

(No Model.)

2 Sheets—Sheet 1.

E. DEDERICK.
STREET LOCOMOTIVE.

No. 477,889.

Patented June 28, 1892.

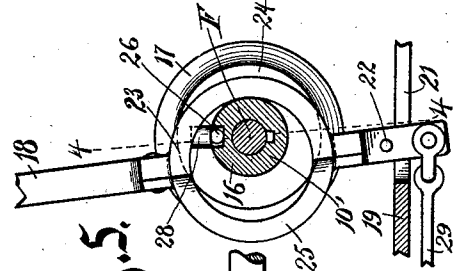
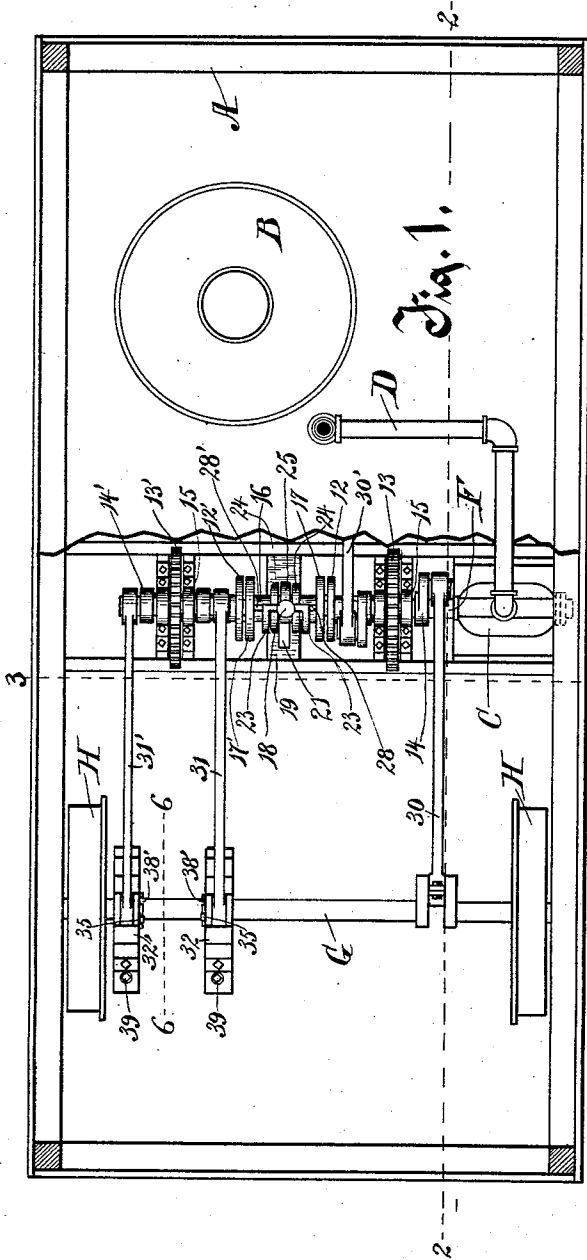


Fig. 4. 5
Fig. 5.

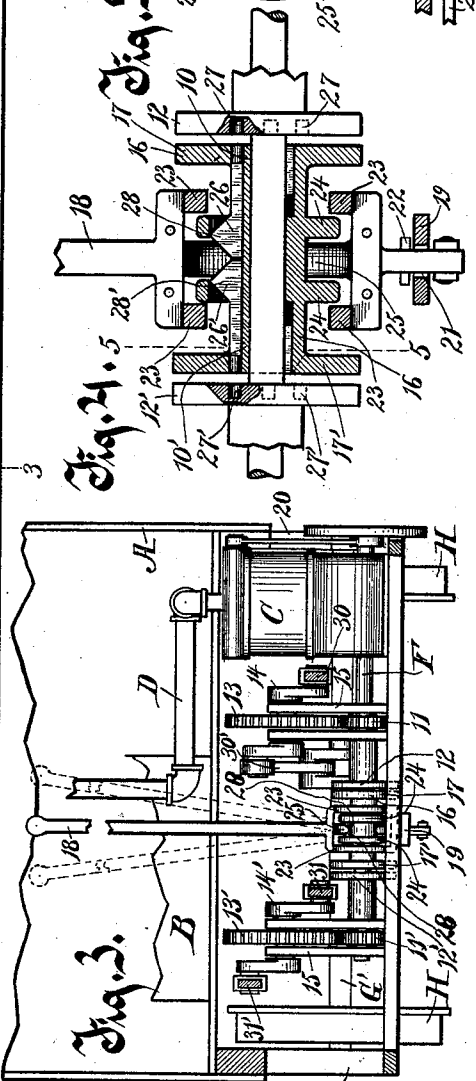


Fig. 3.

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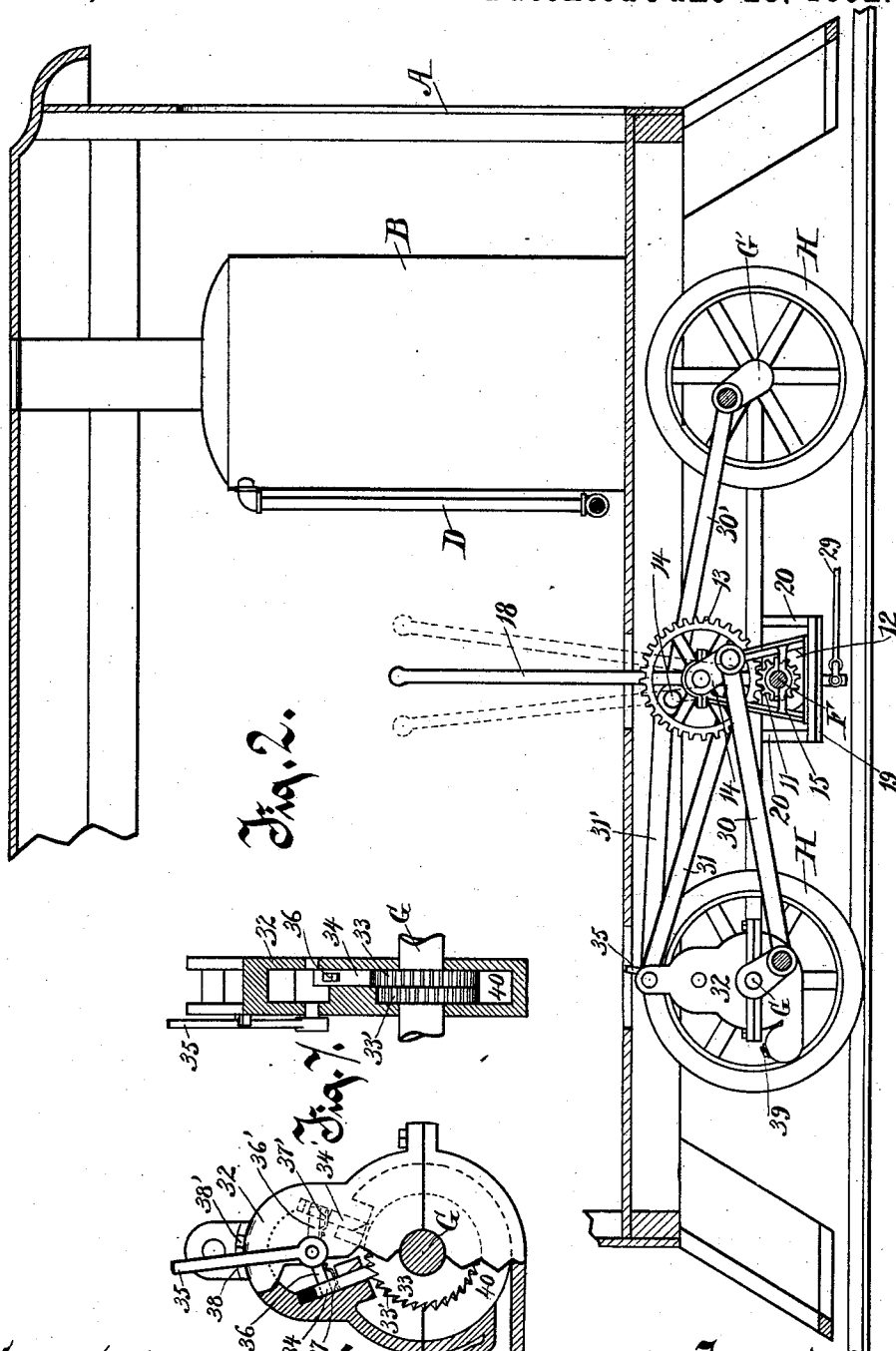


Fig. 2.

Fig. 6.

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UNITED STATES PATENT OFFICE.

EZRA DEDERICK, OF MILWAUKEE, WISCONSIN.

STREET-LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 477,889, dated June 28, 1892.

Application filed August 31, 1891. Serial No. 404,190. (No model.)

To all whom it may concern:

Be it known that I, EZRA DEDERICK, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful

5 Improvements in Running-Gear of Locomotives or Motors, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

10 My invention relates to improvements in the running-gear of a locomotive or motor of the class especially adapted for use on street-railways.

The invention consists of mechanism for 15 connecting the axles of the locomotive or motor operatively to the power-supplying mechanism, parts of which novel mechanism are also adapted to applying the brakes to the wheels of the locomotive or motor.

20 In the drawings, Figure 1 is a plan view of my improved mechanism, shown in connection with the floor of the locomotive, a portion of which is broken away, and an axle connected to the improved mechanism. Fig. 2 is a longitudinal section of the locomotive on line 2 2 of Fig. 1, a portion of the walls and top of the motor-car being broken away for convenience of illustration. Fig. 3 is a view on line 3 3 of Fig. 1, and shows so much of my improved mechanism as is at the right of the 25 line. Fig. 4 is a section on line 4 4 of Fig. 5 of a portion of my improved mechanism that is located about centrally of the mechanism shown in Fig. 3. Fig. 5 is a view of that part of the mechanism shown in Fig. 4 at the right of line 5 5 thereon. Fig. 6 is a view, taken on line 6 6 of Fig. 1, of a part of the mechanism adapted for use for rotating the axle of the locomotive with a leverage and power 35 greater than that ordinarily used. Fig. 7 is a section of the mechanism shown in Fig. 6 at right angles thereto.

45 The locomotive frame or car A is of suitable form for supporting the power generating or supplying mechanism, and the form shown in the drawings is adapted for use with a steam-engine as a means for supplying the power required for actuating the locomotive.

50 There is a boiler B and an engine C, connected with the boiler by the steam-pipe D. These parts—the boiler, the steam-pipe, and the engine—may be of any desired form or

construction, as they form no part of my invention, being only such as are adapted, as in this case, for rotating the shaft F. The axles 55 G and G', provided with the thereto-rigid wheels H, are journaled on the car-frame and support and carry the car.

My improved mechanism is arranged in connection with the shaft F and the axles of the 60 car, and is chiefly adapted to communicating motion from the shaft to the axles. There are two collars 10 and 10', loose on the shaft F, each of which has a pinion and a disk, indicated as 11 and 11' and 12 and 12', respectively. These collars revolve freely on the 65 shaft, but have no endwise movement thereon. The pinions 11 and 11' mesh with the cog-wheels 13 and 13', respectively, fixed on the cranked shafts 14 and 14', which shafts 70 are journaled in brackets 15, secured to the frame of the car. A collar 16, splined on the shaft F between the collars 10 and 10', is provided at its ends with disks 17 and 17', adapted to be put into frictional engagement with 75 either of the collars 10 or 10', as desired, by shifting the collar 16 endwise on the shaft.

For shifting the collar 16 along the shaft a shifting-lever 18 is provided. The lower end of this lever is fulcrumed in a plate 19, rigid 80 on the brackets 20, fixed on the car-frame. The lever is fulcrumed in this plate 19 by being passed through a slot 21 in the plate, in which slot the lever has no movement in the direction of the axis of the shaft F except only a 85 slight oscillating play. The lever is supported by a pin 22, fixed into and projecting from it on both sides, which pin rests on the plate 19. The lever 18 is constructed medially in the form of a yoke loose about the collar 16, which 90 yoke consists of two legs 23 23, extending from above the shaft in a semicircle about it to below the shaft. These legs are at a distance apart and are adapted to straddle and bear against the annular flanges 24 24, rigid on the 95 collar 16. Also, the yoke has a single leg 25, extending in a semicircle from above the shaft to a junction with the two legs below the shaft, which single leg passes around the shaft in the opposite direction to the two legs 100 23 23 and is adapted to enter a channel therefor about the collar 16 between the annular flanges 24. By shifting this lever 18 to the right or left and at the same time holding the

legs 23 23 up to the collar 16, so that they will engage the flanges 24, the collar 16 is shifted into engagement with the disk 12 or 12', according to the direction the collar is shifted.

5 The frictional contact of the disk 17 or 17' with the disk 12 or 12' is adapted to provide for a certain amount of lost motion by the slipping of the parts when the locomotive is started and while it is getting under motion, 10 whereby any undue shock liable to occur by connecting the stationary mechanism with the moving mechanism is obviated.

To enable me to lock the collar 10 or 10' to the collar 16 when there is no longer any need 15 for lost motion between them, I provide keys 26 26', sliding longitudinally in the collar 16, and adapted, when forced outwardly therefrom, to enter one of the sockets 27 or 27' provided therefor in disks 12 and 12', respectively. 20 These keys 26 26' are each provided with radially-projecting heads 28 28', which heads abut against each other when the keys are withdrawn from the disks 10 and 10', the flanges 24 being provided with slots for the 25 passage of the heads of the keys therethrough. These radially-projecting heads 28 28' are beveled from their outer ends in both directions longitudinally, the extent of the bevel 30 longitudinally of the key being in both directions substantially equal to the thickness of a flange 24 and one-half the width of the channel between the flanges 24.

It will be noticed that the diameter of the yoke in the lever 18 is considerably greater 35 than the diameter of the collar 16, and also that the slot 21 in the plate 19 is elongated at right angles to the shaft F, so that the lever has considerable movement in that direction therein. It will be seen that by means of 40 the construction just described, if the lever 18 is moved at right angles to the shaft F, so as to bring the single leg 25 into the channel between the flange 24 while the collar 16 is revolving with the shaft, the leg will be brought 45 into contact with the beveled ends of the keys 26 26', and they will thereby be forced endwise outwardly into the sockets of whichever disk 12 or 12' the collar 16 is in close contact with.

It will be noticed by reference to Fig. 4 that 50 there is sufficient play of the collar 16 endwise between the disks 12 and 12' to permit the key 28 or 28' to project therefrom and be free from the adjacent flange at that end of 55 the collar 16 which is not in close contact with the flange 12 or 12'. By throwing the lever 18 in the other direction at right angles to the shaft F, so as to bring the legs 23 23' close to the body of the collar 16 while it revolves, these legs will be brought into contact 60 with the outer bevels of the heads 28 28', whereby the keys will be forced inwardly longitudinally toward each other and out of engagement with either of the disks 12 or 12'.

65 A brake-rod 29 is connected to the lever 18 below the shaft F and advisably below the plate 19, which rod is intended and is adapted

to be connected at its other extremity to brake-shoes (not shown) adapted to bear against and 70 brake the wheels of the car. This rod 29 runs from the lever 18 at the opposite side to the legs 23, so that the brake is actuated by the strain of the lever 18 on the brake-rod 29 when the legs 23 are bearing against the collar 16 as a fulcrum, which legs at the same 75 time are acting to hold the keys 26 26' out of engagement with either of the adjoining collars 10 or 10'.

Connecting-rods 30 30' serve to connect the two cranks on the shaft 14 respectively with 80 cranks on the axles G and G'. By this construction the motion of the shaft F is, through the shaft 14, communicated directly with the axles G and G' and to the wheels H thereon.

The construction just described, connecting 85 the driving-shaft F with the axles G G' by the rods 30 30', is the mechanism commonly and generally used for running the locomotive; but for starting the locomotive or for running it with more energy when hauling 90 an unusual load other devices mounted on the axle G and connected to the driving-shaft through the rods 31 31' are provided. This starting mechanism, mounted on the axle G, consists, essentially, of the levers (constructed 95 in the form of cases) 32 32', mounted loose on the axle G and provided with devices whereby they engage the axle for rotating it in one direction, the direction of rotation being capable of being reversed, as desired. These 100 lever-cases are duplicate in form and construction and are respectively connected by the rods 31 31' to the wrists of the double-cranked shaft 14'. These lever-cases 32 32', 105 each inclose two ratchet-wheels 33 33', integral with each other and rigid to the axle G, the teeth of which wheels face, respectively, in reverse directions.

Gravity clicks or pawls 34 34', movable endwise in grooves or ways therefor in the case, 110 are adapted to engage the wheels 33 33', respectively, in one direction rotatably and lock the lever in that direction to the axle, whereby by the forcible oscillation of the lever the axle will be revolved in that direction, as only 115 one of these gravity-pawls is to be in engagement with a ratchet-wheel at the same time. I provide a hand-lever 35, pivoted in the case between the gravity-pawls and capable of being 120 oscillated limitedly, which lever is provided with laterally-radiating arms 36 36', which enter slots therefor in the gravity-pawls, being so arranged that by shifting the 125 lever-handle 35 toward the front or rear on the case one or the other of the pawls will be lifted out of engagement with its ratchet-wheel. The slots in the pawls into which the arms 36 36' project are of sufficient length to permit the pawls to rise sufficiently to slip 130 over the teeth of the wheel in one direction, when the pawls one at a time are held yieldingly in engagement therewith by springs 37 37', interposed between the arms of the lever-handle and the pawls respectively.

Two notches 38 38' are provided in the case, into which the lever-handle 35 enters and is locked in position with reference to the case, the lever-handle being sufficiently elastic to permit of its being sprung out of the notches for shifting it from one to the other. The lower portions of these cases 32 32' are liquid-tight, and form receptacles 40 for holding a lubricant. The receptacle is supplied with its lubricant through the aperture closed by the screw-threaded plug or stopper 39.

It will be understood that for ordinary and rapid movement of the locomotive the axles are connected operatively to the driving-shaft only through the connecting-rods 30 and 30'; but when starting a locomotive or moving on an up-grade, where greater traction-power is required, the driving-shaft is coupled to the cranked shaft 14', and thence through the rods 31 31' is connected operatively to the axle through the levers 32 32', which are radially longer on the axle than the crank-arms of the axles to which the rods 30 30' are connected. In this manner a greater force is exerted revolubly on the axles and a greater traction-power obtained. The two cranks of the shaft 14' project radially in opposite directions, and thereby alternate action amounting to a substantially-continuous force is exerted on the axle revolubly. By shifting the lever-handle 35 on both the cases 32 32' the direction of the rotation of the axle is reversed.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a locomotive or motor, a driving-shaft and collar having gear loose on the shaft, a double-cranked shaft geared to the collar, rods connecting the cranks of the shaft to the wrists of cranked axles, one in front and the other in the rear of the shaft, and means for clutching the collar to the shaft revolubly, combined substantially as described.

2. In a locomotive or motor, a driving-shaft, a collar having gear loose on but arranged to be clutched to the shaft, a cranked shaft geared to the collar, and a rod connecting the crank on the cranked shaft to a radial lever loose on an axle and arranged to engage the axle revolubly in one direction, combined substantially as described.

3. In the running-gear of a locomotive or motor, the combination, with an axle and ratchet-wheel thereon, of a radial lever connected at its outer extremity to the crank of

a revoluble shaft, pawls movable in the case and adapted to engage the ratchet-wheels revolubly, respectively, in opposite directions, a lever-handle pivoted in the case, arms there-
60 adapted by the shifting of the handle to raise one or the other of the pawls out of engagement with its ratchet-wheel, and springs interposed between the arms and pawls to hold the pawl yieldingly toward and separately in
65 engagement with its ratchet-wheel, substantially as described.

4. In running-gear for a locomotive or motor, the combination, with a driving-shaft and a collar splined thereon, adapted to be shifted
70 endwise into engagement with gears on the shaft, of keys having beveled heads movable endwise in the collar and a collar-shifting lever having a yoke, one leg on one side of which is arranged to be held up to the revolving collar and as the collar revolves to bear against the beveled heads of the keys and force them outwardly into engagement with the gears on the shaft, substantially as
75 described.

5. In running-gear for a locomotive or motor, the combination, with a driving-shaft and a collar splined thereon, adapted to be shifted
80 endwise into engagement with gears on the shaft, of keys having beveled heads movable endwise in the splined collar and a collar-shifting lever having a yoke provided with two legs on one side of the lever, which are arranged to be held up to the revolving collar and as the collar revolves to bear against
90 the beveled heads of the keys and force them inwardly out of engagement with the gears on the shaft, substantially as described.

6. In running-gear for a locomotive or motor, the combination, with a driving-shaft and a collar splined thereon, of a lever adapted to shift the collar into and out of engagement with the locomotive-moving mechanism and a brake-rod connecting one extremity of the lever to brake mechanism, whereby the shift-
100 ing-lever is adapted to shift the collar out of engagement with the driving mechanism and at the same moment to set the brake, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EZRA DEDERICK.

Witnesses:

C. T. BENEDICT,
JEAN STANTON.