

(No Model.)

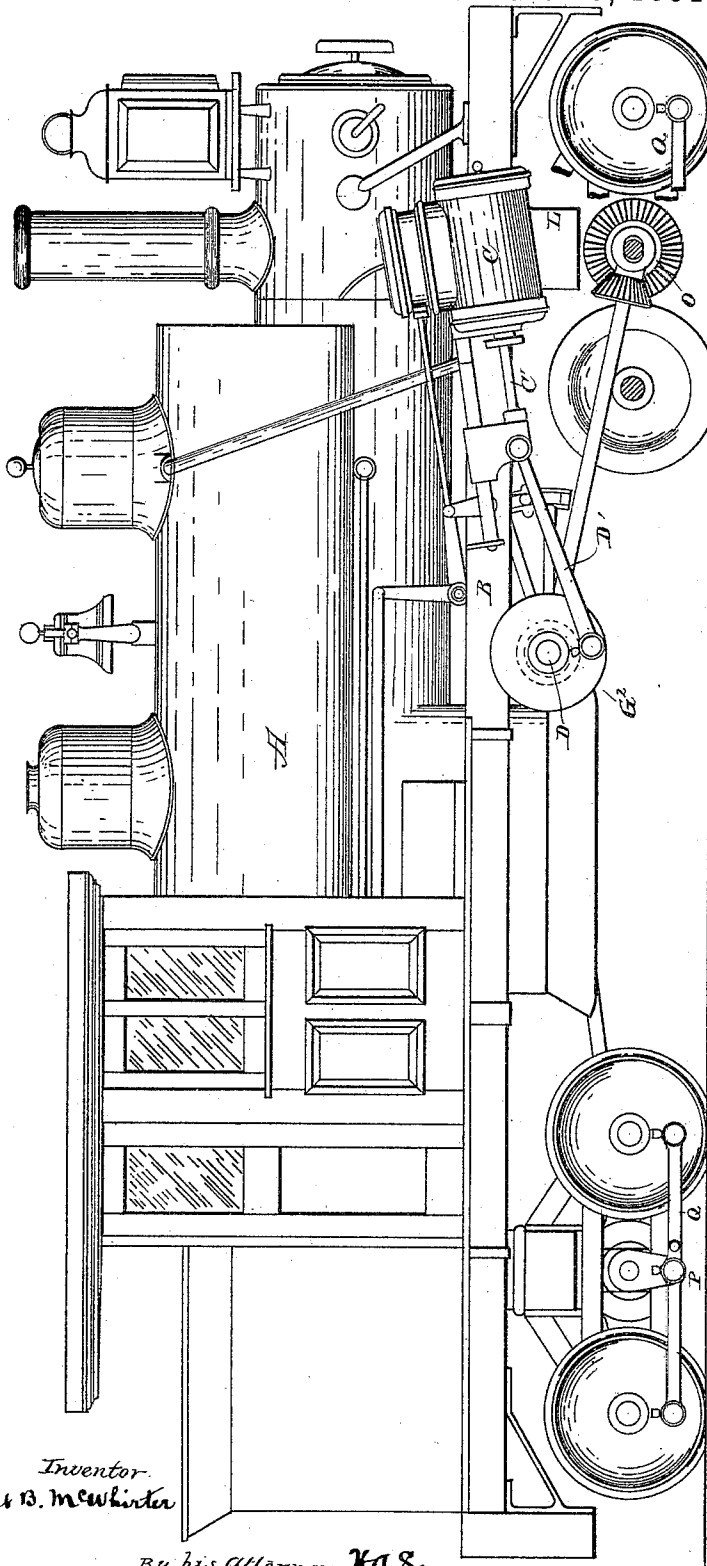
3 Sheets—Sheet 1.

R. B. McWHIRTER.
LOCOMOTIVE GEARING.

No. 448,160.

Patented Mar. 10, 1891.

Fig. 1



Witnesses:
G. F. Downing
S. G. Nottingham

Inventor:
Robert B. McWhirter

By his attorney N. A. Sumner

(No Model.)

3 Sheets—Sheet 2.

R. B. McWHIRTER.
LOCOMOTIVE GEARING.

No. 448,160.

Patented Mar. 10, 1891.

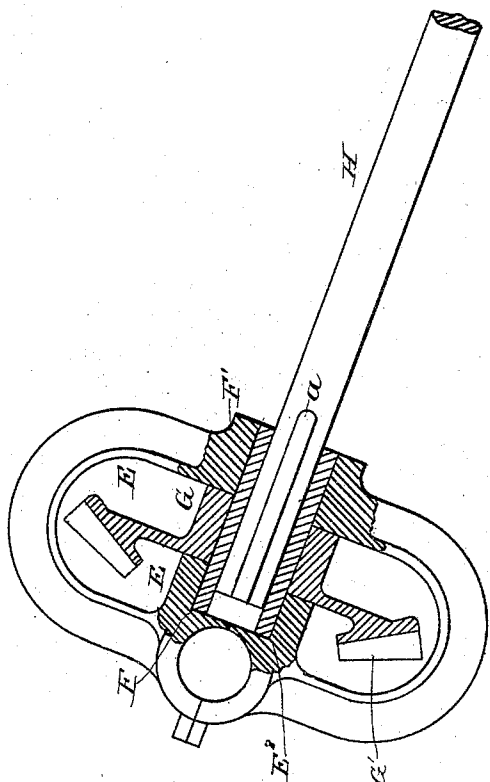


Fig. 2

Witnesses:
G. F. Downing
S. G. Nottingham

Inventor
Robert B. McWhirter
By his Attorney
H. A. Seymour

(No Model.)

3 Sheets—Sheet 3.

R. B. McWHIRTER.
LOCOMOTIVE GEARING.

No. 448,160.

Patented Mar. 10, 1891.

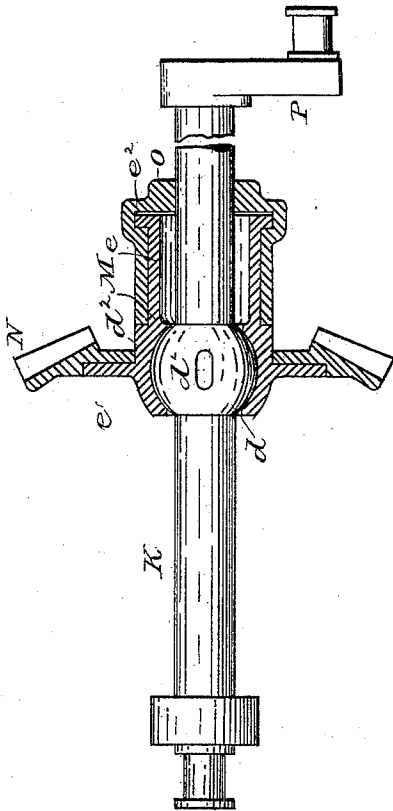


Fig 4

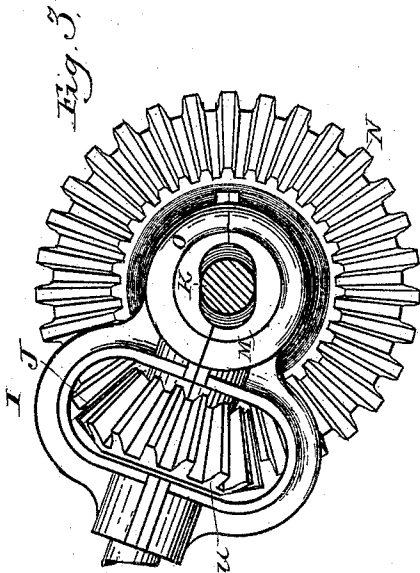


Fig. 3.

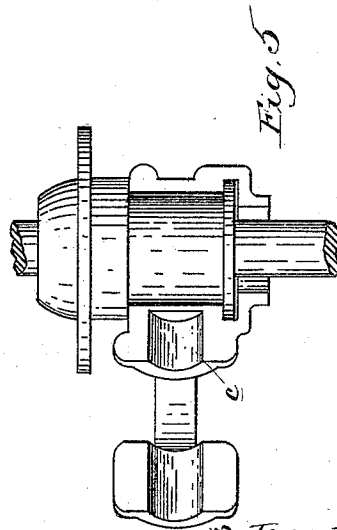


Fig. 5

Witnesses:
G. F. Downing
S. G. Nottingham

Inventor
Robert B. McWhirter
By his Attorney
H. A. Seymour

UNITED STATES PATENT OFFICE.

ROBERT B. MCWHIRTER, OF LIMA, OHIO, ASSIGNOR OF ONE-FOURTH TO
JOHN Y. BURGOYNE, OF SAME PLACE.

LOCOMOTIVE-GEARING.

SPECIFICATION forming part of Letters Patent No. 448,160, dated March 10, 1891.

Application filed December 9, 1890. Serial No. 374,092. (No model.)

To all whom it may concern:

Be it known that I, ROBERT B. MCWHIRTER, a citizen of the United States, residing at Lima, in the county of Allen and State of Ohio, have invented certain new and useful Improvements in Locomotive-Gearing; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in gearing for locomotives, its object being to produce a system of gearing by means of which motion may be transmitted to the driving-wheels, and which will compensate for any irregularities of the movements of the truck carrying said driving-wheels.

A further object is to provide a locomotive with gearing for transmitting motion to the driving-wheels, which gearing shall comprise a comparatively small number of parts and the arrangement of which shall be compact.

A further object is to produce gearing for a locomotive which shall be of simple construction, effective in operation, and capable of application to engines now in use.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of a locomotive having my improvements applied thereto. Fig. 2 is a detail view illustrating the manner of connecting the line-shaft with the main or crank shaft. Fig. 3 is a view illustrating the manner of connecting the line-shaft with the truck crank-shaft. Fig. 4 is a view, partly in section, illustrating the truck crank-shaft and gearing mounted thereon. Fig. 5 is a detached view of the connection between the line-shaft and truck crank-shaft, part of said connection being removed.

A represents a locomotive, and B the main frame thereof, having the cylinders C located on the outside of the latter and provided with the usual pistons and piston-rods C'. Located rearwardly from the cylinders C is a

crank-shaft D, having a crank-arm or disk at the end thereof, which crank-arm or disk is connected by a pitman D' with the piston-rod C' in any preferred manner. Mounted on the crank-shaft D is a yoke or frame E, preferably of oval or elliptical form, and projecting into the yoke or frame E is an integral boss E', having a socket or recess E² for the reception of one end of a bushing F, the other end of said bushing extending into a perforated enlargement F' in the opposite side of the frame or yoke E from the socketed boss E'. Surrounding or mounted upon the bushing F is the hub G of a pinion G', said pinion being adapted to mesh with a pinion G² on the main crank-shaft D. Extending into the bushing F and having a free longitudinal movement therein is the upper end of a line-shaft H. The line-shaft H is provided at its upper end with a longitudinal groove a, and aligning with this groove slots are cut in the bushing F and hub G of pinion G' for the reception of a pin or screw, which latter is adapted to enter the groove a, and thus cause the pinion G' and line-shaft H to rotate together, but permit the line-shaft to have a longitudinal movement independent of the pinion, for a purpose presently explained. At its lower end the line-shaft is journaled in bearings b c in a yoke or frame I, and keyed to said line-shaft within said yoke I is a pinion J. In proximity to the lower end of the line-shaft I a crank-shaft K is mounted in the truck L. At a point between its ends the shaft K is provided with an enlargement d, having a socket or perforation d', and mounted on this enlargement d and secured by a pin or key passing into the socket or perforation d' is a hub or sleeve M, having a portion d² adapted to embrace the enlargement d, and a portion e adapted to project parallel with the shaft K. Projecting from the portion d² of the sleeve M is a flange e', to which a pinion N is secured and adapted to mesh with the pinion J on the line-shaft I. The portion e of the sleeve M is provided at its free end with a flange e², and encircling the portion e of the sleeve M and the shaft K is a sleeve or collar O, having an elongated opening, as

shown in Fig. 3, said sleeve or collar O being made integral with the yoke or frame I. From this construction it will be seen that when the wheels of the truck move slightly from the track, as they frequently do, or when the trucks are moved backward or forward from any cause, the line-shaft I, having a longitudinal movement, as above explained, such irregular movement of the truck will be compensated for, and there will be no strain upon the parts. At the end of the shaft K a crank-arm P is secured and connected to the center of a pitman Q, which latter is connected at its ends to the drive-wheels of the locomotive, whereby the motion of the crank-shaft I will be transmitted to the wheels.

Thus far I have described the mechanism as applied for propelling the forward driving-wheels; but it is evident that motion may also be imparted to the rear driving-wheels of the locomotive from the main crank-shaft D by means of mechanism identical with that already described.

It is evident that slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a locomotive, the combination, with the main frame and the wheels, of a main crank-shaft mounted in the main frame, a pinion on said crank-shaft, a crank-shaft mounted on the truck, a pinion on said truck crank-shaft, and a line-shaft carrying a pinion at each end adapted to mesh with the pinions on the crank-shafts, and a pitman connected to the wheels and the truck crank-shaft, substantially as set forth.

2. In a locomotive, the combination, with the main frame and the truck and wheels, of a crank-shaft mounted in the main frame, a crank-shaft mounted in the truck, and a line-shaft adapted to transmit motion from the main crank-shaft to the truck line-shaft, said line-shaft being adapted to have longitudinal movement to compensate for the irregularities in movement of the wheels, substantially as set forth.

3. In a locomotive, the combination, with the main frame and the front and rear trucks carrying wheels, of a main crank-shaft, pinions thereon, a crank-shaft on the trucks, a pinion on each truck crank-shaft, pitmen connecting the wheels of each truck and connected to the truck crank-shafts, and line-shafts carrying pinions adapted to mesh with the pinions on the main crank-shaft and the truck-shafts, substantially as set forth.

4. In a locomotive, the combination, with the main frame, truck, and wheels, of a main shaft on the main frame, a pinion on said main shaft, a crank-shaft on the truck and connected with the pitman on the driving-wheels, a pinion on the truck crank-shaft, a yoke or frame mounted on the main shaft, a

pinion mounted in said yoke or frame, a line-shaft having a sliding bearing in said frame or yoke and adapted to rotate with the pinion therein, and a pinion on the other end of said line-shaft adapted to mesh with the pinion on the truck crank-shaft, substantially as set forth.

5. In a locomotive, the combination, with the main frame, truck, and wheels, of a main shaft on the main frame, a pinion on said main shaft, a crank-shaft on the truck and connected with the pitman of the driving-wheels, a pinion on the truck crank-shaft, a yoke or frame mounted on the main shaft, a bushing mounted in said yoke or frame, a pinion in the yoke or frame and connected with said bushing, a line-shaft in said bushing, said line-shaft being adapted to have a sliding or longitudinal movement in the bushing and to rotate with it and the pinion, and a pinion on the other end of the shaft, adapted to mesh with the pinion on the truck crank-shaft, substantially as set forth.

6. In a locomotive, the combination, with the main frame, the truck, and the wheels, of a shaft on the main frame, a pinion on said shaft, a crank-shaft on the truck, connected with the pitman of the driving-wheels, a pinion on said truck crank-shaft, a frame or yoke mounted on the main frame, a pinion mounted in said yoke or frame and meshing with the pinion on the main shaft, a yoke or frame mounted on the truck crank-shaft, a pinion in said yoke or frame and adapted to mesh with the pinion on the truck crank-shaft, and a line-shaft connecting said yokes or frames and adapted to rotate with the pinions therein, substantially as set forth.

7. In a locomotive, the combination, with the main frame, truck, and wheels, of a main shaft mounted on the main frame, a pinion on said main shaft, a yoke or frame mounted on said main shaft, a pinion carried by said yoke or frame and adapted to mesh with the pinion on the main shaft, a crank-shaft mounted in the truck, a yoke or frame loosely connected with said truck crank-shaft, and a line-shaft connecting said yokes or frames, said crank-shaft carrying a pinion within one of said yokes or frames and adapted to mesh with the pinion on the truck crank-shaft, the other end of said line-shaft being adapted to rotate with the pinion in the other yoke or frame and have a longitudinal movement independent thereof, substantially as set forth.

8. In a locomotive, the combination, with a main frame and a truck and wheels, of a main shaft, a pinion thereon, a line-shaft carrying a pinion to mesh with the pinion on the main shaft, a crank-shaft on the truck, a pinion on said truck crank-shaft, a yoke or frame having bearings for the end of the line-shaft, a pinion secured to the line-shaft within said yoke or frame, and a sleeve or collar adapted to loosely encircle the truck crank-shaft, substantially as set forth.

9. In a locomotive, the combination, with

the main frame, truck, and wheels, of a main shaft, a crank-shaft mounted on the truck and having an enlargement between its ends, a sleeve keyed to said enlarged portion, a flange projecting from said sleeve, a pinion secured to said frame, a yoke or frame having a collar or sleeve to loosely embrace the sleeve on the crank-shaft, a pinion in said yoke or frame, a line-shaft secured to said pinion and having its bearings in said yoke or frame, a pinion at the other end of the

line-shaft, and a pinion on the main shaft, with which the latter-mentioned pinion is adapted to mesh, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ROBERT B. MCWHIRTER.

Witnesses:

JOHN B. ICSEMAN,
LOUIS E. FEIGHTNER.