labor throughout the country. In order to break the backbone of the local union, and thereby cripple organization amongst its child slaves, some twenty employes were discharged because of their affiliation with the trades union representative of their craft. Thus was this industrial strife engendered.

This union is composed mostly of women and children who are making a magnificent struggle to try and retain their rights as free born American citizens. There is perhaps no class of labor that is so poorly paid as the textile workers, and it is amongst its numbers we find the premature men and women, whose lives are being blighted by cold commercialism.

In accordance with the principles of commercial selfishness the management of these mills is scouring the overcrowded cities of Europe for strikebreakers to take the places of these poorly paid, ill fed strangers to comfort, who are now but striking for their rights as guaranteed by the Constitution of the United States. But the strike has been inaugurated, and it is the duty of every union man in the world to take notice of this fact and help the strikers both morally and financially.

New York State Independent Labor Candidate.

The following appeal from the Workingmen's Federation of the State of New York needs no comment on our part. In view of the facts which it sets forth, the duty of every workingman in that state is plain, particularly when the respective records of Judge E. T. Bartlett and Hon. John T. McDonough are taken into consideration:

UTICA, N. Y., Oct. 10, 1907.

To Organized Labor of the State of New York, Greeting:

This is not politics. It is the welfare of organized labor. The election of John T. McDonough of Albany to a seat in the court of appeals of the State of New York is now our fight.

For the first time in the history of the Workingmen's Federation of the State of New York, in strict conformity with the policy enunciated by the A. F. of L., we have in our convention at Syracuse this year, nominated our free choice for a public office. The vote was unanimous. We are committed, and must make good. We named John T. McDonough of Albany and Judge W. J. Gaynor of Brooklyn, as our candidates to the court of appeals, and appointed a committee to demand their nomination from all parties. Each party refused, except one, the Independence League, which placed John T. McDonough on its ticket.

Now, Mr. McDonough is in nomination, and it is up to organized labor of the state to elect him. He took us at our word, and has accepted the fight. But it is our fight, not his.

The officers of the Workingmen's Federation, irrespective of all party affiliation, are now a campaign committee to promote the election of organized labor's candidate for court of appeals judge. We are ready to do our duty to the utmost. It is your duty to assist by the appointment of a local campaign committee. A campaign costs money. Our position and reasons for McDonough's selection and election must be placed before every wage-earner voter of the state at our own expense. The Federation will accept funds from no other source. Every cent will be publicly accounted for.

Therefore we ask for a contribution from your union for the work of electing organized labor's choice to a place in the court of appeals.

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Whatever sum you may appropriate for this work should be forwarded at once to Edward A. Bates, secretary-treasurer, 256 South street, Utica, N. Y., with a letter of advice giving the names and addresses of your local campaign committee; also notice of the amount subscribed should be sent to Daniel Harris, president, 190 Bowery, New York City. Receipts will be at once returned.

On the other side of this letter is a copy of the resolution naming Mr. McDonough as our candidate; also a comparison of his services to labor's cause with his opponent's fealty to the interests of our enemies.

Start at once, keep busy, and stay on the firing line until the returns are all in. We carried the eight-hour constitutional amendment by 200,000 in 1905. Why should we not repeat the result in 1907? The answer is plainly up to ourselves.

Fraternally yours, for the Executive council,

DANIEL HARRIS, President.

Attest:

EDWARD A. BATES, Sec.-Treas.

Resolution Adopted at the Annual Convention of the Workingmen's Federation of the State of New York.

Whereas, The terms of two of the judges of the court of appeals of this state will expire December 31, 1907, and,

Whereas, Through the public press we learn that it is the intention of two of the political parties to take the judiciary out of politics, and, as we are informed, are considering the matter of a fusion ticket; and,

Whereas, Organized labor in this and other states has for years complained that the courts are made up of men who lack sympathy with the toiling masses, while we see the attorneys of great corporations nominated for judicial honors, often through combination of political parties. We find conscientious lawyers refused these honors because they sympathize with our people; now, therefore, be it

Resolved, That the Workingmen's Federation of the State of New York, believing as we do that the judiciary should be removed from corporation influences, as well as political influences, desire to present to the state committee of each political party for nomination as judges of court of appeals of this state men in whom we have confidence, without consideration of party or faction of party, and that we, therefore, present to each state committee the names of the Honorable William J. Gaynor of Kings county, and the Honorable John T. McDonough of Albany county, as capable, efficient and honest men, fully qualified for the positions for which their names are presented; and be it further

Resolved, That the president of this Federation appoint a committee of five to present their names to the republican, democratic and independence league state committees, and other such state committees as they may deem advisable.

Record of Judge E. T. Bartlett.

Judge Edward T. Bartlett voted in the court of appeals to declare the prevailing rate of wages law unconstitutional.

He voted to declare the law unconstitutional which provided that none but citizens of the United States should be employed on public works in this state.

He voted to declare the law unconstitutional which provided that eight hours should constitute a day's work on public work in this state, commonly known as the eight-hour law.

He voted to declare unconstitutional the law requiring stone used for public works to be cut or dressed in this state, commonly known as the stone-cutters' protective law.

He voted in favor of declaring the plumbers' law unconstitutional.

Judge Edward T. Bartlett wrote the opinion in the transfer ticket case relating to New York City railway lines, holding that when the law provided a penalty for "EVERY" it meant "ONLY ONE" violation, and he voted in favor of overruling three former decisions of the court of appeals, holding the contrary doctrine, in order to save the railroads from cumulative penalties.

In the celebrated Perkins insurance case, where the defendant Perkins was charged with the crime of appropriating about $50,000 of the funds of the New York Life Insurance Company and turning the same over to the treasurer of the republican party for campaign purposes, Judge Edward T. Bartlett voted in favor of acquittal, thus holding that it is not a crime to appropriate trust money belonging to widows and orphans, and use it for political purposes.

In the bake-shop law case, fixing the hours of labor in bakeries, while the court of appeals in this state held it con-

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stitutional, Judge Edward T. Bartlett dissented and voted in favor of holding the law unconstitutional.

In the ice trust case, which was conducted by the state under the Donnelly anti-monopoly law, the court of appeals declared the act constitutional, but Judge Edward T. Bartlett dissented on the ground that it was unconstitutional.

In the case of the Brooklyn ten-cent fare question, where the courts below held that five cents was the legal fare in the borough of Brooklyn, Judge Edward T. Bartlett voted in the court of appeals to uphold the charge of ten cents made by the railroad companies, thereby making it obligatory on the hundreds of thousands of poor people who visit Coney Island to get a breath of fresh air for themselves and their children to pay a fare of ten cents a trip instead of five.

These are only a few of the causes in which Judge Edward T. Bartlett took part in the interest of the classes as against the masses. He is no friend of the people.

Record of Hon. John T. McDonough.

As a member of the constitutional convention of 1894, abolished competition of convicts with free labor.

Assisted the typographical unions of the state in preventing the "ratting" of the state printing; also helped in abolishing printing in the state prisons.

Assisted cigarmakers in their label fights.

Assisted molders in their big fight against the Perry foundry.

Assisted the steam railroad employes in their great strike on the New York Central in 1890.

Among the important measures brought before the legislature and the governor in 1899, were the eight-hour bill, and the prevailing rate of wages bill. These measures had passed both houses, and were pending before the governor, when Mr. Daniel Harris appeared at the head of a delegation of New York workmen to urge their approval. The governor, somewhat in doubt, sent for Secretary McDonough, and, after a consultation with him, announced to the committee that he would sign the bills.

Assisted the street railway employes in their fight for the ten-hour day.

Assisted the stationary engineers in a legislative bill which shut out competition from unskilled workmen, and thus protected the general public by reducing the chances of accidents to a minimum.

In the constitutional convention he fought for a provision to supply children in orphan asylums with an education.

Assisted in the enactment of employers' liability law of 1902, and the railroad employers' liability law of 1906.

Assisted in the passage of the boiler inspection law.

Assisted in the passage of all recent labor legislation as the legal counsel for the Workingmen's Federation of the State of New York, the legislative board of the Brotherhood of Locomotive Firemen and Enginemen, and the Brotherhood of Railway Trainmen.

The Telegraphers' Strike.

As this issue of the Magazine goes to press the telegraphers' strike continues practically unchanged. The strike is in force against the Western Union Telegraph Company, the Postal Telegraph Company and the Associated Press, the three companies having offices in all cities of 5,000 or more inhabitants. When the strike became effective 91 per cent. of the men and women employed by these concerns left their keys, and the national officers of the Telegraphers' Union state that their statistics show that less than one per cent. have deserted their fellow-workers and joined the ranks of the scabs. The companies have picked up a few men and women here and there, whom the union officials claim incompetent and none of whom in times of peace would be eligible for a position as telegrapher. The telegraph companies are maintaining a service that is absolutely unreliable, while the union is as determined in its struggle for fair wages and improved working conditions as it was when the fight began. This determination has been most emphatically demonstrated by the spirit of bitter resentment with which the striking telegraphers have met the proposition contained in President Small's rather discouraging official communication recommending that the locals take a vote on the question of declaring the strike at an end, and which seems rather to have had the effect of inspiring them with greater determination to continue the struggle than to have dampened their ardor in the fight. President Small's communication, which was sent by wire to the locals in all the leading cities of the country, is as follows:

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"NEW YORK, Oct. 12, 1907.

"Prominent New Yorkers appealed to me to call the strike off. All efforts at negotiation are exhausted and the companies' officials say they will fight to a finish. The treasury is depleted and no more funds are available. Requests for relief from all sides are heavy and urgent. The general assembly can not meet them. The strike having been ordered without the president's sanction, I recommend that locals vote on the proposition."

As a result of his issiung the foregoing, President Small has been suspended from office by the national executive committee and resolutions have been enthusiastically adopted by the locals everywhere in favor of continuing the strike. At a meeting of the New York local (one of the largest in the organization), which was called to consider President Small's proposition, and at which he was present in person, he was vigorously denounced by associate general officers, greeted with a storm of hisses by the assembled members and left the hall amid cries of "resign."

Daniel L. Russell, chairman of the strikers' board of strategy, has stated that President Small said nothing whatever to the members of his board, or to any of the other officers of the union, regarding his recommendation relative to discontinuing the strike either before or after the said recommendation was made public, in view of which fact he (President Small) is being generally denounced by officers and members of the union and openly charged with duplicity. The latest press dispatches regarding President Small's relations with the Commercial Telegraphers' Union are to the effect that he has announced his retirement from office and from the union, also stating that he is "down and out," and would not make any further attempt to recover his position and that he would "soon hunt for a job."

That the telegraph companies should be permitted to continue the flagrant imposition on the public which characterizes their present service seems almost incredible, as does also the fact that it is being tolerated. In their haughty arrogance this combined monopoly professes to be perfectly satisfied with the situation and endeavors to convey the impression that their business is moving along just as smoothly and uninterruptedly as though the strike never took place. Such an impression is, however, quickly removed from the mind of any person who undertakes to send a communication by telegraph. Even messages summoning persons to the deathbeds of relatives, or announcing deaths that have already occurred, or advising of accidents have been subjected to outrageous delays.

Many are the incidents which have come to our attention which clearly demonstrate that these companies are using the mails more than their own wires in the transmission of messages. For instance, just recently the father of one of the clerks in the Magazine office—an engineer by occupation—was injured at Cottage Grove, a few miles from Cincinnati, early on Saturday afternoon, October 5th. His wife, who lives at Logansport, did not receive the message advising her of the accident until the following Sunday evening.

It is understood that the telegraph companies mail messages from the offices where they are received to the point of destination and have their messengers deliver them just as though they were being sent by wire. There is no such thing as an ordinary every-day citizen sending a telegram at the present time with the assurance that it will be delivered any sooner than would a letter. For the transmission of certain "commercial" messages it is said the long distance telephone wires are being used, as "captains of industry" and "princes of finance" are, of course, given special consideration.

The states of New York, South Carolina and Texas are suing the telegraph companies for forfeiture of their charter on the grounds that they are not conducting a legitimate telegraph business. Municipal bodies are also demanding that they restore conditions which will insure reliable service, the city council of Indianapolis being amongst the most recent to take action of this kind, that body adopting resolutions at its last meeting declaring that the "financial, commercial and general business interests of Indianapolis for ten weeks have been subjected to great loss and annoyance in consequence of the partly telegraph and partly mail manner of handling their most important communications in use by the telegraph companies" and the "policy of these great corporations in condemning their striking employes to starvation or sub-

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mission," and declaring it to be "their duty to meet the representatives of their striking employes and do all that may reasonably be expected in order to adjust existing differences, to the end that normal telegraph service may be restored."

The resolutions provide that copies of them be sent to President Roosevelt, Labor Commissioner Neill and the presidents, general managers and directors of the Western Union Telegraph Companies and the Associated Press.

The Civic Federation's Trust Conference.

The National Civic Federation's Conference on Trusts and Combinations about to assemble at Chicago promises to be one of the most important gatherings ever held under the auspices of that organization. Many men of national prominence in public and private life will be present, amongst them F. B. Kellogg, special assistant attorney-general of the United States, in charge of the government case against the Standard Oil Company. It is understood that the railroad labor organizations will be represented through their various executives, with the exception of the Order of Railway Conductors, President Garretson of that organization having delegated Brother John O'Mara, of Division 103, Indianapolis, to represent the O. R. C. on the occasion. Brother O'Mara, who is prominent in O. R. C. circles, also represented his division at the Memphis convention in May last.

Government Ownership of Telegraph Lines.

Since the telegraphers' strike began quite a sentiment has been aroused in favor of government ownership and operation of telegraph service. It is being warmly advocated by many prominent men in public life, as well as by various organizations of a political and industrial character. In view of the conditions under which the telegraph companies hold their charter, government ownership is much more feasible than many realize, as the government, on payment to their present owners of a sum representing the fairly appraised value of these properties, has the right to assume ownership and operation of them. This is clearly specified in "an act passed by congress to aid in the construction of telegraph lines and to secure the government the use of the same for postal, military and other purposes," which was approved July 24, 1866. Said act is as follows:

"Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That any telegraph company now organized, or which may hereafter be organized under the laws of any state in this Union, shall have the right to construct, maintain, and operate lines of telegraph through and over any portion of the public domain of the United States, over and along any of the military or post roads of the United States which have been or may hereafter be declared such by act of congress, and over, under or across the navigable streams or waters of the United States: Provided, That such lines of telegraph shall be so constructed and maintained as not to obstruct the navigation of such streams and waters, or interfere with the ordinary travel on such miltary or post roads. And any of said companies shall have the right to take and use from such public lands the necessary stone, timber, and other materials for its posts, piers, stations, and other needful uses in the construction, maintenance, and operation of said lines of telegraph, and may pre-empt and use such portion of the unoccupied public lands subject to pre-emption through which its said lines of telegraph may be located as may be necessary for its stations, not exceeding forty acres for each station: but such stations shall not be within fifteen miles of each other.

"Sec. 2. And be it further enacted, That telegraphic communications between the several departments of the government of the United States and their officers and agents shall, in their transmission over the lines of any of said companies, have priority over all other business, and shall be sent at rates to be annually fixed by the postmaster-general.

"Sec. 3. And be it further enacted, That the rights and privileges hereby granted shall not be transferred by any company acting under this act to any other corporation, association, or person: Provided, however, *That the United States may at any time after the expira-*

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tion of five years from the date of the passage of this act, for postal, military, or other purposes, purchase all the telegraph lines, property, and effects of any or all of said companies at an appraised value, to be ascertained by five competent, disinterested persons, two of whom shall be selected by the postmaster-general of the United States, two by the company interested, and one by the four so previously selected.

"Sec. 4. And be it further enacted, That before any telegraph company shall exercise any of the powers or privileges conferred by this act, such company shall file their written acceptance with the postmaster-general of the restrictions and obligations required by this act.

Approved July 24, 1866."

The Central Labor Union of the District of Columbia recently adopted the following resolutions in support of government ownership and operation of telegraph lines:

"Whereas, The Constitution of the United States, section 8, Article I, has empowered congress with authority to regulate commerce with foreign nations and among the several states; and

"Whereas, The Constitution, section 8, Article I, has further empowered congress to establish postoffices and post roads; and

"Whereas, The present system of telegraphy is but a modern development of the postoffice, and it has been decided by the supreme court of the United States that telegraph companies are engaged in interstate commerce; therefore be it

"Resolved, That it is the sense of the Central Labor Union of the District of Columbia that the greed and avarice of the telegraph companies of the United States are the immediate cause of the present unfortunate strike of the telegraph operators, which interferes with the dispatch of public and private business and social correspondence; and as it is the desire of this body to strike at the root of the evil, be it further

"Resolved, That a copy of these resolutions be sent to the president of the United States, requesting him to declare in favor of government ownership of the telegraph, and to urge upon congress the importance and necessity for the same, in order to avoid a repetition of the present troubles in this regard."

Labor Crushing Government Official.

The manner in which the present public printer, Charles A. Stillings, is conducting, or rather misconducting, the affairs of the government printing office at Washington, D. C., has for some time been the subject of much vigorous protest. It seems that, while in a general way his administration has been characterized by gross mismanagement, he has made ill treatment and oppression of wage earners working under his jurisdiction a special feature of it. He is charged, amongst other things, with assessing penalty fines against proofreaders and other employes, of subjecting female help to clownish and humiliating examinations at the hands of the medical department of the office, of violating the eight-hour law and of reducing compensation paid piece workers while increasing that of salaried appointees owing their positions to the influence of members of congress, who had been instrumental in having his (the public printer's) salary increased recently.

The Central Labor Union of the District of Columbia condemns Stilling's methods in the following resolutions:

Whereas, Charles A. Stillings, United States public printer, has violated the eight-hour law, is an advocate of the "open shop policy," and has been active in promoting the same, and as his attitude in this respect is a blow aimed at the cause of trade unionism, with the avowed purpose of overthrowing it, thereby humiliating its members; and

Whereas, The said Charles A. Stillings has reduced the wages of many faithful and competent public servants under his charge, and increased the salaries of already well-paid officials, including himself; and

Whereas, He has sought to disrupt labor unions in general and the bookbinders' union in particular, by dismissing from public service some of its most earnest and hardworking officers, and all for the purpose of intimidating them as members of their union and humiliating them in the eyes of the public, which conduct brands him as an enemy of union labor; therefore, be it

Resolved, That it is the sense of the Central Labor Union of the District of Columbia, assembled, on the 9th day of September, 1907, that the said Charles A. Stillings is a pronounced enemy of organized labor and has used his high office as a weapon to annoy and oppress its members, and destroy unionism itself; therefore, be it further

Resolved, That we request the president of the United States to remove the

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said Charles A. Stillings from the office of public printer by reason of his lawlessness, inefficiency, injustice and hostility to organized labor and its members, and that a copy of these resolutions be sent to the president of the United States, requesting his removal forthwith.

The claim that Stillings has saved money for the government is answered by the Washington (D. C.) Trades Unionist as follows:

The government printing office expended for labor during the fiscal year closed June 30, 1906, the sum of $4,111,000. For the year ended June 30, 1907, which represents the busiest part of the "reorganization" of the office under Stillings, the office spent for labor—salaries of all kinds—the sum of $4,385,000, an excess over the previous year of $274,000.

Thus it is clear that with the office fully equipped with typesetting machines and labor-saving machinery, installed by his predecessor, with the volume of work the office is called on to do cut almost 50 per cent. by the action of the Keep commission in restricting department printing, and some wise provisions inserted in the printing laws that greatly curtails the congressional work, the public printer runs up his salary list nearly a third of a million dollars.

The significance of these figures is better understood when it is stated that the office has really employed a smaller force than customary in the mechanical divisions, and that no part of the increased expenditure has gone to the people who really produce the printing—the boys who work at the case, on the typesetting machines, read proof, bind the books, work in the pressrooms, and in the foundry, or the women who work in the bindery and folding rooms—no, not a cent to any of these people!

Solicitors, private secretaries, purchasing agents, inspectors, auditors, financial secretaries, stool pigeons generally, these are the people who have received and probably spent the money—not people who produce the printing.

And carriages—how many? Just count them, or else take a look up and down the avenue and see how many you can see of the G. P. O. kind in an hour's time with youthful looking fellows taking a drive.

Public Printer Palmer made his trips to the office on the street cars. The census bureau and many others have no carriages at all. By a strict construction of the law the government printing office would not be entitled to any.

It is to be hoped that President Roosevelt will act at once in the matter of removing Stillings from office and appointing as his successor a man capable of conducting its affairs in a spirit of justice and fairness to all his subordinates alike.

No man who is inoculated with the virus of Parryism should be permitted to hold a public office. It is impossible for a man who is a servant of all the people to be faithful to his trust while entertaining towards millions of them a prejudice born of class hatred. Much less should such a man be permitted to fill a public office in which are employed persons from the class of society against which he harbors such antagonism. The best interests of the government demand that Stillings be promptly removed, and while, of course, "powerful political influences" will operate in behalf of his retention there are "powerful political factors" that would emphatically resent it.

Interstate Commerce Commission Railroad Statistics.

The advance figures in this abstract are based on summaries in the nineteenth annual statistical report of the Interstate Commerce Commission, prepared by its statistician, as the complete report for the year ending June 30, 1906. This report, being similar to preceding reports in the series, contains tables showing details of mileage, capitalization, earnings and expenses by roads, and besides includes many summaries of statistics for the roads as a whole.

Mileage.—On June 30, 1906, the report shows that the total single-track railway mileage in the United States was 224,363.17 miles, or 6,262.13 miles more than at the end of the previous year. An increase in mileage exceeding 100 miles appears for Alabama, Arkansas, California, Florida, Georgia, Idaho, Illinois, Indiana, Louisiana, Michigan, Minnesota, Mississippi, Nevada, North Carolina, North Dakota, Pennsylvania, South Dakota, Tennessee, Texas, Virginia, Washington, West Virginia, Wisconsin, Wyoming, New Mexico and Oklahoma.

The operated mileage for which substantially complete returns were rendered to the commission was 222,340.30 miles, including 7,865.97 miles of line used under trackage rights. The aggregate length of railway mileage, including tracks of all kinds, was 317,083.19 miles. This mileage was thus classified: Single track, 222,340.30 miles, as just mentioned; second track, 17,936.25 miles;

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third track, 1,766.07 miles; fourth track, 1,279.66 miles, and yard track and sidings, 73,760.91 miles. These figures indicate that there was an increase of 10,286.45 miles in the aggregate length of all tracks, of which 3,819.24 miles, or 37.13 per cent., represented the extension of yard track and sidings.

The number of railway corporations for which mileage is included in the report was 2,313. During the year railway companies owning 4,054.46 miles of line were reorganized, merged, or consolidated. The corresponding figure for the year 1905 was 3,802.02 miles.

The report shows that for the year ending June 30, 1906, the mileage of roads operated by receivers was 3,971.43 miles, or an increase of 3,175.61 miles as compared with 1905. The number of roads in the hands of receivers was 34.

Equipment.—On June 30, 1906, there were in the service of the carriers 51,672 locomotives, the increase being 3,315. These locomotives, excepting 1,090, were classified as: Passenger, 12,249; freight, 29,848, and switching, 8,485.

The total number of cars of all classes was 1,958,912, or 116,041 more than for the year 1905. This rolling stock was thus assigned: Passenger service, 42,262 cars; freight service, 1,837,914 cars, and company's service, 78,736 cars. These figures do not include cars owned by private commercial firms or corporations.

The average number of locomotives per 1,000 miles of line was 232 and the average number of cars per 1,000 miles of line was 8,810. The number of passenger-miles per passenger locomotive was 2,055,309, showing an increase of 6,751 miles as compared with the previous year. The number of ton-miles per freight locomotive was 7,232,563, showing an increase of 541,863 miles.

The number of locomotives and cars in the service of the railways aggregated 2,010,584, of which 1,827,789 were fitted with train brakes, or an increase for the year of 186,394, and 1,989,796 were fitted with automatic couplers, or an increase of 118,206. Nearly all the locomotives and cars in the passenger service had train brakes, and all but 72 locomotives in the same service were fitted with automatic couplers. Only 1.54 per cent of cars in the passenger service were without automatic couplers. Substantially all the freight locomotives had train brakes and automatic couplers. Of 1,837,914 cars in the freight service on June 30, 1906, the number fitted with train brakes was 1,689,141 and with automatic couplers 1,820,854.

Employes.—The reported number of persons on the pay rolls of the railways in the United States on June 30, 1906, was 1,521,355, which is equivalent to an average of 684 employes per 100 miles of line. These figures show an increase in the number of employes as compared with the year 1905 of 139,159, or 47 per 100 miles of line. Of the employes 59,855 were enginemen, 62,678 firemen, 43,936 conductors, and 119,087 were other trainmen. There were 49,659 switch tenders, crossing tenders and watchmen. The total number of railway employes, disregarding a small number not assigned, were apportioned among the four general divisions of railway employment as follows: For general administration, 57,054; for maintenance of way and structures, 495,879; for maintenance of equipment, 315,952, and for conducting transportation, 649,820.

The report includes summaries showing the average daily compensation of 18 classes of employes for a series of years, and also the aggregate amount of compensation returned for the several classes. The total amount of wages and salaries reported as paid to employes during the year ending June 30, 1906, was $900,801,653; but this amount is deficient by more than $27,000,000 because of the loss of railway records in the San Francisco calamity.

Capitalization of Railway Property.—On June 30, 1906, the par value of the amount of railway capital outstanding was $14,570,421,478, which is equivalent to a capitalization of $67,936 per mile for the railways in the United States. Of this capital there existed as stock $6,803,760,093, of which $5,403,001,962 was common and $1,400,758,131 preferred; the remaining part, $7,766,661,385, represented funded debt, consisting of mortgage bonds, $6,266,770,962; miscellaneous obligations, $973,647,924; income bonds, $301,523,400, and equipment trust obligations, $224,719,099.

Of the total capital stock outstanding $2,276,801,333, or 33.46 per cent, paid no dividends. The amount of dividends declared during the year was $272,495,974, being equivalent to 6.03 per cent on dividend-paying stock. For the year ending June 30, 1905, the amount of dividends declared was $237,964,482. Of the total amount of stock outstanding,

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$6,803,760,093, 12.60 per cent paid from 1 to 4 per cent; 11.34 per cent from 4 to 5 per cent; 7.60 per cent from 5 to 6 per cent; 9.54 per cent from 6 to 7 per cent, and 14.94 per cent from 7 to 8 per cent. The total amount of funded debt (omitting equipment trust obligations) that paid no interest was $287,954,851, or 3.82 per cent. Of mortgage bonds, $208,060,486, or 3.32 per cent of miscellaneous obligations, $2,827,570, or 0.29 per cent, and of income bonds $77,066,795, or 25.56 per cent, paid no interest.

Of the total amount of railway stock outstanding $2,257,175,799 were reported as owned by railway corporations, and of railway bonds $641,305,030 were so reported.

Public Service of Railways.—The report indicates that the number of passengers carried by the railways in the year ending June 30, 1906, was 799,507,838, this item being 60,673,171 more than for the year ending June 30, 1905. The passenger-mileage, or the number of passengers carried 1 mile, was 25,175,480,383, the increase being 1,375,330,947 passenger-miles.

The number of tons of freight shown as carried (including freight received from connections) was 1,631,374,219, which exceeds the tonnage of the year 1905 by 203,642,314 tons. The ton-mileage, or the number of tons carried 1 mile, was 215,877,551,241, the increase being 29,414,441,731 ton-miles. The number of tons carried 1 mile per mile of line was 982,401, indicating an increase in the density of freight traffic of 121,005 ton-miles per mile of line.

The average revenue per passenger per mile for the year ending June 30, 1906, was 2.002 cents. For the preceding year the average was 1.962 cents. The average revenue per ton per mile was 0.748 cent; the like average for the year 1905 was 0.766 cent. The earnings per train mile show an increase both for passenger and for freight trains. The figures show an increase in the average cost of running a train 1 mile. The ratio of operating expenses to earnings for the year 1906 was 66.08 per cent. For 1905 this ratio was 66.78 per cent.

Earnings and Expenses.—The gross earnings of the railways in the United States from the operation of 222,340.30 miles of line were, for the year ending June 30, 1906, $2,325,765,167, being $243,282,761 greater than for the year 1905. Their operating expenses were $1,536,877,271, or $146,275,119 more than in 1905. The following figures present a statement of gross earnings in detail and show the increase of the several items over those of the previous year: Passenger revenue, $510,032,583—increase, $37,337,851; mail, $47,371,453—increase, $1,945,328; express, $51,010,930—increase, $5,861,775; other earnings from passenger service, $11,314,237—increase, $274,095; freight revenue, $1,640,386,655—increase, $189,613,817; other earnings from freight service, $5,645,222—increase, $564,956; other earnings from operation, including unclassified items, $60,004,087—increase, $7,684,939. Gross earnings from operation per mile of line averaged $10,460, the corresponding average for the year 1905 being $862 less.

The operating expenses assigned to the four general classes were: For maintenance of way and structures, $311,720,820; maintenance of equipment, $328,554,658; conducting transportation, $836,202,707; general expenses, $59,752,230; undistributed, $646,856. Operating expenses averaged $6,912 per mile of line, this average showing an increase of $503 per mile in comparison with the year 1905.

The income from operation or the net earnings of the railways amounted to $788,887,896. This amount exceeds the corresponding one for the previous year by $97,007,642. The net earnings per mile of line for 1906 averaged $3,548; for 1905, $3,189, and for 1904, $2,998. The amount of income attributable to other sources than operation was $256,639,591. There are included in this amount the following items: Income from lease of road, $119,604,619; dividends on stocks owned, $66,861,656; interest on bonds owned, $20,537,011, and miscellaneous income, $49,636,305. The total income of the railways ($1,045,527,487)—that is, the net earnings and income from lease, investments and miscellaneous sources—is the amount from which fixed and other charges against income are taken to ascertain the sum available for dividends. Such deductions aggregated $660,341,159, thus leaving $385,186,328 as the net income for the year ending June 30, 1906, available for dividends or surplus.

The amount of dividends declared during the year under review (including $55,593, representing other earnings to stockholders) was $272,851,567, leaving as the surplus from the operations of the

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year ending June 30, 1906, $112,334,761. The surplus from operations as shown for the preceding year was $89,043,490. The amount of deductions from income as stated above, $660,341,159, comprises these items: Salaries and maintenance of organization, $571,431; interest accrued on funded debt, $322,555,954; interest on current liabilities, $11,653,076; rents paid for lease of road, $122,290,911; taxes, $74,785,615; permanent improvements charged to income account, $49,042,631; other deductions, $79,441,561.

The preceding figures for the income and the expenditures of railway companies are compiled from the annual reports of leased roads as well as of operating roads, and include duplications in certain items of income and also of expenditure on account of the fact that, in general, the income of a leased road is the rent which it receives from its lessee. There is included in the statistical report, however, a summary which presents the income account for all the railways considered as a single system, from which intercorporate payments are substantially eliminated.

The complete report includes a summary showing the total taxes and assessments of the railways by states and territories and also an analysis showing the basis of assessment.

Railway Accidents.—In their annual reports to the Interstate Commerce Commission, carriers include returns for all casualties to passengers, employes, trespassers and other persons. The following figures therefore are not comparable with details in the Commission's Accident Bulletins, based on monthly reports, that chiefly relate to casualties to passengers and to employes while on duty on or about trains:

The total number of casualties to persons on the railways for the year ending June 30, 1906, was 108,324, of which 10,618 represented the number of persons killed and 97,706 the number injured. Casualties occurred among three general classes of railway employes, as follows: Trainmen, 2,310 killed and 34,989 injured; switch tenders, crossing tenders, and watchmen, 147 killed, 1,026 injured; other employes, 1,472 killed, 40,686 injured. The casualties to employes coupling and uncoupling cars were: Employes killed, 298; injured, 3,884. The casualties connected with coupling and uncoupling cars are assigned as follows: Trainmen killed, 266; injured, 3,590; switch tenders, crossing tenders and watchmen killed, 18; injured, 170; other employes killed, 14; injured, 124.

The casualties due to falling from trains, locomotives, or cars in motion were: Trainmen killed, 454; injured, 5,215; switch tenders, crossing tenders, and watchmen killed, 7; injured, 159; other employes killed, 84; injured, 712. The casualties due to jumping on or off trains, locomotives or cars in motion were: Trainmen killed, 130; injured, 4,809; switch tenders, crossing tenders and watchmen killed, 7; injured, 119; other employes killed, 76; injured, 685. The casualties to the same three classes of employes in consequence of collisions and derailments were: Trainmen killed, 693; injured, 5,245; switch tenders, crossing tenders and watchmen killed, 3; injured, 69; other employes killed, 91; injured, 888.

The number of passengers killed in the course of the year 1906 was 359 and the number injured 10,764. In the previous year 537 passengers were killed and 10,457 injured. There were 146 passengers killed and 6,053 injured because of collisions and derailments. The total number of persons other than employes and passengers killed was 6,330; injured, 10,241. These figures include the casualties to persons trespassing, of whom 5,381 were killed and 5,927 were injured. The total number of casualties to persons other than employes from being struck by trains, locomotives or cars was 5,127 killed and 4,905 injured. The casualties of this class were: At highway crossings, passengers killed, 3; injured, 8; other persons killed, 926; injured, 1,884; at stations, passengers killed, 48; injured, 96; other persons killed, 566; injured, 647; at other points along track, passengers killed, 3; injured, 16; other persons killed, 3,581; injured, 2,254. The ratios of casualties indicate that 1 employe in every 387 was killed and 1 employe in every twenty was injured. With regard to trainmen—that is, enginemen, firemen, conductors and other trainmen—it appears that 1 trainman was killed for every 124 employed and 1 was injured for every 8 employed.

In 1906 1 passenger was killed for every 2,227,041 carried, and 1 injured for every 74,276 carried. For 1905 the figures show that 1,375,856 passengers were carried for 1 killed, and 70,655 passengers were carried for 1 injured. For

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1895 1 passenger was killed for every 2,984,832 carried, and 1 injured for every 213,651 carried. With respect to the number of miles traveled, the figures for 1906 show that 70,126,686 passenger-miles were accomplished for each passenger killed, and 2,338,859 passenger-miles for each passenger injured. For 1905 the figures were 44,320,576 passenger-miles for each passenger killed, and 2,276,002 passenger-miles for each passenger injured. The figures for 1905 show that 71,696,743 passenger-miles were accomplished for each passenger killed, and 5,131,977 passenger-miles for each passenger injured.

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*Labor Interests in the Courts.**

Assumed Risk.—Elmer W. Shattuck was an engineer on the line of the Central Vermont Railroad Company, from Battleboro to South Londonderry. The road was originally a narrow gauge, but was changed to a standard gauge in a single day by moving the rails on each side the requisite distance. This change required further work of construction—replacing of ties, blasting, etc. After the change, but before the work of construction was completed, the engine that the deceased was running slid from the roadbed, the roadbed and the rails slid down a bank, the engine was overturned and Shattuck thereby killed. The change was made the 31st of July, and the accident happened on the 28th of August, and during that time the deceased's train was derailed many times to a greater or less extent, and once before on the day of the accident. The rails in the vicinity of the accident were of steel, but of iron at the point of accident, and of less weight. It appeared that an iron rail was broken at that point, and that a piece of it went through the ash pan, and up through the air drum, and struck against the tender so as to bend it up at the end. Another piece of rail was found near by, which the testimony tended to show was broken from the piece that went through the ash pan. The testimony on the part of the plaintiff tended to show that some of the ties at the point of accident were too short, and badly decayed, especially at the ends.

The claims of the parties on trial can be best understood if stated in the words of the charge, thus: "There have been two theories argued to you by counsel on the respective sides. The plaintiff claims, and his counsel argues to you from the testimony and this piece of rail shown you here in court, that the primary cause of the accident was the breaking of the rail; that that let the engine down; and that, being down, it went down the bank, taking a portion of the roadbed with it. On the other hand, the defendant claims, and its counsel argue to you, that the more reasonable theory is that the roadbed itself was insufficient, so that, when this heavy engine came along over it at this particular point, the roadbed itself went down, without regard to any insufficiency of the ties or the rails, but that it was the roadbed that gave way. Now, if you should find that this was really the cause of the accident, that it was the sinking of the roadbed, and not the fault of the rails or the rails and the ties, then the plaintiff can not recover, because he has not sued for any defect in the roadbed itself. I have already called your attention to that—that for the plaintiff to recover, he must show that the defect was in the rails, or in the rails and ties, or the tie itself, and that in consequence of this defect the engine went through and down the bank, and carried some of the roadbed with it. So I have called your attention to these two theories, and you must consider all the evidence bearing upon them, and say which, in your judgment, is the correct one."

After a verdict in favor of plaintiff, the case was appealed to the Supreme Court of Vermont, where the judgment rendered on the verdict in the trial court was affirmed, the court saying:

"The plaintiff's claim was justified, both by his declaration and his evidence. By continuing in the service after the change of gauge, the deceased may have assumed the risk of dangers thereby created, as claimed by the defendant. But the danger here complained of was not thereby created, but existed independently of it, as the plaintiff's evidence tended to show; and therefore the case as presented is one of an extraordinary risk, because existing by the fault of the defendant, and therefore not assumed by the deceased unless he had knowledge of it, actual or imposed.

"But the defendant says that in any view of the case the court confounded

*Prepared for the Locomotive Firemen and Enginemen's Magazine by Geo. H. Murdoch, Jr., St. Louis, Mo.

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contributory negligence and assumption of risk. This may be so, if there is any difference between them, as some say there is, for they say that contributory negligence can arise only when there is negligence on the part of the defendant, in which case contributory negligence breaks the casual connection between the defendant's negligence and the injury complained of, and thus itself becomes the proximate cause of the injury, and defeats recovery; whereas assumption of risk negatives the existence of any duty on the part of the defendant by the breach of which he could be a wrong-doer."

Shanks v. Central Vermont R. Co., 65 A. (Vt.) 529.

Fellow-Servant Doctrine.—C. A. Birk in an action against the Chicago, Rock Island & Pacific Railway Company, for damages received in a derailment and wreck on defendant's line in Indian Territory, alleged, as the cause of the wreck, that the railroad track and bridge, at the point where the derailment occurred, had been negligently and improperly constructed of worn and defective material, and that the track was without ballast, or, if said track and bridge had been properly constructed, that the ties, rails, bolts, etc., had since been negligently allowed to become old, rotten, and unfit for use, the joints of the rails to become loose, and the ballast under the track to be washed out and removed. He further specified the injuries alleged to have been sustained, and charged that they were permanent. The railway company pleaded a denial of the allegations of negligence, and specially that plaintiff was guilty of contributory negligence in the manner of performing his duties at the time of the accident; also that the accident was the proximate result of the negligence of a fellow-servant; that the injury occurred in the Indian Territory, where the common law was in force, and that under this law the plaintiff was not entitled to recover damages for an injury occurring by reason of the act of a fellow-servant: also that he assumed the risk of the injury received by him. It was admitted that the common law of England was in force at the time and place of the accident, and while conflicting, the evidence was sufficient to sustain a finding that the cross-ties and bridge timbers at the point of derailment were unsound, as alleged, and that, in consequence thereof, the rails had spread and the engine upon which Birk was at the time employed as fireman, ran off of the track upon a curve, and that he was injured and damaged to the amount of $3,250, from a judgment for which amount there was an appeal to the Texas Court of Civil Appeals.

One of the assignments of error was as to the action of the trial court in refusing the following special charge: "Unless you find from the evidence that the defendants, or one of them, failed to use and exercise ordinary care to select competent employes, whose duty it was to exercise ordinary care to keep that portion of the track and roadbed and to operate the trains where the accident occurred, in reasonably safe condition, you will find for the defendants, even though you may believe from the evidence that the plaintiff sustained all the injuries and damages claimed by him in his pleadings." With reference to this the appellate court said: "The proposition asserted under this assignment is to the effect that appellant's roadmaster and bridge superintendent and other employes whose duty it was to inspect and maintain the roadbed were fellow-servants of appellee, and that hence appellant is not liable for the negligence of such fellow-servants. Appellant cites numerous authorities, some of which seem certainly to sustain its contention, but our own decisions, we think, are to the contrary, and of controlling effect. . . . The late case of M. K. & T. Ry. Co. of Texas v. Keefe, 84 S. W. 679, by the Court of Civil Appeals for the Fifth district, in which writ of error was refused in our Supreme Court, seems very closely in point. In that case a railroad brakeman was injured as the result of negligence on the part of those intrusted with the duty of keeping the track, upon which the brakeman was endeavoring to make a coupling, clear of cinders, and the court say: 'It was the roadmaster's duty to see that the section men removed the cinders. Appellant's duty to use ordinary care to provide a reasonably safe track and place for appellee to work having been delegated to its roadmaster, he, in the discharge of such duty, was not a fellow-servant of appellee. This fact did not relieve the company of its duty to use ordinary care to provide a reasonably safe track and yard for plaintiff to work.' In this case, as in the one before us, the injury occurred in the Indian

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Territory, where it was stated, as here, that the common law was in force, so that, whatever may be the view entertained by courts of other states, we think our own decisions, as well as the better reason, are against appellant's contention." The opinion of the appellate court, affirming the judgment, covered other points, and boiled down is as follows:

A railway owes a duty to its employe to use ordinary care to see that its track is in a reasonably safe condition so that he may perform his duties with a reasonable degree of safety.

An employe of a railroad engaged in the operation of trains is not bound to inspect the track himself.

A locomotive fireman assumes the risks ordinarily incident to his employment and those of which he had knowledge, and, if he knew the track to be defective, or by the exercise of ordinary care could have known thereof, he assumes the risks incident thereto.

A roadmaster of a railroad in discharging his duty of seeing that a portion of the track was in good and safe condition was not a fellow-servant with a locomotive fireman.

Chicago, R. I. & P. Ry. Co. v. Birk, 99 S. W. (Tex.) 753.

General Labor News.

In consequence of the recent disastrous strike of the engineers and firemen on all railroads in the Argentine Republic, and of the strike now existing of the laborers in the port of Buenos Ayres, both of which have been seriously detrimental to the prosperity of the country, the government has had under consideration certain repressive measures to be submitted for congressional sanction.

The machinists' lodges have begun a vigorous organizing campaign and eight-hour day agitation in every section of eastern New England. The membership there has trebled within the last year.

A fight against the use of convict labor in Wisconsin has been taken up by the Wisconsin State Federation of Labor. A resolution was passed concerning the employment of convict labor, and advising that the federation use every honorable means in fighting it.

On account of labor troubles all the Hindoos were driven from Bellingham, Wash., and have sought new locations. About forty have arrived in Seattle. A large party left for Los Angeles and other southern cities, and others have sought protection in British Columbia.

The number of employes in the divisions of building, construction, municipal work and engineering of the Panama canal has been reduced 25 per cent. because the appropriation is less this year than last.

The United Postal Clerks have decided that during the coming session of congress they will fight for an eight-hour law, thirty days' vacation, and fifteen days' sick leave annually, also for promotions above $1,100 a year, the limit now set.

The New South Wales labor party is fighting to retain the arbitration court in preference to wages boards.

Boston's Barbers' Union reports a membership of 812, making it the largest union of its kind in the country.

The total number of wage earners, covering all classes of employes in manufacturing establishments in Canada for the year 1906, was 344,035.

Some of the lately-arrived immigrants to Australia are writing indignant letters to the English press pointing out how they have been duped in coming to that country by the lying circulars distributed all over England.

A general strike of the boilermakers on the Chicago Great Western, Great Northern, Omaha, Northern Pacific, and the "Soo" railroads has been recently declared.

A demand for an eight-hour day and a 20 per cent. increase in wages was recently voted for by the national convention of the Metal Workers' Union at Cincinnati, which has a membership of 22,000.

Advices from Japan are to the effect that the Japanese government has restricted the number of Japanese allowed to emigrate to Hawaii each month to 200.

The International Brotherhood of Teamsters has spread over the United States and Canada, and has an aggregate membership of over 125,000.

The refusal of the St. Louis manufacturers to yield to the demand for less hours and more pay made by the Independent Boot and Shoe Makers' Union has resulted in a strike of seventeen plants and 7,800 employes.

The Co-Operative Bank and Trust

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Company of Oklahoma City, promoted by the Farmers' Union and the labor unions of Oklahoma, has been chartered with a capital stock of $500,000. No stock is to be sold except to union men.

In the state of New York there are 2,459 trades and labor unions with 414,718 members.

Members of the Journeymen Tailors' Unions in the United States and Canada will celebrate the 101st anniversary of the organization.

Waitresses now have a union in Kansas City, Mo.

In Massachusetts the textile boilermakers have secured the passage of a law, after twelve years' agitation, which will prevent the employment of women and minors in textile establishments between the hours of 6 p. m. and 6 a. m. It goes into effect in October.

The trade agreement between the Amalgamated Society of Carpenters and Joiners of the United States and the United Brotherhood of Carpenters has been extended in order to afford the general council at its next meeting an opportunity to further deliberate on the proposition to amalgamate.

Organized labor is making steady progress in Porto Rico. Labor Day was celebrated this year for the first time on the island.

Postoffice clerks have a new union at Grand Island, Neb.

The Plumbers' and Steamfitters' Union has eighteen thousand members.

Needle makers and file cutters seem to be the occupations most susceptible to the ravages of consumption.

The Canadian government will indemnify the Japanese for the loss suffered by them during the Vancouver riots, and under instructions from the imperial government will offer an apology.

A large number of experienced forestry school men and Harvard and Yale universities are engaged in forestry work in Massachusetts under the direction of Professor Rane, state forester.

All skilled mechanics in Florida are organized.

Representatives of labor and capital in the building trades in San Francisco are discussing a proposition to settle upon a scale of wages for three years.

The victory for the United Garment Workers of America in Montreal in securing a general betterment of conditions was, without a doubt, one of the greatest ever achieved in the history of the U. G. W. of A. in so short a period and with less loss of time and wages.

The striking meat wagon drivers of New York City finally won their demands and returned to work. They resumed work as union men at sixty-five hours a week instead of eighty as before the strike. All minor questions are to be settled by arbitration.

Slate workers of Maine will soon be organized.

Sheet metal workers' strike at Newark, N. J., has been settled favorably to the strikers.

Representatives of the West Australia Miners' Union and the Chamber of Mines recently met in conference at Kalgoorlie, with the object of arranging an industrial agreement without calling to their aid the arbitration court, an institution which is discredited in that state.

The financial report of the International Association of Machinists, just issued, shows nearly double the assets of last year, despite the strikes which the international is financing. The association has on hand a total of $181,047.98.

Cement workers recently chartered new locals in Syracuse, N. Y., Waterloo, Iowa, Cementon, Pa., Columbus, Ohio, and Ogden, Utah.

Last year Regina, Canada, had one union of twenty members; at present the city has twelve unions with over 400 members.

Germany has over 132,000 women in trades unions.

The mill owners of Memphis, Tenn., recently posted notices that their places would be run as open shops.

A dispatch from Fall River, Mass., says that cotton spinners who formerly earned as low as $8.50 a week, are now making $18 to $21 in the same time. Weavers are now earning as high as $18 a week, and improvements in machines have made the work much easier.

The annual convention of the Amalgamated Association of Street and Electric Railway Employes was held in New Orleans, La., October 7.

Secretary of Commerce and Labor Straus announces that President Roosevelt is enthusiastic about perfecting the national organization for promoting industrial peace, the foundation for which was assured by the $65,000 bestowed on the president as the recipient of the Nobel peace prize. The secretary stated

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that Labor Commissioner Neil is to be made secretary of the organization, and a popular subscription of $1,000,000 is to be raised.

The Panama canal officers have been asked to make a report to the war department on charges made in Spain that recruiting agents for the Isthmian canal work have deceived Spanish laborers to induce them to emigrate to the Isthmus. One hundred and fifty Spaniards go to the isthmus now every week under the inducements offered them by LeRoy Marks, labor agent of the canal.

The Canadian Trades and Labor Congress, in annual session at Winnipeg, Canada, recently passed a resolution urging the abrogation of the treaty between Great Britain and Japan so as to pave the way for Japanese exclusion.

The Michigan Federation of Labor has adopted resolutions declaring for suffrage for women in general, and for Michigan women in particular.

The joint board of the parliamentary committee of the Trades Union Congress, the General Federation of Trades Unions, and the labor party of Great Britain have issued a report on unemployment, in which it is recommended that trade unions be urged to abolish overtime, and that where this is not wholly possible, it be restricted to the narrowest limits, and that when worked, it be penalized to the fullest extent.

During 1906, forty-one of the sixty-four unions affiliated with the General Federation of German Trade Unions at Berlin paid unemployed benefits. The amount granted to members out of work varied with the different unions.

A report issued by the secretary of the Federation of Trades Unions in Austria shows that during the year 1906 there was a remarkable increase in the total membership of the unions affiliated with the federation.

A dispatch from Honolulu says that the Spanish immigrants brought to that city some months ago are giving satisfaction in all parts of the islands where they have gone. For the most part, too, they have remained on the plantations where they went to work first.

In the past five years the number of employes in Canada increased by 47,452, the amount of wages by $51,145,150, and the average wage per employe by $90.47.

The International Congress of Miners, at Salzburg, Austria, adopted a resolution opposing any restriction of the output of coal. The Americans voted affirmatively. A resolution in favor of a legal prohibition of the employment of children under 14 in mining, or under 16 in underground work, also was adopted.

Contributed

Should Women in the Home Be Interested in Trades Unions and the Union Labels?

Woman, whether employed in the mill or the factory, or in the home looking after the needs of the family, plays an important part in the world's work and should be interested in all that concerns it. If she works at an organized trade, and does not become a part of the organization, she is not only standing directly in her own light, but is doing a great injustice to her fellow workers.

The woman in the home (possibly the home of a union man) who spends money earned under union regulations for goods that have been made under the most unfavorable conditions, may not be directly affecting herself or her husband, but she is prolonging the struggle of the workers for better conditions. (Look for the union label!)

Every time we make a purchase we become an employer and work for or against our own best interests. It is inconsistent for the wives of union men to be the employers of nonorganized labor. I regret to say that in this matter women have been rather indifferent, notwithstanding the fact that through organization the natural bread winner of the family has been able to command better wages, shorter hours and improved condi-

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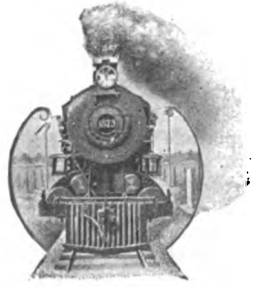
tions. Better wages mean more home comforts. Shorter hours for the bread winner mean not only better health for all, but shorter hours for the housekeeper. It was this apparent indifference on the part of women as individuals which showed the need of the formation of the Woman's International Union Label League, an organization which is filling a long-felt want. Although the underlying principles of our organization are unselfish, we fully realize that everything we do to improve the conditions of the natural bread winner of the family is indirectly in the best interest of every member of his household.

The objects of the Woman's International Union Label League are: To promote the welfare of the wage earners; to discountenance the sweatshop system of production by encouraging the sale of union-made goods; to gain a universal eight-hour day; to abolish child labor; to secure equal pay for equal work, regardless of sex; to aid the Sunday and early closing movement; to urge industrial and political equality for women.

The union label is by far the most effective weapon in the hands of trade unionists today. If union men and their families would buy only such goods as show the label, the result would be far more helpful to the cause than any strike could ever hope to be. According to statistics, child labor has increased 33 1-3 per cent. within the past ten years. This fact alone should inspire women to a determined effort to do their part to prevent the employment of children. They can do this by persistently demanding the union label. It will not be found on any article made wholly or in part by a child.

To organized labor I believe I can safely say: There is nothing you can do that will bring about better results than to devote time and effort to the organization of locals of the Woman's International Union Label League. Women must be taught the value of the union label, and that it is women who are the purchasing power. A united effort on the part of women in the interest of the union label would prove the greatest possible help to the organization of both men and women.

I am ever ready and anxious, upon request, to send information pertaining to this organization. Address Annie Fitzgerald, Int. Pres. W. U. L. L., 286 South Homan avenue, Chicago.



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Miscellany

*November in Upper Michigan.**

November! The very name suggests dull days, leafless trees and brown, sodden fields. The north wind is decidedly cool, and there has been some snow, also rain, but in spite of everything we are foolish enough to prefer our own Michigan to any other spot on earth, so it is a foregone conclusion that a few dull days won't scare us out. With the coming of November, the first fall of snow, and the appearance of "Jack Frost" the fancy of the hunter turns to the time when he will be able to get out into the woods after the fleet-footed deer, the gamey animal of the great north country.

This season has a special charm for the masculine heart and every year hundreds of "copper country" men go to the woods for deer, thousands of which are killed annually. Last year over 1,100 licenses were issued and as every hunter is entitled to two deer, and fully half of them succeed in killing this number, an approximate estimate can be easily reached of how many deer are killed every fall in this district alone, to say nothing of the number killed in other countries of the Upper Peninsula. The season opens November 10th, and it has been estimated by the State game warden that there are about six thousand hunters in the woods after deer at the present time. A large number of them are from the lower part of the State. Extra coaches are attached to regular trains and even extra trains are run for the accommodation of the hunters. Never before in the history of the Upper Peninsula has there been such an invasion of devotees of this exhilarating pastime from outside points. It is known that there are many illegal hunters roaming the woods (without license), but it is not likely that they will be caught by the game warden, as they are ever on the lookout for him and will vanish before he can "land" them. The men of the Upper Peninsula are not kindly disposed towards the men of the Lower Peninsula because of the fact that the latter sometimes hunt deer with dogs, this being unlawful. But many of the non-resident hunters utterly disregard the law, and the game warden, like the rest of humanity, has troubles of his own. Also, many inexperienced hunters will shoot at anything they see moving about in the woods, and many an unfortunate fellow hunter has been mistaken for a deer—and shot. Some one has suggested that all hunters should wear bright-colored clothing, red, yellow, etc. Imagine a hunter in such garb! He would not see any deer, though many of them would see *him*. While it is true that the deer are still plentiful, it is equally true that they are not as plentiful as in years gone by. A hunter who has never missed a season in the woods, states that "in a comparatively few years there will be practically no more deer in this country, and the hunter will have to content himself with shooting jack rabbits and partridges, and after a while he will have to try his skill on tin cans—a delightful prospect! The thinning out of the deer family in this country is said to be due to the large number of wolves, which of late years seem to have increased.

*By Mrs. Clyda R. Johnston.

The Voracious Wolf.

No man living, nor any number of men, can hold their own with the wolf—that shrinking, shaggy brute who moves noiselessly and tirelessly, whose muscles seem to be made of steel springs, and whose appetite is as insatiable as that of the dragon in fairy tales. Wolves drive the deer with a light, even, sliding run, against the persistence and seeming endlessness of which no deer is proof.

At one time a wolf was killed on Grand Island, which, while being hunted, devoured fourteen deer, one caribou and one elk, all of this in two weeks' time. It is said that the capture of this ferocious beast cost the Cleveland Cliffs Company in the neighborhood of $1,000 (one thousand dollars). It is simply a survival of the fittest. The wolf being the fittest of the two will survive, and he will live and flourish until his food supply is finally cut off. By nature, the wolf is shy, suspicious and cunning beyond all conception. Hunters say that the most alluring bait fails to even make him stop, and that he will pass it with a contemptuous sniff and an upturned nose.

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Kill a fat deer and leave it undisturbed and the "midnight butcher" will pass it by and kill his own game alongside of it, for the very fear of danger makes him shun the dead deer. He wants no assistance from mankind and is fully able to provide for himself. Where these wolves come from hunters are unable to state. A few years ago there was hardly a wolf on the Upper Peninsula. especially the northern part of it. Today it is full of them. It is thought, however, that they have come around the lake from Canada, and, if so, we have no reason to thank our neighbor for this class of immigration. It is said also that a large number of deer are being killed all through the year by homesteaders who reside in the woods on places where there is nothing raised and who buy no meat, and who live, and live well.

Trapping.

The trappers of Northern Michigan are preparing for a busy season, and the first price lists of the present season have just been issued by the fur houses of the country. As a general thing the best prices are obtained in December and January, although February is regarded as a very good time for catching animals in Northern Michigan, owing to the severity of the winters. The trappers say, however, that the present season does not promise such large profits as resulted last winter, for the prices obtained will not be so high. Mink still commands a good figure, beaver and otter are getting scarce, and the supply of marten is not nearly so large as might be desired. It is only on the rarest occasions that silver gray foxes are captured in Michigan, so they do not enter very largely into the calculations of the trappers. Fur trapping operations in Northern Michigan are more extensive than most people imagine, for fur-bearing animals are still quite plentiful in certain sections of this country. The season runs well into March and is at its height in December and January.

Fishing.

With the beginning of November the fishing season in the Michigan waters comes to a close. The fish are protected by the law at certain seasons of the year, just as game is protected on land. The fishing business in the waters of the State of Michigan is a great industry and has grown rapidly, though the fishermen claim that the season just ended has been a poor one, and attribute this state of affairs to the warmth of summer and the absence of wind, claiming that the fish do not move in still weather, which tends to arrest their growth. They have not only decreased in number, but such as were caught were undersized. The largest trout taken from the lake this season was caught along the "north shore." It weighed over sixty-five (65) pounds and measured—full length—about three feet. This is a true "fish story." These monstrous fish are called sturgeon. The great winter storms, together with the ice and snow, will put an end to the fishing on Lake Superior, and the fishing tugs have gone to the Wisconsin waters to commence operations there. Every year large concerns buy up all the herring they can ship to the Middle West, where they are sold at good prices, and large profits are made. There is at Duluth a United States fish hatchery, where millions of fish eggs are cared for and the tiny fish that are thus saved from destruction are again placed in the lake "to be caught another day."

Winter Hardships.

November also brings with it the dreaded winter storms some of which have already paid us their annual visit. An early closing of navigation is being looked forward to by a majorty of vesselmen and they assure us that we will have a "cold winter," by which they mean that we may expect an old-time winter. Of course we are all delighted with the prospect of having to grapple with old King Winter, and the fact that he will be more ferocious this year is cheerful to contemplate.

Many boats have already gone into their winter quarters owing to the fact that sailors at this time of the year refuse absolutely to sail Lake Superior after the blinding snow storms have set in. They prefer to remain on shore and are willing to forego their joyous (?) life on the "ocean wave" rather than find a watery grave, as many of them do every fall. The life of the "sailor brave" is not all sunshine by any means, for the winter storms cause no little amount of hardship and trouble, not only to the sailor, but to the master of the ship as well. The thick fogs at this time of the year are also accountable for

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much trouble and many disasters. Some of the boats are now making their last trip and navigation will close entirely in three weeks' time.

A Prosperous Country.

That this is, after all, a prosperous country, is shown by the fact that the logging contractors cannot find men enough to go into the woods. The lumber men have serious times just now, and "lumber jacks" cannot be had for love nor money, and the wages offered to this class of men are higher than usual this year. Some of the contractors have sent word into Wisconsin and other states asking for "choppers" and other woodsmen and offer high wages to any and all who will come. There are no idle men to be found, for everybody, including "father," is busy. The time is not far distant when the time-honored vocation of the lumberman will be a thing of the past and machine logging will be the only method worthy of consideration. The introduction of skidding machines on the Upper Peninsula is in the form of an experiment only, but the results so far obtained point to an early introduction of those or similar machines in all of the large lumber camps of this and other states. By the aid of this machine whole trees are being hauled in and later cut into cord wood. In a few years we will bid farewell to the "lumber jack," as he is commonly called.

But best of all, November brings with it Thanksgiving, the day of old-fashioned family reunions, when peace and harmony hover over all and the family skeleton is buried too deep for resurrection, and every one is quite ready to erect a suitable monument to its horrid memory by feasting with some cousin, or aunt and family, on that great day.

The Salvation Army in Northern Michigan are planning a Thanksgiving dinner for the poor people of their towns who have no special cause for thankfulness. There is no excuse for poverty up here where work is plentiful and wages are good, but the saloon—the most prolific cause of poverty and misery—is here as well as elsewhere, and its presence is felt. But our people generally are charitable and any appeal for clothes, money or provisions meets with prompt response. In spite of hard work, limited income and many disappointments, people are happier on Thanksgiving day than at any time in their lives, and should grow happier as the years go on.

So every day should be one of thankfulness to us, whether in June or November, and every day brings us nearer to that life that shall be an eternal Thanksgiving.

*Notes on Alaska-Yukon-Pacific Exposition.**

The Administration building of the Alaska-Yukon-Pacific Exposition is completed and is being occupied by the executive force of the fair.

The different counties in the state of Washington are planning to make appropriations for separate buildings and displays at the Alaska-Yukon-Pacific Exposition.

The first large exhibit building of the Alaska-Yukon-Pacific Exposition to be started is the Manufactures, Liberal Arts and Education Palace. It will cost in the neighborhood of $90,000.

A fully equipped fire department and a model emergency hospital will be installed on the grounds of the Alaska-Yukon-Pacific Exposition for use during the construction period.

President J. E. Chilberg of the Alaska-Yukon-Pacific Exposition is taking a trip throughout the East and Middle West in the interest of the 1909 fair.

A bill appropriating $1,175,000 will be introduced at the forthcoming session of congress to provide for the participation of the United States government at the Alaska-Yukon-Pacific Exposition.

A large force of men is now at work on the grounds of the Alaska-Yukon-Pacific Exposition at Seattle. All of the grading will be finished by January 1. In the meantime several exhibit buildings will have been started.

Portland, Oregon, is planning to erect a building at the Alaska-Yukon-Pacific Exposition and install therein a municipal exhibit. Spokane, Tacoma and several of the other large cities of the Pacific Northwest will also do the same.

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*From Department of Publicity.

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The Alaska-Yukon-Pacific Exposition will not ask congress for a loan, nor will it solicit any money for expenditure by the corporation. Uncle Sam will simply be asked to participate in the same manner as foreign governments and the different states.

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Hat Code in Kansas.

The Wichita (Kan.) Beacon, in reply to the question, "Please tell when and where are, or is, the correct time for a gentleman to lift or remove his hat?" gives the following reply: Without consulting authorities of etiquette; in fact, giving it to you offhand, so to speak, we should say at the following times and on the following occasions, respectively, the hat should be lifted or removed as circumstances indicate: When mopping the brow; when taking a bath; when eating; when going to bed; when taking up a collection; when having the hair trimmed; when being shampooed; when standing on the head.

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*Phosphorus.**

Phosphorus, formerly classed with the organic products because of its manufacture from bones and other organic substances, has within recent years acquired a place in the long list of mineral-derived materials. The mineral from which it was first obtained was the rock phosphate which furnishes the soluble phosphate fertilizer. A fluophosphate or chlorophosphate of calcium has been used in Europe and Canada to some extent, and a deposit of aluminum phosphate (wavellite) at Mount Holly Springs, Pa., has recently been mined for this purpose and successfully reduced.

The industry in this country is so young that statistics are difficult to obtain. The world's production has been variously estimated at from 1,000 to 3,000 tons a year. The greater part of the world's supply is made at Wednesfield (Oldbury), England, the output of the factory being about 500 tons a year. Other large factories are at Lyon, France, and at Greisheim and Frankfort, Germany. There is also a plant in Sweden, and six plants near Perm, in Russia, in 1890, had an output of about 140 tons.

In the United States the first phosphorus works were built at Philadelphia about forty years ago, and this plant continued in operation until very recently. Another plant was established at Philadelphia in 1891, and in 1897 the English firm operating at Wednesfield established a factory at Niagara Falls. This last named plant now supplies over 50 per cent. of the domestic product. The plant at Mount Holly Springs, where wavellite is used, reports a production of 25,000 pounds a month and a capacity of 40,000 pounds. From 30,000 to 40,000 pounds of phosphorus are imported into the United States annually.

The phosphorus obtained by most commercial processes is a crude form of the white or yellowish waxy variety, containing sand, carbon, clay, and other impurities, which are removed in various ways —by filtering while molten through powdered charcoal or canvas submerged in water, by forcing the molten mass through porous pottery by means of steam, and by redistillation in iron retorts. Because ordinary white phosphorus is very poisonous and injurious to handle, other forms of the element have been sought. A red amorphous phosphorus, which is not poisonous, is readily prepared by heating the ordinary variety to 250° C., in a closed vessel under pressure or excluded from air and water, but this has not the same properties as the white variety. A red crystalline form, which is not poisonous and which is an efficient substitute for the white phosphorous in making matches, has recently been discovered in Germany.

Phosphorus is chiefly used for making matches, which were first manufactured on a commercial scale in 1833. Parlor matches were invented in 1848 and safety matches in 1855. The white variety of phosphorus is used for ordinary matches, but the red amorphous form is used for safety matches. On account of the injury to health in making and handling the ordinary phosphorus and the danger from fire in using parlor matches, certain European countries have forbidden the manufacture and sale of the white variety, so that safety matches are coming into general use.

Phosphorus is sold in the market in round sticks molded through glass tubes and is usually stored in water. Its uses other than for making matches are for fuse compositions, rat and insect poison, phosphoric acid, and other com-

*United States Geological Survey Bulletin.

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pounds. It is also used in the precipitation of precious metals, in electrotyping, and in phosphor-bronze.

A brief account of the methods of manufacture of phosphorus and of the wavellite mine at Mount Holly Springs, Pa., together with statistics of production of the material, is published by the United States Geological Survey in an advance chapter from "Mineral Resources of the United States, Calendar Year 1906," on the production of phosphate rock and phosphorus in 1906, by Myron L. Fuller and George W. Stose. This chapter is now ready for distribution and may be obtained by applying to the director of the survey at Washington, D. C.

Effect of Pure-Food Law on Vanilla Trade.

Consul Julius D. Dreher, of the Society Islands, reports that the price of vanilla beans, which advanced last year, is still advancing, owing chiefly, it is said, to the operation of the pure food law in the United States, which prevents the extensive use formerly made of the adulterated product, vanillin. As good beans are now bringing from 50 to 60 cents a pound in Tahiti, the Chinese, who have almost a monopoly of the vanilla business, find it quite profitable.

*Work on Alaska-Yukon-Pacific Exposition Progressing Rapidly.**

The management of the Alaska-Yukon-Pacific Exposition, determined to have everything finished and in working order by June 1, 1909, the opening day, is busily engaged on the work on the grounds. All of the grading will be finished by January 1 and several of the large buildings well under way. The Administration building has been completed and occupied for several weeks.

The management is fully aware that the success of the exposition depends upon its being ready on time, and intends to take advantage of every minute of the twenty months it has in which to have the fair finished.

The division of exhibits and privileges will soon be organized and the work of arranging for displays and concessions inaugurated. It is the intention of the officials to start this part of their task far enough in advance so as to have all of the exhibit space allotted in time for the exhibitors to have complete installation on opening day.

*From Department of Publicity.

Medical Progress—A New Anaesthetic.

Consul F. W. Mahin, in a report from Nottingham, which appeared in Daily Consular and Trade Reports for December 21, 1906, briefly described a new anæsthetic called "stovaine," which when injected into the spinal column prevented pain, but did not produce unconsciousness. He states that a London publication now gives additional details, as follows:

It produces paralysis of the body below the point of injection and removes all sensation from the limbs, so that it has been found possible to amputate a man's leg while the patient retained consciousness, and could, had he been allowed to do so, have even witnessed the operation. The patient could feel no pain, and after the operation when sensation returned experienced nothing but the sense of bruising, which is one of the sequels of grave operations. For some time experiments with "stovaine" were confined to hospital cases, but we believe we are correct in saying that over a hundred cases have now been treated in private practice. The anæsthetic is, of course, of the greatest use in minor operations and in those where, owing to the patient's age or heart weakness, the administration of chloroform would be dangerous. It has been used in several gynæcological cases, and there is no evidence that any danger attends its use or that, given proper administration, any prejudicial factors accompany or follow its use. It is, however, a drug of great potency and demands the most skilled administration; so that for a time, at any rate, its application will be restricted to skilled operators. The curious name of the anæsthetic, "stovaine," is due to its discoverer, M. Fourneau. M. Fourneau was anxious to perpetuate his own name in connection with it, but as the anæsthetic was of the nature of cocaine and no compound resembling that could be contrived out of "Fourneau," he translated the name into its English equivalent of "stove" and added the necessary termination.

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George Ade and the Turkey.

George Ade on his last European trip spent a good deal of time in the Amerika's smoking room, but, as his wont is, was quiet.

The humorists of the smoking room clustered around Mr. Ade night after night. They told him all their latest stories. They did their best to shine before the young man.

One evening toward the end of the voyage they begged Mr. Ade to tell a story in his turn.

"We have done our best to amuse you," said a western millionaire. "We have given you many a yarn that will come in useful when you get to work on your next book. Now it's your turn. Fire away."

Mr. Ade pondered a moment. Then he said:

"I can't tell you a story, gentlemen, but I'll ask you a conundrum. What is the difference between me and a turkey?"

Everybody gave the conundrum up.

"The difference between me and a turkey," said Mr. Ade slowly, "is that the turkey is not stuffed with chestnuts until after it is dead."—New York Tribune.

*Ten Sermons in Thirty Seconds.**

There are many kinds of "memory methods," but no one has ever invented a scheme which will help a man forget.

If any man were half as good as he knows how, he would be twice as good as he is.

Most men flatter themselves that they can not be fooled by their fellows, but they are fooling themselves by supposing that they can fool others.

It is a most difficult task to drag to its destruction a beast of the field, but it is sometimes a hopeless undertaking to attempt to rescue a human being.

Reputation is what others give us. Character is what we give ourselves.

Some men are trying hard to get rid of sins. They will never succeed until they conquer sin.

Innocence is ignorance of sin. Virtue is sin conquered.

We are punished not so much for our sin as by our sin.

Most men are sorry not because they have sinned, but because of the result of their sin.

The devil never taunts the man of whom he is sure.

*By the Rev. Charles Stelzle.

Drawing the Line.

Tailor—Excuse me, sir, but could you pay something on your account today?

Customer (angrily)—Say, I wish you would quit dunning me so persistently. Do you object to giving me a little time?

Tailor—Oh, no; but I object to giving you that suit.—Columbus Dispatch.

A Great Scheme.

The great manufacturer visited the famous astronomer, and, throwing down a ten thousand dollar bill, said:

"I want you to devote a year or two to the work of ascertaining whether Mars is inhabited."

"I will gladly undertake the task," said the astronomer.

"And if you find that Mars is inhabited I'll give you ten times that amount if you'll find some way of establishing travel between us."

"That, I fear, will be impossible," said the astronomer.

"Well, you prove that Mars is inhabited and we'll do the rest."

"Why, may I ask, are you so anxious to establish travel between the two planets?" queried the man of stars and asteroids.

"Just this," snapped the great manufacturer. "We've got to find more children for our mills, and we've made up our minds to bust these labor unions, cost what it may. You get us into communication with Mars and we'll frame up a scheme to get her kids and ignorant men and women into our mills. Then we'll be fixed on the labor question for another hundred years."—Will Maupin, in The Commoner.

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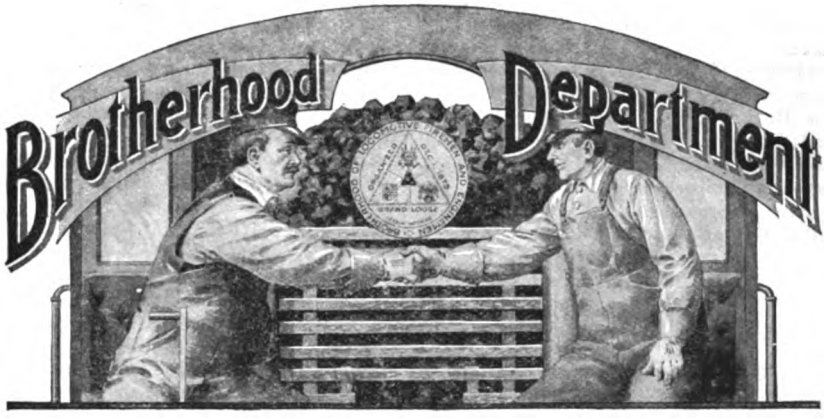

UNION MEETINGS

Great Union Meeting at Harrisburg.

One of the most successful, enthusiastic, and largely attended union meetings that has ever been held under the auspices of the Brotherhood was held, commencing Sunday, September 29th, in Harrisburg, Pa.

Probably the meeting is best described by repeating the account given of it in "The Harrisburg Telegraph" of September 30th, and which is as follows:

Of vast importance were the meetings of the Brotherhood of Locomotive Firemen and Enginemen, held in White's Hall on Verberke street, and which were presided over by Grand Master J. J. Hannahan, of Peoria, Ill., whose visit on this occasion was his first visit to Harrisburg since the firemen's convention here in 1894. Upwards of 1,000 delegates were present, representing thirty-five lodges, and coming from all over the United States, but mostly from the lodges east of Pittsburg and Erie. The presence of the Grand Master is always an occasion for a big gathering, but yesterday's sessions were of additional importance because First Vice Grand Master Wilson, of Jersey City, was on hand, and he is also a great man with the Brotherhood boys everywhere, especially in the East.

Throughout the day many important questions were discussed and Grand Master Hannahan gave timely instructions for further work. In the evening a special session was held at which there was an exhibition drill by the ladies degree team of nineteen members. This was the big feature of yesterday's sessions and the members of the Ladies Auxiliary were warmly congratulated by the representatives and higher officials. Their exhibition drill consisted of the formation of the letters B. of L. F. and E. The drill was perfect and the ladies presented an attractive appearance in their white costumes and white caps, with their staffs trimmed with red, white and blue ribbons. The evening session also included music, vocal and instrumental, and addresses. Grand Master Hannahan expressed himself as most agreeably surprised at the work of the ladies.

Gift for Bro. Wilson.

Just before adjournment Grand Master Hannahan was handed a package with instructions to present it to Vice Grand Master Wilson. The package contained a handsome pair of gloves and a silk full dress scarf. Mr. Wilson received the gift with timely words and strong expression of appreciation and thanks, and in turn handed Grand Master Hannahan a gold mounted umbrella, also a gift from the local lodges. In his remarks Mr. Wilson referred to being in God's country, where it rained only at night when all good men were in their beds, and that the umbrella would come in very handy in sections where it seldom did anything else but rain, and that it would also be found a valuable weapon.

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Grand Master Hannahan, in conversation this morning with a Telegraph representative, said: "I am glad of the opportunity to tell the people of Harrisburg of the great good accomplished by the Brotherhood of Locomotive Firemen and Enginemen. This is my first visit in your city since 1894 and I was most favorably impressed with your very extensive improvements, the clean streets, quiet Sabbath and the general air of push and progress everywhere in evidence. Harrisburg is a great town and deserves to be talked about everywhere. Your city is making good with a vengeance.

"Yesterday's meeting was the most successful held in Pennsylvania State in a long time, and for this reason it was decided to hold another meeting in Philadelphia on December 29th. You can say regarding the labor questions that the atmosphere is clear all over the country. No corporation is fighting us, nor is likely to, as we have proven our worth. There is not one week that we are not asked to furnish large numbers of men for various railroad lines, and our men are always in demand. This is an evidence that the Brotherhood of Locomotive Firemen is an organization that commands respect and confidence."

Many Admissions.

From January 1st until September 1st there were 12,274 admissions to the order, a record unparalleled in the history of labor organizations. There is every indication that the fall and winter months will add greatly to this increase. Eleven lodges are waiting to be instituted and that means several more thousand members. The total number of lodges in the United States, Canada and Mexico is 742, and the membership close to 66,000. The order started in Port Jervis in December, 1873, with eleven members. Since that time insurance and donations have been paid amounting to $10,549,765. During July the amount of insurance paid was $86,700; and in August, $72,500. In twelve months donations amounting to $95,000 were paid and death and disability claims to the amount of $947,100. The organization now has a balance of nearly three-quarters of a million dollars in its treasury.

Much credit is due the members of the local lodges of the Brotherhood of Locomotive Firemen and Enginemen for the successful meeting. The members of the committee were from Harrisburg Lodge No. 174 and William H. Morne Lodge No. 673. Everything possible was done for the entertainment of the visitors. Luncheon was served at noon. Many of the firemen remained over until today and were shown about the city."

* * *

Philadelphia Union Meeting.

From Philadelphia comes the news of another Union Meeting, and plans have been formulated and arrangements are already well under way which bid fair to make it a magnificent success. The date set for it is December 29, 1907. It is expected that the Philadelphia gathering will be one of the largest of its kind yet held, as no efforts will be spared to make it a record breaker.

We are not yet in possession of all the details as to arrangements, but hope to be able to publish full particulars in the December issue.

If the Philadelphia boys are figuring on beating that Harrisburg meeting of September 29th, last, they have most assuredly a gigantic task on their hands. The enthusiasm that is emanating from these Union Meetings is a grand invigorator, and the members in the East are to be congratulated upon their great work in this particular.

* * *

Official Circular No. 16 of the Grand Lodge.

OFFICE OF GRAND MASTER.
PEORIA, ILL., Oct. 17, 1907.

To All Subordinate Lodges:

Sirs and Brothers—I desire to call attention to the following letter from the Commercial Telegraphers' Union of America, which has just been received from the General Secretary and Treasurer of that organization, Brother Wesley Russell:

"CHICAGO, ILL., Oct. 14, 1907.

To Organized Labor, Greeting:

The Commercial Telegraphers' Union of America is now engaged in a life and death struggle with the Western Union and Postal Telegraph Companies and the Associated Press. The fight was not of our seeking, but came as a result of a lack of good faith on the part of the telegraph companies in failing to keep

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either the letter or spirit of an agreement made with us.

The lines of these great companies extend into almost every city, town and village in the United States. Our people are on strike in nearly two thousand cities and towns, and we have fully twenty thousand people to care for during this trouble. About fifteen per cent. of our members are working in positions that are fair, and they are paying liberal assessments weekly, but this source of revenue is entirely inadequate.

The companies lost fully ninety-five per cent. of their telegraphers in the fair-sized cities and towns, and our people are making a fight that I believe should command the admiration and support of the labor world.

We are out now ten weeks, and the desertions from our ranks have been very few.

The companies are determined to starve us into submission. Our people are equally determined to fight until victory is theirs. The Western Union and Postal Telegraph Companies have an aggregate capitalization of more than two million dollars. Our resources are limited, and the demands of our people for financial assistance have been extremely reasonable. These demands are now becoming heavier and we must meet them. If organized labor will assist us in this crisis we can and *will win.* A defeat to us would be a set-back to the entire labor movement.

We are asking for an eight-hour day, equal pay for equal work by women, 15 per cent. increase in wages, and that the companies furnish the typewriters used in their service.

After ten weeks on the firing line we find the courage and determination of our membership undaunted, but ammunition (money) is running short, and the work of raising funds daily becomes more difficult.

We have this battle won if we can secure the necessary support to enable us to hold out a few weeks longer. Will you help us?

Trusting that you will at once take the necessary steps under your laws to secure us an appropriation, and that you will bear in mind that this is a case where "He who gives quickly gives twice," I beg to remain,

Yours fraternally,

(Signed) WESLEY RUSSELL,
Gen. Sec.-Treas.

Approved by the General Executive Board.

(Signed) S. J. KONENKAMP,
Acting Chairman.
JOS. M. SULLIVAN,
M. J. REIDY."

Under our laws there is no provision made for the appropriation of funds for the purpose above named, but I have decided to submit to our members the appeal of the Commercial Telegraphers' Union so that each can act voluntarily in the matter as his circumstances permit him to do.

I am satisfied that any contributions that may be made with a view of assisting our brothers in supporting the principles of unionism in which they are making so earnest a fight will be thoroughly appreciated by them, and no doubt the money can be used to good advantage at this time.

All contributions should be sent in postoffice order, express order or bank draft to Brother W. S. Carter, Grand Secretary and Treasurer, who will issue receipt, make record, and remit same to the treasurer of the Commercial Telegraphers' Union.

All contributions must be remitted separately from any other money and a letter should accompany such remittance, in which it should be distinctly stated from whom, or what lodge the contribution comes.

Fraternally yours,
JOHN J. HANNAHAN,
Grand Master.

Attest:
W. S. CARTER,
Grand Secretary and Treasurer.

* * *

Why the October Magazine Was Late.

Owing to a general strike of the International Brotherhood of Bookbinders our October issue was considerably delayed in reaching its readers. That number was already in the bindery when the strike became effective.

The prolongation of the strike at Indianapolis was due chiefly to a difference of interpretation placed by the contending parties on the provisions of a contract entered into during the strike of the Typographical Union in 1905. It took somewhat over a week for the parties interested to reach a settlement, during which time, of course, no binding

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work was done on the Magazine, which was the cause of the delay in its delivery.

We are glad to announce that the strike has been satisfactorily settled and that harmony once more prevails between the bookbinders and their employers. In every shop in Indianapolis but one that was a union shop before the strike, as well as generally throughout the country, the bookbinders are now working eight hours per day instead of nine without any reduction in wages.

* * *

Sparks.

The best method by which a fireman can improve himself is to follow in the footsteps of many of those who have gone before him. Carry a small library of useful works in the seat box and utilize the time spent on sidetracks in improving your mind, protecting your family and helping your fellow man. Study brings its reward.

Brothers, it is an easy thing for you to sign your letters for publication. Please bear in mind that we positively cannot give any attention whatever to them unless they bear the signature of the author. It is not necessary that the name of the writer be published, but it must be attached to the letter as evidence of good faith. We receive numerous letters from various sources signed "Subscriber," "Member," "Ex-Fireman," "Well-Wisher," etc., many of which are so meritorious that we would very much like to give them space, but as the name of the writer is absent we, of course, cannot publish them. If you want your letters published let us know who you are, and if you do not want your name to appear in the Magazine in connection with them, so advise and your wishes in the matter will be absolutely respected and the authorship of the letter retained as a matter of inviolable confidence.

The Catechism of the Electric Headlight is just exactly what its title implies; it is the standard authority on the workings of that modern appliance, and will teach you all details about it and how it should be handled. If you want to become familiar with this up-to-date headlight, send for a copy of that little book, which may be had from John F. McNamee, Editor and Manager, 806-7 Traction Terminal building, Indianapolis, Ind., for the sum of fifty cents.

H. R. Stoepel, of Detroit, Mich., maker of the "Starunion" overalls, is devoting the space of his advertisement this month to telling our readers about the new patent fire-proof leg his factory is turning out. This is something that will interest all firemen, who know how quickly the overalls burn out on being exposed to the intense heat from the firebox. Read the ad and you will become interested in it at once.

If any person has a copy of the June, 1902, issue of the Magazine, and is willing to dispose of same, we shall be glad to have him send it to John F. McNamee, Editor and Manager, 806-7 Traction Terminal Building, Indianapolis, Indiana, who will be pleased to remit the usual price for same.

Have you ever admired the brilliant rays streaming from that modern locomotive appliance—the electric headlight, and wished to master its workings in all their details and to understand its mechanism? You can easily gratify that desire by sending fifty cents to John F. McNamee, Editor and Manager, 806-7 Traction Terminal building, Indianapolis, Ind., and requesting him to send you a copy of the Catechism of the Electric Headlight. That is the name of the only little book on the market that can give you the desired information.

Mr. William Thompson, president of the Kalamazoo Stove Company, whose ad appears in this issue of the Magazine, recently gave out an interview wherein he justified the practice of purchasing direct from the manufacturer by mail order on the ground that it effects a saving on the price paid for the commodity, and any such saving means increased savings to the community.

The strength of our Brotherhood lies right in its own membership. Therefore the more energetic and loyal our members are, the stronger and more impervious to the effects of undesirable proselyting. The firmer we stand together the stronger our bonds of unity.

No more handsome litle pocket book on the market than our edition of the

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Catechism of the Electric Headlight; and the beauty of the thing is, there is no more authentic work on this most modern of all locomotive headlights. All enginemen and firemen should possess one, as the day is not far distant when all locomotives will be electrically lighted. The price of it is fifty cents, and may be had from John F. McNamee, Editor and Manager, 806-7 Traction Terminal Building, Indianapolis, Ind.

Whenever a brother approaches you and begins to complain about the officers of the lodge or the Brotherhood, it is generally well to ask him when he was last at lodge meeting, and nine times out of every ten the man who complains does so because he has been misinformed, and did not get his information at first hand in the lodge room. Ever think of that?

The Greene Railroad Safety Device Company is now financing for the manufacture of a device that it claims to be a "positive security against open switch accidents" on railroads. If the device is all that is claimed for it, its adoption on railroads will mean a vast future saving in life. limb and property. The company is advertising the sale of stock therein in this issue of the Magazine, and as the perfection and adoption of a device of this kind is of more vital importance to railroad employes than to any other class, the company hopes to sell small holdings of stock to a large number of our readers.

Everybody at some time during life seeks a gem of some kind. We have one of the finest gems of technical literature for enginemen, along its particular line, in the world, the Catechism of the Electric Headlight. We are enjoying a splendid run on this book, and it is recognized as the standard work on that modern illuminating device. It is sold for fifty cents per copy—worth twice as much. Write or send price to John F. McNamee, Editor and Manager, 806-7 Traction Terminal Building, Indianapolis, Indiana.

The Magazine is in receipt of a letter advising that Lodge 75 is advancing the candidacy of Bro. J. Dowlin Myers of that lodge for a position on the railroad commission, which, under a new act of the State, is appointive by the Governor. Brother Myers is deserving and we trust that he will ride to victory on his lodge's recommendation and the support of his fellow-workers. The Governor will make no mistake in his selection, should he choose Brother Myers.

The Hoosier Stove Company has been an advertiser in our Magazine for several months, and reports that it is making sales right along. They have a stove that is the product of union labor and it is sold at a reasonable price, so that any prospective buyer of a new stove should certainly write to them for their prices before buying elsewhere.

Every man who is wideawake to his own interests dislikes to be considered as not up-to-date. If you have not yet secured a copy of our Catechism of the Electric Headlight, you should do so without delay and post yourself upon the mechanism and intricacies of that up-to-date headlight. If the railroad company for which you are working has not yet adopted that device as the standard, they will do so in the very near future, and there is no better descriptive book on the market than we are selling for fifty cents. Address John F. McNamee, Editor and Manager, 806-7 Traction Terminal Building, Indianapolis, Indiana.

If you are honest with yourself and your family, you will attend lodge meetings regularly, work hard to strengthen your Brotherhood and will protect its good name from slander and unkind words. It is the bulwark surrounding your position and your home.

This issue of the Magazine has a larger volume of advertisements than has appeared in any one issue for many months, and the ads are all of them attractive and of good quality. This means that business men are realizing more and more the importance of gaining the friendship and patronage of the railroad people. The object of the Magazine in carrying these advertisements is, of course, to earn a revenue for the Brotherhood, as well as to keep our members informed as to prices and values of those commodities that they have to buy. The object of every reader should be to buy so as to get best value for his money, and, all things being equal, he should certainly assist the Brotherhood by buying from the Magazine advertisers.

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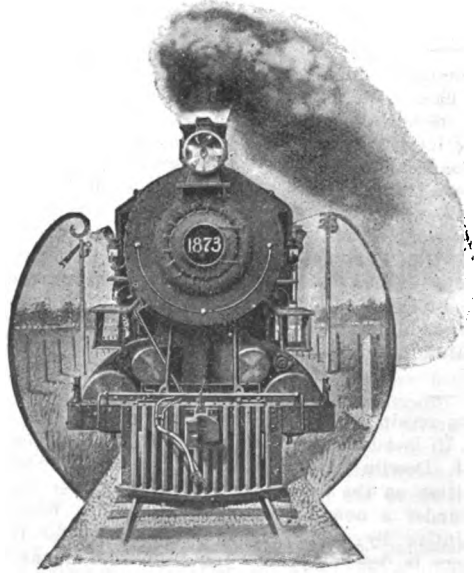
Always demand the union label on all your purchases. It is the insignia of fair play and the silent worker that is destroying exploitation of infants. Be thoroughly union and patronize nothing but union institutions.

The Hanover glove factory began a series of full-page advertisements of "Hanover Gloves" for railroad men in the October issue of the Magazine. An interesting feature of this glove is that the palm leather is stitched to the back leather by means of a patented strap passing between the fingers, thus making it impossible for the glove to come apart. This feature is clearly illustrated in their advertisement.

Edward J. O'Byrne, of 163 West Sixty-sixth street, New York City, N. Y., advises us that he has the following Magazines for disposal: March to December, inclusive, 1903, as well, also, as all of the numbers for each 1904, 1905 and 1906. Brothers or others desiring these numbers would do well to write him concerning same.

We show in this month's Magazine an illustrated advertisement of the "Farney Handstone," an invention made from carborundum, which, if used in conjunction with soap and water, will thoroughly cleanse the pores of the skin of dirt, grease and grime without the least injury to the skin. This is a novelty that costs but little and will last a lifetime. Every reader of the Magazine who values clean hands and a soft skin will be interested in the advertisement of this handstone, by F. A. Reichardt & Co., of New York City.

Brother H. E. Cochran, of 422 West Bacon street, Pottsville, Pa., is desirous of obtaining a copy of the Magazine of August, 1903, issue. Anyone having such copy for disposal will do well to write to the brother above mentioned.



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Old Beneficiary Certificates.

Complications continue to arise in death claims where members have failed to surrender their old beneficiary certificates and attempt to change their beneficiary, and die before the matter is adjusted.

So far only about forty thousand (40,000) members have protected their interests, and the interests of their beneficiaries, by exchanging for the new form of certificates. Many members seem to take no interest in the matter.

Secretaries are urged to do all they can to induce members to surrender their old certificates. Remember that it is impossible for a member to change his beneficiary on the form printed on the old certificate.

Mothers and Wives of Deceased Members.

No doubt in many instances members have their beneficiary certificates issued by this Brotherhood payable to their mothers, or fathers, and have other insurance protection for their wives and children.

In a great many more cases it will be found that members have married since their beneficiary certificates were issued, and they "intend" to change the beneficiaries now named in their certificates so as to protect their wives and children.

It is surprising how many members die without carrying out their "intentions." Repeatedly secretaries write to the Grand Lodge to learn if it is not possible to pay the proceeds of a certificate to the widows and orphans, as "it was the intention" of the deceased brother to have changed his beneficiary, "but kept putting it off." The only reply that can be made is that the insurance carried by the deceased brother can only be paid to the beneficiary named in the certificate.

Of course, no member expects to die in the near future, but the records of the Grand Lodge show that nearly 500 of them have died during each of the past three years. Even though a man gives no thought to death, he should think enough of his wife and children to protect them.

In most cases the widow, discovering herself without a dollar to provide for the children of the deceased brother, rushes to a lawyer. A protest is filed with the Grand Lodge against payment of the claim to the beneficiary named in the certificate, on the grounds that her husband had said, in the presence of witnesses, that he "was going to have his certificate changed," etc. In some cases the member before his death had attempted to make the change on his old certificate. The widow in nearly every instance loses the suit against the person named as beneficary.

When a widow finds herself with her husband's corpse on hand, and without anything with which to support his children, she will find that she can usually get more consideration from the person named in her husband's certificate as beneficiary by appealing to his or her charitable sentiments, than by bringing a lawyer into the case. In some instances the mother, although propertyless, has divided with the widow. In one case the mother, not being in poverty, assigned the entire amount to the children. In one case, however, the mother and father, who were the beneficiaries, refused to let the widow and orphans have a cent, and threatened to sue the Brotherhood because the lodge had deducted the expense of their own son's funeral from the proceeds of the certificate.

And yet, thousands of our members are "going to" attend to this matter—and never will.

Increase and Decrease of Beneficiary Certificates.

Secretaries and members should remember the following requirements of the Constitution:

To decrease a member's insurance he must file with the Grand Secretary and Treasurer, (1) an application for such

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decrease over his own signature and (2) his old beneficiary certificate, which will be cancelled at the same time the new certificate for a smaller amount is issued.

To increase a member's insurance, he must file with the Grand Secretary and Treasurer (1) an application for beneficiary certificate (Form S-19), in which the amount of insurance he desires to carry will be specified, and (2) his old beneficiary certificate, which will be cancelled at the same time the new certificate for a larger amount is issued.

No member can secure a new certificate for either a smaller or larger amount and retain his old certificate. He must surrender his old certificate or his application for decrease or increase is void.

Section 172 of the Constitution is explicit that in all cases where members desire to change their classes of insurance they must file with their application for such changes their old certificates.

Not a quarter passes that secretaries do not send to the Grand Lodge office applications for increase of insurance of members, which applications are properly accompanied by applications for beneficiary certificates (Form S-19), as is also required by section 172. To expedite matters, the Grand Medical Examiner has examined and approved the application for beneficiary certificate and the Grand Secretary and Treasurer has written to the secretary that the member's old beneficiary certificate must also be sent in. Time passes and the old certificate is not received. The first of the following quarter is reached, when all increases and decreases must take effect, when it is discovered that the Grand Secretary and Treasurer has on hand many applications for increase and decrease for which the old certificates have not been surrendered. The result is the new certificates can not be issued, the old certificates remain in force, and if the application has been for an increase the approval becomes void and the member has to incur the expense of another medical examination.

For the protection of the Brotherhood's interest, where increased insurance is applied for, no more applications for beneficiary certificates (Form S-19) will be referred to the Grand Medical Examiner unless the member's old certificate is filed with the application. Read the law carefully, which is as follows:

Sec. 172. A member desiring to decrease the amount of his beneficiary certificate shall make application upon the form furnished by the Grand Lodge for this purpose, and shall file said application, together with his old beneficiary certificate, with the secretary of his lodge, taking his receipt for same, who shall immediately forward them to the Grand Secretary and Treasurer.

A member who shall apply for an increase in the amount of his beneficiary certificate must file with the secretary of his lodge an application for insurance, upon the form furnished by the Grand Lodge, his old beneficiary certificate and an application for beneficiary certificate, the same as a new applicant. In his application for beneficiary certificate he must state the amount of insurance he desires, and the medical examination must be made in the same quarter in which the application for increase is made. A member will not be granted an increase in his beneficiary certificate if he has passed his forty-fifth (45) birthday, and he will not be granted a Class D, or Class E, beneficiary certificate if, at the time of his medical examination, he has passed his fortieth (40) birthday.

No member shall be permitted to change the amount of his beneficiary certificate except prior to the beginning of the quarter, and provided not less than thirty days' notice be given to the secretary of his lodge of the proposed change. Such changes, made in accordance with this section, shall take effect on the first day of the following quarter.

Section 68 provides that "when a member's beneficiary certificate has been lost or destroyed, or possession of same is denied or refused to the member by any one having possession of same, the member may direct its cancellation, upon a form prescribed by the Grand Secretary and Treasurer. If a member's beneficiary certificate is lost, he should secure a new certificate, when he could easily change the class of same or the beneficiary named therein.

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Forum

Absorption vs. Consolidation.

I feel that there are some of us who can conscientiously cast a vote in opposion to consolidation of the B. of L. E. with the B. of L. F. and E.

In one respect I am like our worthy brother from 212, I like to read my Magazine; but in another sense I am very much unlike him, and that is I can not see where we can base sound logical argument in favor of consolidation. With all due respect to our brother—and no man admires his fidelity to the old "tried and true" more than I do—I can not see how he could overlook the injuries of the past and shake hands with the men who have stolen from our brothers the fruits of their labor; to do this would be about as useless as to attempt to yoke together the wolf and the lamb and expect them to lie down in peaceful quietude. There is one exception which I must make and take issue with the brother on, and that is where he says "we have fought together and won;" I am inclined to believe that when we review the history of the B. of L. E. and our own organization, we will find that the B. of L. E. almost invariably permitted the B. of L. F. and E. to do the winning, and that the other organization has lost no chance in trying to thwart the aspirations of our Brotherhood.

I have for some few months been trying in my own feeble way to play the part of a locomotive engineer, and notwithstanding that the members of the B. of L. E. have frequently intimated that it would be well for me to belong to their organization should I lose out here, I retain my membership in the old "tried and true" and hope to be a member still when you next hear from me, which, if I follow the past as an example, will be some time; nor do I believe that the B. of L. E. will have been consolidated with the B. of L. F. and E. in the meantime. The brother refers to us as twin organizations. I can hardly swallow that, for I am an American citizen and believe in the doctrine of the Pilgrims—every man worshipping according to the dictates of his own conscience. I will admit that our duties are so closely related that in the discharge of them the engineer and fireman often die together; but the organizations as twins—never; they of the B. of L. E. are too drastic in their crabbed conservatism for us to assimilate that organization through consolidation. Look into your dictionaries, brothers, and see if the word "consolidation" should not be substituted by the word ABSORPTION—through the education of our young runners in the virtues of their own dear old Brotherhood; it strikes me that looks much better and much more reasonable.

Wishing our Brotherhood unlimited success, I am unequivocally against consolidation and a strong advocate of an educational absorption.

T. T. MARTIN, 569.

Consolidation Is Best.

I notice in the September issue of the Magazine two letters upon the subject of the title of this article, one brother of Lodge 21 being thoroughly opposed, and another brother of Lodge 212 being heartily in favor of and advocating the idea. I have been a member of our noble Order for eighteen and one-half years (I was initiated in Saratoga Lodge 209, March, 1889), and since have, from time to time, traveled quite extensively in the west and south, and met a large number of brothers, most of whom have expressed themselves as being satisfied with the B. of L. F. and E. A considerable number of these brothers are engineers, many of them with ten or more years of service as such to their credit. Some of them are members of the B. of L. E. but retain their membership in our Brotherhood. A great many B. of L. E. men have been honest enough to tell me that our (the B. of L. F. and E.) insurance is the better and cheaper insurance. Now, then, such being the case, will it not be possible in the not distant future to consolidate the two orders under our present name, and run the thus constituted organization under our own liberal laws instead of the laws of the B. of L. E.?

I have many friends in the B. of L. E., many warm personal friends, some of whom withdrew from our Order several years ago, before we were in position to

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give them the protection as engineers which they needed. I have, however, yet to find one of them who is in favor of the present policy of their Order. I am therefore inclined to believe that the day is not far distant when they will make a change in their Grand Officers, laws and policy, and if we could then unite in one order under our present name, or even for the sake of a consolidation—and thus secure harmony between the men on both sides of the engine—put the E. ahead of the F., and make it the B. of L. E. and F. We could even go so far as to adopt a portion of their laws without in any way lowering the dignity of our own Order; but let the insurance department be like our plan instead of in any way like theirs. If we can persuade the older runners with a kindly argument that this is the way to secure harmony between the two orders, I for one would be heartily in favor of consolidation; but as long as they retain their present policy, it should not by us for a moment be thought of. Let us have a friendly and thorough discussion of this matter in our Magazine, and see if we can not unite the two, now discordant, brotherhoods, into, as they should be, one friendly order.

While I have been out of railroad service for eleven years, I am proud to still be a member of the B. of L. F. and E.

Come, brothers, reason this matter out and let us have your opinions upon the question of consolidation.

J. W. FARRAR, Member 353.

They Are Still At It.

I desire to call to the attention of our membership some of the despicable tricks the members of the local division of the B. of L. E. are resorting to on the D. & H. Two of the most prominent members of the local division are getting very energetic in endeavoring to induce those firemen who have not yet become members of the B. of L. F. and E. to remain out of the labor movement until they are eligible for membership in the B. of L. E., and then they will take care of them. Well, if there is one thing sure, it is the fact that if they wait until they are eligible for membership in the B. of L. E., they will not join the labor movement by securing membership in that organization, or at least not in the proper sense of the word.

In spite of the contemptible underhand methods they adopt in trying to drive prospective members out of our way, we are succeeding remarkably well, in that at the last two meetings we have actually taken in two engineers whom the B. of L. E. people could not begin to persuade to join them. Is not the resorting to such tricks evidence that they feel the truth of the argument that they are waning? MEMBER 71.

Is Good Enough for Them.

Our promoted men are retaining their membership in the old "tried and true" and seem to realize that in the B. of L. F. and E. they have something that is good enough for them. Personally, I do not believe that I could be persuaded to leave the sheltering branches of the B. of L. F. and E. for the ranks of an organization that has officially endorsed scabbing. Stay with the Brotherhood, boys, when you have been promoted, and you will then learn the benefits of a more solid organization and co-operation than when the line divides us.

MEMBER, LODGE 59.

Our Interests Are Mutual.

Our lodge (548) is gettng along nicely and we have a good many members, several of whom have fortunately passed their examinations and climbed to the right-hand side of the cab. Again, we have some very good friends on our system who are active members in the B. of L. E., and I am sure that if they were all like the members of whom I speak there would be no antagonism between our Brotherhoods, and the sister (?) organization would never stoop to the depths its present Grand Officers have carried it.

I believe that if ever two orders should be close together it is the B. of L. E. and our own Brotherhood. Our interests are so closely interwoven that if they would but stand firmly on the labor platform we could, combined, go up against any grievance that might come up and win out without having to parley. I think it is simply outrageous that two organizations like ours should be split by the narrow-mindedness of some who never were really true Brotherhood men, and whose crabbed smallness

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injures those who are large of heart and willing to do the right thing when it comes to protecting the homes, the families and the positions of the membership. When we consider how often it is we see in our list of death claims the same lodge number twice in consecutive order with the words "derailment of engine" or "boiler explosion," it should teach us that we are frequently called from this life in each other's company, and the men who are responsible for the insertion of those obnoxious laws into the constitution of the B. of L. E. have a great weight of moral responsibility to carry that they don't seem to realize.

We have a lot of good, fine B. of L. E. men in this section of the country, but I am like many more of our boys. If I was told that I had to join the B. of L. E. and give up my membership in the B. of L. F. and E., I would certainly refuse to be intimidated, and yet because I have the courage to express my opinion as to the reprehensibility of the practices recently indulged in by some members of the B. of L. E., those who do not personally like me tell me that I am a dynamiter and ought not to say such things in the Magazine; but the "truth is the truth," and, while it may hurt some there is where my heart lies and I am going to remain with the honorable old Order.

I wish to thank the member of 499 who wrote the letter appearing in the Forum department for September, as it fills the bill, and I hope that he will write again, as he surely has a good scheme for keeping the members with us. I will come to a close by thanking the brother from 212 for his ideas, which I believe are all right. The boys ought to sign their names so we would know them.

J. H. WALLACE, MEMBER 548.

Have They Migrated?

If the news from Cuba be true, the engineers in that little island are of the same stamp as those employed on the Southern Pacific, Atlantic System, and who endeavored to "keep the wheels turning" during the late unpleasantness. The New Orleans Picayune for September 27, had a news item dated from Havana, Cuba, on the 26th of September, as follows:

A general strike of the employes of the United Railroads and the Havana Central Railroad was declared today. Trains are running with the help of engineers only, without firemen or conductors. A tie-up of all the roads in the island is feared.

Since the above appeared in the New Orleans paper I learn from the Toledo Citizen of October 6th, that fifty strike-breakers are being sent from the United States to help those engineers "turn" the wheels.

Can it be that those despicable specimens of humanity who took our places on the S. P. have been persuaded to face the dangers of the deep and migrate to Cuba to try and down those poor firemen and trainmen who are endeavoring to get fair wages and better working conditions on its railroads? When we realize the depth of their perfidy we should not be surprised to learn that these engineers on the railroads in Cuba are pets of the Big Chief—anyway they are tainted with the same obnoxious odors, their disease is similar, and they are doubtless proud members of the great International Brotherhood of Strike-breaking Wheel-turners.

Thank goodness our lodge has lost but few of its members in the past few years, and they are men who had been expelled from our own Order for non-payment of dues, so their worth as members did not add force to our fighting strength. When that organization knowingly admits to membership the delinquents of another brotherhood, it is evident that they are not very particular as to the standard of the personnel of their own society. MEMBER 399.

We Had Better Consolidate.

Before reading this letter, I would be pleased to have the readers turn to page 423 of the September issue, and carefully digest "A Question Answered" and "Would Consolidate;" then compare them with reference to the idea of consolidation.

In "A Question Answered" we find a somewhat pessimistic view of the question, and we are invited to look back some ten years, and then we are invited to see what? what the writer sees, "the utter fallacy of the proposition."

Now, beneath this request may be found the words of another, one who has been a member of the good old Brotherhood for twenty-five years, and he can doubtless look back some ten years more

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and then some. Let us see what he says. "How many members of either order could conscientiously cast a vote against consolidation of the twin brotherhoods is beyond my comprehension."

To me it would seem that one brother overlooking the benefits of a closer affiliation in our callings, and the results of individuality, seeks to build up logical contentions upon what is at present proving our stumbling block in the attempt to obtain commensurate wages. The other brother evidently realizes that every inch we get further apart is that much the greater chasm to bridge ere we reach success in handling our grievances and bringing to us what rightly belongs to us.

There is a division of opinion which may be rightly expressed through the columns of our Magazine, and we must never overlook the indestructible truth that men standing together, with their arms entwined, are capable of sustainink more weight between them than two men who are standing so far apart that their hands are not sufficiently close to prevent the enemy crawling through the break. One brother states that "the B. of L. E. is so arrogant that no self-respecting member of the B. of L. F. and E. could combine his interests with theirs and retain his manhood in any community." Rather a strong expression when we consider that the other brother has evidently remembrances where, as he says, "we have fought together and won victories, and were trimmed to a standstill together." Here, again, arises an opportunity to do a little thinking and a whole lot of reasoning on both sides. If our interests were not almost identical with theirs, would we have fought together? If we then allied our forces there must have been something which called forth that solidarity. If our interests were then identical, why, then, should we stand apart? When we realize that the membership of the other community originally emanated from the ranks of our own Brotherhood, it seems strange that they should have conceived the idea that antagonism would effectually strengthen the cause of labor. Something illogical there. Again, is there a member of our organization who would not be proud to belong to the strongest labor organization on earth and one that stands for the betterment of its own interests and conditions? I tell you, brothers, that the question is a serious one.

When we seek concessions, the way things are now, there is scarcely a railroad official who takes your demands very seriously, whether you are a fireman or an engineer, because he knows that the house is divided against itself; and both organizations have practically been unable to demand their rights, while the combination of the Conductors and Trainmen have made more than one official sit up and take serious notice. The scratching of a sore does not heal it; it merely irritates it the more, and the only way to cure it is to remove the cause; therefore, let both organizations throw aside prejudices, repeal obnoxious laws, forget and forgive, and, as the brother who wrote "Would Consolidate" appeals to all that is good and manly in us, let us give his thoughts serious consideration. There is one thing sure—antagonism never brought favors nor successes from opposing forces that are so equally divided; but it has always been nothing more nor less than wasted energy for both parties and a loss to all. Let us ask the question of the members of the B. of L. E.: What would be your objections to consolidation? Does your present course enhance your opportunities of gaining advantages which the combined strength of the engine service demands, and which to obtain really requires absolute harmony? Then, again, let us turn to the other side and realize that there are amongst the membership of the B. of L. E. men of sound judgment and ripe years who could give valuable advice in the lodgeroom at critical moments; who can deny the fact that had the brotherhoods been united, even in a close alliance, the trouble on the S. P. would never have occurred. To the two lodges of the B. of L. F. and E. and B. of L. E. in Ohio, which voted unanimously for consolidation, I say, well done. You have evidently realized the only method by which we may hope to gain our ends, namely, through an unbroken strength.

Let us see some of those well-meaning members of the B. of L. E. champion the cause of closer affiliation, and perhaps when their next convention meets the stumbling blocks may have been removed and the path made clear. The railroad companies will then accord to us the recognition which our combined energies will command. The closer the piers the stronger the bridge.

MEMBER 126.

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The Kind of "Consolidation" That Counts.

Our lodge has fifty members, thirty engineers and twenty firemen—all of whom belong to the B. of L. F. and E. There is not a B. of L. E. man working within the jurisdiction of 239; therefore we have taken no live interest in the jurisdiction question as we have it here, so that the *one committee serves for both sides of the engine.* Every man belonging to the same lodge makes it extraordinarily pleasant, and the boys on the left side always get a square deal and a friendly smile. If our promoted brothers will only do as we have done, retain their membership in the old "tried and true," they will soon be enjoying the same treatment as are we, and there will be *one grand organization* working under the liberal provisions of our constitution, and class differences on the engines will be unknown.

MEMBER, LODGE 239.

Fancies Dissolved by Facts.

A general chairman of G. C. of A. of one of the lines of railroad operating through the "Lone Star" State addressed letters to several young runners of our Brotherhood, in an endeavor to persuade them to relinquish their membership in the B. of L. F. and E. and seek affiliation with, and membership in, the very Order which had but recently scabbed upon their brothers on a railroad running through the same section of country. Such missionary work as this chairman endeavored to undertake is of little avail, however, in the locality where the membership of the B. of L. F. and E. has had the opportunity to witness, first hand, the perfidy of the Order to which he belongs. Like others of the leading lights of that organization, he was evidently rounding them up in a hurry so as to make the appearance of a great influx of membership. In his letters he says: "In my rush I overlooked you two, and maybe others." In fact, he was in such a "rush" that the comparisons made in his letter do not altogether stand the test of investigation, and the one I have to hand is strongly suggestive of an elastic imagination. His arguments are neither logical nor reassuring, and while I for one do not take any stock in them, I give a few samples of them for the benefit of those of our readers who may have the slightest indecision as to their future action.

First, he advances that old, time-worn, stereotyped argument of craft classism and says: "When a man is firing he should belong to the B. of L. F., and when a man is an engineer he should belong to the B. of L. E., and when he becomes a general manager he should belong to the General Managers' Association," etc. Now that may sound all right when put forth orally, and one has to keep time with the talker in order to know what he is saying; but when it comes to putting such arguments into black and white it becomes different, as we then have an opportunity to dissect them, so to speak, and thrash out the idea and see if there is any truth in the assertion or logic in the argument. Now, then, to start with. Don't forget that this argument should be regarded absolutely and positively from the viewpoint of a trades unionist and not from the viewpoint of an insurance agent, or strike-breaking agency official. To use such an argument in the specific manner in which this man did in the letter to me, is about as forceful and as logical as to say that a man and his wife should have separate homes, but this we know is foolishness in the extreme, and since the B. of L. E. has grossly violated the first principles of unionism and co-operation, it has no right whatever to pose as a labor union. There is so little distinction between engineman and fireman that there is now only one order in which he may rightfully hold his membership and claim the privileges of identity with a non-scabbing institution, and that is right in the B. of L. F. and E.; it is the home for the two men on the engine just as naturally as the house is the natural home for the man and the wife, and as the engineman and fireman frequently meet danger together and sometimes death, and as the conditions under which they work improve or deteriorate in proportion to their solidity and force, it is but logical to assume that so long as the B. of L. E. officially sanctions strike-breaking and scabbing (as it did on the S. P.) there is but the one order for the young runner, and that is right where I belong now, the B. of L. F. and E., the contentions of this Gen. Ch., G. C. of A., to the contrary notwithstanding.

As to the general manager and the General Managers' Association: That is rather a weak effort in comparison, and

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far fetched, by reason of the fact that it is neither a labor organization nor one in which the individuality of the member cuts any figure; it being merely an association for the promotion of operating efficiency, and the membership of the general manager is not a voluntary one, but in line with the dictates of the policy as laid down by his superiors; consequently it is not at all analogous.

Further, in his effort to boost up the idea of class craft organization, he gives a few isolated cases of heterogeneous associations having "gone to the wall," but nothing is said as to the true cause for their disintegration.

He goes a little further along with his proselyting and says that "he would like to see all who have been running six months become members of the B. of L. E.," and offers to champion their cause by "recommending them himself for membership." Doubtless this is a gospel truth; he would both like to see them members and would be willing to personally recommend them, but he oversteps the mark a little when he says "The B. of L. E. is one of the best organizations on earth" (that is, if he speaks of it as a labor organization), and he describes it as "the daddy" of them all. Right here is where it becomes interesting. Let us analyze this statement. A labor organization must recognize and practice every principle of trades unionism to be "one of the best on earth," and as that Brotherhood (?) officially sanctioned strike-breaking to the extent of depriving my brother of the B. of L. F. and E. of his position, it degenerates into one of the worst in the world amongst labor unions. It has no claim to the title of a labor union after its official sanction of scabbing on the S. P.

Now, then, as to the term "daddy of them all." To those who do not remember the early days of our history, or who have not read of them, this may sound very plausible and extremely encouraging, but to those who have familiarized themselves with the facts it sounds like a magnificent piece of carelessly handled truth. It was *not* the daddy of the Brotherhood of Locomotive Firemen, which is now known as the Brotherhood of Locomotive Firemen and Enginemen, and it refused positively to recognize us in our infancy, and one of its past executives went so far as to say that the firemen had not the right to organize, as the engineers were organized and would take care of them; quite a pretty piece of arrogant assumption on his part, to have people infer that we were nothing better than the slaves of the members of the B. of L. E. This being a fact, then, we claim that its repudiation of us when in our swaddling clothes abrogates all right for the Gen. Chm., G. C. of A., to assume that it is the "daddy" of the B. of L. F. and E. It has never earned the appellation of "daddy of them all" and it will never be recognized as such by the membership of our organization.

Then, again, he tells me that the insurance feature is "the best in the world," etc. Right here he falls again into the pit of unrestricted imagination. Its insurance feature is neither as good nor as cheap as our own, and while he says it "pays the full face of the policy for the loss of one foot," we must remind him "there are others;" our own Brotherhood does likewise. Again he says that it pays the full face of the policy for the loss of one hand; here again we lose him, as the B. of L. F. and E. does the same thing. While it is a fact that our Brotherhood does not pay the full face of the policy for one eye, it does pay it for total and permanent blindness, and then goes them some better by paying the full face of the policy for four other constitutional disabilities: viz., locomotor ataxia, Bright's disease of the kidneys, consumption of the lungs and paralysis. How does that, at $10.20 per $1,000 per annum stack up against his "best in the world?" I think it goes him "one better" and then some.

There are a thousand and one reasons why our young runners should not pay any attention to such carelessly written letters and should retain their membership where it is now, but the first and foremost is that the Brotherhood of Locomotive Firemen and Enginemen never countenanced a scab officially, and it practices what it preaches.

I am glad I got this letter, as it gives me an opportunity to show to the membership the style of proselyting indulged in by the influential members of the B. of L. E., and when that general chairman thinks he can persuade me to relinquish my membership in a straight out-and-out non-strike-breaking Brotherhood, he will have to put up better argument than any he has yet presented or is able to present. The young runners of Texas should stand together and stay with the Brotherhood that is capable of keeping their name unsullied in the company of trades unionists. MEMBER, Texas.

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Another Voice Against Consolidation.

In reading my September Magazine I can not help but smile at the letter written by my dear friend and brother of 212, and I think if he will read carefully the two letters preceding his, he will find that they answer his questions very fully and truthfully. If the members of the B. of L. F. and E. will only stick to their own order it will be but a short time until the engineers and firemen will be members of one great, grand and glorious labor union, and that will be the Brotherhood of Locomotive Firemen and Enginemen.

As the brother writing from 212 is not in active service on the rail, he is hardly in a position to know what is best for the "man behind the scoop," and here is possibly something of which he has never heard; but it is true nevertheless. On certain eastern roads the B. of L. E. men say that if trouble should arise wherein the B. of L. F. and E. men should leave the service, they (the B. of L. E.) would take the Italians at present working on the right of way for firemen, in order to keep the wheels turning, should it become necessary to do so. Then, again, the B. of L. E. are offering inducements of all kinds for our members to join their ranks, and only recently it was suggested to me that if I would join their organization the local division would pay my expenses incident to becoming a member.

As to the referendum vote, I do not believe in it, for if the members of the B. of L. E. do not like their present laws, why in the name of goodness don't they change them? And as long as they do not change their laws I shall always be convinced that they are satisfied with them, and in this instance so am I, for I was born under the stars and stripes and I am a free American citizen, and were I to join the B. of L. E. I would not be one; therefore, let us say, "If ye are brutes, then stand here like fat oxen waiting for the butcher's knife; if ye are men, follow me."

MEMBER 71, B. OF L. F. AND E.

Texas Still in Evidence.

I have been in railroad life but a short time, only about sixteen years, but in that time I have watched with some degree of interest the controversy now going on again between the Brotherhood of Locomotive Firemen and Enginemen and the Brotherhood of Locomotive Engineers.

The latest point where the question has come up that I have observed was on the Texas & Pacific Railroad, but from reliable information I learn that the Texas & Pacific officials have retained the right to permit the humblest employe to knock upon the door of their offices, and they are yet permitted to allow that same employe, even though he holds no higher position in their service than that of fireman, to come in; they are to be allowed to listen to anything he may want to say for another employe who may be in trouble, and they have been permitted to retain that right by the grace and goodwill of our esteemed old friend H. Wills of the "Wheel-Turning Propensity," as I see from state papers he has withdrawn his demand upon these officials, which was, if he is quoted correctly, that they must not permit the firemen's committee to plead the case of any engineer.

I would like to ask you, Mr. Editor, the question: Upon what ground does the Brotherhood of Locomotive Engineers, through its board of adjustment, its general chairman, or its Grand Chief, assume the right to dictate to any railroad president, or general manager, or even the superintendent of motive power, or their subordinates, to make a contract or an agreement of any kind whereby that official is denied the right to open his door and listen to any respectful communication, either verbal or written, that may be submitted to him by men whom he recognizes as employes in that service.

Another question: What kind of an official is it that will humbly bow his head and agree to his liberties being tampered with in that way by any committee, either from the B. of L. E. or the B. of L. F. and E.? If they ever submit to that kind of an agreement, I would like to know what would be the next move.

I am no prophet, neither am I the son of a prophet, but I feel that the handwriting on the wall is too plainly in evidence to need to claim second sight. The B. of L. F. and E. is NOT going to submit to any such insults, no matter where they may arise. Death in some instances is better than dishonor, and I feel that it would be dishonorable to per-

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mit a man to enter our Order and promise to protect him against any and all injustices so far as lies in our power, and then, without fighting the point to the death, fail in carrying out that promise.

Our engineer members are not leaving our ranks, even though the engineers' organization is making such claims. Some few may leave, as there are always a few weak-minded members in every organization, but those that will bear the brunt of any battle—members whom you can depend upon in any emergency—are not leaving us in any numbers, and they will not until the B. of L. E. assumes that place in organized labor which she should occupy in order to be consistent with its principles.

The member who will withdraw from the B. of L. F. and E. today to join the engineers does it with a full knowledge of the fact that he is joining an organization that legalizes scabbing in its fullest sense, and some day he may be called upon to play the part usually assigned to men who should be employed solely by Grand Chief Farley. No man who understands the situation and has any principle will take these chances.

A MEMBER.

* * *

Joint Protective Board Meeting, C., St. P., M. & O. R. R.

The Joint Protective Board of the Brotherhood of Locomotive Firemen and Enginemen was called to meet in St. Paul, Minn., on Monday, August 12, 1907. The purpose of said meeting was to obtain a new contract with the officials of the company, whereby the rate of pay for firemen and engine dispatchers might be increased and the working rules changed so as to better working conditions.

The first four days' sessions were spent formulating articles of agreement which the board desired to bring before the officials of the company for consideration.

Having completed this work, the secretary was instructed to request a conference with the superintendent of motive power and machinery, Mr. J. J. Ellis. Said request being made, Mr. Ellis consented to meet us, setting date of conference for August 20, 1907. This date being agreeable to the board, the meeting was called to order at the office of Mr. Ellis at 9 o'clock a. m., on said date. The day was spent in conference without any material results, as the business we desired to transact was of such nature that Mr. Ellis advised us to take same before the general superintendent, Mr. S. G. Strickland.

On request being made for conference with Mr. Strickland, he set date of conference for August 26, 1907. There being a number of days' time to elapse before said date, and considering the fact that the board was composed of inexperienced members, with one exception, it was decided to ask for the able assistance of our worthy Grand Master, Mr. Jno. J. Hannahan, and under his direction the board conferred daily with the general superintendent, who showed a disposition to be very fair and agreeable, and willing to listen to all reasonable arguments that were presented in support of our request. We feel assured that it is his earnest desire to be fair and just with our members and, while we are enjoying the increased rate of pay and the better working conditions which relieve us of all cleaning of engines and other unpleasant duties, we wish to express our appreciation of the good-will of our general superintendent. In connection with this subject, I would say, that only the highest tribute should be paid to our worthy Grand Master for the conservative manner in which he directed the members of our board, and with all due respect for our worthy Grand Master, we must not forget our worthy Vice-Grand Master, Brother Shea, acting in his official capacity and displaying an interest in the welfare of our members which is unexcelled. And when our worthy Grand Master and Brother Shea are working together they can go forth into the camp of the enemy without fear, and, brothers, when they advise the engineer members of the organization to retain their membership in the B. of L. F. and E., you can rest assured it is the proper thing to do, as that fact has been proven beyond all question of doubt on this road—as we have always been heard on matters pertaining to our engineer members and never failed to get justice when it was necessary for our organization to ask for it.

The object of our meeting in St. Paul was to ask for a contract which would better the working conditions and increase the rate of pay of our members, and not a contract with the company to prohibit another labor organization from bettering the working conditions of its

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members, as has been done heretofore by the B. of L. E. committee. On Labor Day, assembled in the name of the Brotherhood of Locomotive Firemen and Enginemen, while the fifes were playing, the drums beating and the flags floating in plain view of the window of the office of our general superintendent, we signed a contract which brings about the most favorable working conditions and highest rate of pay ever enjoyed on this road.

While we are enjoying the improved working conditions above spoken of and higher rate of pay, let us be ever mindful of the fact that we can thank our organization and its leader for those improvements, and, to say the least, I believe our worthy Grand Master is one of the most able, honorable and fair-minded labor leaders the world ever produced. For example: compare our organization today with the same organization at the time Brother Jno. J. Hannahan was elected Grand Master, and see the universal improvement in working conditions for our members throughout the entire country. Brothers, if you have never met our worthy Grand Master and an opportunity to do so is presented to you, do not fail to avail yourselves of the occasion, as if you are so favored you will then say as did every member of the Joint Protective Board on the C., St. P., M. & O. R. R.: "He came honestly by the title *Grand Master*." The members of the Joint Protective Board on this road will not forget their first meeting with him very soon, as it was one of interest, from a business standpoint, until our contract was signed with the officials of the company; and thereafter one of pleasure. The members of our entire board were invited to be his guests at the home of Mrs. Hannahan's parents, Mr. and Mrs. D. M. Sullivan, where we received a most cordial welcome. During our visit the picture of the members of our Joint Board, together with our worthy Grand Master and John J., Jr., which appeared in the October issue, was taken. We then partook of an elaborate spread, following which Mrs. Hannahan entertained us with several vocal and instrumental selections, which were thoroughly enjoyed by all. We very deeply appreciate the courtesy extended to us by our worthy Grand Master and his wife and her parents, which fact we hope some day to practically demonstrate.

W. H. HALEY, *Sec'y*,
J. P. B., C., St. P., M. & O. R. R.

The Detroit Union Meeting.

The Union meeting held in Detroit, Mich., on October 9th, 10th and 11th, under the auspices of the members of subordinate Lodges Nos. 158, 508 and 532, made up in enthusiasm everything that it lacked in numbers, and by the visiting Grand Officers was pronounced one of the best "revivals" held by the Order during the present year.

The local joint committee, composed of Brothers Melvin Crawford, Ralph Rust and J. V. Harcourt, did itself proud in the way of perfecting arrangements for this Union Meeting, as well as conducting same. Detroit brothers met all inbound trains and boats during the week, and as fast as visitors arrived they were conducted to headquarters at the Light Infantry Armory, where, after registering, they were taken to their hotels.

Grand Master and Mrs. Hannahan and Vice Grand Master Ball and Mrs. Ball arrived on the morning of the first day, as did also Vice Grands Shea and Kelly.

The secret meetings were presided over by the Vice Grand Master and many of the local and visiting brethren discussed subjects of good to the Order in general.

The leading speakers at the public reception on Wednesday evening were City Controller Doremus, Judge Murphy and Grand Master Hannahan. A musical program had been prepared by the local committee, which included songs by Brothers Leo Kent and L. W. Hiser.

In his remarks the Grand Master dwelt particularly on the high moral standard of our membership and the respect entertained by Brotherhood men for every law of city, state and nation. He also dwelt on their regard for contracts entered into by the Brotherhood and the wrong done by any labor organization that broke a contract with any firm or corporation to go out on a sympathetic strike.

Judge Murphy, following the Grand Master, complimented him on the manly talk he had made, stating that such sentiments would tend to elevate the Order in the minds of men of the business world.

On the afternoon of the first day a special reception was given by Ladies Society No. 11 to the visiting sisters. Among the distinguished visitors were Grand Vice-President Mrs. Maude E. Moore, of Goderich, Ont., and the Editress of the Ladies Department of the Magazine, Mrs. Agnes G. Strong, of

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Boone, Iowa; also Mrs. Mary E. DuBois, Grand Secretary and Treasurer of Ladies Society. The ladies also provided other special entertainment for their guests during the week, including a theater party Friday afternoon.

It is believed that as a result of the good feeling created among the wives and sisters of the Detroit brothers that No. 11 will not only have a large immediate growth, but also that at least one more lodge of the Ladies Society will be organized in Detroit during the next few weeks.

At the open meeting on Friday morning the public speakers were Congressman Denby, President of City Council Heineman and Washington I. Robinson. The congressman spoke feelingly of the recent legislation that affected railroads and railroad employes, particularly the hours of labor. He gave his pledge to aid in the future in securing the enactment of legislation along this line.

Grand Master Hannahan, in his response to the congressman, stated that the movement was now well under way for an eight-hour day for all trainmen, and that if the men would stick together it was only a question of time until this was secured. He announced that a meeting would be held in Buffalo during the present month when this matter would be discussed and the plan of campaign outlined.

The Grand Master spoke of the large growth of the Order during the past year and also of its excellent condition financially. He stated that almost $1,000,000 —accurately, $947,100—had been paid out in death and disability claims during the last fiscal year, and that in addition to this the sum of about $100,000 had been expended by order of the Milwaukee convention in relieving the distress of members who are not constitutionally entitled to receive one penny from the Brotherhood—an amount sufficient to build a library which would cause the name of a Carnegie or a Rockefeller to be published in every daily paper in the United States and perpetuate their identity in a municipality for generations to come; but this amount was dispensed from the hard-earned money of the working man, and hence it was allowed to pass practically unnoticed.

This was one of the best sessions of the meeting, being largely attended by the ladies, as well as all local members who could get away from their work.

One of the interesting and special features of the week was an entertainment and reception tendered the visitors by Hamilton Carhartt, manufacturer, maker of union overalls and gloves. The guests were shown through his immense plant at the corner of Tenth and Michigan streets, where 1,000 people are employed. The visitors were particularly impressed with the light and cleanliness of the place, as well as by the many conveniences furnished the employes—the parlors to be used during rest hours, where music is furnished every noon: the branch public library, where good books are always on hand for use of those wishing to read, and which can be taken home if desired, and the emergency hospital, in case of accidents. In the dining room three meals a day are furnished to employes desiring same, at actual cost.

Grand Master Hannahan, and Vice Grand Masters Shea, Ball and Kelly were immensely pleased with their visit to the Carhartt plant. Refreshments were served and each guest given a souvenir. The reception to the guests was in charge of Hamilton Carhartt, Jr.

The last grand event of the week was the closing ball Friday night, given with the compliments of Hamilton Carhartt; in fact, it lasted until well nigh morning. The grand march was led by Mayor William B. Thompson and Mrs. Hannahan. During the evening Governor Fred M. Warner, of Michigan, was introduced by the Grand Master and made a few appropriate remarks, dwelling on the great good the Order had accomplished during its life.

During the week considerable sentiment developed in favor of Detroit being a candidate for the 1910 bi-ennial convention, and Milton Carmichael, secretary and manager of the local Convention and Tourists' Bureau, who helped advertise this meeting, has already promised to go to Columbus next year and help the local boys in their efforts.

E. W. C.

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Correspondence

LODGE 59—(*Member, Pueblo, Colo.*) It has been some time since we have seen anything in the Magazine from Lodge 59, therefore I will endeavor to let the remainder of the membership know how we are getting along. We are having some splendid meetings, and not long ago we had the pleasure of a visit from Vice Grand Master Dillon. We wish the Grand Officers could visit the lodges situated on mountain roads more than they do, as we need them badly. We have a splendid set of officers, who are ever active and honestly working for the good of the Order.

LODGE 569—(*S. T. Lippard, Chaffee, Mo.*) I have been anxiously waiting to see something in the correspondence columns of our Magazine from 569. However, I believe the absence may best be accounted for by the fact that our members have been kept so busy all summer.

There is one thing sure, if we have not been contributing to the columns of the Magazine, we have been adding to the membership of the Brotherhood, and still have several applications pending, with the possibility of more in sight; that is encouraging, indeed. Outsiders might think we had not been as energetic in our lodge work as we might have been, but the scarcity of firemen in this section of the country made it pretty hard for the boys to attend to lodge duties as they would otherwise have done; however, cold weather is fast approaching and the business will slack up, and then I hope that 569 will be in position to take up the old-time enthusiasm. It is somewhat difficult, however, for us to have large meetings, as we are so scattered.

Several of our boys have been promoted during the past year and they, one and all, express their intention of staying with the old "tried and true," and I feel sure they will never regret their action.

We have a good set of boys down here, and we are all pleased with our choice for lodge officers for the present year; they are live hustlers in the right sense.

LODGE 239—(*Member, Eureka, Cal.*) I have waited for some time to see a few lines in the Magazine from Lodge 239, but so far I have been disappointed, and will, therefore, write myself and tell the brothers generally how we are getting along in this section of the country.

Our lodge, Redwood 239, as the name suggests, is situated in the center of the great Redwood forest, and our principal business is hauling those giant trees to the mills, where they are sawed into the world-famous redwood lumber, and from thence to the ships on Humboldt Bay, where they are sent to all parts of the inhabitable globe.

Our engines are all small; just large enough to handle the traffic; some of them are oil-burners, while others that are assigned to switching service and short runs still continue to burn wood.

The great Northwestern Pacific is headed our way, and when connections are made we expect to be permitted to get out into the world.

LODGE 548—(*J. H. Wallace, Commerce, Texas.*) As no one else in 548 seems to take the opportunity to write to the Magazine and tell the Brotherhood at large what we are doing and say a good work for the Order of which we proudly boast, I will again try to say a few words, although I would rather some of the other brothers take a hand at it.

The goat is kept busy, and we are proud of our lodge and its officers, as they have been doing good work.

The officials of the road are a good set of men and the motive power is kept in pretty good shape. We have very good coal as a rule. We burn two kinds on the north end out of here, and we have a coal chute fifty-seven miles distant. The division is 118 miles long and we can have our fire cleaned if it needs it. On the south end we have to go 100 miles and get no coal, and when we get to the terminal we have shoveled all the coal off the tank, and maybe have to take coal somewhere out of a car. We have big engines on the north end and smaller ones on the south, and we have another division fifty miles out of here west. We get coal there and our fires cleaned. Business is good on the whole system and the boys are all getting in good time.

I wish some one of more experience

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would write a letter from 548, as I am afraid I am trespassing too much, and will, therefore, come to a close. Dixie lodge is neither dead nor asleep, but very live and wide awake, and we are proud of her.

LODGE 203—(*G. W. Iler, Garrett, Ind.*) As there has been no news from Lodge 203 for some time, I thought I would write to the Magazine to let our brothers in other parts of the country know that we are still progressive. We have been by no means idle, for our membership has been rapidly increasing. The members of our lodge are unquestionably hustlers of the highest type, and they never let anything get "by" them in the way of lodge work. It is such an enthusiastic membership as this that makes the progress of our Brotherhood possible.

LODGE 379—(*Member 379, Sayre, Pa.*) I have looked for a long time hoping to see a letter from Lodge 379, but as yet nothing has appeared for at least over a year; however, we have had a book full of up-to-date reading, both technical and otherwise, and it is a credit to the organization of which it is the mouthpiece.

Weaver Lodge 379 is still on earth, but not progressing in the way of increasing its membership like it should do, considering the eligible material we have here to work on. The firemen outside the ranks of the Brotherhood do not seem to give serious thought to the economic side of the principles of unionism, and they evidently do not realize that it is the Brotherhood which really stands between them and a reduction in wages. They seem to be entirely ignorant of the fact that it costs money to maintain such a bulwark for our positions and wages, and, judging from the conversation of some of them, all they seem to think is necessary to improve conditions is to stand on the street corners and complain of the Brotherhood for not doing more; yet they never offer to help defray the expenses of the Joint Protective Board, their real field force of fighters. If they wish to enter a protest against working conditions they can do so more forcibly by entering the ranks of the Brotherhood and helping us to present a stronger front to the powers which are ever alert to assail our position.

Our Joint Protective Board has had a rather lengthy session with the management and, while they procured a fair increase in wages, they could not reduce the hours of labor. It seems impossible for those outside the Brotherhood to understand that they, themselves, by remaining out of the ranks, are responsible for any failure which the Board makes by reason of a divided class of wage-workers.

We have, however, begun to make inroads on some of the outsiders, and at our last meeting we had twenty-nine applications to work on, and that is at least encouraging. The trouble here at this time of the year is that it is our busy season and we don't have very large attendance at our meetings; however, the goat is kept in prime condition and feeling good at all times.

Brother Wilson, our First Vice Grand Master, has promised us a visit during the fall and will spend a day or two with us; let us hope he will be able to arouse sufficient interest among the non-members to bring them all within the fold.

Brother Hannahan's "Blue Book" was O. K. and it will be of benefit to our young runners throughout the country; our members are staying with the old "tried and true," we having only lost two or three during the past year.

I will say to the brothers in other sections of the country that we also get "real estate" once in awhile in lieu of coal for heating purposes.

I always enjoy the letters appearing from time to time in the "Forum" Department, and would like to see more of them. It is a splendid medium for the interchange of ideas, and through that channel we learn what our brothers at a distance are doing.

Working conditions with us are fair and the officials of the road seem to want to do the square thing by us.

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Official

Addresses Wanted.

Persons requiring the address or any information concerning another will please communicate with the Secretary of the lodge located nearest the residence of the person making such request. Upon receipt of a communication from the Secretary of such lodge requesting that a notice be published in the Magazine inquiring for such address or other information same will be complied with. However, the Magazine can not undertake the office of a collecting agency, and must decline to lend itself to such purpose. The following requests have reached this office since the last issue. Information should be sent to the persons specified in the notice:

John Wittie—Last heard from on the Mexican Central Railroad, where he was employed. He has brown eyes, black hair, a dark complexion and is of medium height. Anyone knowing his present whereabouts will confer a favor by notifying the secretary of Lodge 702 at Teague, Texas.

Harry Burtless—Formerly a member of Lodge 182. Any one knowing his present address will please advise H. E. Boyd, Jr., 440 East Commercial street, Springfield, Mo. His parents are anxious to locate him.

Lost Traveling Cards, Etc.

This office has been notified of the loss of the following traveling cards, receipts, etc., and the request is made that all members be on the lookout for them. Should they be discovered in the possession of persons not entitled to them they should be retained and forwarded to the owner or to the Secretary of the lodge which issued them:

Traveling card, receipt for quarter ending September 30, 1907, and other receipts belonging to Bro. John Skie, of Lodge 132, have been lost. Any one finding same will please send them to John Skie, Central Y. M. C. A., Buffalo, N. Y., or to the secretary of Lodge 132, Eagle Grove, Iowa.

Acknowledgments.

Mrs. Anna Borg and family desire to express their gratitude to the brothers who assisted them during their sad bereavement by reason of the death of Bro Gustave Borg, as also for the beautiful floral offerings received from the lodge.

The Home Account.

The following donations were received at the Home for Aged and Disabled Railway Employes for the month of September, 1907:

B. of L. F. and E. lodges, 16, $12; 59, $7; 123, $12; 241, $5; 290, $11.75; 392, $5; 485, $12; 510, $18.75; 549, $5.....	$76 50
L. S. to B. of L. F. and E. lodges, 30, $5; 33, $4; 78, $5; 90, $2; 140, $5; 171, $3.....	19 00
O. R. C. Divisions.....	75 00
B. R. T. Lodges.....	125 30
B. L. E. Divisions.....	255 25
L. A. C. Divisions.....	37 95
L. A. T. Lodges.....	23 00
G. I. A. Divisions.....	35 00
James Costello, Division 270, O. R. C.....	1 00
Alfred Lunt, B. of R. T. Lodge 456	1 00
Proceeds of a picnic given at the Home by Fidelity Lodge No. 4, L. A. T.....	22 05
Sale of junk.....	5 00
Total	$676 05

Respectfully submitted,
JOHN O'KEEFE,
Sec. and Treas. R. R. M. H.

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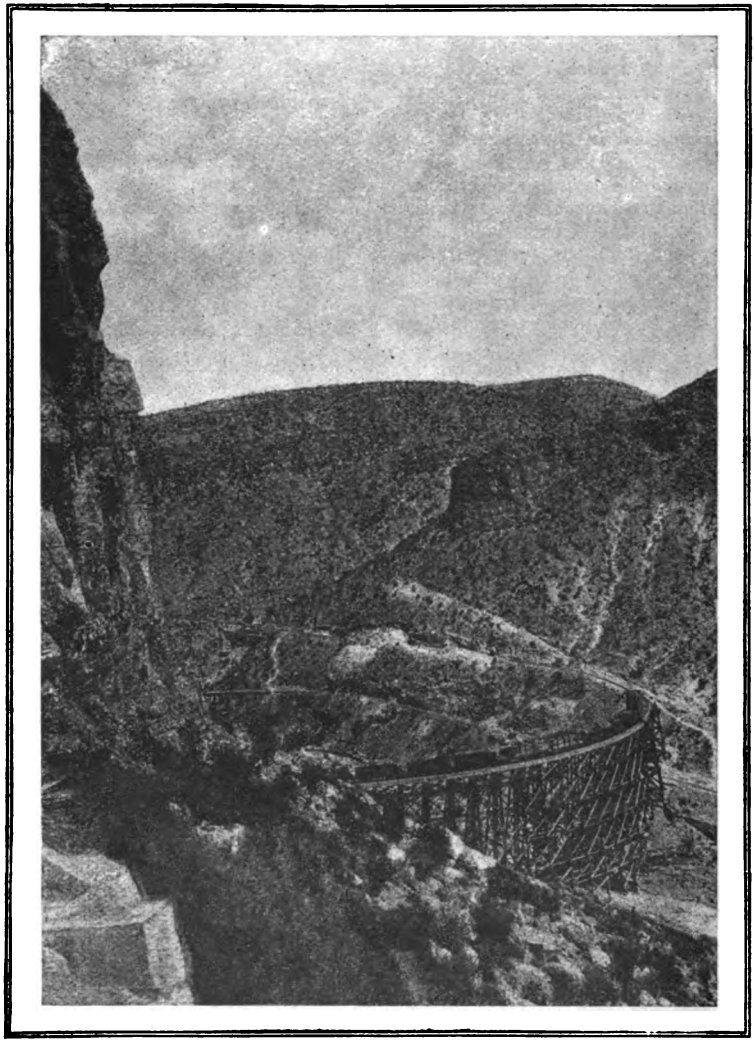

VIEW ON THE MORENCI SOUTHERN RAILWAY, NEAR MORENCI, ARIZONA

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Beneficiary Statement

OFFICE OF GRAND SECRETARY AND TREASURER,
PEORIA, ILL., October 1, 1907.

TO SUBORDINATE LODGES:

The following is a statement of receipts in the Beneficiary Department for the month of September, 1907:

RECEIPTS.

Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.
1	.....	74	.....	147	.....	220	.....	293	.....	366	.....	439	.....	512	.....	585	.....	658	.....
2	.....	75	.....	148	.....	221	.....	294	.....	367	.....	440	.....	513	.....	586	.....	659	.....
3	.....	76	.....	149	.....	222	.....	295	.....	368	.....	441	.....	514	.....	587	204 50	660	.....
4	.....	77	.....	150	.....	223	.....	296	.....	369	.....	442	.....	515	.....	588	57 75	661	.....
5	.....	78	.....	151	.....	224	.....	297	.....	370	.....	443	5 25	516	.....	589	.....	662	.....
6	.....	79	.....	152	.....	225	.....	298	.....	371	.....	444	.....	517	.....	590	.....	663	.....
7	.....	80	.....	153	.....	226	.....	299	.....	372	.....	445	.....	518	.....	591	.....	664	106 75
8	.....	81	.....	154	.....	227	109 25	300	.....	373	.....	446	.....	519	.....	592	.....	665	.....
9	.....	82	.....	155	.....	228	.....	301	.....	374	.....	447	.....	520	.....	593	.....	666	.....
10	.....	83	.....	156	.....	229	.....	302	.....	375	.....	448	.....	521	.....	594	.....	667	.....
11	.....	84	.....	157	.....	230	.....	303	.....	376	47 50	449	.....	522	.....	595	.....	668	.....
12	.....	85	.....	158	.....	231	.....	304	.....	377	.....	450	.....	523	.....	596	.....	669	.....
13	.....	86	.....	159	.....	232	.....	305	.....	378	.....	451	.....	524	.....	597	.....	670	.....
14	12 00	87	.....	160	75	233	4 50	306	.....	379	.....	452	.....	525	.....	598	.....	671	.....
15	.....	88	.....	161	.....	234	165 00	307	4 50	380	.....	453	.....	526	.....	599	.....	672	.....
16	.....	89	.....	162	.....	235	.....	308	.....	381	.....	454	.....	527	.....	600	.....	673	.....
17	.....	90	.....	163	.....	236	.....	309	.....	382	.....	455	4 50	528	196 00	601	.....	674	.....
18	.....	91	.....	164	.....	237	.....	310	.....	383	.....	456	.....	529	.....	602	.....	675	136 50
19	.....	92	.....	165	.....	238	.....	311	.....	384	.....	457	171 25	530	.....	603	.....	676	141 00
20	.....	93	165 50	166	.....	239	.....	312	.....	385	.....	458	.....	531	.....	604	83 50	677	.....
21	.....	94	6 00	167	.....	240	.....	313	.....	386	.....	459	.....	532	115 00	605	160 75	678	.....
22	.....	95	.....	168	.....	241	310 75	314	185 00	387	.....	460	.....	533	.....	606	.....	679	.....
23	.....	96	.....	169	.....	242	.....	315	.....	388	.....	461	.....	534	.....	607	.....	680	.....
24	.....	97	7 50	170	.....	243	.....	316	.....	389	.....	462	.....	535	.....	608	.....	681	.....
25	285 25	98	.....	171	.....	244	.....	317	.....	390	.....	463	.....	536	.....	609	.....	682	.....
26	.....	99	.....	172	.....	245	.....	318	.....	391	.....	464	.....	537	.....	610	.....	683	.....
27	.....	100	.....	173	326 25	246	.....	319	.....	392	.....	465	.....	538	.....	611	.....	684	84 75
28	.....	101	.....	174	.....	247	.....	320	.....	393	.....	466	.....	539	.....	612	.....	685	.....
29	.....	102	.....	175	.....	248	.....	321	.....	394	.....	467	.....	540	281 25	613	4 50	686	.....
30	.....	103	.....	176	.....	249	.....	322	.....	395	.....	468	.....	541	.....	614	.....	687	.....
31	.....	104	.....	177	.....	250	.....	323	.....	396	.....	469	.....	542	.....	615	.....	688	.....
32	.....	105	.....	178	.....	251	.....	324	.....	397	.....	470	.....	543	.....	616	.....	689	.....
33	147 00	106	.....	179	7 50	252	.....	325	.....	398	.....	471	.....	544	118 50	617	.....	690	.....
34	.....	107	.....	180	.....	253	.....	326	.....	399	.....	472	.....	545	.....	618	.....	691	.....
35	.....	108	.....	181	.....	254	.....	327	.....	400	.....	473	.....	546	39 75	619	.....	692	.....
36	.....	109	.....	182	.....	255	.....	328	.....	401	.....	474	.....	547	.....	620	.....	693	.....
37	.....	110	.....	183	.....	256	76 75	329	.....	402	4 50	475	.....	548	.....	621	.....	694	.....
38	.....	111	.....	184	.....	257	.....	330	.....	403	.....	476	.....	549	.....	622	.....	695	84 00
39	.....	112	.....	185	.....	258	.....	331	.....	404	.....	477	.....	550	144 00	623	.....	696	.....
40	.....	113	.....	186	.....	259	.....	332	.....	405	.....	478	.....	551	.....	624	78 75	697	.....
41	71 25	114	.....	187	.....	260	.....	333	.....	406	.....	479	.....	552	.....	625	.....	698	.....
42	.....	115	.....	188	.....	261	88 00	334	.....	407	.....	480	.....	553	.....	626	.....	699	.....
43	.....	116	138 75	189	.....	262	.....	335	.....	408	.....	481	.....	554	.....	627	.....	700	.....
44	.....	117	.....	190	.....	263	.....	336	.....	409	.....	482	140 25	555	.....	628	.....	701	.....
45	577 50	118	.....	191	.....	264	.....	337	.....	410	.....	483	86 75	556	.....	629	.....	702	69 75
46	.....	119	.....	192	.....	265	.....	338	.....	411	.....	484	.....	557	253 00	630	.....	703	.....
47	.....	120	.....	193	.....	266	.....	339	.....	412	.....	485	.....	558	.....	631	.....	704	.....
48	.....	121	.....	194	.....	267	.....	340	.....	413	.....	486	.....	559	.....	632	.....	705	.....
49	155 00	122	.....	195	.....	268	.....	341	.....	414	172 50	487	30 75	560	.....	633	.....	706	.....
50	85 50	123	.....	196	121 75	269	157 75	342	266 50	415	.....	488	.....	561	.....	634	.....	707	.....
51	.....	124	.....	197	.....	270	.....	343	.....	416	.....	489	174 75	562	.....	635	.....	708	.....
52	.....	125	.....	198	.....	271	.....	344	.....	417	.....	490	.....	563	.....	636	.....	709	.....
53	.....	126	.....	199	.....	272	.....	345	.....	418	.....	491	.....	564	.....	637	82 75	710	.....
54	.....	127	12 50	200	.....	273	.....	346	.....	419	.....	492	.....	565	.....	638	.....	711	.....
55	.....	128	.....	201	.....	274	.....	347	.....	420	.....	493	.....	566	.....	639	.....	712	.....
56	.....	129	.....	202	.....	275	.....	348	.....	421	.....	494	.....	567	.....	640	57 75	713	.....
57	.....	130	.....	203	.....	276	.....	349	.....	422	.....	495	54 25	568	.....	641	.....	714	.....
58	.....	131	.....	204	.....	277	.....	350	.....	423	.....	496	.....	569	.....	642	77 00	715	1 50
59	.....	132	.....	205	.....	278	.....	351	.....	424	.....	497	.....	570	.....	643	.....	716	.....
60	.....	133	355 75	206	.....	279	.....	352	.....	425	.....	498	.....	571	.....	644	.....	717	.....
61	.....	134	.....	207	.....	280	.....	353	.....	426	.....	499	.....	572	.....	645	.....	718	.....
62	.....	135	.....	208	.....	281	.....	354	.....	427	45 00	500	.....	573	.....	646	.....	719	.....
63	261 50	136	.....	209	241 50	282	.....	355	.....	428	.....	501	.....	574	.....	647	.....	720	.....
64	.....	137	.....	210	.....	283	.....	356	.....	429	.....	502	.....	575	.....	648	.....	731	.....
65	.....	138	.....	211	.....	284	.....	357	.....	430	.....	503	.....	576	.....	649	.....	722	.....
66	.....	139	.....	212	.....	285	.....	358	.....	431	.....	504	3 00	577	141 00	650	.....	723	.....
67	.....	140	.....	213	.....	286	.....	359	83 50	432	.....	505	74 25	578	.....	651	.....	724	.....
68	.....	141	.....	214	.....	287	.....	360	.....	433	.....	506	.....	579	.....	652	.....	725	.....
69	.....	142	.....	215	.....	288	1 50	361	.....	434	.....	507	.....	580	22 50	653	138 75	726	.....
70	.....	143	407 25	216	.....	289	3 00	362	.....	435	.....	508	.....	581	.....	654	.....	727	.....
71	.....	144	.....	217	.....	290	.....	363	.....	436	.....	509	.....	582	.....	655	.....	728	.....
72	.....	145	.....	218	.....	291	.....	364	.....	437	.....	510	.....	583	98 25	656	.....	729	.....
73	.....	146	.....	219	.....	292	.....	365	.....	438	.....	511	4 50	584	156 75	657	.....	730	.....

Received during month of September $9,017.25

Respectfully submitted, W. S. CARTER, G. S. and T.

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Statement of Death and Disability Claims

PAID BY THE GRAND SECRETARY AND TREASURER, FROM AUGUST 31 TO SEPTEMBER 30, 1907.

Claim No.	NAMES.	Lodge No.	Death or Disability.	Date.	Am't. of Ins.	Cause.
446	John W. Davies	175	Death	July 6, 1907	$1,500	Striking water spout.
278	Robert R. Light	366	"	Apr. 14, "	1,500	Duodenal catarrh.
400	David T. Williams	705	"	June 13, "	1,500	Derailing of engine.
405	Robert F. Knight	13	"	" 14, "	1,500	Consumption of lungs.
448	Edward J. Anderson	192	"	" 13, "	1,500	Peritonitis.
460	John Harrison	83	"	" 28, "	1,500	Suicide
461	Francis L. O'Rourke	21	Disability	July 27, "	1,500	Consumption of lungs.
462	C. E. Russell	109	Death	" 13, "	1,500	Crushed between car and engine.
463	Charles D. Carrel	162	Disability	" 30, "	500	Paralysis.
466	Peat Hudson	572	Death	May 2, "	1,500	Derailing of engine.
468	Jacob Scheer	166	"	July 16, "	1,500	Cirrhosis of liver.
469	Wm. Frothingham	228	Disability	" 1, "	1,500	Amputation of foot.
471	James S. Graham	194	Death	" 17, "	1,500	Derailing of engine.
473	Harlie A. Knowles	431	"	" 20, "	500	Collision.
474	Richard N. Satterfield	231	"	" 17, "	1,500	Falling from engine.
476	William C. Arbuckle	249	Disability	May 16, "	1,500	Amputation of hand.
478	Harry J. Youngblood	198	Death	July 23, "	1,000	Appendicitis.
479	Frederick A. Haines	72	Disability	Aug. 17, "	1,500	Consumption of lungs.
480	Chas. A. Shields	596	Death	July 23, "	1,500	Crushed between engine and R. H.
481	W. B. Kauffman	251	"	" 22, "	1,500	Murdered.
483	Noah F. Kupp	214	Disability	" 17, "	2,000	Amputation of foot.
484	Wilford Heather	144	Death	" 26, "	500	Collision.
486	Eugene Drew	205	"	" 26, "	1,500	Paralysis.
490	Edgar Williams	470	"	" 31, "	1,500	Derailing of engine
492	Charles Petrie	355	"	" 25, "	1,500	Falling from car.
493	John G. Bowman	687	"	" 27, "	1,500	Typhoid fever.
494	Albert J. Ricks	399	"	" 24, "	1,000	Derailing of engine.
495	Adam J. Markley	514	"	" 24, "	1,500	Derailing of engine.
496	William M. Spotts	174	Disability	Aug. 22, "	1,500	Bright's disease.
497	Delno S. Ford	659	Death	July 8, "	1,500	Derailing of engine.
498	Frederick Eble	475	Disability	" 2, "	1,500	Amputation of foot.
499	William H. Terhune	3	Death	Aug. 4, "	1,500	Falling from engine.
503	Mat. E. Wilcox	667	"	" 5, "	1,500	Abscess of liver.
504	Charley F. Clements	609	"	July 16, "	1,500	Derailing of engine.
506	Charles A Studley	666	"	Aug. 8, "	1,500	Run over by engine.
508	James H. Evans	426	"	" 7, "	1,500	Gunshot wound.
511	Timothy J. Toohey	666	"	" 9, "	1,500	Crushed between engine and tender.
482	Ernest B. Elrod	86	"	May 26, "	1,000	Crushed between cars.
453	Wilbert Vance	597	"	July 5, "	1,000	Derailing of engine.
491	Lewis Yetter	320	Disability	Sept. 12, "	1,500	Bright's disease and locomotor ataxia.
508	James Roberts	329	Death	July 20, "	500	Peritonitis.
467	Ray R. Howard	284	"	" 12, "	1,500	Struck by train.
1367	J. M. Beezley	529	"	Aug. 10, 1905	1,500	Collision.
455	Benjamin Robinson	4	"	June 21, 1907	1,000	Gunshot wound.

Death Claims Paid.		Disability Claims Paid.		
27—A	$40,500	7—A	$10,500	44 death and disability claims paid, aggregating $60,000.00
5—B	5,000	1—C	500	
3—C	1,500	1—D	2,000	
35	$47,000	9	$13,000	

Pending Claims September 30, 1907.

77 death claims aggregating	$100,500
21 disability claims aggregating	28,000
Total of 98 claims aggregating	$128,500

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Statement of Death and Disability Claims

FILED WITH THE GRAND SECRETARY AND TREASURER DURING THE MONTH ENDING OCTOBER 15, 1907.

Claim No.	NAMES.	Lodge No.	Date of Filing.	Death or Disability.	Alleged Cause of Death or Disability.	Am't of Ins.
556	Hargraves, Louis S	396	Sept. 16, 1907	Death	Peritonitis	$1,500
557	Bennie, Edward A	597	" 16, "	"	Run over by train	1,000
558	Miller, Harvey C	64	" 16, "	"	Heart disease	1,000
559	Barnette, Harry J	581	" 16, "	"	Collision	1,500
560	Eberhartson, Carl M	270	" 16, "	"	Collision	1,500
561	Sunderland, Joseph	123	" 17, "	"	Consumption	1,500
562	Tressel, Stolly	202	" 18, "	Disability	Paralysis	1,500
563	Long, Eugene E	174	" 18, "	Death	Typhoid fever	1,500
564	Sullivan, Leslie T	97	" 19, "	"	Collision	1,500
565	Kinch, William J	287	" 19, "	"	Collision	500
566	Shuppert, Frank	482	" 20, "	"	Collision	
567	Cutting, Meritt N. (1)	73	" 20, "	"	Crushed between cars	
568	Pickering, John	163	" 23, "	Disability	Arm broken improper union	1,500
569	Craven, Jas. L	236	" 23, "	"	Locomotor ataxia	1,500
570	Lindall, Oscar	564	" 24 "	"	Amputation of foot	1,500
571	Saults, Alfred C	38	" 25, "	"	Disease of heart and liver	1,000
572	Johnson, Chas. R	201	" 25, "	"	Paralysis	1,500
573	O'Donnell, John	624	" 26, "	Death	Heart disease	1,000
574	Fiscus, Harvey A	25	" 26, "	"	Heart disease	1,000
575	Marsden, J. E	45	" 27, "	"	Run over by train	1,500
576	Johnson, Walter H	284	" 27, "	"	Collision	1,500
577	Allis, John L	284	" 27, "	"	Collision	1,500
578	Riffle, Norbert	219	" 27, "	"	Boiler explosion	1,500
579	Johnson, Chas. F	128	" 27, "	Disability	Paralysis	1,000
580	Colgrove, Eugene	241	" 28, "	Death	Cancer of the stomach	1,000
581	Ladd, Wm. H	26	" 30, "	Disability	Amputation of foot	1,500
582	Alexander, David	378	" 30, "	Death	Consumption	1,500
583	Beard, Robert	56	Oct. 1, "	"	Amputation of foot	1,500
584	Beach, Frank	71	" 2, "	Disability	Consumption of lungs, last stage	1,500
585	Riddle, Bernard	559	" 2, "	"	Collision	1,000
586	Lowery, Orie	302	" 3, "	Death	Typhoid fever	1,500
587	Brooks, Hugh L	431	" 3, "	"	Paralysis of stomach	1,500
588	Oaks, Lyman E	400	" 3, "	"	Collision	3,000
589	Pledger, Thos. H	140	" 3, "	"		1,000
590	Herndon, Edward B	8	" 4, "	Disability	Total and permanent paralysis	3,000
591	Sharwath, Daniel J	94	" 4, "	Death		1,500
592	Bohn, John A	296	" 7, "	"	Derailing of engine	1,500
593	Daly, Walter C	212	" 7, "	"	Typhoid fever	1,000
594	Ross, Edward	189	" 7, "	"	Collision	2,000
595	Cooley, A. J	164	" 7, "	Disability	Amputation left foot	1,500
596	Larch, Chas. G	426	" 7, "	Death	Collision	1,500
597	Callahan, Daniel	575	" 8, "	Disability	Insanity	1,500
598	Hilms, Chas	149	" 8, "	"	Paralysis and locomotor ataxia	1,500
599	McEntee, James	202	" 9, "	Death	Meningitis	1,500
600	Chambers, Fred	51	" 10, "	"	Derailing of engine	1,500
601	Atherton, Chas. R	371	" 10, "	"		1,500
602	Michael, J. F	501	" 12, "	"	Typhoid and pneumonia	1,500
603	Shean, Walter E	91	" 12, "	Disability	Consumption of lungs, last stage	1,500
604	Horning, S. F	152	" 12, "	"	Amputation right foot	3,000
605	Colbert, Newton	302	" 14, "	Death	Run over by cars	1,500
606	Flanagan, Fred	687	" 14, "	"	Appendicitis	1,000
607	Stewart, W. S	569	" 14, "	"	Amputation of foot	1,500
608	Hellings, Samuel E	253	" 14, "	"	Struck by car	1,500
609	Bradford, Wm. S	231	" 14, "	"	Kidney trouble	1,500
610	Dolby, Wm. H	451	" 14, "	"	Crushed between cars	3,000
611	Warren, V. A	147	" 15, "	Disability	Paralysis	1,500

(1) Merritt N. Cutting died an expelled member of lodge 73.

Respectfully submitted,
W. S. CARTER,
G. S. and T.

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Beneficiary Assessment Notice No. 8.

SERIES H.

GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., November 1, 1907.

To the Treasurers of Subordinate Lodges:

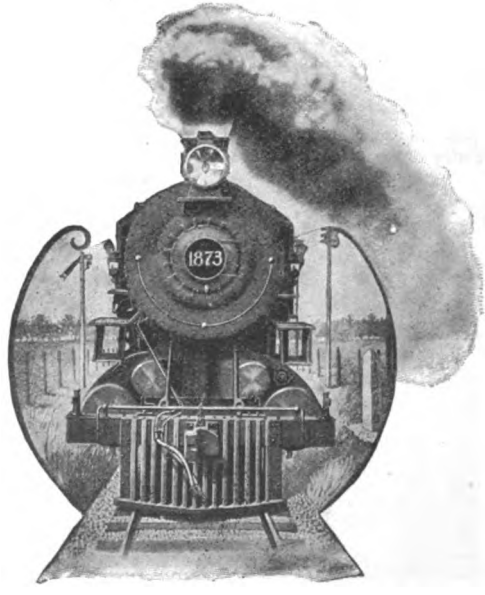
Sirs and Brothers:—You are hereby notified that assessments for death and disability claims are hereby levied as follows: For each beneficiary member whose name appears on the rolls of membership on October 31, 1907 (also for all beneficiary members transferred from your Lodge after October 1), carrying a Beneficiary Certificate of THREE THOUSAND ($3,000) DOLLARS, you are required to forward the sum of SIX DOLLARS ($6.00). For those carrying a Certificate of TWO THOUSAND ($2,000) DOLLARS, you are required to forward the sum of FOUR DOLLARS ($4.00). For those carrying a Certificate of FIFTEEN HUNDRED ($1,500) DOLLARS, you are required to forward the sum of TWO DOLLARS AND TWENTY-FIVE ($2.25) CENTS. For those carrying a Certificate of ONE THOUSAND ($1,000) DOLLARS, you are required to forward the sum of ONE DOLLAR AND FIFTY ($1.50) CENTS, and for each member carrying a Certificate of FIVE HUNDRED ($500) DOLLARS, you are required to forward the sum of SEVENTY-FIVE ($0.75) CENTS. You are hereby requested to make remittance for assessment No. 8 as soon as possible, and in no event to reach the Grand Lodge later than November 20, 1907, as provided in Section 82 of the Constitution.

Yours fraternally,

J. J. HANNAHAN, G. M.

W. S. CARTER, G. S. and T.

SPECIAL NOTICE.—All remittances must be made by BANK DRAFT, MONEY ORDER, OR EXPRESS ORDER. Beneficiary members whose applications were approved after October 31 are not liable for this assessment.



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Notice.

Communications intended for publication in the Ladies Department of the Magazine should in all cases be addressed to the Editress, Mrs. Agnes G. Strong, 527 Green street, Boone, Iowa.

A Song of the Thankful Time.

We think of Thanksgiving at seeding time,
In the swelling, unfolding, budding time,
When the heart of Nature and hearts of men
Rejoice in the Earth grown young again.
We dream of the harvest, of field and vine,
And granaries full, at Thanksgiving time.

We think of Thanksgiving at growing time:
In the time of flowers and the vintage prime;
When the palms of the year's strong hands are filled
With fruitage, with grain and with sweets distilled;
When the dream of hope is a truth sublime,
Then our hearts make room for the thankful time.

We think of Thanksgiving in harvest time:
In the yielding, gathering, golden time;
When the sky is fringed with a hazy mist,
And the blushing maples by frost-lips kissed;
When the barns are full with the harvest cheer,
And the crowning, thankful day draws near.

We think of Thanksgiving at resting time:
The circle completed is but a chime
In the song of life, in the lives of men!
We harvest the toil of our years, and then
We wait at the gate of the King's highway,
For the dawn of our Soul's Thanksgiving Day.

—ROSE HARTWICK THORPE, in the Ladies' Home Journal.

Our Example.

During the month of November there will be the national day of Thanksgiving. We, as an organization, have much for which we can be thankful. As we review the work and the good fortune which has attended us, we can thank the All-Wise Providence for the good he has permitted us to do. Friendship and Charity are the foundation stones upon which we have built our edifice, and if we fail in our duty and in our every day work do not try to put into practical effect the full significance of these words, then we will have to admit that we have not lived up to the ideal we have set up.

I take it that one cause of our society's growth is because of the unison of spirit which has ever characterized our

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workers. Unconsciously we have taken advantage of the truth, that only in union is there strength, and this is the secret of any society's advancement. There is the fable of the banyan tree which for years had cast a luxuriant shadow to passers-by; the roots became angry at the leaves. "We toil underground, and you flutter idly in the sun," said the roots. "We drink in the rain and light and send down to you ingrates," responded the leaves. Then, both angry, they resolved to act no longer in unison. The roots would send no sap to the branches. The leaves, in consequence, withered and died, and the shade being removed, the ground beneath it dried and baked in the burning sun, and the roots, deprived of moisture, soon shriveled and died.

I have read of a king who had a room in his palace, higher than all the rest, to which he resorted only on special days. When he wished utter quiet, or when some great event had stirred his inmost soul, to this room would he repair, and alone with his thoughts, contemplate the past and present and anticipate the future. Winding roads could he follow from this dizzy height, which led to his various possessions, and extensive forests told of wealth still unsought. And in one's life there are occasions, which might be called crises, when we would rejoice to leave the excitement of the crowd, and, alone with our thoughts, contemplate the situation.

In my Ladies Society life I approach many such occasions. I often love to resort to this chamber of memory and ponder, and also to ask myself what is the future of our beloved Order? For to me it is not enough that we are represented in many states. The size to which we have grown heightens our responsibilities. It is not enough that we have delightful social gatherings, and often literary feasts. In this age something is expected of a society of our size. As this is humanity's century, we must enter as a factor of progress and good. We should bear in mind that throughout the width and breadth of this fair land of ours the work is going on. We are not ashamed of our Order, and when we pass over the divide, we should leave the Order better and brighter by having been a member.

There is something solemn and awful in the thought that there is not an act done, or a word uttered by a human being, but carries with it a train of consequences, the end of which we may never trace. Not one but to a certain extent gives a color to our life and a tincture to our character, and insensibly influences the lives of those with whom we come in contact. The good deeds or words will live, even though we do not see them fructify; so, also, will the bad. No person is so insignificant that his example will not do good on the one hand or evil on the other. The spirits of men and women do not die; they still live in the broadened realms beyond the tomb. "There is, indeed," said one, "an essence of immortality in the life of man in this world." Not one of us in our beloved Order stands alone; each of us is a component part of our noble institution, and of a system of mutual dependence; and by our several acts we either increase or decrease the sum of human good now and for all time to come. A profound thinker said: "As the present is rooted in the past, and the lives and examples of our forefathers still, to a great extent, influence us, so are we, by our daily acts, contributing to the condition and character of the future. No man's acts die utterly; and though his body may resolve into dust and air, his good or his bad deeds will still be bringing forth fruit after their kind, and influencing future generations for all time to come." It is in this momentous and solemn fact that the great peril and responsibility of human existence lies.

Hence, how important it is for us to fix our eyes on Him, the father of all, and follow His teachings in all things; then we will accomplish much good in our lodge work and know that our work has not been in vain.

* * *

Notes.

How gay the souvenir postals from everywhere, sent by the happy L. S. girls, away on their vacations in every corner of the United States, Mexico and Canada.

"Don't look for the flaws as you go through life;
And even if you find them,
It is always kind to be somewhat blind
And look for the good behind them."

Do we realize the solemnity of our obligation and honor the binding force

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of our law? The end of friendship is to aid and comfort each other through all the relations of life, even unto death. That is the ideal. How near do we come to it? Do we even fall in its shadow?

"Friendship, above all ties, should bind
the heart,
And faith in friendship is the noblest
part."

Practically, to most members of the Order, it seems but a glittering generality, which has no loftier aim than mere enjoyment of the passing hours. We forget too often that the way to have a friend is to be one; that friendship is only the reflection of a woman's own worthiness from other women.

How prone we are to think that other people who do not see as we do are prejudiced, and if they are displeased, that they have an imaginary grievance. Yet, whoever considered herself to have an imaginary grievance, or to be prejudiced, or to have petty personal feelings about matters? No one. So we ought to take that fact into consideration. Is ours to be the judgment what is petty personal feeling, prejudice or imaginary in others' estimate of matters? As far as they are from the true estimate, may we not be also? None of us can know another's heart.

Again and again it has been urged upon the officers and members the importance of careful study of laws governing our Order. Yet, still, many of our lodges remain in ignorance of not only the laws of the Grand Lodge, but also of their own lodge; wherein many little troubles and even offenses might be evaded if the law was better understood. And I would suggest that as far as possible each member shall have a copy of the Constitution and By-Laws of the L. S. and it shall be read in open meeting at least twice a year. I truly wish that the officers and members would make a greater effort and see the necessity of a more thorough knowledge of the work and heeding the little things which help so much in making the work uniform.

The interest of many lodges is retarded by not opening on time. I would suggest to all lodges to have a stated hour of meeting, and then bear in mind that to meet on the hour is as essential as the night meeting.

New Lodges.

Green Valley Lodge No. 235, organized September 10, 1907, at Grafton, W. Va., with eight charter members. Organizer, Sister Anna M. Brady, of South Cumberland, Md.

Instructor Appointed.

Sister Stena Ward, president of No. 117, of Sparks, Nevada, has been appointed instructor in place of Sister Farran, resigned.

Big Ten.

Below is given the membership of the ten largest lodges of the L. S. to B. of L. F. and E., reported October 1, 1907:

1. No. 142, Empire, Buffalo, N. Y.—120.
2. No. 3, Hazel, Peoria, Ill.—111.
3. No. 70, Holly, Buffalo, N. Y.—102.
4. No. 60, Pride, Harrisburg, Pa.—92.
5. No. 151, Missouri, St. Louis, Mo.—78.
6. No. 10, Helpmate, Elkhart, Ind.—75.
7. No. 51, Grayson, Denison, Tex.—75.
8. No. 125, Charity, Jackson, Mich.—74.
9. No. 146, Virginia, Chicago, Ill.—71.
10. No. 113, Fort Orange, Albany, N. Y.—71.

Hints to the Wise.

"Just do a thing! Don't talk about it! This is the great secret of success in all enterprises."

"Unselfishness writes beauty first upon the heart, and then, gradually, but with marvelous sureness, upon the face."

"Empty hours, empty hands, empty companions, empty words and empty hearts draw in evil spirits, as a vacuum draws in air. To be occupied with good is the best defense against the inroads of evil."

Wise Sayings.

"It ain't never no use puttin' up yer umbrell' till it rains."

"It looks like ever'thing in the world comes right if we jes' wait long enough."

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"Somehow I never feel like good things b'long to me till I pass 'em on to somebody else."

"Ma use' to say livin' was like quiltin' —you orter keep the peace an' do 'way with the scraps."

"I jes' do the best I kin where the good Lord put me at, an' it looks like I got a happy feelin' in me 'most all the time." —From "Mrs. Wiggs of the Cabbage Patch."

Things Money Can Not Buy.

Though immensely wealthy, the Duchess of Roxburghe is well aware that money can not do everything. Had she any delusions on this point they would have been removed soon after she became mistress of Floors castle, when she tried in vain to purchase a collie from an old shepherd. She was just leaving a bazar she had been opening when her attention was caught by a fine collie in the possession of a poor old shepherd who had come down from the hills. The duchess, who is fond of animals, at once desired to have that collie, and asked the price of it. It was not for sale said the old man. Then the duchess offered $75 for it, increased her offer to $125 and finally to $625, but in vain. The old man, whose dress betrayed his poverty, was not to be tempted. Fondly he drew himself up and said: "Ma leddy, gin ye were the queen hersel' me and ma dowg wull ne'er be parted for siller." The duchess took the rebuke in good part and afterward sent him a handsome present, for, as she said, she admired his disinterestedness.—Chicago News.

Teddy-Bear.

In a department store in a city
  Midst a wonderful window display
Of muslins, laces and ribbons,
  Sat a brown Teddy-bear one day.
His face, with its quaint expression,
  And his odd little upturned nose,
Brought many a smile of pleasure
  Where sadness was wont to repose.

He looked so proud and defiant,
  Like a king he sat in state;
Each passerby for his subject—
  The sad, the gay or sedate.
With his clumsy paw held upward,
  And his foot with its chamois sole,
Stretched out in saucy posture,
  He played his important "role."

But at length when the sun shone fairest
  On the brown Teddy-bear so gay,
A sad little face peeped at him
  From a basement across the way;
And a pair of blue eyes so wistful
  Gazed up in his shaggy face,
While some way the skies seemed darkened,
  And Teddy-bear out of place.

He saw that her gown was faded,
  That her shoes were old and torn,
While deep in those baby features
  The furrows, by illness worn;
And he longed to escape the trappings
  Of that wonderful window display,
To comfort the little maiden
  In the basement across the way.

But into a shining auto
  Poor Teddy-bear soon was thrust;
And that night, some miles from the city,
  He lay in the roadside dust,
While the charming girl who had bought him,
  So cold on the damp earth lay,
And the wonderful window seemed empty
  From the basement across the way.

At length to the city one morning
  A wandering fellow came,
And his rough old heart was saddened
  By a child that was wan and lame.
So out from his ragged pocket
  Came Teddy-bear once so gay,
To live with the little maiden
  In the basement across the way.

IMOGENE BATES.

Oneonta, N. Y.

Character.

Character is another name for backbone, for individuality.

The beginning of good character is sincerity. Insist upon doing the thing that seems to you right.

Persist in saying the thing that seems to you to be true.

Never allow yourself to consent, even tentatively, to things that seem to you false.

Nothing short of this is sincerity.

Nothing short of this will lead to a good character.

Character is the great heart tonic in the world. It quickens the circulation, strengthens the heart beats, flushes the cheeks with blood.

It gives strength to the nerves and expression to the face.

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It is composed of equal parts of sincerity, courage and human sympathy. It is a tonic that should be taken every day the whole year around.

It is a drugless remedy in reach of every one. It costs money, effort, and it never fails to give good returns.

Character throws out its threads of usefulness everywhere, in standing for sentiment, in defending principle and in working for the good of the whole as well as for individual aspirations.—Indianapolis Star.

A Rosebud.

No one fulfills the full measure of opportunity or of possibility in this world. "If I had only acted differently," rings through the corridors of all time, and "it might have been" poisons the atmosphere of eternity. Who can measure the good that may result from a very simple, and, what we conceive to be, little act? A little child gave a tiny rosebud to a poor, degraded woman, whose bloated face and bloodshot eye told the terrible story of dissipation. There was a fragrance in the bud—a pure, fresh fragrance—that reached the face of that outcast woman. It was the only perfume, the only pure odor, she had breathed for many a long day. There is surely an avenue to every human soul, and if that avenue is found, the most depraved nature may be touched, and the hardest heart may be melted. The tiny rosebud, with its fresh, sweet fragrance, was the avenue to that woman's heart. Startled, as one aroused from a horrible dream, she seized the flower, pressed it to her lips, and with tears of true penitence streaming down her besotted cheeks, she dared to look up into the pure atmosphere of heaven. The sunlight smiled upon her face, and the little child smiled, too. This was purity surrounding a monument of human depravity.

Who can tell of the anguish of that woman's heart, or the earnest prayers she breathed as she recalled her own days of purity and innocence? Tearfully she thanked the little child, and would gladly have taken her in her arms and kissed her, but she shrank from polluting that infant face with the offensiveness of her foul breath. Her heart had been reached. She went away, but not to her old haunts in the dives and among the dissolute. The tiny, fragrant rosebud, the innocent baby fingers, and the smile of God's sunlight had done their work. The woman was saved, and when only a short time ago she was borne to her last resting place, beneath the rosebuds and the lilies, many gathered to do honor to her cherished memory.

For two years, from the moment the tiny rosebud and innocent little child found the avenue to her soul, until the day she died, she had led a chaste, pure and lovely life. Her precepts and example had won many others to forsake their evil ways. As she lay in her coffin, shrouded for the grave, her face wore a smile of sweet content, and its whiteness rivaled the beauty and purity of the lily which she held in her hand.

This is a true story of life and doubtless many will remember it, and many shall rise up and call "Blue Bird," as she was known among her later associates, blessed, and in the presence of the Eternal Judge she will forever praise the baby fingers and the tiny rosebud that found the way to her heart in the days of her depravity.

It was a very little act, but momentous in its results. A little child, a little flower, a saved woman. The man who will not act because he can not do a great thing will never do anything. Time passes by seconds. Each pulse-beat brings us nearer to the close of life.

What are you doing?—Masonic Standard.

Enterprise Lodge 162, L. S.

Having been an interested reader of the Magazine, and not having seen any letter from our lodge for some time, I thought perhaps the sisters would like to hear from us.

Our lodge is at present enjoying an era of prosperity, due no doubt to the careful and efficient set of officers this lodge has always had the good fortune to enjoy. We have not a very large membership, still we have interesting meetings and manage to keep things moving.

We are, in the near future, to hold a joint meeting with Endeavor Lodge No. 267, and although we can not boast of as much talent as our brothers, we hope to be able to make them feel that they have at least spent a pleasant evening. We are going to try, at any rate.

I think the ladies of Enterprise Lodge

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are optimistic, believing that one has achieved success who has lived well, laughed often and loved much; who has gained the respect of intelligent men and the love of little children; who has left the world better than they found it, whether by an improved poppy, a perfect poem or a rescued soul; so I do not think we are going to acknowledge failure: but I do ask that the brothers will cover us with the mantle of charity and hide our little errors from the world. I will tell you of this joint meeting in my next letter.

The Grim Reaper has entered the home of Sister Martinez and taken away her dear son Leonce. To his sorrowing family Enterprise Lodge No. 162 extends its sympathy and codolence. May He who doeth all things best comfort them in their bereavement.

"There is no flock, however watched and tended,
But one dead lamb is there!
There is no fireside, howsoe'er defended,
But has one vacant chair."

Fraternally,
ANNIE JOHNSON.

Surprise Party.

It was on the evening of September 2, 1907, also Labor Day, when the rain was falling in torrents from the heavens, which made the life of the railroad man very unhappy. But such was not the case with the brothers of Wm. H. Morne Lodge No. 673 and Harrisburg Lodge No. 174 and their families, and Pride Lodge No. 60 of the L. S. We met at the home of Sister Redmonds, and from there proceeded to the home of Sister Felix, where was given a delightful birthday surprise party in honor of Sister Felix's thirty-eighth birthday. The evening was spent in social entertainment and music. Sister Felix was the recipient of many handsome and useful gifts. Sister Fink, the worthy president of No. 60, in a very neat address presented the presents to Sister Felix, who in return responded in a very pleasing manner.

No. 60 has some very remarkable members in their society. For instance, there is Sister Bless, ex-president, whom the brothers of Lodges No. 673 and No. 174 claim is the champion coffee cooker, and that she can not be beat anywhere. Hurrah for May!

There is Sister Yost, who is better known as Barbee, the brush woman. She has changed her attentions from packing hair brushes in grips when visiting other sisters to the "Saratoga potato chip eater," which Brother Yost, familiarly known as "Timothy Tom," was not aware of, for when the refreshments were served Barbee made a clean sweep of the plates of Saratoga chips, while the rest just looked on to see what next she would do. Arrangements have been made with the "Saratoga chip man" to supply Barbee daily, except Sundays, with the sliced Murphies.

Brother Felix, of Lodge 673, said that he did not know that his wife was such a "wind-jammer" until he heard her respond to Sister Fink's presentation speech.

There is Brother Thomas Redmond, of Harrisburg Lodge No. 174, who lays claim to be the champion coffee drinker. He always looks for the largest cup, for he knows that the coffee is good when made by Sister May Bless.

Mrs. Keller, wife of Bro. A. J. Keller, of the B. of R. T., assisted in filling the inner wants of the guests with lemonade and ice water. Mr. F. H. Mauk, the popular undertaker, was present for the first time at a gathering of the L. S. and B. of L. F. and E., and he spoke very highly of us, and we must tender our thanks to Mr. Mauk for his kindness in donating us the use of his chairs for the occasion.

Sister Frickman laid claim to the champion table dresser (she is all to the good at that).

After all present were served with refreshments they returned to their homes, wishing Sister Felix many more happy returns of the day.

I DID IT—MEMBER NO. 673.
Harrisburg, Pa.

A Good Act.

"I expect to pass through this life but once. If there is any kindness or any good thing I can do to my fellow beings let me do it now; I shall pass this way but once."

This expression is attributed to William Penn. While the sentiment is of the highest moral type, yet in this age it would hardly be safe to herald at large such a desire, for the reason that the animus would be misunderstood, and

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numerous unreasonable requests would be the result. However, in fraternal parlance there seems to be a thought that is worthy of consideration, and it is in this field of speculation that our minds wander, and in its rumination we find one of the main purposes of the Order.

With some people it is a personal gain that causes their annexation, and in such instances the disappointments are numerous, for the one who joins for business only finds little sympathy and success. I see in the speculation a motive that prompts the masses, and the essentials of the motive are a desire to perform good acts and to enjoy the reciprocation, to enter into the routine business, to mingle in all associations and in their performances when opportunity offers, to carry out the mandates expressed in William Penn's assertion already quoted.

Every one who joins the association has some strong personal motive for the act. Occasionally some one may be heard to remark, "I joined merely for social enjoyment," and while it may be partly true, I doubt if there is one initiation but that the novitiate has weighed well the probable results of such affiliation. The writer is of the opinion that with a majority it is both to make others happy and to increase the happiness of the party described. There is certainly pleasure in performing good acts, and being the originator of the act itself is gratifying in the extreme.

There is a lesson in the topic for the Order, and I am inclined to the opinion that a large proportion of the members have the good act as the primary cause for joining.—Alonzo J. Burton, in the Eastern Star.

* * *

October.

Glorious, beautiful October, how welcome you are with your mellow sunshine —the kind one likes to stay out in—and your delightful autumn breeze, which brings to the tired system after the summer heat what an exquisite bouquet of roses brings to tired, unhappy eyes—a happy, contented rest.

As a child I often thought, could I alter the calendar, I'd have six Junes and six Octobers. Since then I have learned that life's richest blessings are of short duration, and that diamonds never come in bushel baskets. If they did we should cease to care for them. Were there no storms on life's pathway we would cease to love sunshine.

"The clouds may hide the sunshine
Of heaven from our sight,
And life have much of sorrow
To mar the heart's delight;
But if, like faithful sunbeams,
We children do our part,
We'll bring a ray of brightness
To every shadowed heart.

"Then let us live our mission
Of sunbeams day by day,
And scatter joy and brightness
About us all the way;
Let's chase away life's shadows
With loving thought and deed,
And be the sunshine makers
Of which the world has need."

On September 24th one of the most enjoyable social events of the season was given at the beautiful home of Brother and Sister Shepherd in the form of an afternoon reception.

To those who have had the honor of being a guest in this hospitable home I owe no description; but to those who have not, I beg space to tell just a little about it. The parlor, reception and dining rooms were very beautifully decorated with roses and ferns. Sister Shepherd—ever the spirit of hospitality—was on this occasion even more gracious and charming than usual, being assisted in receiving her guests by her sister, Mrs. R. A. Sullivan.

Sisters Sara McGow, Cammie Shepherd and Mrs. R. A. Sullivan have lately returned from a visit to relatives at Boonville, Mo.

Miss Mamie Harrison, the beautiful and accomplished daughter of traveling engineer J. E. Harrison, of Batesville, is visiting relatives in Little Rock.

Sisters and members of No. 80, if you don't want to come to lodge meetings, why just don't; but I assure you whenever you miss a meeting you have lost that much pleasure. Sister Prieur is certainly a fine president, and all of the new officers are doing their duty in a thoroughly businesslike manner; from the opening to the closing ode everything is bright and interesting. Now, you just come out and see if I do not speak the truth.

With best wishes to our kind Editress and all members, I am, as ever,

ORA BOON.

Little Rock, Ark.

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Our Little Ones.

There's a sound that I love, for to me it is more precious
Than aught I can hear from the morning till night;
'Tis the voices of children ringing out full of laughter,
For it tells me of hearts that are merry and light;
And nothing to me seems half so sweet
As the pit-a-pat of my little boy's feet.

The rich may deck out their children in jewels
And lay them to rest on a soft bed of down,
And mine may go barefoot the long summer weather
'Till their dear little feet will be hardened and brown;
And their pants may be worn from the knee to the seat,
Yet how dearly I love the pit-a-pat of their feet.

Ah, you who are tempted to chide or to scold them
For soiling your carpet or marking a chair,
Remember it is easier to clean and repair them
Than to fill these young hearts full of sorrow and care;
For be sure there is nothing on earth more sweet
Than the pit-a-pat-pat of your little child's feet.

There's a spot that to me is so sacred and holy,
It's a very small space covered over with sod,
But it tells of a sweet little angel who left me,
No trace can I find where those little feet trod;
And never on earth can I hope to greet
The pat, pit-a-pat of my darling's feet.

Who can tell in the future how rough or how thorny
The pathway may be where those feet have to tread;
And perchance all the friends that they loved will have left them
To join the great army that lies with the dead.
While you may then be careful to heartily greet
The pit, pat-a-pat of your children's feet.

MRS. HENRY B. JONES.
Washington, Ind.

Letters from Friends.

FROM L. S. 78.—(*Mrs. Laura Christal, Raton, New Mexico.*) The year that is just drawing to a close has been full of pleasant happenings to Lodge No. 78. While we have not increased as rapidly numerically as some of our sister Lodges, yet we are a happy band of workers. I am not going to write you a long letter at this time. I am going to leave that for our new Magazine correspondent, but I can not resist my desire to tell you of the first annual ball of New Endeavor No. 78, L. S., Thursday evening, June 20, 1907.

We sold over two hundred tickets and cleared about ninety dollars. We would have done much better than this if such a storm had not come up in the evening, keeping many away that otherwise would have been present; and then, too, our expenses were unusually high, but as it is, we are all very well satisfied, for it was a decided social success as well as a financial one.

As we enter upon our new year, with all of its possibilities before us, may the principles of our sisterhood be more deeply inculcated into every heart, and each one do her part, that we shall feel more strongly the sacredness of the tie that binds us, and this year be the most prosperous we have ever known.

♦ ♦ ♦

FROM L. S. 154—(*M. Edith Reece, Newport, Vt.*) Well, I wonder what our sisters are all doing this hot weather? Perhaps it will make you all feel cooler just to read a line from cold, old Vermont; but the greetings Lodge No. 54 sends you is just as warm as the weather. Although our lodge is still young, it is doing a flourishing business, I tell you.

We have had one glorious joint meeting. A dainty little luncheon greeted the smiling faces of our brothers. The tables were decorated with red carnations—our emblematic flower. After luncheon dancing was enjoyed, and mirth and laughter rang through the hall and every one went home feeling—just as I heard one jolly fireman remark—as if they had had "a ripping good time."

Wednesday, August 28th, the lodge is going to have a picnic up Lake Memphremagog. Come on, brothers and sisters, with your lunch baskets and picnic with us. I assure you all a hearty welcome and a pleasant time.

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We are happy to announce one birth, and that a darling baby girl that has come to brighten the home of Sister Watkins.

I wish I could tell all of the sister lodges how interested our members are in their lodge work. Nearly half of our membership lives in Lyndonville, a distance of thirty miles from Newport. Now every meeting night the ladies make a great effort to be present, and I want to assure them it is greatly appreciated by the home members. They seem to follow the teachings of the old Roman proverb, "I'll find a way, or make it."

We, as members, are not only interested in our own lodge, but in every society of the B. of L. F. and E. We really form one grand lodge, working for one common cause, and that is to help each other and to make life happier and brighter, not alone for others, but for ourselves as well. It is true:

"Give to the world the best that you have,
And the best will come back to you."

With Friendship and Charity toward all.

♦ ♦ ♦

FROM L. S. 51—(*Mae Gensel, Denison, Tex.*) July 1st Red River Lodge No. 8 and Grayson Lodge No. 51 held a joint installation in B. of L. F. and E. hall and drew the largest attendance and was one of the most successful socially of any event of the kind ever given in this circle. The elaborate ceremonies of installation, the splendid program rendered and the informal social feature made the evening one long to be remembered by all present. Sister Hattie Roe, as installing officer, assisted by Sister Anna Wright, as marshal, with Sister Anna McCune as musician, all performed their part in the work with grace and ease. At the conclusion of the ceremonies the newly-installed president, in behalf of Grayson Lodge No. 51, presented to each of the installing officers a beautiful bouquet of cut flowers in appreciation of the excellent work done. A very enjoyable program was arranged by the following committee: Sisters Smith, McCune, Fullington. Every number was given in a splendid manner. Refreshments, consisting of ice cream and cake, were served in the banquet hall. Success to the new officers the coming year.

At the following meeting the retiring president, Sister Hattie Smith, read her yearly report, which was an excellent showing. She told how many sick and distressed members she had visited and taken flowers to—to let them know that, although they were obliged to be absent from lodge meetings, they were not forgotten. She also reported twenty-six candidates received and two by transfer cards.

Sister Smith has been a most worthy president, always wise and just in her decisions, kind and thoughtful toward all sisters, and as a slight token of our esteem and appreciation of her successful work the past year she was presented with a beautiful Past President's pin.

We initiated one candidate at our last meeting, and have several more in view whom we expect to get for our class soon.

Some of the sisters are very careless about attending regular meetings of our lodge. Sisters, remember your obligation you have given to your society. Pause and think what it means to us and our families in many ways. Come out and be one of us, and you will get interested. Show the officers, and especially the president, that their efforts in our behalf are appreciated, and you can materially do this by regular attendance at meeting.

The stork visited the home of Brother and Sister Russell and left a dear little L. S. lady.

With best wishes for unlimited success to our dear Editress and to all sister lodges, also to the great Brotherhood in whose interests we are organized—the B. of L. F. and E.

♦ ♦ ♦

FROM L. S. 22—(*Aimee C. Perrin, Denver, Colo.*) It is time again to let you know how Scenic Route Lodge No. 22 is prospering. We have very good meetings and hold them regularly, and all are enjoyed so much.

Our collector, Sister Smith, entertained the members of No. 22 and a number of the B. of L. E. ladies most royally at a very elaborate dinner at her home in Barnum. Games and music helped to pass a most enjoyable afternoon, and when we all reluctantly parted we thought of the splendid time we had and the abundance of chicken.

We have had election of officers once more and they take hold of the work with new life and energy, and we hope to make quite a mark this year.

We were delighted to have Sister Lynn

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Flynn, from Kansas, with us today and hope she will come again soon. We are always glad to welcome visitors.

Wishing all success and harmony.

♦ ♦ ♦

FROM L. S. 187—(*Laura E. Stoner, Columbia, Pa.*) August 7th we held our annual picnic at Chickies Park. We had a very fine time. The day was perfect and everything went merrily. We had with us Miss Clara Smoker, who gave us with his graphophone. Their kind- Also, Mr. J. H. Myers, who entertained us with his graphaphone. Their kindness was greatly appreciated and added much to the enjoyment of the picnic. We certainly hope that they will come again.

As the summer months have gone by we look back and realize that we have not accomplished much in the way of promoting our lodge interests, but now as autumn is at hand and all have had their vacations and the cool weather is here, let us settle down and work as never before for the good and welfare of our beloved Order and try and be one of the largest and best lodges on the roll.

♦ ♦ ♦

FROM L. S. 41—(*Mrs. McFarland, Cumberland, Md.*) As I have been appointed press correspondent for No. 41, I will let you know that we are not dead altogether, but we are at a standstill, or were at a standstill for some little time. July 24th we had a very pleasant meeting and took Sister Stuck through the ceremonies of initiation, and after the regular session of lodge was over the sisters had a nice social time together, with refreshments of ice cream and cake, etc. We hope to have more to initiate soon.

The first meeting in July we held a joint installation with Altamont Lodge No. 448, and every one there reported a good time.

If this finds space in the Ladies Department you will hear from us again.

♦ ♦ ♦

FROM L. S. 155—(*Mrs. Nettie Pierce, Somerville, Mass.*) Not having seen anything from Lodge No. 155 recently would like to let the sisters know that we are still alive and prospering. At our last meeting, August 10th, we had the pleasure of initiating three new members, and expect many more soon.

We have many very pleasant social events. Among them was a very pleasant picnic, held August 7th, at Norumbega Park, and a very enjoyable day was spent. Another outing has been planned to Revere Beach, which we look forward to with pleasant anticipations.

Hoping this will not find the waste paper basket, I am, yours in Friendship and Charity.

♦ ♦ ♦

FROM L. S. 91—(*Miss Matilda Powell, Altoona, Pa.*) As Mountain City Lodge No. 91 has not been heard from for some little time, I will try and let you know how we are getting along. We are steadily increasing our membership and hope to continue to do so.

On Sunday, June 30th, we held a joint meeting with the brothers of No. 287, and we had as our guests the brothers of No. 673 and No. 174, of Harrisburg, and the sisters of No. 60, also of Harrisburg, with their drill team, which we enjoyed very much.

On Tuesday, August 20th, a union picnic was held by No. 673, No. 174 of Harrisburg and No. 287 of Altoona and all lodges on the main line between the two places and also the ladies, and also the ladies of No. 60 and No. 91. The picnic was held at the old fair grounds at Port Royal. There were about five thousand persons in attendance and we had the honor of having First Vice Grand Master Charles A. Wilson with us, who, I am sure, enjoyed himself very much, as did all present. My one hope is that we may all live to enjoy many more union picnics.

With best wishes for all sister lodges.

♦ ♦ ♦

FROM L. S. 129—(*Mary Hissan, Jersey City, N. J.*) It has been many moons since No. 129 was heard from, but our existence has been an actual one and our labors pleasant and profitable. At our last regular meeting we sold a beautiful silver tea set, and with the proceeds, or part of it, we are going to present our two past presidents with Past President's pins. We feel that when an officer has filled the president's chair she certainly has earned a pin, and we believe in wearing the emblem of your order.

Our regular meetings are well attended and are interesting and instructive. We are working together, hoping to do everything right, according to our light;

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and seeking to increase our light in every possible way.

♦ ♦ ♦

FROM L. S. 195—(*Mrs. Meta Clark, Spokane, Wash.*) As our lodge grows larger we feel that we should be heard from oftener through the columns of the Ladies Department, for we are steadily increasing in membership and interest.

We took in two new sisters by transfer during July, and at our first meeting in this month (August) we have three new members to initiate, and of course we have our eyes on others whom we hope to secure later on.

When the weather gets a little cooler we expect to begin our regular monthly afternoon social entertainments again, for we found them so popular last winter, and we hope to make them even more popular this winter.

We are very proud of our lodge, and the sisters are all such good workers that we believe that there is no limit to what we can reach.

♦ ♦ ♦

FROM L. S. 147—(*Lizzie McDonald, San Antonio, Tex.*) Not seeing anything in the columns of the Ladies Department for quite a while from Blue Bonnet Lodge No. 147, I thought I would let you all know that we are in a very flourishing condition, thanks to the active and efficient officers who are at the head of it.

The meetings this year have been very interesting, first, on account of such good attendance, and second, we have at least one initiation at nearly every meeting.

Sister Mosie Surkey presented us with a pig (not a live one but a money bank to put our pennies in), and the feed that pig gets at each meeting is enough to open any one's eyes—wide, too. This fund is used for flowers and fruit for any sick sister or brother.

On the 27th of May this lodge celebrated its sixth anniversary with a dance. We always have a crowd, and every one thoroughly enjoy themselves, too. All of the sisters of No. 147 know just how to entertain, and with the help of the brothers we are always sure of a good attendance and a good time. The programs were unique, being entirely the work of our president, Annie Aylmer, and were as follows:

PROGRAM.

1. March—Waltz—To Our President, Annie Aylmer.
2. Two-Step—Take off Your Blue Bonnet and Dance.
3. Schottische—B. of L. F. and E.
4. Waltz—Vice-President Lizzie McDonald.
5. Quadrille—"Pop Goes the Weasel."
6. Two-Step—Past President Annie Snyder.
7. Waltz—Our Motto, "Friendship and Charity."
8. Redowa—Secretary Jannie Barr.
9. Ladies' Two-Step—The Blue Bonnet, Texas State Flower.
10. Waltz—Chaplain Sallie Vandlingham.
11. Two-Step—Our Brothers Davy Crockett Lodge No. 145.
12. Newport—Save Your Pennies for the Pig.
13. Waltz—Our Santa Claus, Mosie Surkey.
14. Schottische—Sisters Ritche, Ahrens, Hoag and Miles.
15. Two-Step—Our Friends of the B. R. T.
16. Ladies' Waltz—"I Don't Know Why I Love You."
17. Schottische—Sisters Nichols, Dudley, Rohmer, Andree.
18. Waltz—Sixth Anniversary Blue Bonnet Lodge.
19. Two-Step — Sisters Gallagher, Stone, Fontaine, Hoey.
20. "Home, Sweet Home"—To Meet Again in 1908.

♦ ♦ ♦

FROM L. S. 231—(*Mrs. Daisy W. Hite, Sacramento, Cal.*) Wishing to identify Lodge No. 231 with the other L. S. lodges of our state and country, we venture this letter to the Magazine, which will partially detail its brief history. We are a new lodge, just organized, and are known as the California Poppy Lodge No. 231. We were organized on August 7, 1907, with just seven charter members. The organization was effected through the influence of Sister Jennie Ford, of Lodge No. 117, Sparks, Nev., assisted by Mrs. Phillips, of the same lodge, before taking up her residence in our city. Words can not express our appreciation for the kind words and good advice given us by these sisters.

Our brothers of Lodge No. 260 donated a large sum of money to start us out in our good work, and on the eve of our organization we held a banquet in honor of our sisters who assisted in or-

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ganizing us, and the brothers joined in helping us show them a good time.

So far our lodge is getting along very nicely. We have held three regular meetings and one called, one to initiate a candidate, and have had a very good attendance. Every one seems interested and we have seven applications for membership now on file.

We meet twice a month, on the second and fourth Wednesday afternoons. We have not completed our plans for our social evenings or joint meetings, but we are just starting in, and we hope to report to the Ladies Department the success of every meeting.

FROM L. S. 222—(*Mrs. Floy Crockett, Thayer, Mo.*) Having been recently appointed Magazine correspondent for Fern of the Ozark Lodge No. 222, I will begin at once on my new duties. On May 28th, at the regular meeting, the sisters of Fern of the Ozark Lodge No. 222 conducted the writer through the sublime ceremonies of initiation. After business was over, the lodge adjourned until our next meeting. The sisters served refreshments to their families and all of the brothers of No. 280 who "were in," there being only eight brothers who could be with us. After refreshments were served, Brother and Sister Freeman entertained us with several select songs. Our worthy president, Sister Eva Lohnes, is an energetic worker, and we expect to see much good done under her administration and many good times.

Quarterly Insurance Assessment.

(Second Series Numbers.)

Notice No. 20, for the Quarter Ending December 30, 1907.

GRAND LODGE
LADIES SOCIETY OF THE BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN.

Office of
GRAND SECRETARY AND TREASURER.

BOONE, IOWA, Dec. 1, 1907.

To all Treasurers of Subordinate Lodges:

Sisters—Assessment No. 20, for the quarter ending December 30, 1907, is hereby levied upon all members holding membership in the Insurance Department of the Society on or before November 1, 1907. You will forward to this office so as to reach here on or before the tenth day of December, 1907, the sum of sixty (60) cents from each member carrying a $200 policy and one dollar and twenty ($1.20) cents from each member carrying a $400 policy, using the two printed blanks which accompany this notice.

All remittances to be made by draft, postoffice or express money order, payable to "Grand Secretary and Treasurer, Ladies Society, B. of L. F. and E."

Members initiated on and after November 1, 1907, will not be liable for this assessment.

MARY E. DUBOIS,
Grand Secretary and Treasurer.

Approved:

GEORGIE M. SARGENT,
Grand President.

NOTE—We enclose *two printed* blanks upon which treasurers will make returns to the Grand Lodge for the above assessments. Both statements will be filled out *exactly* alike and sent with returns. If all names do not appear in the printed list they will be added. If any corrections are necessary they can be made by the treasurer. One of the printed statements, with receipt, will be returned to the treasurer.

For the names, lodge number, cause of death, etc., of deceased sisters in the payment of whose claim this assessment is levied see issue of the Brotherhood of Locomotive Firemen and Enginemen's Magazine, where detailed statement of the same will be given in department devoted to the Society.

Death Report.

Ida B. Barkley, Lodge 91; died September 5, 1907; cause, pericarditis, with effusion, pulmonary edema. Insurance, $200.

Nellie Harless, Lodge 100; died August 17, 1907; cause, gastroenteritis. Insurance, $200.

Eula James, Lodge 7; died June 22, 1907; cause, stomach and bowel trouble. Insurance, $200.

Maggie Jordan, Lodge 133; died September 8, 1907; cause, meningitis. Insurance, $400.

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The M. C. B. Association recommends a

Knuckle Opener

"Which will throw the knuckle completely open and operate under all conditions of wear and service"

This recommendation exactly describes the operation of the

PITT—COUPLER

To make the operation of opening the knuckle by means of a "Kicker" as safe as it has always been by hand it is essential that the "Kickers" should work every time. The failure to do so has been the cause of many serious accidents.

We find many switchmen who, taught by experience, disregard the presence of any "Knuckle-Opener" or "Kicker" and open the knuckle, always, by hand, thus, in a very practical way is made manifest the necessity for a safe design in a "safety-appliance."

The "Knuckle-Opener" in the Pitt coupler is positive in its operation and pushes the knuckle open to its fullest range of movement either from a fully closed position or from any partially open position ***regardless of rust.***

With the Pitt coupler the switchmen will never be obliged to reach in—on sudden impulse—at the last moment and when the car is in motion to open the knuckle by hand.

Manufactured only by

The McConway & Torley Co.

Pittsburgh, Pa.

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Jepson Bros.
SOLE OWNERS.

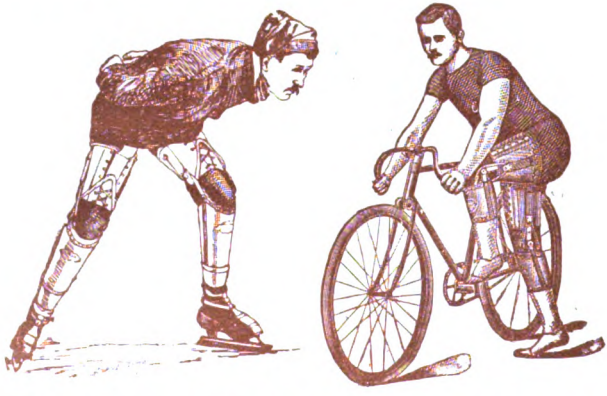
LARGEST MANUFACTORY OF ARTIFICIAL LEGS IN THE WORLD.

THE LATEST IMPROVED
·PATENT ADJUSTABLE·
·DOUBLE SLIP SOCKET·

Artificial Leg

WITH
SPONGE RUBBER
MEXICAN FELT OR ENGLISH WILLOW
Foot

WARRANTED
NOT TO CHAFE THE STUMP.



This cut shows leg for amputation six inches below the knee, with inside socket thrown out of its proper position in order to show its construction.

Perfect Fit Guaranteed from Measurements and Casts without leaving home.

Send for Our
New Illustrated Catalogue.

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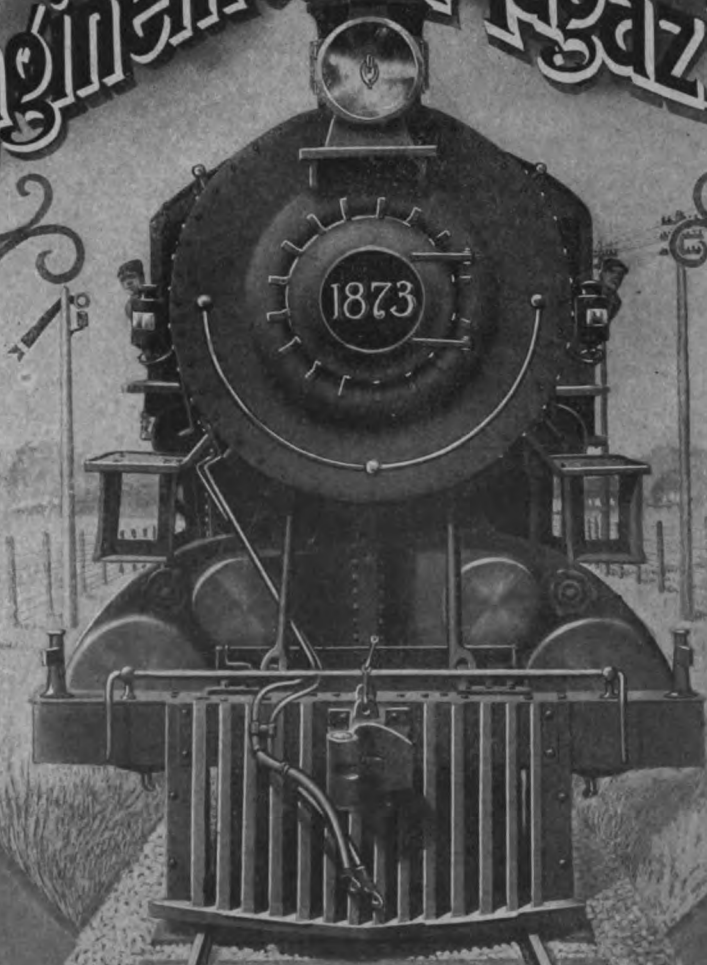
Locomotive Firemen and Enginemen's Magazine



Published at INDIANAPOLIS, IND.
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Brotherhood of LOCOMOTIVE FIREMEN AND ENGINEMEN

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Here's the Glove

for You, Mr. Railroadman

Grinnell "Rist-Fit"

(Patent Allowed)

MADE of tough, wear-resisting "Reindeere" leather, especially tanned so that it cannot be injured by either heat or wetting. This leather is remarkably pliable, enabling you to work as well with gloves on as barehanded.

But the big thing, the unique thing about these gloves, the point where they excel all other railroad gloves is the

"RIST-FIT" FEATURE

This consists of a V-shaped portion cut out of the stiff cuff, filled in with a soft piece of leather and by means of a strap (shown in cut) the glove is drawn snugly about the wrist affording a close, comfortable fit, holding the glove securely in place and keeping all dirt, snow and cold wind from getting within.

This "rist-fit" feature is our own invention, and cannot be found on any other gloves.

The glove cuffs are large and roomy to admit the end of your coat sleeves. A pair of these gloves will assure any engineman or trainman *more service*, *more comfort* and *more satisfaction* than any other glove money can buy. Try a pair and learn what a perfect railroad glove is.

Made Especially for **Engineers Firemen and Trainmen**

A Pair Free of Cost Should your dealer not handle our gloves send us his name, also your size and style wanted, and if you are the first one to do this, we will send you a pair *free* with the first order received from him.

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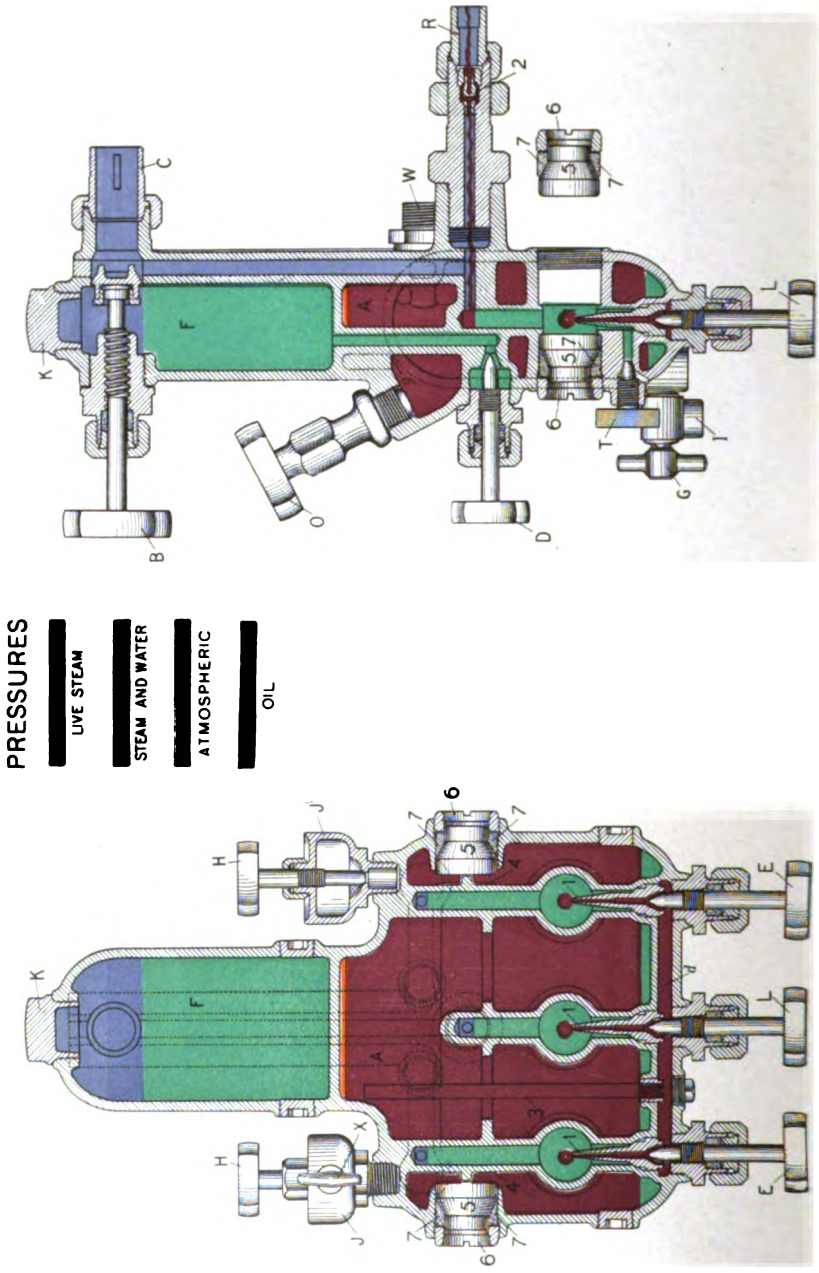

Locomotive Firemen and Enginemen's Magazine Educational Charts

LOCOMOTIVE APPLIANCE SERIES

PLATE XV.—DETROIT No. 21 TRIPLE FEED LOCOMOTIVE LUBRICATOR (Oil Feeding)

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BROTHERHOOD OF
Locomotive Firemen and Enginemen's Magazine.
TECHNICAL DEPARTMENT

JOHN F. McNAMEE
EDITOR AND MANAGER

SUBSCRIPTION PRICE
$1.50 PER YEAR

PUBLISHED MONTHLY BY THE BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN

Entered as Second-class Matter December 27, 1906, at the Post Office at Indianapolis, Ind., under the Act of Congress of March 3, 1879

VOL. 43 No. 6 INDIANAPOLIS, IND. DECEMBER 1907

Plate XV—Detroit No. 21 Triple Feed Locomotive Lubricator (Oil Feeding).

Plate XV of the Locomotive Appliance Series of the Locomotive Firemen and Enginemen's Magazine Educational Charts shows sectional views of the Detroit No. 21 Lubricator with oil feeding.

As will be noted, the lubricator has been refilled, full pressure has been turned on by means of the steam valve *B*, water valve *D* has been opened, as well as the oil feeds *E L E*, and the lubricator is now feeding solid oil. However, it is desired to again call the attention of the reader to the fact that atmospheric pressure occupies the highest point in the expansion chamber—just as it would in any other design of lubricator. As a matter of fact, atmospheric pressure is confined in all lubricators each time they are filled; it is simply impossible to avoid it. Now let us see what the result will be.

We have noted that the instant the feeds *E L E* were open the drops of oil were solid—the hydrostatic pressure exerting a pressure equal to its weight on the lower side of the oil, and, the feeds being open, causes a downward current in the oil tube *3*, which permits the confined atmosphere to escape in the direction of the feeds—possibly in five, ten or fifteen minutes, all depending on the rate of the feed. The engineman may be surprised to see that one or all of the feeds have apparently quit feeding. There is not a thing wrong with the lubricator, except that the confined atmosphere is escaping through the feeds, and as soon as that has been accomplished the oil will flow as it did in Plate VIII. The reader should keep in mind this one fact, that oil and water, air and oil, or steam and oil have no affinity for each other; that is, they will not remain mixed long, but will separate at the earliest possible opportunity.

* * *

The Cantilever Bridge.

From the discussions of the Quebec bridge disaster appearing in engineering, scientific and technical journals, it is evident that faith in the cantilever type of bridge has in no sense weakened, the collapse of that great structure being attributed rather to causes other than the impracticability of building a cantilever bridge of its proposed immense proportions.

On the subject of cantilever bridge construction the following is to be found in the Encyclopedia Americana:

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"Cantilever bridges were developed through the decisions resulting from the discussion of the merits and demerits of the continuous bridges built in Europe prior to 1870. It was noted that in a continuous bridge a slight variation in the height of one of the supports produced great changes in the strains and stresses, and that if the chords were cut near the inflection points for full loads those for partial loads would occur at those points also, and thus render the reactions statically determinate. . . . .

"The practicability of building out long-span cantilever beams from the opposite banks of a stream until they connected at the middle point, was first considered in connection with the principle of the suspension system, in which the truss is supported by cables and stays. Trowbridge proposed to do away with the cables and depend altogether upon the stays for support; but, as it was impracticable to extend the stays conveniently and effectively to the middle of the center span, he arranged to bridge the interval between the water ends of the anchor spans with a simple truss.

"In the practical application of the principle to the modern cantilever bridges the towers are supplanted by balanced anchor spans, the ends of which are connected by a simple truss. In the simplest form they consist of three spans, with the anchor trusses supported at the piers on a single point; but a better condition of reactions is obtained by supporting the trusses on the pier at two points. The disadvantages of a continuous structure are thus avoided. . . . .

"The cantilever system is best adapted to long spans where the ratio of dead to live load is great, and is not economical for short spans where that ratio is small. For spans ranging from 500 to 1,500 feet it is as economical as the arch and the suspension bridges; but, for spans exceeding 1,500 feet, it can not be built as economically as the latter, notwithstanding the fact that the Forth bridge in Scotland, one of the most important of its kind, has spans of 1,700 feet, since many considerations relative to the construction of the piers and the erection of the trusses lead to the conclusion that its selection was practically a mistake. In comparison with continuous structures, the cantilever system has the same advantages possessed by the former over a series of simple trusses of equal spans; that is, in the preservation of the uniform distribution of the moments, and the susceptibility of being erected, panel by panel, where false work is impracticable. . . . .

"The cantilever bridge has come into very general use in recent years, not because of the economy in metal required, as this type weighs more than a simple truss or an arch of equal span, but because of the great advantage that it can be erected without putting falsework in the main channel. Since the government now prohibits even temporary interference with navigation, it has made this type practically mandatory for long spans, as, if any other type is adopted, the span must be erected with additional material, causing it to act temporarily as a cantilever, and this additional erection material overbalances the saving of any type adopted. When the erection is considered, therefore, it has been found that the cantilever is the most economical of all types for long spans, and while some engineers claim that a suspension bridge is cheaper for very long spans, it is certain that equal rigidity can not be obtained for equal cost by using a suspension bridge on a span of less than 1,500 feet; and even considerably above this span the cantilever will in all probability prove the most economical. For this reason the cantilever has practically become the standard type for all long spans, and several very notable bridges of this kind have recently been completed and are now under construction. . . . .

"Cantilever bridges are comparatively new, but even in the few years in which they have been in use they have been greatly improved in their general arrangement, details, and erection devices. The capacity of the bridge shops to manufacture eye bars as large as 16 inches by 2 inches and 83 feet long, center to center of eyes, with pin holes 13 inches in diameter, and heads as large as 36 inches in diameter, as well as to build and ship single compression members weighing 100 tons, together with the ability of the erecting gangs to put these huge pieces in place with moving travelers, has given the designing engineer practically unlimited opportunities, and has brought about the construction of several very large spans of this type in the last two years, notably the 1,800-foot span at Quebec, the 1,182-foot span at Blackwell's Island, N. Y., and the 812-foot span over the Monongahela River at Pittsburg, Pa."

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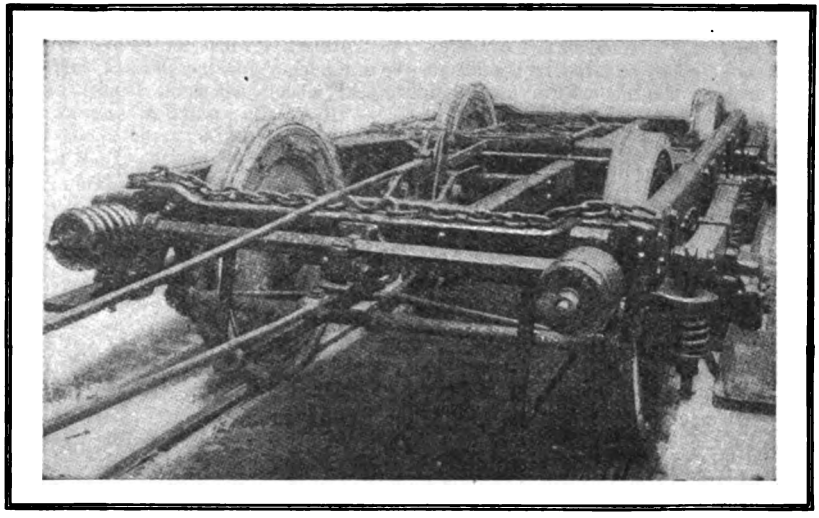
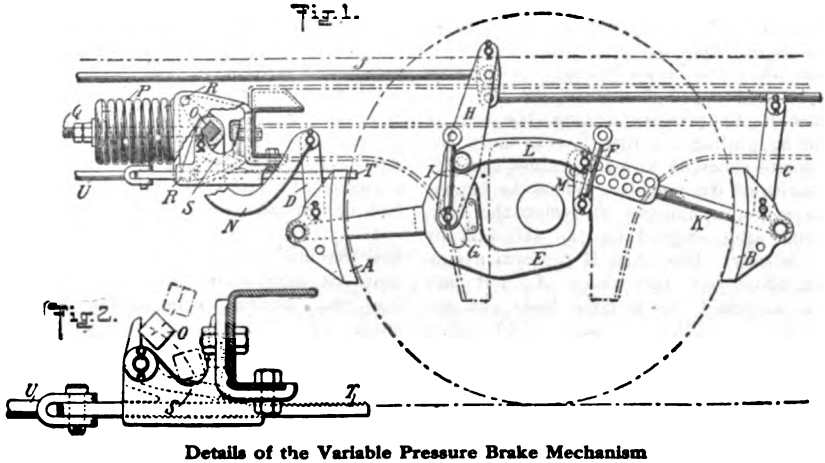
Variable Pressure Mechanism for Air Brakes.

About thirty years ago, during some experiments with air brakes, conducted by the Institute of Mechanical Engineers of London, it was discovered that the friction between the brake shoe and the wheel is dependent not only upon the pressure applied to the shoe, but upon the speed of the wheel as well, because the same pressure at high speeds will not develop as much friction as it will at low speeds. It is on this account that the engineer must ease off the brakes as his train slows down, else a pressure which could safely be applied to the wheels when traveling at high speed would, as the speed slackens, develop sufficient friction to lock the wheels and produce injurious skidding. With a view to overcoming this defect of the common air brake, a valve mechanism has been devised, which automatically acts upon



Truck Equipped with Variable Pressure Brake Mechanism

(From Scientific American)



Details of the Variable Pressure Brake Mechanism

(From Scientific American)

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the air pipe to reduce the pressure gradually.

Our attention has recently been directed to a new solution of the problem, consisting of a mechanism that is operated and controlled directly by the frictional engagement of the shoe with the wheel, varying the shoe pressure without reducing or wasting the air pressure. The coefficient of friction between the wheel and shoe is held at a predetermined constant, regardless of speed or slippery conditions of the wheel. In this way a maximum retardation of the train is obtained at the outset, and the same uniform retardation is maintained until the train comes to a stop. The new brake is called the "Maximus," and details of the mechanism are shown in the accompanying drawings. Each truck wheel is provided with a pair of brake shoes *A* and *B*, respectively operating on opposite sides of the wheel. The shoes *B* are suspended from the truck frame by means of hangers *C*, while the opposite shoes *A* are supported by links *D*, which connect them with the pressure-regulating mechanism, as will be presently explained. The brake beam, which carries the shoes *A*, is formed at its center with a yoke *E*, that extends under the axle and finds support in a pair of hangers *F*. A cam groove *G* is formed in the yoke *E*, which is adapted to receive a roller mounted on the lower end of a lever *H*. The lever is supported at this end in hangers *I*, while its upper end is connected to the brake rod *J*, which runs to the usual brake cylinder. The brake beam *K*, carrying the brake shoes *B*, is connected to the lever *H* by means of links *L*, and to the end of yoke *E* by means of links *M*. It will be evident that when the brake cylinder is operated to move the rod *J* toward the left, the lever *H*, by pressing against the cam *G* and by pulling the link *L*, will draw the opposite shoes, *A* and *B*, against the peripheries of the wheels. When the brakes are set, the hangers *C* resist the frictional drag exerted on the shoes *B* by the wheels. The links *D* perform a similar office for the shoes *A*, but are not attached to a rigid body as are the hangers *C*, and will yield when the frictional drag exceeds a predetermined limit. It will be observed that the links *D* are connected to arms *N* affixed to a square shaft *O*. The ends of the shaft *O* are inclosed in a pair of boxes carried by the truck frame. A pair of springs *P*, held in compression between the boxes and adjustable heads on a pair of studs *Q* projecting from opposite ends of the shaft *O*, exert a tension on this shaft, which is sustained by the legs *R* formed on the shaft and bearing against the end walls of the boxes. It is these springs *P* which govern the amount of pressure that shall be exerted by the brake shoes on the wheels. If the truck be traveling toward the right, there will be a tendency for the shoes *A* to ride up on the wheels when the brakes are set, thus lifting the arms *N* and swinging the shaft *O* upward on the upper legs *R* as a fulcrum. Should the truck be traveling in the opposite direction, there would be a downward drag on the shoes *A*, tending to swing the shaft *O* downward on the lower legs *R* as a fulcrum. However, any displacement of the shaft *O*, whether upward or downward, is resisted by the springs *P*. By adjusting the heads on the studs *Q*, the spring tension on the shaft *O* may be regulated to any desired degree. Not until the coefficient of friction at the shoes *A* overpowers the resistance of the springs *P* will the shoes *A* be displaced; but with them the shoes carry the brake beam and yoke *E*, and by altering the point of contact of the lever *H* in the cam groove *G*, the pressure of the shoes on the wheel is eased up.

When this occurs the brake cylinder is prevented from exerting a higher pressure by the action of a bell-crank lever *S*, as best shown in Fig. 2. One arm of this lever bears against the square shaft *O*, and the arm is adapted to engage the teeth of a rack *T*. The latter is connected by means of a rod *U* with the piston of the brake cylinder. Normally, the lever *S* is held out of engagement with the rack, but when the shaft *O* is swung bodily upward or downward by excessive friction on the brake shoes *A*, the lever is pressed by a spring into engagement with the rack *T*, thereby locking the piston of the brake cylinder.

It will be evident that this mechanism may be made to give any desired minimum or maximum pressure, by adjusting the normal compression of the springs *P*. When the brakes are applied at any speed, they adjust themselves at once to the friction existing at that speed, and reduce the pressure at the shoes as the speed reduces. Skidding is impossible, and there is no danger of injurious shocks. A uniform retardation

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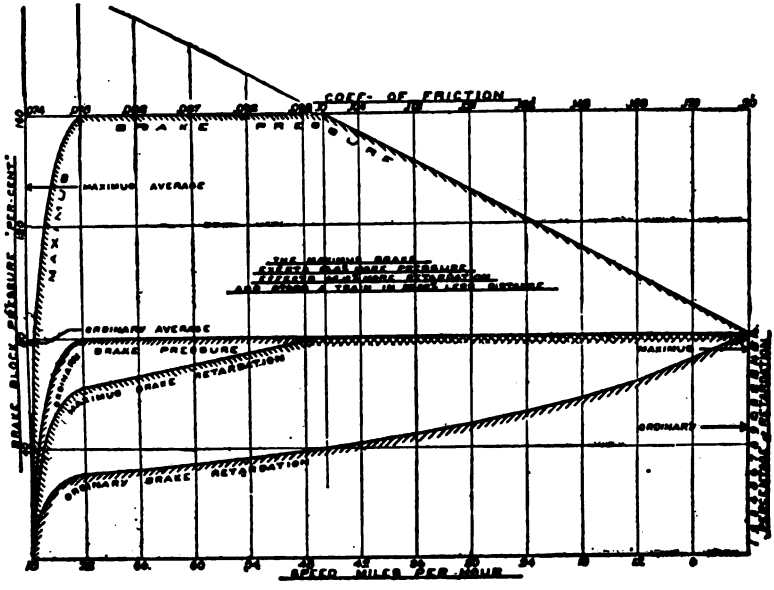
is automatically effected without imposing any responsibility on the engineer. The brake has been put into actual service on one of the principal railroads of England, and has thoroughly proved its efficiency. It applies a varying force, which is 160 per cent. or more of the weight of the vehicle at the commencement of application, and gradually eases off to 80 per cent. A comparison of the improved brake with the ordinary air brake is shown in the accompanying diagram, and it is found that the former exerts nearly 70 per cent. more pressure, that it effects 62 per cent. more retardation, and that it stops a train in 38 per cent less distance than the ordinary brake.—Scientific American.



Efficiency of Improved Brake as Compared with Ordinary Brake

(From Scientific American)

The Accuracy of Pressure Gauges.

The accuracy of a pressure-gauge is a matter that has to be taken very much on trust by the ordinary user. Except for the periodical tests made by the boiler insurance company, he has no means of assuring himself that the indications of the pointer have any direct relationship with the boiler pressure. Of course, when a battery of boilers is supplying the same steam main, there is ground for doubting the reading of any gauge which does not agree with the majority; but in the case of an isolated boiler this check is absent. Then the imperative warning of the safety-valve is the only hint that the pressure has passed its safe limits. So great, however, is the reliance often placed on gauges that their indications have even been accepted in preference to the evidence of the safety valve, and fatal accidents have resulted, as at Barking.

That the confidence in pressure-gauges is, in general, justified is amply shown by the results of tests of these instruments recently carried out on the suggestion of the Manchester Steam-Users' Association, at the National Physical Laboratory. Unfortunately, the results are hardly so typical as they might be, because the gauges experimented on were not bought at random in the open market, but were those sent by makers specially for the purposes of test. Moreover, although ten gauges were tested they only represented the products of two firms, as other makers applied to did not comply with the request. Of the gauges submitted eight were manufactured by Messrs. Schaffer and Budenberg and two by Messrs. Dewrance. The Schaffer in-

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struments comprised two standard 7-in. gauges marked at 5-lb. intervals up to 300 lb. per square inch; two 7-in. gauges, marked every 5 lb. up to 250 lb.; two other 7-in. gauges, marked at every 5 lb. up to 300 lb.; and two 5-in. portable test-gauges, marked at 2-lb. intervals up to 250 lb. The Dewrance gauges had both 7-in. dials, reading by 5 lb. to 200 lb., one gauge having the rack, tube, and hand all balanced, and both having solid-drawn phosphor-bronze Bourdon tubes, brazeless, and redrawn after bending. Two of the Schaffer instruments above mentioned had also solid-drawn phosphor-bronze tubes, the others being brazed.

The first test consisted in subjecting the gauges to the highest dial pressure for a few seconds and then checking the readings both up and down the scale, at 20 lb. intervals, up to a maximum pressure of 250 lb.—the limit of the calibration of the standard mercury column. From the full records, which give the figures for 122 separate tests, there appears to be a fairly constant error of less than 1 lb. per square inch at all pressures, the gauges reading higher than the true pressure by this amount. Thus what error there is is nearly always on the safe side, and when it is remembered that in many instruments the motion of the pointer is only one-sixtieth of an inch per pound of pressure. the substantial accuracy of the readings is evident. In seven of the ten gauges the error is never on the wrong side; in one case the reading is one-hundredth of a pound low at 15 lb. pressure; and the remaining two gauges share between them a dozen low readings, the worst of which is a reading of 150 lb. when the real pressure is 150.35 lb. If we may assume, as is very probable, that the mercury column, against which most of these gauges were originally calibrated, gave scale readings corresponding to the pressure of mercury at 32 deg. Fahr. the temperature correction alone will result in the gauges having been marked high by about a quarter of 1 per cent., and this allowance will bring the average error considerably smaller even than it is already.

The second test was devised to detect any creepage of the reading after long-continued pressure. The gauges were raised to their full-dial reading, and the pressure maintained for 24 hours, but in no case could any appreciable difference be observed between the readings at the beginning and end of the experiment. The effect of temperature on the accuracy of the instruments was noted by running them in an electrically-heated chamber, and comparing their readings, at a temperature of 150 deg. Fahr., with those of a standard gauge maintained at 65 deg. Fahr., and also with their own records at this temperature. At a pressure of 10 lb. per square inch, the rise of the gauge-reading, due to the higher temperature, varied from ½ lb. per square inch to 1½ lb. per square inch. At the end of the scale, the error due to temperature alone varied from 5 lb. to 6 lb. per square inch. It will be noted that the errors were again on the safe side, but they are certainly rather more than one would have expected. Probably few gauges work at a temperature of 150 deg. Fahr. in practice, but many certainly are in very warm situations, subjected to the radiations from a boiler front and the currents of hot air rising around them. The high reading of a hot gauge may have often been responsible for an apparently excessive pressure drop in a steam-pipe, for the tests quoted show that a normal pressure drop of, say, 5 lb. from the boiler to the engine stop-valve might appear as 10 lb. from the evidence of the gauges. An interchange of the gauges would, of course, make no difference, and undeserved blame might be cast on the steam-pipe arrangement.

The effect of vibration of the gauges on the behavior of the pointers was tried by fixing the instruments to a horizontal slider moved rapidly to and fro by means of a crank. The gauges vibrated along the axes of the pressure connections, and the tests were made under various pressures. Before starting pressure was put on, and the gauge then disconnected from the supply, leaving the Bourdon tube completely filled with water at the desired pressure. The tests included vibrations of 1 in., ½ in., and 1-10 in., at 195, 340, and 725 revolutions per minute respectively. For the unbalanced gauges it was found that in all cases the maximum disturbance of the pointer occurred at the highest frequency of vibration. The oscillations of the pointers of the unbalanced gauges varied from 1 lb. on the scale to as much as 32 lb. in one case, though at all pressures and frequences the balanced gauge remained perfectly steady. A memorandum to the report, written by Mr. C. E. Stromeyer, the chief engineer to the Manchester Steam-Users' Association, which we hope

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to give in full in a future issue, gives particulars of the balancing device adopted in the gauge in question, as well as many interesting notes on balancing and other matters connected with gauges. The oscillation of instrument pointers is a trouble that electrical engineers have long had to contend with, and they now have succeeded in making instruments deadbeat in a variety of ways. The conditions are not the same, as comparatively large forces are at play in steam-gauges as compared with switchboard instruments, but it would be interesting to know whether the oscillations of a steam-gauge could not be damped out instead of the forces being balanced. Magnetic damping is frictionless, very simple, and on certain instruments remarkably effective.

After the vibration tests the various gauges were tested for friction and backlash in the mechanism. The readings, taken with a slowly-rising pressure, were compared with those taken with a slowly-falling pressure, care being taken not to touch the instrument meanwhile. The difference between the readings was taken as the measure of the friction and backlash at the pressures indicated. The figures obtained show that in the worst case the total error due to friction and backlash never reached 1 lb. on the scale. The mean readings of the instruments, moreover, closely agreed with the first readings taken, showing that the gauges had not been injured in any way by the heat and severe vibration tests they had undergone. The smallness of the effect of the intermediate tests is shown by a table in Mr. Stromeyer's report, to which we have referred. In this same report the author refers to the use of stops to limit the motion of the pointer or the Bourdon tube. The only legitimate use of a stop in any important instrument is to create an artificial zero. This is never needed in steam-gauges for ordinary work, where a reading over the whole range of pressure is required. In the case of a gauge made specially to indicate a pressure of or about a given value with great accuracy, and where, therefore, a short open scale is desirable, it may be permissible to use a weak Bourdon tube and cut off the lower part of the scale by limiting the backward motion of the tube. In ordinary circumstances, however, there seems little to be said for the provision of any stops for either the tube or the pointer, even though their absence might be held to justify the veracious story of a boiler explosion, in which the fact that the gauge only read a few pounds pressure was accounted for by the statement of the attendant that it was going round for the second time.—Engineering, London, Eng.

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*Surprise Tests of Signals.**

A good deal is being said these days concerning surprise tests to determine whether enginemen are properly observing signals. While the idea is not new, the determination to improve the efficiency of signals is rapidly gaining ground. Discipline, like many other things on which the public welfare depends, can be maintained only through "eternal vigilance," and the only way to find out whether enginemen are obeying the indications of automatic block signals is to institute a watch and see whether they actually do it, and then discipline the negligent ones.

In recent issues we have referred to such tests made by the Pennsylvania R. R., the Lehigh Valley R. R., and other roads, and, from all reports which we have heard, the results of these tests have been salutary. The Southern Pacific road has been continuing such tests about four years, and a recent monthly report covering 1,196 of such tests shows that only in sixteen cases did the engineers fail to observe signals. In every case where a red flag, crossing, station or block signal set at danger was displayed there was no failure to observe the signal, the failures referred to being with special tests. These road tests are made in person by each division superintendent and his subordinate officers, and once each month the general superintendents and general manager are required to make a number of surprise tests, two or more of each of eighteen different kinds of surprises being made on each division each month. Besides the usual signal indications the tests include the use of torpedoes, fuses, slow and red flags and switch lights out.

Now that the use of automatic block signals is very rapidly increasing, there is particular urgency that trainmen be rigorously made to understand the importance of observing automatic signals just as faithfully as they would a signal displayed at a tower with a man in the tower to report any lack of obedience.

*From The Railway and Engineering Review.

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There are two reasons why observance of automatic block signals has not been as good as that of manually operated signals. One of these has already been intimated, namely, that with manually operated signals there is a man to report any infraction of discipline, and another reason is that for some years after automatic block signals began to be installed, these signals were not as reliable as they are at the present day, and failures to danger were of sufficient frequency to discount these devices in the minds of trainmen. Hence, there was more or less presumption as to the condition of things ahead when a signal was found in the danger position, resulting in quite loose practice in the observance of signals and a disposition to ignore signals found at danger when it seemed clear to the engineman that the stop position of the signal was due to failure of its operation.

The need of block signals is now so clearly seen, and the installation of the same on heavy-traffic lines is so rapidly progressing that, in any general sense, we doubt whether there is need for Congress to enact compulsory legislation. It will be only in exceptional cases and with lines of light traffic where any compulsory law regarding block signals can be really effective at this time. It is now too clearly seen that the "Cheap John" plan of operating railroads has passed, at least for the heavy-traffic lines. The real problem for railway managements and Congress to settle is what to do in the way of signaling lines of light traffic and branch lines. Block signaling is expensive to install and maintain, but in the end is economical, and the public welfare demands it. It is therefore for the railroads to find means to meet the great outlay of capital and increased cost of maintenance, which must be borne from this time forward on account of signals, and this the public should appreciate, for in the end the public must foot the bill. English railways, with a mileage capitalization several times that of American roads, have been frequently held up as criterions in comparisons of accident records. The density of population along practically all railroads is increasing and consequently the amount of traffic carried. Such increase assists the railroads to meet the increased expense of signal installation from their own resources; but, for all that, the real cost of transportation per unit is increased. However, the only sensible way to arrive at safer handling of passengers and freight is to pay what it costs to equip the lines with signals and then see that they are properly observed.

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Gasoline Motor Car.

The gasoline motor car question, as applied to railroad inspection work, has been receiving considerable attention of late, and is conceded by leading railroad officials as being a most satisfactory method, not only for the inspection work itself, but because of the saving effected, which it is estimated runs from $45 to $60 a day.

It is stated that when Fairbanks, Morse & Co. first brought out the automobile type inspection car, feeling ran high against the machine on account of its weight, the officials claiming that it was not practicable to run a heavy car except on train orders, which they did not want to do, never taking into consideration that a special car and engine always had to have orders. After persistent effort on the part of the motor car people, a large inspection car was sold to the Michigan Central Railroad and the figures shown on one trip were astonishing.

Record of trip made by Geo. H. Webb, chief engineer, M. C. R. R., with No. 16 two-cylinder gasoline motor car:

Total mileage	2,327
Total gallons of gasoline	122.5
Total number of battery cells	24
Total gallons of lubricating oil	4.5
Number of miles per gallon of gasoline	19
Number of miles per battery cell	97
Number of miles per gallon of lubricating oil	517

Marshall to Allegan, 66.4 miles, in 1 hour 40 minutes. Rate, 40 miles per hour.

Tekonsha to Harris, 29 miles, in 45 minutes.

South Haven to Kalamazoo, 39.6 miles, in 45 minutes. Rate, 52.94 miles per hour.

Since the first type machine came out numerous changes have been made in the construction of the car, and an illustration of the most approved type of up-to-date inspection cars is shown herewith.

The observation end of a special car, on a fast train, is an ideal place to make a lightning inspection, but the inspection that really counts now is done with a

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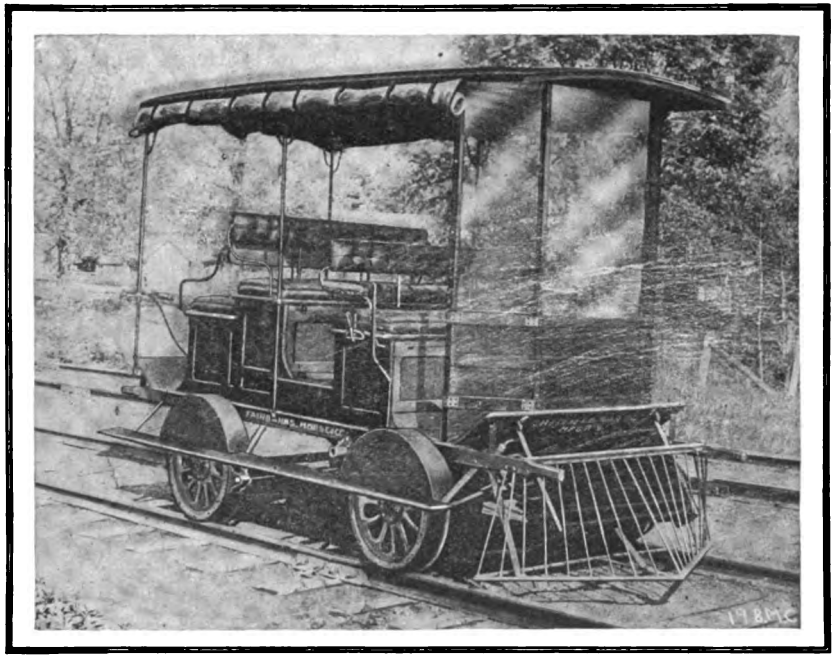
gasoline motor car, operated at a speed best adapted to a careful and thorough examination of the roadway. The superintendent often finds a condition of affairs existing which hardly seems possible, and it enables a better check to be maintained over the entire division. A little illustration of this is reported to have occurred while on an inspection trip on one of Chicago's largest trunk lines. This line grants terminal privilege to a number of other roads, but the taking of water is confined to stations in the lower yards. The superintendent discovered foreign line engines taking water from forbidden tanks. The result is obvious. Also, on this particular trip a defective block signal was discovered which had been down and out for nearly a week, and no report had been made. Also, on this trip, at an interlocking cross-over, which is supposed to be carefully watched, nearly half of the connecting bolts were missing and the rail braces were conspicuous by their absence.

One small freight wreck would nearly equip a large line with enough motor cars for every superintendent and roadmaster. It is said that owing to the large number of wrecks in the west, some of the large roads have furnished motor cars for every roadmaster and have issued a bulletin that the division must be carefully covered once a week.

The motor car has evidently come to stay and is daily becoming a greater factor in the up-to-date and economic handling of large railroad systems. Strange though it may be, there are few, if any, objections to be placed in the way of gasoline motor cars, as their advent has done much for the railroad from an economical point of view. Not only are the railroads benefited, but the traveling public is assured of better protection, careful inspections reducing accidents, due to defective road equipment, to the minimum.



FAIRBANKS-MORSE No. 16 TYPE "C" SPECIAL MOTOR CAR

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*Fog-Signaling.**

Winter and its inevitable fogs are with us again, and in view of the examinations which are being conducted in regard to the principles and duties entailed in

*By T. F. Berry, in The Victorian Railways Magazine.

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fog-signaling, a few hints may be instructive to some and interesting to others. A very large number of our fog-signalmen are not connected with the Transportation Branch, which supervises such arrangements, and although many may be conversant with the external features of signalling operations, it is just probable a few may have become "rusty" on this duty, while quite up to the requirements of their usual occupation.

Compared with the great fogs with which English railways have to contend, ours would be described as a mere haze; only on one occasion, some years ago, have we been visited by what are designated "black fogs." In England that class is by no means uncommon. In duration we are again favored. Here the duration of a fog rarely exceeds five hours, while in 1888 England was visited by a fog which continued without intermission for five days. It is scarcely necessary, though probably not out of place, to state that the ordinary system of communication between signalmen and enginemen becomes impracticable in foggy weather, and that the primary object of the system of fog-signaling is to meet the conditions which prevent the signalmen and enginemen from having a clear view of the semaphores. This involves a great deal more than would reach the mind of the casual reader, but it forms the only viewpoint from which we can obtain a proper sense of the regulations in regard to the fog-signalman's responsibilities. Under ordinary conditions, when the atmosphere is clear, the signalman is personally responsible for the signals being in proper order, and for exhibiting a danger signal at the distant semaphore immediately a train passes. But all these responsibilities fall upon the fog-signalman in foggy weather. Furthermore, the latter is required to substitute the audible signal of the detonator as a means of warning the enginemen when the semaphore signal is at danger; to give timely warning of an improper semaphore signal, or when an obstruction exists in the vicinity of his operations. This supplies the answer to the question as to when it is necessary to employ a fog-signalman. If, owing to a fog, snowstorm, or any such atmospheric disturbance—even a duststorm, if continuous—the distant semaphore, or the home signal where a distant is not in use, is obscured from the signalman's view, the weather is foggy within the meaning of the regulations, and the services of fog-signalmen become a necessity.

The regulations of Australian railways, which are practically similar to those of Great Britain, carefully preserve a very wide margin on the side of safety in regard to foggy weather. The distance of distant signals varies according to surroundings, and although the regulations state that detonating signals must be employed when semaphore signals can not be seen clearly from a distance of a quarter of a mile, the obscurement of the distant signal is an ominous warning for full preparations. Nor do the regulations permit any ambiguity in regard to the character of foggy weather. They recognize no moderate or intermittent fogs. According to the regulations, the weather is foggy when signals are likely to become obscured, and remains so until officially declared off by the station-master or signalman. It is unnecessary to state when the regulations require the men to report for duty, or the station-master to send for them. But it may be necessary to explain that each fog-signalman should report to the S. M. or signalman, and sign on duty in the register, in order to avoid any misunderstanding as to the full attendance of the staff. As a general rule, each man is appointed to a certain post for the season, a practice which has its advantages. Still, a fog-signalman may be required to take any post. It is a ruling principle of railway working that, in the incidence of danger, the sooner a train is stopped and the driver notified the better. It should be, therefore, borne in mind that distant semaphores have the most important claims upon the first men who report—first, because the enginemen may not observe the semaphore or its signal, and, further, because the semaphore may be showing an improper signal. Next in the order of importance are the next stopping semaphores, whether home, junction, or directing signal. But at a junction of double and single lines the home signal on the latter is of these semaphores the most important.

The rules regarding the supplies and ready access to the stock of detonators and hand-signals, and the necessity for these being ready for immediate use, are too obvious to require further explanation, even for the most inexperienced, but some features of these appliances might be at once outlined. Notwithstanding the hand-lamp should be ready for use,

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the fog-signalman is responsible for observing that it is in such condition, and that the colored glasses are complete and work freely. He must himself light his lamp and have a supply of matches. In the event of an injury to his lamp at the post which interferes with its proper functions, he must make every effort to obtain a fresh lamp. This can be obtained by a messenger, or his message may be sent by the driver of a train which is stopped by the semaphore signal; but only in the event of his inability to employ other means is he permitted to stop a train for such purpose. He is also responsible for obtaining the proper supply of detonators and flags.

The audible signal of the detonator represents the signal which should be visible on the semaphore. A defective detonator is, therefore, similar in effect to a defective semaphore. In the event of its failing to give the proper report, such detonator should not on any account be trusted again, nor left on the rail. First, because it is obviously unreliable, and, secondly, because the cause of its failure must be ascertained. Something more than the ordinary care is advisable in handling a defective detonator in view of its having been depressed. It should be laid aside or attached to the flange under the rail at least two inches clear of the ballast, and handed to the S. M. when signing off duty. In view of possible failure of a detonator, the importance of placing two on the rail is obvious. At the same time, the report of one detonator constitutes a signal to stop. Even at a distant semaphore the detonation not only means danger in the ordinary sense of the distant signal, but is also a signal to stop for the verbal instructions of the fog-signalman, unless the latter is exhibiting his green hand-signal.

Under normal conditions enginemen obtain a view of the distant semaphore signal from a considerable distance beyond it, and, in accordance with this early warning principle, the fog-signalman should take up his position as far beyond the semaphore as his distinct view of the semaphore arm will permit; and if, as is required, the enginemen must be prepared to stop at the fog-signalman, it follows on the same principle that the detonators should be fixed still more distant. Hence the incidents of contrary indications by the detonators and hand-signals are not always avoidable. If the semaphore arm is not lowered until the close approach of a train, the fog-signalman is not expected to expose himself to the danger of attempting to remove the detonators.

The first consideration of the fog-signalman is to see that his kit is complete and in proper condition. Proceeding to his post, he should examine the path of the signal wires. Arriving at the semaphore, he should ascertain if the lamp is burning properly, and that the signal gear is free from defect or obstruction. In the event of any defect which he is unable to rectify, it must be reported as soon as possible, as previously explained in regard to a defective hand-lamp. We may now proceed to consider duties incumbent on the fog-signalman at the post, commencing with the distant.

Finding this semaphore arm at danger, we at once place the detonators in position, and, standing intermediate, we exhibit the red hand-signal, our attention fixed upon the signal arm. On the arm being lowered to "All right," we display the green hand-signal and remove the detonators. Keeping the signal arm in our view, we continue the green hand-signal to the driver, and also to the guard of the approaching train; after which we replace the detonators, exhibit our red signal, and watch for the semaphore signal to be replaced to danger. We shall consider irregularities further on, and for the present assume that after a reasonable time the signal arm is duly replaced at danger behind that train. After an interval, during which our attention is fixed as before on the semaphore signal at danger, we hear the report of our detonators, which is the only intimation we receive of an approaching train. Turning towards the train, we find that it has slowed down and that the driver is on the look-out for our hand-signal and instructions. If we have not reason to believe that an obstruction exists in the vicinity of our semaphore, we inform the driver of the distant signal being at danger, display the green signal to allow him to proceed, and notify the guard as he passes on cautiously. Here the driver is expected to realize the possibility of being required to stop short of any obstruction, the position of the next semaphore signal, and to proceed with the necessary precautions. These form the ordinary conditions of fog-signaling at the distant semaphore, but not all the knowledge required to pass the examination; nor does

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it embrace all that is observed by a proper study of the regulations on the subject. In addition to those mentioned, we must be prepared for other irregular occurrences which are likely to arise, and in order to consider these irregularities more thoroughly, we shall take them in their order of importance:

(a) The semaphore arm may remain at the all right position after a train has passed. It will be borne in mind that the signalman does not replace the distant signal to danger as promptly in foggy weather as in ordinary conditions. Except where ground bells are employed, the signalman is careful to first see that the train has passed the semaphore; but the failure of the semaphore arm to go to danger in due time after a train has passed is unquestionably one of the more, if not most, serious in the list. This must be due to one of two causes. The first, most reasonable, and at the same time the most serious view, is that the signalman is unaware that the train has passed the signal. From this viewpoint—always assuming that sufficient time has elapsed—it is safe to decide that the train has come to a stand just within the distant semaphore, and, bearing in mind that the train is signaled forward, its stoppage must be due to some unforeseen defect. Our detonators are fixed in position, and it is true we hold out our red hand-signal, but the signal arm of the semaphore falsely signals "All right." If a train approaches us now, the driver may observe the contrary signals; but the probability should not be overlooked that he may not observe our hand-signal. Perhaps, seeing the semaphore signal at "All right," he would not look for a contrary hand-signal, and go forward. Acting again on the principle of the early warning, we must at once go back as far as every consideration of safety requires, continuing our red hand-signal, and, having reached a point of vantage, place two extra detonators on the rail, and, in accordance with the practice, return to our original position. When the train is stopped, we inform the driver of the conditions, instruct him to proceed cautiously, and to inform the signalman, if necessary, of the irregular semaphore signal. This seems a suitable place to remind guards that they must not rely on fog-signalmen protecting their trains. This, like every good rule, works both ways.

(b) The semaphore arm, after having been lowered, may be replaced to danger before the train reaches the semaphore. In view of the care with which the signalman works the signal, if a semaphore signal is so reversed before the train reaches the fog-signalman, the latter must likewise reverse his hand-signal, and, if possible, also replace the detonators. It is not required here to advance reasons which render such reversal of the semaphore signal advisable. Every railway man knows that it may become necessary at any time to stop a train after its being signaled forward, especially at public crossings. Fog-signalmen should remember, too, that the semaphore is the means by which the signalman communicates with them, and that which appears a premature reversal of a signal may be an imperative message to the fog-signalman to stop the train. If under these conditions a train is stopped, it should be treated as if the signal had not been lowered, but the driver should be informed of the circumstance.

The spectacles of the semaphore lamp may become displaced or broken. In such event a white instead of the colored light would be visible, which a fog-signalman and enginemen must regard as a danger signal. In all irregularities it becomes the duty of the fog-signalman to notify the signalman as soon as is practicable in keeping with his duties. A messenger is much more suitable than to stop a train for such purpose. In accordance with principles ruling railway signaling, the sooner a train is in and under protection the better. In the event of an irregular semaphore signal, however, it becomes necessary to stop the train.

At some places other signal arms—stopping signals—are erected on the same semaphore as a distant signal arm. It is scarcely necessary to state that the former are invariably worked from the rear. But the fact that they are so worked furnishes a reason for additional alertness on the part of the fog-signalman. When the distant signal arm of a station is erected on the same post as the departure signal in the rear, the latter is always above the distant, and the mechanical connections are so arranged at the post that the distant arm cannot be lowered in the ordinary process while its companion signal is at danger. Anything contrary to this arrangement must be due to some disorder easily localized and remedied, but, meantime, the cir-

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cumstance should be regarded as a danger signal. In the process of the block system, this distant signal would remain at danger until not only the section in its advance, but also that beyond, is clear. This is an unusual condition in these short sections, especially during the hours when our fogs are pleased to visit us. Our ordinary experience is that the stopping signal is off, and the distant otherwise, as each train arrives; but the position of the former does not relieve the fog-signalman of his duties towards the distant, and, although most of his trains may be required to stop at the platform, he must employ his detonators in preparation for non-stopping trains. If a train stops at the semaphore, he must, after informing the driver of the position of the signal arms, proceed to protect the train; but it is unnecessary to proceed beyond the signal-box, where, placing his detonators, he informs the signalman of the position of the train and signals. The fog-signalman, while informing the enginemen that the departure signal is off, must, in the event of the distant being at danger, be very careful to say so.

A feature of this verbal communication not unimportant to enginemen is that it does not in any sense relieve them of their ordinary responsibility for their personal observation that the stopping signal is not at danger. The same rule obtains with all stopping signals. If the signal arm is not visible, it is the duty of the fog-signalman to consider it at danger, and his verbal communication must be accepted as indicating that the driver has reached the semaphore, when the latter becomes responsible for ascertaining the signal, and, in the event of being detained, for notifying the signalman of the position of his train.

All signals at danger other than distant signals are stopping signals, and may for the purpose of this article be regarded as home signals. Every such signal protects some obstruction or operation which may exist or be performed beyond it. For example, at stations on single lines where trains meet, the semaphore signals erected within the fouling point perform functions precisely similar to those outside. Each protects an operation at the points or crossings where the local roads foul or meet the main line. Both of these, in common with all signals which perform similar functions, define a given point, beyond which, if passed at danger, an engine trespasses upon the field of another operation, and, as such, are equivalent to home signals. If signaling for a home signal, we take up the same position, between the detonators and the signal, as at the distant, fixing likewise the detonators and exhibiting our red hand-signal when the signal is at danger or when it is invisible. On the train being stopped, we inform the driver, and immediately proceed to protect his train in the rear, even going so far, if its detention continues, as to meet the man at the distant semaphore and inform him of the obstruction. If a distant signal is not in use, the home signal is invariably erected at the position the former usually occupies. If a train is stopped at this signal, the fog-signalman must remain to protect the train at a safe distance in the rear.

Shunting is not always avoidable in foggy weather, and it may become necessary for a train to be placed on a main line for a time, an operation which is not without complications. Mnemonics plays little or no part in modern railway systems, especially in signaling, and as Dr. Charles Ryan's standards of vision are in abeyance, responsibilities ordinarily residing with the signalman fall upon those engaged in the shunting operations. When a train or engine is detained at a semaphore, or has been placed out on a main line, and when a goods train or engine is detained within station, the limits or yard waiting to be crossed on to another line or into a siding, the guard or the fireman, whichever of these is nearest, must go to the signal-box and remain with the signalman as a reminder until the latter is prepared to remove the obstruction, before which the signalman must allow sufficient time for them to join their train. The official who performs this duty must satisfy himself and the signalman that his train is not standing foul of another road, and that it is clear of the interlocking gear, or outside its signal. He must also satisfy himself that the signalman is protecting the obstruction. If a shunter is in charge of the train, or if there is an assistant guard, these officials must perform this duty.

At some places the duties of a fog-signalman vary according to local requirements. He receives special instructions where necessary from the S. M., or, if not connected with a station, from the signalman. By the time this is in

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print every man shall have been appointed to his position, and it is just as well, for it is correct for one to ascertain the requirements of his own field. It is well to consider, too, that an article written from the ranks does not bear the official seal of correctness, which consideration should, of course, show the advantage of verifying its statements by a study of the official regulations.

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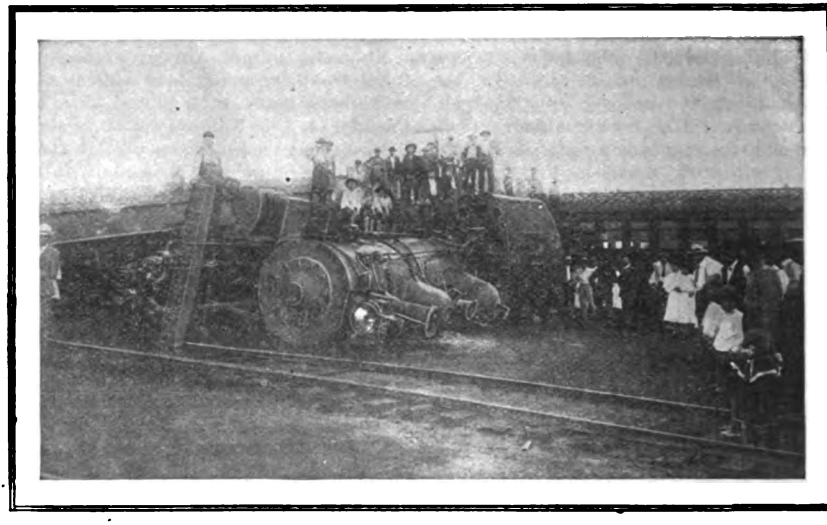
Wreck on St. L. S. W. Ry.

The wreck, illustration of which is shown herewith, occurred in the yard of the St. L. S. W. Ry., at Commerce, Tex., October 6, 1907. Our correspondent states that it is supposed to have been caused by a sharp flange on the engine truck and defective switch points. Brother Kelly, the engineer, jumped and received a sprained ankle, while Brother Leath, the fireman, failed to get off and crawled out from under the engine after the wreck, being somewhat scalded, but his injuries are not serious. Both are members of the B. of L. F. and E.



WRECK ON ST. L. S. W. RY., OCTOBER 6, 1907, IN YARD AT COMMERCE, TEX.

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Progress With Steel Ties.

In discussing the steel tie question eight years ago we said that the aggregate length of track in this country which had been laid with metal ties up to that time was less than five miles. This statement held true until about three years ago, notwithstanding that the rapid depletion of the sources of timber supply had been fully appreciated by railroad men, as well as by the government forestry experts, and a good deal of discussion and agitation had been taken up by the technical associations. While the importance of experimenting with some substitute for wooden ties seemed to be quite generally admitted, railroad managements were exceedingly slow in getting such trials under way.

As will be seen by statistics of track laid on steel ties, as published in another column, it is now necessary to revise our former figures, for there are now 200 miles of track on steel ties in this country, one road alone having in service about 90 miles of such track. The facts as to the number of steam railroads which are now experimenting with steel ties, as well as to the actual number of ties in use, are quite encouraging, and there can now be hardly any doubt that railway companies will, before many years, be using steel ties or combination ties built largely of steel, on a large scale.

It is our belief that enough experiments have already been carried out to demonstrate that a steel tie, or combination wood and steel tie, can be produced that is satisfactory in every way as to service.

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In our opinion the most important question concerning steel ties at this day is that of cost, but we do not think this will remain a barrier for many years. It is time that railway men ceased to expect to obtain a steel tie at a slight advance in cost over that of an oak tie. Owing to the scarcity of oak timber supply these costs are now much nearer together than they were five years ago, and they will approach nearer still; but the economic advantage of a tie which will remain in the track during a period equal to several times the life of an oak tie, even though the first cost be much higher, will soon be appreciated much more widely than it is at the present time—just as the economical advantage of block signals is now coming to be seen, notwithstanding that the expense of installation and maintenance are heavy as compared with similar accounts where trains continue to be run on the dispatching system.

The cost of steel ties is now high, and the problem is to reduce this cost. If it can not be done by rolling the ties from new material attempts should be made to solve the question by utilizing scrap rails. We are told that methods of rolling, as now practiced, are not adapted to such conversion of scrap material, but we have not yet heard of any serious effort which has been made to improve rolling work for this purpose. Considering the enormous tonnage of old rails which are taken out of track in this country every year and the apparent demand for a cheaper product in the form of a steel tie, we think the object should be one well worth the time and energy of some ingenious metallurgist to work out the problem. We are still impressed that Mr. Buhrer's original idea is the one that will prevail in the end, namely, that the railroads will work up their scrap rails into ties.

An interesting development of these steel tie experiments is the use of insulation for track where block signal circuits must be maintained. A few years ago this question seemed to impose an insurmountable obstacle to the use of steel ties, but it now seems to be reducing itself to a question of expense. Insulated steel ties have been in use in track circuits for several years, and although some trouble has been experienced in maintaining the circuits, this trouble has not been nearly as great as had been expected.

Another important question which remains to be settled is that of resilience, for there are many who think that plain steel ties make a track that is too rigid for fast trains when the ground is frozen. If such is the case a composition tie of steel, with softer material for the rail seats, will have to be worked out, and quite a number of ties designed on this principle have been doing service for a considerable time. If it is true that steel ties have not yet been produced which meet all desired conditions as to both service and cost, such fact is no indication that the objections may not be removed after further experience. It has been only a few years since the trial of steel ties in this country was taken up with any considerable showing of earnestness.—The Railway and Engineering Review.

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*The "Conformity Line" of Tramway Cars.**

A definition should follow rather than precede explanation or understanding of the particulars which it summarizes. It is always difficult to give a definition, for, whether we use metaphorical language or words of absolute literality, the meaning conveyed differs according to the point of view and individuality of the person who reads. It is characteristic of the highly skilled in crafts or professions that he carefully ascertains all the conditions which ought to be fulfilled, laying down exact lines along which he intends to work, and then adheres as far as possible to those lines.

In order to grasp the necessity for such a term as "The Conformity Line," it must first be taken for granted that Newton's first law of motion "that all bodies in motion tend to move in a mathematically straight line" is a generalization which includes tramway and railway vehicles. There is then a powerful tendency for a tramcar weighing several tons, running at ten miles an hour, to pass along in a path of perfect straightness. Any consideration of the behaviour of a self-propelled tramcar which does not square with this generalization is erroneous.

For practical purposes the variation from this dead straight line may be considered in two planes only—the vertical and the horizontal. The variations from

*By J. Sutherland Warner, in The Tramway and Railway World.

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the vertical plane in practice have always given the least trouble, because the gravitational force drawing the car downwards is constant; desired track level is easy to arrange; and the average small amounts of irregularity in track level have always been satisfactorily minimized by the vertical elastic cushioning of springs.

There is a marked contrast between the mathematical line a car body inherently tends to take, and the irregularity of even the most perfect tramway tracks. The same applies equally to the most perfect railway tracks, but there are qualifying considerations, connected principally with the difference in track construction, which we must ignore here. Just as springs are used to compensate for slight vertical deviations of the track from the true level, so an equivalent must be employed if cars are to run truly straight, to compensate for slight horizontal irregularities.

It is necessary in considering this question to discriminate carefully between the wheels and the body of the vehicle. The wheels must always follow the track —the body should ride as far as possible in a mathematically straight line, and since the track is irregular in level and horizontally, the body of the car must never follow the track, but must follow a line which in the main conforms to the track.

Car designers, by placing suitable springs under vehicles, have always assured that the car bodies should not follow the minute variations in track level, although they have never found it necessary to employ any term to express the line which thus averages up the track level. This line on an ideal system would be a mathematically straight line, and in practice it is a mathematical straight line, varied by conformation to general track level or the contour line. Just as car designers may be said to have placed springs under vehicles to provide for variation of level in the track from the contour line without any particular regard for the contour line itself, so there is a horizontal equivalent of the contour line, the track variations from which they must provide for.

A convenient point to take on any car for the purpose of considering the relation of the running of that car to the "Conformity Line" is the center of gravity of the car. When the car is running over the track this point will make a line, which in practice will vary from the track, and also from the ideal conformity line. In height then the conformity line may be taken at the height of the center of gravity of a car.

In the vertical plane, the conformity line will be parallel to the contour line, and in a horizontal plane it coincides with a perfectly straight center or average line drawn between the two rails.

The foregoing may be summarized into the following definition of the conformity line:

The conformity line is a hypothetical line used to delineate the most perfect path a vehicle running on a given track could follow. For simplicity, the conformity line may be remembered as a bee-line over the track.

The conformity line then is a line which the car builder has to work to. He will arrange that his wheels shall follow the track, and to such extent as he can compel the center of gravity of a car to follow the conformity line in preference to track deviations, his work is perfect.

It is extremely difficult in the space of a short article, to justify the introduction of a definition on lines which have not been usually expressed, although they may subconsciously have been followed. There may be many who will ask whether it is not possible to design, specify, and purchase cars, without reference to such a term as the conformity line. To those the answer is logarithms, and one is reminded that of logarithms a certain gentleman said: "Do I know what logarithms are? Well, I can't exactly say as I do, but nations have ris and fell—cities have been built, the inhabitants of which never had a darned logarithm to divide between them, so they don't seem to be, as you might say, exactly essenthul to human existence."

To return to practical politics. It is for the want of proper definition and regard to the conformity line that at the present moment thousands of tramcars and railway vehicles, sway uncomfortably, and jerk in and out of points, and oscillate. To the writer's knowledge one vehicle, which was new not eighteen months ago, has broken over 100 of the keeps which connect the boxes to the axles.

It is also for want of regard to the innate tendency of vehicles to run in a mathematically straight line, that of successive tramcars, of identical design, fol-

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lowing each other on a piece of track, probably more than one-half of them will be found to sway and oscillate uncomfortably, while the balance are very much better on that particular part of the track. Closer examination of these vehicles show that if their designers weighed the proper considerations their constructors did not.

In the foregoing remarks no consideration whatever has been given to many other important questions in the design of cars for perfect running, such as the proper disposition of wheels to support the car body, the proper steering of those wheels to minimize the friction of flange steering in the same, and to give the maximum of rolling with the minimum skidding of the wheels, which insures silence, and low traction resistance, the prevention of swaying, and of vertical oscillation, and while also methods of propulsion and many other features in car running have been ignored, it is not suggested but that many splendid examples of both design and construction of railway and tramway vehicles exist.

The use of such a definition as is given here is to facilitate the interchange of ideas, and the expression of those ideas in concrete form. Having established the conformity line, the object in testing cars by a standard test such as the method published in the Official Circular of the Tramways and Light Railways Association for May, 1907, under the heading of "Warner Lines," becomes obvious. A fine stream of paint directed on to the track from the front or rear of the car marks at once, in the simplest manner possible, a line which can be measured, and its variation from the track or the conformity line recorded. A number of cars can be run over the same track, each painting a line, and the series of lines can be photographed. Such a photograph will show the comparative riding qualities of the cars tested. For instance, a car which in this test painted a line which was more irregular than the track itself should be promptly altered, because when the proper changes have been made it will not only ride with more silence and comfort to the passenger, but the traction resistance will be lower, and the wear of the wheels, track and carbody will be less.

The whole of the foregoing refers to cars in general, and should not be confused with the peculiar steering action of which the writer is patentee. As far as possible the Warner truck has been designed to make a bee-line over the track, but it differs essentially from all other trucks, even radial trucks, in that even on straight track any two axles of the truck are never parallel to each other, except for an occasional instant. This is interesting at a time when it is advocated on every hand that trucks should be strengthened considerably so as to compel the axles to maintain their parallelism, because we are told that such parallelism is to remove the possibility of rail corrugations, but the writer suggests that before reaching this stage it would be better first to define clearly the line which the car really has to take. This line is surely the Conformity Line.

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*Some Principles of Discipline.**

The essence of discipline is to get so in the habit of doing things right and according to established rules that the right thing will always be done in the right place, without prompting or without calling the necessity of the act into question. The worst trouble in maintaining discipline is to get employes to observe regulations regarding the small things, the urgent necessity for which is not apparent except occasionally. An employe will sometimes be heard to inquire the reason for this or that rule regarding a matter seemingly insignificant, but the chances are that the necessity for all the printed rules and regulations concerning the operation of a railroad have been well studied out at some time, and that sooner or later every employe will find occasion for the strict observance of every rule governing the department in which he is engaged.

The reason that army and navy discipline is better than that of railroads is because officers and privates habitually observe the regulations without question or without thought of exercising discretion. As an illustration, a company of soldiers drilling at manual of arms could not attempt to carry out a wrong command in shifting the piece from one position to another, for the simple reason that in drill they have been in the habit of doing nothing contrary to the regulations.

While it can not be expected that rail-

*From The Railway and Engineering Review.

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way employes can be drilled and held under any such discipline as is maintained in a standing army, nevertheless it would be an excellent thing if every employe would voluntarily subject himself to the observance of at least the minor details of railway operation by rote, so that duty will always be fully performed unconsciously, as it were. He who stops to consider whether he will strictly observe this or that regulation regarding some apparently trivial matter may some time find himself called upon to perform duty more quickly than will admit of any hesitancy or deliberation. One will occasionally find an employe who has conscientiously followed rigorous practice in regard to discipline, out of fear that occasional neglect, where necessity is not apparent, might beget habits of carelessness.

There is scarcely a department of railroad work where such principles of discipline will not apply, and life or death often hangs upon the alertness of men to observe rules and reasonable behavior under the attending circumstances. As an illustration, it may be mentioned that throughout this whole country there is a frightful loss of life among trespassers on railroads, particularly where there are two or more main tracks. A very large percentage of such fatalities occur where the unfortunate person is occupying one track while a train is passing on another. Should a second train approach, on the track which he occupies, he is in grave danger of being struck, for the twofold reason that the noise of one train drowns that of the other, and also because the train passing on the adjoining track is for the moment engaging his attention, thereby making it somewhat improbable that he will take thought of another train of which he stands in danger, even should he hear its approach or hear it whistle; for the whistle of a locomotive or the ringing of a bell is a very common and familiar sound on a railroad. Some engineers, the very instant they see a person in such a predicament, instantly apply the brakes, and then try to engage the person's attention by whistling. They take no chances that the person in danger will take warning of a whistle in the presence of other loud noises or other things which may for a moment absorb the attention. While such might be considered self-imposed discipline on the part of enginemen there is no doubt but that many lives are saved by such practice.

All engineers, however, are not thus considerate, for it is frequently the case that the brakes are not applied until it begins to appear that the attention of the person in danger can not be aroused. The delay of a very few seconds in applying brakes might mean the difference between striking a man or stopping short of him, or striking him at a speed of ten miles an hour and a speed of thirty miles an hour. The engineer who hesitates in such situations takes chances, and taking chances is not good discipline. The engineer who acts quickly with expectation of the worst that can happpen may frequently make a needless stop or slow-down which, commonly speaking, is not a serious matter, and he may save lives thereby. When a man is seen on the track at any reasonable distance ahead of a train, with the prospect that he will not get off without warning, the time to whistle him off is after the brakes have been applied and not before. We once saw an accident avoided by the very quick application of brakes by a passenger engineman who observed a teamster, while still a good distance from a crossing, whipping up his horses to get over the crossing ahead of the train. While the train was not brought to a standstill it was slowed down to a moderate speed by the time it reached the crossing and barely missed striking the wagon. What the teamster should have done was to have stopped and permitted the train to pass the crossing first, but the engineman, having quickly observed the teamster's determination, estimated that he would get in the way of the train, and such would certainly have happened had not the train slackened its speed. In that case the teamster would have been entirely at fault, but the engineman would take no chances, and that is the kind of discipline that saved the teamster and team from injury or death. At the speed the train was running it was futile to expect a stop before reaching the crossing, but the slow-down was what prevented the accident. It is needless to remark that an engineman with less regard for discipline would, in the same situation, have sounded his whistle, which would have served no useful purpose whatever under the circumstances.

Last week a train on a certain railroad ran over and killed a man who was walking the track at a point where local noise prevented him from hearing the approaching train. The engineman is re-

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ported to have wept and to have stated that during his experience he had met with upwards of forty similar accidents which had resulted fatally. While we have no knowledge whatever of the man's record, the accident, as reported, calls to our mind the difference in the habits of enginemen regarding the taking of chances of striking people on the track or at road crossings.

Last week two foreigners, who had been in the country but four days, and who could not speak the language, were passengers on a through train from New York to Chicago. After the train had arrived at the terminal station in Chicago these passengers still sat in the car, not knowing for certain that the train had arrived at its last stop. In this they probably acted with some reason, because the train had previously made other stops within the city where passengers had been discharged. Presently a switch engine was coupled to the train and it was hauled down into the yard. Some employe of the company went through the train, and, seeing two men still in the car, took them for trespassers stealing a ride and ordered them off. At the first stop the men hurriedly got off the train, leaving their luggage still in the car, one getting off at the west side of the train and the other at the east side. The train had stopped in a network of tracks where a number of switch engines were shifting cars. The first track from the train on the east side was clear, but a suburban passenger train was rapidly approaching. The second track was occupied by a switch engine and string of box cars in motion, so that the man alighted on an unoccupied track between two trains. The suburban train tried to whistle him off, but he became bewildered and was run over and both his legs were cut off. He died in a hospital nine or ten hours later.

Now the situation in which that man found himself was caused by either or both of two infractions of discipline. In the first place the trainmen should have cleared the train of all its passengers while it stood in the station. The warning for all passengers to leave a car at a terminal stop should always be distinct and emphatic. In the second place, it was bad discipline to put them off a train in a yard, and the fact that the men had baggage with them might have indicated that they had some business on the car. Had ordinary discipline been followed in either case this man could not have lost his life in the manner he did.

It is unnecessary to mention other classes of accidents to illustrate the importance of rigidly observing the simple rules of operating a railroad. Some employes never take chances, while others are inclined to do so, and this is what sometimes makes trouble.

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*Briquettes as Fuel for Locomotives.**

In determining the best method of preventing the waste of our fuel supply, the United States Geological Survey has found that a valuable aid to this end will consist of the briquetting of fuel.

"Briquette" is the name given to a prepared fuel made of slack or waste coal, of peat or of lignite, held together by a bonding material, such as pitch, the mixture being pressed into a compact mass, of a size and shape suitable for use as a fuel. Briquetting is the latest and most satisfactory method yet devised for utilizing the waste from mines.

The tests which have been conducted at the government fuel testing plant at St. Louis, Mo., during the last two years have proved so satisfactory that they are to be continued with even more vigor this year at the new plant at Norfolk, Va., where the briquettes will be burned in naval vessels in order further to demonstrate their efficiency, not only as steam producers, but as an admirable smokeless fuel.

While the primary object of the United States Geological Survey has been to find the best utilization of the fuels used by the government, the entire country can not help but profit by the results of the investigations. These tests have enlisted the interest of manufacturers and others, for they have resulted in the opening to the commercial world of a hitherto unknown field which it is thought is destined to become an important factor in the production of fuels.

Within the last six months, eastern and western capitalists have begun the erection of briquetting plants in North Dakota, Washington, Michigan and Missouri, their purpose being to manufacture briquettes from coal waste, lignites and peat.

The successful developing of the coal-briquetting industry in the United States

*From Railway Master Mechanic.

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depends upon a number of conditions that are expected to work out well in the future tests. The present drawback to such an industry is the low price of bituminous coal and especially the small difference between the prices of lump coal and that of slack or fine coal.

With anthracite and semi-anthracite coals, the difference between the price of lump coal and that of slack is often more than sufficient to cover the cost of manufacturing briquettes. There can be no question that the manufacture of briquettes from some of these coals will be successful commercially. Concerning still other coals, it is claimed that the difference between the price of lump and that of slack is either just sufficient or scarcely so, to cover the cost of briquette manufacture, but the fact that briquettes present certain advantages over the lump coal may enable them to command a sufficiently higher price to afford a margin of profit.

The most favorable outlook at the present time for the development of this industry is in connection with the use of briquettes in locomotives and in domestic furnaces and stoves. It has not yet been demonstrated that, at anything approximating existing prices, briquettes can be manufactured for successful use in the ordinary power plants of the country.

The results of recent investigations have shown that on boilers requiring forced draft, like locomotive boilers, briquetting so increases the efficiency of the fuel as to more than cover the increased cost of making.

Another advantage claimed for this fuel in locomotives, and one that will appeal to the great masses of the people, is that the briquette is practically smokeless. When it is realized that the smoke from locomotives in railroad yards constitutes a large part of the smoke nuisance of the great cities, the importance of this fuel will be seen at once. For the purpose of speedily solving this problem the government will conduct a number of tests in co-operation with the railroads of the country.

The Missouri Pacific Railroad, the Rock Island, the Illinois Central, the Burlington, the Pennsylvania and other railroads have been testing briquettes for some time with excellent results. The Missouri Pacific officials have reported that briquettes were used satisfactorily as fuel for locomotives in two tests made on runs out of St. Louis. The data obtained showed that the advantages gained were more than sufficient to cover the cost of manufacture. Although at the present time definite statements can not be made in regard to the practicability of this fuel for locomotives use, it would seem that briquettes are suitable for fast passenger trains and where high speed is necessary in express service, or in any difficult work, such as climbing hills, where the efficiency from coal is demanded.

It is claimed that briquettes burn with a higher efficiency and with less smoke than coal, because they allow a better circulation of air; that the combustion is more complete and uniform, and they burn with more flame (owing to the added combustible material) and at higher temperature.

Perhaps the most important of the tests to be made at the government plant at Norfolk this summer will be in connection with the burning of briquettes under the boilers of naval vessels. Briquettes have been used successfully in the navies of France and Germany for many years, and our own ships often, when on cruise in the Mediterranean, have used them with uniformly good results.

One reason for the increased efficiency is that the briquette retains its shape until completely consumed.

Briquettes made from Indiana coal were used on an Indiana railroad last year in order to compare the efficiency with lump coal from the same mines. These briquettes showed an increased efficiency over the lump coal from twenty-five to forty-five per cent.

Briquettes were also made from West Virginia coke breeze (waste) with and without the addition of a small amount of raw coal. The briquettes made by both methods were hard and burned well, and doubtless would make a good substitute for anthracite coal. It would seem from these tests that this might open up an important industry which would utilize a waste product and produce a valuable fuel.

Some experiments have been conducted with culm, the waste from anthracite mines, and these have met with excellent results. Briquettes made from culm are now being tested by the Lehigh Valley Railroad in its locomotives, and so far they have been successful. With the

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growing scarcity of anthracite coal, the vast amount of fuel that now lies unused at the anthracite mines may in the future prove extremely valuable.

* * *

*The Advantage of the Hot Water System of Washing Out and Filling Boilers.**

In considering this subject it was deemed essential to adhere strictly to the title of the paper and investigate the advantages obtained by the hot water system of washing out and filling boilers and not to enter into the details of the several boiler washing systems, beyond such general principles as bear directly on the subject at hand.

With this end in view a list of twenty questions was prepared for the purpose of obtaining information and the questions were distributed by the secretary in order that the report might represent, as far as possible, the opinion of the association as a whole.

As the questions divide the subject into several sections, the report is arranged similarly and the information from the various members is thus collected briefly.

1. Should locomotive boilers be washed and filled with hot water?

The replies to the first question evidence very clearly that washing out and filling boilers with hot water is considered of decided advantage.

2. If so, why?

3. If not, why?

The advantage obtained from washing and filling boilers with hot water is due to the fact that the metal in the boiler does not suffer from the unequal contraction and expansion which results from the extreme ranges of temperature when cold water is applied to the warm metal. Washing with hot water under pressure and filling boilers with hot water will keep the boiler at a comparatively high temperature, and unequal strains are less likely to develop in the fire-box sheets than when cold water is used. The fire-box sheets are so rigidly braced to the outside sheets that they are not free to expand and contract easily, therefore sudden changes of temperature tend to set up unequal strains in the metal of the fire-box.

Unequal expansion and contraction tends to crack side-sheets and stay-bolts, and to elongate and shorten the tubes, thereby loosening the joint between the tubes and the flue-sheet.

By reducing the damage to boilers the use of hot water naturally minimizes the amount of boiler repairs in roundhouse work. This is particularly noticeable in the smaller amount of work necessary in caulking and rolling tubes, etc.

Removing the deteriorating effects of cold water increases the life of sheets and tubes and the life of the boiler is lengthened, providing a greater term of usefulness for the locomotive between shoppings on account of boiler repairs.

Not only does the use of hot water in washing out and filling boilers tend to increase the life of boilers and reduce the expense of maintenance, but by shortening the time necessary to blow off a boiler, wash and refill it, the terminal detention is considerably reduced and the earning capacity of the locomotive increased accordingly.

When a boiler is to be washed and filled with hot water it is not necessary to allow an engine to stand in the house to permit the boiler to cool to that temperature at which it is safe to apply cold water. After the boiler has been washed and refilled, steam may be generated in much less time and with a smaller amount of coal for firing up, when water is put into the boiler at a temperature of 212 degrees, or nearly so, and when the metal in the boiler has been maintained at a comparatively high temperature during the process of washing.

4. Will hot water remove mud and slush from boilers more rapidly than cold water?

The expressions of the several members who replied would lead to the conclusion that there is a difference of opinion whether hot water will remove mud and slush from boilers more rapidly than cold water. However, the more general opinion evidently is that the hot water is more effective because it has a tendency to soften the mud and thereby remove it more rapidly.

Two writers expressed the opinion that washing a boiler with hot water before the boiler becomes cool, removes the mud and slush before they have a chance to harden on the sheets, stay-bolts and flues; while cold water has a tendency to harden the foreign substance.

*Committee Report, fifteenth annual meeting of the Traveling Engineers' Association, held at Chicago, Ill., September 3-6, 1907.

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Another writer says that cold water is more effective in removing scale than hot water and adds that so far as mud and slush are concerned, it should make no material difference.

Of course it is understood that with either hot or cold water there is a good pressure at the nozzle of the wash-out hose.

5. Where no facilities are provided for putting hot water in boilers, do you put in cold water as the hot water is running out?

A number of roads consider it good practice to admit cold water into the boiler as the hot water is running out in order to bring about a gradual change of temperature in the metal. That such a practice is widely followed is shown by the number of replies to question 5, although a few replies indicate that this method is not always followed.

Some replies show that it is occasionally the practice to let out the hot water, remove the plugs and begin washing almost immediately. This is done on account of limited time or in an effort to reduce terminal detention for which the Mechanical Department is responsible. It would seem that such admissions argue for the introduction of systems for washing and filling boilers with hot water, in view of the recognized damaging effects resulting from rapid changes of temperature.

6. Do you put in cold water in top or bottom of boiler?

In those instances where cold water is admitted to a boiler as the hot water is running out, for the purpose of cooling the water gradually, it seems to be very general practice to force the cold water through the injector. While in some cases the throttle at the fountain is shut off in order to deliver all of the cold water through the check valve, the opinion of many is that it is better to admit the cold water through the throttle in order that the cold water will mix with the hot at the highest point. The tendency is for cold water to sink to the bottom, and by delivering it at the top it accomplishes the greatest results in finding its way to the outlet at the lower portion of the boiler.

7. Have you had broken stay-bolts or cracked sheets due to cold water washing and crowding?

It seems very generally agreed that washing boilers with cold water is directly responsible for broken stay-bolts and cracked sheets when the work is crowded, or, in other words, when the cold water is allowed to cool the metal rapidly. At the same time, however, it is believed that when sufficient time is taken to cool the boiler properly and no sudden changes of temperature are allowed to occur, washing with cold water may be done without ill effects to sheets and stay-bolts. Demands for power often prompt the roundhouse force to hurry too much when washing a boiler with cold water and it is believed that the rapid cooling resulting from such a method is responsible for the cracking of sheets and stay-bolts.

One road reports that before installing a hot water system for washing out boilers, it was a common occurrence to have stay-bolts broken after the boilers had been washed out and filled with cold water. This road also had quite a number of cracked side-sheets and the sheets usually cracked while the boiler was being filled with cold water—after the washing-out process had been completed. Since using hot water exclusively for washing and filling boilers, stay-bolt breakage has been reduced fifty per cent.

8. Have you had tight tubes begin to leak after the boiler had been washed with cold water?

While there are various causes responsible for tubes leaking and the entire responsibility cannot be attributed to washing boilers with cold water, the application of cold water to the warm metal certainly tends to loosen the joint at the juncture between the tubes and the tube-sheet. It has been said that where the boiler is allowed to cool thoroughly before cold water is admitted, no difficulty will ensue. Here again the time factor is introduced. An engine is delayed several hours for cooling alone if it is allowed to stand a length of time sufficient for the metal in the boiler to reach that temperature at which cold water will not be injurious.

Reports from various roads show that leaking tubes frequently occur after a boiler has been washed with cold water. This feature is especially noticeable where the process of washing and cooling has been pushed too rapidly.

While the ill effect of cold water is recognized, enthusiasm over the hot water system should not lead its advocates to blame cold water for all tube troubles. For instance, there are some districts in which the available water

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contains a large amount of sludge-forming material. Boiler washing is required frequently; in some cases every 200 miles. When the tubes have run a certain length of time they frequently leak after the fire has been knocked out, this being particularly true just after washing, even with hot water. There are instances where tubes do not leak until the boiler passes a certain stage of solid accumulation, when it is impossible to keep the tubes dry either before or after washing. This is considered more on account of the severe conditions resulting from the heavy accumulation of sludge than because of the effects of washing.

A certain road reports that when cold water was used exclusively for washing out and filling boilers, it was necessary to work the tubes over in the fire-box end every time the boiler was washed, in order to prevent engine failures from tubes leaking. With hot water this is found unnecessary.

Another road reports that tight tubes have begun to leak after washing out with cold water and especially so with wide fire-boxes. While this road has not had experience with hot water washing, it finds it necessary to work the tubes after boilers have been washed.

The experience of still another road is that when washing with cold water it is necessary invariably to have a boilermaker spend two hours, at 38 cents per hour, in expanding tubes after each boiler has been washed. While this may not be absolutely necessary, those in charge of the work find that if it is not done there is no certainty that the tubes will not leak on the first trip after being washed. At the same time, however, when the tubes have been expanded after each washing the number of failures from leaking have been found to be reduced to a minimum. As a protection, therefore, this road has the tubes of every engine rolled after each washing. At a terminal where there are nine-five washings per month, the cost for labor on tube work alone is $72.20 per month. While this road had not installed a hot water system of washing at the time these figures were obtained, the investigations made led to the conclusion that by washing out and filling boilers with hot water, this item of expense would be greatly reduced, if not eliminated.

9. Without describing any system on the market, what essential features do you consider should be embodied to constitute a most economical and efficient hot water system?

The essential features of a system for heating water to be used in washing and filling boilers, which seems to be considered with greatest favor, embodies the principle of utilizing the heat contained in the water discharged for raising the temperature of the water to be used for washing and filling. Utilization of exhaust steam from various sources provides a means of maintaining the temperature of the water when locomotive boilers are not being blown off.

A system operated according to this principle requires a battery of heaters located at some convenient point in or near the roundhouse, where the heat contained in the water and steam blown off may be utilized in heating the water used for washing and filling. The heaters are connected by suitable permanent mains and adjustable connections with the locomotive boiler blow-off cocks in order that all water and steam blown off will be delivered to the heater. The heat so utilized is supplemented by delivering waste steam from the exhaust of stationary engines and air compressors.

The economical feature of this system is that heat which would otherwise be wasted is utilized to good advantage and the water for washing and filling is heated at an extremely low cost. Where it is necessary to obtain live steam from a boiler to operate the heaters, the economical feature of the system is destroyed.

It has been suggested that in order to wash a maximum number of boilers two pipe lines are necessary between the heaters and the blow-off connections at the boiler. One pipe is for blowing to the cistern and the other is for delivering hot water to the boiler during the process of cooling after the steam has been blown off.

Such an arrangement establishes a pressure in the boiler and discharges water from the boiler more rapidly than the water would naturally escape by gravity alone, because of the frictional resistance offered by the pipes through which it is discharged. It is considered undesirable to blow water and steam from the boiler at the same time and allow scale and mud to stand on the hot metal without being covered by water. For this reason it is maintained that water should not be let out of the boiler until

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the temperature of the metal is the same as the temperature of the water that will be used for washing.

Heating systems may be so arranged that the heat of the steam released when the boiler is blown off may be used to heat the water for both filling and washing, or the boiler may be washed out with the water originally drawn from the boiler and the filling water alone heated by the steam blown off.

Where the power house of a railway shop plant is equipped with condensing engines, the hot water from the condensers may be led to a pool or cistern and delivered to the roundhouse for washing boilers.

Another method of providing hot water for washing is to deliver all water blown out of the boilers to a receptacle where the water is allowed to settle and the same water is used frequently. Arrangements are necessarily made to dispose of the scale and sludge that settle in the bottom of the receptacle.

A method suggested is to pipe the roundhouse with water and steam connectors at each pit and provide a portable injector to be carried from one engine to another.

10. What time can be saved in preparing an engine for service by using hot water for washing and water at 212 degrees for filling?

When cold water is used for washing and filling boilers about seven or eight hours are usually consumed to blow off, wash out, fill up and raise steam to 100 pounds pressure. To perform the work in less time is apt to cause detrimental results to the boiler. Where hot water is used for washing out and filling, a boiler can be blown off from 150 pounds pressure in twenty minutes. It may be washed almost immediately with hot water and by filling with water at a temperature of 212 degrees Fahrenheit, a pressure of 100 pounds may be raised in thirty minutes from the time the fire is started. The actual time consumed at the point from which these figures are quoted is usually about three hours for blowing off, washing out, filling up and raising steam. Boilers have been washed out at this point in less than two hours and there are other instances on record of equally short time. It is believed, however, that two hours will hardly represent general or regular practice.

While opinions vary as to the time actually saved by washing and filling boilers with hot water, it is generally considered that an engine will be ready for service in at least one-half of the time usually required when washing and filling with cold water.

11. If the hot water blown out of the boiler is used and all the heat units of the steam transferred to a fresh body of water, what would you consider the cash saving to be as compared with the cold water system?

The actual cash saving to be obtained by utilizing the heat in the water blown off depends upon a number of variable factors and can hardly be determined with any degree of accuracy, inasmuch as the same figures would not apply to all cases. Requests for information have resulted in various replies. Several authorities consider that a saving of fifty per cent. is effected; another authority advises thirty-three per cent.; a representative of one road says, side-sheets seventy-five per cent., flues and stay-bolts fifty per cent.; another representative believes that an average of one dollar per boiler is saved.

A representative of a Western road wrote the committee that he did not believe in saving alkali water, no matter how many heat units are lost. He added that more heat units are lost by blowing out after leaving the terminal.

The actual economy obtained depends, among other things, upon the size of the boiler, the amount of heat in the steam blown off, the initial temperature of the water to be used for washing, the size of grate, as well as the heating value and the price of the fuel used.

The results of some experiments showed that locomotives with a grate surface of fifty-four square feet could be fired up with about 1,200 pounds of coal when the boiler was filled with hot water, and a good fire was left on the grate. To fire the same engine when the boiler was filled with cold water required from 2,200 to 2,400 pounds of coal.

With a locomotive having seventy-two square feet of grate area, 1,600 pounds of coal were required to fire up when the boiler was filled with hot water, the greater amount of coal used, as compared to the grate of fifty-four square feet being due to the difference in size of grates. When the boilers were filled with cold water there was very little difference in the amount of coal used on the two grates.

At a certain locomotive terminal where

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ninety-five boilers are washed per month the cost of labor and fuel for each boiler washed is as follows:

Seven hours' labor, one man, at 18c per hour	$1 26
1,500 pounds coal for building fire, at $2.00 per ton	1 50
200 pounds coal for pumping about 6,000 gallons of water to cool boiler	20
Total	$2 96

With a system of hot water washing investigated by those in charge of this terminal three hours per boiler washed was considered a conservative estimate. The corresponding cost per boiler washed with the hot water system would be:

Three hours' labor, one man, at 18c per hour	$0 54
900 pounds coal for building fire, at $2.00 per ton	90
Total	$1 44

According to these figures, the saving in labor and fuel for each boiler washing would be $1.52. Washing ninety-five boilers per month would represent a saving of $144.40 per month, or $1,732.80 per year. Estimating the cost of installing the necessary equipment for a hot water system to be $9,000.00, the figures quoted would represent an interest of 19 per cent. on the original investment.

A further economy represented by the hot water system is in the shorter terminal detention. The earning capacity of a locomotive is realized when it is on the road and not when it is in the roundhouse undergoing repairs.

The figures quoted show that an engine may be ready for service in four hours' less time when washed with hot water than when cold water is depended upon. Assuming the average engine mileage to be ten miles per hour, the time saved would represent forty engine miles, and at, say, 960 tons per train, the four hours' additional service of each engine would represent 38,400 ton miles. The ninety-five engines washed per month would then enable the road to obtain 3,648,000 more ton miles per month from engines cared for at the terminal under consideration. In busy seasons this additional ton mileage would seem representative of considerable economy.

12. Please state all advantages to be gained by the use of hot water for washing and filling locomotive boilers.

This question is probably answered to the satisfaction of those concerned by the replies to the other questions. It was inserted for the purpose of bringing out such information as the various members might have in mind and might not otherwise seem to have been asked for.

13. If the system conveys all steam and hot water from the engine house and eliminates all noise and fog, do you consider that roundhouse employes can accomplish more work?

It is generally considered that roundhouse employes can accomplish more and better work when fog and noise of escaping steam are eliminated. Instances sometimes occur where it is almost impossible for a workman to see a few feet in front of him and such conditions are certainly not conducive to efficient work. When the wash-out section is filled with steam and fog it is impossible for men to move around rapidly, especially so with trucking, and there is always danger of men stumbling over obstacles on the floor, falling into pits or colliding with some one carrying a heavy tool or piece of work. Piping the blow-off water and steam provides an opportunity for men to work in the pit beneath the engine and it is not necessary to wait until a boiler is blown off before machinists' work can be begun.

14. If so, what per cent. per boiler washed?

The percentage of additional work which may be accomplished by having the interior of the roundhouse free from steam and fog is necessarily an arbitrary figure. However, it is generally agreed that clear and dry atmosphere within the building provides a much more favorable working condition.

Figures suggested vary from eight to thirty per cent. and one member intimates that the greater work possible to accomplish under the more favorable condition depends in large measure on the gray matter in the head of the roundhouse foreman.

15. What do you consider should be a minimum number of boilers washed per day to justify the installation of a hot water system?

Statements of the various members regarding the number of boilers that should be washed per day to justify the installation of a hot water system, vary between wide limits. The most conservative suggests twenty-five; another suggests two, and a number vary between

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four and twelve. A very enthusiastic writer says all boilers should be washed with hot water, if only one a week.

The number of boilers which should be washed per day to justify installing a hot water washing system would then seem to depend on the peculiar local governing conditions and the interest that would be represented by the investment. On the other hand the elaborateness of the plant might well vary with the amount of work to be done. For instance, if but very little boiler washing is done at a roundhouse, the use of a portable injector would seem practical, for it is more than likely that there is a boiler in the roundhouse for operating the wash-out pump, even if there are but five or six stalls in the house.

16. Can boiler repairs in engine house and shop be reduced by using hot water for washing and filling?

The results obtained by the hot water system of washing and filling boilers indicate that not only is much time saved in turning engines at terminals, but repairs to boilers in engine house and back shop are reduced by this method of caring for boilers. In bad water districts, the use of treated water in connection with the hot water system of washing and filling, results very successfully in lengthening the life of tubes and fireboxes.

17. If so, what per cent.?

This is another point in which it is difficult to quote other than general figures. Many of the members who replied to this question were non-committal and those who quoted figures varied among themselves. Some of the percentages quoted are 1, 5, 25, 33 and 50.

A representative from a Western road advises that before the installation of a hot water system in 1903, tubes were removed from freight engines every 10,000 miles and from passenger engines after 15,000 miles' service. Since this system has been in operation the mileage of the tubes has been doubled.

A representative of a road that has had a hot water system in operation for fifteen months advises that engine failures due to leaking tubes and side-sheets have decreased 50 per cent. and that repairs for boiler work have decreased 22 per cent.

Another representative says that before three hot water plants were put in operation on a division, the heavy power in frieght service made 30,000 miles between flue settings. The same power is now making 50,000 to 60,000 miles, using the same feed water as formerly.

18. Do you approve of live steam for heating boilers before putting in hot water?

The opinions expressed by those who discussed the advisability of using live steam for heating boilers before putting in hot water would lead to the conclusion that such a method is not beneficial. It is believed more practical to fill the boiler with water very nearly at the same temperature as the temperature of the metal, thus obviating unequal expansion and contraction.

19. In a general way give any information or data that you may have relative to this subject, whether embodied in the questions or not.

The information received was so generally covered by the replies to preceding questions that but little remained to be brought out in a more general way.

Occasion is taken here to acknowledge the assistance rendered by the several members who replied to the questions, some of whom replied at great length.

20. What roundhouses do you know of that are equipped with hot water washing systems worthy of investigation for this report?

The locomotive terminals having in operation hot water systems of washing and filling boilers that seem worthy of investigation are on the A., T. & S. F. Railway, at Albuquerque and Raton, N. M.; C. & O. Railway, at Clifton Forge, Va., Hinton, W. Va., and Russell, Ky.; C. B. & Q. Railway, at Grand Crossing, Wis.; C. I. & S. Railway, at Gibson, Ind.; C. L. S. & R. Railway, at South Chicago, Ill.; C. M. & St. P. Railway, at Milwaukee, Wis.; C. R. I. & P. Railway, at Eldon, Ia., Blue Island and 47th St., Chicago, Ill.; C. C. C. & St. L. Railway, at Lyons and Mt. Carmel, Ill.; I. C. Railroad, at East St. Louis, Ill.; L. S. & M. S. Railway, at Elkhart, Ind., Toledo, Ashtabula and Collinswood, Ohio; N. Y. C. & H. R. Railroad, at Albany, N. Y.; N. Y., N. H. & H. Railway, at South Boston, Mass.; P. & L. R. Railroad, at McKees Rocks, Pa.; S. P. Railway, at Oakland, Cal., and Wabash Railroad, at Montpelier, Ohio, Fort Wayne and Peru, Ind.—T. F. Howley, Chairman; S. D. Wright, A. M. Bickel, C. F. Schragg, M. H. Haig, Committee.

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Rubber from Peat.

The use of the air brake on railroad cars gave the first great stimulation to the demand for india rubber, and increasing use for the substance has made the demand greater than the supply. On this account chemists have been laboring very hard to produce artificial rubber by synthesis, which is a process of building up a material from its elements. It is said that peat contains elements very close to those in rubber, and a movement has been started in Scotland to use its numerous peat bogs for the manufacture of guttapercha, which is used as a substitute for rubber in many processes.

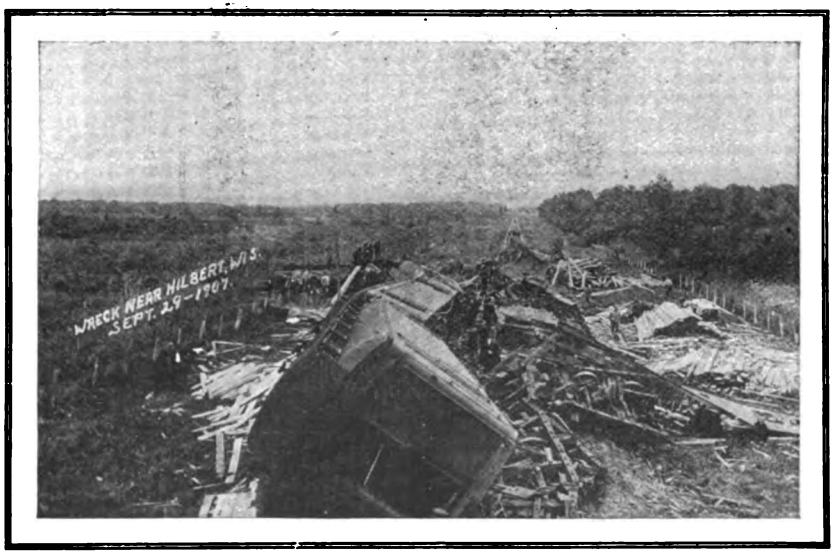
So far, guttapercha is the only substance which has been found to furnish perfect protection for a wire against the chemical influences of salt water, and the product is not only limited, but is practically controlled by a few manufacturers, who own the forests in the East Indies from which guttapercha is obtained.

The price of guttapercha has been gradually increasing for years owing to the enormous demand, and the supply is diminishing, so that if this latest discovery should prove successful it will contribute greatly to the world's economy. In Ireland there are over 3,000,000 acres of bogland, which are at present useless, while in Scotland 2,500,000 acres will be at the inventor's disposal.—Railway and Locomotive Engineering.

* * *

Wreck on C., M. & St. P. Ry.

The illustration herewith is of a wreck which occurred September 29, 1907, near Hilbert Junction, on the C., M. & St. P. Ry., which our correspondent states was occasioned by train No. 2 southbound colliding with the rear end of an extra freight train, resulting in the death of Bro. Edward Ross of Lodge 189, B. of L. F. and E,, and the severe injury of Engineer Parkinson and the rear brakeman of the freight train.



REAR-END COLLISION BETWEEN PASSENGER AND EXTRA FREIGHT ON C., M. & ST. P. RY., SEPTEMBER 29, 1907, NEAR HILBERT JUNCTION, WIS.

*Western Railroad Activities.**

Great Earth-Moving Operations.—The Southern Pacific Company has not only spent millions of dollars recently in making great improvements to its system in south San Francisco, and immediately below the city, along the coast line of the immense peninsula, but is still expending very large sums of money in making further extensions. Besides the work now in progress on what is known

*By J. Mayne Baltimore, special correspondent to the Locomotive Firemen and Enginemen's Magazine.

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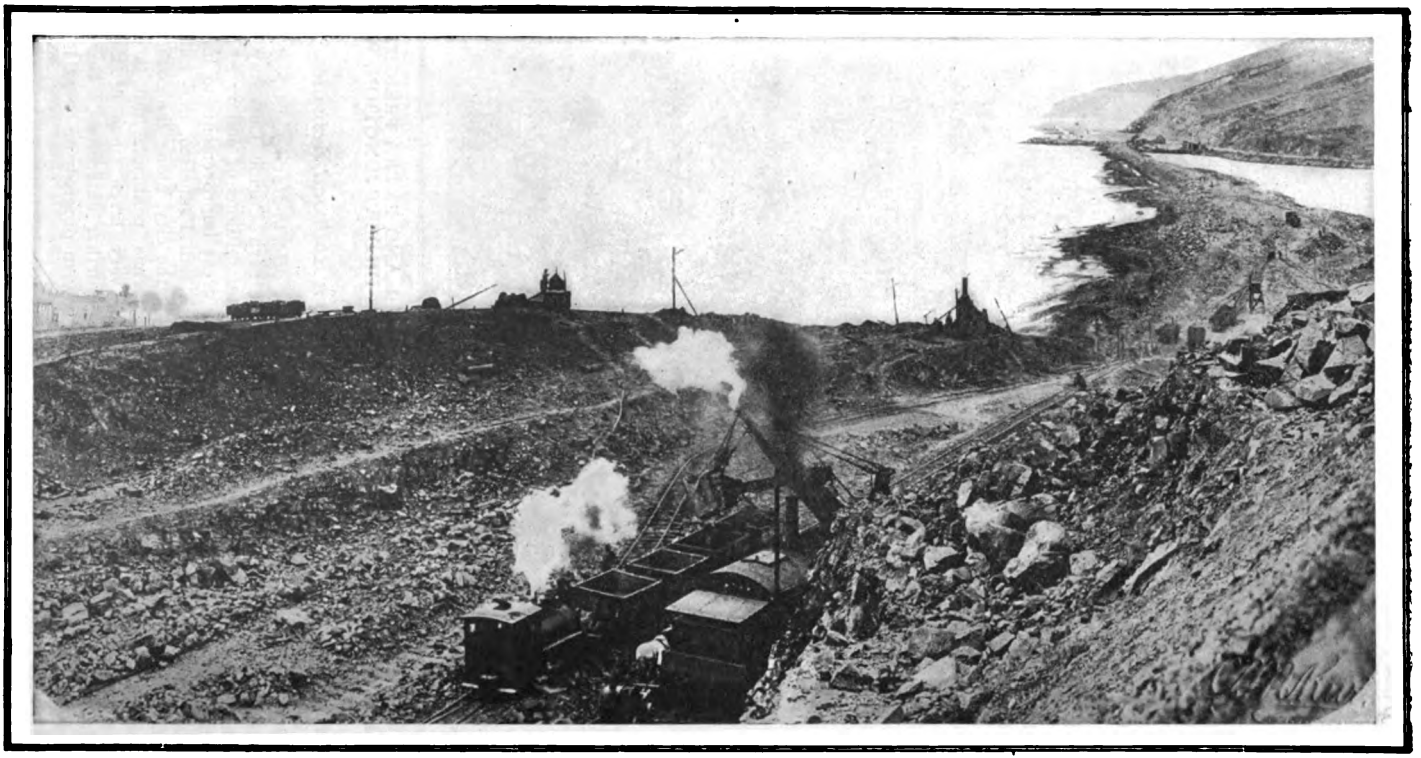

HEAVY EARTH AND ROCK-MOVING OPERATIONS ON THE SOUTHERN PACIFIC

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as the Dumbarton Point cut-off, the company is building a cut-off between Santa Clara and Los Gatos, on the San Jose-Santa Cruz route. The new route will greatly shorten the distance between Santa Cruz and San Francisco. In connection with this improvement there will be much widening of roadbed and tunnels. The total cost of this work will reach nearly $1,000,000. On the extension to the southward of Baden, a great deal of heavy earth and rock-moving operations are in progress. The accompanying picture shows the nature of some of the heavy work required—where powerful steam shovels and dump trains are kept busy removing vast masses of rock and earth and making fills. By the middle of next summer all of these extensions and improvements will have been completed, including the Dumbarton Point cut-off, the new route to Santa Cruz and all intermediate work south of Baden.

New Trunk Line at Coos.—D. H. Moffatt, a Denver banker and railroad builder, is acquiring terminals for another transcontinental railroad at Coos Bay, Oregon, and has engaged Major Kinney, a prominent organizer in that section, to look after his interests. It is stated on good authority that Major Kinney is endeavoring to obtain a franchise for the proposed belt line railroad through Empire City, North Bend and Marshfield. These towns are strategically located on Coos Bay, which eventually must form an outlet for a vast area of timber, coal and agricultural lands in southwestern Oregon. The general opinion in railway circles is that Mr. Moffatt is acquiring terminals for the Denver, Northwestern & Pacific Railroad, which he is now building to Salt Lake.

To Clear Right of Way.—The Northwestern Pacific Company (belonging jointly to the Southern Pacific and Santa Fe systems, has just entered into a contract with the Pacific Lumber Company, by which the lumber company is to start immediately clearing the big redwood timber off the proposed right of way of the railroad from Shiveley southward to the Eel River in Humboldt county, California. Capt. A. H. Payson, president of the Northwestern Pacific, states that the dispute with the lumber company in regard to the right of way has all been settled; the axmen and loggers are to do the preliminary work, so that the railroad graders can do their part.

Work in Old Mexico.—E. A. McFarland, chief engineer of the new line which Mr. Harriman is now constructing in Old Mexico, states that the grading and track-laying forces now number 6,000 men. As soon as the dry season arrives it is the purpose to increase the active working force to 10,000. A branch line is being built from Cananea, Sonora, to Nogales, where it will connect with the Benson-Guaymas line. Another line is being built from Navajo to Alamos. It will be completed very soon. Several years will be required to complete the whole of the work now proposed by the Harriman system in Old Mexico.

A Gigantic Railroad Blast.—Perhaps the most gigantic railroad blast ever known in the history of railroad construction in the United States—or even in the world—was sent off on the morning of September 5, 1907. This stupendous explosion took place at a point known as Hooper, Washington, on the line of the Seattle-Portland Railroad, which is now being constructed by the Great Northern System, and will reach Portland by building along the north bank of the Columbia.

By this great blast 150,000 cubic yards of rock were blown up and shattered into fragments ranging from the size of a man's head up to half a ton or more. The giant charge was made up of 7,264 cans of powder, or 181,000 pounds of black powder, and 4,000 pounds of dynamite.

All of this work was done by the Western States Construction Company of San Francisco, Cal. The Western States Construction Company has two contracts on this line. One section is fifteen miles long, at, and near the Dalles, Oregon; the other is seventeen miles long and embraces the work at Hooper, where the giant blast was made. The 150,000 cubic yards of solid rock was displaced from a towering cliff. It was between 800 and 900 feet long, averaging from top to about 80 feet, and from 20 to 90 feet in thickness. Two and one-half months were required to fully prepare this mighty blast. Day and night the work progressed—three shifts of twenty-five men each being employed. Contractor W. A. Whitley had general charge, while William Moore acted as chief powder man. The total cost of this tremendous blast—including labor and all of the material—reached the very large sum of $26,000. The charge was pre-

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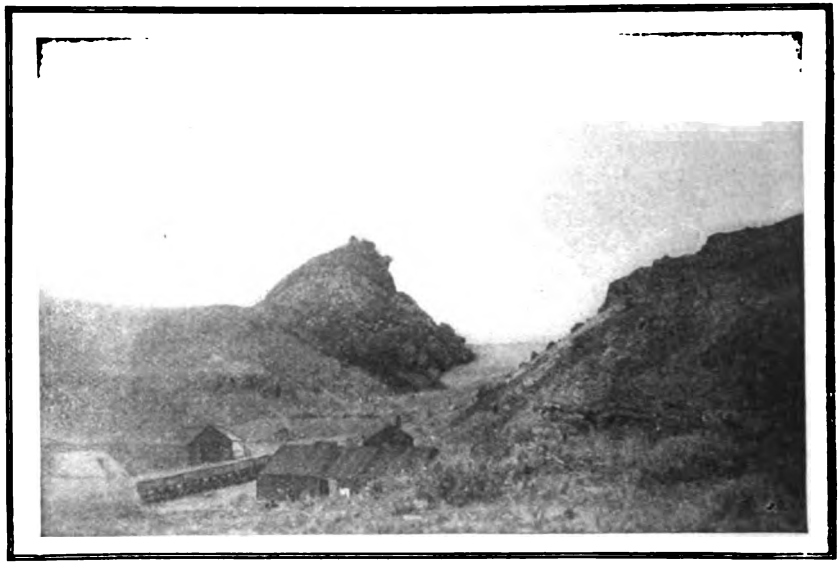
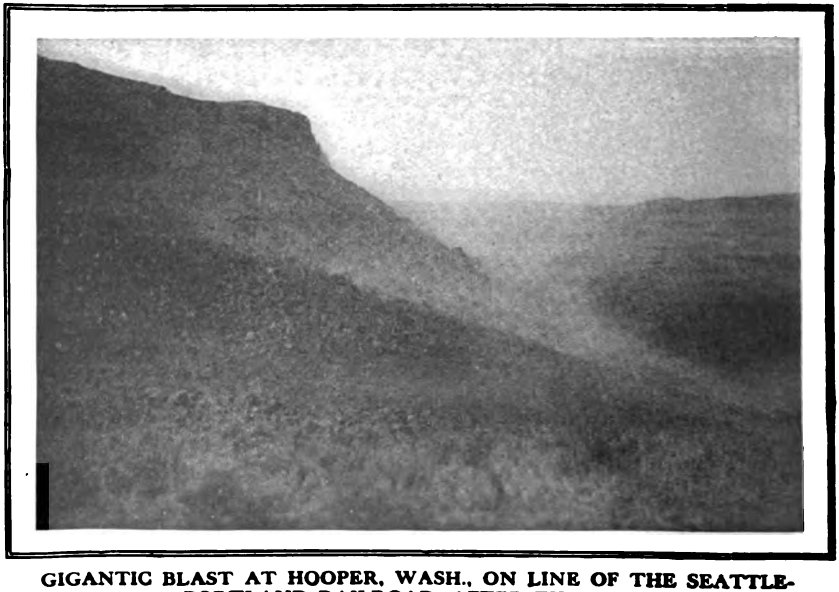


GIGANTIC BLAST AT HOOPER, WASH., ON LINE OF THE SEATTLE-PORTLAND RAILROAD—THE EXPLOSION

pared by drilling fourteen tunnels, or "coyote holes" into the cliff at different points. Into these large holes the explosives were placed to the very best possible advantage. These powder tunnels varied in depth from 20 to 90 feet, and at the ends of the tunnels were driven short "Ts," or pockets, into which the powder itself was loaded. The longest tunnels were loaded in six places, and the shortest in two. In each "coyote hole" was placed from 300 to 900 pounds of explosive material. The charge was then connected by wire with the dynamo.



GIGANTIC BLAST AT HOOPER, WASH., ON LINE OF THE SEATTLE-PORTLAND RAILROAD—AFTER THE SHOT

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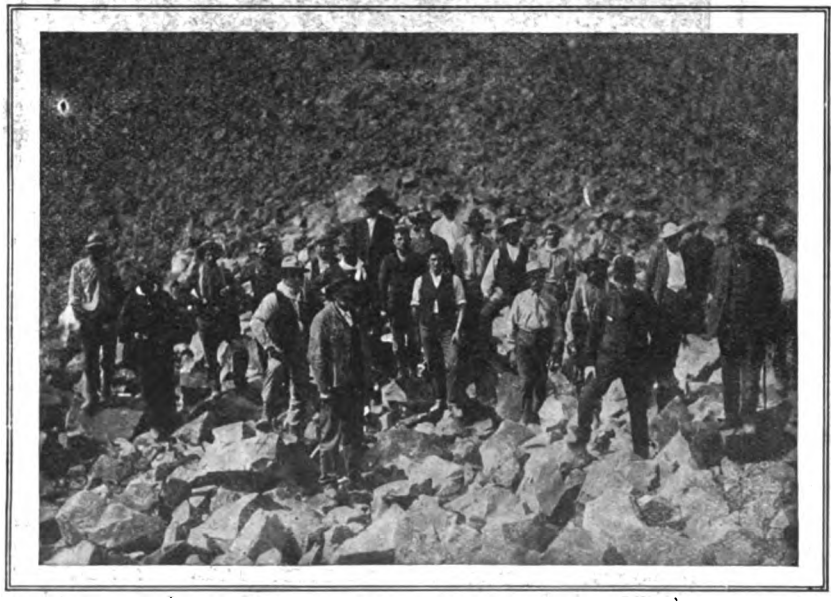
and when everything was in perfect readiness, warning was given and all the small army of men hurried away to places of safety. When every preparation was completed, the electrical switch was thrown on and the mighty blast was sent off. Fully 1,000 persons witnessed the blast, many coming for a long distance to see the explosion. Such a spectacle was never witnessed before on the coast in any railroad work. From the commencement to the finishing, no accident, involving life or limb, occurred. Special Contractor Whitley had exercised very fine judgment and caution throughout. Every arrangement and appliance was perfect before the electrical current was sent in. Contractor Whitley was very highly complimented by the chief engineer of the road for the success which had attended the work. Engineers all declare that it was a splendid piece of engineering work. For acres vast piles of shivered rock lay many yards high. So powerful was the explosion that the rock was shattered into small fragments, and can be easily handled by the huge steam shovels. The work of removal is now in active progress. Costly as was this mighty blast, it is considered a very effective piece of operation. For some time the obstruction puzzled the engineers, and the question of tunneling was discussed; but finally they decided that the whole face of the cliff must come off—and come off it did in a twinkle—clear down to the required grade.

Big Railway Work Completed.—A heavy piece of contract work was recently completed by the Western States Construction Company on the California & Northeastern Railroad, in the extreme northeastern part of California. This is a branch extension belonging to the giant Harriman System, and extends from Weed, on the main trunk line of the San Francisco-Portland route, over into the southeastern part of Oregon. Work on this extension has been in progress more than a year. The grading contract referred to was about thirty miles beyond Weed, extending over a stretch of four miles. It proved to be one of the hardest and heaviest pieces of railroad work ever accomplished in Northern California. About eight months were required to complete this contract. The total excavation was over 200,000 cubic yards of rock. There were several heavy cuts and two large fills—one particularly, across an arm of Grass Lake. All the excavations were utilized in making the fills.



GIGANTIC BLAST AT HOOPER, WASH., ON LINE OF THE SEATTLE-PORTLAND RAILROAD—THE MEN WHO DID THE WORK

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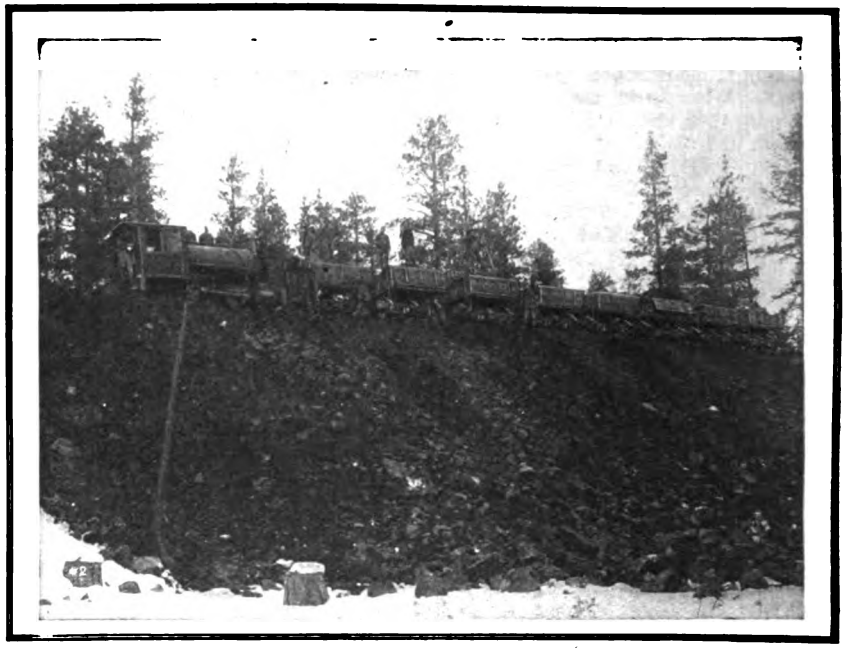
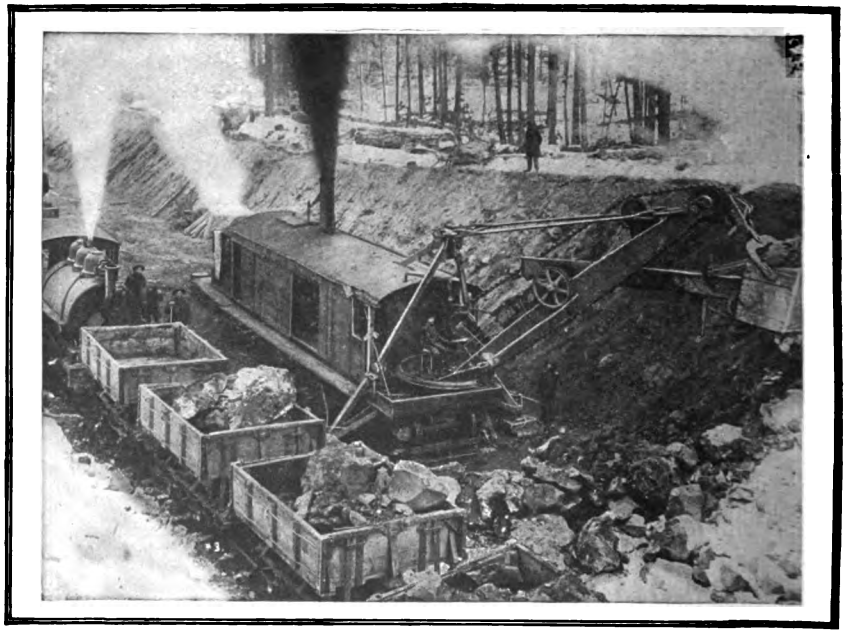


HEAVY FILL BEING MADE FROM THE "SUMMIT CUT"—CALIFORNIA & NORTHEASTERN RAILROAD



ONE OF THE BIG STEAM SHOVELS WORKING IN THE "SUMMIT CUT"—CALIFORNIA & NORTHEASTERN RAILROAD

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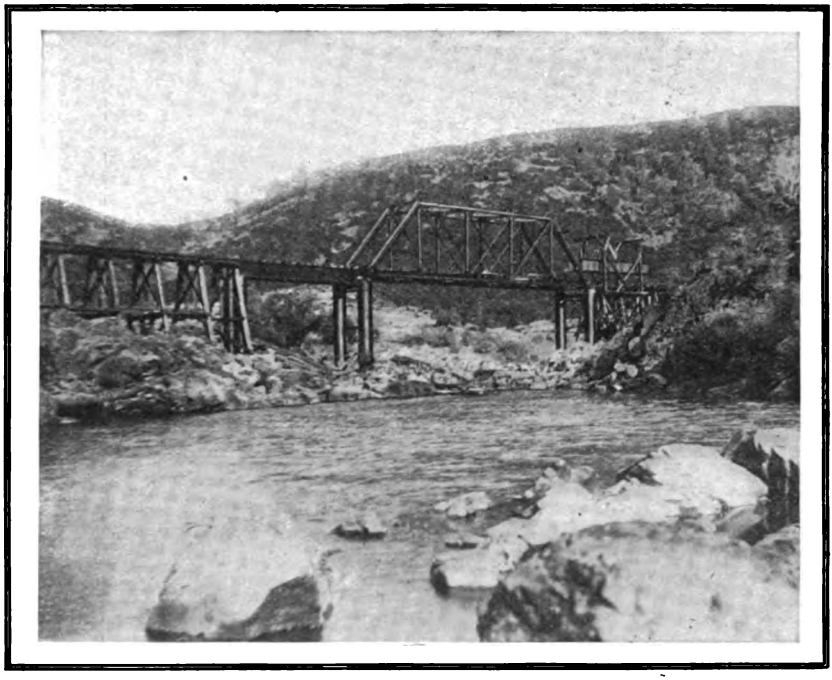
The excavations were all made through very hard lava rock—so flinty that the drilling work progressed very slowly. The drillers rarely made more than 10 feet per day, the rock being so obdurate as to turn the diamond-pointed drills. Three large steam shovels were constantly in operation on the cuts, while five locomotives and sixty dump cars were used on the fills. On an average about 200 men were constantly at work. The total cost to the railroad company for this piece of work will aggregate $200,000. The heaviest and most difficult piece of excavation was at the big Summit cut. Much of the work was done during the winter months, when very cold and rainy weather prevailed. To add to the difficulty besetting the drillers, it was very hard to keep the dynamite from freezing, and the powder perfectly dry. So the work moved slowly, despite the activities of the contractors and the forces. Engineers declare that the work was well done, and accomplished in good time, considering the heavy and hard nature of the operations. An excellent grade will be secured on this branch route, it rarely exceeding 1½ per cent. at any point. The total extension will cover over 150 miles. President Harriman, on his very recent trip to the Pacific Coast, passed over this, as yet, unfinished line, and made a careful inspection of all the work thus far done. Mr. W. A. Whitley, of the construction company, had general supervision of the four miles contract work.

Bridging the Mercedes River.—In the construction of the Yosemite Valley (steam) Railroad, some very difficult engineering work was required, especially in building up the Mercedes River Canyon. Some heavy grades had to be overcome, besides frequent bridging of the Mercedes River. The road crawls along the narrow winding canyon and it was necessary to bridge the stream at four different points.



BRIDGES OF THE YOSEMITE VALLEY RAILROAD

Showing the placing of a 50-foot span

The total length of this road is eighty miles, and its total cost reached nearly $2,000,000. It begins at Mercedes City, Mercedes county, and extends to El Portal station, within twelve miles of the Yosemite Valley proper. The construc-

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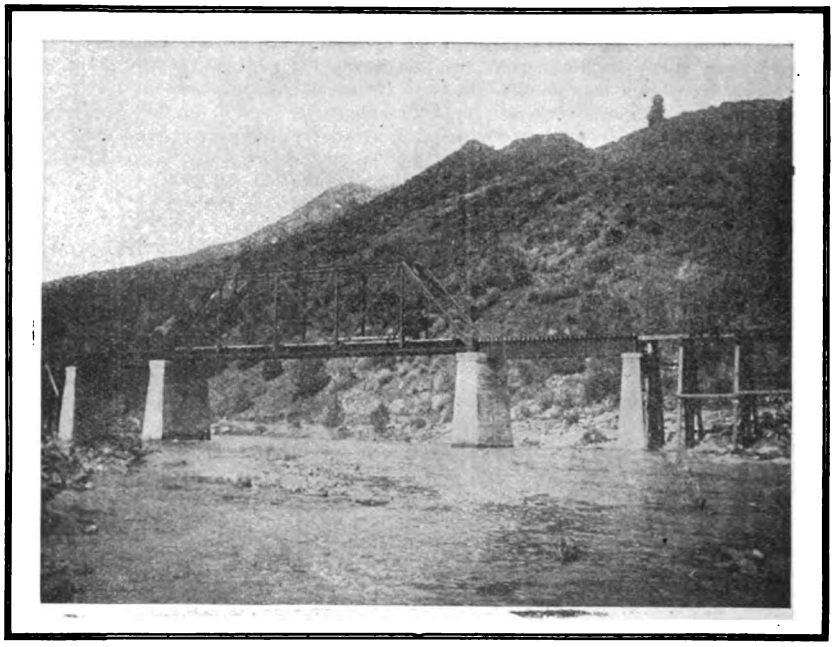

BRIDGES OF THE YOSEMITE VALLEY RAILROAD

Bridge with one 125-foot through span and two 50-foot girder spans

BRIDGES OF THE YOSEMITE VALLEY RAILROAD

Bridge with one 125-foot through span and two 50-foot girder spans

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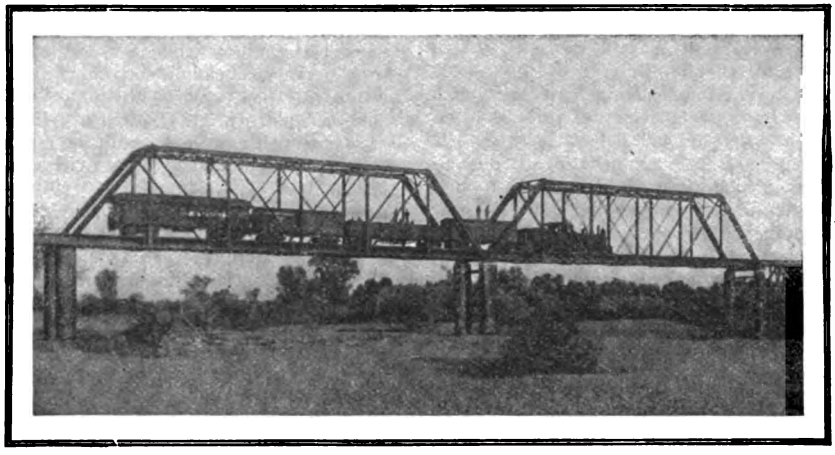
tion of the bridges across the Mercedes proved one of the very difficult features of the construction. All this bridge work was done by the Atlantic, Gulf and Pacific Company of San Francisco. In the bridge-building much unavoidable delay resulted, which was not the fault of the contracting firm, but was mainly due to the railroad company's inability to complete the grading between the points where the bridges now span the Mercedes River. High water in the stream was also a source of much delay that could not be avoided.



BRIDGES OF THE YOSEMITE VALLEY RAILROAD

Bridge with two 150-foot through spans; tubular concrete piers

One of these bridges has two 125-feet through spans, a third has one 125-feet through deck, and a fourth bridge two 50-feet plate girders. All of the superstructural work is of steel. Two of the bridges rest on tubular steel piers filled with solid concrete, and two on oblong solid concrete piers. All the work has been done in a very strong and substantial manner. This was necessary, as the Mercedes River is a very strenuous water course during its higher stages—deep, with a tremenduous current running.

Engineers claim that these bridges have been built in a manner that will enable them to successfully withstand, with perfect safety, the heavy strain of passing trains and the sweep of waters.

This line was recently completed and is now in operation. During the past summer season there was very heavy tourist travel over this new line. Tourists can now reach a point within twelve miles of the Yosemite Valley, and then have only a short trip by stage.

To Improve Terminal Facilities.—Work has been commenced on the expenditure of $100,000 in improvement of the terminal facilities of the Gila Valley, Globe and Northern Railroad, in the city of Globe, Arizona. There is to be a new freight depot, a handsome new passenger station and roundhouse that will cost about $50,000.

Work Begun on a New Road.—A force of men has just commenced work upon the Nogales-Cananea branch of the Cananea, Yaqui River and Pacific Railroad. Nogales is in Southern Arizona. Work will be crowded forward and the building of the road will occupy about one year.

Using Giant Steam Shovel.—On difficult mountain construction work in Butte and Plumas counties, California, the Western Pacific Company is making surprisingly rapid progress. On one of the largest tunnels, the Spring Garden, the company is putting on more men and machinery every week. A giant steam shovel has just been moved to Twelve Mile Point, and is already in full operation there.

The company is constructing an air compressor which is to drive the 1,800-foot tunnel located near the old Spanish Creek bridge. At the new Spanish Creek bridge a log crib 3,500 feet long has just been completed, and the 65-ton Bucyrus steam shovel will be employed in filling this cribbing. This mammoth shovel is

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a curiosity, even to experts. Never before has a shovel of this size been moved sixty miles overland from a railroad. The Utah Construction Company, which is building the road in that section, lays claim to the record for several other shovels being operated along the Feather River Canyon.

* * *

*Engine Failures.**

Engine failures probably receive more attention than any other one thing in connection with the operation of a railroad, since, when the engine stops, the revenue and all things attendant thereon suffer. Without a well defined system governing the handling of failures it is evident that much energy can be wasted, as the improper charging of failures often results in prolonged debate between the mechanical and transportation departments, which time could be used to better advantage in improving the service.

Engine failures are reported for two reasons:

First: To afford explanation of delays to traffic and affix responsibility.

Second: To furnish such information as will assist the mechanical department in correcting imperfections in design and workmanship.

Delays to traffic will occur as long as railroads are operated, and as an abstract proposition it is immaterial whether the delay ensues from power, rolling stock, roadway or transportation difficulties, but in the interest of the betterment of service, it is imperative that all reports be accurate and that each department bear its own responsibilities.

Delays charged to "engine not steaming" which in reality were due to the inefficient appointing of meeting places, or "working on engine" when a hot box was being cooled on a car or where the improper distribution of ballast destroyed the efficiency of the cylinder cocks, have no tendency toward improvement, and these illustrations serve to indicate the necessity of a well defined system of reporting and tabulating failures.

It seems essential, in a discussion of this subject, that the following be considered:

A concise definition of an engine failure.

A proper method of reporting and tabulating failures.

A satisfactory basis for comparing failures.

A systematic course for improving conditions.

Owing to the various causes which may retard the departure of an engine from a roundhouse, it does not seem proper to include terminal delays in the list of failures. These should be handled independently and only such delays as result after the engine is in actual service should be considered, as failure reports should serve as an indication of the condition of power.

All delays to traffic due to the condition of the engine, which are not afterwards overcome, should be charged as failures, but the value of the reports diminishes rapidly when failures are listed that were the immediate result of excessive delays on side tracks, damaged rolling stock or bad condition of the roadway. This emphasizes the necessity of stringent rules covering these details, as failures once charged should never be canceled.

It is obvious that the mechanical department knows more about the handling of power than the transportation department, and that the latter knows more about the handling of trains than the former, so that it should not be a difficult matter to properly define an engine failure, but when discussions are permitted relative to the charging of a failure, which was primarily due to transportation or roadway difficulties, it is essential that rules be made to cover all these details, and when once made, that they be rigidly enforced.

Since the effect produced by those causes which tend to decrease the efficiency of a locomotive, varies with the size and service of the engine, the water conditions and the topography of the country, it is improbable that a definition of a failure could be arranged that would be universal in all sections of the country, though it is possible to have one common in part, if not in entirety, leaving the adjustment of the details to those in immediate charge. These, when once arranged, would enable the train dispatcher to charge all failures correctly upon the receipt of a separate report from the conductor and engineer, which ruling should be effective in order to effect uniformity in all reports of delays and remove the liability of errors.

A telegraphic report, to be followed by

*J. F. Whiteford, General Roundhouse Inspector, Santa Fe, in American Engineer and Railroad Journal.

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a copy by mail, of all failures where the engine is concerned, should be furnished each morning to the heads of all departments, and the roundhouse foreman should have complete information of failures, so that a thorough examination and subsequent report can be made immediately on the arrival of the engine at the terminal.

A blank form should be furnished the engineer to be filled out on his arrival, permitting the mentioning of such details as may be necessary to supplement the telegraphic report, and his statement, together with the one from the roundhouse foreman, should be in the master mechanic's or division foreman's office within five hours after the arrival of the engine.

Where machinery is broken, a "defective machinery blank" properly filled out should accompany the other reports, as the cause of all failures of power can not be followed too rapidly or too thoroughly.

Provision for the handling of these reports beyond the master mechanic's office should be made to suit conditions on each individual road, in orner that imperfections in design may be corrected as early as possible, and instances of inferior workmanship may be handled as conditions permit or necessities require.

A monthly report, where all the failures occurring on each operating division are shown, should be issued and all failures itemized as follows:

Hot Bearings	*Machinery*
Driving boxes	Piston loose
Engine trucks	Piston bent
Tender trucks	Piston gland broken
Eccentrics	Piston heads broken
Crank pins	Piston follower broken
Etc., etc.	Etc., etc.

A suitable comparison should be made as regards the total failures on each division with the preceding month or that of a year previous.

Since the monthly report can not reach the various division offices for three or four weeks after the last of the month, the writer has found it of considerable advantage to separate the failures shown on the daily reports into the following general heads:

Air	Machinery
Blow-off Cocks	Oil Burners
Grates	Foaming
Hot Bearings	Leaking
Injectors	Not Steaming
Miscellaneous	

By such a system, an unusual number of failures of any one of the foregoing classes are readily discovered and such action immediately taken as may be necessary for improvement. Much good may be accomplished by the master mechanic's office furnishing the various subforemen with a copy of the failures for each week, with comparison of the preceding week, showing the failures of each class on engines leaving the various terminals separately.

A satisfactory comparative basis is very necessary, as otherwise it will be impossible to make accurate comparisons of different divisions for the same period and of the same division for different periods, but after a thorough investigation of the situation, it appears that the common comparative factor—average mileage per failure—is not only inadequate but very misleading, as numbers only are considered, regardless of the variations of detriment to the service that result from the failure.

Since the primary reason for the reporting of failures is to explain delays to traffic, it is imperative that the extent and importance of the delays should be considered in making comparisons, as a delay of eight hours is more detrimental to the service than one of five minutes, and delays to passenger trains are of more relative importance than those to through freight, and the latter, in turn, are more important than those to local and switch service.

In the days when engines were of the same size and total failures were the only ones counted, the necessity of checking delays was not as vital as at present. The number of failures only was sufficient for comparative purposes, but since a failure may be anything from a three-minute delay to where the engine gives up the train, it is evident that the numerical feature is not sufficient.

A storekeeper whose records of a stock of pipe consist of the number of feet of pipe, regardless of the diameter or quality, would be in bad shape, which illustrates that the number of failures are meaningless without some additional information relative to the damage to the service, and while this may necessitate more clerical work, I am of the opinion that the needs justify the expense, as otherwise it will be impossible to determine whether any improvement is being effected.

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For example, consider the following failures:

Eng.	*Train*	*Time*	*Cause of Delay*
107	4	2 hr. 40 min.	Broken piston rod on air pump. Delayed No. 4, 2 hours and 40 minutes waiting for No. 77's engine. Delayed No. 77, 6 hours and 30 minutes waiting for another engine.
1732	33	1 hr. 55 min.	Blew out cylinder head, reduced to 40 per cent. tonnage.
2621	Loc. E	20 min.	Packing hot box on engine truck.
2112	Switch	30 min.	Broken brake rod. Delayed yard work 30 minutes while engine went to roundhouse for repairs.

The foregoing failures, varying from a total failure where a limited train was delayed two hours and forty minutes and a fast freight six hours and thirty minutes to that of a failure where a local train was delayed twenty minutes, while differing largely as to extent and importance of the delay to traffic, are all of the same value where numbers only are considered.

It seems advisable to divide failures into three divisions, namely: passenger, time freight, local and switch.

These divisions, when all failures are reduced to a total hour delay in the first and third classes and a tonnage hour deday in the second class, would enable very satisfactory comparisons to be made, and those in charge of operation would be able to determine accurately, from the monthly report showing the total delays resulting from failures, the extent of improvement or otherwise on any and all divisions. Under the present system, ten failures of five minutes each are considered of more consequence than five where the engine fails entirely and gives up the train, which is incorrect altogether, since the service was impaired more in the latter case than in the former.

For the improvement of conditions or the diminishing of failures, it seems necessary to have a prompt, explicit and correct report followed by a thorough investigation and the necessary action taken to correct imperfections in design and workmanship.

Efficient supervision is the only remedy and should exist not only in the roundhouse, but on the road, as many failures due to carelessness on the part of the workmen could have been avoided if the enginemen had given their engines the proper attention.

When one engineer can run an engine successfully without a failure for six months, and another on the same service under identical conditions has an average of one failure per week, it indicates that much improvement can result from the co-operation of the enginemen.

However, but little good can result from asking an engineer to "please say why" he had a leaking failure after he had remained on a side track an excessive time, or a hot bearing when it was necessary to use a freight engine for passenger service, which again illustrates the necessity of a concise definition of a failure, as the engineman should get full credit for meritorious service in this respect.

In connection with the proposed methods of tabulating engine failures, the monthly report could be arranged so as to show the total delays resulting from each individual engine, which in cases of assigned engines should serve as a record of individual engineers. The establishing of a system of giving merit marks according to the decrease in delays, would have a good effect. A report of this nature would permit the condition of each engine in service to be reflected without the introduction of individual foremen's opinions, as the first report is usually correct, while the latter is only a matter of conjecture.

A rigid inspection on the arrival and departure of an engine at a terminal by both the engineer and roundhouse man, and the constant attention of the enginemen while on the road, will serve to improve the service of a locomotive, and with such corrections of imperfections in design as may be determined from the reports of failures, is all that those in immediate charge can accomplish, though the care of an engine both on the road and at the terminal should occupy the attention of all in the operating department.

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*Development of American Steam Locomotives.**

A committee, of which Charles E. Ronaldson is chairman, has made a valuable report to the Franklin Institute regarding the development of the American locomotive as exemplified in the Baldwin Locomotive Works of Philadelphia. Of the plant the report says that it was founded in 1831 and has grown to the extent that while a whole year was consumed in the building of the first locomotive, the works are now able to turn out about fifty-two completed engines every week.

In the process of evolution from the first crudely constructed locomotive, the American type developed, having four driving wheels and a four-wheeled truck; then followed the ten-wheeler; then the "Mogul," "Consolidation," "Mastodon," "Decapod," "Atlantic," "Mikado," "Prairie," "Pacific," and "Santa Fe" types, besides a great variety of locomotives of different gauges and for different kinds of service, representing current requirements. The letters patent owned and controlled by this company are "legion" in point of numbers, so that it is impossible to enumerate all of them, the committee confining themselves to those that are essential to the efficiency of the American locomotive as exemplified today.

In the second locomotive built the valve motion was actuated by a fixed eccentric for each cylinder, the straps of each had two arms attached one above, one below, the driving axle being back of the fire-box, these arms were prolonged backwards under the footboard, with a hook upon the inner side of the end of each; the rock-shaft had arms above and below its axis and the hooks of the two rods were moved by hand-levers, to engage with either arm, thus producing forward or the reverse motion. In 1834, five locomotives were completed. The important devices adopted and employed in these early engines, being the result of Mr. Baldwin's study and experiments, were patented in 1834, and the same patent covering the following inventions, viz.: 1. The half crank. 2. New method of constructing wheels for locomotives and cars. 3. New mode of forming joints of steam and other tubes. 4. New mode of forming joints and other parts of the supply pumps and of locating the pump itself. This last claim consisted in utilizing the hollow guide bar and making it do duty as the pump-barrel, the plunger of which was attached to the piston rod. Mr. Baldwin laid great stress upon the position of the driving wheels by placing them back of the fire box, thus throwing one-half the weight upon them and one-half upon the four-wheeled truck, thus extending the wheel base and producing steadiness and less track damage.

The application of ground steam joints in the steam pipes added greatly to the success of his early engines, and this manner of grinding the joints is now universally used. In 1839, Mr. Baldwin bought the E. L. Miller patent, this being a method of increasing the adhesion of the locomotive and throwing the weight of a part of the tender upon the rear of the engine.

On April 3, 1835, Mr. Baldwin took out a patent for certain improvements in the wheels and tubes of locomotives. That for the wheel related to casting the hub and spokes together and having the spokes terminate in segments of a rim. The improvements in tubes consisted in driving a copper ferrule or thimble upon the outside end of the tube. The object was to make a tight joint with the tube sheet and the advantage gained by the outside ferrule strengthened the tube and made a tight joint with the sheet. It left the tube free and unobstructed its entire length. This patent proved extremely valuable, and the method is now generally used.

In this year the first outside-connected locomotive was built, and it embodied the Miller device and was put in service upon the Philadelphia & Trenton Railroad.

There was a decrease in the demand for locomotives which caused a reduction in the output from 40 in 1837 to 9 in 1840. The average weight of these locomotives was between 20,000 and 26,000 pounds. In the latter part of 1839, the old wooden frame disappeared, the machinery truck and pedestals of the driving boxes were attached to an iron frame which took its place. Eight-wheel tenders were first being used about this time.

In 1842, Mr. Baldwin secured a patent for his flexible truck, which contributed more than any of his subsequent patents or inventions to the foundation of his fortune, and led to the construction of his well-known six-wheel connected locomotive, which had the four front drivers

*From Railway World.

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combined in a flexible truck; the rear wheels were rigidly placed in the frame, behind the fire-box, with inside bearings. The action of the flexible beam was such that the engine in passing a curve the middle pair of drivers could move laterally in one direction, say to the right, while the front pair would swing in the opposite direction, or, to the left, the two axles remaining parallel to each other and to the rear driving axle. The operation resembled that of a parallel ruler; on a tangent the axles and beams formed a rectangle, on a curve, a parallelogram. We call attention to this flexible truck patent, as it was fundamental to the future development and perfection of the Baldwin locomotive.

The performance of the first locomotive using the flexible truck excited widespread interest. The weight of the engine was but twelve tons, its haul was 250 tons, upon a grade of thirty-six feet per mile.

Mr. Baldwin first used iron flues or tubes in 1844, and the advantage found was in the fact that the iron flue sheets and iron tubes expanded alike, while the unequal expansion of iron sheets and copper flues caused leakage. Link motion was first applied in 1845, and also the "half stroke cut-off." The present design of four drivers and a four-wheeled truck was first adopted by Mr. Baldwin in 1845. In 1846, an eight-wheel connected type of engine was built, and at this time the wooden cab with sash and glass was added, and made for the Baltimore & Ohio Railroad. In 1847, rocking grate bars were introduced, and the first "rack" locomotive was built. In 1848, steel axles were first used. Fast-speed passenger locomotives were able to travel sixty miles an hour. In 1849, outside-connected engines were built almost exclusively. In 1850, the wagon-top boiler superseded the old dome boiler, which had been in use since 1834.

In 1852, the ten-wheel engine was placed in the Baldwin classification, yet not until 1860 did this type of engine wholly supersede the old pattern of six or eight-wheel connected. The adoption of the link-motion clearly marks the dividing line between the early experimental and the present locomotive practice. Intense interest was taken about 1859 in the proper means to be employed in combustion. Various experiments were tried in the fire-boxes. The result of study and experiment led Mr. Baldwin to the conclusion that the ordinary form of boiler, with plain fire-box, was right, with, perhaps, the addition of the fire brick arch; that the secret of successful and economical use of coal was in the manner of firing, rather than in any particular design of fire-box.

In 1861, eighteen-inch cylinder freight locomotives with six wheels connected, with a pony-truck, were built. This is the first instance of the use of the "pony" truck in these works.

The introduction of steel in locomotive construction became a distinguishing feature at this time, and steel has gradually replaced wrought iron, etc., for tires, fire-boxes, and boilers. Another distinguishing feature at this time was placing the cylinders horizontal. Casting the cylinder and the half saddle in one piece, and fitting it to the circular smoke-box was designed by Mr. Baldwin. He was the first builder to adopt an outside cylinder, with a circular flanged segment cast to it, in order to be bolted to the boiler. The advantages of this arrangement are simplicity, strength and economy. The cylinders can be used for rights and lefts, one pattern answers for either. From high inclination the cylinders were gradually brought to less until the horizontal position was attained and maintains today.

In 1866, the "Consolidation" type came into use, the first engine being the "Consolidation," built for the Lehigh Valley Railroad Company. It had four pairs of drivers connected and a Bissell pony-truck. The following year (1867) the "Mogul" class of engine, with three pairs of drivers connected and a swinging pony truck, took its rise in the practice of these works from the "E. A. Douglas," built for the Thomas Iron Company, and this plan of engine has rapidly grown in favor for freight duty upon grades and where heavy loads are to be carried.

Steel flues were first used in ten-wheel freight engines in 1868, and also steel boilers the same year. The 1854 type of engine having a straight boiler and two domes was revived in 1866, and until 1880 both the freight and wagon-top boilers were built; yet since 1880 the two domes have been seldom specified. The first narrow gauge locomotive (3½ feet) was built in 1868. The decade 1870-1880 witnessed the introduction of several improvements. In June, 1871, a double-ender locomotive was designed for suburban service on the Central Railroad of

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New Jersey. This was the first engine to have a truck with side bearings. These were used on the rear truck, which had four wheels.

In 1878, a locomotive driver-brake, operated by steam, was introduced by these works. This brake was operated by a slide valve, which was replaced in 1882 by an improved form of disc valve. When required the brake was arranged for application to tender as well as driving-wheels. The equalized tender brake on both trucks was first used in 1872, by the Baldwin Locomotive Works. Locomotives for single-rail lines were built in 1878-79.

A locomotive for a gold mine in California was built in 1876, the gauge being but twenty inches. Steel tires were first shrunk on without being secured by bolts or rivets in any form in 1870, and now this is the prevailing custom.

In 1885 the "Decapod" locomotive was built, having ten wheels connected, with a "pony" truck. A locomotive was constructed during the year 1886, having an outside frame. In 1887, a new form of boiler was built. An extended wagon-top was used, extending to allow the dome to be placed in front of the fire-box, near the center of the boiler, having the crown sheet supported by radial stays from the outside shell. Many boilers of this type have since been constructed. These works have also taken an active part in the development of the "Wootten" boiler, in its original and modified forms. They were the first to place the grate above the frames and thus use all the space between the wheels for the width of the fire-box. The first locomotive for Japan was shipped in June, 1887.

During 1888-89, an active demand sprung up for steam motors for street railway service, and ninety-five of them were built; also, two rack-rail locomotives of the "Riggenbach" system for foreign locomotive service were built.

In October, 1889, the first compound locomotive was completed. It was the four-cylinder type designed and patented by Mr. S. M. Vauclain, then the general superintendent of the works. That they came rapidly into use is evidenced by the fact that in the year 1889 one was built and ten years later 242 were built.

In 1889 the first test was made as to the time in which a locomotive could be built. The order was given upon June 22 for a narrow gauge locomotive, "American" type, for passenger service and upon July 2 it was completed, having consumed but eight working days from the raw material.

In chronological order improvements were made as follows: 1890, rack-rail locomotive under the "Abt" system for the Pike's Peak Railroad; 1890, "Mogul" type of one meter gauge; 1891, largest locomotives in the history of the works were designed and built for service in the tunnel under the St. Clair River, of the Grand Trunk Railway. They were ten-wheel connected with tanks on the boiler and weighed each, in working order, without fire, 186,800 pounds. Five compound locomotives of the "Decapod" pattern were built for the Erie Railroad. The first locomotives for Africa were built this year. They were of the "Mogul" type, for three feet six inches gauge.

In 1892 the high speed "Columbia" type was produced, and in 1895 the "Atlantic" type of passenger locomotive. During the latter year the first electric locomotive was produced. In 1896 a high-speed engine having a single pair of drivers 84¼ inches in diameter was built for the Reading Railroad, which made the trip of ninety miles from Philadelphia to Jersey City in 105 minutes, including the time consumed during six stops. Another notably fast run was made on the same road from Philadelphia to Atlantic City, 55½ miles, in 46½ minutes, or at the rate of 71 3-5 miles per hour.

The demand for increased horsepower, involving greater steaming capacity and a larger grate area, evolved the "Atlantic" type locomotive from the "American" type or eight-wheeled passenger engine; so in order to produce a locomotive to cope with the enhanced condition, viz.: heavier trains at high speed, the "Prairie" type of engine was designed, a type resulting from the "Mogul" or ten-wheeled locomotive.

In February, 1902, the 20,000th locomotive was completed. This engine embodied several interesting features, viz.: compound cylinders, with the new arrangement, Vauclain type.

In May of this year, the largest locomotive ever built was turned out. It was a "Decapod," for the Atchison Railroad Company. The total weight of the engine alone was 267,800 pounds. It was designed for heavy hauling upon steep grades.

Two types of compound locomotives, the balanced and the tandem, both new in

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the practice of these works, were constructed in 1902. Both these types employ four cylinders.

In 1906, five locomotives of the "Mallet" type were built for the Great Northern Railway Company. A new feature in these locomotives, introduced by these works, was the addition of a two-wheeled radial truck at each end of the engine. This results in better curving qualities and reduces the flange wear on the leading pair of driving wheels. These engines are the heaviest thus far constructed in the experience of the works. The total weight of the locomotive is 355,000 pounds. The weight upon the drivers is 316,000 pounds. The weight of the engine and tender is 503,000 pounds.

The product of the works in 1906 was 2,652 locomotives and 17,432 men were employed.

* * *

*The Double-Deck Surface and Tunnel Station of the Hudson Companies in Jersey City.**

New York City is, at the present time, the greatest center for engineering works of magnitude in the world. In proof of this, it is sufficient to state that the work in the way of terminal railway stations, bridges, tunnels, and water supply now under construction in or near this city represents a total outlay of over $600,000,000, or about three times as much as the estimated cost of completing the Panama Canal. One of the largest of these public works is the elaborate system of tunnels and terminals, which is being built by the Hudson Companies to provide better transit facilities between Jersey City and Manhattan Island—a work, the cost of which, when fully completed, will probably be over $50,000,000.

This system of rapid transit (for such it is) has grown out of the abortive attempts, made some thirty years ago, to drive a tunnel from Jersey City to Manhattan, between Hoboken and the foot of Morton street. Meritorious as was the original scheme in plan and purpose, it failed for mechanical and financial reasons. Considering that subaqueous tunneling was then in its infancy, and that modern methods of driving were unknown, it is surprising that the original company should have accomplished what it did; but lack of mechanical appliances, coupled with the treacherous character of the river silt through which the tunnels were being driven, to say nothing of the difficulty of securing the necessary capital, led to the abandonment of the work. Thanks to the far-sightedness and energy of Mr. McAdoo, president of the Hudson Companies, the work of completing the abandoned tunnels was taken up a few years ago, the necessary capital subscribed, and the work of driving the tunnels through to Manhattan commenced. Under the care of Charles M. Jacobs, chief engineer, who brought to the work a large experience and the very latest methods of driving with the Greathead shield, the tunnel soon began to make rapid progress toward the Manhattan shore.

Before the work had been long in progress, it was realized that, if the scheme for providing rapid transit between the two cities was to be adequately carried through, it would be necessary to provide additional tunnels at a crossing located in the latitude of the "downtown" financial district; and accordingly, the company laid out a route extending from the Pennsylvania Railroad Company's terminal station in Jersey City to Cortlandt and Fulton streets in Manhattan. At the same time, the scheme was developed to its logical conclusion, by planning to build tunnel lines parallel with the Jersey foreshore, extending from the Hoboken terminal of the upper pair of tunnels to a connection with the Jersey City terminal of the Cortlandt street tunnels. Also, with a view to placing Jersey City in direct touch with the uptown shopping district, it was planned to continue the Morton street tunnels, easterly below Manhattan to Sixth avenue and northerly below Sixth avenue to Thirty-third street, and build a branch line from Sixth avenue to Astor Place. The plans also called for a huge terminal station and building, extending on Church street from Cortlandt to Fulton street, the tunnel to contain five parallel tracks, and the terminal office building to be twenty stories in height on a block 180 feet wide by 420 feet long.

This ambitious undertaking has been pushed along during the past two or three years with untiring energy, and with a remarkable absence of the delays which would seem to be so inseparable from large engineering works of this character. At the present writing the

*From Scientific American.

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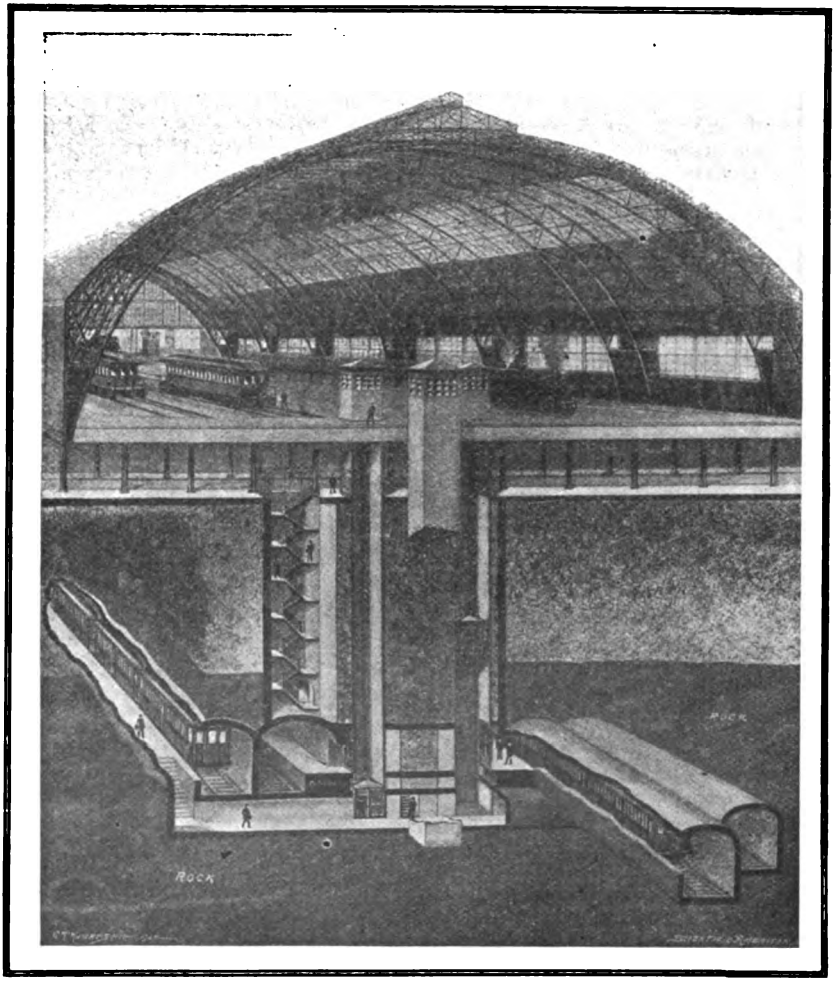
two upper tunnels are completed, and the Hoboken terminal station is nearly so. Also the extension of the tunnels below Manhattan Island has been fully completed to Sixth avenue, and is nearly the winter sets in. The Cortlandt street tunnels have been driven 82 per cent. of the distance below the Hudson River, and the big terminal building is now up to the eighth floor. It is expected that



THE JERSEY CITY TUNNEL STATION OF THE HUDSON COMPANIES. THIS STATION IS 1,000 FEET LONG AND IS BUILT BELOW THE PENNSYLVANIA TERMINAL

(From Scientific American)

completed to Eighteenth street. The work of excavation is well under way from Eighteenth to Thirty-third street. As matters now stand, there is every indication that trains will be in operation from the Hoboken terminal to Eighteenth street and Sixth avenue before this building will be completed by May 1, 1908, and that the tunnels connecting with it will be ready for service in the autumn of the same year.

From an engineering standpoint, one of the most attractive features of the Hudson Companies system is the large

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underground station, which has been excavated below the present terminal of the Pennsylvania Railroad Company in Jersey City. This station, which is 150 feet in width, and with its approaches nearly 1,000 feet in length, has been cut out of the solid rock at a depth of 85 feet below street level, and, as will be seen from our front-page engraving, lies immediately below the large Pennsylvania Railroad Company's train shed. The walls and roof are finished throughout with a heavy lining of concrete. The station provides for four, and in some places five, parallel tracks, two for through trains, and two for local trains. Access is had either directly from street level by a subway below the floor of the upper station, or from the station floor itself, by means of six passenger elevators. Two elevators lead directly to the street, and four elevators of exceptional size, each being capable of holding over a carload of passengers, lead directly from the platforms of the tunnel station to the platforms of the Pennsylvania station overhead.

Joint traffic arrangements have been made between the Hudson Companies and the Pennsylvania Railroad Company, according to which, as soon as the new Pennsylvania terminal station on Thirty-third street is completed, the present terminal in Jersey City will be handed over for operation to the Hudson Companies. All long-distance travel on the Pennsylvania lines destined for upper New York will be carried directly through that company's tunnel to Thirty-third street; while the long-distance travel on the Pennsylvania destined for lower New York will transfer at Harrison for the Hudson Companies' lines, and will enter New York by the Cortlandt street tunnel route. Eventually, the Hudson Companies will be in a position to carry passengers to Newark and vicinity, either by ferry, and by surface lines over the present tracks of the Pennsylvania Railroad, or direct by tunnel beneath the Hudson River, said tunnel tracks emerging by an incline near Harrison.

An excellent feature in the operation of this system is the fact that a new type of car of absolutely uninflammable construction will be used exclusively. The cars, which were designed expressly for this service, will be entirely free from wood, and even the cushions of the seats will be of fireproof material. It is estimated that 250 cars will serve to maintain a constant succession of trains through the tunnels on a headway of one and a half minutes. During the rush hours there will be eight cars to the train. Operation will be by the multiple-unit system, and every car will be equipped with motors. Advantage was taken of the fact that the cars were to be built entirely of steel, to provide them with a wide margin of strength over cars of the ordinary construction. They are designed on the bridge or girder principle, which has been preserved in spite of the fact that in addition to the usual end doors, center doors are provided on every car.

These middle or side entrances are operated by compressed air; the impulse for operating which will be given by the motorman at each end of the car. At the proper moment, he will move a lever, which will close or open not only the doors on the end platforms, but also the double doors on the sides of the cars. The force of this impulse, however, will be controlled, so that there never will be any possibility of a person being caught between the doors. In other words, the force which closes the doors will be just sufficient to do so: and should a passenger be about to enter the car at that moment, it will be possible for him to stay the progress of the closing door with the hand.

These center doors are on both sides of the cars, and have been thus installed for the purpose of solving some of the rapid transit problems which always exist in any large terminal station in New York. For instance, the trains of the Hudson Tunnel system will run between platforms in the new terminal station building at Church and Cortlandt streets; there will be five tracks running between six platforms. Alternate platforms will be used for the purpose of loading and unloading the cars. Passengers will pass out of a train just arrived on to an unloading platform, the side doors of the cars permitting them to discharge their passengers in a comparatively few seconds' time. The doors on that side of the cars will then be closed, and the doors on the opposite side will be opened to admit passengers from the loading platform, who desire to embark. Thus the incoming and outgoing passengers cannot collide, and there can be no congestion.

The cars are large and comfortable, and capable of seating over fifty persons each. There are no cross seats, as at

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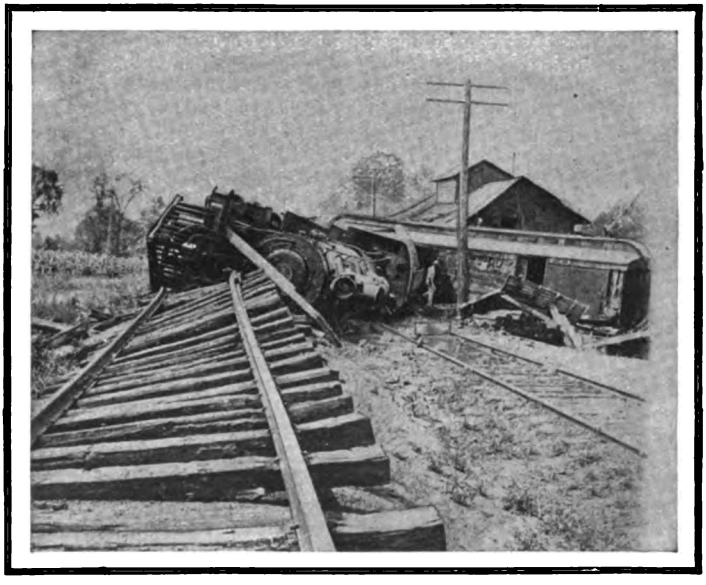
present exist in the elevated and subway trains, because the side doors of the cars take up the space at present occupied by the cross seats; but for the convenience of those who may be compelled to stand on the three-minute run under the river, there is a series of posts extending from the floor to the roof of the car, to which one may conveniently cling or lean. The floors of the cars have been laid with cement which may be readily washed, thus giving it the highest sanitary efficiency. In the cement floors will be imbedded quantities of carborundum, which is a very hard abrasive material, impossible of wear under the feet of the passengers, and which makes it impossible for a passenger to slip.

Binding Materials for Briquette Making.

It has been the custom on the Continent, and also in parts of the United Kingdom, for some years to put to a practical use the small and broken coal turned out by many collieries by making it into briquettes. The amount of this refuse coal, to a great extent quite unmarketable in its original state, when it is separated from the larger coal, varies with the different qualities of coal. The coal from some beds is hard and clean, and the slack produced is, comparatively speaking, only a small percentage of the coal mined. In other beds, however, the coal is so friable that 50 per cent. of that brought to the surface is of but little value in its ordinary state. Under certain conditions, which are, it must be admitted, numerous and extremely variable according to locality, a satisfactory marketable fuel may be made out of this slack, thereby reducing considerably the loss incurred by producing unsaleable material. Not only may the slack from good coals be made into a satisfactory fuel, but coals of inferior quality may also be treated in this way with good re-



WRECK ON MOBILE & OHIO RAILROAD, JULY 31, 1907, AT WHITEHOUSE, ILL.

Wreck on the Mobile & Ohio Railroad.

The illustration herewith was sent us by a correspondent, who states that on July 31, 1907, train No. 1, engine 307, was derailed at Whitehouse, Ill., and the engine turned over. Bro. Edgar Williams, of Lodge 470, B. of L. F. and E., was caught between engine and tender and so severely scalded and crushed by the coal from the tender piling upon him that death resulted.

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sults; being, in fact, in some cases, considerably improved in the process.

It will, however, be at once realized that there are matters which have a direct bearing on the economy of such a process as briquetting, and unless these are favorable, the slack had better stay where it is, in the dump heaps at the colliery. The most influential factor in the question is, perhaps, the quality of coal procurable in the district. If this be good and cheap, it may well be that there would practically be no market for briquettes. If the margin between the value of coal and that of culm is small, the expense of binding materials and of the manufacture of briquettes may render their production unremunerative. The price of suitable binders, other conditions being favorable, has a most important bearing on the economical results of the process, and as these vary in different countries, the possible conditions, favorable or unfavorable, are many times augmented. It may even happen that a quality of coal not worth briquetting where both culm and binder are cheap would be so in another district where these conditions are less favorable.

There are still further matters to be taken into account. Binders may be available, but a selection must be made as to that most suitable. In addition to this the process of manufacture, and the form of briquette produced, have also a bearing on the quality of the briquette as a fuel. It is, of course, desirable to turn the material to as good an account as possible, and the briquette as a fuel should give at least as good, if not better, results than the coal from which it is made. The form of briquette has in some cases a distinct influence on this, the large briquette or block, measuring about 6 inches by 5 inches by 4 inches, for instance, not giving such good results as the egg-shaped lumps, weighing about 1-3 lb. each, produced by other makes of machines. The chief factor in this particular question appears to be the nature of the binder used. For instance, in the case of those made with resin, better results seem to be obtained with small than with large briquettes.

Another point may also with advantage be taken into consideration, and that is, the use for which the briquettes are to be sold. It will readily be allowed that, under many conditions, good, clean briquettes of small size are preferable to the larger blocks, which require breaking before putting on the fire, and which, perhaps, in breaking, crumble again into small material. A briquette of this latter type is an unsatisfactory one, and its manufacture might, by the selection of better binding material, be abandoned for that of one of a much better character. The substitution of one binder by another, or a change in proportions, may make all the difference. The briquette to be aimed at, in addition to its thermal qualities, must be one easily handled and of good weathering qualities. As storage is often made in the open, and as fuels are also exposed to the weather in transport by rail, etc., a briquette that disintegrates readily under the alternate action of rain and sun would be of scarcely greater value than the culm of which it is made. Neither must it be so brittle that, although of good weathering qualities, it is easily broken up into small particles and chips in handling, loading, and unloading. Still one more fact must be considered—namely, that a soft and sticky briquette is also troublesome to handle, and, perhaps, also a good smoke-producer at the same time—a characteristic to be avoided if possible in the production of a marketable fuel.

Among the binding materials most commonly found to be suitable are pitches of various grades, asphalts, etc. Pitches seem, on the whole, to give, generally speaking, the best results, but under certain conditions other binders may be more satisfactory.

Suitable pitches may be obtained by the distillation of various forms of tar, such as that produced by gas works, by-product coke ovens, producer, Pintsch, water, or petroleum-gas plants. They should not contain much moisture, and for this reason the water contained in producer-gas tar and Pintsch-gas tar (if these be used) must first be driven off. Analysis has shown that, approximately, it appears to be the rule that good binding pitches should contain a high percentage of volatile matter and a low percentage of fixed carbon. This rule does not seem to be without numerous, and at present unexplained, exceptions, and a safer guide is to be found in the percentages of volatile oils they contain. Pitches containing up to 1.91 per cent. of volatile oil driven off at a temperature of 400 degrees Fahr. have not been found to give good results, as they are hard, produce porous or crumbly briquettes, except under great pressures, and

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must be used, to obtain sufficient binding, in quantities about twice as great as that necessary with more suitable pitches with the same coal. In fact, it may be necessary to use as much as 16 per cent. of such a pitch with coal of a certain quality, which can be made to produce a better briquette with 6 to 9 per cent. of another pitch. Pitches containing from 7½ to 14 per cent. of volatile oils are found to be quite suitable as binders, while those containing a higher percentage than this are found to be too soft. Others, of which the oils are driven off from a temperature of 315 degrees Fahr., produce creosote oils, which command a higher price than pitches. If analysis be impossible, a simple test is that of chewing. If it becomes plastic in the mouth, like chewing-gum, the pitch will probably make a satisfactory binder.

It has been found that the hard pitches may be improved for briquetting purposes by mixing with creosote, in proportions such as five of pitch and one of creosote, and a satisfactory binder produced by these means. Mixtures in certain proportions of hard pitches and water-free producer gas-tar melted together will also make satisfactory binders. The foregoing binders may be used satisfactorily with bituminous coal, as may also certain of the petroleum-gas pitches. Some of these are, however, too soft for using under all conditions. A special field in which these latter pitches seem to be satisfactory is that of the briquetting of lignitic fuels. So far very little successful work has been done in the way of briquetting the brown lignites, but the black lignites give promise of better results. From 8 to 9 per cent. of a pitch which was a by-product of the manufacture of gas from heavy petroleum produced, in tests made at the United States Geological Survey Testing Plant at the St. Louis Exhibition, with black lignite from New Mexico and Wyoming, a fuel which burned well and weathered well, and which, though soft and liable to break when hot, had a crushing strength, when cold, of 339 pounds to 454 pounds per square inch. The only other binder for use with lignite found to give promising, but not altogether satisfactory, results was an asphalt.

In these tests at St. Louis a number of experiments were tried with combinations of various kinds. Resin was experimented with, and lime, both with and without other binding materials. A mixture of 6 per cent. resin and 1 per cent. Kansas crude petroleum made a satisfactory binder for a bituminous coal which would only briquette with petroleum-gas pitch, or asphalt, and would not briquette even with 8 per cent. of a pitch containing 13 per cent. of volatile oil (driven off at 400 degrees Fahr.). This coal, which was of dirty character, would not make a satisfactory briquette with 6 per cent. resin and 1 per cent. lime, though, in burning, less smoke was produced with the lime-resin briquette than with the simple resin or pitch briquettes of this coal.

Asphalt and asphaltic pitches do not give such satisfactory results as true pitches. In some cases the briquettes are soft, in others they are brittle. With other asphalts or asphaltic compounds the fuel disintegrates in the fire. Asphalt and brown lignite briquettes do not burn well, and with most coals the briquettes, from a marketable point of view, are inferior to the pitch briquettes.

Semi-anthracite coals take about 6 to 8 per cent. of a pitch containing 7.5 per cent. of volatile oils to make a good fuel satisfactory to handle, while good results may also be obtained by using 2 or 3 per cent. of a hard pitch containing less than 2 per cent. volatile oils and 3 per cent. resin. Such coals also with 4 per cent. resin and 1 per cent. petroleum make very hard briquettes.

Briquetting need not be confined to bituminous and the lower-grade coals. Anthracite will briquette with a suitable pitch, without the addition of any other substance, and will make such firm briquettes that when dropped on stone they will be found to have quite a ring. The pitch used should have about 7½ per cent. volatile oils driven off at 400 degrees Fahr. A briquette of this description will burn smokelessly, and like anthracite itself, with very little flame. It does not crumble in the fire, has a crushing strength of nearly 600 pounds per square inch, and weathers well. Coke breeze may be treated in a similar manner, needing nothing more than a good pitch as a binder. The addition of coal or other substance is unnecessary, but in this case it appears to be advisable to employ a pitch containing considerably more of the volatile oils than is necessary in a binder for anthracite culm. Eight per cent. of a pitch containing about 13 per cent. volatile oils driven off at 400 degrees Fahr., and 92 per cent. coke-breeze,

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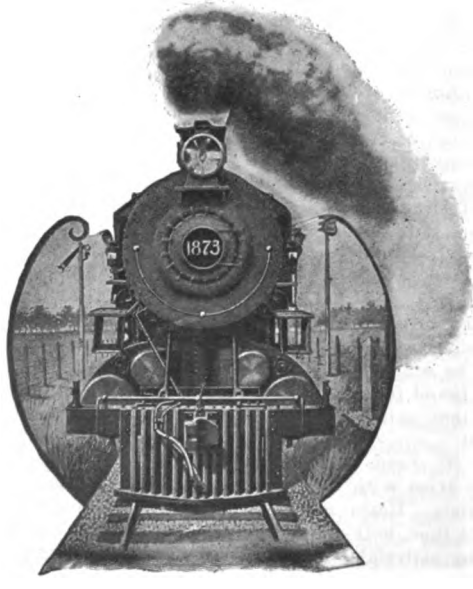
will make a briquette having a crushing strength, when properly made, of over 1,000 pounds per square inch, and which will burn very much like coke. The addition of a small percentage of bituminous coal also produces a good briquette burning after the manner of anthracite, with but little, if any, crumbling in the fire.

Finally, it is possible to briquette certain coking coals without any binder at all. If these coals are heated till caking begins, and are then subjected to considerable pressure, an excellent briquette may be made.

Generally it may be said that the briquettes having good weathering qualities, and those giving the better results in burning, are those which have a crushing strength of over 300 pounds per square inch. With different coals and binders, briquettes may not infrequently be produced which form a better fuel than the original coal, a difference of 0.5 pounds of water evaporated from and at 212 degrees Fahr. per pound of fuel being obtained in favor of the briquette. It must be admitted, however, that with poorly selected or proportioned constituents the balance is often against the briquette. In the case of lignite the gain by briquetting may be even greater than above mentioned.

It will thus be seen that a large range of fuels may be successfully briquetted. A successful briquette from the fuel or transport point of view does not necessarily mean one of which the manufacture would be financially successful under any specified conditions, and to determine this the several points to which we have drawn attention above must be duly considered. The working margin is often not great, and to overstep it reduces the promoter to the pitiable state described by Mr. Wilkins Micawber: "Annual income, twenty pounds; annual expenditure, twenty pounds ought and six; result, misery."—From Engineering, London, Eng.



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Technical Contributions

ANOTHER EVENING AT THE Y. M. AIR BRAKE CLUB

BY WILL W. WOOD

Interest in technical matters has not fallen off any among the boys on the Air Line, in spite of the heat and general humidity of this summer, and although the instruction car is out on the road to spend the season with the employes at other division terminals and lay-over points, the "Y. M. Air Brake Club" still holds regular meetings at the Smithville Railroad-branch Y. M. C. A. building, that are always well attended. Air brake subjects are not the only ones discussed at those meetings; the name simply has reference to the "paramount issue" when a bunch of our fellows get together for a "gabfest."

It was all air brake talk at the last convocation, however. It seems like it is easier to get the younger fellows started asking questions and relating experiences when the instructor on air is not present; and an engineer who has just lately been given that title and sent out on the coal branches to make his *debut*, had brought his engine in to the Smithville shops for some repairs and was the first one to start things going.

"I never packed an air pump piston rod before I was set-up," he remarked, "and my first experience was with that duplex pump on the 33. We got in to Conway pretty early, had a long lay-over for dinner and didn't have to leave until 2 p. m., so I thought I would put new packing in all four of the stuffing-boxes after dinner when the pump had had time to cool off. The air car was laying at Conway, and you know the instructor always eats up at Maggie Jones's, where the railroad gang all feed; he walked down to the engine with me and watched me pack one stuffing-box—the lower, left-hand one. Say, it's a tough job to make the packing-nut catch the thread on the stuffing-box when you have filled it as full as it ought to be, and I had her full—seemed like I never was going to get that nut on unless I took out some of the packing. I did get it caught once or twice and each time the threads were crossed, and I was about to tear out some of the filling when the instructor butted in and made me wise on a point that I had always considered too simple to pay much attention to—just packing a pump—no trick in that; but there is, just the same. Say! You old heads have packed air pumps in Germany, Ireland and Patagonia; what's the easiest way to start the nut when you've got an overload in the stuffing-box, hey?"

But nobody present would commit himself very far in answer. One or two engineers said they never had any trouble that way; never filled the stuffing-box too full to start the nut. As a matter of fact their experience in that line is generally obtained on a page of the "work report book," with a pencil, and some roundhouse employe makes the threads catch.

"This is the way he showed me," explained Eddie Hanlon, the branch engineer, and he made a rough sketch of a duplex pump for reference on the blackboard. "I had filled the lower left-hand stuffing-box, you see, so the instructor told me to just leave the nut lay on the gland for awhile, and to tighten up the packing-nut of the upper, left-hand box, which I did. You see, he wanted to get as much space as possible between the upper and lower packing-nuts; then, he measured the distance between them and hiked out over to the planing mill yards near the siding where the engine was standing, and pretty soon he came back with a dressed, white pine stick, one inch by three-quarters inch thick, from which he cut two pieces about two and one-half inches long, each; then he inserted the two blocks between the upper and lower left-hand packing-nuts, and, using the greatest thickness of the blocks, they just about fitted in—one on each side of the piston rod. Next thing he took the spanner-wrench and began slowly turning down—unscrewing and loosening—the upper packing-nut. The blocks held in place all right as the face of the upper nut slid around on them, and after about one turn the friction was great enough

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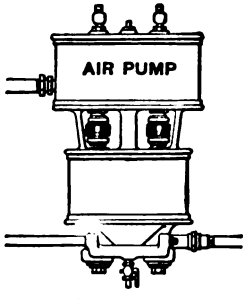
that the lower nut began to turn, but, of course, *in the proper direction for it to tighten*, and say!—that lower nut took the thread as true as you please. After it was safely caught he used the wrench on it for an eighth of a turn, then an eighth turn of the upper nut to hold the lower one squarely in position; then another turn to the lower nut followed by a turn of the upper one; and, alternately, so on, until the lower nut had taken enough threads to stand the wrench alone.

"After the lower packing-nut was pretty tight the instructor ran the upper nut down the rest of the way with his fingers after removing the two blocks, dropped the nut and gland, and I got busy and filled the upper stuffing-box. When I was ready to screw up the upper packing-nut the instructor slipped in the blocks again between it and the lower nut, using the narrow thickness of the blocks this time, but they weren't a bit too narrow, at that; we had to drive them, just a little. Well, it was the same way: he began unscrewing the lower packing-nut and the upper one started turning and caught the thread right away, so he didn't have to loosen up the lower nut very much until the upper one was ready for the wrench, which he started to use very slow and carefully for a turn or two, and after the upper nut was made permanently tight he retightened the lower one for good.

"We packed the right-hand stuffing-boxes the same way," continued the engineer, "and it didn't take as much time as I have taken in telling about it, I believe. I am carrying two pairs of those little blocks now, giving me four different thicknesses, to use whenever I have to pack an air pump piston again."



A Help in Packing an Air Pump

The air pump figure on this page is a reproduction of Eddie's blackboard sketch illustrating the method of blocking between the packing nuts, the block shown in the black squares.

"Speaking about blocks, and blocking-up," observed Whit, the foreman of car inspectors, who is always "present or accounted for," "and taking it on a larger scale than Hanlon's blocks—why, give me enough timber to block an' prise with an' I can put one o' them new consolidation engines on top o' the Soldiers' and Sailors' Monument. Say, once, when I was inspectin' air a few years ago, I found a busted zillery reservoy an' brake cylinder under a car, and it hadda come down; the car builders, or the galvanizers, one, always took 'em down or put 'em up, usually, but this car was standin' way down on the Barbary, an' the boss said I had to take the furniture down and put up new ones myself; an' durn quick, too. It takes three of them imported Swedes to do it, but, by heck! Say—I got a thousand big blocks an' a long two-by-four, an' I built up three piles of blocks—one under the cylinder and one under the zillery reservoy—up, close—and another pile 'longside. Then I removed the nuts an' let her down on the blocks an' by operatin' the two-by-four as a controllin' lever and using the third pile of blocks for a fulcrum, I commenced lettin' her down by removing the underneath blocks, first from under the cylinder and next from under the reservoy, lettin' each end down alternate like; see? Finally she's down an' outa the way, and I get the new furniture in position an' reverse the precedin' proceedin's by buildin' up 'stead of tearin' down; and I'm here to tell you fellers that I didn't work as hard as if I had helped two or three guys to lift that iron combination by main strength. And I got her up onto the bolts, tight, by my lone."

"Whit," said the traveling engineer who had dropped in in time to hear the inspector's narrative, "don't you know that you were making use of the fundamental principles of physics; that your methods were those of the engineers who have raised the mighty works of civilization, from the temples of the ancients—the Pyramids, built of stones weighing tons at a point far removed from the quarries, and such a thing as a railroad not then dreamed of—down to the Great Dam of the Nile, the bridges and sky-scraper buildings, etc., of the present day? Some wise head has said that 'given a fulcrum upon which to rest a

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lever' and he could 'lift the world;' and it is that principle of *leverage* that supplies weak man with unlimited power to accomplish the placement and displacement of any existing matter. But it is the triumph of brains over matter; for the man without a good brain, or a man with brains that are not made use of, can not accomplish anything that he has not already seen done.

"Why, not half of us fellows use our brains when we should, like Whit did," the T. E. went on, addressing the other listeners; "many an engineer has had a breakdown on the road and wired for help when the *matter* was too heavy for his intellect, while if he had set his *intellect at it* he would have found a way, no doubt, to have easily remedied the trouble with such tools, material and men as were at hand—could have gone in with his train, maybe, or at least have cleared the main line. Why, a man don't realize what he can do until he resolutely tries, and I say, like Whit, give me plenty of blocks and bars to pry with and I can put about anything where I want it."

Such talk like that sets a fellow thinking. Some fellows are "all in" when anything serious happens. An engineer understood his orders wrongly the other day, and through his error a collision occurred; he knew he would be discharged—at least he thought so; so he shed his overalls and moseyed down to the telegraph office and wired his resignation. Now there was a lot of necessary work to be done on his engine before she could be moved—disconnection, etc.; the other engineer was hurt and couldn't be expected to give any assistance. That kind of man will "lay down" in the presence of almost any mishap, and probably the road is better off without him. He would naturally expect, however, to apply for a position as engineer on some other road, and what kind of a recommendation could he hope for from the officials of the Air Line?

Another engineer has been running a regular passenger engine for a number of months; there are two air pumps on his engine—one on each side of the boiler—and he ought to run them both, but alternately, one every other trip, so that they will both be known to be in good order; but he never used the left-hand pump, and one night recently he went out on his run with an extra fireman, and he hadn't got more than one-third of the way over the division when the air pump that he was working—the right-hand one, of course—broke down. He couldn't locate the trouble at the time and couldn't get the pump to run, so what did he do but compel the train crew to brake by hand all the rest of the way over the division; he had left on time, and went in away late. Now, what do you think of that? An exceptional case, of course, but it actually occurred. When his attention was directed to the left-hand pump, on arrival, he was flabbergasted but made the excuse that the left-hand pump was also inoperative; well, it was, until steam was turned on, when it went to work all right.

So a man can't get along very well without a plentiful use of his wits; and wits combined with an application of the common laws of physics—forces—as brought out in Whit's experience, will enable an engineer to accomplish, all alone and unaided sometimes, things that at first thought would seem impossible.

"I would like to state"—Eddie Hanlon had the floor again—"that the steep grades out on the Branches make that a district where air braking has got to be done to a scientific exactness. We have had trouble in trains getting away on those grades on account of the air leaking off, when at tests before and after the trouble those brakes would remain set an unusually long time and show no material leakage. While the air car was at Conway the instructor explained this thing, and we had plenty of chances to try out his theory—and he's all to the good in it, too.

"He said you can take almost any Westinghouse quick-action triple-valve that has been in service some months—and it don't matter if it has just been cleaned and oiled—in good shape, cylinder, also, with packing-leather tight; you make a train line reduction of anywhere from 5 to 25 pounds and that brake will remain set about as long as you care to stay and watch it. The instructor said that nearly all the brakes, in nearly every train, are good holding as long as you don't reduce the brake pipe—train line—pressure any more than is necessary to secure equalization between the auxiliary reservoirs and the brake cylinders, and that it requires a 25-pound reduction to secure that complete equalization throughout the whole train—though it is not necessary to make that much of a reduction unless you want to set the brakes with their full power. But, he further

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said that most of the brakes on most every train will begin to lose their power just as soon as you begin to *overdraw the train line*—which ain't necessary, either. He said that if you have drawn off 25 pounds, every additional 5-pound reduction after that causes approximately a 5-pound reduction of brake cylinder pressure. It's all in that bottom check-valve in the triple; during reductions up to 25 pounds the train line is greater, or as great, as the brake cylinder pressure above the check-valve, but after that it's the other way; the brake cylinder pressure can get no greater while with each train line reduction the latter pressure under the check gets less; and it is not until then that this check-valve comes into play, for its duty is to keep the brake cylinder air at this time from flowing back into the train line, for the direction of flow is reversed after equalization occurs; and as long as train line pressure is higher than that of the brake cylinder there wouldn't be any need of a check-valve, as the rubber-seated emergency valve at that time separates the pressures and prevents train line air from flowing into the brake cylinder. Because a leaky check-valve has no effect whatever at reductions of from 5 to 25 pounds is the reason why the brakes of one of those runaway trains will hold so well at tests—we never make a service test by any way near emptying the brake pipe.

"Are those check-valves inclined to leak much, you ask? Remember your own experiences along that line, and failures of your brakes to hold at a critical time, that can't be explained in any other way. The instructor says that as the check-valve is so exposed to the train line dirt and dust it will be found to leak in nearly every triple-valve in the train, and this when they are in normally good condition, as I conceded at the beginning of my remarks; and that time tests of individual triples taken from cars in regular service show some mighty bad cases; and he said that with a long train, in which the train line pressure falls so slowly at service reductions, after 25 pounds have been drawn off if you then keep on drawing off, that on many of the cars the brake cylinder pressure will reduce equally in time with the reduction of the train line air—"

"Say, Bo! Say, that's a fact," exclaimed Whit; "why, when 74 pulled in to the yard this mornin' with fifty-seven cars of air the engineer stopped 'em on No. 3 with a light application, and when the engine was cut off I opened the angle-cock at the head end of the train an' left it open, 'nd started down the line ahead of the boys to note the piston travel 'n' other etceterays; all right, for the first nine or ten cars, an' then as I go along I hear the brake levers a screakin' on the carryin' irons 'n' next thing the piston sleeves are crawlin' back in the cylinders. Why, with only two or three exceptions the brakes on all of the hind half of that train was clear off when I got to 'em—an' I traveled back some rapid, too."

"Yes," replied Hanlon, "and we engineers have been losing out on account of overdrawing our air when we get in a tight place. Take it in a case of holding 'em up on a steep, down grade, or stopping at a station where it won't do to run by—a water column for instance; a fellow will keep drawing off until the black gauge pointer is at 45 pounds; and then, if he isn't absolutely sure of getting stopped within the distance he will keep on reducing the train line pressure—and as I know, now, equally reducing the pressure in most of his brake cylinders, too—and he runs by; maybe, on a hill, his train gets away from him and there is *another air brake failure;* the brakes don't fail, though; the air would have held *if he had held it.* Say, Bunnie," and Eddie turned to address his conductor, who had accompanied him, "tell the folks how you tested the air brake instructor's theory."

"Why, I stopped at Haw Creek," was that worthy's reply; "picked up a car of stock and that made twenty-seven cars in the train; this here guy couldn't start 'em, and Pete found the brake stuck under the third car from the caboose; he had the reservoir bled when I got there, but she wouldn't release. Pounded on the triple-valve—didn't cut no ice; cut her out and cut her in—same thing. Well, Pete started for the engine to get a wrench to take the oil-plug out of the brake cylinder—no tools in the caboose—Hanlon's annexed all such. When Pete starts I close the angle-cock at head end of stuck-brake car and go back and open angle-cock at hind end of rear car; leave it open. Then I sit down to watch the stuck brake, but get right up again, for that piston's a retreatin', and in about no time she's clear back at rest in the cylinder and the brake's released. Then

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I close the cut-out cock under that car and go back and close the angle-cock at the hind end of the train and open the one ahead of the cut-out car—opened it easy, like, and give Hanlon a signal to pull out, which he does."

"And the brake released itself," observed Eddie, "before long-legged Pete could make a hurry-up trip to the engine; he was on the engine when the con. gave me the signal to go."

"That's another scheme, and a new one on me, for releasng a stuck brake," remarked the traveling engineer; "we sometimes have a defective triple-valve that will not release by bleeding the auxiliary reservoir, as in the case just mentioned, and more often—especially in the winter—a stuck brake, merely, in connection with a stuck or frozen bleed-cock, and in such case it might be well to experiment in releasing the brake by emptying the brake pipe completely on the car in question."

"There is something that the instructor has called your attention to," continued the T. E., "that I want you engineers to bear in mind; it is a matter of a great many dollars to the railroad company. You know that when any certain pressure is charged up in the train line it has got to be maintained; it must not be permitted to drop until you wish for the brakes to apply. Now, there have been a great many cases of slid-flat wheels, lately, that have resulted from no apparent cause—brakes all in release leaving a station, but one of them 'sticking' while *en route* and sliding the wheels. Now, you all plead innocent, yet nothing on earth could cause it except a fall of the brake pipe pressure, and it is one of your particular duties to see that that pressure does not fall. Well, many of you have seized onto the introduction of the slide-valve feed-valve as being responsible; have declared that you didn't have this trouble with sticking brakes and flat wheels until that valve made its appearance. Neither did you have long trains of air when you used the old style feed-valve exclusively. Now, I am going to shatter that excuse for you, to a certain extent—at least show you that the slide-valve feed-valve is not to blame, itself. The fact must remain that the man in charge of the maintenance of brake pipe pressure is at fault for any ordinary creeping-on of his train or engine brakes.

"I want each and every one of you enginemen to go to the air car at your very earliest convenience," he went on, "and ask the instructor to show you some of the cards taken on the air brake recording gauge; he takes them every day; has the gauge actuated by brake pipe pressure of the instruction rack in the air car. To remove any doubt, watch the work of the recording pen yourself. That brake pipe pressure is regulated by either of two or three feed-valves, one of which is the old, plain, D-5 valve style, and the others are of the slide-valve pattern.

"There is the full equipment of engine, tender and eleven cars in the rack, and an additional pipe line of seven car lengths that may be cut in, providing a train line of eighteen car lengths of pipe and thirteen auxiliary reservoirs to charge. And there is brake pipe leakage, too—everything is natural. I have watched that recording pen as the paper dial traveled around, and a compass-pen could not describe a more perfect circle on the 70-pound line than was produced by the pressure supplied by the slide-valve feed-valve.

"However, the instructor pulled another record card off the file for my observation, on which was an exact plan of a circular field enclosed by an old-fashioned, zig-zag rail fence, the brake pipe pressure being indicated by just such oblique lines, rising and falling with an exact regularity between 68 and 73 pounds, the rise covering just five minutes of time while the fall of 5 pounds would take place in but little more than one minute. That was the greatest variation line that he had taken. He took down other cards recording the work of the same feed-valve, where there had been a different amount of brake pipe leakage, different main reservoir pressures carried and shorter train lengths, and the maximum and minimum points embraced within the scope of the pen under the automatic influence of the feed-valve varied as between those different conditions, but in any one case there was a *regular irregularity;* the difference in the pen's travel might be but 2 pounds, yet in regard to time the fall of the pressure would always occur in just about one-fifth of the time required for it to rise again.

"That kind of evidence seems to suit you fellows all right, eh? But wait. The instructor gave me a convincing lesson. He took apart that slide-valve feed-

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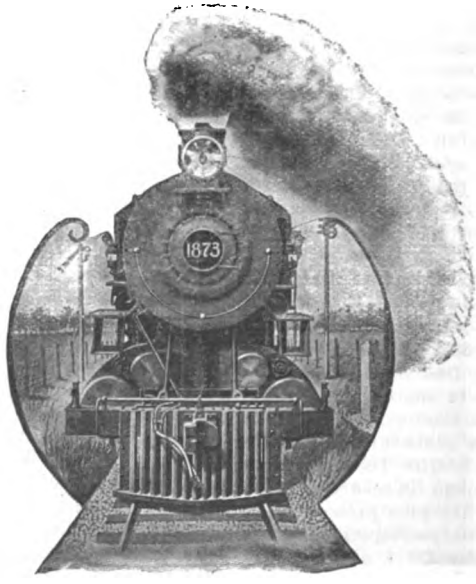
valve that had been in use when those very bad examples of pressure regulation had been taken; inwardly it looked about like all of your feed-valves do when they are opened up for inspection—full of dirt, gum, etc., and the parts dry that should be lubricated. Well, he cleaned everything nicely, touched the friction parts sparingly with a fine, graphite, air brake lubricant, and put it together and to work again. After which he took a new card on the recording device—in fact, he has been taking them ever since from that feed-valve that I saw him clean and oil—and the pressure line was perfect; and it will continue perfect—until the instructor lets that feed-valve get dirty again.

"That's all there is to lots of those cases of slid-flat wheels; not the feed-valve to blame; *nor the dirt* in the feed-valve, for *'dirt is only desirable matter out of place;'* it is *the man* who is to blame who allows 'matter' to accumulate too extensively in a place where it doesn't belong, and where it will make trouble.

"Clean your slide-valve feed-valve, boys," the traveling engineer concluded, "and throw away that rabbit foot you have been carrying in your pocket ever since the Old Man got after you about your copious flat-wheel record. No luck—bad or otherwise—about it. The next time you are in a street car read those soap advertisements—some good advice there, and it applies to machinery as well as men."



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ELECTRICITY—POWER TRANSMISSION

BY ELWOOD GRISSINGER

The trolley takes its current from the overhead wire, which is called the trolley wire. The size of this wire varies from No. O to No. OOO Brown and Sharpe gauge. It must not be understood, however, that the trolley wire carries all of the current for the entire length of the line, i. e., that it carries all of the current for all of the cars that may be operating on the line at the same time. It may only carry the current for the cars at the points where such cars are operating. In observing the construction of any overhead electric railway lines, it will be noticed that on the same poles from which the trolley wire is suspended, one or more very heavy and insulated copper wires or cables are strung. If the details are sought, it will be observed that about every dozen poles a wire will be brought out from the heavier cable and attached to the trolley wire proper. The reason that this is done is to avoid carrying too much current on the trolley wire, for when the cars come along they will draw current through the taps from the feeder cable. The current may therefore come from one or two such taps for the same car, and, flowing both ways, meet at the trolley pole. The natural result of this method of construction is to increase the current carrying capacity of the overhead line while keeping down the size of the trolley wire.

In cities where the districts are crowded, and there are a great many of the feeders which supply the trolley wire with current, it is the practice to cut the trolley wire into sections and insulate one section from the other. This is done so that if any one section breaks down it will not affect the entire system. In the power station there is always erected a large marble or slate switchboard, upon which are mounted the switches and circuit breakers which control the different feeders or circuits which supply the trolley wire with power. This individualizes the system, giving any particular section of the road greater stability of operation.

It is always an advantage in any system of electric traction to have the power station located near the center of the system. The problem of distribution of power is very much simplified when this is done. It is much easier to feed from a center outward than it is to feed from either end and traverse the entire distance. Central distribution means that it is not necessary to place as heavy wiring on the poles in order to get the required amounts of power to the different sections. It also means that, with any given size of wire, a much better service can be maintained. This is because it is easier to maintain the full pressure of current at all points in the one case, whereas if it is necessary to carry the entire power all of the way to the end of the line greater cost of construction is entailed, while at the same time the service can not be as good.

The distance over which a direct current at the usual pressure of 550 volts can be carried varies with the amount of power it is desired to transmit and the size of wire that will be employed. If it were required to transmit 500 horsepower ten miles, the initial pressure being 550 volts, and it was desired to have a pressure of 500 volts delivered at the end of the line ten miles away, it would be found that the cost of the line copper necessary to do this would be so great as to make the undertaking prohibitory. Therefore, if we want to carry any great amount of power to any appreciable distance, we are compelled to adopt other methods than that of one power station producing the usual electrical energy for street car purposes. We can build more than one power station which will deliver power into the same line. These power stations can be placed at each end of the line, or one station can be in the middle and the other at either end. Another method is to place one station or power plant at one end of the line, send the current it generates along toward its destination, and at points along the line, where it is found that the electrical pressure drops to a lower value that it ought to have for good and satisfactory service, install what it is termed a "booster set." The function of a booster set is to increase the electrical pressure any pre-determined amount above that at which it is received. What such a combination usually does in practice is to receive the total energy that comes along

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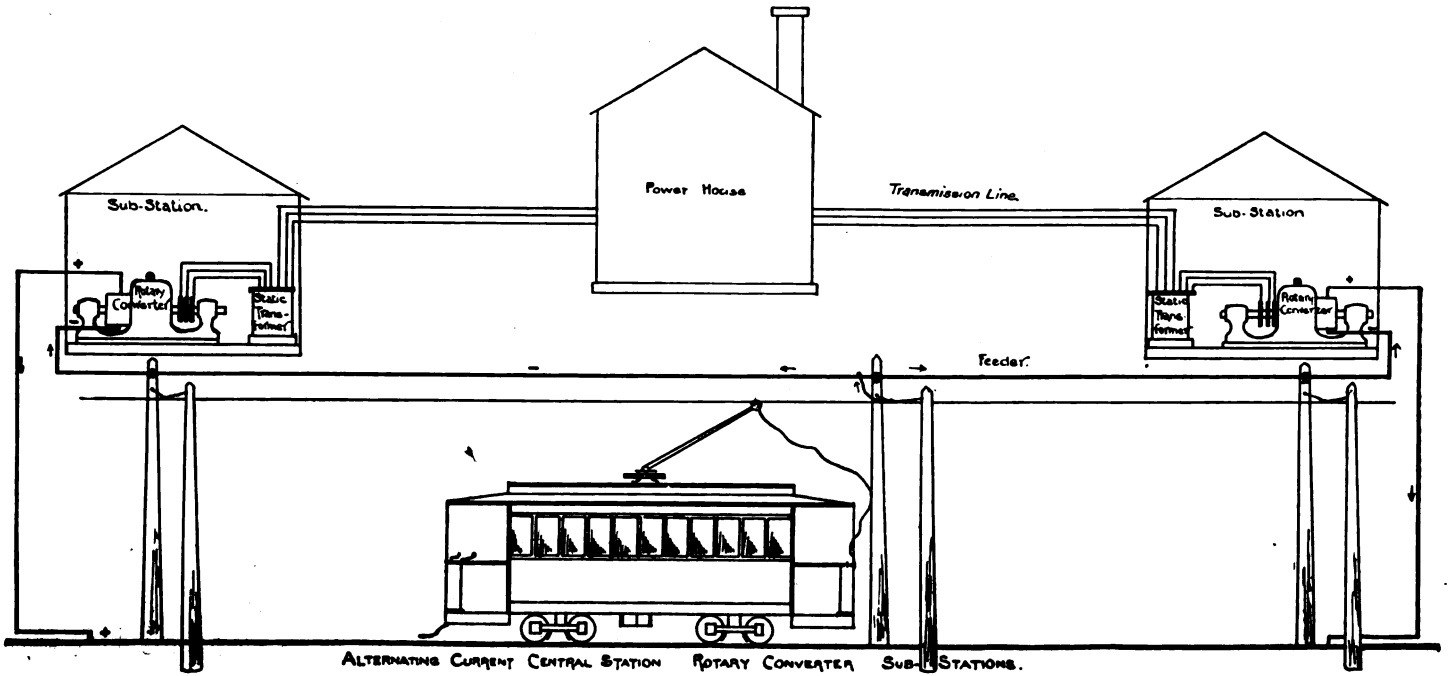

Showing General Arrangement of Feed Wires, Trolley Wires and Apparatus—Power House at Center of System

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and increase its voltage or pressure by an amount equal to that which it lost in transit, plus the amount of additional pressure necessary to deliver the power under proper conditions at the remotest point from the station where such booster set may be installed. A booster set may be operated with a steam engine; or what is much better, and generally made use of, is to connect the boosting unit with a motor, the motor deriving its current from the power line. This makes a very simple and efficient arrangement for cutting down the size of the line copper, while also improving the electrical pressure delivered at the different points along the line. The carrying of electrical energy in large quantity over wide areas introduces many problems and frequently the booster method offers many disadvantages.

In an early article of the series it was pointed out that the higher the pressure of a current of electricity the farther it could be carried. Therefore, it was sought to find a means of increasing the pressure. This was readily accomplished, but, when it was, how was a current at such a high pressure to be utilized when it was obtained? It has not been commercially practicable to build direct current machinery that would handle a current under a pressure of 700 volts or over and this makes extremely hazardous working in more ways than one. Some engineers have recently put forth arguments in favor of direct current systems to operate at approximately 1,200 volts, but the practicability and reliability of such a system are yet to be demonstrated. The transmission of electrical energy in large amounts over great distances is today commercially possible when the alternating current system of generation and distribution is employed.

It may be recalled that another article of the series pointed out that every form of dynamo in use generated an alternating current, i. e., that current generated in the armature of every dynamo is alternating in character and will remain so unless it is commutated by means of a commutator fitted with the customary and necessary brushes.

The modern systems of power transmission on a large scale employ the alternating current system of generation at the power station. The elaborate and extensive systems of the Manhattan Railway Company, the Interborough Railway Company, the New York, New Haven & Hartford Railway Company, and the street car systems and power service of Buffalo and Niagara Falls are examples of the modern method of power transmission.

These systems have a large central generating or power plant in which are installed large alternating current generators which may generate alternating current at a pressure of 2,200 volts, as at Niagara Falls, or at 11,000 volts as found in some of the stations at Niagara Falls and at other points. These generators are driven by water turbines at Niagara Falls, and have an individual capacity of 5,500 horse-power in some units, and 11,000 horse-power in others. Some of the generators in the New York power stations are of 10,000 horse-power capacity, and deliver electrical energy in the form of alternating current at a pressure of 11,000 volts. At Niagara Falls, and as is the case in all central power stations, all of the generating units deliver their power into the same circuits, unless it is desirable to divide the output differently, for commercial reasons.

Two thousand two hundred or eleven thousand volts pressure is not sufficient for the conditions imposed when transmitting large amounts of power over great areas. The development of generators shows that it is not practical to build them for the generation of currents at a higher pressure than 11,000 volts. The pressure can be increased above 2,200 or 11,000 volts by using a simple and efficient piece of electrical apparatus termed the "static converter." These useful devices have no moving parts. They are virtually a pressure raising or a pressure reducing valve, as the case may be, for if they can be used to raise the pressure they can also be utilized for the purpose of reducing the pressure as well. They can be made to increase an alternating current pressure to any amount, depending only upon the insulation of the wires and the apparatus necessary to transmit the power. In one of the installations at Niagara Falls and in some other installations in this country, current is received from the alternating current generators and stepped up in pressure to 60,000 volts. The current is transmitted by means of specially constructed overhead transmission lines at this apparently enormous pressure, and where it is desired to utilize a sufficient portion

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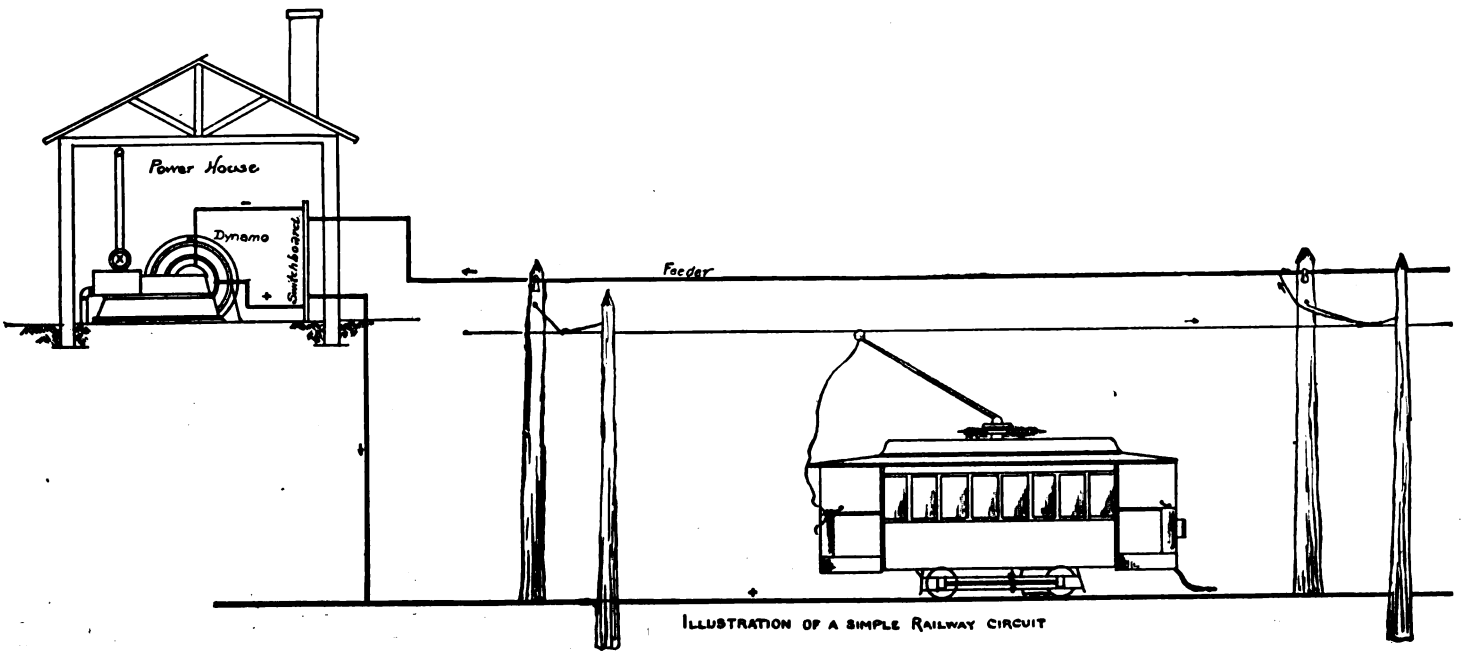

Showing General Arrangement of Feed Wires, Trolley Wires and Apparatus—Power House at End of System

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for industrial or other purposes, it is carried into what are termed "sub-stations."

The sub-stations will have electrical apparatus installed in them of such form and kind as the conditions surrounding the use of the power will require. In any event, the pressure will be reduced from 60,000 volts to the proper working pressure through the medium of the pressure reducing devices above mentioned, and this pressure may be 350, 440, 1,100, 2,200, 4,400, 6,600 or some other commercial and standard pressure. The reduction of the pressure does not, however, change any of the other characteristics of the current as received. The current is still alternating current. Street cars in nearly every instance require a direct current at a pressure of approximately 550 volts. Wherever the current is to be employed for the purpose of operating street cars, additional transforming apparatus must be installed, and this additional transforming equipment is termed "rotary converter." It is a rotary, because it has a rotating member, and it is a converter because it changes the characteristics of the current which it receives. If it receives an alternating current at a pressure of 350 volts, it will deliver a direct current from its other side at a pressure of approximately 550 volts.

The rotary converter is a machine that looks very much like the ordinary direct current generator, only a smaller machine for the same output. The difference most noticeable is, that on one end of the machine there will be seen collector rings with copper brushes bearing upon them, and upon the other end of the rotating member there will be found the usual direct current generator commutator with carbon brushes. What happens when the machine is in operation is. that an alternating current is taken into the rotating member through the copper brushes and collector rings, passes through the windings of the rotating member and is commutated on the commutator. If the alternating current that is taken into the rotor has the correct proportionate pressure, the direct current that is taken from the machine will have a pressure of 550 volts.

The Manhattan Railway Company, for example, has installed alternating current generators of a nominal capacity of 5,000 horse-power each. These large machines are each direct connected, without the use of belts, to compound condensing engines using steam at a pressure of 150 pounds. The capacity of the power station when running all of its equipment is 100,000 horse-power. All of these machines feed into the same general system of switchboard equipment and from there into static transformers which increase or decrease the electrical pressure as may be required at various points.

From the main switchboard this current is transmitted underground to the sub-stations throughout the city. There are about a dozen of these sub-stations, and in each of them will be found high-pressure switchboard panels, such panels delivering the current to the static transformers which reduce the pressure from 11,000 volts to approximately 352 volts alternating current. It is then carried to the rotary converter switchboard panels, which deliver the energy to the rotary converters, and these transform the current from alternating current to direct current for delivery through suitable switchboard devices to the third rail.

The motor equipment upon the cars of the elevated road are quite similar to those found upon the surface roads, about the only difference being in the size of the units. The starting devices and method of motor control embody the latest ideas pertaining to the art, the system of motor control being that known as the multiple unit plan. This arrangement permits the coupling together of any number of cars, all of which or any number of which may be equipped with motors and individual controlling sets. All of the cars in a train may have motors and controlling devices, or only a part of the train may be so equipped. The connections between the cars of the train are such, however, that all cars fitted with motors can be used to assist in the hauling of the complete train, no matter what the position of the individual cars may be in the train with respect to the whole. Moreover, the train can be operated as a unit, starting and stopping the entire train and operating all of the motors in the train from any one of the motor cars wherever such car may be placed.

The braking mechanism of all modern electrically equipped lines is that of compressed air. The operation of such type of brake is familiar to all readers and explanation of the same will not be offered. Air under pressure is obtained

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by means of the usual air compressor outfit, except that such outfit is driven by an electric motor instead of a steam unit. Each motor car, or each car having motors mounted upon its trucks, has its own motor driven air compressor mounted beneath the car. The motor is of the low-speed type and is direct connected to the air compressor. An electro-pneumatic starting and stopping device is used in connection with each such air compressor outfit and this starting device is so connected that it will automatically start and stop the motor within the limits of air pressure to be maintained in the air reservoir. When the air pressure falls below a pre-determined amount, the motor will automatically be placed in operation, and, similarly, when the air pressure in the reservoir exceeds a pre-determined amount the motor will be stopped automatically. The source of power supply is the same as that of the motors upon the car.

The commoner method of delivering current to the cars is that recognized as the overhead system, the cars carrying an overhead trolley. Two other methods are in use in this country to some extent, known as the underground conduit and the third rail systems, in connection with either of which the cars make use of an under-running current collecting device. The third rail is placed at the side of the track, elevated some six or eight inches above the same, and mounted upon insulators of sufficient strength to support it. At intervals along its length taps are made into it with copper wire attached to the feeder circuits, the same as with the overhead system of distribution. These taps are made for the purpose of properly distributing the current and, while the rail is much larger than the usual trolley wire and therefore has a larger sectional area, it is to be noted that a steel rail does not have as good electrical conductivity as does copper wire, and it must therefore have a much larger cross section than if it were copper in order that it may carry the same amount of power economically. The steel rail is cheaper to install, though, and by tapping into it at intervals will answer the purpose quite satisfactorily and will wear much longer than copper. The collection of the current from the third rail is accomplished through the medium of a shoe that is a part of the car truck. This shoe travels with the car and is so supported that it makes a yielding contact with the rail at all times, taking up for any inequalities in the alignment of the third rail. The shoe will maintain contact with the third rail under almost uniform pressure, notwithstanding any lateral movement of the car truck or its change in elevation and position when rounding curves. The current travels from the collecting shoe to the controlling devices on the cars, from whence it is disposed of to the motors as the man at the throttle elects. From the motors the current seeks the rails of the roadbed or the overhead trolley, as the case may be, and completes the circuit to the power house or to the sub-station.

The two cuts accompanying this article are intended to show the general arrangement of feed wires, trolley wires and apparatus that go to make up the different methods of transmitting power to street car motors. The direction of the current passing is also shown, having assumed that the trolley wire in each case was made negative, meaning that the current flowed out from the power house to the rails and returned through the trolley wire. This arrangement is generally adopted in practice.

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MOVEMENT OF TRAINS

BY H. A. DALBY

Obedience to Rules.

We have received a communication from an engineman who sees cause for discouragement in an honest attempt to live up to the rules and who thinks that under certain circumstances men are not expected to obey them, or, worse than that, are expected not to obey them. We quote from his letter:

"There are a good many rules in the Code that are not lived up to, and I have seen the officials themselves help to violate them. When a superintendent seats himself on the left side of the engine and sees a flagman flag a train, i. e., give them a high ball with a red flag instead of a white flag, go over a red fusee forty miles an hour, pop one torpedo, which is a signal to stop, but does not stop, and says nothing, it looks as if they do not want the rules obeyed. These violations are all right as long as nothing happens, but when something does happen then we lose our jobs. I knew one man that overtook the rear of a train that had parted and the flagman was on top of the caboose flagging following trains. Was that a proper way to flag? The trainmaster was on the engine and said nothing to the flagman, but told the engineer to go ahead of the rear portion of the other train. The engineer refused to go ahead and quoted Rule 101, which says that the detached portion of a train that is parted must not be passed until the front portion comes back. He was disciplined and taken off his run. I should say he was obeying the rules exactly, but evidently they did not want the rules obeyed."

It would not be right for one at a distance to attempt to pass judgment on the cases mentioned, for the reason that it is impossible for him to know the details of every situation and just how it should be treated. All he can do is to affirm such principles of action as seem to him right and advise what appears to be the only proper course to pursue, that of strict obedience to the rules. Ordinarily, we should think a red flag is hardly the proper object to use in giving a "high ball" and that a flagman protecting a rear end should be on the ground instead of on the top of a caboose, yet, as has been said, we are not in a position to correctly render a decision.

Viewing as a whole this apparent disregard of rules, however, it would seem that the practice on that road must be very exceptional. Our own experience has not furnished evidence of the seeming desire to have them ignored that the letter would indicate. On the contrary, we are led to believe that, generally speaking, it is the intention and the desire of operating officers that the rules be strictly observed.

We realize the fact that there may be occasionally a situation where the strict observance of some particular rule may not be necessary, but rules are and must be made to cover all cases of a similar character, and if there should be an occasional exception to the needs of such a rule the employe can not be permitted to use his own judgment in the matter. The rule is there and there is no way of escape from its provisions.

In former times, before train operations were reduced to a science as they are today, the matter of strict observance of rules was influenced largely by the personal attitude of the superintendent or other officer. If he were inclined to be liberal in his interpretation of them there would be some deviations of greater or less importance, but if not, they would be more strictly obeyed. But we believe there is now, for various causes, a very general tendency to insist on rules being observed to the letter.

We have many times urged this policy, for we believe it is the only true basis of successful work. Whatever may be said for or against this course, we are confronted by the fact that in the greater number of collisions that have happened the cause may be directly traced to the fact that some one has disobeyed a rule. This is what has called forth criticism from the public, much of it harsh and unjust, but, unfortunately, founded on fact. When trouble does occur there is an unoounded satisfaction to the man who knows he is right and has lived up to the rules.

We hardly know how to advise our friend who writes us. If his officers are inclined to ignore such rules as he

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mentions it certainly puts him in an embarrassing, not to say dangerous, position. In fact, we should be rather afraid to run on a road where such an attitude toward the rules prevailed. At a distance it is hard to determine just how well his fears are grounded, even though he does present some quite forcible illustrations of such disregard. We repeat, however, that conditions must be exceptional on his road, for we feel sure that, in general, employes are urged to strict compliance with every rule and are disciplined for failure to do so. At any rate, this is the only correct procedure, and an official would certainly be worthy of censure who failed to uphold his men in this line of conduct.

This is an interesting and important topic. Doubtless some of our readers are able to contribute further information in regard to it. What has been your experience? Do you meet with discouragements in trying to obey rules?

* * *

Do Enginemen Disregard Block Signals?

We have before us two communications recently printed in a leading railroad publication having reference to the disregard of block signals when standing in the stop position. One is from a signal engineer who designs and erects signals, and the other from an operating officer who has charge of their maintenance after they are installed, and is considerably interested, in conjunction with other officers, in seeing that they are properly obeyed. The first, as might be natural from his standpoint, is inclined to bewail the fact that the modern signal systems which, for the most part are admirable achievements in their line, are sometimes cast into disrepute by the looseness with which they are handled, or, to put it more plainly, and using his own language, "The total indifference to the enforcement of signal rules by so many superintendents, trainmasters and dispatchers." He says that "entirely too many superintendents and dispatchers are prone to wink at disobedience to block rules by trainmen," and that this produces a very dangerous condition. In this he seems to strike a chord in sympathy with the writer of the letter referred to in the previous article, and yet, as we said in that connection, we hardly think his estimate can be truthfully applied to all officers or all roads, as will be shown by facts brought forth later. We must also make a certain allowance for his viewpoint, that of one who furnishes a device for the safe operation of trains, and is disappointed in its failure through no lack of its own, but by a lack of proper regard by those in whose charge it is placed.

However, we can not fail to realize that there is ground for truth in his statement. He draws an unfavorable comparison between results obtained in this country and England. He says, "In England, where the signals themselves are crude and old-fashioned and frequently placed in disadvantageous situations, and where the operating mechanism is ramshackle to an appalling extent, they have no collisions due to failure of block signals. Why? Because the operating officers appreciate the value of the signals and see that their men obey them." Continuing, he says: "In this country, where the signal engineers have developed a type of signal, both mechanical and automatic, far in advance of the signals used in England, we do have collisions. Why? Because too many of our operating officers look on the signals as a useless nuisance, and 'like master, like man,' the men under them think so, too, to the extent of disregarding them."

Emphasizing the importance of properly observing signals, he says: "We all know that a very poor system, vigorously administered, often produces better results than a much better system with a lax adminstration, and this applies to block signaling to a marked degree." Whether or not his conclusions are warranted by facts, they are well worth considering, and the expression of extreme views sometimes arouses us to vigorous and much-needed action.

The other writer, whose business is, in part at least, to see to the proper application of the block signal system, expresses the same need, and among other things says that "when collisions occur it is not because of the failure of the block system but because of the failure of the employes to observe certain definite rules governing its operation." He adds that "failure of employes to observe the rules is brought to a minimum on many roads by effective instruction and discipline." He states that on their line employes are thoroughly instructed in the use and proper observance

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of signals, made acquainted with the facts concerning collisions that have taken place by reason of carelessness or neglect, and are then required to pass a rigid examination as to their understanding and intention to comply with instructions. He believes that wilful disregard of a signal should be sufficient cause for dismissal, and is of the opinion that this course has the effect of making men very careful in this regard. He says the pursuit of this policy will "so fortify the block signal as to make it the protection it is supposed to be and should be."

On the line above referred to the simplest kind of system is used, the station train order signal being used, the operators communicating with each other by telegraph in regard to the occupation of the particular block section under their charge. We are informed that it has reached a high degree of efficiency and that during the ten years of its operation there has been no loss of life among passengers which could be charged to the system or its operation. This is a gratifying record and, we may say, it is on one of the heavy signal track lines of the Northwest. This officer attributes their success entirely to the extreme care taken in the selection of men, the thorough instruction they receive and the supervision exercised over each, insisting that the block signal rules and instructions be implicitly carried out.

* * *

Surprise Tests.

This is a subject which is closely akin to that of obedience to the rules and to that particular phase of the subject which contains the suggestion of encouragement of the officers in such obedience. Surprise tests, while not altogether new in principle, have developed extensively in late years and with especial reference to the observance of signals. The manner in which the tests have been prepared for and announced to the men, together with the reasons therefor, have been such as to inspire the utmost good feeling, so that there has been no resentment on the part of those who were so watched. And there should be none. Men who are careful in the matter, and make it a point to obey every signal indication, have nothing to fear from a test, and inasmuch as one who satisfactorily meets the test is given due credit for his faithfulness, it not only acts as a compliment to him, but serves to distinguish him from those who are less trustworthy. A man should remember that he is but one of many hundreds under the same officer and the others may not be as careful as himself. Therefore, it is no indication that suspicion is directed toward him, but only a desire to demonstrate the fact to the higher officers and to the public that the men on a particular division are reliable and trustworthy and that trains are operated with absolute regard to the dictations of the signal system, which is erected and maintained, usually at a considerable cost to the company. Men should feel that it is a measure adopted for their own personal safety and that there is an honest desire to show that the line is safe for its own employes and the passengers and freight in its charge.

There are frequent reports of these tests made public and they are usually very gratifying. A recent report from the Pennsylvania Lines states that in a series of tests covering a period of three months and involving almost 2,300 trains, 97 per cent. of the enginemen stopped at the signal as the rules require and the other 3 per cent. stopped very soon after passing it. There were no reports of failure to stop. Reports of this kind are frequent, and speak well for the men, at the same time showing clearly that the officers not only encourage observance of the rules but are inclined to censure those who violate them as well as to commend those who do not.

The usual method of conducting a test is for the officer in charge, or some one delegated by him, to take a position where he may see if the stop signal is observed, and while cases have been known in which the signal has been purposely placed in the stop position, yet this action should not in any sense be taken as a desire to lead men into temptation or get them into trouble.

There is at least one road where the intention of conducting surprise tests was openly announced and the reason fully explained, together with an expression of hope that there should develop no case where discipline would be necessary. It was stated that the desire was that their men should be the best men in the country and that they might have abundant proof to that effect. The results, as might have been

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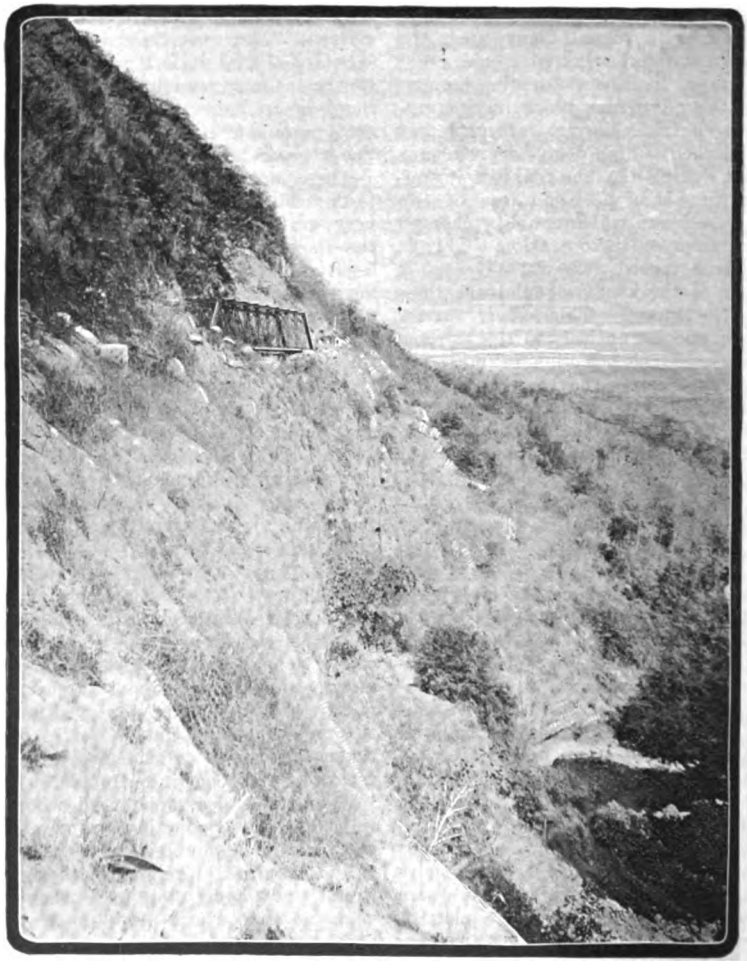
expected, were very satisfactory both to officials and employes, the latter entering into the plan with perfect good will and the former showing a desire to commend in every case where commendation is due, although discipline is necessarily severe where there is disregard of rules. There is but one moral and but one kind of advice: Stick to the rules and all must be well in the end.



CHOY BRIDGE—MEXICAN CENTRAL RAILWAY

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Questions and Answers

Locomotive Running and Repairs.

Answers by F. P. Roesch.

547. Degree of Curve.—"Please state in your next issue how to find the degree of a curve."—*E. M. F.*

Answer.—As one degree of curvature is equal to a radius of 5,730 feet, therefore if the radius is known the radius divided into 5,730 will give the number of degrees in the curve. If the radius is not known, then to find the radius proceed as follows:

Lay off carefully on the inside rail by any convenient means (a stout string will do) a chord of any desired length,

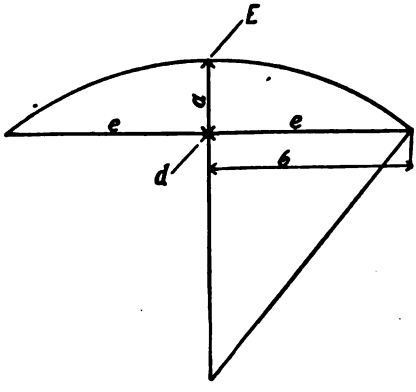

Fig. 1

as shown in Fig. 1. Measure the center height or middle ordinate of the chord (See *a*, Fig. 1) in feet or fraction of a foot and work out the example by the following formula:

$$R = \frac{a^2 + b^2}{2a}, \text{ in which}$$

R=Radius of curve in feet.
a=Middle ordinate in feet.
b=One-half of the chord in feet.

After finding the radius, divide it into 5,730 as stated above to get degrees.

A method commonly employed by section men and requiring no calculation is: Take a cord or stout string 62 feet long with a knot exactly in the middle of it. When the string is stretched so that each end touches the gauge side of the outer rail of the curve, each inch of distance from the knot to the gauge side of the rail equals one degree of curvature. Thus, referring to Fig. 1, let the curve shown represent the gauge side of the outer rail, *e e* represent a string 62 feet long, and the point *d* represent the knot in the center of the string. Then the distance from *d* to *E*, as shown by *a* measured in inches, will represent the degrees of curvature.

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548. Test for Valve Blow.—"Please explain how you can test for leaky packing rings in a Vauclain compound low-pressure valve (or the inside heads)?"—*H. B. C.*

Answer.—All tests for blows in Vauclain compounds are explained fully and in detail on page 188 of the August, 1906, number of the Magazine.

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549. Mallet Compound.—"What does the word Mallet mean, and why is the engine called an articulated compound?"—*J. O'B.*

Answer.—The word Mallet is a proper noun, and is the name of the designer of that type of locomotive, hence it is called by his name. Articulated means jointed or flexible. The locomotive is so called because it really consists of two separate and distinct sets of engines under one boiler, one of the engines being rigidly attached to the boiler, while the other (the leading engine) is simply connected by means of a center casting, making the forward engine flexible or free to swing while curving, the same as an engine truck swings under an eight or ten-wheel engine.

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550. Tensile Strength.—"What does tensile strength mean as applied to tensile strength of a boiler?"—*J. O'B.*

Answer.—Tensile strength means in this case the strength or the power it would take to pull it apart. For instance, if we say the boiler is built of steel having a tensile strength of 50,000 pounds, we mean that it would take a pull of 50,000 pounds applied to one end of a bar of the steel one inch square to pull it in two. This must not be confused, however, with the bursting pressure of the boiler.

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551. Radial Stayed Boiler.—"What is a radial stayed boiler, and what are the advantages of the same?"—*J. O'B.*

Answer.—A radial stayed boiler is one

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whose crown sheet is made on a radius to conform to the radius of the outer or wrapper sheet, or shell of the boiler, the crown sheet being stayed or held in position against pressure by means of long staybolts screwed into both crown and wrapper sheets exactly the same as the firebox side sheets are stayed. The advantages are a cheaper form of construction than a crown bar stayed type, better circulation, and less difficult to keep clean.

552. Curvature of Link.—"Please explain why the links are curved instead of being made straight."—*H. B. C.*

Answer.—A glance at the diagram, Fig. 2, will make this plain. The link is an arc of a circle whose radius is equal to the distance from the center of the axle on which the eccentrics are mounted to the center of the lower rocker arm. Therefore, as the link is raised and lowered with the engine on the dead center, as shown in Fig. 2, there is no change in the position of the link-block pin *c* (and through this to the valve) except the slight change increasing the lead. as explained in the answer to question 415, page 347, in the September, 1906, issue of the Magazine. If, however, the link was straight, it would be represented by the chord of the arc, as shown in Fig. 2, and the link-block pin would assume the positions as shown at *d* and *c* respectively when the lever was in the center or in full gear.

553. Location of Saddle Pin.—"How does drilling the hole in the link saddle back of the center of the link overcome the angularity of the main rod?"—*H. B. C.*

Answer.—Locating the saddle pin or suspension stud back of the center of the link or link arc causes the link to rise and fall during its oscillation sufficient to compensate for the angularity of the main rod. This is commonly called "the slip of the block." By referring to Fig. 2 perhaps it can be made more clear. Imagine the point *d* on the chord of the arc (shown in the figure) to represent the hanger or saddle pin, and the point *o* on the arc to represent the center of the link. Then it is obvious that if the link is oscillated on the point *d* that point *o* will move up and down. If, however, the saddle pin was located at point *c* and the link oscillated there would be no movement whatever, thus causing a

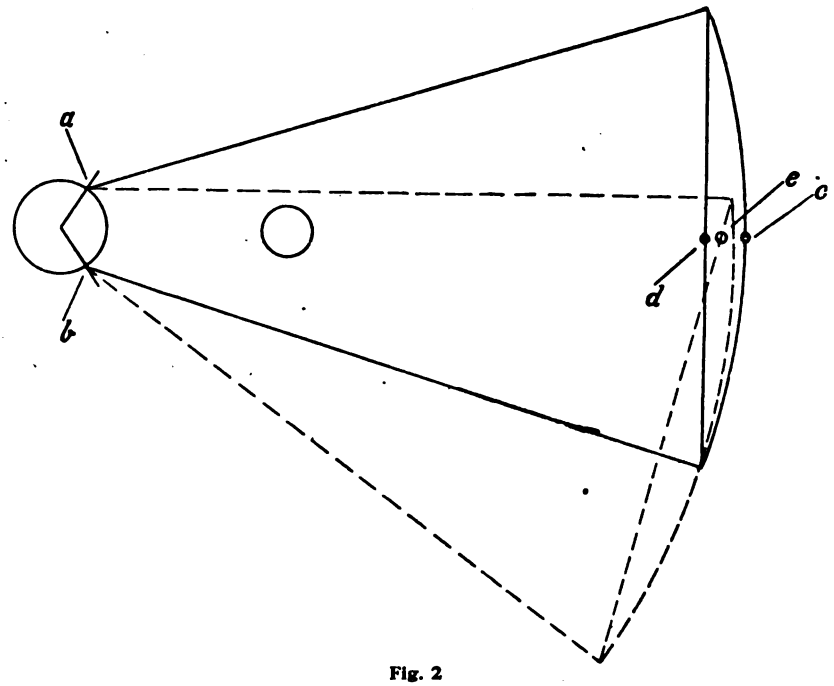

Fig. 2

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difference in the cut-off between the forward and backward strokes.

554. Burnt Boiler.—"Will a boiler that has been scorched or burnt carry water as well as one that has not been burnt?"—*J. O'B.*

Answer.—There should be no material difference, although many engineers will argue to the contrary. In our experience, however, we have never found one able to prove his case.

555. Heating Surface.—"When speaking of heating surface, what does the term include?"—*J. O'B.*

Answer.—The term includes the entire inner surface of the firebox and tubes, also the outer surface of the arch tubes if engine is so equipped.

556. Calculating Horsepower.—"How do you arrive at the horsepower of an engine when the tractive power is given? Say the engine has 20x24-inch cylinders, 50-inch driving wheels, 140 pounds boiler pressure, and the speed is 25 miles per hour. Show how to find each."—*J. O'B.*

Answer.—When the tractive power is given, to find the horsepower: Multiply the tractive power by the speed in miles per hour and divide by 375. To find the tractive power, square the diameter of the cylinders, multiply by the stroke, then by 85 per cent. of the boiler pressure and divide by the diameter of the driver in inches. Thus in the example given:

$$\frac{20 \times 20 \times 140 \times .85 \times 24}{50} = 22{,}848 \text{ pounds.}$$

To find the horsepower at 25 miles per hour:

$$\frac{22{,}848 \times 25}{375} = 1{,}523.2 \text{ H. P.}$$

The Westinghouse Air Brake.

Answers by F. B. Farmer.

330. Pump Works Slow.—"Suppose a New York pump begins to work slower and slower each day without any apparent cause, where would you look for the trouble?"—*W. L. B.*

Answer.—This would indicate that the discharge passages of the air cylinder are being gradually closed by an accumulation of gum, resulting from oil and dust baked on by the heat from the compressed air.

331. Brake Valve Positions.—"Name the positions of the New York brake valve."—*W. L. B.*

Answer.—Release, running, lap, service graduating (five notches) and emergency.

332. Brake Valve Operation.—"Explain how the New York brake valve reduces and controls the escape of brake pipe air in service application."—*W. L. B.*

Answer.—Moving the brake valve handle to a service graduating notch makes an opening from the brake pipe past the edge of the cut-off valve, through a comparatively small port in the face of the slide valve, into a passage in this valve. Another port from this passage is then connected with an opening in the seat and leading to the atmosphere.

The cut-off valve works on the face or bottom of the slide valve and controls the first mentioned port in the slide valve. The cut-off valve is controlled by the equalizing piston, to which it is connected by a lever. The cut-off valve side of this piston is exposed to brake pipe pressure and the opposite side to supplementary reservoir pressure. These two pressures are ordinarily equal.

The reduction in brake pipe pressure, caused by the opening described, results in the then higher pressure on the opposite side of the equalizing piston, communication between the two sides being cut off at this time, moving it in the direction which causes the cut-off valve to gradually close the port leading from the brake pipe into the passage in the slide valve and thereby stop the flow to the atmosphere. The cut-off valve stops when the equalizing piston movement has sufficiently enlarged the supplementary chamber volume to reduce its pressure, by expansion, down to that in the brake pipe.

Each successive service graduating notch repeats this operation and the fifth or last notch gives a total reduction of about 25 pounds, starting from 70 pounds.

333. Brake Valve Pressures.—"What part of the New York brake valve (a) does main reservoir air occupy? (b) brake pipe air? (c) supplementary reservoir air?"—*W. L. B.*

Answer.—(a) All about the slide valve except its face. (b) Under a portion of the face of the slide valve and on the cut-off valve side of the equalizing piston. (c) The opposite side of the equalizing piston.

334. Effect of Service Application.—"When the handle is placed in one of the serv-

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ice graduating notches, what takes place?"—*W. L. B.*

Answer.—The restricted discharge of brake pipe air causes the brakes to apply gradually, the amount depending on the notch used, brake pipe pressure carried and, if other than the first notch, whether previous notches are used. The gradual closing of the brake pipe discharge prevents the release of the head brakes, as will follow with a train of any considerable length if the discharge is stopped abruptly by moving the brake valve handle toward lap.

335. Emergency Position.—"When the handle of the New York brake valve is placed in emergency position, what takes place?"—*W. L. B.*

Answer.—A large opening is made from the brake pipe to the atmosphere, thereby causing a quick and full application of all brakes coupled.

336. Service Action Defect.—"When making a service reduction, if the New York brake valve fails to lap, what should be done?"—*W. L. B.*

Answer.—When the desired brake pipe reduction is obtained, gradually move the brake valve handle toward lap until the discharge ceases.

337. Equalizing Discharge Defect.—"What usually causes the graduating valve of the New York brake valve to fail to lap the service exhaust when making service applications?"—*W. L. B.*

Answer.—Leakage from the supplementary reservoir, its pipe, past the cap on the equalizing piston chamber or by the equalizing piston packing leather and ring.

338. Supplementary Reservoir Pipe Broken.—"If the pipe connecting the supplementary reservoir of the New York brake valve should break while on the road, what should be done?"—*W. L. B.*

Answer.—Plug its connection with the brake valve and in each service reduction move the handle carefully toward lap as soon as the desired amount of brake pipe pressure has been discharged.

339. Adjustment of Straight-air Reducing Valve.—"What pressure should be developed in the brake cylinder by the New York straight-air brake?"—*W. L. B.*

Answer.—Presuming the New York B2 equipment is referred to, would advise that they instruct that the straight-air reducing valve should limit the brake cylinder pressure to 40 pounds when straight-air is used.

340. New York Safety Valve.—"What is the handle on the top of the New York safety valve for?"—*W. L. B.*

Answer.—The handle is to operate the safety valve by hand, in this being equivalent to a release valve which closes automatically. The New York Air Brake Co.'s printed instructions regarding this safety valve are as follows:

"The safety valve is for use at all times to graduate off brake cylinder pressure after an application of the train brakes when same is desired and to regulate the pressure in the brake cylinders during high speed operations. It is set at 53 pounds and should so be adjusted in service."

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Train Rules and Train Practice.

Answers by H. A. Dalby.

239. Rule 93.—"In your book, 'Train Rules and Train Dispatching,' at the foot of page 36 you say in connection with Form B, Example 2, that this form is not to be used for trains of the same class, as they already have that right. Now, Rule 93 says that a regular train which is delayed and falls back on the time of another train of the same class will proceed on its own schedule. According to this rule I can not see where trains of the same class can precede one another without a train order."—*G. O. F.*

Answer.—The example under Form B to which the questioner alludes is this: "No. 6 will pass No. 4 when overtaken." It is true that this form does not apply as between trains of the same class, for the rules already authorize a train to precede another of the same class. When we made the statement it was based on the old Standard Code, for the present one was not then in existence. We claimed as authority for the statement Rule 93, which has been quoted, and also Rule 84, which authorized a train leaving its initial station or a junction when a train of the same class is overdue to proceed on its own schedule. These two rules taken together seemed to indicate that any train could proceed ahead of another of the same class from any point on the road. We believe this is the general understanding and is still practiced on roads using the old Standard Code. It may be argued that this was only an inference from the two rules mentioned, but we believe the inference is warranted by the privileges which they do confer. The new Standard Code, however, settles the question definitely and leaves no room for argument. Rule 85 of the

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new code is as follows: "When a train of one schedule is on the time of another schedule of the same class in the same direction, it will proceed on its own schedule. Trains of one schedule may pass trains of another schedule of the same class, and extras may pass and run ahead of extras." This means that trains of the same class in the same direction have equal rights and either may precede the other as occasion may require. It is certainly true, then, under the new code, that Form B, Example 2, is not intended for trains of the same class.

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240. A Schedule Order.—"I want to ask a question in regard to an order given under Form G, Example 3 (a schedule order). Should the train display white signals? If so, under what circumstances and why? They say on this road it should not display white signals, as it is provided with a schedule and is classed as a regular train. If this is the case, the Purdue University special which collided with the yard engine near Indianapolis a few years ago was considered a first-class train and had a right to run through yards regardless of yard engines. I should think a train which is given right over all trains is a first-class train, as right is superior to class or direction."—*G. O. F.*

Answer.—A train running on an order under Form G, Example 3, is an extra. The order distinctly says that it "will run extra" and that is all that can be made out of it. The fact that it is given right over other trains and has a time at each station does not alter the fact that it is an extra. The rules require that an extra must display white signals. They also require extras to run through yards looking out for yard engines and prepared to stop if necessary. These rules apply to an extra under this form of order as well as to any other kind of an extra.

Of course, the officials of any road can make a contrary ruling if they wish, and those using the order must do as they are instructed, but the Standard Code is very clear on the points mentioned.

Referring to the Indianapolis collision, the special was an extra and was given right over all trains, but a yard engine is not a train. A train is clearly defined in the rules and a yard engine does not come under that description; therefore a train running on that kind of an order has not a right over yard engines unless the superintendent or train master rules that it has.

As to the statement that such a train is provided with a schedule, this is a mistake; the train is not provided with a schedule. A schedule is defined in the rules as a part of a time-table, and a train order is not a part of a time-table in any sense. We know that these orders are called "schedules," but that is only for want of a better word. They are not schedules and the rules regarding a schedule, i. e., a column on the time-table, do not apply.

The rules define the case exactly. The train is an extra and should therefore display white signals and should look out for yard engines unless relieved from so doing by the proper authority.

Railway Club Proceedings

*Electricity and Its Uses.**

Mr. President and Members of the Richmond Railroad Club: I assure you it is a great pleasure to be able to be before you. I have been requested by one of the members of your subject committee to give you a lecture on electricity, but the time since I was notified has been very short, so I am going to try and give you more of a talk than a lecture. I hope I won't put any of you to sleep, but if I do, I have a little current here that will wake you up. I am going to start from the beginning and carry you through to the present day manipulation, and give you what I think we may look forward to in the future. Of course no one in the world knows what we may do in the future. I want to express as far as possible what electricity is, though no one knows what it is, but the old saying still goes, "If you have a dollar bill in your pocket, you don't care if it is silk or cloth just so you can spend it." We

*By Mr. Frank Z. Brown.

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don't care exactly what electricity is, but we know how to get it. There have been men for years and years trying to decide what electricity really is, but up to this date no one that I know of knows anything as to the correct definition of electricity, or what it really is. The only thing we know is that electricity is a power which manifests itself in five different ways. To speak of all five different ways would take me many hours, so I shall speak of only one, and that is current electricity; but before going into that one, I shall give you the five classes that present themselves to us. The first is what we call static electricity, which is obtained by rubbing glass with silk, or india rubber with wool. I don't suppose many of you have heard of the experiment, but if you shuffle your feet across a brussels carpet and put your hand to the gas you can light the gas jet. That is what we call static or friction electricity. It is the friction of your shoes with the carpet that forms a static charge. These charges are mostly used in therapeutics. The next electricity we have is what we call dynamic electricity, or voltaic electricity, which was presented to us by Volta. The first man who discovered this class of electricity was named Galvani, who in 1603 discovered the galvanic cell, and we call it the Galvanic battery or voltaic battery. Galvani had pieces of copper and zinc which he put into a vessel with a solution of sulphuric acid, and was surprised to receive a fairly strong current. He did not know how it was going to act, and it was not until Voltaire discovered in 1786 the Voltaic cell, and from the Voltaic cell we have gotten the batteries that are in practical use today.

The next electricity that we know of is what we call thermo electricity. It is gotten by heating two metals, antimony and bismuth. These two metals when placed side by side and heated give out a fairly large electric current.

The fourth electricity is what we call atmospheric electricity, and this is found in the condition of electrical disturbances in the air or clouds. Unfortunately, we have never been able to handle this on account of its high voltage.

Tonight I shall try to tell you the difference between current, volts and resistance.

The last electricity which I shall speak of, and the one which I shall dwell on mostly, is what we call magnetic electricity. That is electricity derived from magnetism. It has been known for centuries that specimens of iron ore that we call magnetite had the power, when suspended, to point in one direction. This was found in Asia Minor, in Magnesia. The man who discovered the magnet stone was a shepherd, and while carrying his iron crook, which shepherds used in those days, he discovered that some of the stones would be attracted by it. He called the stone Magnesia. It has the power when suspended by a thread of pointing in one direction.

When the shepherd brought some pieces of this stone to the city, the natives were scared of it for the simple reason that no matter how they turned this stone would point in one direction, and they called it a load stone, because they thought it was loaded; not like people get sometimes, however. No matter how they turned it it always pointed toward the north. They carved some of these stones in cylindrical shape and used them for guiding stones, and after the word load stone was discarded they called it leading stone.

This is a sample of the stone, and as I have used it quite often, it has lost a good deal of its magnetism. If you will notice on this paper here I have a few iron filings, and when I hold the stone close to them it will attract the filings. This property is called magnetism.

After a while the natives learned how to heat these stones and extract from them this iron ore and cast the ore either into a bar or horseshoe shape, and the bar or horseshoe had the same power as the stone. In other words, it is a magnet. A magnet is an instrument that has the power of attracting iron or steel filings. Magnets attract, as a rule, only iron or steel.

Now, why have I taken up this time to talk about magnets? The simple reason is that it is from these magnets that you are getting your electric lights today. How is that? Now let us remember that a magnet has the property of attracting iron or steel. If it has the property of attracting anything, it must have energy, and that is energy which ought to be developed. You can not destroy energy; you can transform it, and you can develop it. There is no more water and no more land in this world than was here a million years ago; therefore, as this energy has been here for years and years it is nothing new.

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If it has energy, why can not we utilize it? How does this energy manifest itself? This energy is manifested in what we call lines of force, which means that there are invisible lines of force that go from the north to the south pole. You can not see them, but they are there. They are invisible lines of force that go from the north to the south, and it is the lines of force that cause this magnet to point to the north. All magnets point to the north magnetic pole. You all know that Peary has been on exploring expeditions to discover, not the north magnetic pole, but is trying to discover the north geographical pole. A great many suppose he is going for the honor. That is one reason, of course; but all vessels have to obtain a chart year by year to show the deviation between the true magnetic pole and the geographical pole. The compass points to the magnetic pole about fifteen degrees east of the geopraphical pole. There is a company which measures this deviation between the north magnetic pole and the north geographical pole, and makes up charts for which they charge large sums of money. If we knew where the north geographical pole is, knowing where the north magnetic pole is, we could tell what the deviation would be, and all vessels would be saved the expense of getting these yearly charts. That is what Peary is trying to find now. Not for the honor only, but to try to get rid of this continuous changing of the two poles, so that those companies who employ vessels will not have to buy these expensive charts year by year.

What causes it to point north? It is the attraction which the north pole exerts on magnets, and is called the law of magnetic attraction, and it is also upon that law that every generator is built. The law is that all like poles repel each other and all unlike poles attract each other, and it is from this law that we get the electricity that we use today. Magnets are made in different ways; some in the shape of a bar, which we call bar magnets, and some in the shape of a horseshoe, called horseshoe magnets. Every horseshoe magnet, as well as bar magnet, has a north and south pole. On one end a north pole, and on the other a south pole. To show that energy is present, if you take a piece of paper and put it over the ends of the horseshoe magnet and sprinkle some iron filings on the paper, you will see that the filings arrange themselves in lines from one pole to the other. These lines going from the north to the south pole, which we call magnetic lines of force, are the things that are essential to our having generating electricty, and are called magnetic lines of force. They have energy, for they have the power of attracting iron filings. This magnet does work, in that it has energy, and energy is the power of doing work. Therefore, lines of force are the lines that go from the north to the south pole, and they are the lines that we utilize in our generators for the production of what we call electric current.

There are two kinds of metals that we use for magnets; one is cast iron and the other is wrought iron, or steel. Cast iron, however, has its advantages over wrought iron, first, for the simple reason that it is cheaper, and second, cast iron can be magnetized more quickly. However, wrought iron has an advantage in that it can be magnetized, and when magnetized it will retain its magnetism permanently. This property is called retentivity.

Here is a dynamo. I don't care whether these fields are magnetized or not when the dynamo is not working, but when I want it to work I want them magnetized. So that in all electric machines we employ cast iron. It is cheaper, and can be magnetized instantly. Wrought iron has a higher retentivity; cast iron has the higher permeability; that is, the power of allowing electric lines of force to pass through it. Wrought iron has the higher power of retentivity; that is, it retains the magnetic force longer than cast iron. These magnets are made in two ways, and only two ways. The first is by rubbing or stroking, the second is by the Helix method. I shall show you examples of both. Here is a piece of wrought iron that is magnetized. It is called a permanent magnet, because it retains its magnetism permanently. Here is a piece of cast iron, which I can magnetize by rubbing against this wrought iron magnet; it will not retain the magnetism to any great extent unless fully magnetized, but can be magnetized at any time. We do not employ this method in the magnets. The way we magnetize generators is by what we call a Helix method, and that is simply a coil of wire wrapped in a Helix form. In the center of this Helix we put an iron bar that has not been magnetized. Now,

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generator, or dynamo, as we speak of it, is an instrument which transforms mechanical energy into electrical energy. The dynamo is nothing in the world but what we call an electric magnet; that is, a magnet made by electricity going around a coil of wire, and is only magnetized when the current is going around the coil. If by any way I can pass a wire or conductor in such a manner as to cut these lines of force, I have induced in that conductor an electric force, or current. Right here let me say that the conductors are always metal, and the best conductor that we know of is copper, or rather silver is the best conductor, but silver is too expensive. If you pass a conductor back and forth through the magnetic field in such a way as to cut lines of force, there is induced in this conductor an electro motive force, and this force is in proportion to three things. First, the larger the magnetic field, the larger will be your current. Second, the more conductors passing through this field the more lines of force will be cut, and more will be the current. Third, the faster that the conductor goes through that field, the faster will those lines of force be cut, and, therefore, greater will be the current. Only three things—electric force or lines of force, conductors and speed of conductors. Therefore, we state that a generator is a machine that takes in mechanical energy and gives out electrical energy. The generator consists of two parts, the fields and the armature. The part which revolves is what we call the armature, and on the armature are what we call conductors, and the conductors are wires wound from end to end of the armature. The more wires the more electricity.

The next thing is the fields. The fields of a generator are simply iron shaped in the form of a horseshoe with the top flattened down, flat across the top, with coils of copper wire wound around them. As to cost of copper conductors, we can state that our electric wiring on the streets here cost more than every car in town, every piece of electric apparatus and all the salaries paid the men in one year. Copper wire is, then, the most expensive kind of wire used in electrical transmission.

The armature is composed of a shaft; to the shaft is keyed a spider, and on the spider is a core, and on the core are the conductors. How do we get the current from these armatures? Simply this, the conductors cut the lines of force, the induced electro motive force is conducted by the conductors to what we call segments, and from these segments we get the current by means of brushes.

What is the difference between a direct current and an alternating current? Everything in Richmond, this side of Harrison street, is one kind of a current, and everything the other side of Harrison street is another kind of current. Alternating and direct. Let us see the difference. Alternating current means this, that every time that one of these wires or conductors on the armature makes a complete revolution the current is changed in it twice, every time one of these conductors revolves the current in it changes; that means that for every revolution of every conductor the current goes around the line once and comes back, alternates, all over the city of Richmond and back. The direct current continues in a continuous direction around the line back to the machine and around again. The direct current continues right around in one direction always. The alternating current is one which during each revolution of the conductor will go around in one direction and then back in the other direction. Therefore we have two currents, one alternating and one direct. How can we tell whether the machine is alternating or direct? All generators give an alternating current in the conductors on the armature and the way we get the direct current from the alternating is this: If by some means when the current is going in one direction and the instant it tends to change in the opposite direction I can commutate that current and make it reverse and go on in the same direction; I have a direct current. The way we get that is by what we call a commutator; it is composed of segments, each little segment is entirely separated from the other by mica. The way you can tell the machine generally is this—if the machine has the segments on it, it is generating a direct current; if it has rings slipped over the shaft, it is alternating. The advantages of the direct current and the alternating current differ greatly. In the direct current this machine will give us, say, a constant voltage. In the alternating current it will give us a certain voltage, but suppose the machine is giving one hundred volts, and my house was wired for two hundred volts, I could not get two

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hundred volts from this direct current machine, because the direct current can not be transformed, unless you spend a great deal of money in purchasing motor generators. If I wanted to raise this direct current from one hundred volts to two hundred volts, I must employ a motor, and to its shaft must be connected another generator, which must generate the required voltage.

Now, as to the electrical units—voltage, current, resistance: Let us take the example of the old muzzle loading gun; put the powder in and then the bullet. Let us fire the bullet through a fence, and we have right there a generator, a current and a resistance. The lights in this room would never light like this unless we had something to call the current to them. It is the voltage forcing itself through these lamps that we term current; it is the current we burn, not the voltage. Let us go back to the gun, the powder represents voltage, the ball going through the fence is what we call current, the fence is what we call the resistance which tends to hold back the bullet. The lights in this room burn at two hundred and thirty-five volts; a volt, then, is the amount of force necessary to send one bullet through one fence; that one bullet is a unit of current which we call one ampere. The fence is one unit of resistance, which we call one ohm. Ampere discovered the electric current. Voltaire discovered the electric cell. To repeat the units, then, one volt is the amount of force necessary to send one ampere through one ohm of resistance. One volt is the amount of current that sends one bullet through one fence. One ampere is the amount of current flowing when sent by one volt through the fence. One ohm is the resistance offered by that fence when one ampere is coming to it when sent by one volt. These three units are used extensively, and the product of volts by amperes gives the unit of power called watts.

If the generator will take in mechanical energy and give out electrical energy, can I not get a machine which will reverse that process? The motor is such a machine. The motor transforms electrical energy into mechanical energy. The motor is essentially a generator, and a generator is essentially a motor. We can use any generator as a motor, and any motor as a generator. In one we put mechanical energy, and take out electrical energy; and in the other we put in electrical energy, and take out mechanical.

Now, a word as to the future of electricity.

Speculation on the future of electricity is like speculation on immortality. Something entirely new may come up at any moment, as the X-ray and radium were discovered not so very long ago, but it is probable that after a time there will come a lull in the scientific discovery. In the age of Greek supremacy, art was paramount; in the middle ages, religion; at the present, useful science and material development. The next great human activity may be something entirely new and as yet unimagined.

Today the most important electrical task is the installation of electrical traction on the steam railroads, the driving of the old steam locomotive out of business; but it will be years before the locomotive will disappear, and the change to electrical traction will cost millions of dollars, besides no end of patient investigation and practical experiments.

The New York Central's pioneer work in electrifying its suburban lines out of New York is a matter of necessity, for the steam locomotive can no longer handle its traffic. It is necessity that is driving the Pennsylvania Railroad to do the same thing on its New York line, and through the tunnel now building under the Hudson. The Long Island Railroad is already using electricity largely; the New York, New Haven & Hartford is hurrying to install the current in place of steam, and the Erie announces that it has to follow suit. This does not mean that the big trunk lines will have to throw their locomotives away. Those displaced on suburban lines will replace all worn-out engines on branch lines; thus steam traffic will be constantly driven farther and farther from the densest traffic. But it will be a long time before the engines can be displaced as fast as they wear out and many engines would be worn out before it would be possible for the great electric companies to build the vast equipment necessary to a change of motor power, were all the big roads to decide on it tomorrow. With regard to the use of the direct or the alternating motor, the direct as yet has the preference, since it exerts a constant pull, as steam does in the turbine engine, while the pull of the alternating current is constantly interrupted the same as the pull of steam is in single reciprocating

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engines. Direct current motors are used on all elevated and subway lines now in operation, though the alternating current is used on some trolley lines in the West. The N. Y., N. H. & H. is preparing to equip its lines with single phase alternating current motor, and our Richmond-Ashland line will also be equipped with alternating current machinery. The alternating current is much preferable for transmission over long distances, and so may be used on those lines whose traffic is so infrequent that the power houses must be far apart, but most trunk roads will use the direct current on their suburban and main lines where traffic is heavy and the power houses near together.

I think that no matter which current is used in the motor, it will be of an alternating type as transmitted, and for some time to come the change to the direct current form will have to be accomplished by revolving transformers. As for the means of production of electric current, the development of water power has only begun. Whether the electric current produced by water power will be more generally utilized at a distance, or near the power house, as at Niagara, will depend mainly on transportation facilities; cheap transportation of product to market is essential to the success of any manufacturing enterprise, and it would not pay to locate works of any kind far enough away from trunk line transportation to increase materially the freight charges.

The old culm banks composed of refuse of coal mines will be used, no doubt, in the future for the production of electricity, and great power plants will be constructed at the mines. These could only be built, however, where maintenance of the transmission line is less costly than transportation of coal to the cities for the production of power there. Should this happen, then the cities will once more have the pure air and blue skies that they had before the present industrial development began.

At present few can afford electricity for cooking purposes, but through growing consumption by the well-to-do, the demand brings down its price, and then it will prove a blessing to the poor. Then electrical cooking will be the cheapest method for all classes. Coal is used by nobody so wastefully as by the poor in cooking, for the fire is not hot enough to cook with until much of the fuel has been burned, while during all of the latter part of the fire there is also too little heat to use.

It is hardly probable that the electric current will be produced directly from coal at a profit. The steam engine is the most economical apparatus yet devised to transform heat into power and is likely to stay. It delivers to the electric wire from ten to twenty per cent. of the energy of the coal consumed in the transmission. While there is a waste of from 80 to 90 per cent. of energy in changing coal into steam, there is a waste only of from ten to twenty per cent. in developing the power of the steam.

The electric current, which, it must be remembered, is not power at all; merely taking the power you give it at one place and developing it at another, wastes less than any other known transmission agency,

Wind mills will play a small part in the future for the production of electricity. The wind's power is relatively weak, and a vast number of wind mills covering much space would be required to develop any material power; they would be constantly getting out of order, and it will cost too much to keep them in repair. Big storms would wreck them and there would be such long calms that the largest storage batteries would fail. The storage batteries would be troublesome and expensive.

In future, I believe, the farmer will have the labor question solved by the use of electricity. Motors can be, and are made so simple that any intelligent American farmer can use them. I hardly think, however, that the power furnished the farmers will be by any trolley companies, but rather by specially organized companies catering to consumers of power and light in farming districts. Doing the mechanical farm work and lighting the farm house with power from a water-fall miles away or through the burning of some old culm pile at the mouth of some distant mine will, I believe, be truly revolutionary.

I thank you for your kind attention, and I hope if there are any questions you would like to ask on the subject that you will do so, and while I do not know it all, although I have been studying this subject about ten years, every year I realize that I know less and less, yet I am here to try to answer any questions that you may ask. Again I thank you for your attention.—April 8, 1907, meeting, Richmond Railroad Club.

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The End of the Line

By H. M. Orton

At the time my story opens a great many of the road men running south out of Baraboo had a sweetheart somewhere along the line between there and Harvard. Billy Malvern, fireman on the local passenger, was no exception to the rule. On the outskirts of a pretty little town I shall call Carter, a few miles south of Madison, a blue-eyed, golden-haired girl waved to him daily from the door of a little cottage amid tall spreading trees. That Billy loved her deeply all the men on the line knew, and agreed with each other that in all the State there was none fairer than Magdeline Edwards.

Magdeline Edwards was beautiful; her hair was a rich golden hue, while the big blue eyes that looked into yours had just enough of the roguish twinkle in them to tell her sunny nature. From the crown of her well poised head to the tip of her dainty slipper that peeped from beneath her skirts, her form was perfect. She had a pleasant word and a smile for all whom she met, and she carried herself at all times in that ladylike manner that men so admire in women.

Malvern's engineer, Hank Bellis, a big-hearted, good-natured sort of a fellow, enjoyed the "love making," as he called it, between Billy and Miss Edwards. The peculiar pull which he gave the whistle as they dashed into Carter would bring her to the door. Billy was never busy at this particular point, and as he leaned from the cab window she would smile and wave her hand. Billy would wave in return, Bellis would pull the whistle softly, and then the train would vanish around the curve, leaving her looking after it till its roar was lost in the distance.

One day as Bellis went to sign up he noticed an extra fireman was to go out on the run with him. Billy had always been regular in his work, scarcely ever losing a day, and was a great favorite with Bellis, for whom he had been firing for three years. "Hello!" he said to the foreman, "how's this? Where's Billy?"

"Asked for ten days and went south on four. You'll see him, no doubt, at Carter when you go through," was the answer.

As the foreman had predicted, when the train rounded the curve at Carter, Billy was seen sitting on the porch talking with Magdeline. Leaning from the cab Bellis shook his fist at Billy, then turning to the fireman said: "Dead gone on that girl is Billy; don't blame him much, either, for she is about the prettiest bit of a woman along this right of way."

When they passed the cottage the next day on the return trip nothing was seen either of Billy or Miss Edwards. Trip after trip was made in like manner, and as his wonderment grew he went to the foreman and said: "Heard anything from Billy lately?"

"Not a thing," replied the foreman, "and his ten days were up yesterday. Seen anything of him down around Carter?"

"Not since the first day he was off," answered Bellis. "Blamed if I've seen the girl, either. Seems queer, don't it?"

Bellis was oiling the 901 the next day when the foreman came to him and said: "Keep an eye out for Billy when you go through Carter today, and if you get the chance ask that girl of his what she has done with him."

Taking a piece of waste from his pocket and wiping the oil from the can, Bellis replied: "Looks mighty queer to me. I am inclined to think something is wrong." Then, as the whistle of the local was heard coming through Lyons, he climbed into the cab and backed down ready to couple on.

As they rolled into Carter that day Bellis was surprised to see Magdeline standing on the platform. And, as he stepped from the cab, oil can in hand, she came up to him and said: "Mr. Bellis, have you seen anything of Billy lately?"

"The very thing I was going to ask you, little one. No, I haven't seen him since the first day he came down here." Then, stepping nearer, he lowered his voice and asked, "Has anything come between you and him?"

In the big blue eyes that looked into his the tears were standing and the voice, though sweet, trembled.

"We quarreled, Mr. Bellis, and in the heat of anger I sent him from me, telling

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him never to come into my presence again. He took me at my word and left me, and I have heard nothing from him since. I am sorry for what I said to him and I have come to ask you to tell him so when next you see him, and ask him to come to me. Will you?"

"Yes, little one, and I'll try mighty hard to find him, too." Then, as the conductor's "all aboard" sounded, he climbed back into the cab and the train went speeding away to the south, leaving Magdeline looking after it till it vanished over a swell in the prairie.

The days came and went. Spring came, clothing the Wisconsin hills with velvet green, but not one word from Billy Malvern. The seasons glided into years, till four had passed, and still no word.

"If I knowed where he was, little one," said Bellis to her one day, "I'd go get him and make him get down on his knees and ask forgiveness for the way he has treated you. And if he didn't do it, I'd, I'd"—Just what he would do he did not say, but the way he jerked the throttle open left no doubt in Magdeline's mind as to what would befall Billy Malvern should Hank Bellis lay hands on him.

With an author's privilege I ask my readers to leave the Wisconsin hills and go with me to that great expanse of treeless, waterless plain, over which one of the railroads, in building across the Texas Panhandle, passes. Out, far out on that dreary level, at the end of the line, lies the little station of Raidon. Raidon owes its existence to the fact that around it roam countless thousands of cattle and sheep. And, to get in touch with this great stock belt the railroad had pushed its arms of steel across that lonely plain.

A roundhouse, with a machine shop in connection, was a source of pride to the citizens of Raidon. A mixed train leaves there for the East in the early morning; and late in the afternoon, after an all-day's run, covered with smoke and sand, another comes in. These two trains and the single thread of wire stretching from pole to pole, following the road in its course across the sandy plain, is all that keeps Raidon in touch with the busy world beyond that soap plant level.

Three miles east of the station lie the stockyards. Here it was the ranchmen gathered to cut out and ship their stock. During this season Raidon put on metropolitan airs. A majority of its citizens had grown up in the West, and it made no difference to them if the cowboys did carouse and shoot the air full of holes. Money was plenty, times were good.

Raidon boasts of a good hotel, "The Travelers' Rest." The proprietor, Henry Burton, formerly of Carter, had come in with the railroad, and, believing a future was before the town, had embarked in the hotel business. He set a good table, was pleasant, and had a good word for everyone. No one in Raidon had more friends that the genial landlord of the "Travelers' Rest."

His daughter Blanche had been a great favorite in Carter society, and, coming to Raidon with her sunny smile and pleasant way, had won the respect of all who came to know her. At her old home in Carter she and Magdeline Edwards had been close friends, and she was greatly pleased one day to receive a letter from Magdeline, saying she was coming out to make her a long visit.

Just as the golden sun was going down beyond "El Capitan" one bright May day, the express from the east arrived at Raidon and from it alighted one who during her stay there was loved and worshiped as no other one had been.

Magdeline Edwards was still beautiful. The four years that have intervened since last we saw her have dealt kindly with her. The look in the big blue eyes of something that the soul seemed to long for appeared to add to rather than detract from her beauty.

One of the first in Raidon to form Magdeline's acquaintance was LeRoy Everett, a tall, broad-shouldered, tan-faced cowboy, who long before the railroad had been talked of drifted into that locality from the north. He was a man of some education, a fluent talker, and though at times rough in his ways, was in all a perfect gentleman. He owned considerable property in Raidon, while out on the range and further down in the Campbell Hill country, thousands of cattle and sheep carried his brand. From the moment he looked into Magdeline's blue eyes he admired her. Admiration grew to love, and in a week's time Everett knew that at last he had met his fate, and that the golden-haired, blue-eyed girl from the Wisconsin hills filled a place in his heart no other one could fill. As he lived at the hotel he had many chances to cultivate her acquaintance. Picking out the gentlest broncho in his bunch, he taught her to ride. The daily rides they took were a source of joy to

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Magdeline, and were looked forward to from day to day, till at last it dawned upon her that Everett loved her, and at any moment might ask for the hand which years ago she had given to Billy Malvern. This at last led her to keep from his society as much as was possible.

Noting the sudden change in Magdeline toward him, Everett, in true western fashion, decided to learn the cause.

As Magdeline was standing at the window one morning looking at the great sweep of plain that could be seen from the hotel, Everett came up to her, and reaching out his hand, said: "Good morning, Miss Edwards. I hear you are to start for the East next week, and I have come to ask a favor of you. Will you grant it?"

She looked up at him, her face a shade paler, and replied: "Ask it, and if it lies in my power I will grant it."

"I am going out to where the cattle are feeding today, and I wish you to accompany me. I have something to say to you. Will you go?"

Hat in hand he stood before her, his brown eyes looking into hers as though to read her very thoughts. She knew what was coming; she had tried to avoid it, but now that it was before her she resolved to meet it and have it over with at once. As a last request she could not refuse him, so she said: "I will go. When do you start?"

"As soon as you are ready," he replied.

A short time after they rode away side by side, little dreaming what the coming home would be.

They ate dinner with the men at the end of the "chuck wagon," and after instructing them in regard to their work, he helped her to mount and they started on the return trip. For awhile they rode in silence, then pulling his broncho close to her side he said: "Magdeline, I have known you but a few short months, yet in that time I have grown to love you as only once in a lifetime it is given men to love. Were God to say to me, 'Of all the world take what thou wilt,' I should ask for you, Magdeline; I love you. Will you be my wife?"

"Mr. Everett," she replied, "when a man says to the woman of his choice, be my wife, he lays at her feet all that he possesses, and that woman fails in her duty who does not honor him. The question you have asked is one that every woman at some time in her life must answer. I can not be your wife, and in all fairness to you I will tell you why. Years ago, back in my old Wisconsin home, I loved one who was my all in all. He asked me to be his wife and I told him 'yes,' We were happy, he and I, and the wedding day was set. Then we quarreled. He refused to leave the road, and not thinking how foolish my request had been, I handed him back his ring and told him to go. He took me at my word and left me, and from that day to this I have never seen or heard one word from him. He and I may never meet on earth again, but as long as I live I shall be true to the promise I made him. Day by day, hour by hour I am living with the hope that some time he will come and claim me. If not, then I will go to my grave his promised wife. Mr. Everett, the most precious thing in all the world to a woman is the knowledge that she is loved and cared for. For the kind words you have said to me, the kindly way you have treated me while here, I thank you. I can not be your wife, but I desire that you keep at all times in the chain of friendship one unbroken link for me. And I hope you may yet find one in the sunshine of whose presence you will ever live happy."

For a moment he was silent. A prairie dog at the door of his home looked wonderingly at the riders passing so near.

"Magdeline," he said, "I shall always call you Magdeline, because to me it is the sweetest name I have ever heard. I did not know that your love had been given to another or I would have kept mine for you a secret. They tell me that we cherish and treasure most the things we can not have. Just why God puts angels on earth to live, that man, seeing them, may love them, I do not know, unless it is to show them a glimpse of that which lies beyond. I have hoped your answer would be yes. Yes, Magdeline, in the silent hours of midnight I have knelt in my room and prayed that it might be. Since you came there have crept into my heart things sweeter and better than ever before. Though you can not be my wife it will be sweet to know, as the long days go dragging by, that once we were friends."

She reached out a little hand, tanned by the wind and sun of the plain, and said: "Yes, LeRoy, always friends."

Shortly after they were joined by Blanche Burton and a small party who had ridden out to meet them.

"If looks denote anything," said

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Blanche, "I should say you two had been to a funeral." Then hoping the others might not see what her quick eye had detected, she cried: "It's a mile to the railroad; here's for a race to see who will be first over." In a moment the entire party were speeding over the plain.

In the six months Magdeline had been at Raidon she had become an expert horsewoman, and, knowing the horse she was riding to be one of the fastest in that locality, she at once started in the race with the satisfaction of seeing the distance between her and the leader grow less with every bound of her mount. Gradually the distance was overcome until at last she was leading the party. So taken up were they in the race that they failed to see through the cloud of dust that partly hid the railroad from them, the "Special" coming down the line at the rate of a mile a minute. It consisted of an engine and two cars, one of them the private car of the president of the road, in which, besides the president, the superintendent and a few other officials, was United States Senator Holbrook. It had left Baker late in the forenoon in charge of Conductor Prentis and Engineer Malvern. For some time the road had been contemplating extending its line further west, and it was in this cause the special was taking the officials to Raidon.

The head trick at Baker, as he handed the orders to Prentis, had told him to "shake them up."

"If there is an engine on the road that can do it, it's old 303," said Malvern, as Prentis handed him the orders.

"Who's pulling us?" asked the superintendent of the conductor, as he noted the rapidity with which they were traveling.

"Malvern," was the quiet reply.

"A north end man, a good runner and a true Christian," said the superintendent.

Ahead in the cab, his hand on the throttle and his eyes constantly on the long line of track ahead, sat a knight of the rail. He saw the party racing and at once took it for granted the road was the goal for which they were striving. He closed the throttle in readiness, should anything occur. And occur it did. Magdeline saw the approaching train about the time Malvern closed the throttle, and believing she could easily cross ahead of it, urged her horse to do its best. Seeming to understand its rider's intention, he renewed his efforts and would easily have crossed ahead of the train had he not, when within a few feet of the goal, stumbled and fallen. He partly regained his footing, and then pitched headlong onto the track with his neck broken, a helpless mass, pinioning his rider beneath him.

There was a wild shriek from the locomotive, the engineer slid from his seat, with lightning-like rapidity reversed his engine, then pulled the throttle wide open and applied the air. Could he stop the train in time? Did he have the great panting monster of steel and iron completely under his control? The distance was so short, the speed so great; could he do it? He turned his eyes upward and his fervent "God help me" was plainly heard by the fireman, who from the other side of the cab had closed his eyes and was waiting for the shock to tell him that all was over. The ponderous drivers were grating along the steel rails, while a ring of fire was flying from every wheel beneath the train. On and on it went. Everett and the rest of the riders watched with horror-stricken faces. To them it seemed that nothing could stop the speeding train in time, and that Magdeline would be crushed and ground beneath its wheels. Did the Divine Watcher above answer the prayer of the engineer and, taking charge of the train, stop it with its pilot within a foot of the dying broncho and its helpless rider?

Leaping from his horse, Everett ran to Magdeline's side, and as the train crew, the officials and the senator came up, the dying broncho was rolled over. Kneeling on the hot sand Everett placed one arm beneath Magdeline's head and lifted it to his lap.

The senator, the president, the superintendent and the rest of the officials were standing, silent watchers of the scene before them. In their midst, with his eyes fixed intently on the still form in the cowboy's arms, stood the engineer of the special. His face was colorless, while his form was trembling like a leaf. Little did those present know the thoughts surging through his mind. The woman before him was Magdeline Edwards. Was she still the same Magdeline of old, true to the old promise? Or did the man holding her so tenderly have the right to hold her as he did? For a moment his thoughts went back to the old days when love's young dream was brightest. Again he was back among the green clad Wis-

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consin hills with Magdeline; again he could see, just as once before he had seen, the happy years that stretched ahead. Then the quarrel, the separation and the long days when it seemed the heart would break with the load it carried. He had loved her so well, his beautiful Magdeline. And as he beheld her now in the arms of another, it seemed to him he loved her as never before. Then he shuddered as there came to him again the scene through which he had passed. Better, far, that she was another's to love and care for than that she should have been crushed beneath the wheels of his train. So thankful was he for it all that, unmindful of those around him, he knelt and lifted his face to the blue sky. Every head was bared. "Thank Thee, My Father, I thank Thee."

"Amen," said the senator.

"Amen," echoed the superintendent.

As the engineer arose to his feet Magdeline opened her eyes and in a dazed manner looked around. From one to another the blue eyes traveled till at last they rested on the engineer. Steadily she looked into his face and then, as a smile came over her countenance, she reached out her hand. "Billy, Billy," she said. Then her eyes closed again.

The cowboy looked at the engineer. "Is your name Malvern?" he asked.

"Yes," was the reply.

Quietly the cowboy arose. "The place I have, then, belongs to you. Less than an hour ago she told me of you and hoped that some time you would come and claim her. As she was the day you left her back among the Wisconsin hills, so you find her today, true to the promise she made you. When God gave you the right to claim and love her, He placed in your hands the fairest flower that ever bloomed. Were the world mine to give, I'd give it all to stand in your place. My life has been full of disappointments, but this one is softened by knowing that with the man of her choice she will ever be happy."

While the cowboy was talking the engineer had moved to Magdeline's side and was holding one of her soft little hands in his. The superintendent suggested that they carry her to the car and hasten to Raidon, where the service of a doctor could be had.

Tenderly taking her in his strong arms, Malvern carried her to the car and placed her on the soft cushions. Then he motioned to Everett.

"Care for her till we reach Raidon," he said; "my duty at present is ahead."

A few minutes later the train reached Raidon and Magdeline was carried to the hotel and the doctor summoned.

"A severe fall and badly frightened, but I think she will be herself in a day or two," said the doctor after a careful examination.

All that night Malvern and Mrs. Burton watched at Magdeline's bedside. The great golden sun was showing above the plain to the east when she opened her eyes and looked into Billy's face.

He moved to her side and as he leaned over to kiss her Mrs. Burton left the room.

"O, Billy, Billy," she said, "it seems so strange; I did not think they could stop the train, and yet, as my horse fell and I was caught beneath him, I asked God to help the engineer."

"And He did it," Billy said, as he gathered her close in his arms. "Magdeline, by our own misunderstanding we have been parted all these years. Let us now renew our vows, thankful to Him, who in His own way, and in His own time, has brought us together again, here, at the end of the line."

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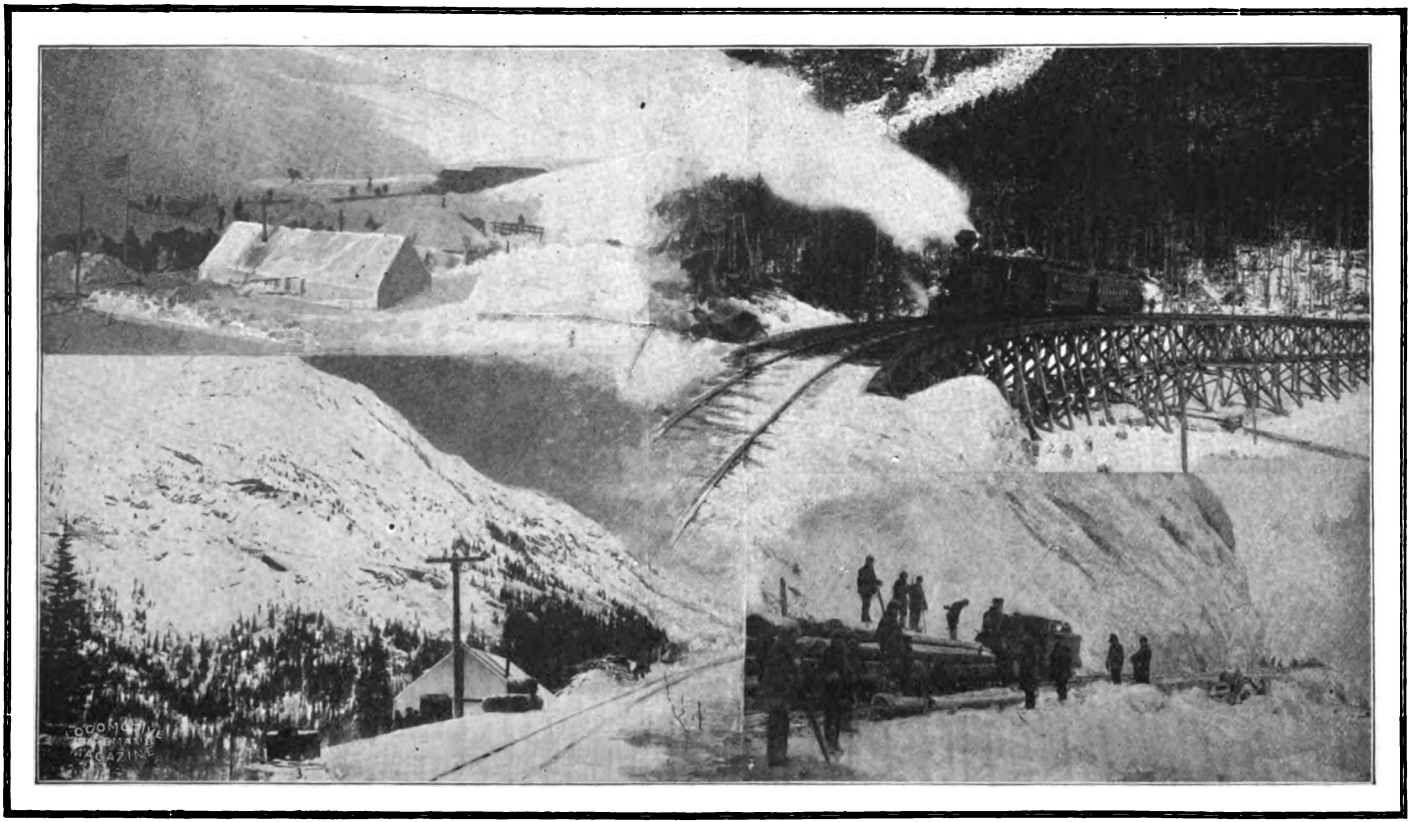

VIEWS FROM THE WHITE PASS AND YUKON RAILWAY

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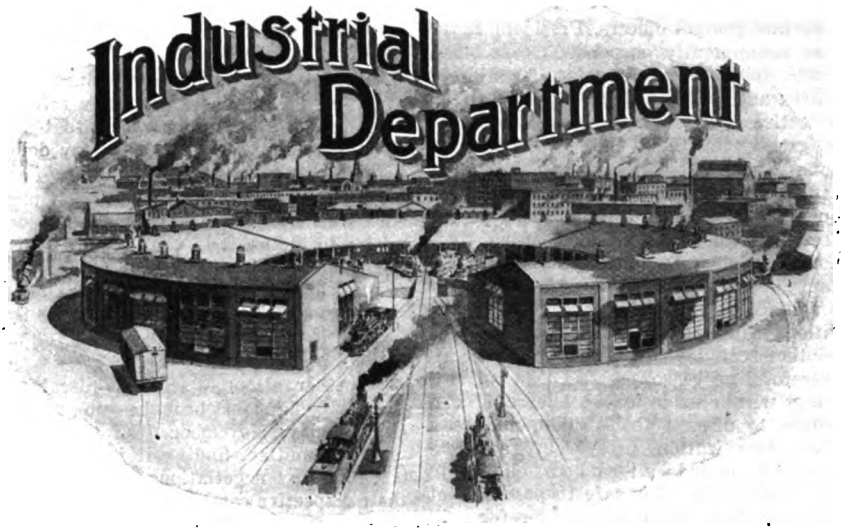

DISCUSSION OF CURRENT TOPICS

Suspension of the Telegraphers' Strike.

After a struggle of almost three months' duration the Commercial Telegraphers' Union has decided to suspend its strike against the Western Union, Postal Telegraph and Associated Press Companies, the suspension becoming effective on Saturday, November 9, 1907.

The fight developed into a test of endurance between the telegraphers' union and the companies involved, and the latter having millions at their disposal were able to hold out the longer, notwithstanding the extent to which their business was suffering and the immense loss they sustained, and as a consequence they won in the contest. But that they were victorious in the fight does not necessarily follow from this fact. Their financial loss is estimated at $22,000,000, and the extent to which their business must have suffered is evidenced by the fact that over 75 per cent. of the striking telegraphers have been restored to their former positions since the suspension of the strike, while the respective managements are but awaiting an opportunity to gracefully dispose of numbers of the incompetent scabs still remaining.

While the companies succeeded in maintaining their arrogant and unreasonable attitude of refusal to recognize the telegraphers' union, they have been taught a lesson that they will not soon forget, and it has been intimated by them that a substantial improvement in the working conditions of their employes will soon be established and will be maintained.

To the general publication in the press of the country of President Small's official message of October 12th to the various locals of the telegraphers' union, is attributed the termination of the strike at this time, as it had the effect of discouraging, not only the striking telegraphers, but as well affiliated labor organizations that had been contributing financially to the maintenance of the strike. In that communication President Small stated that prominent New Yorkers had appealed to him to call the strike off, that all efforts looking to negotiations with the companies' officials had been exhausted, and that the latter had declared they would fight to a finish. It also stated that the treasury was depleted and no more funds available and concluded with the recommendation that as the strike had been ordered without the president's sanction, the locals vote on the proposition. The effect of such a message, coming from such a source at such a time, can easily be understood. For the issuing of this statement, which was done without consultation with his

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associate general officers, President Small was subsequently suspended from office.

The telegraphers fought a magnificent battle, and the fact that they knew when to retire with their organization intact is greatly to their credit. They have gone back to their work with their ranks unbroken, their spirits unconquered and in full consciousness of the fact that they have demonstrated their power to such an extent that the arrogant and disdainful corporations that sought to subject them to sweatshop conditions will not be at all likely to invite another conflict with them. There is, therefore, no reason to feel that any attempt will be made by the telegraph companies to disrupt their union, and with their organization prosperous, and extended to include all who are eligible to its membership, it is safe to predict that all they have been contending for will eventually be theirs without the necessity for another battle.

The situation is best expressed in a circular and resolution anent the conclusion of the strike sent by the general officials of the union to all locals, and which is as follows:

November 6, 1907.

The following resolution, adopted at the Milwaukee special convention (held commencing Wednesday, October 23, 1907), is self-explanatory:

"That this convention elect by ballot one committee of three striking exclusive Western Union employes, one committee of three striking exclusive Postal employes, one committee of three striking exclusive Associated Press employes, that they proceed to New York and enter into negotiations with the three corporations against whom we are striking for a settlement.

"That the three committees named, after receiving a proposition, shall meet as a joint committee, discuss it, and after voting upon the same their report shall be made to the president and general secretary-treasurer and the recommendation of the national officers shall be submitted to the various locals."

While the original report is quite lengthy, in substance it is as follows:

"The committee reports that their efforts to secure an audience with the officials of either company were unsuccessful; that attempts at negotiations through outside parties were in a measure, successful, but failed to bring results.

"Honorable Charles P. Neill made another call upon the officials of the various companies, but found them obdurate, all overtures having been absolutely refused. The committee was informed that the Western Union would spend every dollar in its treasury to defeat the union.

"On Saturday, November 2, great pressure was brought to bear upon the committee to induce it to confer with former President S. J. Small and consider a proposition he wished to make. The entire day was consumed in discussing this proposition, which finally was unanimously rejected.

"Further attempts through direct and indirect channels brought no results. On Monday, November 4th, the settlement committee, finding it impossible to conclude any negotiations whatever with their respective companies, adjourned sine die.

(Signed by committees representing striking employes of all three companies.)

Since the unfortunate episode of October 12th, donations from affiliated unions and other sympathizers have dwindled until they have almost ceased, despite determined and concerted efforts to again enlist the financial assistance of our friends. A large percentage of the strikers having reached the limit of self-sacrifice and endurance in this noble struggle, and without prospect for materially increased assistance, we feel that our moral responsibilities render incumbent upon us a plain statement of the true conditions now existing. . . . .

The existing alarming conditions in the financial and business world, and apprehension of worse to come, impel us to the belief that our duty demands that we do all in our power to improve conditions and reassure the public mind.

It has been intimated that while the companies will remain obstinate in their refusal to acknowledge defeat they are willing, upon the termination of the strike, to materially improve the conditions of their employes. Time will tell. In view of the conditions hereinbefore enumerated we deem it wise that the strike be suspended pending further developments. We struck for better conditions. In accomplishing this result we shall have won a substantial victory.

While the companies may boast that they have defeated us, truthfulness would compel them to add, in the words of Pyrrhus, a famous Roman general who

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won a hard fought battle, "if we have such another victory we are undone."

Your general officers, the committee on negotiations concurring, therefore recommend the adoption of the enclosed resolution.

Fraternally yours,

(Signed by President Beattie, General Secretary Russell and approved by General Executive Board.)

RESOLUTION.

Whereas, The Commercial Telegraphers' Union of America has been on strike throughout the United States for nearly three months in rebellion against twenty-five years of corporate tyranny and oppression, during which time the prosperity of the telegraph companies has been in glaring contrast to the constantly decreasing wage of their employes; and,

Whereas, The demands of our membership have been endorsed by the general public, the members of many civic and municipal bodies and several state legislatures, as reasonable and just; and,

Whereas, Many attempts have been made by representatives of the striking telegraphers to secure an honorable adjustment of the differences between themselves and their employers, and only corporate pride, together with a total inability on the part of the managing telegraph officials to harmonize the actual results of the strike with their early predictions, seems to stand in the way of a graceful acknowledgment of defeat at the hands of the heroic army of men and women who have by much sacrifice and suffering attested their courage and loyalty to principle, by winning a moral victory in one of the greatest and most important labor battles ever fought. Therefore, be it

Resolved, That we, the Commercial Telegraphers' Union of America, in order to give our employers a reasonable time to bring about improved conditions in the telegraph service do hereby recommend a suspension of the present strike, effective upon the adoption of this resolution by majority vote of the locals.

Note: Wire result of the vote immediately.

In suspending the struggle after a three months' campaign, characterized by heroic courage and determination and fortitude, we do so with a full realization of the truth that the splendid loyalty and solidarity of our ranks remains undismayed and unconquerable.

We have not lost. The pride and obstinacy of the great commercial telegraph companies, which brought them to the verge of bankruptcy in their efforts to destroy our organization, have met with a salutary and abiding rebuke. They will not provoke another conflict. The Commercial Telegraphers' Union of America still lives. It has created for itself a name that makes it a potent factor in the labor world. Preserve and upbuild and extend the organization and another fight will never be necessary in order to gain deserved concessions. In resuming work take hold with renewed energy and zeal and fidelity. Be loyal to your employers, but remember that your first duty is self-protection and self-preservation. In order to enjoy the fruits of our struggle we must uphold the organization which made rebellion against injustice possible.

Although a new organization, we have set a high mark in industrial warfare. If mistakes have been made, let us in the future profit by these mistakes. The membership at large have been guided by a devotion to principle, a loyalty to conviction, and a steadfastness of purpose that are an absolute guarantee that the discipline and experience of this battle will not be lost sight of in future contingencies.

Our mutual benefit department remains intact and will aid us in keeping the fires of patriotism and fraternalism burning in every breast. To our local officers we wish to express our most sincere appreciation and heartfelt thanks.

To our members at large we attribute the splendid fight that has been made.

To our railroad brothers we wish to express our most hearty appreciation of their efforts to aid us, and they may rest assured of ever being remembered.

To affiliated labor unions we express our heartfelt thanks for the assistance rendered and pledge our reciprocation whenever possible. For ourselves we can only say we worked earnestly to make the strike a success, and our future efforts shall be earnestly exerted in upbuilding and extending the organization.

CIRCULAR SUSPENDING STRIKE.

Upon receipt of votes from the requisite number of locals necessary to authorize the suspension of the strike another circular was sent out as follows:

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OFFICIAL CIRCULAR.

CHICAGO, Nov. 9, 1907.

To all Local Officers and Members:

A large majority of the locals voting having declared in favor of the resolution mailed to all locals on Wednesday, November 6th, the strike against the Western Union and Postal Telegraph Companies and the Associated Press is hereby officially declared suspended, effective 12 o'clock noon, Saturday, November 9, 1907. All strikers who may desire are free to seek reinstatement in their former positions.

(Signed by President Beattie and General Secretary Russell, and approved by General Executive Board.)

* * *

Annual Meeting of the National Civic Federation.

The annual meeting of the National Civic Federation will be held December 16 and 17, 1907, in the assembly room of the Park Avenue Hotel, New York City. The following subjects will be discussed: "Currency Reform," "Postal Savings Banks," "Wage Earners' Insurance," and "Is the Reduction of Wages in Time of Depression Justifiable or Necessary?"

At this meeting reports will be submitted on the work of the Public Ownership Commission, the Conciliation and Immigration Departments; on the investigation of the conditions surrounding the employes of the government at Panama, and reports will also be submitted on the conference of combinations and trusts recently held at Chicago, as well as on the proposed plan of work of the joint child labor committee.

* * *

Canadian Railroad Casualties.

The Toronto Daily Star of October 21st publishes, in almost three columns of space, interesting statistics showing the enormous death roll of railway employes in the Dominion. The loss of passengers has not been considered. One employe's life a day is the average yielded on Canada's railway battlefield. The figures are taken from the statistics of the Bureau of Labor, and doubtless were there added to this list the number of men annually maimed to the degree of permanent disability, the figures would be swelled considerably. During the first eight months of the present year over two hundred stalwart Canadians gave up their lives in the fight for existence through railway train service.

The Episcopal Appeal.

On October 11, the general Episcopal convention adopted a resolution, presented by Bishop Greer, of New York, which asks all churchmen to join in a great fight against child labor in the United States. The resolution reads:

Whereas, The evil of child labor is apparently on the increase in the United States, and it is known that the employment of children in factories, mines and shops reduces wages, disintegrates the family, deprives the child of natural rights to a period of training and depreciates the human stock; and,

Whereas, We recognize the profound responsibility of the church for our ethical as well as our spiritual standards;

Therefore, We call upon employers and parents to use their influence to better legislation and better enforcement of the laws, to the end that the exploitation of the labor of children shall become impossible in this Christian country.

This appeal should prove of great benefit to the working children, since naturally many directors of manufacturing and commercial corporations are communicants and members of the Episcopal church. Even more numerous are the indirect employers, the bondholders and sotckholders of child-employing corporations. The appeal can not be made too often or too earnestly to bondholders and stockholders to attend meetings of their corporations and there bring out their disapproval of the employment of children. It is not altogether unusual for philanthropic women to contribute to child labor committees money derived from the bonds or stocks of cotton mills, mines, telegraph companies and other enterprises in which children are employed under hurtful conditions. The work of the Consumers' League and the child labor committees in behalf of the children will be much reinforced when such contributors themselves represent the interests of the children within the employing corporation. It is to be hoped that this wider interpretation may be very generally given to the word "employer." The purchasing public pretty widely recognizes its duty as the indirect employer. But the conception of the stockholder and bondholder as employer is not yet prevalent.—From Charities and The Commons, New York, October 26.

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General Labor News.

For eight months of the year the immigrants to Canada numbered 216,865, an increase of 50,066 over 1906. The homesteads in Western Canada in July were taken by 1,032 Americans, 583 English, 03 Scotch, 28 Irish, 389 Austro-Hungarians, 121 Russians, 39 French, 66 Germans, and 58 Canadians returning from the States.

The year 1906 was for the German trade unions a period of extremely successful work. The aggregate membership of all existing unions increased about 25 per cent.

The latest industrial strike in Nova Scotia is that of the court stenographers.

Filipino girls employed as telephone operators are very apt and intelligent and are rapidly developing a most satisfactory service. They receive, as beginners, a salary of $10 a month, which is increased to twice that amount on their becoming proficient.

The United States Circuit Court of Appeals recently confirmed the decision of the United States District Court of the Eastern District of Missouri, holding that it was proper to enjoin labor organizations from boycotting a manufacturing company by forcing contractors to discontinue the use of products or to do without laborers.

Shoe stitchers used to work for 30 cents a day. In this year, 1907, many shoe stitchers are able to earn 30 cents an hour.

Paris, France, is on the brink of an important labor struggle, in which the principle of recognizing a trade union is involved. The manufacturing jewelers of the city held a meeting recently, and unanimously resolved not only to refuse to recognize the union, but to withdraw a previous concession of nine and one-half hours as the working day, and to enforce ten hours. A lockout will take effect.

An international agreement forbidding night work in factories by women has been signed by England, France, Germany, Austria, Italy, Denmark, Spain, Belgium, Portugal, Sweden and Switzerland. It will be put in practice in December, 1910.

A general order issued by the war department recently is calculated to put an end to the long-drawn-out controversy between organized labor and the army engineers over the question of enforcing the eight-hour day on all government work. The labor unions win decisively, for the new order is in the shape of an amendment to the army regulations making the eight-hour day general.

The Court of Appeals of New Zealand has finally declared that the great strike of the slaughterhouse men and their sympathizers is illegal.

The Nova Scotia government has appointed a commission to examine into and report on the feasibility of old age pensions for workmen.

Premier Bent, of Victoria, who has just returned from England, gives it as his opinion that $1.75 per day in Australia is better than $2.75 in Canada.

Labor Leader Bath, of West Australia, condemns the amended arbitration act introduced by the government of that state, as a primitive measure aimed at trade unionism, and actuated by the worst manifestations of party bias.

Federal Judge Dayton, at Wheeling, W. Va., recently granted an injunction temporarily restraining John Mitchell, president; T. L. Lewis, vice president, and the directors of the United Mine Workers of America from organizing or interfering in any way with 1,000 non-union miners employed by the Hitchman Coal Company, the Glendale Coal Company, and the Richmond Coal Company, located in Wheeling district.

Amalgamated Society of British Engineers has been identified with every movement of the times looking to the betterment of its members, and in England the main body has been especially active in the political field.

United States Consul Harris, of Smyrna, reports that the number of peasants emigrating from Asia Minor to the United States is large, so much so that the Ottoman government, fearful lest the whole province be depleted of able-bodied men, has refused to permit anyone to leave the country, except upon giving a guarantee that he will return.

The General Federation of Labor in France is considering the advisability of a general strike in retaliation against the government's action in prosecuting members for congratulating soldiers who refused to fire on the workers.

Count Von Posadowsky-Wehner, minister of the interior of Germany, has undertaken the preparation of a scheme for the maintenance of persons out of work while they are seeking employment.

The increasing wages paid Chinese in

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the Dominion of Canada is the inducement which is of late causing the Chinese to be taken there. Those interested in the supply of Chinese labor now figure that with the increased wages paid to the Chinese they can as readily pay $500 as they were previously able to pay the $100 assessed them when Chinese labor was held much more cheaply than at present.

Operating officials of the five railways involved in the strike of the boilermakers —the Great Northern, Northern Pacific, Chicago Great Western, Chicago, St. Paul, Minneapolis & Omaha, and the Minneapolis, St. Paul & Sault Ste. Marie —have formed an organization to fight the strike.

A big strike of miners has taken place in several of the Rand, South Africa, mines, in consequence of the companies attempting to compel the men to work three machines instead of two.

The recent national convention of the Metal Polishers, Buffers, Platers, Brass Molders and Brass Silver Workers' Union formulated a demand for an eight-hour day and a 20-per cent. increase in wages.

The membership of the Brotherhood of Painters, Decorators and Paperhangers of America now exceeds the 70,000 mark. During the first six months of the present year ninety-seven new unions were organized.

It is said that the International Association of Machinists has adopted a resolution providing that each member of the association lay aside one day's pay each year to go into a general strike benefit and emergency fund. It is figured that in a few years the fund will run into the millions.

Senator Cox, who is connected with some of Canada's biggest enterprises, has declared for admission of Asiatic labor, asserting that millions more might be spent on Canadian railroad construction if there were more men.

One hundred and fifty thousand railway workers in Italy are on strike.

For the first time in the history of unions of the United States, Japanese laborers were present as recognized delegates at a convention of union men in the annual meeting of district No. 22, United Mine Workers, recently held in Denver, Colo.

United States Senator Flint, of California, announces that he will introduce a bill in the next Congress to restrict the immigration of Hindoos.

Premier Laurier, of Canada, has declared his refusal to denounce the treaty with Japan, as requested by the Canadian Trades and Labor Congress.

Union men in Wilkesbarre, Pa., have started a movement to boycott the beef packers as long as prices remain at the present high rate.

For nearly a century Viennese householders have been compelled by law to take care of sick domestic servants, and to provide hospital accommodations for them when it was not possible to care for them in the house.

* * *

*Sermons in Common Things.**

Interesting and profitable are a series of "Don'ts" printed in Machinery. Practical ideas, every one of them—for machinists, especially—but in principle applicable to every chap in any kind of a shop. Some of them are highly suggestive. They are sermons in epitome. Here's one: "Don't try to make a finishing cut on scale." That's horse sense. You can't do it with men, either. You can't put a polish on a fellow who has all the hardness suggested by the scaly surface of a chunk of cast iron. You've got to get at something beneath his vest before you can fit him with the right kind of an overcoat—to use another figure of speech. Somebody once said that men are wrong when they look "out" for opportunities—they should look "in," for that is where they come from. There is usually a soft spot beneath the scale, that will permit of a beautiful polish—if you can only get at it. Sometimes it looks like a hopeless task, but it has been done, and what has been done, may be done.

"Don't make a piece of work too small, and then bend the gauge to fit it," is another hint. Mean, sneaky business that, anywhere. But some fellows are quite ready to lower standards in order to accommodate their own small deeds.

"Don't work to a caliper that has been set by another man; set it yourself." That means that our temperaments are different. Our sense of touch varies. The temperature of men's hands may make a difference in the expansion or contractoin of a sensitive gauge. There's an individuality about every man which influences every job that he tackles. But here's the point—every fellow must make

*By the Rev. Charles Stelzle.

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good in his own way. We can't fight in another man's armor. We can't do our best work with another's tools. If we do, they must be given the test of our own experience, and that practically makes them our own.

Look about you. You'll find many a sermon in the shop, actually staring you in the face. You will find

"Tongues in trees, books in the running brooks,
Sermons in stones, and good in everything."

Contributed

Sixteen-Hour Law.

On the 14th of March, 1908, the Sixteen-Hour Law, passed by the last session of congress, will become effective. Let us see what this means to all men engaged in railroad service. It reads in part as follows:

"Sec. 2. That it shall be unlawful for any common carrier, its officers or agents subject to this act, to require or permit any employe subject to this act to be or remain on duty for a longer period than sixteen consecutive hours."

After giving the matter considerable thought, the writer has come to the conclusion that the whole law is contained in the two words, ON DUTY.

The schedule of wages between the railroad on which I am employed and its men contains the following: "Time on duty shall be considered as being from the time the train is ordered at initial terminal, to arrival at destination."

Now, where do we get off at?

We are called two hours before the leaving time of the train. We must leave the roundhouse at least forty-five minutes before the time the train is ordered to leave the initial terminal. When does the sixteen hours begin? When does the sixteen hours end? Does it end on arrival at the terminal of destination, or when we turn the engine over to the dispatcher at the coal chutes?

I want to be fair in this matter. I am willing to give and to take. Suppose we say we are on duty when we take charge of the engine and we are on duty until we turn it over to the roundhouse forces at the other end. It does not seem reasonable that any common carrier can kick at that. I have in mind a neighbor of mine, a hod carrier. He leaves his home at 7 o'clock in the morning to commence work at 8 o'clock. Suppose my friend on his arrival at the building on which he is employed is put to work building the scaffold to which he is to carry brick all day, isn't he as much on duty as if he were carrying his hod of bricks?

When we as engineers and firemen are getting the engines ready for the road, we are practically building the scaffolding on which we are to work all day, and possibly far into the night; the argument holds good in our class of employment the same as it does in that of my friend the hod carrier.

It seems to me that this point is a good one for consideration on the part of the Interstate Commerce Commission, and that body should be requested to give a ruling on the meaning to be understood by those two words, ON DUTY. This could be accomplished by instructing our legislative representative at Washington, Brother Fuller, to seek an official interpretation of that section of the act. I am satisfied that if every member of the B. of L. F. and E. that is interested in this matter would write to Brother Fuller, our interests will be well taken care of.

HARRY W. HORDER.

Trade Unions in Russia.

The organizing committee of the first Russian Trades Union Congress has just published statistics relating to the present state of the economic organization of the working people in the "Tsar's Empire." The statistics prove that the Russian workmen everywhere are organizing on trade union lines, in spite of all difficulties which a semi-barbarous system of government puts in the way of regular development.

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In the first quarter of 1907 there were 652 trades unions in existence, with a total membership of 246,272, or nearly a quarter of a million. The following table shows the number of unions and of members by groups of trades:

GROUPS OF TRADES.	Number of Unions.	Number of Members.
Metal trades	81	54,173
Textile trades	25	34,214
Commerce	101	32,475
Printing trades	72	28,654
Food trades	78	24,848
Clothing trades	59	15,039
Building trades	43	12,396
Leather trades	85	12,066
Woodworking trades	38	9,927
Mining	5	2,475
All other trades	65	17,005
Total	652	246,272

The geographical distribution of organized workmen in Russia is of interest; there are in the district of Moscow, 60,942; in the northern district, 53,514; in Poland, 47,712; in the Caucasus, 16,172; in the Black Sea district, 15,498; in the northwestern district, 14,533; in the Volga district, 12,354; in Little Russia, 11,309 trade union members, while in each of the other districts they numbered less than 10,000.

The organized workmen are largely concentrated in great cities; eight cities contain about 180,000, or more than 70 per cent. of the total membership, viz.: Petersburg, 51,728; Moscow, 48,058; Lodz, 26,198; Warsaw, 17,117; Baku, 11,813; Odessa, 7,930; Yekaterinoslaw, 7,382; Wilna, 7,375. In the smaller cities and villages, outside of the eight principal trade union centers which have been considered above, there were about 60,000 trade union members.

The size of the unions differs considerably; but small unions still predominate. Six unions had more than 5,000 members each, nine unions had over 3,000 but less than 5,000 each, thirty unions had over 1,000 but less than 3,000 each; all other unions had a smaller membership.

In comparing the number of persons employed in the various industries with the number of trade unionists in the same industries, it will be seen that the printers are the best organized of all; their unions have 28,654 members, representing 43 per cent. of the persons employed in the printing trades. Next in order follow the metal workers with 8.6 per cent. of all workers organized, the food trades with 7.2 per cent., the leather trades with 7.1 per cent., etc. In the other trades less than 7 per cent. of all employes belong to trade unions. Of the 7,000,000 industrial workers in Russia, only 3.5 per cent. are trade unionists.

There are three features characteristic of the Russian labor movement of today: 1, the small number of trade unionists compared with the large number of industrial workers; 2, a dissipation of organizing power in consequence of the existence of several local and sectional societies in every trade, which are much less efficient in the economic struggle than national trade unions would be; 3, the concentration of the unions in large cities. These peculiarities can be easily understood if we recognize that trade unionism in Russia is of recent origin; its inception dates back only two and one-half years. Notwithstanding that an imperial decree of March 17, 1906, legalizes trade unions, the authorities still resort to oppressive tactics in endeavoring to prevent the progress and consolidation of the movement.

Nearly all the larger trade unions have their own journals. During the earlier part of 1907, seventy-two union periodicals were published, but some of them have been suppressed. The oldest trade union journal is "The Printers' Herald," established in the summer of 1905.

It is impossible to give a more complete account of the Russian trade union movement, which is gradually developing. The first forceful starts of the organization justify the hope that unity and a safe existence may shortly be achieved by the trade unions in the vast empire of Eastern Europe.

H. FEHLINGER.

Munich, Germany.

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Miscellany

*A Christmas Present for Our Little Ones.**

In some publication during the fall of 1906, I read an interesting article on a Christmas tree. Such a one as it described would, however, be far too expensive for the home of the average wage-earner. I have a few ideas which I desire to express, as some of our readers, like myself, may desire something new for the entertainment of their little ones. Being foreign born, it is but natural that some customs in vogue throughout portions of this country appear strange to me, one of which is that of having Christmas trees merely for the distribution of presents.

Let us first consider what Christmas is, especially for the little ones. It is the most sacred season of the year and recognized by all alike, irrespective of creed or nationality. During Christmas time a sense of love and charity fills the air, as does independence and patriotism on the Fourth of July. This being the case, we should endeavor to make it a happy occasion for the young, and this may be done with very little extra expense. Let me assure each and every parent who did not have a Christmas tree in their own home during their childhood, that the pleasure of watching their children for thirty minutes will more than compensate for their labors, and in years to come when that holy season approaches and the children are scattered throughout the land, their thoughts will go back to the little room where they beheld the beautiful tree and eagerly scanned its branches to find that something which was to gladden their hearts. The scenes of my childhood and the thoughts engendered by the remembrances of the Christmas tree has often brought tears to my eyes, and I have invariably tried to send some token of affection to my parents in return for the joys which they had given me in my childhood; and now that I have children in my own home, I make an effort to provide a nice Christmas tree to adorn the front room for two weeks every year. Doubtless some of our readers will conclude that their children have not been neglected; they get drums, houses, dolls, blocks, picture books and the many other things dear to the infant heart and mind. Be that as it may, those children do not realize what they are deprived of. The drum is noisy and frequently gets demolished before a week is out; even at the best it is but of a few days' duration; then, again, it is frequently a source of innocent annoyance to those of delicate nerves—then there are such a vast number of articles that are both useful as well as ornamental and to be equally appreciated, which could be substituted for it.

Let us see what it costs to have a nice Christmas tree, and we will assume that you are living where you can not get a regular fir tree. Get 12 to 24 (according to size of tree desired) boughs of cedar or other evergreen, from 18 to 30 inches in length, and it will do no tree harm to cut these; then wrap all the boughs with a suitable tint of tissue paper cut in strips two inches wide and fringed on one side, using a little mucilage or paste on end of each strip. After you have gotten the boughs and are ready to proceed, get the trunk of a small tree, or in case you can not get that, take a piece of 2x4, 3 to 4 feet long; dress the edges with a hatchet so as to give it a round appearance. Bore a hole into one end of it the size of a lead pencil and about 3 inches deep, and then bore as many holes as you have boughs, beginning near the top and turning pole a quarter round each time, being careful not to strike any holes already drilled. The holes must go clear through the pole and must be as slanting as possible to give the tree effect; after you have sufficient holes bored, sharpen the ends of the boughs and insert them, holding them in place by a thin wire from an old broom if necessary; then get a box about one foot square and about one foot high; or, better yet, a candy bucket; trim it with green paper and fill with rocks, placing them firmly against the tree, so as to hold it steady and firm.

Now the tree is ready for decorations, which should be plentiful, and may consist of the following for a tree of twenty-four boughs, which will be 6 feet 6 inches from the floor to the top, and 2 feet from the floor to the first hole; two dozen candle holders, about 8 cents to 12 cents a dozen; three dozen candles, 15 cents; twelve yards gold and silver tinsel, about

*By a member.

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20 cents; one dozen assorted pictures, equipped with tinsel and colored paper, etc. The pictures may be, and in fact ought to be, those bearing on the feast, namely: Santa Claus, angels, crib and pictures showing the birth of Christ; these may be had anywhere from 1 cent to 5 cents each, according to size. Six other tree ornaments, consisting of colored glass balls and tinsel, cost about 20 cents; one peck of small red apples with stems on them (you can always select them for this purpose by explaining the reason to the grocer); tie these with threads. One dozen oranges, around which make a netting of thread, which is easily done by tying thread clear around and then looping and netting it; by dividing the orange into eight parts with the thread it has a pretty effect. Get what candies you want for the children and tie it on the tree with strings; also secure six pockets the size of a No. 9 children's slipper, made of gilded or silvered pasteboard, or little baskets suitable for holding the candies and nuts. These should cost about 5 cents; string about twenty yards of popcorn; get three-quarters of a pound of tinfoil, such as comes in chewing tobacco, and cover two pounds of peanuts and two pounds of English walnuts; tie peanuts in strings of five and hang near tip end of bough; take toothpick and break it in two, stick the sharp end in the back end of each English walnut and hang each separately about six inches from tip of twigs. If English walnuts are not available, use black walnuts and cover them with tinfoil; they will look well, but carpet tacks will have to be used instead of toothpicks. If you have any books or other presents, you may hide them in the boughs. Care should be taken that nothing is placed near the candles that is inflammable. The former may of course be varied to suit the occasion and the requirements of the family.

I do not believe in deceiving children, but when I have my tree erected I close the door and impress upon my children that the door must not be opened, and then at such times as the children are away I dress the tree and place the things around for distribution.

While many may not be able to purchase tree ornaments in their various towns, still the mail order houses will send them in a day or so. The cost of a tree similar to the one described may be made for not more than $1.75 all told.

To those who have not heretofore indulged in Christmas trees for their children, let me say, try it once, and the pleasure beaming on the faces of the little ones will more than recompense you for the trouble. Once given a trial, it will always be a source of pleasure.

Big and Little Postage Stamps.

"The largest postage stamp ever issued was a five-cent stamp of the United States intended for newspaper postage. It was 4 by 2 inches in size. The smallest postage stamp, on the other hand, was a twenty-five pfennig stamp of Mecklenburg-Schwerin, issued in 1856. It was one-fourth the size of an ordinary postage stamp. Incidentally, it has been calculated that about 13,000 different kinds of postage stamps have been issued by the various countries of the earth.—Potter's Herald.

True Heroes and Heroines.

Do not weary in well-doing. Those who achieve the most are oftenest those who are hedged in by the thickest obstacles. These turn evil into good, failures into successes; they make inspiration of impediments, and let pluck triumph over worn out eyes, poor health and broken fortunes, and rise grandly above every obstruction. Character enwraps them as a garment, and they so clothe themselves with courage and persistence that the assaults of adverse fortune can not harm them. It is the one who is hampered by many cares, weighed down by physical infirmities, and who knows not where the next penny is to come from, who achieves in greatest measure. Not all the heroes and heroines of this world have their name writ on the scroll of fame, or are known outside their own domicile. Some day, the books shall be opened, and the air will be full of surprises. In many instances "The last shall be first, and the first shall be last."—Exchange.

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CHRISTMAS GREETING

Another Christmas is almost at hand. Again is the Christian world preparing to celebrate the birthday of the Saviour. Again the streets are crowded and the stores resplendent in the bright display and decorations of Christmas time, while rich and poor alike, with that keen pleasure that springs from the joy of giving, are secretly selecting, as their means permit, tokens of love for their dear ones. Soon in the happy home will be seen the lighted Christmas tree beautiful in its burden of glittering ornaments, and little ones, already joyous in the possession of all that Christmas has brought or eagerly anticipating old Santa's visit, while in the faces of the grown folks is reflected their childish delight, mingled with the benevolence and good-will which well within themselves.

All this does Christmas bring, and more, for where strife prevails its advent means spontaneous truce and sometimes reconciliation—animosities are forgotten and hostilities suspended while the Christmas spirit lasts.

"Glory to God, the sounding skies
With Heavenly anthems ring.
Peace to the earth—good-will to men
From Heaven's eternal King."

Full of poetry, feeling and glad associations, Christmas renews the bonds that unite families and friends, and strengthens kindly sympathy. Even lifelong associates require such a regularly recurring occasion to refresh the ties that bind them together. What but a Divine Power could thus so universally influence humanity. Kingdoms come and go. Nations flourish and decay. Empires rise in glory and power, then, weakened by internal dissensions or vanquished by superior external force, crumble and go to pieces, but the kingdom which Christ has established in the hearts of men yields not to the ravages of time, nor is it shaken by the vicissitudes of human domination; the ages but give it added strength and the passing centuries deeper root. Instituted by the humblest of men, and founded on principles that appeal to all that is good, noble and elevating in humanity, it is destined yet to silence the tumults of war, eradicate that selfishness which makes man forget his brother, and in his heart implant in its most perfected form and universal sense that Christly attribute—that joy which predominates at Christmas time—the joy of making others happy.

That mankind longs for the blessings of "peace on earth" is evidenced by the efforts of The Hague peace conference, held during the year about to close, and on the fact that that great gathering of the nations' representatives made some slight advance in that direction is humanity to be congratulated.

For the success with which our beloved Brotherhood has been blessed during the year that is about to close, we are most deeply grateful to the Giver of All

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Good, and in this particular have we much to be thankful for.

To our members, their loved ones, and our readers in general, the Magazine extends its greetings, with the heartfelt wish that for them is in store all the joy that a truly happy Christmas and bright New Year can bring.

* * *

Death of the Grand Master's Brother.

Once again has the heavy hand of death bereft Grand Master Hannahan of one near and dear to him, his brother Frank having answered the final and inevitable summons on Wednesday morning, November 13, 1907. Bro. Frank Hannahan, who was a member of Lodge 50, was one of the oldest engineers in point of service in the employ of the Rock Island system, running out of Chicago. He was 42 years old.

He was stricken while on duty, his death being caused by heart failure. He was beloved and respected by his fellow employes and associates generally, and held in high esteem by the officers of his company. An honest and straightforward manhood, a kind, generous and tender heart, a broad, liberal and magnanimous spirit and a sympathetic and affectionate disposition were some of Bro. Frank Hannahan's most conspicuous characteristics. Although of strong domestic tendencies, he subordinated to the love of his two sisters the joys of a home of his own, preferring to continue the old family ties unbroken that he might perpetuate their happiness. It is not surprising that such a man should be beloved by all who knew him.

To the Grand Master in particular has the death of his brother come as a sevère blow, as the two men were deeply attached to each other, the passing years having but served to strengthen the deep, brotherly affection existing between them since the days of childhood.

The fact that the Grand Master had been looking forward to a visit from his brother during the week following that in which his death occurred, added to the intensity of the sorrow that sad event occasioned him. Brother Hannahan's funeral was held from the residence, 4033 Dearborn street, services being conducted at St. Elizabeth's church, interment taking place in Mt. Olivet Cemetery, Chicago, Ill., to which point the remains were conveyed over the C., R. I. & P. and Grand Trunk railways in a special train consisting of ten coaches, draped in mourning, the officials of those roads refusing to accept compensation for the services rendered.

The ritual services of our Brotherhood were held at the grave and were conducted by First Vice Grand Master C. A. Wilson, assisted by Fourth Vice Grand Master A. P. Kelly, Fifth Vice Grand Master Asa Dillon and Dr. W. B. Cory, Grand Medical Examiner. Bro. W. S. Carter was also in attendance and at the side of the Grand Master. Bro. J. N. Parry, of Lodge 50, who is as old in point of service with the C., R. I. & P., as was Brother Hannahan, waived his rights as an officer of the lodge to Brother Wilson. Bro. Parry distributed the cedar twigs and did much towards making the service at the grave solemn and impressive. Bro. Geo. Goding, of Lodge 499, rendered most valuable and efficient service in handling the funeral train.

To the Grand Master and Brother Hannahan's other relatives who are left to mourn him, the Magazine extends its sincère sympathy in this their hour of bereavement.

* * *

The Philadelphia Union Meeting.

Arrangements are now almost complete for a Grand Union Meeting to be held at Philadelphia, Pa., on Sunday, December 29th. Owing to the extensive preparations that have been under way and the large number of lodges interested, the gathering promises to be a most pronounced success. The lodges under whose auspices the meeting will be held are 60, 72, 75, 319, 253, 231 and 333, all of which have entered into the work with a spirit of determination that insures for the event the greatest possible success.

Bro. P. A. Lynch, of Lodge 75, has been selected chairman of the arrangements committee, and Bro. Ernest Evans, of Lodge 333, as secretary.

The meeting will be held at Davis hall, 3930 Lancaster avenue, West Philadelphia, Pa. While invitations in circular form will be sent to the various lodges throughout the eastern country, the arrangements committee desires, through the columns of the Magazine, to extend a hearty invitation to all members throughout the entire jurisdiction of the

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Brotherhood to come and enjoy the pleasures of their union meeting.

Grand officers will be in attendance and no effort will be spared to insure to all present a most pleasant and entertaining time. The boys are enthusiastic over the prospects of a big meeting and there is no doubt as to the result, as the brothers of Philadelphia and vicinity know how to take care of such a gathering, and for those of our members who can possibly arrange to be present there is certainly a treat in store.

* * *

Brother Carter Has Something to Say.

Special attention is directed to the article appearing elsewhere in this issue, contributed by Bro. W. S. Carter, Grand Secretary and Treasurer, entitled "The Real Issue Between the Two Enginemen's Brotherhoods." The arguments and statements set forth in same are not only logical, but being the result of a quarter of a century's experience on the part of a conservative man, who has made the subject a careful study in all its phases and details, is absolutely reliable as well. It is doubtful if there is anyone who is in a better position to discuss the insurance feature of the two organizations than is Brother Carter, his position as Grand Secretary and Treasurer, and the assiduity with which he applies himself to its duties, affording him a range of knowledge on this subject that is hardly otherwise attainable.

Brother Carter is not now and never has been in any sense inclined to indulge in exaggerations, and it will be to the interest of our members and thousands of those of the Brotherhood of Locomotive Engineers as well, to read and carefully reflect upon his contribution to the columns of this issue. Our members could not probably serve their friends and acquaintances amongst the latter more substantially than by directing their attention to this article and inviting them to read and consider it.

It is to be hoped that if there are any members in our Brotherhood who for any reason entertain even a remote idea of ever joining the B. of L. E. and thus surrendering their membership in the Brotherhood of Locomotive Firemen and Enginemen, they will read Brother Carter's article and, appreciating the awful mistake they would make by taking such a step, abandon their contemplated action in this particular.

Canadian Subscriptions—Important Notice!

Notwithstanding the fact that on May 8, 1907, the postage rate on publications mailed in the United States to subscribers in Canada was increased to *four times* the rate charged for the same publications mailed to subscribers within the United States and Mexico, the subscription price of the Locomotive Firemen and Enginemen's Magazine to Canadian subscribers remains the same, viz., $1.50 per year.

Consequent upon the taking effect of the increased postage rate on second-class matter mailed in the United States for subscribers in Canada, many of the leading publications of the United States immediately increased their subscription rate to Canadian subscribers to a sufficient amount to cover the increased cost of postage. The subscription price of the Magazine being fixed by a law enacted by the Convention, our membership will readily understand that the Editor and Manager has no discretionary power in the premises, and notwithstanding the fact that the increase in postage on Magazines mailed to Canada has almost eliminated any possible profit that might accrue therefrom, and the further fact that where commissions were paid to solicitors for such subscriptions same were furnished at an actual loss to the Brotherhood, he has felt it incumbent upon him to fill all such orders.

After giving the matter much thought and serious consideration, he has decided to avail himself of the privilege conferred by Section 32 (lines 25 to 32 inclusive), page 20 of the Constitution, which says: "The Editor and Manager *may* appropriate a sum not to exceed 50 cents on each subscription ordered by any person, said amount to be expended in the purchase of a premium or premiums for the person so ordering and paying for subscriptions, at such time as application is made for the premium desired and to which the person is entitled." This, it will be noted, leaves it discretionary with the Editor and Manager as to the amount to be paid in the way of a commission or premium (providing it does not exceed 50 cents on each subscription ordered), or whether any commission or premium at all shall be allowed. Such being the case, and knowing that the subscription price of the Magazine to our Canadian subscribers can not be increased prior to the *convening* of the Grand Lodge *in conven-*

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tion assembled, and believing that it is not the desire of our membership that the Magazine should be supplied to such subscribers at an *actual loss* to the Brotherhood, the Editor and Manager gives notice herewith that beginning January 1, 1908, all orders for subscriptions to be sent to Canada must be accompanied with the full subscription price of $1.50 each, and no commissions will be paid or premiums allowed on such subscriptions.

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The San Antonio Union Meeting.

The lodges throughout the Southwest have decided to hold a monster Union Meeting representative of that section of the country, the dates fixed for it being January 29, 30, 31, 1908. The meeting is to be held in the beautiful city of San Antonio, which, on account of its pleasant climate and the memories of great historic events which cluster around it, render it unusually appropriate for such a gathering.

San Antonio is the largest city in the state of Texas. It is situated on the San Antonio river, a distance of 150 miles from the Gulf Coast. It is an old Spanish city, beautifully laid out on both banks of the river on the top of a plateau 661 feet above the sea level. There are still to be found in its public plazas many of the quaint characters of the old Spanish regime. The grand old Alamo is alone worth a trip to see. During the month of January the moss-clad evergreen oaks will be in their glory, the winter scenes in the public parks being sights never to be forgotten.

San Antonio combines the quaintness of its identity with the long gone past and the energy and progress of a great American people. Spanish scenes, localities and public buildings still designated in the liquid language of Spain mingle interestingly with the progressive characteristics of the modern American city. A visit to San Antonio during the dates of the union meeting will be a most pleasant experience to the winter-bound brothers of the North.

We are not yet in possession of information as to the program, arrangements, etc., but full particulars will appear in the January issue. The committee of arrangements consists of wide-awake, hustling brothers, Bro. Otto L. Kingsley, of the Grand Executive Board, being its chairman.

Heroic Rescue.

Another act of daring heroism through which the life of a toddling infant has been saved, is to be recorded in the annals of the railroad history of the United States. On August 17, 1907, a fast freight train on the Baltimore & Ohio Railroad—No. 82, consisting of thirty heavily loaded freight cars and hauled by engine No. 2273, with Engineer J. G. Brown and Fireman T. Conley in charge—was thundering on its way from Parkersburg to Grafton, W. Va. On rounding the curve at Krawha the fireman was horrified to see the form of a little child between the rails about 400

TIMOTHY CONLEY

yards ahead. With a yell to the engineer, which caused the latter to make instant use of every agency at his command to stop the train, Fireman Conley bounded to the running board, crept down on the pilot and fastening one of his feet between its slats, awaited his opportunity to save the precious little life that now depended upon the success of his noble effort. Despite the momentum of the ponderous freight—which, when the child was first observed was making forty miles an hour—he caught the little form in his manly arms and stuck fast to his perilous position until the train was brought to a standstill.

Realizing the rate of speed at which they had been moving, and believing that it was hopeless to expect that his brave

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fireman could have succeeded in saving the little one, the engineer on getting stopped jumped from his engine and started back along the train, expecting to see the mangled remains of the child and its rescuer under the wheels. His delight can be better imagined than described upon finding them both alive and unhurt. Mrs. Jackson, the mother of the child—whose name, by the way, is Joseph Jackson—lived close to the track. She had just missed the little tot and observing the fast freight coming to a standstill, started in quest of her baby. When she saw the manly fellow coming with her child unhurt, the strain incident to her contending emotions being too great to bear, she fell in a swoon.

Brother Conley, whose photograph we publish herewith, is a member of Green Valley Lodge No. 223 of our Brotherhood, and is also local chairman of his division. He has been complimented by the general manager of the system, and it is understood that his superintendent has written a full account of the case to the Interstate Commerce Commission, as well as to the Carnegie hero fund, with a view to securing for him all the honor and recognition that can through these sources be bestowed upon him, and of which he is so well deserving. Such men as he are amongst the greatest assets a nation can possess.

The Cleveland Union Meeting.

Arrangements are well under way for a Grand Union Meeting to be held in the city of Cleveland, Ohio, under the auspices of Forest City Lodge No. 10, on January 21, 22 and 23, 1908, in celebration of its thirtieth birthday. The program as outlined promises to be of unusual interest, owing to the fact that one of the largest classes of candidates in the history of the Brotherhood will be on hand for initiation. It is expected that this class will number not less than 100, and may exceed that figure.

The arrangements thus far provide for exercises as follows:

January 21: There will be a secret session in the afternoon, to be followed by a public meeting in the evening. The latter meeting will be addressed by men of prominence, amongst them Tom Johnson, mayor of Cleveland.

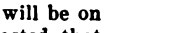
January 22: There will be two secret sessions, at which the class of candidates above referred to will be initiated. These sessions promise to be amongst the most interesting of their kind in the history of our Brotherhood. They will be followed in the evening by a vaudeville entertainment, a special program being arranged for this occasion at one of the leading theaters.

January 23: This date will be devoted to two secret sessions, at which matters of interest to the Brotherhood will receive attention, and in the evening there will be a grand ball.

Lodge No. 10 is determined to make this union meeting a most interesting and enjoyable event. This lodge has a record of which its membership may well feel proud. From a small beginning, thirty years since, it has flourished and grown to its present proportions—475 members. It has to its credit a magnificent accomplishment in the field of organized effort.

Every member of the Brotherhood is cordially invited to attend this meeting and help celebrate the thirtieth birthday of Lodge 10. A warm welcome awaits them at the hands of the boys of the Forest City.

One of the most sure guarantees of the complete success of the Cleveland Union Meeting is the fact that Forest Flower Lodge No. 15, of the Ladies Society, will co-operate with No. 10 in taking care of all visitors, part of the work it has laid out for itself on the occasion being the serving of meals in a hall adjoining the hall in which the meeting will be held. Forest Flower Lodge occupies a position in the Ladies Society similar to that occupied by Lodge 10 in the Brotherhood, being one of the most successful in the Society, and with two such organizations co-operating for the success of a union meeting, it is unnecessary to say that same is assured.



Concerted Movement—Lines East of Chicago.

In the early part of the present year, the General Chairman of the roads west of Chicago met in that city in a concerted movement, arranged for the purpose of securing more uniform employment, better rates of pay and working conditions generally within their respective jurisdictions. That very substantial benefits have resulted from that movement is a fact generally recognized and appreciated

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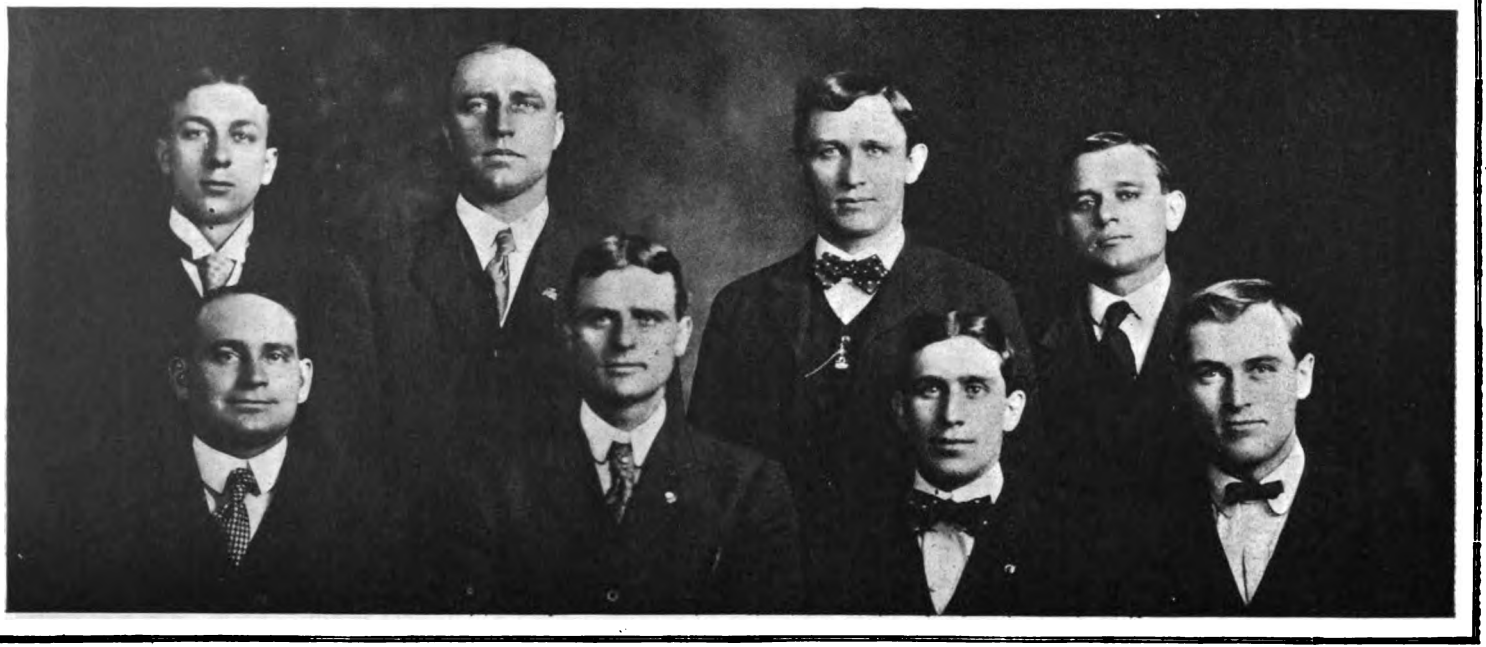

Wm. Parr, 856 — J. H. Bridges, 405 — J. M. Riopelle, 532 — W. H. Dikas, 408

Finis McLean, 54
Vice-Chmn.

Chas. F. Thomas, 535
Chairman

W. L. Dwelley, 49
Sec.-Treas.

M. Jensen, 526

JOINT PROTECTIVE BOARD, WABASH SYSTEM

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—so much so that a concerted movement for the lines east of Chicago has been planned, to arrange for which General Chairmen of those lines met in the city of Buffalo, N. Y., on October 15, 1907, which meeting will be reconvened in Buffalo on December 5, 1907. The Stafford House has been selected as headquarters.

Circulars giving particulars, which need not be repeated here, have been distributed amongst our membership on the lines interested, and it is to be hoped that the General Chairmen of those lines without exception will be present at the meeting of December 5th, so that success may attend the concerted movement of the lines east of Chicago as great, or greater, than that which characterized the concerted movement of the lines west of Chicago.

Prominent amongst the advantages to be derived from concerted action is the elimination of the tedious, expensive and tiresome waits to which our Joint Boards are often subjected in meeting with the officials of individual systems, and the uniformity in rates of pay and working conditions that can in this way only be established and maintained.

The success of this concerted movement will mean that many of our members who today are receiving less pay and working under more unfavorable conditions than those employed on other systems in the territory covered by it will be brought up to the highest standard established in that territory as a result of said movement, and that the uniformity thus established will be maintained perpetually.

Our members on the various systems interested should take the necessary steps to insure the attendance of their General Chairmen, so that the movement may be in every sense that the word implies, a concerted one, and its efforts correspondingly efficacious. It is to be earnestly hoped that every system east of Chicago will be represented by its General Chairman.

THE REAL ISSUE BETWEEN THE TWO ENGINEMEN'S BROTHERHOODS

By W. S. Carter, Grand Secretary and Treasurer

The dispute between the Brotherhood of Locomotive Engineers and the Brotherhood of Locomotive Firemen and Enginemen, which dispute has involved to some extent the railway companies, has been misunderstood. Railway officials, and perhaps the public, have been led to believe that it is simply a "jurisdiction" fight between two labor organizations, each contending for supremacy.

Nothing could be farther from the truth. The contest is a struggle between two insurance organizations, and it is well known to the members of both that it will be a case of "the survival of the fittest."

A great many years ago the Brotherhood of Locomotive Engineers, realizing the importance, if not the necessity, of providing insurance protection for its members, adopted insurance features not unlike those of other mutual benefit associations. In the beginning participation in the insurance department of the Brotherhood of Locomotive Engineers was optional, but it was found that in order to make the insurance department a permanent institution, the laws would have to be so changed as to make it obligatory on every member of the Brotherhood of Locomotive Engineers to take out a beneficiary certificate in its insurance departmuent.

As the Brotherhood of Locomotive Engineers became an older institution, naturally the beneficiary assessments, necessary to maintain its insurance department, became heavier and a greater burden for its members to carry. One of the first results of this increased cost of insurance in the Brotherhood of Locomotive Engineers was to cut off from it some of the supply of young engineers which had always come to it from the

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men who had been promoted from locomotive firemen by the officials of the railway companies.

Years subsequent to the organization of the insurance department of the Brotherhood of Locomotive Engineers the locomotive firemen patterned after them an organization known as the Brotherhood of Locomotive Firemen, and in turn adopted an insurance department similar in many details to that of the Brotherhood of Locomotive Engineers.

A large proportion of the locomotive firemen in the service of the railway companies affiliated with this Brotherhood of Locomotive Firemen and took out beneficiary certificates, or insurance policies, in that organization. When it became known that the cost of insurance in the Brotherhood of Locomotive Engineers greatly exceeded the cost in the Brotherhood of Locomotive Firemen, there was a hesitancy on the part of the young engineers in joining the Brotherhood of Locomotive Engineers, and many thousands of them refrained from so doing. Thus it will be seen that the supply of "young blood" was largely cut off from the insurance department of the Brotherhood of Locomotive Engineers.

This failure or refusal of promoted men to join the insurance department of the Brotherhood of Locomotive Engineers aggravated the disease, and it soon became evident that the Brotherhood of Locomotive Engineers must in some manner secure the assistance of these young engineers in carrying on their insurance work. In order to secure this assistance, the Brotherhood of Locomotive Engineers has resorted at different times to the following methods:

The Tactics of Desperation.

When it was discovered that young engineers who were members of both the Brotherhood of Locomotive Engineers and the Brotherhood of Locomotive Firemen, i. e., members of both organizations, carried little or no insurance in the Brotherhood of Locomotive Engineers and carried their insurance in the Brotherhood of Locomotive Firemen, a law was enacted which denied to these "double headers" the right to represent a division in a convention, and other petty burdens were placed upon these "double headers," the purpose of which was to induce them to withdraw entirely from the Brotherhood of Locomotive Firemen and put all of their insurance contributions into the funds of the Brotherhood of Locomotive Engineers. While this method was perhaps not intended to give affront to the members of the Brotherhood of Locomotive Firemen, it was immediately resented as a restriction of the personal liberties to which every American citizen is entitled. This resentment led to a result the reverse of that which was intended, and young runners refused in many instances to affiliate with the Brotherhood of Locomotive Engineers in any manner whatever.

More radical measures were subsequently adopted, wherein it was prescribed that no member of the Brotherhood of Locomotive Firemen, who joined that Brotherhood after the enactment of a new law, could retain his membership in the Brotherhood of Locomotive Firemen after a certain period of time. This prohibited an engineer from being a "double header;" that is, it prohibited him from joining the Brotherhood of Locomotive Engineers and at the same time retaining his membership in the Brotherhood of Locomotive Firemen. It was thought that by the enactment of this radical measure young engineers, in order to get the "protection" from the Brotherhood of Locomotive Engineers as a labor organization, would surrender their insurance protection in the Brotherhood of Locomotive Firemen. To a certain extent this drastic measure succeeded in forcing young runners to abandon the Brotherhood of Locomotive Firemen, and its cheap insurance, and affiliate with the Brotherhood of Locomotive Engineers, and its expensive insurance. This oppressive measure, however, resulted in greater resentment on the part of the young engineers who believed that they should be protected in their rights as employes of a railway company, and yet not be forced to surrender their interests in an insurance fund to which they had contributed for so many years. This resentment on the part of the engineers who had retained their membership in the Brotherhood of Locomotive Firemen, led to an estrangment between these two organizations, and the latter has now become an association of both firemen and engineers.

The laws of the Brotherhood of Locomotive Engineers now in effect, which were enacted for the purpose of compelling all locomotive engineers to contribute to the insurance department of the Broth-

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erhood of Locomotive Engineers, are as follows:

Coercive Legislation.

On page 29 of the present constitution of the Brotherhood of Locomotive Engineers it will be seen that section 27 compels all members of any other labor organization who become members of the Brotherhood of Locomotive Engineers, to show satisfactory proof that they have withdrawn from all other labor organizations within ninety days, and failing to show this proof they will suffer the penalty of expulsion. As few or none of the engineers who join the Brotherhood of Locomotive Engineers belong to any other labor organization than the Brotherhood of Locomotive Firemen and Enginemen, it can be readily understood that this penalty of expulsion would never be enforced except against a member of the Brotherhood of Locomotive Firemen and Enginemen.

It will be seen by referring to section 27 that if any subdivision of the Brotherhood of Locomotive Engineers fails to enforce these laws of that brotherhood, that its charter shall be suspended.

On page 32 of the present constitution of the Brotherhood of Locomotive Engineers, section 39 prohibits any member of the Brotherhood of Locomotive Engineers in active service joining any other labor organization, under penalty of expulsion. As no engineer in active service would probably ever desire to join any other labor organization except the Brotherhood of Locomotive Firemen and Enginemen, it is easily understood at what labor organization this section is directed.

By referring to page 23 of the constitution of the Brotherhood of Locomotive Engineers, it will be noted that section 2 prohibits any member who is a member of the Brotherhood of Locomotive Firemen and Enginemen, and who may have joined the Brotherhood of Locomotive Engineers before these restrictive measures were enacted, from being elected as chief engineer, delegate to the Grand International Division, or as a member of any general committee of adjustment, or any local committee or legislative board of any division of the Brotherhood of Locomotive Engineers.

By referring to page 39, it will be seen that section 69 prevents the reinstatement of any member who has been expelled, unless he furnishes evidence that he has not joined the Brotherhood of Locomotive Firemen and Enginemen during the period of his expulsion.

It will be seen, by referring to page 69, that section 45 prohibits the General Committee of Adjustment of the Brotherhood of Locomotive Engineers from meeting in joint session with a committee of the Brotherhood of Locomotive Firemen and Enginemen so long as an engineer who has more than six months' experience as a locomotive engineer is on the committee of the Brotherhood of Locomotive Firemen and Enginemen.

Unfortunately, the belief has become popular with the members of the Brotherhood of Locomotive Firemen and Enginemen that all of these coercive and restrictive measures have been directed against members of the Brotherhood of Locomotive Firemen and Enginemen because of the purpose on the part of the Brotherhood of Locomotive Engineers to injure or destroy the Brotherhood of Locomotive Firemen and Enginemen. It would perhaps be fair to the Brotherhood of Locomotive Engineers to confess that the only purpose it has had in the enactment of all of these coercive measures has been to compel young men who have been promoted from the position of locomotive firemen to that of locomotive engineer to come into the Brotherhood of Locomotive Engineers and furnish the "young blood" that is so essential to the existence of all mutual benefit associations.

A Struggle for Existence.

It has been known to the Brotherhood of Locomotive Engineers, in convention assembled, for many years, that the insurance department of that organization could not survive unless methods were adopted which would compel young engineers to contribute their support to the insurance department of that organization. The picture that has been painted to delegates at the conventions of the Brotherhood of Locomotive Engineers has been so dark that twelve years ago that organization abandoned its insurance department as an integral part of its labor organization. While making provisions for the coming calamities, the Brotherhood of Locomotive Engineers created what is known as the "Locomotive Engineers' Mutual Life and Accident Insurance Association," which association has a separate set of officers and to all intents and purposes is a dis-

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tinct organization from the "labor organization." The labor organization, however, yet compels every engineer who joins that Brotherhood, and who is physically qualified, to participate in its insurance department. By this segregation of its insurance department from its labor union, the Brotherhood of Locomotive Engineers is in position to abandon its insurance department whenever it becomes bankrupt, and yet maintain the labor organization.

Looking Out for Themselves.

When we take into consideration that the delegates at the conventions of the Brotherhood of Locomotive Engineers are usually made up of gray-haired and aged men, it is not surprising that they should be influenced in their legislative work by the knowledge that they must depend upon the insurance department of the Brotherhood of Locomotive Engineers for insurance protection of their families. They have realized, these delegates, that they have passed the age when they could get insurance in any other organization, and as far as these delegates are concerned, it is a life and death struggle with them. Having in view this fact, they perhaps are more to be pitied than to be blamed for the enactment of the coercive measures heretofore quoted.

As the best evidence that the legislation of the Brotherhood of Locomotive Engineers is being dictated by men aged and gray, and largely in the interests of old men, we can refer to page 89 of their present constitution, whereon will be found in section 35 provisions that all old men who are out of employment and unable to earn over thirty dollars a month, will have their insurance paid and perpetuated by the younger members of the Brotherhood of Locomotive Engineers, who will be compelled to maintain its insurance funds. This section shows how thoughtful these aged and gray-haired men have been for themselves. They have known that it was but a matter of a few years, at the most, when they would be too old for service, and possibly thousands of their old members would not be able to keep up the expenses of their insurance. The framers of this section evidently realized that while the old men secured the benefits, the young engineers, who were coerced into joining the Brotherhood of Locomotive Engineers, would be compelled to pay the expenses of not only their own insurance, but of these old men as well.

By referring to page 14 of the present constitution, the handiwork of the aged and gray-haired delegates is again noted. Section 41 provides that when any member becomes unable to pay grand dues, the Grand Chief shall have the power to remit his grand dues.

Section 42 provides for an "indigent fund," whereby aged members who are unable to perform any kind of labor and have no one to take care of them but the Brotherhood of Locomotive Engineers, may receive a pension not to exceed twenty dollars a month.

Seek Railroad Companies' Help.

The time came when the Brotherhood of Locomotive Engineers had to adopt more radical measures to force young engineers to join that organization. It is now proposed that railroad companies be enlisted as recruiting agencies. The Brotherhood of Locomotive Engineers, by direction of its recent convention, is now attempting to compel officials of railway companies to enter into contracts with the Brotherhood of Locomotive Engineers which will take from the engineers who yet retain their membership in the insurance department of the Brotherhood of Locomotive Firemen and Enginemen, their last hope. The Brotherhood of Locomotive Engineers now propose to enter into a conspiracy, if you like to call it by that name, with certain railway officials, which will take from locomotive engineers who are not members of that organization, the right to secure justice, in a manner which has always been accorded to them in the past. It is proposed that contracts will be entered into between railway officials and officials of the Brotherhood of Locomotive Engineers, that will say to any locomotive engineer who yet retains his membership in the Brotherhood of Locomotive Firemen and Enginemen, that "unless you join the Brotherhood of Locomotive Engineers and abandon your insurance in the Brotherhood of Locomotive Firemen and Enginemen, for which you have paid for so many years, you shall not receive justice from the railway companies."

It is a fact well known to all railroad officials that there is more or less contention between all employes in train service over the question of "seniority rights." These disputes as to seniority rights are usually between members of the same or-

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ganization, and it requires much of the tact and diplomacy of the officers of these organizations of railway employes to settle the disputes between its individual members as to their respective seniority rights.

Under these circumstances, what justice can a locomotive engineer who is a member of the Brotherhood of Locomotive Firemen and Enginemen expect to receive from the company when his case must be presented by a committee of his bitterest enemies—by a committee who would gladly deprive him of his seniority rights in order to give it to one of their own kind? There are but few railway officials of years of experience who do not know that many of the contentions that come before them are presented by the Brotherhood of Locomotive Engineers on the one hand, and the Brotherhood of Locomotive Firemen and Enginemen on the other hand, and the subject under dispute is the seniority rights of the members of the two organizations. If the Brotherhood of Locomotive Engineers can adopt this last measure by the assistance of the railway officials, it is hoped that the insurance department of the Brotherhood of Locomotive Engineers may be prolonged until its present old men are dead.

Facts That Are Incontrovertible.

This challenge is here presented: If a true statement of the ages of members of the Brotherhood of Locomotive Engineers will be submitted to any insurance actuary, and the facts and circumstances surrounding the membership in that organization are so submitted, that actuary will give an opinion, without hesitation, that the Brotherhood of Locomotive Engineers' insurance department can not last twenty years.

It is safe to say that there are 25,000 of the members of that organization who are now beyond the age of fifty years; perhaps twenty per cent. of the members of that organization are near the age of sixty years. It is a conservative statement to say that the Brotherhood of Locomotive Engineers, if it meets all of its insurance obligations during the coming twenty-five years, must contribute to its insurance fund more than $100,000,000 (one hundred million dollars). It must be remembered that these old men, whose lease of life has nearly run, have all taken out as much insurance as the organization will grant them. When these old men begin to die it will not be unlike the falling away of the membership in the Grand Army of the Republic. How well we all remember the scoffs that were hurled at the old soldiers' organization because for so many years the pension list seemed to grow, but how well do we also know that when the turn of the tide came that the old soldiers fell away like autumn leaves, and it is but a few years at the most until nearly all are gone.

Many locomotive engineers now in the service of the railway companies on the North American Continent do most vigorously protest against being robbed of their insurance by being compelled to abandon an organization made up largely of young men and cast their lot with an insurance organization of old men. They know full well that there is not one of them who in the prime of his life thus abandons his insurance in the Brotherhood of Locomotive Firemen and Enginemen and takes up the burden of maintaining the insurance department of the Brotherhood of Locomotive Engineers, and is so fortunate as to live for a period of twenty-five years, but will find himself at that time without any insurance protection in the Brotherhood of Locomotive Engineers, and himself too old to secure insurance protection from any other source whatever.

A Timely Declaration.

The Brotherhood of Locomotive Firemen and Enginemen, on behalf of its sixteen thousand locomotive engineer members, hereby protests against the railway companies attempting to compel them to enlist as pall-bearers to an organization that now realizes it soon must follow its dead.

It is for these reasons that the Brotherhood of Locomotive Firemen and Enginemen protests against any agreements between officials of the railway companies and the officials of the Brotherhood of Locomotive Engineers, which agreement will deprive, or tend to deprive, its engineers of the insurance protection for which they have paid so many years.

The many, many thousands of locomotive firemen, who are members of the Brotherhood of Locomotive Firemen and Enginemen, realize that it will be but a short period of time when they in turn, as locomotive engineers, will be subjected to coercive tactics with a view to having them abandon their insurance protection.

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This mutuality of interests of locomotive firemen and locomotive engineers in the Brotherhood of Locomotive Firemen and Enginemen causes them to unite in vigorous protest against any effort on the part of a railroad company to prolong, at these men's expense, the existence of an insurance association that is on the verge of collapse.

The members of the Brotherhood of Locomotive Firemen and Enginemen are so earnest in this protest that they will resort to every measure at their command to protect themselves, their wives and their children, from so gross an injustice.

* * *

Sparks.

Many new advertisements appear in this month's issue of the Magazine. Many of these are special lines of holiday goods. The appearance of these ads in the Magazine should aid our readers in solving the perplexities of selecting suitable Christmas presents for their friends and loved ones. Buy from our Magazine advertisers wherever and whenever you can. By so doing you will no doubt save money and at the same time be helping the Magazine and the Brotherhood.

Remember December 29, 1907, the fifth Sunday in December, is the date of the Grand Union Meeting to be held at Philadelphia, Pa.

Brothers, read Brother Carter's article entitled "The Real Issue Between the Two Enginemen's Brotherhoods," appearing in this issue. From it you will learn of the serious mistake a man makes from a standpoint of insurance protection alone, in abandoning the Brotherhood of Locomotive Firemen and Enginemen to join any other organization.

The more active the membership the stronger the Brotherhood. An organization of indifferent members soon goes to pieces. It should be the ambition of every B. of L. F. and E. man to bring our Brotherhood up to the 70,000 mark for the Columbus convention. If every one will put his "shoulder to the wheel" this can be easily accomplished. Let no man within the circle of your acquaintance who is eligible to membership remain outside of our ranks through your failure to furnish him with application blanks, and explain to him the benefits of the Order.

The Cleveland Union Meeting, under the auspices of Forest City Lodge No. 10, to be held in celebration of its thirtieth birthday, promises to be as a union meeting all that can be wished for. No effort will be spared in making it a magnificent success.

Every locomotive employe should be thoroughly proficient in a knowledge of the construction and use of the electric headlight. The best work thus far published on this all-important subject is our Catechism of the Electric Headlight. Engineers and firemen, as well as hostlers and other roundhouse employes working in connection with locomotives, should have one. Send 50 cents to John F. McNamee, 806-7 Traction Terminal Building, Indianapolis, for a copy. You can not afford to be without it.

Elsewhere in this issue will be found from the pen of our Grand Secretary and Treasurer, Bro. W. S. Carter, an article entitled "The Real Issue Between the Two Enginemen's Brotherhoods," bearing on the present relations between our Brotherhood and the Brotherhood of Locomotive Engineers. This article demonstrates in the clearest and simplest terms the extent to which a man's insurance interests are jeopardized by withdrawing from our Brotherhood to become a member of the B. of L. E.

A visit to San Antonio during the coming Grand Union Meeting will be a special treat to those boys of the winter-bound North and their friends who can arrange to attend it, for the meeting will be held January 29, 30 and 31, 1908—midwinter—and San Antonio is a city of perpetual flowers and balmy weather.

To those brothers who have been asking concerning the statement that the B. of L. E. is making inroads in our membership on the Southern Pacific, we wish to state that there is no truth in the rumor. Our engineer members are remaining as firmly B. of L. F. and E. men as they were during the strike, and we do not believe they would care to associate with men who scabbed on them. Our men on the Southern Pacific are not of that stamp.

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Look out for the big Union Meeting to be held in Philadelphia, Pa., December 29th. They are expecting a big crowd and a good time is assured every one who attends.

Bro. H. S. Peters takes occasion in his page advertisement this month to point out the fact that he has been operating his "Brotherhood' overall factory on the eight-hour basis for a number of years. The eight-hour movement and the Saturday half-holiday are old and well-established institutions with Brother Peters.

Every fireman of good character who has been employed as such for nine months or over, as well as every engineer whom you can induce to join, should be members of the B. of L. F. and E. Brothers, see to it that none whom you can influence to become members remain outside of the ranks of the old "Tried and True."

Bro. Henry Herman, 97 Grand avenue, Middletown, N. Y., has complete volumes of the Magazine from 1892 to 1907, inclusive, in first-class condition, and wishes to dispose of them.

Remember January 21, 22 and 23, 1908, are the dates of the Grand Union Meeting to be held in the city of Cleveland, Ohio, under the auspices of Forest City Lodge No. 10, and in celebration of its thirtieth birthday.

Second-hand lodge news is always unreliable. The active members who get it first seldom grumble. Street-corner gossip is hardly to be depended upon when it centers on lodge work. Go to lodge and find out for yourself what is going on.

The demand for the Catechism of the Electric Headlight is an excellent proof of its efficiency and popularity as a textbook on that device. If you want to have a copy before the supply is exhausted, send 50 cents to John F. McNamee, 806-7 Traction Terminal Building, Indianapolis, Ind., and receive one by return mail.

One of the most pleasant trips our members can at present contemplate is a visit to San Antonio, Texas, during the days when the Big Union Meeting will be in session—January 29, 30 and 31, 1908. The boys of the South are true blue and they are noted for their hospitality and then, besides, San Antonio is a city of most interesting historic buildings and scenes.

The "Real Issue Between the Two Enginemen's Brotherhoods" is the title of an article from Bro. W. S. Carter appearing elsewhere in this issue. Every brother should carefully read and reflect on it.

Do not overlook the date of that big Union Meeting to be held in Cleveland, Ohio, January 21, 22 and 23, 1908, and at the same time remember that it has been arranged in celebration of No. 10's birthday.

Notwithstanding the numerous requests we have made to our readers to sign their letters for publication, we are still receiving anonymous communications, amongst the latest being one wherein a technical question is asked concerning broken eccentric straps. This letter was written from Calgary. And another from Seattle concerning time-card rules on interurban roads. If the writers will give us their names the questions will be answered in the usual way. Otherwise we can take no further notice of them.

The Philadelphia, Pa., Union Meeting, Sunday, December 29, 1907, promises to be a magnificent success. It will be held under the auspices of seven lodges, Nos. 60, 72, 75, 319, 252, 231 and 333. All members of the Brotherhood are cordially invited to be in attendance, and they can rest assured that the boys who have projected the meeting will leave nothing undone to make their visit all that can be desired.

Every General Chairman of the lines east of Chicago should be present at the meeting to be held in the city of Buffalo, N. Y., December 5, 1907, to take part in the concerted movement. The Stafford House will be headquarters.

The many compliments paid by our members to the Catechism of the Electric Headlight is very deeply appreciated. We are pleased to have been able to place in the hands of Magazine readers this useful little work. The demand for it has been so great that a second edition has been published. It is still supplied at the price of 50 cents and can be

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secured by addressing John F. McNamee, Editor and Manager, 806-7 Traction Terminal Building, Indianapolis, Ind.

There is a most interesting time in store for all who can attend the Philadelphia, Pa., Union Meeting. Judging from the character of the arrangements, and the number of lodges interested, it will be amongst the largest and most successful that has been held under the auspices of the Brotherhood during the year. Grand Lodge officers will be in attendance and no effort will be spared in making the event one long to be remembered.

The Webb C. Ball Company shows resettings of both its watch and emblem jewelry advertisements this month. Those who have Christmas presents to buy for their husbands, brothers, wives or sweethearts will find it to their advantage to correspond with the Ball Company in response to its advertisements in this Magazine.

Remember the dates of the Grand Union meeting to be held at San Antonio, Texas, January 29, 30 and 31, 1908.

Fifty cents mailed to John F. McNamee, 806-7 Traction Terminal Building, Indianapolis, Ind., brings you one of those books they are all talking about —the Catechism of the Electric Headlight. If you are ambitious you can not afford to be without one. They are what you need.

The Texas boys are determined to make their union meeting at San Antonio (announcement of which appears elsewhere in this issue) an event long to be remembered. All brothers who can possibly arrange to attend should be present.

It is to be hoped that our members on every system east of Chicago will be represented at the meeting of General Chairmen which will be held December 5, 1907, at Buffalo, N. Y., for the purpose of conducting a concerted movement. Headquarters will be at the Stafford House.

When it comes to Brotherhood matters, don't always take the other fellow's word for it. Reason out for yourself and you will always be better satisfied. Attend lodge meetings regularly and take a hand in the work.

Forest City Lodge No. 10, Cleveland, Ohio, is one of the largest lodges in the Brotherhood. Its membership now numbers about 475. This most successful and energetic lodge has announced that it will, jointly with Forest Flower Lodge No. 15 of the Ladies Society, celebrate its thirtieth birthday anniversary with a Grand Union Meeting. Judging from the scope of the preparations that are already under way, No. 10 proposes to make this celebration one of the most memorable events in the history of the Brotherhood. Neither effort nor expense will be spared in making this union meeting and celebration in general a magnificent success. The dates of the meeting are January 21, 22 and 23, 1908.

Union meetings constitute an excellent medium for maintaining interest in Brotherhood matters. There is nothing more effective in stirring up members that are inclined to be indifferent. If you have not had a union meeting in your district yet you should start to arrange for one without delay.

Special attention is directed to the union meetings to be held at San Antonio, Texas; Cleveland, Ohio, and Philadelphia, Pa., announcements of which appear elsewhere in this issue. Every brother that can possibly do so should be in attendance.

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BROTHERHOOD BULLETINS

FOR THE INFORMATION OF ALL LODGES AND MEMBERS, CONDUCTED BY THE GRAND SECRETARY AND TREASURER

Good Intentions Save No Souls.

A sinner has just as good a chance to break into heaven because of his "good intentions" as a member of this Brotherhood has to protect his widow and orphans after his death by simply "intending to change his beneficiary."

Last month in these "Brotherhood Bulletins" the matter was again referred to, but cases continue to arise that excite the sympathy.

Read the following letter, as a sample:

Mr. W. S. Carter, G. S. & T., B. of L. F. and E., Peoria, Ill.:

DEAR SIR AND BROTHER—Your letter of November 6th received and contents carefully noted in regard to our late brother and his insurance, and also the changing of his beneficiary. In reply will say that shortly after he was married he talked with me about changing his insurance from his mother to his wife, and I told him to do it.

Upon investigating Dr. ——'s books I find that Brother —— was examined on December 23, 1906. Dr. —— told me he gave the application for beneficiary certificate to Brother ——, and that is all he knows about it, and in fact that is more than I knew about it before now. No doubt Brother ——'s intentions were all right, but at the particular time he was examined business was good on this road, and he was an engineer running on the extra list and I think he was called out right away, and thought when he got in he would attend to it, but when he came in he probably did not get much rest before he had to go out again, and so on until he had forgotten all about it. Of course this is merely a supposition on my part, because I do not know anything about it.

When Brother —— was killed I went to —— after his remains and was asked several times how much insurance he carried, and I told them he carried $500, because that was all I knew anything about, but when I arrived in —— with his remains I met the collector and he said that Brother —— had been paying for $1,500. That was the first I knew he had more than $500. The collector said that Brother —— had told him that he had his insurance raised and that is all the authority he had for taking the money. I never received any papers from Brother ——, or his old policy, and as near as I can find out it has never been found, and there has never been any papers lost in the mail because I never had any to send, and Lodge —— is perfectly innocent of any wrongdoings along these lines.

In the first place, Brother —— had no business paying for $1,500 until he had that much insurance, or until he knew he had passed the medical examination, and I think it is purely neglect on his part. I do think his wife should have the money. She is left with an infant child on her hands to support, but the law must be lived up to. The best I can say is that I am sorry for Mrs. ——. His mother had been asked to assign the proceeds in favor of the widow, but I understand this is something she refused to do. Now this is all I know about it, and owing to the fact that they have nothing to show he had more than $500 insurance, I do not see how they can expect to get more.

Hoping this will be satisfactory to you, I am, with best wishes,

Fraternally yours,

Violation of Laws and Violation of Obligations.

Presumably, each and every collector of each and every lodge, when installed into his position, made oath that he would honestly and faithfully fulfill his duties as prescribed in the Constitution and By-Laws of the Brotherhood.

Assuredly, the Grand Secretary and Treasurer, when he was installed, made oath that he would discharge the duties of his office as prescribed in the Constitution of the Order.

That part of the Constitution which prescribes the method of readmitting ex-

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pelled members within thirty days after expulsion, specifically says:

"If a request for readmission under the provisions of this section reaches the office of the Grand Secretary and Treasurer after thirty days have expired since the expulsion of the former member, the Grand Secretary and Treasurer *shall not readmit him.*"

The same section of the Constitution says:

"*A collector shall not issue an official receipt* for any amount deposited with him by an applicant for readmission under the provisions of this section *until notified by the Grand Secretary and Treasurer that the applicant has been readmitted.*"

It would be surprising, if not alarming, to the members of this Brotherhood should they learn of the great number of collectors that are deliberately and continuously violating the Constitution of the Brotherhood by issuing official receipts to expelled members before they are readmitted.

It would be amusing to the members of the Brotherhood should they learn how indignant some collectors become when the Grand Secretary and Treasurer refuses to violate the Constitution of the Brotherhood by readmitting members "after thirty days have expired since the expulsion of the member."

All collectors and secretaries should read and remember the laws of the Brotherhood regulating the expulsion and readmission of members, which are as follows:

Sec. 174. Any member failing or declining to make payment of his dues as herein provided, shall stand expelled, *and no action of the lodge shall be required to be taken to give effect to said expulsion,* and said expulsion shall take effect on the second day of the quarter. On the second day of the quarter *the collector shall deliver to the secretary in writing the names of all members expelled* under the provisions of this section, and *the secretary shall forthwith make a report thereof to the Grand Secretary and Treasurer,* and at the first meeting thereafter *he shall make a similar report to the lodge and record the same in the minutes of the meeting.*

Sec. 200. A person who has been expelled for the nonpayment of dues or assessments may be readmitted to membership by the Grand Secretary and Treasurer if within thirty days after the expulsion of the former member a request is received by the Grand Secretary and Treasurer from the lodge for such readmission, and such request is accompanied by a statement of the collector that the full amount of the delinquent dues and assessments has been deposited with him, and that he truly believes the former member to be in good physical condition when such deposit was made. *If a request for readmission under the provisions of this section reaches the office of the Grand Secretary and Treasurer after thirty days have expired since the expulsion of the former member the Grand Secretary and Treasurer shall not readmit him. A collector shall not issue an official receipt for any amount deposited with him by an applicant for readmission under the provisions of this section until notified by the Grand Secretary and Treasurer that the applicant has been readmitted.* Lodges will be held responsible for the payment of dues and assessments of members so readmitted. When the applicant is not readmitted the amount deposited with the collector shall be returned to applicant.

Sec. 201. A person who has formerly been a member of the Brotherhood, and *who is not eligible for readmission under the provisions of the foregoing section,* may request any lodge to make application to the Grand Master for his readmission by special dispensation, and if such request meets with the approval of the majority of the members of the lodge at a meeting at which the request is presented, the secretary, over seal of the lodge, shall make application to the Grand Master for such readmission and accompanying the application for readmission an application for beneficiary certificate, completed on the same form and in the same manner as by applicants for initiation, shall be filed with the Grand Master, who shall be authorized to issue a dispensation readmitting the applicant to membership, notifying the Grand Secretary and Treasurer and the secretary of the lodge that the applicant has been readmitted, and when his dues and assessments shall begin; provided, that no person who has been expelled for other causes than the nonpayment of dues and assessments may be admitted under the provisions of this section without the consent of the lodge from which he was expelled. *A member readmitted*

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under the provisions of this section shall remain a nonbeneficiary member until his application for beneficiary certificate has been disposed of by the Grand Medical Examiner in the same manner as in the initiation of new members.

Trying to Name Illegal Beneficiaries.

Many applications for beneficiary certificates are held up, and many changes of beneficiaries are refused by the Grand Lodge, because applicants and members insist in naming persons as beneficiaries who can not legally be named as such.

Section 60 of the Constitution plainly says that "the member may select and designate as his beneficiary or beneficiaries any one or more of the persons named in the following class, *and not otherwise*, viz.: (a) wife; (b) child or children; (c) mother; (d) father; (e) brothers and sisters; (f) blood relation and dependent ones; (g) affianced wife."

Immediately above the space on applications for beneficiary certificates, on which the local medical examiners write the name and relationship of the beneficiary, there appears in bold-faced type the following warning:

"A beneficiary must be either wife, children, mother, father, brothers, sisters, blood relations, dependent ones or affianced wife. Certificate can not be made payable to 'lodge,' 'estate,' 'heirs,' 'administrator,' or 'legal representative;' nor to a relative 'by marriage,' unless they are dependent upon the applicant for support, which dependence must be plainly stated on the application by writing the word 'dependent' under the word 'relationship.' If beneficiary is an adopted child, send copy of adoption papers with this application."

But the medical examiners do not take time to read instructions, and write as beneficiaries "friends," "estates," "heirs," "persons who may be named in my will," "legal representatives," and lots of other people and things.

The laws of the Brotherhood, and the laws of the State under which the Brotherhood is doing business, forbid the naming of any persons as beneficiaries except those specified in section 60 of our laws.

Always State Number of Lodge.

Officers of lodges that do not use the standard form of lithograph letter heads furnished by the Grand Lodge, usually write on plain paper. A great many of such officers forget to state the number of the lodges of which they are members. When such letters show the name of town from which the letter was written, and the writer belongs to a lodge in such town, it is possible to discover from what lodge the communication comes by checking up the membership in the lodges in that town. When this can not be done letters are written to the writers and they are asked concerning the numbers of their lodges.

When the regular lithograph letterheads are used, or any letter-heads on which the number of the lodge is printed, much delay is avoided, but when officers do not use printed stationery they should be careful to give the number of their lodges.

This also applies to all members who correspond personally with the Grand Lodge. When any letter is written on Brotherhood matters the number of the lodge should be mentioned.

No Transfers of Membership After December 10th for This Quarter.

Section 187 distinctly says:

"An application for transfer shall be made by members during the first two months of the quarter and no application for transfer made by a secretary shall be granted by the Grand Secretary and Treasurer unless said application reaches the Grand Secretary and Treasurer at least twenty days before the beginning of the following quarter. Should an application be received during the last twenty days of a quarter the Grand Secretary and Treasurer shall advise the secretary making the application that it has been received too late, and that the member shall pay his dues and assessments to the lodge from which he desires to transfer for the next quarter, and that the application may be renewed when the member presents his receipts showing that he has paid such dues and assessments."

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The Unit

A wild-eyed man with a hunted look and a brow all seamed with care,
With shambling feet and palsied hands, and a mop of disheveled hair:
His gaze was fixed on a distant thing, like one who gropes for fate,
With mind distraught and loaded down with some oppressive weight.

He crooned a song unto himself, like a lonely child at play,
And his sighs were like the rustling breeze on a gusty autumn day.
"Oh, what is it ails you?" the passers-by cried, as they saw the wreck forlorn;
"A unit, a unit, oh, which is the unit?" he muttered from early morn.

"A ton one mile and an engine mile, and a tractive haul as well,
A loaded car and an empty car." Then his eyes began to swell.
"A commercial mile, a net ton mile and a gross ton mile, oh, dear!
Tons and miles, and trains and cars, it surely is most queer.

"If we get five cents for hauling a crab from Boston's quaint old streets
To Friscotown, by the Golden Horn, what are the net receipts?
How much for coal, for wear and tear, for all the trainmen's pay?
How much dead weight does the engine haul, if the crab dies on the way?

"How many grades to the lineal mile, how many ties in a section?
The engine's loss and the waste of the wood? Oh, is there any connection?
Oil, tallow and waste, and water supply and fuel for locomo's,
Repairs and renewals of engines and cars, goodness only knows.

"What is the weight on the driving wheels, what power goes up in the stack?
How much sand is used on the rails, when there's ice upon the track?
What pressure is on the air brakes, what resistance in the air?
Was ever problem so abstruse—to make you tear your hair?

"How many tons to a pint of oil, how many ton miles to boot,
And ton miles to a ton of coal, as the engine goes toot-toot?
What is the total tractive power? It's as easy as A B C;
C square into S into eight-five P divided by D equals T.

"And then those per cents so bother my head, of actual to the potential,
And all the small items that loom up so big, official and consequential.
Can I get me a unit that'll stand for all time, a talismanic lamp of Aladdin
(Instead of a maze to the end of my days), my statistical heart to gladden?"

And thus he went crooning the live-long day: "A unit, a unit I want."
Till his hair grew white, and his back grew bent, and his figure lean and gaunt;
He faded away like steam in the air, or a hobo under a train,
And the jury's verdict was: "He died of a unit on the brain."

—P. S. HANNAGAN, in The Railway Age.

Chicago.

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Forum

Some Questions for Grand Chief Stone to Answer.

Will he make an affidavit before a duly commissioned notary public that the statements contained in his circular dated August 14, 1907, and addressed to the B. of L. E. members, are truthful in every particular, and forward a copy of such affidavit to the Grand Lodge of the Brotherhood of Locomotive Firemen and Enginemen?

Will he truthfully say that the officials of the Bangor & Aroostook Railway entered into an agreement with their engineers to fire and run alternate days without the knowledge and consent of the latter parties?

Will he go on oath and say that the private circular sent out exclusively to members of the B. of L. E. on the B. & A. road was so distributed unknown to the B. of L. E. committee or to Assistant Grand Chief Hurley, who was in Bangor during the controversy? If so, who furnished a list of the B. of L. E. members and took the necessary steps to overcome the possibility of others than B. of L. E. members receiving a copy of that circular?

Will he kindly forward a copy of the agreement he says was made between the B. of L. F. and E. committee and the company, and give the date when the B. of L. E. and the B. of L. F. and E. committees, with their grand officers, met together? This information is desirable, as it is news to our members.

Will he produce positive evidence to prove that Brother Ball said he would poll any other road, or that he mentioned the word "strike" before the officials of the Bangor & Aroostook Railway?

Will he deny that on the division of the Canadian Pacific Railway from Montreal to the Atlantic Coast the B. of L. F. and E. represents over 60 per cent. of the engineers in active service?

Will he deny that some of his associate grand officers have made the statement in various division rooms that the B. of L. E. insurance was cheaper than that of the B. of L. F. and E.?

Will he deny that 50 per cent. and over of the members of the B. of L. E. are over 45 years of age, and 20 per cent. of that membership holds certificates for $4,500 insurance, and can he deny that at that rate his organization will have to raise over $85,000,000 within the next twenty-five years or go out of business so far as its beneficiary department is concerned?

Will he deny that during the present boilermakers' strike at Minot, N. D., this fall, a person wearing a B. of L. E. emblem pin applied for a position as a boilermaker?

When he awakens to the fact that the B. of L. F. and E. has been using its present name for over a year, and that the organization has always been conducted along lines with a true regard for the ethics of organized labor and truthful and honorable principles, he will realize that he is living in the present age of progress and enlightenment.

If he answers these questions there will be others equally as important to follow; should he remain silent, then let our membership draw their own conclusions as to the cause of his refusing to enlighten us on this score.

MEMBER.

* * *

The Pangs of Death Bring Forth Another Scream.

It became known some few weeks ago among the members of the B. of L. F. and E., on the Canadian Pacific Railway, that something deep and mysterious was being considered by the B. of L. E., and as usual the old saying "Murder will out" has again been verified. And although we were told that the precious document was too sacred for other hands than those of the three chosen and faithful "Eagle Eyes" to be found in each "Eyrie" of "Lost Hopes," the cat got out of the bag, and we are now in possession of what we are assured is a true copy of a circular issued by the officers of the B. of L. E. over the signatures of W. S. Stone, G. C. E., and Wm. B. Prenter, F. G. E. The circular is headed "The True Facts Relative to the Bangor and Aroostook Agreement," and is dated Grand Office B. of L. E., Cleveland, Ohio, August 14, 1907.

The true facts relative to the Bangor and Aroostook trouble are so well known and understood that I believe a contradiction of the statements made in the

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circular to be unnecessary. But another matter is referred to, wherein my name is used, and statements made which I believe are intended to poison the minds of the members of the B. of L. F. and E. against their own organization and myself. Therefore, I do not propose to allow it to pass unheeded.

The statement reads as follows:

"To further show you the attitude of the B. of L. F., and that they are not acting in good faith when they claim that they only want to represent engineers who are members of their organization on discipline cases, I would refer you to my own late experience. I have just returned from Montreal, Can., where I was before the officials with the Canadian Pacific G. C. of A., on the question of wages on the lines east of Ft. William, and where I was informed by Mr. Leonard, Assistant General Manager, in the presence of the entire committee, that a strong protest had been filed by Mr. Wark, salaried General Chairman of the B. of L. F., and also by the local lodges on the Atlantic Division of the C. P. located at Henderson, Me., and St. Johns, N. B., against any settlement being made with the G. C. of A. of the B. of L. E. on the question of wages for engineers without their being called in and consulted and giving consent to same.

"We, however, made a settlement and will continue to represent the engineers on the Canadian Pacific on matters of wages and all business of engineers."

In order to prove the incorrectness of Mr. Stone's alleged statement, the following is a true copy of the letter to which he refers:

TORONTO JUNCTION, May 13, 1907.

Mr. J. W. Leonard, Assistant General Manager, Canadian Pacific Ry., Montreal, Quebec:

DEAR SIR—I have been advised that the Brotherhood of Locomotive Engineers in making contracts for engineers on lines west of Fort William, inserted a clause giving them the right to represent all engineers, and that the granting of such a request, unless retracted, may result in disturbing the harmony that has so long existed between the company and their enginemen, and as I understand the B. of L. E. committee are now in session in Montreal for the purpose of securing new and separate agreements on lines east, and will no doubt attempt to have a clause inserted similar to that in western schedules, I write to protest against the granting to them of any privilege detrimental to men who may belong to the Brotherhood of Locomotive Firemen and Enginemen's organization.

We fail to see why they should ask for, or be granted, the privilege of representing men on whom they have no claim whatever, and while it is not our intention to interfere with them in making schedules for engineers while they represent a majority of engineers on the system, yet we claim, and will insist, on the right to represent our members who may be engineers, in matters pertaining to grievances and seniority rights.

Our desire is to maintain the peace and harmony which has existed in the past and respectfully request your assistance toward that end.

Respectfully yours,
(Signed) GEO. K. WARK,
Chairman B. of L. F. and E.

The following is Mr. Leonard's reply:

CANADIAN PACIFIC RAILWAY COMPANY.
Office of Assistant General Manager.
EASTERN LINES.

MONTREAL, May 23d, 1907.

G. K. Wark, Esq., Toronto Junction, Ontario:

DEAR SIR—I beg to acknowledge receipt of your letter of May 13th. Following the course that this Company has always adopted, we can only deal with our employes, and the officers of this Company will, in the future, as in the past, be always willing and pleased to meet any committee of our employes to deal with any subject affecting either the employes or the Company, and it is immaterial to us if the members comprising such committee belong to any, all or no organizations; in other words, we do not propose to be made a party to any dispute or differences that may exist between the officers of such organizations.

Yours truly,
(Signed) J. W. LEONARD.

I believe nothing further is necessary to convince any one that Mr. Stone is decidedly in error when we consider the above letters, and the fact that nearly 50 per cent. of the engineers on the Canadian Pacific Railway are members of the B. of L. F. and E.

GEO. K. WARK,
General Chairman B. of L. F. and E., Canadian Pacific R. R.

Protest Against Consolidation.

Having been a constant reader of the Magazine during a membership of ten years, I wish to add my voice to those already raised against any move seeking consolidation with the B. of L. E.

First, because such a union looks not only undesirable but utterly impossible, as it could not be accomplished without bringing in its wake many of the objec-

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tionable, and confessedly unwise, features that are working so detrimentally to the interests of the B. of L. E. It would also bring upon our beneficiary department an unwarrantable burden unless some special features in levying assessments were adopted. Of course, against this could be argued the economy gained by the elimination of one set of Grand Lodge officers, and one legislative body, committeemen, etc., which would be considerable; but then we are confronted with the question: Would not the B. of L. E. men want to try and dominate and control our lodge meetings and conventions, and if our membership, through deference to age, should permit them to guide the ship, would they not bring it into the same unsavory waters in which they now find themselves? A sorry plight, and in bad repute with every true labor union in the country, or, in fact, on the North American Continent.

There would always be an undercurrent of unbrotherly feeling amongst the old-time B. of L. E. men, and the lodge room would lack that air of solidity which is now given it by the B. of L. F. and E.

The better way is to remain apart, keep to our membership in the B. of L. F. and E. and in a few short years the problem will solve itself. As the gardener must have flowers with which to fill his garden, so must the B. of L. E. have new blood with which to infuse life into their organization, and if our members do not supply it, the consequences are evident. Brothers, will you supply that necessary new blood? Why, of course not: you are true union men.

HARRY A. PEARY,
B. of L. F. and E. Engineer.

A Few Words from An Old-Timer.

As a member of this Brotherhood, promoted to the position of locomotive engineer nearly twenty years ago, I shall freely express myself concerning the "representation question."

Although apparently without "protection," from a labor standpoint, I have never suffered the loss of a single right, nor have I been deprived of any privilege accorded other runners. Nor have I seen any other engineer deprived of a single right because he preferred to remain a member of this Brotherhood.

True, I have witnessed attempts to give seniority rights to members of the B. of L. E. that justly belonged to members of the B. of L. F., and later of the B. of L. F. and E., but I never saw one of these attempts successful.

My observations have led me to believe that the B. of L. E. committees have been fortunate in getting what was clearly due them.

I believe that too much importance is assigned this "representation" question. If the B. of L. E. is so bent on "securing justice" for all engineers, let them do it. It remains for the Brotherhood of Locomotive Firemen and Enginemen to see that they do secure the justice. If, after having insisted on undertaking the job, they deprive a single member of this Brotherhood of a single right that is his due, we can then insist that justice be done. If we are going to tie up a road with a strike, let it be because one of our members has been done an injustice, and not because the B. of L. E. wants to secure justice for him. If one of our members is wrongfully discharged, is wrongfully deprived of his seniority rights, and a strike is the result, we will have at least a real and a just grievance. You can depend upon it that no railroad manager can afford to let it be known that he has provoked a strike in an effort to establish the "closed shop" for the B. of L. E.

I have heard for years all of the arguments of the B. of L. E. as to why the twenty thousand engineers who retain their membership in this Brotherhood should join them. They usually say that "it is every man's duty to join his own organization." It can be just as truthfully said that it is every labor organization's duty to permit a member to retain his manhood. When the B. of L. E. cleanses itself of its legislative filth it will be time enough for it to prate about the "duty" of locomotive engineers. They pretend to believe that if they enact a law that requires all applicants to be emasculated that we should walk up and undergo the operation. If such was their law no doubt they would find some who would stand for it, but men who are proud of their manhood will remain aloof from the B. of L. E. until such time as they can take their manhood with them—yea, even unto the dazzling presence of the most exalted "grand chief."

The threat is often made to the timid boy who, "with his heart in his throat,"

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is making his first few trips as an engineer, that "if he does not join the B. of L. E. he will be deprived of his rights, and can not secure justice from the company's officials." Bah! Such rot can have no effect upon a man! The best evidence that an engineer is a coward is to see him scared into joining that bunch. Any engineer who will join the B. of L. E. and abandon the B. of L. F. and E. because of fear that he will lose his job, would probably later on join the strike-breakers and abandon the B. of L. E. for the same reason.

But there are a great many honest, conscientious members in the B. of L. E. who have joined that organization for other reasons. They have looked upon the B. of L. E. as an organization of higher degree, and they are now imbued with that idea. They have honestly believed that engineers and firemen should be separated into different Brotherhoods, just as the whites and negroes are separated in the churches. They can not help feeling towards a fireman just as the white man feels towards the negro. A man should not be blamed for the "blue blood" he imagines is in his veins. He will realize how quickly it can coagulate when the next hard times and wage-reductions come. He may then call upon his fireman to help him.

There will come a time when a vast majority of locomotive engineers will learn by bitter experience that locomotive engineers and firemen must of necessity merge their forces. So long as they can be separated into hostile camps wage-reductions are easy. So long as the one can be used to defeat the other the future looks dark.

In the meantime, let us of the Brotherhood of Locomotive Firemen and Enginemen keep cool heads on our shoulders. Instead of wasting our ammunition chasing chipmunks, let us save a few rounds for larger game. The present financial flurry indicates that the "open season" is near at hand.

AN OLD TIMER.

Why the Eight-Hour Day Was Lost.

I have been told by a man who is in position to know, but who can not afford to say it out loud, that the B. of L. E. traded its eight-hour movement at Chicago last winter for recognition as the sole representative of locomotive engineers. The statement is made that after carrying their eight-hour demands as far as it could be done with safety to the jobs of their engineers, the matter was dropped and it was understood that written agreements would be made with the General Boards of Adjustment on the western roads wherein they would be given the sole right to represent engineers on those systems. At this rate the eight-hour day is far off.

J. L. T.

B. of L. E. Tactics in Canada.

Judging from the letters we read in the Forum Department from time to time, our membership in Canada, and especially in that part of the country around Winnipeg, is being subjected to the same low, contemptible tricks which some members of the B. of L. E. resort to in order to try and induce young runners to sever their connection with the Brotherhood of Locomotive Firemen and Enginemen and cast their lot with the B. of L. E. But I need not go into details, as our brothers generally are fully awake to the situation, and when it is sought to influence them with the false statements and other misrepresentations which a certain class amongst the members of the B. of L. E. are unprincipled enough to utilize in seeking to augment their own ranks, our boys merely "wink the other eye" and refuse to swallow.

In what I say in the foregoing I do not desire to be regarded as condemning every man who wears a B. of L. E. pin. Many members of that organization in our section are honorable and upright men and real "good fellows," and these men we hope eventually to have back with us in our ranks where they belong.

Our young runners in Winnipeg and the neighboring country are a hard proposition to run up against; they are, as a class, intelligent, honorable and educated men, who think too much of their manhood to disregard the ethics of organized labor and have too much self-respect to consent to affiliate with a body of men who have officially sanctioned the grossest breach of such ethics by recognizing and sanctioning scabbing. No—those young runners belong to the old "Tried and True," and our younger members have learned to look up to them, and inspired by their example, are firmly determined to stand unflinchingly by the colors of the B. of L. F. and E. after they, too, have become runners.

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In this neck of the woods the B. of L. E. is practically at a standstill, and this explains why, in trying to obtain new members, they have become so desperate as to resort to falsehood. Scarcely anyone has joined them of late and many of their members are getting ready to quit and join a better organization, and when they start it will be a case of follow the leader like a flock of sheep.

Young runners everywhere should study the principles of organized labor, then peruse the history of the two organizations, and it is unnecessary to say that all of them who are attracted by a clean reputation will remain within the ranks of the Brotherhood of Locomotive Firemen and Enginemen.

MEMBER.

A Voice from Texas.

With strike-breaking and trying to open the way for negro firemen, some of the loyal members of the B. of L. E. are making strenuous efforts to maintain a lead in Texas. Thank goodness, none of the B. of L. F. and E. runners have ever tried to take the bread out of the mouths of the wives and children of their fellow workers, as did the B. of L. E. men on the Southern Pacific, nor have any of them been running with negroes firing their engines so long as white men were available.

An incident of the nature referred to recently occurred in this part of the country. There is a local on this particular road which has its Sunday layover at the other end of the division, and the boys dead-head home on passenger so as to spend Sunday with their families. On November 4th the fireman on this run got left in some manner and the engineer took a negro from the cinder pit and put him on the engine, telling the negro that he would meet the fireman down the line. This, on a road where we have not had negro firemen, is a sample of the deal they are trying to give the members of the B. of L. F. and E. in this locality. However, I am glad to say that there are some good ones and they try to do the right thing by the firemen. The man that I am firing for is a fine fellow, and he very often remarks that he wishes the two orders were getting along together. He is right, too, as we would then be in a better position to demand our rights and would not have the onerous burden to carry which their arrogance places, not only on themselves, but everybody in transportation service.

Some of the boys have been called up for examination for promotion to the right side, and I am glad to say they are all good Brotherhood men and will stay right with the B. of L. F. and E. when they are promoted, as I know that the "Big E." doesn't look good to them just now.

We are getting some of the grief that I notice the boys in other sections of the country have to endure—poor coal and big engines, and when you add bad track to that you hit us where we stand at the present time.

I am glad to see the brothers writing so much as to the doings of those members of the B. of L. E. who are antagonistic to our cause, and it is through the Magazine that we can the better give publicity to their contemptible tactics.

You can put it down that here is one who is going to remain right in the same ranks where he now is, if he is ever fortunate enough to become an engineer; that "Big E." has no charm for me.

MEMBER 548,
Commerce, Texas.

Initiative and Referendum.

I wish to say a few words in support of Brother Adams's able letter published in the July issue of the Magazine on the subject of the initiative and referendum form of government, through which could be elected all our officers and boards and the important changes in our laws approved or disapproved by the direct votes of the rank and file. While this matter has been mooted around for several years it has never received the thought and publicity it deserves. Such a method would give the membership at large the opportunity to pass on everything of importance, to say nothing of the immense saving in pay of delegates and incidental convention expenses. I know of no logical argument that can be advanced against the initiative and referendum system of doing business; it is not only feasible, but absolutely practicable and economical.

Our organization is made up of men who must study in order to successfully pass their examinations for engineers, and why should we not take to ourselves the opportunity to make our laws by direct vote instead of by delegate representation—by proxy, so to speak—especially

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as it would give every member the right he enjoyed before conventions were begun. The original thirteen members had a direct vote, and now that the mails are so prompt and transportation facilities so good, why should not the thousands do the same thing? That is what we should strive for, and not pay men to go and vote for us by proxy.

A. M. STURROCK, Lodge 275.

On Music

When thro life unbless'd we rove,
  Losing all that made life dear,
Should some notes we used to love,
  In days of boyhood, meet our ear,
Oh! how welcome breathes the strain!
  Wakening thoughts that long have slept;
Kindling former smiles again
  In faded eyes that long have wept.

Like the gale, that sighs along
  Beds of oriental flowers,
Is the grateful breath of song,
  That once was heard in happier hours;
Fill'd with balm, the gale sighs on,
  Though the flowers have sunk in death;
So, when pleasure's dream is gone,
  Its memory lives in Music's breath.

Music, oh how faint, how weak,
  Language fades before thy spell!
Why should Feeling ever speak,
  When thou canst breathe her soul so well?
Friendship's balmy words may feign,
  Love's are ev'n more false than they;
Oh! 'tis only music's strain
  Can sweetly soothe and not betray.

—THOMAS MOORE.

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Correspondence

LODGE 492—(*H. C. Haynie, Secretary, Smithville, Texas.*) The most enthusiastic meeting we have had for some time was held by this lodge on Saturday evening, November 2, 1907. The occasion was an unexpected visit from our Second Vice Grand Master, Brother Timothy Shea. Unfortunately, Brother Shea was unable to give us but six hours' notice, and what that means to railroad men is easily understood by those who are in active service. Your humble scribe was busy attending to the duties of his vocation when the news came that we were to have so distinguished a visitor with us that evening, and I stepped out to catch some member and tell him the news and he undertook to spread it; he did so with such good results that his efforts were rewarded with thirty members being present when the lodge was called to order. We had two candidates to initiate, and Brother Shea went through with the initiatory ceremony and exemplified the secret work in such a splendid manner that some of us opened our eyes when we saw the real beauty of the ceremony.

After the initiatory ceremony several brothers made short talks on the "Good of the Order," after which Brother Shea gave us an intensely interesting talk, which, while it lasted for 1 hour and 50 minutes, was so instructive and of such a nature that we regretted to hear the hour of midnight proclaimed. It was a splendid talk on the workings of our organization, its accomplishments and its possibilities, and those who have heard him speak realize that Brother Shea is in his element when showing up the good of the Order.

Several of the brothers accompanied him to the depot and remained with him until time to leave for San Antonio, which he did at 2:15 a. m. Sunday.

* * *

LODGE 673—(*Thomas H. Yost, Harrisburg, Pa.*) A word for the Ladies Society, No. 60, Harrisburg, Pa.: They have now reached the one hundred (100) mark, with more candidates coming in. This is something that all the brothers of No. 673 are proud of, and I am sure I, as one, am very proud of it. One hundred members with one of the best treasurers, having $1,000 to take care of the sick and distressed members. They are always ready at all times to assist the brothers in all their undertakings. Above all is the fine drill which they give with sixteen ladies and their white suits and caps, making the name of their society, and B. of L. F. and E., and which is something that is very much appreciated by all who see it. Bro. J. J. Hannahan had the pleasure of viewing the same when he was among us, and he thought it fine. Boys, give them a word of encouragement; get your wives in and you will be proud of it; at least you ought to be. I am not going to give up until No. 60 of Harrisburg has the largest Ladies Society in the history of the Brotherhood.

A MEMBER OF NO. 673.

* * *

LODGE 188—(*R. T. Dixon, Secretary, Chicago, Ill.*) It has been some time since I have had the pleasure of reading any news from Lodge 188, so I thought I would let you all know that we are still in existence and also adding new names to our register right along. I believe we could get more new members than we do if a plan could be devised whereby each and every member of the organization would undertake to do missionary work amongst the eligibles. If some good brother can inform us how to get lukewarm members interested enough to regularly attend lodge meetings, as we all obligated ourselves to do, it would be appreciated by the officers of this lodge.

I would invite the attention of every member of our lodge to the criticism contained in the October Magazine in a letter to the Ladies Department. The same reason for the complaint of the sisters—which is just—is responsible for the fact that during the present year we have had to forego our meetings for lack of attendance. The scarcity of attendance is only due to the lack of interest of the membership of that lodge.

We have some members who work hard, because they know that the officers need all the assistance that can be given to them. It may seem to some that a few can run a lodge to the satisfaction of all, but let me say to you, brothers, that we need you all; the Brotherhood needs your close attention to its affairs,

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but not half so much as you need the Brotherhood; therefore be honest with it and do your share to make the meetings interesting to yourself and others. Take a try at it and see how it works. I sincerely ask each and every member to make some little sacrifice in the way of amusements on lodge meeting afternoons and nights. Vacant seats in the lodge room make an unfavorable impression upon the newly admitted member, and he, through want of encouragement on your part, sinks to the same level, perhaps, as the member who can not see his own interest sufficiently plain to devote a little while to lodge meetings. We have had good meetings and can have them again if the membership wills.

All Grand Lodge officers and brothers and our Brotherhood in general have my very best wishes for future success.

LODGE 217—(*N. E. Windsor, E. St. Louis, Ill.*) I have not seen anything for some time in the Magazine from Lodge 217, and we wonder what is really the cause; has our correspondent fought and failed, or did he never venture?

We are still in the field and adding new members at almost every meeting.

While our meetings are not as well attended as we could wish, yet we must not overlook the fact that the boys are busy at this season of the year. Notwithstanding this, however, there are members absent who could be present, and as a consequence attendance on meeting nights is not nearly as large as we would wish it.

Second Vice Grand Master Shea was with us for a few days and gave us some excellent advice, and we wish that Brother Shea could be with us more.

Let us remember that our Brotherhood is only as strong as its membership makes it, and the better members we are the better will be our Brotherhood and the stronger will be the protection it can afford us.

Come to lodge meetings more often, brothers, and then we can have some interesting meetings and thereby create a good wholesome activity within our ranks, and during the winter months this is especially desirable.

While the boys on our division are not doing a rushing business, still they are kept at it pretty regularly and we are using coal that is put on the tanks in good shape, and we do not have much use for our picks. Our lodge meets every second and fourth Sundays, and visiting brothers are always welcome.

LODGE 597—(*Member, Winnipeg, Canada.*) I have been a member of 597 for a year and a half, and in all that time I have not seen a message from my fellow members in the Magazine, so here goes.

We are getting down to business in real earnest, and we have a lodge to be proud of. We are rolling in new members right along and voting on a batch of applications for membership at every meeting.

I sometimes wonder if our "goat" is not just about the busiest and hardest worked animal in the Brotherhood; there is one thing sure, if there is another that "hits the ball" any more lively than ours, he must be a dandy. We are considering the advisability of issuing a special assessment for extra feed for our poor, hard-worked "Billy." May the good work go on.

LODGE 599—(*Member, McCook, Neb.*) We on the Burlington are not asleep, but are very watchful and energetic. I will say that we have in our lodge twenty-six engineers, fifty firemen and eighteen members at work in other positions and on other roads.

Our freight engines are of the R4 type, built by the Baldwin and the American Locomotive companies, and our passenger engines are the S1 and the P3 compound types.

The coal we burn in our freight engines is of a lignite nature, and the boys have facetiously nicknamed it "hay," but on passenger we use Newcastle and Colorado coal.

To those who can find time to give us a call, we extend, through the columns of the Magazine, the hand of "brotherly love."

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Official

Addresses Wanted.

Persons requiring the address or any information concerning another will please communicate with the Secretary of the lodge located nearest the residence of the person making such request. Upon receipt of a communication from the Secretary of such lodge, requesting that a notice be published in the Magazine inquiring for such address or other information, same will be complied with. However, the Magazine can not undertake the office of a collecting agency, and must decline to lend itself to such purpose. The following requests have reached this office since the last issue. Information should be sent to the persons specified in the notice:

C. B. Clayton—Formerly of Lodge 139. At one time ran a switch engine at Needles, Cal., and is supposed to have left that place for some point in Old Mexico. Any brother knowing his present whereabouts will please advise Geo. W. Taylor, P. O. box 568, Needles, Cal.

Bonaparte McManus—Is supposed to be running an engine on the U. P. Railway west of Omaha. His home was in Minnesota when he first began railroading. His sister, Louise, is anxious to learn of his whereabouts, and if any one knows of the person sought, sometimes called "Bony" for short, they will confer a great favor upon his friends by writing to Mr. H. W. McManus, Rapid City, S. D.

P. Schoyan—Formerly worked on the Belt Railroad in Chicago. He has a foreign appearance, dark complexion, is tall and speaks several languages. Any one knowing his present whereabouts will confer a great favor by sending information to Bro. E. O. Edwards, 5516 LaFayette avenue, Chicago, Ill.

Lost Traveling Cards, Etc.

This office has been notified of the loss of the following traveling cards, receipts, etc., and the request is made that all members be on the lookout for them. Should they be discovered in the possession of persons not entitled to them they should be retained and forwarded to the owner or to the Secretary of the lodge which issued them:

Receipt and order for secret works for the present quarter, issued by Lodge 141 to Bro. John W. Allen, 621 East Eighth street, Kansas City, Mo. Any one finding same will please send to Brother Allen at the above address.

Bro. W. R. Barbee lost his coat containing quarterly dues receipt for present quarter, and traveling card, issued by Lodge 374. Any one finding same will please return to the secretary, Bro. W. C. Bateman, Herrington, Kansas, or to Brother Barbee at Creve Couer, Mo.

Traveling card and receipt, with order for secret work, belonging to Bro. O. P. M. Hessey, of Lodge 162, were stolen from him at St. Paul, Minn. The description on the card is height 5 feet 9 inches; weight, 160 pounds; hair, brown; eyes, gray. Any one finding same will please forward them to the secretary of Lodge 162, at Elkhart, Ind.

Travelng card No. 10,364 and receipt No. 25, issued to Bro. C. R. Pratt, of Lodge 344, were lost on the streets of Denver on October 3d. These are for the current quarter, and any one finding same will please forward them to the secretary of that lodge, Bro. A. A. Hammer, Trinidad, Colorado.

Traveling card No. 7,948, issued to Bro. J. H. Roddy, by Lodge 426, was lost at Birmingham, Ala., about November 1st. This card is for current quarter. Any one finding same will please send it to C. J. Goff, secretary Lodge 426, 2909 Avenue G, Birmingham, Ala.

Traveling card for current quarter, issued by Lodge 526 to Roy L. Sparks, has been lost. Any one finding same please send to L. M. Thompson, secretary Lodge 526, Stanberry, Mo.

Pocketbook containing traveling card, etc., property of Bro. H. N. Webb, of Lodge 532, has been lost or stolen in the vicinity of Havre, Mont. The receipt for current quarter's dues was also in the pocketbook. Any one finding same will please send it to J. R. Graden, 2214 Fort street W., Detroit, Mich.

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The Home Account.

The following donations were received at the Home for Aged and Disabled Railway Employes for the month of October, 1907:

B. of L. F. and E. lodges, 86, $3; 224, $10; 238, $10; 303, $5	$28 00
L. S. to B. of L. F. and E. lodges, 36, $5; 218. $2	7 00
G. I. A. Divisions	44 00
O. R. C. Divisions	48 00
B. of R. T. lodges	342 25
B. of L. E. Divisions	164 00
L. A. C. Divisions	76 40
L. A. T. lodges	24 50
James Costello, O. R. C. Division 270	1 00
Alfred S. Lunt, B. of R. T. lodge 456	1 00
E. Buck, O. R. C. Division 81	1 00
Station No. 23, Conductors' room, C. & N. W. Depot	3 65
Members Division No. 86, B. of L. E.	10 00
Members Division No. 158, B. of L. E.	3 75
Proceeds of a moving picture show given by Lodge 449, B. of L. F. and E., and Lodge 115, L. S. to B. of L. F. and E., of Cleburne, Texas	17 90
Station No. 2, Brakemen's room, C. & N. W. Depot	1 35
Total	$745 80

Miscellaneous—1 box of books from F. G. Sprague, Division 113, O. R. C.; 1 trunk of clothing from Mrs. T. J. Bingford, No. 102, G. I. A.

In the November Magazine an error was made in totaling the receipts for September from the B. of L. F. and E., which should have been shown as $88.50, and the Ladies Society should have read $24.00 instead of $19.00.

Respectfully submitted,
JOHN O'KEEFE,
Sec. and Treas. R. R. M. H.

Acknowledgments.

Bro. Frederick A. Haines, of Lodge 72, desires to thank the Brotherhood for the prompt payment of his disabiliy claim, and highly commends the methods adopted by the Brotherhood for the care of its beneficiary members.

Mrs. Nellie Wasnidge extends to the Brotherhood in general, and Lodges 3 and 149 in particular, her sincere thanks for courtesies extended during her recent bereavement, and for the beautiful floral offerings sent by the lodges named.

Mr. and Mrs. J. F. Lewis, of Charleston, W. Va., desire to thank the Brotherhood in general for the prompt payment of beneficiary claim, and particularly to those brothers who accompanied the remains of their son and bestowed attention and courtesies during their sad bereavement.

Mrs. R. R. Howard, widow of our late brother, R. R. Howard, desires to thank the Brotherhood for the promptness with which her beneficiary claim was paid. "It came," she says, "in time to assist her in her hour of trouble."

Mesdames J. P. Bishop and A. P. Faulkner, sisters of our deceased brother, Charles H. Pulman, desire to express their gratitude to the members of Lodge 248 for the many kindnesses and sympathy shown them during their sad bereavement, and to the Brotherhood in general for the promptness with which the death claim was paid.

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Beneficiary Statement

OFFICE OF GRAND SECRETARY AND TREASURER,
PEORIA, ILL., November 1, 1907.

TO SUBORDINATE LODGES:

The following is a statement of receipts in the Beneficiary Department for the month of October, 1907:

RECEIPTS.

Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.	Lodge No.	Amount.
1	418 50	74	185 25	147	222 75	220	623 50	293	143 25	366	93 75	439	.....	512	154 50	585	88 50	658	80 25
2	27 25	75	482 25	148	271 75	221	128 25	294	....	367	194 25	440	207 50	513	93 00	586	4 50	659	166 75
3	945 00	76	23 25	149	447 75	222	117 00	295	309 25	368	107 75	441	198 25	514	101 25	587	210 50	660	178 00
4	275 75	77	412 50	150	342 25	223	244 00	296	297 75	369	187 75	442	.....	515	183 50	588	71 25	661	61 50
5	327 00	78	143 25	151	126 75	224	81 25	297	230 25	370	46 50	443	196 75	516	148 50	589	51 00	662	61 00
6	388 00	79	66 00	152	270 50	225	97 50	298	167 75	371	165 75	444	424 25	517	76 00	590	159 25	663	204 75
7	213 50	80	....	153	153 75	226	288 25	299	123 25	372	143 00	445	244 50	518	39 00	591	251 25	664	113 50
8	489 25	81	121 75	154	114 25	227	99 50	300	213 00	373	183 00	446	244 00	519	228 25	592	140 50	665	74 00
9	322 00	82	142 50	155	84 00	228	.. ..	301	140 25	374	..	447	84 25	520	45 00	593	62 50	666	244 75
10	877 25	83	320 75	156	240 75	229	237 25	302	423 25	375	89 25	448	692 00	521	167 00	594	160 75	667	73 00
11	237 00	84	105 75	157	83 25	230	520 00	303	109 50	376	47 50	449	314 25	522	261 50	595	57 75	668	151 50
12	234 00	85	273 25	158	111 75	231	477 00	304	240 25	377	198 00	450	298 50	523	81 75	596	115 50	669	77 75
13	230 25	86	236 00	159	201 50	232	203 25	305	123 75	378	552 00	451	170 50	524	33 25	597	143 25	670	231 00
14	484 25	87	190 75	160	195 75	233	221 25	306	239 25	379	419 50	452	141 25	525	167 50	598	84 75	671	104 75
15	114 00	88	174 50	161	52 50	234	173 25	307	167 50	380	67 50	453	49 50	526	42 75	599	97 75	672	99 75
16	493 25	89	48 00	162	501 25	235	222 00	308	62 00	381	398 25	454	151 50	527	116 25	600	163 00	673	833 25
17	223 00	90	88 50	163	187 75	236	504 50	309	352 00	382	....	455	162 75	528	207 25	601	286 75	674	36 00
18	156 00	91	355 50	164	88 00	237	393 50	310	305 00	383	200 50	456	137 50	529	174 00	602	163 75	675	143 25
19	235 00	92	175 50	165	67 75	238	242 25	311	98 25	384	192 00	457	.....	530	91 50	603	117 50	676	84 00
20	42 00	93	.....	166	229 00	239	78 25	312	188 00	385	90 75	458	64 50	531	109 75	604	86 50	677	115 75
21	259 50	94	351 75	167	137 50	240	358 25	313	146 25	386	64 50	459	78 75	532	112 00	605	.....	678	67 00
22	100 50	95	61 75	168	238 50	241	290 50	314	193 75	387	67 50	460	92 25	533	120 75	606	36 25	679	90 00
23	114 25	96	211 00	169	381 25	242	303 75	315	197 50	388	197 25	461	119 25	534	235 75	607	63 00	680	72 00
24	363 25	97	356 50	170	235 75	243	117 00	316	217 75	389	105 50	462	221 25	535	175 00	608	162 25	681	137 50
25	280 75	98	253 50	171	130 50	244	204 75	317	94 75	390	153 50	463	171 75	536	107 00	609	52 50	682	107 25
26	237 00	99	565 25	172	78 00	245	106 50	318	341 75	391	154 25	464	153 50	537	107 00	610	51 75	683	149 75
27	245 75	100	137 00	173	294 75	246	260 25	319	163 75	392	165 75	465	251 00	538	187 75	611	76 75	684	.....
28	162 25	101	....	174	713 25	247	355 75	320	67 50	393	199 50	466	158 50	539	258 00	612	98 50	685	85 75
29	106 75	102	161 50	175	369 00	248	296 25	321	125 00	394	27 00	467	114 25	540	279 00	613	37 50	686	33 75
30	184 00	103	62 00	176	162 75	249	146 50	322	103 25	395	115 50	468	24 00	541	182 75	614	302 00	687	93 50
31	129 75	104	203 50	177	190 50	250	199 75	323	39 75	396	214 25	469	132 00	542	207 00	615	108 50	688	68 50
32	169 00	105	139 75	178	220 00	251	319 50	324	143 25	397	.....	470	244 00	543	253 50	616	66 75	689	97 75
33	133 50	106	89 25	179	125 25	252	374 25	325	86 00	398	152 00	471	33 75	544	112 50	617	141 25	690	59 00
34	210 25	107	247 00	180	.....	253	255 00	326	....	399	.....	472	364 75	545	93 75	618	..	691	28 50
35	128 50	108	198 25	181	47 50	254	111 50	327	370 25	400	189 50	473	62 75	546	45 75	619	88 50	692	38 75
36	133 50	109	203 50	182	564 50	255	75 75	328	205 75	401	270 50	474	120 00	547	87 00	620	81 25	693	42 00
37	199 00	110	178 50	183	246 25	256	65 50	329	....	402	.....	475	130 75	548	.....	621	77 00	694	97 25
38	....	111	200 75	184	63 75	257	102 75	330	282 75	403	45 00	476	86 00	549	137 25	622	210 50	695	42 00
39	128 00	112	64 50	185	96 00	258	27 50	331	134 25	404	104 50	477	380 25	550	..	623	175 75	696	47 25
40	348 50	113	485 75	186	78 00	259	95 50	332	113 25	405	222 00	478	146 50	551	204 50	624	....	697	.....
41	68 25	114	56 25	187	112 00	260	254 50	333	286 00	406	75 00	479	96 25	552	218 25	625	79 50	698	131 25
42	48 00	115	117 25	188	342 25	261	81 25	334	254 50	407	244 50	480	49 50	553	281 50	626	138 00	699	89 50
43	162 75	116	121 50	189	250 00	262	285 00	335	44 25	408	211 00	481	228 50	554	101 25	627	81 00	700	42 00
44	290 00	117	127 50	190	57 75	263	179 50	336	102 00	409	208 00	482	150 50	555	108 00	628	115 25	701	160 25
45	532 75	118	56 25	191	397 75	264	100 75	337	336 00	410	147 00	483	91 25	556	55 50	629	29 50	702	94 25
46	41 25	119	128 25	192	340 75	265	407 50	338	150 75	411	249 50	484	167 25	557	249 00	630	143 50	703	62 25
47	260 50	120	212 00	193	116 50	266	299 25	339	110 25	412	206 00	485	872 50	558	182 25	631	108 00	704	145 50
48	367 75	121	312 75	194	378 25	267	108 00	340	125 50	413	39 75	486	94 50	559	112 00	632	48 00	705	62 25
49	81 00	122	73 75	195	101 50	268	38 25	341	220 75	414	168 75	487	25 50	560	69 00	633	152 25	706	26 25
50	78 75	123	338 25	196	112 00	269	141 75	342	262 00	415	156 00	488	72 00	561	186 75	634	..	707	62 25
51	157 50	124	150 75	197	90 00	270	285 25	343	.....	416	218 75	489	164 25	562	388 50	635	151 00	708	118 50
52	336 50	125	51 00	198	426 75	271	127 00	344	.....	417	81 00	490	289 25	563	277 00	636	.....	709	65 50
53	124 50	126	142 00	199	187 50	272	62 25	345	178 00	418	207 75	491	60 00	564	196 50	637	94 75	710	87 25
54	440 75	127	.....	200	108 75	273	203 50	346	33 75	419	108 25	492	273 50	565	50 50	638	127 75	711	45 75
55	63 00	128	123 50	201	311 25	274	144 25	347	106 50	420	70 50	493	54 75	566	.....	639	55 00	712	26 25
56	232 00	129	289 50	202	216 00	275	349 50	348	174 00	421	78 75	494	104 75	567	147 50	640	47 25	713	77 25
57	520 00	130	460 00	203	311 75	276	226 25	349	336 00	422	75 00	495	.....	568	161 50	641	113 75	714	16 50
58	200 50	131	42 25	204	262 00	277	135 00	350	104 00	423	49 00	496	177 25	569	151 00	642	..	715	25 75
59	481 00	132	120 75	205	103 50	278	28 50	351	45 25	424	139 75	497	112 00	570	88 00	643	25 50	716	41 25
60	328 25	133	332 75	206	84 00	279	83 25	352	111 25	425	86 25	498	126 75	571	187 75	644	83 75	717	27 75
61	120 00	134	105 75	207	312 75	280	112 75	353	169 50	426	272 75	499	43 50	572	.....	645	75 25	718	49 00
62	100 50	135	197 50	208	80 25	281	206 75	354	260 25	427	53 00	500	119 25	573	180 75	646	280 50	719	395 00
63	240 75	136	119 25	209	226 50	282	33 75	355	174 75	428	87 25	501	224 00	574	156 75	647	98 75	720	41 25
64	233 50	137	116 50	210	75 75	283	116 25	356	186 25	429	126 75	502	226 50	575	....	648	.....	731	....
65	207 75	138	323 00	211	268 25	284	661 00	357	75 00	430	132 75	503	180 25	576	67 50	649	43 50	722	40 50
66	136 50	139	308 25	212	190 75	285	448 50	358	169 75	431	75 00	504	64 50	577	103 00	650	51 75	723	28 75
67	136 50	140	377 50	213	180 75	286	158 50	359	76 75	432	218 25	505	58 50	578	273 75	651	118 50	724	81 25
68	..	141	643 25	214	519 00	287	1324 50	360	108 75	433	141 50	506	124 50	579	54 75	652	108 50	725	53 00
69	75 75	142	199 50	215	387 75	288	107 50	361	105 00	434	197 25	507	154 50	580	11 25	653	130 25	726	55 50
70	214 00	143	363 50	216	125 25	289	93 50	362	83 25	435	175 25	508	335 50	581	80 50	654	85 00	727	48 00
71	328 50	144	31 50	217	178 25	290	153 50	363	420 75	436	270 00	509	75 00	582	89 25	655	85 00	728	47 50
72	327 00	145	.....	218	230 75	291	77 25	364	144 00	437	38 25	510	194 00	583	109 50	656	124 25	729	.....
73	224 50	146	.....	219	270 00	292	48 00	365	55 50	438	109 00	511	233 75	584	101 25	657	182 00	730	39 25

Received during month of October..... $121,617.00

Respectfully submitted, W. S. CARTER, G. S. and T.

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Statement of Death and Disability Claims

PAID BY THE GRAND SECRETARY AND TREASURER, FROM SEPTEMBER 30 TO OCTOBER 31, 1907.

Claim No.	NAMES.	Lodge No.	Death or Disability.	Date.	Am't. of Ins.	Cause.
259	Hiram C. Percy	18	Disability	Sept. 7, 1907	$1,500	Consumption of lungs.
452	John O. Hutchins	432	Death	July 10, "	1,500	Typhoid fever.
477	Peter Cox	54	Disability	Sept. 9, "	1,500	Consumption of lungs.
509	Samuel Gilchrist	189	Death	Aug. 7, "	1,000	Internal operation on urethra.
99	Chas. E. Goens	578	"	Nov. 18, 1906	1,500	Diphtheria.
411	Charles H. Anderson	443	"	June 21, 1907	500	Collision.
414	Eugene L. Dumolt	88	"	June 10, "	2,000	Struck by bridge.
512	Asa B. Lewis	294	"	Aug. 5, "	2,000	Consumption of lungs.
513	Charles Murphy	400	Disability	Dec. 2, 1906	1,500	Amputation of foot.
515	John Fitzpatrick	215	Death	Aug. 4, 1907	1,500	Struck by chain.
516	John Wasnidge	149	"	" 15, "	1,500	Bright's disease.
519	Thomas J. Scranton	536	"	" 18, "	1,500	Derailing of engine.
521	Michael J. Cawley	440	"	" 21, "	1,500	Typhoid fever.
523	Joseph Cross	225	Disability	June 22, "	500	Amputation of foot.
526	George A. Kreke	16	Death	Aug. 24, "	1,500	Blood poisoning.
527	Charley S. Cantillon	634	"	" 6, "	500	Crushed between cars.
528	William Woerner	60	"	" 9, "	1,500	Collision.
529	John B. Platt	275	Disability	June 8, "	1,500	Amputation of arm.
531	Daniel H. Hellahorn	203	Death	Aug. 25, "	1,500	Collision.
532	Samuel Ellsworth	213	"	" 23, "	1,500	Consumption of lungs.
533	Frank J. Kirkwood	182	Disability	July 24, "	1,500	Amputation of foot.
535	George J. Dansreau	61	"	Sept. 11, "	1,000	Bright's disease.
536	George E. Allen	171	Death	Aug. 1, "	1,500	Run over by train.
537	Reinert Kleist	296	"	" 21, "	1,500	Falling into an ore pocket.
540	John H. Borders	289	"	" 26, "	1,500	Boiler explosion.
541	Harry W. Talley	284	Disability	Sept. 7, "	1,500	Consumption of lungs,
542	John L. Williams	298	"	July 22, "	1,500	Amputation of arm.
544	Ivan W. Holmes	179	"	Sept. 9, "	1,000	Locomotor ataxia.
545	Joseph P. O'Connell	260	Death	July 25, "	1,500	Abdominal abscess.
548	Frank C. Baily	240	"	Sept. 3, "	1,500	Derailing of engine.
549	L. C. Allen	137	"	" 5, "	1,500	Bright's disease.
554	George T. Scott	26	"	" 5, "	1,500	Heart disease.
555	Gustaf Borg	539	"	" 5, "	1,000	Jumping from engine.
518	Harry M. Wilson	366	"	Aug. 14, "	1,500	Paresis.
404	John Flynn	436	"	June 15, "	1,000	Consumption.
489	Charles Farlardeau	335	"	July 1, "	500	Bright's disease.
2190	George A. Jamison(1)	127	"	Dec. 4, 1906	1312½	Pneumonia.
195	John A. Calbick	656	"	March 4, 1907	1,500	Unknown.
500	Avra Chapman	473	"	Aug. 2, "	1,000	Typhoid fever.
514	Wm. G. Wilshire	188	"	" 9, "	1,500	Epilepsy.
522	Christian W. Benz	440	"	" 24, "	1,500	Collision.
524	Martin Munson	543	"	" 7, "	1,500	Appendicitis.
530	Charles E. Mack	51	"	" 24, "	500	Collision.
534	Charles F. Sells	273	"	" 24, "	1,500	Heart disease.
550	Charles H. Pulman	248	"	" 10, "	1,000	Consumption.
552	Leonard O. Wylie	663	"	" 12, "	1,500	Boiler explosion.
517	Charles B. Carl	192	"	" 10, "	1,500	Collision.
538	Joseph M. Shields	192	"	" 13, "	1,500	Striking a standpipe.
546	Charles A. Millerke	293	Disability	Sept. 19, "	1,500	Consumption of lungs.

(1) Claim 2190. $187.50 due to missing beneficiary.

Death Claims Paid.		Disability Claims Paid.	
26—A	$39,000.00	8—A	$12,000
5—B	5,000.00	2—B	2,000
4—C	2,000.00	1—C	500
2—D	4,000.00		
1	1,312.50	11	$14,500
38	$51,312.50		

49 death and disability claims paid, aggregating $65,812.50

Pending Claims October 31, 1907.

75 death claims aggregating	$104,500
28 disability claims aggregating	38,000
Total of 103 claims aggregating	$142,500

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Statement of Death and Disability Claims

FILED WITH THE GRAND SECRETARY AND TREASURER DURING THE MONTH ENDING NOVEMBER 15, 1907.

Claim No.	NAMES.	Lodge No.	Date of Filing.	Death or Disability.	Alleged Cause of Death or Disability.	Am't of Ins.
612	Owen, George M.	204	Oct. 16, 1907	Disability	Amputation of hand	$2,000
613	Pfaffle, Fred H.	249	" 16, "	Death	Collision	1,500
614	Ping, Ira J.	620	" 17, "	Disability	Consumption of lungs	1,500
615	Jones, Harry D	605	" 18, "	Death	Ptomaine poisoning	1,000
616	Foster, Wm. T	427	" 18, "	"	Boiler explosion	2,000
617	Wren, Lewis M	591	" 19, "	"	Run over by engine	1,500
618	O'Mara, James F	191	" 21, "	Disability	Paralysis	1,500
619	O'Brien, Daniel T.	318	" 21, "	"	Amputation of hand	1,500
620	Shick, Jr., Chas	640	" 21, "	Death	Struck by car	1,000
621	Hooker, D. J	182	" 21, "	Disability	Consumption of lungs	1,500
622	Guthrie, Herbert K	202	" 23, "	"	Pul. involv. of L. lung, kidney, etc.	1,500
623	Anderson, Bengt P.	398	" 23, "	"	Partial excision of elbow joint	1,500
624	Bartels, Harry	369	" 23, "	Death	Operation for rupture	1,500
625	Petterson, Carl F.	602	" 25 "	"	Typhoid fever	500
626	Heinzer, Andrew C	194	" 25, "	"	Typhoid fever	3,000
627	Greenhalgh, Wm. C.	443	" 26, "	"	Derailing of engine	1,500
628	Strittmatter, Andrew D.	287	" 28, "	"	Typhoid fever	1,500
629	Durkee, Halsey M.	708	" 28, "	"	Typhoid fever	1,500
630	Neis, Willia L.	363	" 28, "	"	Struck by an engine	1,500
631	Andrews, Chas. E	657	" 28, "	"	Struck by train	1,000
632	Windham, Robert W.	83	" 28, "	Disability	Sundry injuries	1,500
633	Woodruff, Symeon W	146	" 28, "	"	Consumption of lungs	1,500
634	Gudmansen, C. H. L.	143	" 29, "	"	Consumption of lungs	1,500
635	Porter, Edgar W.	544	" 30, "	Death		1,500
636	Clayton, Harvey A.	65	" 30, "	"	Appendicitis	1,500
637	Churchill, Walter B.	492	Nov. 1, "	"	Gall stones	1,500
638	Wilhite, Elgin M	156	" 1, "	"	Typhoid fever	1,500
639	Lear, George W.	11	" 2, "	"	Collision	1,000
640	Betters, Charles L.	63	" 2, "	"	Heart disease	1,500
641	Newkirk, Frank L.	59	" 4, "	Disability	Dislocation of right shoulder, etc.	500
642	Kelm, Henry G	653	" 4, "	Death	Collision	1,500
643	Reynolds, Tilden H.	411	" 4, "	"		1,000
644	Wynn, Leaman G.	80	" 5, "	"	Typhoid fever	1,500
645	Waterman, Frank T.	284	" 6, "	"	Crushed between cars	1,500
646	Canavan, George J	362	" 6, "	"	Typhoid fever	1,500
647	Capehart, J. M.	325	" 7, "	Disability	Paralysis and locomotor ataxia	1,500
648	Largent, Frank	330	" 7, "	Death	Typhoid fever	1,500
649	Watson, Bud	400	" 7, "	"	Derailing of engine	1,500
650	Griffith, Vernon	700	" 7, "	"	Typhoid fever	1,000
651	Heckroot, Chris J.	154	" 8, "	"	Dropsy	1,000
652	Burnett, Merle	684	" 8, "	"	Collision	1,500
653	Oxford, Jensen J	279	" 9, "	Disability	Amputation part of hand	1,500
654	Vandenberg, Charles	621	" 9, "	Death	Intestinal obstruction	1,500
655	Brett, Edmund	521	" 9, "	"	Collision	1,000
656	Griesemer, Walter D.	562	" 9, "	"	Suicide	1,500
657	Mahan, Edward R	544	" 9, "	"		1,500
658	Post, Orra B.	295	" 9, "	Disability	Tot. & perman'ly blind, both eyes	2,000
659	Klomps, John	699	" 11, "	"	Amputation of hand	1,500
660	Thomas, David L.	56	" 11, "	Death		1,500
661	Jones, Charles F.	10	" 11, "	"	Consumption of lungs	1,500
662	Smith, Wm. L.	277	" 11, "	"	Boiler explosion	1,500
663	French, Fred C.	8	" 11, "	"	Collision	500
664	McAlister, Augustus	543	" 11, "	Disability	Traumatic neurasthenia	1,500
665	Rosine, William A	199	" 11, "	"	Paralysis	1,500
666	Van Nest, Nelson	149	" 11, "	Death	Cancer	1,500
667	Bowen, Oscar N.	367	" 11, "	"	Murdered	1,500
668	Baldwin, Clinton E.	683	" 12, "	Disability	Amputation of foot	3,000
669	Inglish, J. B.	177	" 13, "	"	Consumption of lungs	1,500
670	Berner, Wm. F.	85	" 13, "	Death	Asphyxiated	1,500
671	Young, Ross W.	108	" 13, "	Disability	Amputation of hand	1,500
672	Harris, R. L.	492	" 13, "	Death		1,500
673	Fine, Charles	454	" 14, "	"	Derailing of engine	1,500
674	Hannahan, Frank K.	50	" 15, "	"		1,500
675	Beach, Frank	71	" 15, "	"	Consumption of lungs	1,500

Respectfully submitted,
W. S. CARTER,
G. S. and T.

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Quarterly Dues Notice

OFFICE OF THE GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., December 1, 1907.

To Members of Subordinate Lodges:

SIRS AND BROTHERS—You are hereby notified that the dues for the quarter ending March 31, 1908, are now payable, and must be paid to the Collector of your Lodge on or before January 1, 1908. Said dues shall be such an amount as may be determined by the several Lodges, provided, in no case shall it be less than twelve dollars and fifty cents ($12.50) for each member carrying a beneficiary certificate of three thousand dollars ($3,000), eight dollars and fifty cents ($8.50) for each member carrying a beneficiary certificate of two thousand dollars ($2,000), five dollars ($5.00) for each member carrying a beneficiary certificate of fifteen hundred dollars ($1,500), three dollars and fifty cents ($3.50) for each member carrying a certificate of one thousand dollars ($1,000), and two dollars ($2.00) for each member who shall carry a certificate of five hundred dollars ($500). All beneficiary members now enrolled, and those admitted prior to February 1, 1908, are liable for the dues above referred to. All members initiated during the months of February and March will be exempt from the payment of dues for the said quarter as provided in Section 171 of the Constitution. Beneficiary members initiated during the month of January are liable for the full amount of quarterly dues for the above quarter. All officers and members are requested to give the foregoing their careful and strict attention, and govern themselves accordingly. Any member failing or declining to make payment as above provided will be subject to the penalty of expulsion from the Order, as per Section 174 of the Constitution, said expulsion taking effect January 2, 1908. Yours fraternally,

W. S. CARTER, G. S. and T. J. J. HANNAHAN, G. M.

Grand Dues Notice

OFFICE OF THE GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., December 1, 1907.

To Members of Subordinate Lodges:

SIRS AND BROTHERS—You are hereby notified that the sum of one dollar and twenty-five cents ($1.25) for semi-annual Grand Dues for the six months ending June 30, 1908, is now payable, and must be paid to the Collector of your Lodge on or before January 1, 1908.

Any member failing or refusing to make payment of his Grand Dues as above required will stand expelled, said expulsion taking effect January 2. Collectors are required to deliver their returns for Grand Dues, together with the proper statements, to the Treasurers of their Lodges not later than January 5, and Treasurers are required to forward the same so as to reach the Grand Lodge not later than January 20, as provided in Section 169 of the Constitution.

Honorary members are hereby notified that they are liable for the payment of Grand Dues.

Yours fraternally,

W. S. CARTER, G. S. and T. J. J. HANNAHAN, G. M.

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Notice to Treasurers

OFFICE OF THE GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., December 1, 1907.

To Treasurers of Subordinate Lodges:

SIRS AND BROTHERS—You are hereby notified, as provided in Section 80 of the Constitution, that no beneficiary assessment is required for the month of December, 1907, and that therefore none has been levied for said month.

Yours fraternally,

W. S. CARTER, G. S. and T. J. J. HANNAHAN, G. M.

Notice to Secretaries

OFFICE OF THE GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., December 1, 1907.

To Secretaries of Subordinate Lodges:

SIRS AND BROTHERS—Pursuant to Section 174 of the Constitution, you are required to report to the Grand Lodge as expelled all members who fail to make payment of their Quarterly Dues for the quarter ending March 31, 1908, and semi-annual Grand Dues for the six months ending June 30, 1908. The names of said members must be reported to you by the Collector of your Lodge not later than January 2d, and by you reported to the Grand Lodge, as per Section 174 of the Constitution, immediately thereafter. Failing to report the names of expelled members as herein provided, the Grand Lodge will hold Subordinate Lodges liable for their assessments, as per Section 85 of the Constitution.

Yours fraternally,

W. S. CARTER, G. S. and T. J. J. HANNAHAN, G. M.

Notice to Collectors

OFFICE OF THE GRAND LODGE, B. OF L. F. AND E.
PEORIA, ILL., December 1, 1907.

To Collectors of Subordinate Lodges:

SIRS AND BROTHERS—You are hereby notified that under the new law you are not permitted, and have no authority, to reinstate members who have been expelled for the nonpayment of dues. You must immediately report all applications for readmission to the Grand Secretary and Treasurer, who has authority to make such readmission if said application reaches him within thirty days after expulsion of member. Applications for readmission that reach the Grand Lodge more than thirty days after expulsion of member, must be addressed to the Grand Master and be accompanied by an application for beneficiary certificate, completed by the expelled member.

Yours fraternally,

W. S. CARTER, G. S. and T. J. J. HANNAHAN, G. M.

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SANTA CLAUS AUXILIARY

Of all the busy people round,
This busy Christmas-tide,
None works like Mistress Santa Claus
For days and nights beside;
The good old man, her sturdy spouse,
Has so much now to do,
If Madam Claus did not take hold
He never would get through.

They've dolls in every corner there,
They've dolls on all the chairs;
Piled high on every cupboard shelf,
And all the way upstairs;
But not a stitch of clothing would
On any doll be seen,
Unless his wife were there, for he
Can't sew on a machine.

The North Star brightly shining down
Gives all the light they need,
For "How to Climb a Chimney" is
The only book they read.
But Mistress Claus is working hard
On dresses, bonnets, sacks,
And there are lots of clothes to make
For all the jumping jacks.

The reindeer now are harnessed fast;
The toys packed in the sleigh;
And Santa Claus, wrapped up in furs,
Soon dashes on his way;
But, as he goes, cries, smiling back,
"I never in my life
Could do so much for boys and girls
Without so good a wife."

—Christmas in Song and Story.

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Notice.

Communications intended for publication in the Ladies Department of the Magazine should in all cases be addressed to the Editress, Mrs. Agnes G. Strong, 527 Green street, Boone, Iowa.

Christmas Bells.

Merrily through the frosty air
The Christmas bells are ringing,
Happy the morn when Christ was born
Let all the earth be singing
Glory to God! Good-will to men!
The Christmas Day has come again.

Angels beneath the starlit sky
Of that first Christmas morning,
Sang of the Son of righteousness
Which on the world was dawning,
"Glory to God!" we sing it still,
"Peace upon earth, to men good-will!"

So merrily ye bells ring on—
Nor cease your Christmas greeting,
While every earnest Christian heart
With holy joy is beating,
For Christmas Day has come again,
The day of God's best gift to men.

—Our Little Folks.

Greetings.

Again the holiday season, with its home enjoyments, is at hand. To us all there already recurs that message of peace and love and good-will which makes Christmas-tide so full of meaning. To the members of the Ladies Society I would send out, in this manner, my most sincere wishes for their happiness and prosperity. I have so long been closely associated with you that your personal welfare has grown to be a matter of real regard. I wish it were possible to meet each one of you, to wish you "A Merry Christmas and a Happy New Year." Failing in this, you must accept the words and the wishes through the medium of the types. I wish you a Merry Christmas and hope the bells of the New Year will ever ring joyously for you.

Detroit Union Meeting.

A Union Meeting was held in the city of Detroit, Mich., October 9, 10, and 11, 1907, under the auspices of Lodges 158, 508 and 532, of the Brotherhood, and Lodge 11 of the Ladies Society. We had been looking forward with glad anticipation to these few days, and we now look back with supreme satisfaction as they have gone by, for they mark an epoch in the history of No. 11 from which great benefit will result; not alone to them, but all others that took part. No. 11 is not a large lodge, numerically, but we were well pleased with the evidence of earnestness and industry exhibited by the officers and members. We were very sorry, indeed, that we were not permitted to meet their president, Sister Mary Hilling, who was detained at home by the serious illness of her little daughter; her place was very ably filled, however, by Sister Janette Sutherland, and Sister

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Bertha York, who so generously and graciously welcomed us to their city, to their hearts and to their homes. By their warm words of welcome and their sunshiny faces and glad hand clasp, they made us very happy, indeed, and aroused in us a desire to meet their welcome with the best that was ours to give.

Three grand officers were in attendance, Sister Maud E. Moore of Goderich, Ont., Grand Vice President; Mary E. DuBois, Boone, Iowa, Grand Secretary and Treasurer; Agnes G. Strong, Boone, Iowa, Editress of the Ladies Department of the Brotherhood Magazine; Mrs. John J. Hannahan of Peoria, Ill.; Mrs. A. P. Kelley, Chicago, Ill., and many other visiting sisters.

On Wednesday afternoon a reception was tendered the visiting ladies and wives of local members, given by Lodge No. 11. A very fine program was rendered, after which we were invited to the banquet room, where a delightful two-course luncheon was served by the faithful sisters of No. 11. When the inner man had been satisfied there flowed from happy hearts good wishes, merry jests and ready wit, Brother Shea, Vice Grand Master, officiating in a happy manner as toastmaster.

We were then ushered back to the Light Infantry Armory, where a public reception was given to the visitors by the local members of the Brotherhood. Every number on the program was thoroughly enjoyed and worthy of praise, but space forbids.

Thursday morning, Wayne's Better Half Lodge No. 11, met in special session and opened in form with Sister Maud E. Moore, Grand Vice President, in the chair. The ballot and initiatory work was exemplified, also floor work of lodge. Piano selections by Sister Josephine Warring added much to the work. Visiting sisters, Mesdames Hannahan, Kelley, Ella Johnson (Jackson, Mich.), Patten and Waugh (Stratford, Ont.), and DuBois, assisted in the work, Sister Strong acting as Conductor. Remarks were made by all present and many helpful suggestions offered. Our only regret was that there were not more of the members who were privileged to enjoy them.

Thursday afternoon a reception at the factory of Hamilton Carhartt, manufacturer, was tendered the entire visiting party, as guests of the corporation, which had paid most of the expenses of the convention. It certainly was an inspiration to us to greet the happy, cheerful faces of the eight hundred girls employed in this factory. It was quite different from the many stories we had heard of the life of a factory girl, and it made us happy to see them so robust and healthy and in such a pleasant environment. I truly hope that all other manufacturers will follow the same humane system as that followed by Hamilton Carhartt.

Thursday evening we formed a box party to the Lyceum Theater, where we again had the pleasure of enjoying an evening with "Sis Hopkins."

Friday morning, through the kindness and courtesy of the local members of the Brotherhood, we enjoyed a most delightful automobile ride, which gave us a fine opportunity to see the city and surrounding country; also the beautiful Belle Isle.

We were then driven back to the Light Infantry Armory, where an open meeting was held with the brothers.

In the afternoon we were guests at the Vaudeville Theater of the members of No. 11, and in the evening was given the closing reception and ball.

The morning hours of a new day broke upon us ere we parted companionship, and the memory of that delightful occasion will linger long in the minds and hearts of those who were privileged to enjoy it.

* * *

The Christmas Season.

This is the gladdest month of the year, the world over. It is the holiday month for all those who believe in the Christian religion. We have other holidays, to be sure. They come at all times of the year and are properly celebrated, but there are none for which such preparations are made as for Christmas. It is the one holiday of all the year which is a gift day. Weeks before, everyone is thinking about presents for friends and relatives.

Children look forward to the Christmas tree for weeks. They never tire of speculating on what Santa Claus will bring them. How eagerly they inspect their stockings on Christmas morning. All of these pleasant customs should be encouraged. They help to make life brighter for the children, who will soon enough encounter trials and troubles. Let them have all the pleasure they can out of the Christmas festival.

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Christmas means much to all. The student has a well-earned rest from school or college. The business man reaps a harvest from the Christmas shoppers. The busy housewife is busier than ever. Everybody is happier than usual and here is where the good comes from the Christmas celebration.

It is well that there is one time of the year when we forget our selfishness and devote our energies to making other people glad. Rich and poor come nearer to each other at Christmas than any other time, and the generosity of the former does much to ease the hardships of the latter.

Now a word as to Christmas gifts. Do not try to outdo your neighbors. Give within your means. Being generous does not mean that it is necessary to stint yourself for months in order to make Christmas presents that are too expensive.

In order to be happy at Christmas we must use common sense just as at any other season of the year.—People's Popular Monthly.

The Big Ten.

1. No. 142, Empire, Buffalo, N. Y.—120.
2. No. 3, Hazel, Peoria, Ill.—111.
3. No. 70, Holly, Buffalo, N. Y.—102.
4. No. 60, Pride, Harrisburg, Pa.—92.
5. No. 151, Missouri, St. Louis, Mo.—78.
6. No. 10, Helpmate, Elkhart, Ind.—77.
7. No. 125, Charity, Jackson, Mich.—74.
8. No. 146, Virginia, Chicago, Ill.—72.
9. No. 51, Grayson, Denison, Texas—71.
10. No. 113, Fort Orange, Albany, N. Y.—69.

No. 116 at Columbia, Pa.

Some time ago we received an invitation to attend the anniversary of Lodge No. 187, and unanimously decided to accept.

With the clouds hanging heavy over us, we left the Union Station, with one aim in view, to have a good time, thinking the clouds would soon give way to sunshine and brightness. As we left York for Columbia the rain just poured down in torrents and continued to do so throughout the entire day.

We were greeted, however, at the station by two members of our sister lodge, who escorted us to the hall, where preparations were being made for their anniversary meeting at night.

The members of No. 187 were untiring in their efforts to give us a pleasant time and provided us all with supper at the homes of their members.

About 9 o'clock, after the brothers, in the rooms above, introduced a candidate to their active, though good-natured "goat," we were entertained with music, moving pictures and illustrated songs. This was followed by a splendid repast, in which the brothers took active part, as well as some sisters of Harrisburg Lodge. We were surprised when some of them said they did not know there was a lodge of the Ladies Society in Baltimore. They should read the Magazine a little closer, for I think this is my fourth contribution since becoming correspondent for No. 116.

It seemed necessary that some of the sisters return home to Baltimore that same night, and to keep together we bid our friends good-night, and all but two started to walk to Wrightville, over a bridge a mile and a quarter long, where a special car awaited us to convey us to York.

The night was never darker, the rain never "wetter," the wind never blew harder, and no bridge ever seemed longer, but by steady perseverance we finally reached the end, with our umbrellas broken, wet garments, hats awry, etc. Our spirits were somewhat dampened by our rough experience, but that will all come right again, and we hope you will always find No. 116 of Baltimore very much alive, indeed.

We were, indeed, fortunate in having the company of Brother Howard of No. 314, whom we often used as a bureau of information.

We hope the weather man will treat us a little more kindly the next time we endeavor to take a trip.

LILLIAN F. MARKEY,
Baltimore, Md.

Excursion and Picnic.

The joint excursion and picnic at Marshall Hall, given by Mount Vernon Lodge No. 202, and Potomac Lodge No. 7, B. of L. F. and E., which I mentioned in my last letter, turned out a grand suc-

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cess, both socially and financially. The weather was delightful and the accommodations all that could be wished. So far as returns have been made at this writing, the financial result is $130 above all expenses, to be divided between the two lodges, with probably twenty-five or thirty dollars still to be collected.

Marshall Hall is an ideal place for a day's outing. The grounds are spacious and beautiful, while the arrangements for both comfort and pleasure leave little to be desired. The trip down the historic Potomac is in itself a joy long to be remembered. The scenery is delightful, and the points of interest closely connected with important events in our country's history are so numerous as to keep one's attention constantly engaged. Leaving Washington, the first to attract the eye is the Navy Yard and Naval Gun Factory, with its well-kept grounds and spacious buildings looking out upon the river. Here all the great and small guns for our battleships and cruisers are manufactured, to be taken down the river, when completed, for trial at the Indian Head proving grounds. Next comes the quaint old city of Alexandria, Washington's old market town. This place is full of memories of revolutionary days. The church in which Washington attended divine service is still standing, and visitors are always granted the privilege of sitting in the pew formerly occupied by the father of our country. Passing down the river from Alexandria we next come to the grim fortresses, Forts Washington and Hamilton, located on opposite banks of the river and maintained as a part of the defenses of the national capital. With their great guns and powerful searchlights they are able to sweep the river for miles in either direction, and to escape the vigilance of their garrisons would seem to be an impossible feat. We next come to the former home and present tomb of Washington, beautiful Mount Vernon. This is truly a spot to awaken patriotic feelings, a Mecca for tourists, once visited never to be forgotten. Almost directly across the river from Mount Vernon lies Marshall Hall, where we land and spend a day of pleasure unalloyed.

But the Marshall Hall trip, despite its joys, is not the only delightful event to be recorded. We have had the pleasure of a visit from our Baltimore sisters, and entertained both them and the brothers of Potomac Lodge No. 7, on July 12th. Interesting and instructive addresses were made by our Grand President and Grand Counsellor, and a very pleasant day and evening was spent. We greatly enjoyed the visit of our Baltimore sisters and hope to have the pleasure of meeting them again in the near future.

Another pleasant event was the entertainment given by our Grand President to the sisters of Mount Vernon Lodge. Sister Sargent's home was beautifully decorated with palms and carnations, the flower of our order. In discharging her duties as hostess, our worthy President was ably assisted by her sister, whose name I regret that I can not recall, and her daughter Mabel. The only regrettable feature connected with the entertainment was the absence of the man of the house, our worthy Grand Counsellor, who was unexpectedly called to New York on business. A most delightful evening was spent in social intercourse, charming music, both vocal and instrumental, and games in which prizes were contested for. Sister Sargent's daughter, Mabel, was the musician of the evening. She has marked talent, which is so well cultivated that her efforts could not fail to please. Prize winners in the games were Sisters Kate Ruhlman, Mary Criste, Flora Williams and Margaret Smith. The refreshments were in keeping with the delightful character of the entertainment as a whole. All felt regret when the hour for parting arrived, and it was unanimously agreed that Sister Sargent is unequaled as an entertainer. It is to be hoped that a series of social evenings of this character may be undertaken by the sisters of our lodge this coming winter, thus cementing the bonds of fraternity and promoting good feeling in our ranks. None can hope, however, to acquit herself so well as did our worthy President on the occasion here noted.

JEANETTE BORLAND,
Washington, D. C.

Balls and Entertainments.

Courteous invitations have been received by me to attend the following balls and entertainments. With best wishes for all for a thoroughly enjoyable and successful time: Lodge 235—First annual ball, at Brinkman Hall, Grafton, West Virginia, Tuesday evening, October 22, 1907. Lodge 203—First annual ball, at Ottumwa, Iowa, Wednesday evening, November 20, 1907.

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New Lodges.

Presque Isle, Lodge No. 233, organized at Erie, Pa., September 30, with eighteen charter members. Organizer, Sister Arilla C. Curtiss, of Lodge No. 42, Conneaut, Ohio.

Only.

Only a faded blossom, only a man's false part;
Only one more vow cast to the winds, only a broken heart;
Only the sweetest rosebuds by fairest lips were pressed,
Only a girl in a coffin lay with the roses on her breast.

Only a tiny casket, to a cottage one day came,
Only a babe was laid therein, a baby without a name;
And yet a larger casket was brought that summer day,
And side by side in the cottage, mother and baby lay.

Only a weary woman whose hair is turning gray,
Kneels by the side of a new-made grave and presses the clammy clay;
And only "my precious darling," her trembling lips can say;
And it's only one scene in many we may witness any day.

Only a man abroad in the world, with never a thought of care;
What link can there be between these three and this handsome debonair?
God pity the trusting maiden—God pity the mother so wan,
But surely God's curse from heaven will follow the guilty man.

MRS. HENRY B. JONES.
Washington, Ind.

All Reserved.

Frank P. Sargent, the United States commissioner of immigration, said one day in Washington:

"There is fine stuff in some of these poor people who come to our shores. I heard recently of a young Swedish woman. Brave, witty and honorable, she would bring splendid young Americans into the world.

"A short time after she arrived among us her husband got out of work. Naturally, then, the rent fell behind. The landlord called for it one day in her husband's absence.

"He listened to the young woman's tale of misfortune, regarding the while her yellow hair, her clear blue eyes, her red mouth and white teeth. Suddenly, bending toward her, he said:

"'Give us a kiss.'

"She drew back, and her blue eyes, as cold as ice, dwelt on him disdainfully.

"'No,' she said, 'my husband and I may be too poor to pay our rent, but we are not so poor that we can't do our own kissing.'"—Clipped.

Christmas Giving.

As the happy Christmas time draws near the very atmosphere seems to breathe "Good will to man," that "wondrous song the angels sang," so many centuries ago, above the birthplace of Him whose influence throughout all Christian lands is most strongly felt as this great anniversary draws near, so universally and joyously celebrated.

And as the Savior came as God's best gift to man, it is appropriate that on the day of his coming in each recurring year we give our best gifts to our loved ones.

Words are too poor to express our appreciation of gifts from the heart, that represent so much of loving thought and self-sacrifice. And how little do we prize the gifts that are not prompted by love—the duty gifts, the perfunctory presents that are made because it is thought by the senders that they are expected, in return for one received, or because a gift is anticipated from the recipient.

The occasion should not be desecrated by such sordid gifts and thoughts. A Christmas gift should be a loving gift.

Note how spontaneously the child-heart responds to the true spirit of the season. Ask to whom he will send gifts and he replies only with the names of those he loves, first the nearest and dearest, then his loving thought enlarges until the circle grows beyond his reach.

Let us all become as little children and send gifts only from the heart. And if, as with the child, the circle grows beyond the reach of our handiwork or our purses, we may at least send words of love and friendly greeting—white winged messages that will be wafted in to our friends on the Christmas tide, and tell them they are still enshrined in our hearts.

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Especially should we make a "Merry Christmas" for the children, who are so easily made happy. And remember "the least of these," for whom His work of love can only be done through human hearts and hands.

Is it not a most beautiful and solemn thought, that our every impulse to kindly acts may be in direct response to the prayer of some afflicted or lonely one, whose cry to the great All Father is answered through our means?

Thus, good friends, may we all observe, create and enjoy a most blessed and "Merry Christmas."—The Farmer's Wife.

A New Year's Social.

Two persons, perhaps the President and Vice President, should be prepared to represent Father Time and Lady New Year. Father Time's costume may be a long dark robe, a voluminous snow-white beard, and a wig to match. Lady New Year is dressed in white Grecian costume with gilt or silver border and girdle and a coronet or Grecian bandeaux in the hair. The opening speech, by Father Time, should briefly review the chief events of the past year, and introduce Lady New Year, who follows with a prophecy appropriate to the hopes and plans of the society for the coming year, and then introduces, in her turn, four other speakers. These should be officers, committee chairmen or other active members thoroughly familiar with the society's work. Each is dressed to represent a different season of the year, and speaks for five minutes on "The Best Season for Our Society to Work, and Why." The endeavor of each speaker is to prove his own season the most fitting for active work by the society, showing how many kinds of work may be undertaken at that time, etc. The company decide by vote on the one who makes the best argument. The winner is then presented, by Father Time, with a pretty calendar containing artistic or literary suggestions pertaining to the interests of the society. This may be varied by having the twelve months instead of the seasons. The dress may be elaborate in effect, or as simple as usual, with only a sash or badge containing the name of the month, and suitable flowers—a sprig of holly for December, etc. Refreshments may be cake and chocolate, with white paper napkins, on which are printed the date and "A Happy New Year." Close with a New Year's chorus, in which all can join.—L. M. H., in Eighty Pleasant Evenings.

Hurrah for the Brothers and Sisters of No. 41.

After six days of fun and entertainment the Ollepaw fall festival came to a close this afternoon in Ottumwa, Iowa. It has been a huge success and the farewell reception to Chief Wapello this evening in the city park was the closing feature of an occasion that will be long remembered by Ottumwans and the thousands of visitors who have been here this week.

In the big street parade held Wednesday evening the first prize in the Fraternal Floats was awarded to the B. of L. F. and E., No. 41, and the sisters of No. 203 assisting them. They had a big traction engine gaily decorated with bunting, containing members of the lodge, and pulling an immense imitation coach in which rode the sisters of No. 203. The car was draped in bunting and the ladies wore uniforms in which the colors of our lodge were prominent. The brothers wore their overclothes and caps.

Entertained.

Mrs. Thomas Ware of 717 East Main street entertained the ladies of the Brotherhood of Locomotive Firemen and Enginemen of Lodge No. 203, at her home Friday from 2 o'clock until 5 o'clock. The afternoon was spent in working on the monogram quilt that will be presented to the Railroad Men's home at Highland Park, Ill. Mrs. Ira Wallace was winner of the first prize and Mrs. Elmer Campbell won the second prize for the best needle work. Mrs. Grace Jennings furnished entertainment with piano selections. Mrs. Charles Crouch assisted Mrs. Ware in receiving the guests.—Clipped.

A Letter from Fort Orange No. 113.

To the Members of the Ladies Society. Greetings—Although a little slow in sending my first communication, I assure you Fort Orange must not be judged by its correspondent.

Having returned from our vacation, thoroughly rested, we have started in

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with a will; our new officers are rehearsing the work, and we have no fear but that they will sustain the reputation of their predecessors.

On September 18th we were guests of Rensselaer City No. 118, on an outing to Boston. Fifty-seven sisters left Albany at 4:15 a. m., all determined to improve every moment, to see all we could in the allotted time, and to enjoy ourselves to the utmost, and we certainly made a grand success of it. We arrived in Albany on our return, at 7:20 a. m. on the 19th, all thoroughly tired out, but of the same opinion—a glorious good time, long to be remembered. Long flourish No. 118.

Our next adventure—a euchre party at the home of the correspondent. Prizes were awarded and refreshments served. A number of our guests retired early, but those who remained were given a rare treat. Sister Wenner presided at the piano, and to the strains of a lively ragtime, Past Presidents Truax and Schmeltz, ably assisted by Brother Bill Booth, gave a cake walk that would do credit to professionals.

It was voted a social and financial success.

About this time we received an invitation to attend a joint meeting with the lodges of Green Island and Troy at Odd Fellows' hall, Green Island, on October 3d. There was quite a delegation from the local lodges present.

The meeting was called to order and opened in form by Master Hine, assisted by Sister Toomsey, president of Christmas Lodge. A most delightful evening was passed. Addresses were made by visitors, recitations were given, interspersed with vocal and instrumental music. Refreshments were served and certainly enjoyed.

"Into each life some rain must fall,
Some days must be dark and dreary."

We felt the truth of this saying more than ever on our last meeting day, when Sister Chesbro, our efficient and faithful treasurer for over three years, tendered her resignation, caused by her removal from this city. Surely her genial presence will be sadly missed. In behalf of No. 113, a number of the sisters called, and in a few well chosen words Sister Truax presented Sister Chesbro with a cut glass berry dish as a slight token of good will and our appreciation of her.

Wishing all members a happy and prosperous New Year, I will not trespass further on your valuable space. Yours in friendship and charity,

FLORA CORNELL,
Albany, N. Y. L. S. No. 113.

The Falling Leaves.

With the falling leaves,
Let the old fears die,
While the cold north wind
Chants its weird death cry.

Let the swirling wreaths
Of the pure white snow,
Cover up mistakes
Of a year ago.

The heart, aching, cleaves
To the happy past;
To hours of sunshine
Too sweet, ah! to last.

The past, smiling, weaves
Rainbow tints to charm,
And the spirit weak
Sees not the harm.

But the falling leaves
Sing a new, sweet song,
"A season of rest,
While the night is long."

And the purling wreaths
Of the pure, white snow
Cover up the wounds
Of a year ago.

While our Precious Lord
Hope's sweet message weaves
To one and all
In the falling leaves.

Oneonta, N. Y. IMOGENE BATES,
Member of L. S. No. 83.

Anniversary Celebration.

Charity Lodge No. 125 is eight years old, and its anniversary was pleasantly celebrated on the evening of October 23d at the Engineers' Hall. The hall was beautifully decorated for the occasion with bunting and paper flowers, using the lodge colors, red, white and purple, and the ever-beautiful stars and stripes.

The banquet hall was also trimmed with bunting, paper flowers and ferns. From 6 until 8 o'clock a delicious supper was served, and the guests were members of Gilbert Lodge No. 240, B. of L. F. and E., and their families, who were shown every attention by the capable committee.

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The sisters of the lodge were nearly all dressed in paper costumes. The scheme was very beautiful in its effect.

A delightful program, which had been arranged by Sisters Chapman, Bowman, Butterfield and Compton, was enjoyed by all. Dancing and progressive pedro completed the evening's entertainment.

Sisters York and Sutherland, members of Lodge No. 11, Detroit, Mich., were the guests of honor.

The L. S. has the use of the hall every fourth Wednesday in the month, afternoon and evening, so that we will have some form of entertainment every month.

Each anniversary meeting is looked forward to with a great deal of pleasure by all. With kind wishes for all sister lodges, I am, yours in friendship and charity, ANNA S. KIRBY.

Jackson, Mich.

Letter from No. 208.

Prairie Flower Lodge No. 208 held a very interesting meeting on Thursday evening, October 3d. The winter's work was mapped out and a prize offered of a four-dollar pin to the member who should bring in the most new members, and a three-dollar pin as a second prize for new members brought into the lodge before December 31, 1907. We are going to give a real old-fashioned Christmas dinner to the Brotherhood Lodges Nos. 127 and 597, and give the "boys" a square meal for once, especially the strangers who are "boarding out." Now, boys, keep this dinner in mind and govern yourselves accordingly.

Now, sisters, a few words from our lodge may not come amiss, under the head of "Good of the Order," on the subject of "Gossip," and its effect in the lodge room.

Gossip is certainly demoralizing. It is the smallest, meanest trait that human nature is prone to. I do not believe that such a state of reformation could be brought about that would suppress this dreadful evil, but in lodges where this evil prevails it can be helped and bettered if each member will resolve to shut their ears up tight to all gossip. If there is a time when such is thrust upon you unawares, show your disapproval by your protest, and be careful never to repeat it again. I believe it would be a splendid idea to form a club in some lodges, this club to be called "The Don't Knocker's Club," and each member obligate herself, promising not to gossip and, whenever possible, to prevent others from doing so, if in her power to prevent, and to protect a sister's character in her absence as you would if she were present. Would this not be an ideal club, and would not the Ladies Society be better for such a happy state of existence, and would not the world be better for the existence of the Ladies Society? Sisters, think on these things.

After each meeting this winter we have arranged for refreshments to be served and a social time after each meeting, as we meet only once a month, and we want to double our membership before July next. So we expect to have many social affairs this winter.

Sister and Brother Wise are in England on a visit, and on their return we are going in a body to give them a hearty return home.

JANE GOODERHAM.

Winnipeg. Manitoba.

The Borrowed Christmas Baby.

For long had we wanted a baby
To share in our Christmas joys;
So we borrowed a neighbor's baby,
By coaxing and many toys.

Away from the other babies,
And oh! there were many of them;
We carried our Christmas baby,
Our dear little borrowed gem.

And the baby just screamed with laughter
That dimpled her cheeks so fair,
As close in her arms she gathered
A soft little brown Teddy-bear.

While her blue eyes grew dark with wonder
At a wonderful Christmas tree,
And her joy in her new-found treasures
Was a sight that was good to see.

We marched her wooden soldiers
While the toy drum she beat;
We built up wonderful castles
To be destroyed by her fleet.

All through the house she flitted,
This borrowed sunbeam of ours;
Filling our hearts with incense,
Like perfume from rarest flowers.

But just when the sun was fading
Behind the huge Christmas tree
Our borrowed Christmas baby
Grew sad as a babe could be.

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She stood by the scattered playthings,
And this tired little girlie said,
"Where's muzzer and all the babies
And my bowl of milk and bread?"

But scarce had I time to answer
When the door was opened wide,
And two arms outstretched to the baby,
Who so gladly crept inside.

While a voice that throbbed with music,
So sweet with the mother call,
Said, "No matter how many babies,
A mother's heart has room for all."

Oneonta, N. Y. IMOGENE BATES,
Member of L. S. No. 83.

* * *

From 187.

Not seeing my last letter in the Ladies Department, I fear it has gone head foremost into that big waste paper basket of the Editress, so I will just write a few brief lines at this time to inform the sister lodges of the pleasant time we had celebrating our third anniversary.

On October 28, 1907, we passed our third mile stone, and the brothers of No. 252 very kindly gave us their rooms and also assisted us in entertaining our guests with their moving pictures and with music. We had with us a number of sisters and brothers from Baltimore and Harrisburg and we were delighted to have them with us. We spent a very pleasant evening together. Refreshments were served.

The day was a very disagreeable one, as it rained in torrents all afternoon and night, but nevertheless all seemed to have a jolly good time.

A great deal more could be said about this pleasant event, but, as I said in the beginning, I fear the waste paper basket and will not take up too much of your valuable space.

Wishing all sister lodges success.

LAURA E. STONER.
Columbia, Pa., L. S. No. 187.

* * *

Letters from Friends.

FROM L. S. 53—(*Edna Ashley, Trinidad, Colo.*) Well, here I am again to tell you No. 53 is still very much alive and thoroughly interested in all that pertains to the L. S.

I had the pleasure of visiting in Denver during July and August, and while there I visited Lodge No. 64 together with one of our own members, Sister Adams, who is now living in Denver, and we were treated royally by the sisters of No. 64, who, although they are few in numbers, are striving with a will to keep on growing.

The sisters of No. 53 gave me a delightful surprise party last week and presented me with a handsome linen tablecloth and napkins to match.

The stork has made three visits since last you heard from us, leaving with Sister Cora Furlow a boy, to Sister Carrie Smith and Sister Henkle tiny daughters. No "race suicide" for No. 53.

We feel that we have prospered this year, and hope to do greater things in the future.

* * *

FROM L. S. 103—(*Lovina Stick, Galesburg, Ill.*) Having recently been appointed Magazine correspondent for Co-Ed Lodge No. 103, will take great pleasure in reporting our success.

We organized last April with fifty-nine charter members, and am now proud to say we have sixty-five, and expect to number more by the first of the year.

To increase our membership the sisters have decided on a contest, closing January 1st. Two prizes will be awarded in this contest by two generous-hearted sisters, the first prize being a handsome hand painted china plate, given by our sister secretary, Maud Huber; the second prize is a lovely hand-made, embroidered centerpiece, given by our worthy president, Tillie Pennington. These prizes are beautiful and well worth working for.

We gave our first annual ball some time ago to raise money towards purchasing a new piano. I must say it was a great success socially as well as financially, we realizing the sum of one hundred dollars clear.

We have given three card parties of late, which were well attended and much enjoyed by all. The first of these was held with Sister Burkhalter, and took the nature of a flower contest also. Delicious refreshments were served. The second party was held at the home of Sister Huber, where a very pleasant time was had and dainty refreshments served. The third of our series was held in Firemen's Hall. The hall was tastefully decorated for the occasion with asters and golden glow by the committee. A luncheon, consisting of coffee, pickles,

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sandwiches and two kinds of cake, was served.

We also gave an ice cream social this summer at Sister Branham's home, which proved a success for such a cold, wintry night. We now know that hot coffee and doughnuts would have served to a better purpose than ice cream.

For the good of the Order we have had sisters visiting us from other lodges —Sister Hammer, president, and Sister Artz, past president, from Mississippi Valley Lodge No. 102, Fort Madison, Iowa, and Sister Berry, past president, from Eloysia Lodge No. 84, Chicago, Ill. We were delighted to have these sisters meet with us, and greatly appreciated their kind and helpful words.

We hold our meetings the first and third Thursday of each month in the B. of L. F. and E. hall on Main street, and would be glad to have all sisters visiting our city to remember our meeting time and place and visit our meetings. I can assure all who come a hearty welcome.

Wishing all sister lodges success, I am yours in Friendship and Charity.

FROM L. S. 100—(*Mary Picard, Joliet, Ill.*) On the 8th of August Eloysia Lodge No. 84 gave its annual picnic, and Steadfast Lodge No. 100 was invited. Owing to sickness and various other causes only three members were in attendance, and as the writer was one of the "lucky ones" I can assure you I had a grand time. We left Joliet in the morning and met Eloysia Lodge at the entrance to Jackson Park, where they held their picnic. An elaborate dinner was served, to which all did justice. In the afternoon games of all kinds were indulged in. Supper was then served, after which all left for their homes, assuring the ladies that the next time they gave a picnic we would be sure and be there. During the afternoon we were pleased to meet some of the ladies of Auburn and Virginia Lodges. Sister McKenzie and her officers deserve great credit for their efforts in making it pleasant for every one who was fortunate enough to be present. And now, having written of our pleasures, I come to the sad part of my letter, for however gay we may be, surely

"Into each life some rain must fall,
Some days must be dark and dreary."

We grieve (the second time during the past four months) for our dear Sister Stone, who died after a few days' illness, leaving a husband and two little ones, one an infant, who also died while the funeral party was at the cemetery burying her mother. Sister Stone had not been affiliated with the L. S. very long; in fact, she was the last to join Steadfast Lodge and the first to die since our lodge was organized.

On the 17th of August death again visited our ranks and took our beloved sister, Nellie Harless, one of our most earnest and faithful workers, and one who will be greatly missed by all, for she scarcely ever missed a meeting of the lodge. She had been a member of our lodge five years and had always filled an officer's chair, and was elected and installed our vice-president for the ensuing year, but never had the pleasure of filling the chair. She was sick a little over a week, realizing from the first that she had but a small chance of recovery, but she was well prepared and reconciled to the will of her Master. She left to mourn her loss a devoted husband and two little ones, also an aged father and mother, four sisters and two brothers. Her funeral was in charge of Steadfast Lodge. The floral offerings were many and beautiful. She was laid to rest in Oakwood Cemetery.

FROM L. S. 165—(*Mrs. Birdie Sismilch, Trenton, Mo.*) There has been nothing heard from Annabell Lodge No. 165 since its organization. We were not afraid to write, only just a little bit neglectful. We were organized April 23, 1905, being at the present time just a little over two years old. We have a splendid lodge of eighteen members. We started with a small membership, but have grown rapidly, with good prospect of more new members soon.

On February 28th we entertained the brothers and their ladies at cards. Covers were laid for forty and a splendid repast was served. All felt happy and a most pleasing spirit was present.

April 23d we celebrated our first anniversary by having a social. It is needless for me to say that it was a decided success, for success always attends a united effort of any organization. A nice program was rendered and dainty refreshments were served. We realized about $45, and after paying balance on our piano we had about $35 for our treasury.

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June 13th a pleasant surprise was planned and successfully carried out at the home of Sister Josie McInillan on Sister Lemley, who was soon to leave for Minneapolis, Minn., where Brother Lemley is now employed on the railroad. Sister Lemley was presented with a gold pin, our emblematic pin, as a small token of our love and esteem for her. Music was furnished by Sisters Keith and Kenneth. Sister McInillan, assisted by Sisters Fish and Warren, served a dainty luncheon.

August 21st we held a lawn social at the home of Sister Anna Smith. We realized $12.50 for our efforts along this line.

September 12th being regular meeting night of Success Lodge, the L. S. planned a surprise on them. We went to the hall loaded with good things to eat, and while Sister Keith presided at the piano we marched in, taking possession of the hall and filling the officers' chairs, Sister Kennett in the master's chair, and in a few well chosen words told the brothers that we were about to get even with them, for when we organized they very kindly donated us $25, and it was greatly appreciated, and now we were going to return the compliment by presenting them with a check for $25. Brother Beckelheimer thanked the ladies in behalf of Success Lodge, after which the ladies served refreshments and treated the boys also to cigars. All had a good time and departed at a very late hour for their homes.

* * *

FROM L. S. 201—(*Ida Roderick, Chicago, Ill.*) Having seen nothing recently of our lodge doings in the Ladies Department of our Magazine I venture to write and let you know a little of what we are doing.

I am quite sure the sisters would be interested in knowing that Pride of No. 188 Lodge No. 201 is so prosperous that it may encourage other lodges to hear of it, so will be a real missionary and send the word along.

Our president, Sister Mae Metzinger, is one of the few people who know how to get out of the members the very best that they are capable of. The entire membership is congenial, and with such efficient officers we are making long strides in perfecting our work.

Our worthy past president, Sister Burton, donated a very handsome point lace handkerchief to the lodge, which they in turn sold for $8, and this was put in our treasury.

We give many social functions during the year. It not only helps to replenish our treasury, but it promotes sociability and brings in many new members.

We are going to hold our third annual reception and ball on November 15th at Central Park Hall, Francisco and Lake streets.

Life has its joys and sorrows, and as we are a band of sisters joined together by the strong ties of Friendship and Charity and Love, let us at all times exemplify these teachings by kindness and forbearance one toward another, and let us guard most zealously the harmony existing among our members everywhere.

* * *

FROM L. S. 85—(*A Member, Amarillo, Tex.*) As the sisters of the Ladies Society have not heard of Paladuro Lodge No. 85 since our organization three years ago, thought we would let you know that we are still in existence, and also tell you of a very pleasant entertainment given us by our past treasurer, Dode M. Cramer, on September 13th in honor of her birthday. The house was beautifully decorated in the lodge colors, red, white and purple, and a profusion of purple and white asters. The refreshments were served on the porch, which was also tastefully decorated, and the table was especially pretty with an immense cake, with the lodge colors and the lodge number, 85, on the top, occupying the center of the table. After all were seated Sister Arah Stearns, president, with a very neat speech, presented Sister Cramer with a bunch of roses, one for each year, and a gold piece as a remembrance from the lodge for her splendid work as treasurer since the organization of the lodge three years ago. Sister Stearns was also given a gold piece for her excellent work as president of the lodge for the past year. The presentation was made by the secretary, Sister Lucy Mitchell.

A great deal of fun was enjoyed in a pinning contest, in which Sister Renison was the most successful. All went home after a delightful afternoon, which came to a close all too soon, and all voted Sister Cramer an ideal hostess and wished her many happy returns of the day. The out-of-town guests were Mrs. John Lerman and daughter Aliweise,

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Lafayette, Ind., and Mrs. N. Stevens, of Kansas City, Mo.

Our lodge is progressing nicely and we are getting quite a few new members, and some day we hope to be numbered among the "Big Ten."

FROM L. S. 155—(*Nettie Pierce, Somerville, Mass.*) Pride of the East Lodge No. 155 had a very enjoyable trip down the harbor to Nantasket August 28, 1907.

Last week a basket picnic was held at Lexington. All those who went felt well repaid for the trip.

Saturday evening, September 14th, a social, dance and whist party was held at Newcomb Hall, Broadway, Somerville. The piano, violin and cornet players furnished excellent music for those who enjoy dancing. Our committee worked hard, both in supplying partners and looking after those who were playing whist. Refreshments were served during intermission. These parties will be held the second Saturday evening of each month throughout the winter.

At our regular meeting Tuesday afternoon, September 24th, we had the pleasure of initiating Sister Waldron, of Dover, N. H., and at our next meeting we hope to initiate three more candidates.

FROM L. S. 144—(*Mrs. Della Marshall, Yoakum, Tex.*) Just a few words from Yoakum No. 144 to let you know how we are getting along.

We have about twenty members, and most of us attend meetings regularly. We also hold joint meetings the first Monday night in each month with the brothers of No. 281. We always serve refreshments of different kinds and have a royal good time.

The L. S. meets twice each month—the second and fourth Tuesdays, in the afternoon. We anticipate four or five applications soon. We are doing all that we can to increase our membership, and we have some fine material to work on.

We give social evenings and entertainments occasionally, and invite all eligible to membership for the purpose of getting them interested.

We had quite a pleasant surprise on our last regular meeting day, when Sister S. H. Hood treated us all to ice cream and cake, and of course she invited Brother Hood, who was home playing nurse.

Best wishes for all sister lodges.

Grand Dues Notice.

GRAND LODGE
LADIES' SOCIETY OF THE BROTHERHOOD OF LOCOMOTIVE FIREMEN AND ENGINEMEN.

OFFICE OF
GRAND SECRETARY AND TREASURER.

BOONE, IOWA, Dec. 1, 1907.

To All Subordinate Lodges:

Sisters—Pursuant to the requirements of the laws, you are hereby notified that the amount of fifty (50) cents for grand dues, for the six months ending June 30, 1908, will be due and payable by all members whose names appear upon the rolls of membership January 1, 1908, to the collector of the lodge, on or before January 1, 1908. The collector is required to deliver the amount thus collected, together with the proper statements, to the treasurer of her lodge not later than January 5, 1908, and the treasurer is required to forward the same so as to reach the office of the Grand Secretary and Treasurer not later than January 10, 1908.

Fraternally yours,
MARY E. DUBOIS,
Grand Secretary and Treasurer.

Approved:
GEORGIE M. SARGENT,
Grand President.

Death Report.

Minnie E. McDonald, Lodge 58; died October 14, 1907; cause, septic peritonitis. Insurance, $200.

Emma Killingsworth, Lodge 64; died September 27, 1907; cause, peritonitis. Insurance, $200.

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The M. C. B. Association recommends a

Knuckle Opener

"Which will throw the knuckle completely open and operate under all conditions of wear and service"

This recommendation exactly describes the operation of the

PITT COUPLER

To make the operation of opening the knuckle by means of a "Kicker" as safe as it has always been by hand it is essential that the "Kickers" should work every time. The failure to do so has been the cause of many serious accidents.

We find many switchmen who, taught by experience, disregard the presence of any "Knuckle-Opener" or "Kicker" and open the knuckle, always, by hand, thus, in a very practical way is made manifest the necessity for a safe design in a "safety-appliance."

The "Knuckle-Opener" in the Pitt coupler is positive in its operation and pushes the knuckle open to its fullest range of movement either from a fully closed position or from any partially open position ***regardless of rust.***

With the Pitt coupler the switchmen will never be obliged to reach in—on sudden impulse—at the last moment and when the car is in motion to open the knuckle by hand.

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WINKLEY ARTIFICIAL LIMB Co.

Jepson Bros.
SOLE OWNERS.

LARGEST MANUFACTORY OF ARTIFICIAL LEGS IN THE WORLD.

THE LATEST IMPROVED
PATENT ADJUSTABLE
DOUBLE SLIP SOCKET

Artificial Leg

WITH
SPONGE RUBBER
MEXICAN FELT OR ENGLISH WILLOW
Foot

WARRANTED
NOT TO CHAFE THE STUMP.

Made from Measurements and Cast Without Coming to Factory.

This cut shows leg for amputation six inches below the knee, with inside socket thrown out of its proper position in order to show its construction.

Waverly, Ky., Feb. 12th, 1906
Winkley Artificial Limb Co.:

GENTLEMEN:—I lost my leg in a wreck on the Southern Railway. Five months after the accident I received one of your Double Slip Socket Legs and can now walk nearly as good as before I suffered the accident and the leg does not chafe or hurt my stump in the least and I have walked miles at a time. I will gladly answer any letters of inquiry concerning the subject. Yours truly,
BOYD PHIPPS,
No. 409 B. of L. F.

Ft. Smith, Ark., Feb. 24, 1906
The Winkley Artificial Limb Co.:

GENTLEMEN—I am more than pleased to say that your leg is giving the most perfect satisfaction and it has proven just as you represented it to me. It does not chafe my stump or give me any discomfort whatever. I am a perfect walker and can hardly realize that I am a cripple. I can run and jump just the same as I did before my misfortune. I am on my feet continuously every day and with perfect ease and comfort. I will gladly answer all correspondence and especially to Railway men, who have had my misfortune.
HARRY GLENN, No. 244 B. of L. F.

THE WINKLEY ARTIFICIAL LIMB CO.: SOMERSET, KY., Feb. 19, 1906.

GENTLEMEN:—Five months after amputation I received your leg and took my engine again. Can catch on or get off a train running 15 miles an hour; have been on my leg from 30 to 50 hours at a time; can take water and coal as quick as ever; am firing through a mountainous system and railroad boys know what that means. I ordered a second leg of you after wearing the first one several years and finding it satisfactory. Will answer any letters from the boys. L. B. GUFFEY, No. 367 B of L. F.

MINNEAPOLIS, MINNESOTA, U. S. A.

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