J. L. McGEE.

REVERSE LEVER OPERATING MECHANISM FOR LOCOMOTIVES.

APPLICATION FILED SEPT. 2, 1909.

969,181.

Patented Sept. 6, 1910.

2 SHEETS—SHEET 1.

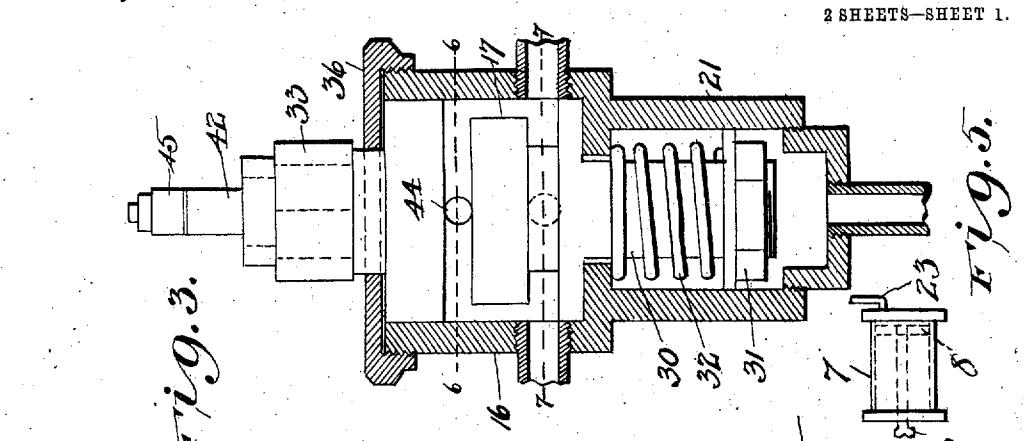

Fig. 3.

Fig. 5.

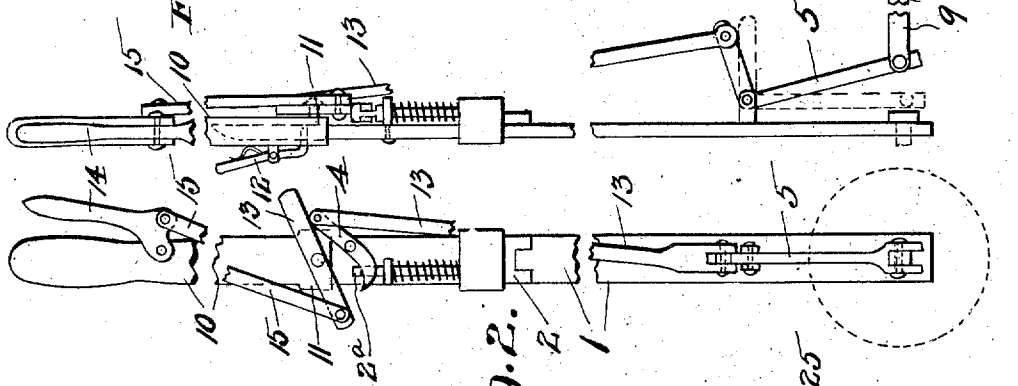

Fig. 2.

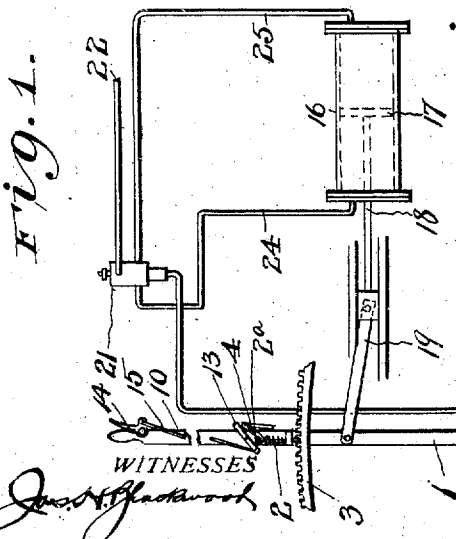

Fig. 1.

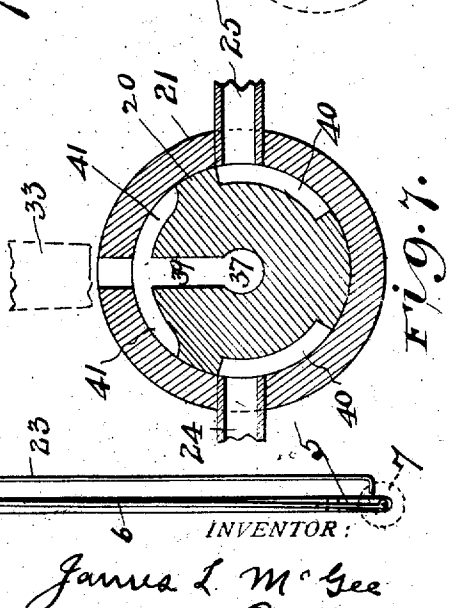

Fig. 7.

WITNESSES

J. H. Blackwood

W. O. Blackwood

INVENTOR:

James L. McGee

by James K. Polk

Attorney

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Fig. 4.

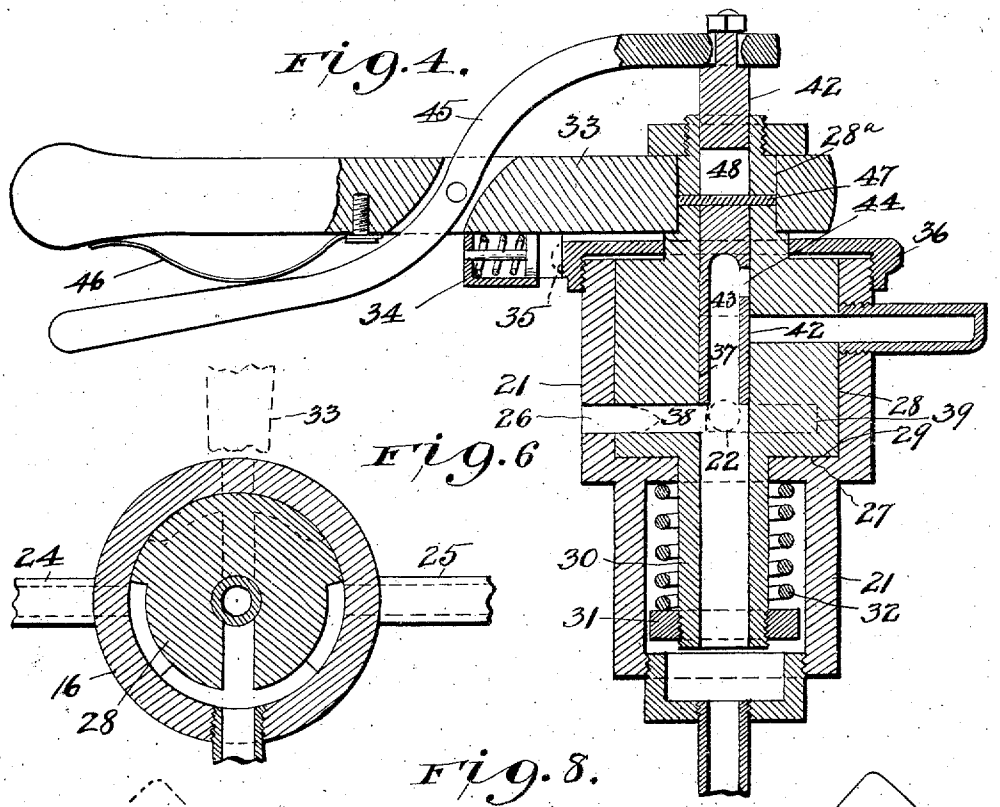
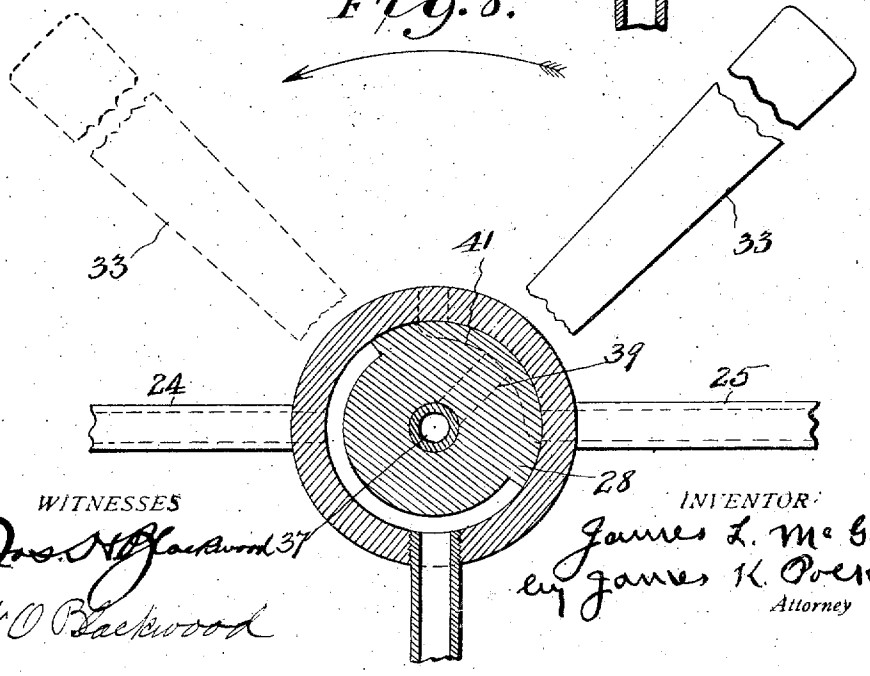


Fig. 6

Fig. 8.



WITNESSES

Jos. N. Blackwood

W O Blackwood

INVENTOR

James L. McGee

by James K. Polk

Attorney

UNITED STATES PATENT OFFICE

JAMES L. McGEE, OF LA JUNTA, COLORADO, ASSIGNOR TO THE McGEE SIX-WAY VALVE COMPANY, A CORPORATION OF COLORADO.

REVERSE-LEVER-OPERATING MECHANISM FOR LOCOMOTIVES.

969,181. Specification of Letters Patent. Patented Sept. 6, 1910.

Application filed September 2, 1909. Serial No. 515,823.

To all whom it may concern:

Be it known that I, JAMES L. McGEE, a citizen of the United States, and a resident of La Junta, in the county of Otero and State of Colorado, have invented certain new and useful Improvements in Reverse-Lever-Operating Mechanisms for Locomotives, of which the following is a specification.

My invention relates to power actuating mechanisms for operating the reverse levers of locomotives, and has for its object the provision of motors operated by the compressed air used in the air brake system or other motive agent to lift the latch controlling the position of the lever and to swing it into the position desired to the exclusion of the manual operation at present in use.

My invention also contemplates the provision of an improved construction of valve for controlling the direction of the motive agent consisting of the provision of a casing provided with an inlet and exhaust port, two ports for directing the air or other agent to the reverse lever motor, and a third port to direct the air to the latch-swinging motor, and a reversible piston having an air-duct to direct the air from the inlet-port to the reverse lever motor ports, and a piston movable longitudinally of the revoluble piston to direct the air to the latch-lifting motor. The revoluble piston is also provided with ducts leading to the exhaust to drain the motors.

My invention will be described in detail hereinafter and illustrated in the accompanying drawings, in which—

Figure 1 is a diagrammatic view showing the reverse-lever, motors, and valve, with connections; Fig. 2, a side view of the lever; Fig. 3, an edge view of the lever; Fig. 4, a central vertical sectional view of the valve and operating lever; Fig. 5, a vertical sectional view of the valve casing on a plane ninety degrees from the plane of the section in Fig. 4, with the valve-piston shown in elevation; Fig. 6, a section on the plane 6 6 of Fig. 5, showing the normal position of the valve; Fig. 7, a section on the plane 7 7 of Fig. 5; and Fig. 8, a sectional view of the valve on the same plane as in Fig. 6, showing the piston turned to direct the air into one end of the motor for moving the reverse lever and exhaust it from the other.

In the drawings similar reference characters indicate corresponding parts throughout all of the views.

1 indicates the reverse-lever of a locomotive, on which is mounted a spring-propelled latch 2 to engage the teeth of a ratchet 3.

4 indicates a dog pivotally secured to the lever 1 and engaging the stem 2^a of the latch 2.

5 indicates a bell-crank lever fulcrumed on lever 1, and 6 a rod connecting one arm of lever 5 and dog 4.

My invention contemplates providing a motor for lifting-latch 2 consisting of cylinder 7, having a reciprocating piston 8 therein, with its piston-rod 9 secured to the free arm of bell-crank lever 5, but to provide for the emergency of the motor being temporarily inoperative I provide a hand-hold for manually operating the lever 1 and latch 2, consisting of a bar 10, having a socket 11 to engage the free end of lever 1, and having a spring-catch 12 mounted thereon to hold the bar in position.

13 indicates a lever fulcrumed on the lower end of bar 10 that engages dog 4 when in position, 14 a grip-lever pivotally secured near the upper end of the bar, and 15 a rod connecting the lever 13 and the grip-lever 14.

16 indicates a motor cylinder having a reciprocating piston 17 therein, with its piston-rod 18 connected by pitman 19 with lever 1.

20 indicates a valve for controlling the motors aforesaid, having its casing 21 connected by means of tube 22 with a source of power, such as the compressed air brake system or the steam-boiler, (not shown,) by means of a tube 23, tapped into its lower end, with motor-casing 7 to actuate piston 8 to lift latch 2, and by means of tubes 24 and 25 with the two ends of motor-cylinder 16.

26 indicates an exhaust-port in the casing 21.

As shown in the drawings, inlet-tube 22 and exhaust-port 26 are diametrically opposite one another but on different horizontal planes, while tubes 24 and 25 are tapped into the casing 21 on the same plane as exhaust-port 26, but diametrically opposite one another and ninety degrees removed from the inlet-tube and exhaust-port.

Casing 21 is provided with a shoulder 27

below the plane of the connections of tubes 24 and 25 and exhaust-port 26, and 28 indicates a piston revolubly mounted in the casing and having an offset portion 29 that seats on shoulder 27, the reduced portion of the piston indicated at 30 extending into the lower end of the casing 21 and is provided with a threaded lower end on which is seated a nut 31 to regulate the tension of the coil-spring 32, engaging said nut 31 and shoulder 27 to hold the offset 29 in air-tight engagement with said shoulder.

33 indicates an operating-lever secured to the stem 28^a of the piston 28 and having a spring-actuated catch 34 mounted thereon to engage a notch 35 in cap 36, secured to the top of the casing 21, said catch and notch being so constructed that the lever will be held from accidental displacement, but not securely enough to prevent the lever from being moved by hand.

37 indicates a longitudinal bore through the piston 28, 38 a transverse bore connecting the bore 37 with the delivery end of supply-tube 22 when the operating-lever 33 is in its normal position, so that catch 34 is in engagement with notch 35, and 39 another transverse bore extending from the bore 37 on a plane with the exhaust-port 26.

40 indicates ducts extending from each side of the bore 38 and downwardly to the plane of the connections of tubes 24 and 25, so that when the piston is in the position shown in Figs. 5, 6, and 7, the air or steam will be directed into both of said tubes.

41 indicates a horizontal duct in the piston extending on each side of bore 39, so as to drain one or the other tubes 24 or 25 when the piston 28 is turned as shown in Fig. 8 to direct the pressure into only one of said tubes to move the piston 17 to swing lever 1.

42 indicates a rod slidably mounted in bore 37, having its lower end formed tubular, as shown at 43, and provided with a transverse opening 44 in vertical alinement with bore 38 and adapted to register therewith when the rod is lowered, as will be hereinafter described. 45 indicates a lever fulcrumed on lever 33 and having one end engaging rod 42, while its other end engages a spring 46 to hold the rod in a raised position. 47 indicates a pin engaging valve-stem 28^a and slot 48 in rod 42 to prevent the rod from turning or twisting relatively to the piston 28.

In operation the valve is normally in the position shown in Figs. 4, 5, 6, and 7, with the rod 42 raised so that the motor-cylinder 7 is in communication with exhaust-port 26 and both ends of the cylinder 16 are in communication with supply-tube 22.

When it is desired to move reverse-lever 1 the engineer grasps levers 33 and 45 and by squeezing them together against the resistance of spring 46 the rod 42 is actuated downwardly so as to close the transverse bore 39 and to bring the opening 44 into alinement with the bore 38. Pressure will be admitted through bore 38, tubular portion 43, bore 37, and tube 23 to the cylinder 7 to move piston 8 and lift the latch. The lever 33 is then swung to one side or the other, as it may be desired to move the reverse lever 1, so that pressure is directed into one or the other tubes 24 or 25 through ducts 40 and into one end of cylinder 16 to move piston 17, while the other end of the cylinder is drained through the other tube and duct 41. Then by releasing lever 45 the rod 42 resumes its original position so as to release the pressure in cylinder 7 and the spring-latch 2 reseats itself, the cylinder draining through exposed bore 38.

Having thus described my invention, what I claim is—

1. A valve for controlling motors comprising a casing, inlet and exhaust ports in the sides of said casing and on different planes, tubes tapped into the sides of said casing, a tube tapped into the end of the casing, a piston revolubly mounted in the casing, the piston formed with a longitudinal central bore and lateral bores on the same planes as the inlet and exhaust ports, and ducts in the surface of the piston connecting the inlet and exhaust ports with the tubes in the sides of the casing, substantially as shown and described.

2. A valve for controlling motors comprising a casing, inlet and exhaust ports in the sides of said casing and on different planes, tubes tapped into the sides of said casing, a tube tapped into the end of the casing, a piston revolubly mounted in the casing, the piston formed with a longitudinal central bore and lateral bores on the same planes as the inlet and exhaust ports, a rod slidably mounted in the longitudinal bore and having a tubular portion, said tubular portion provided with a lateral opening adapted to register with the lateral bore on the plane with the inlet, a lever secured to the valve-piston, and a second lever fulcrumed on the first-mentioned lever and secured to the rod, substantially as shown and described.

In witness whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES L. McGEE.

Witnesses:
GEO. R. BANE,
CHAS. F. HELM.