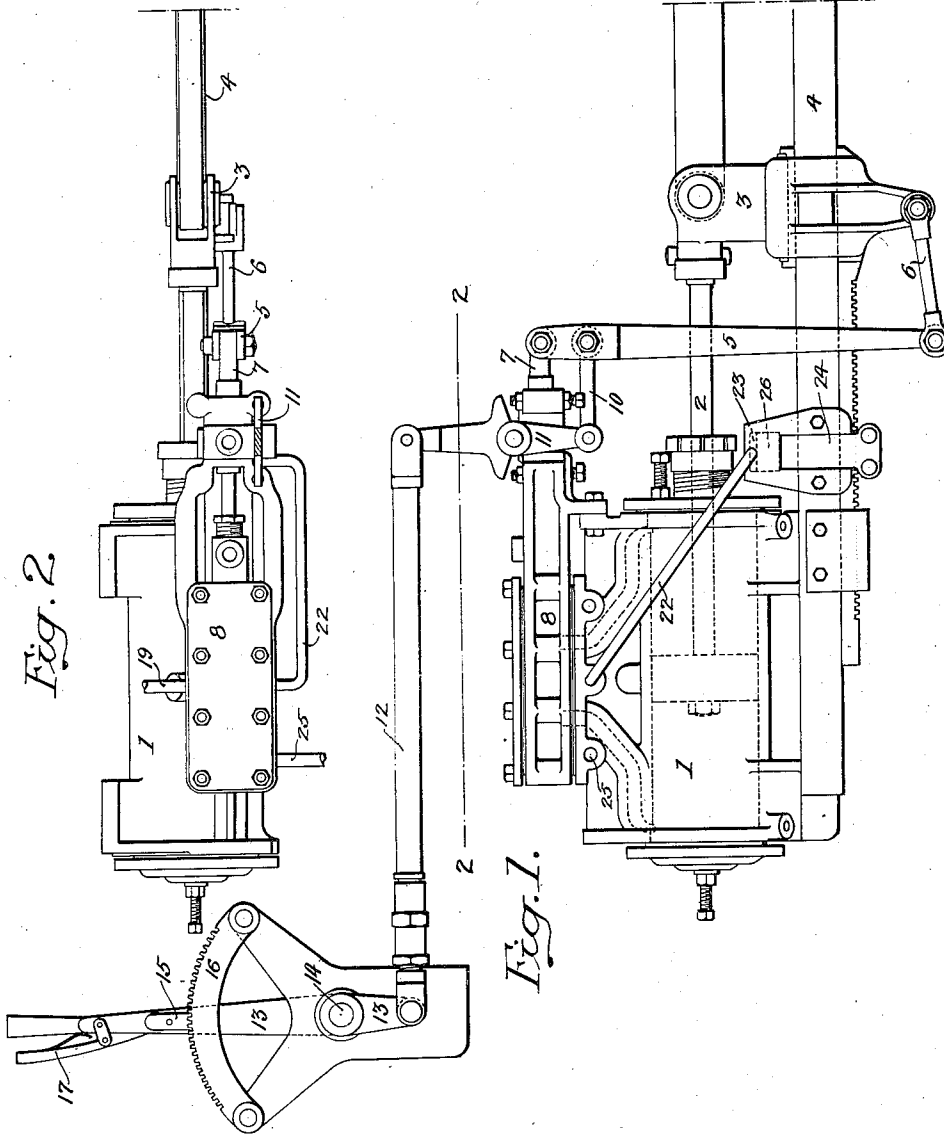


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APPLICATION FILED OCT. 13, 1916.

1,296,322.

Patented Mar. 4, 1919.
4 SHEETS—SHEET 1.



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Fig. 3.

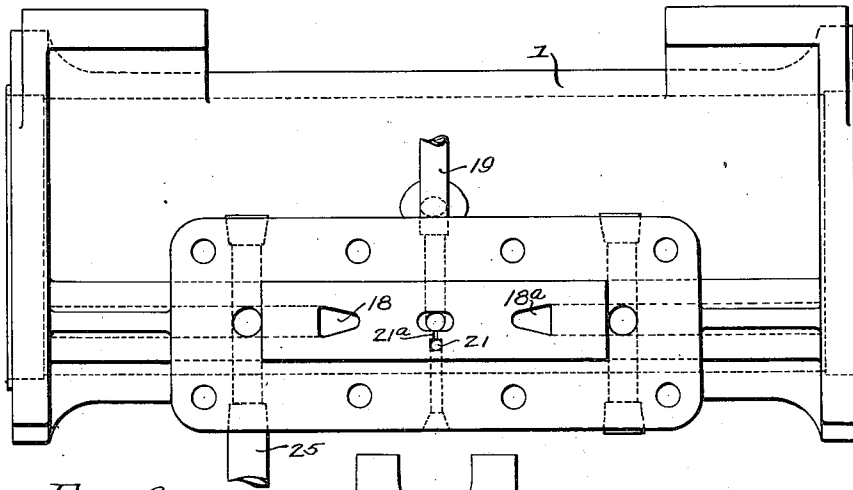
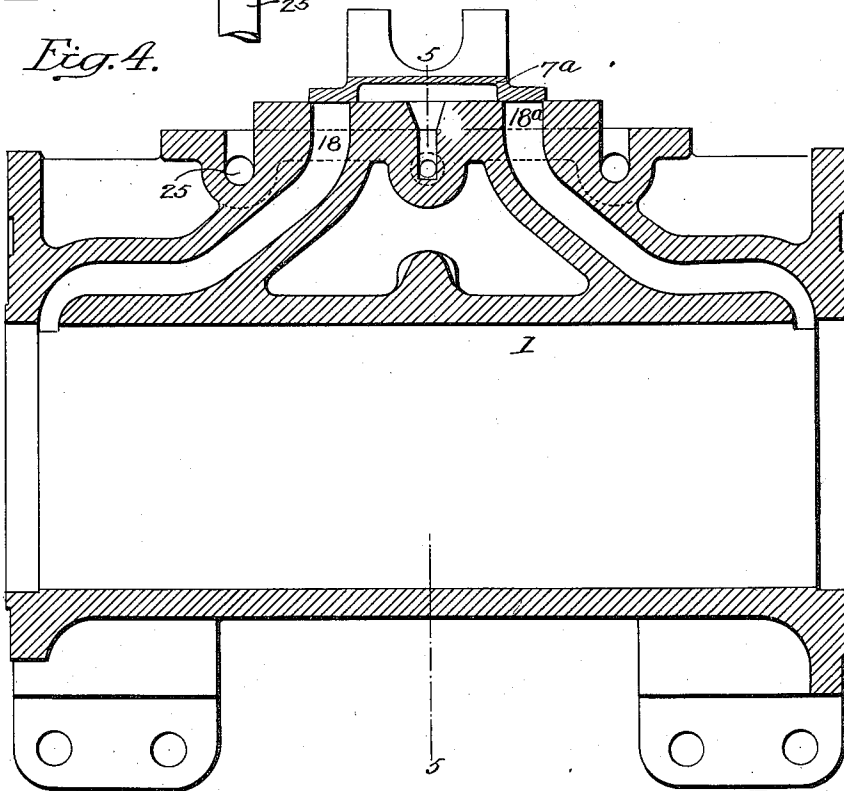


Fig. 4.



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Fig. 5.

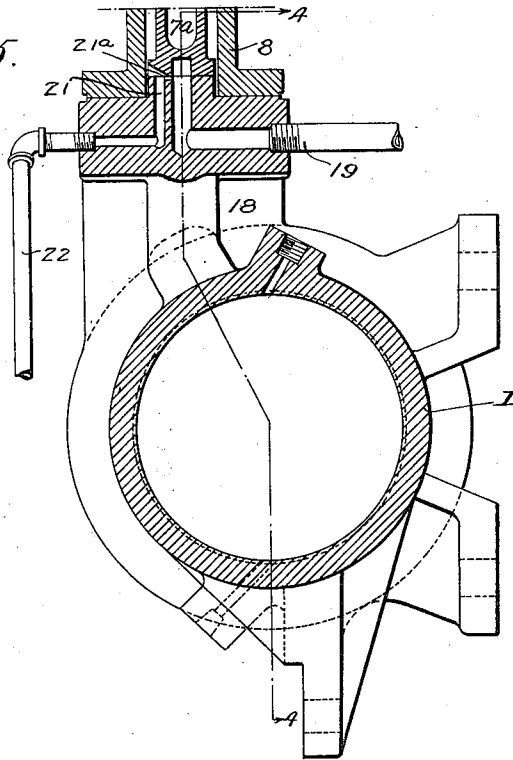


Fig. 6.

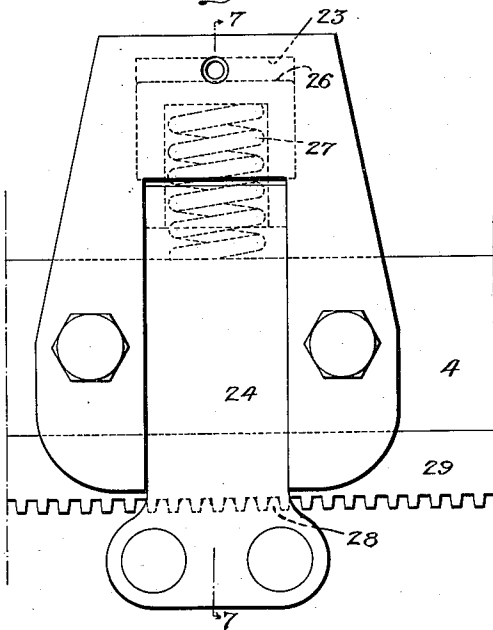
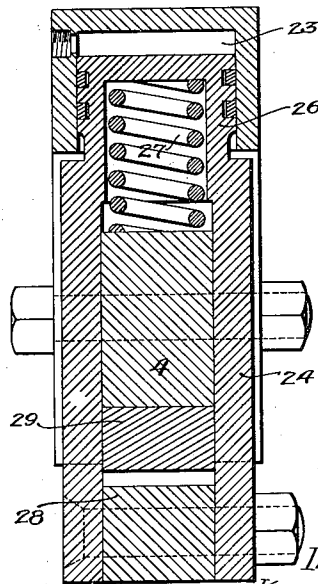


Fig. 7.



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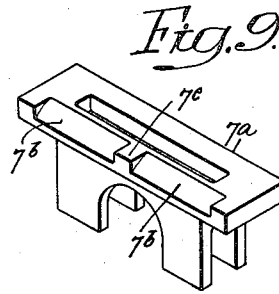
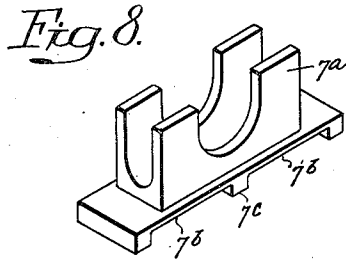


Fig. 10.

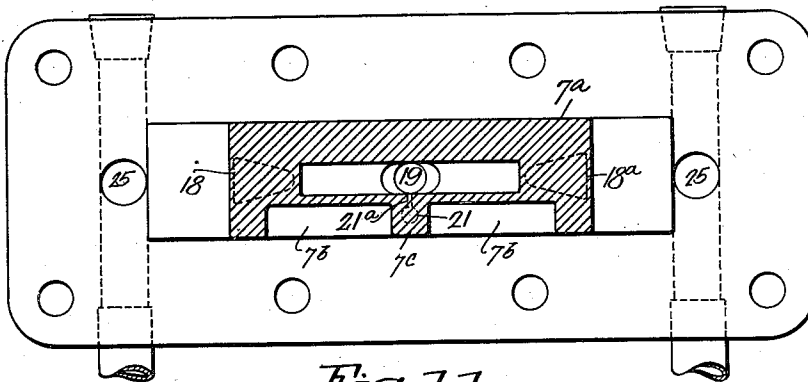
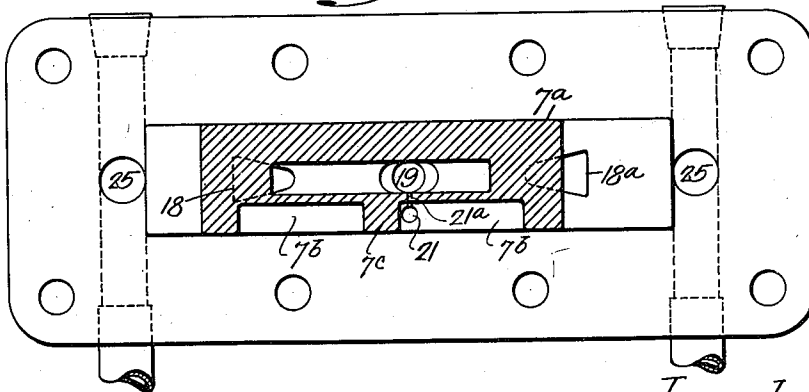


Fig. 11.



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UNITED STATES PATENT OFFICE.

KENNETH RUSHTON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE BALDWIN LOCOMOTIVE WORKS, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

POWER-REVERSE MECHANISM.

1,296,322.

Specification of Letters Patent.

Patented Mar. 4, 1919.

Application filed October 13, 1916. Serial No. 125,494.

To all whom it may concern:

Be it known that I, KENNETH RUSHTON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Power-Reverse Mechanism, of which the following is a specification.

My invention relates to certain improvements in power reverse gears in which a positive lock is used for preventing the piston of a starting cylinder from moving after it has been shifted to a given position, such as that disclosed in the patent granted to E. M. Shannon, No. 1,129,741, dated February 23rd, 1915.

The object of my present invention is to simplify the construction and to make a direct connection between the valve chest of the starting cylinder and the locking cylinder.

In the accompanying drawings:—

Figure 1, is a side view of my improved power reverse gear;

Fig. 2, is a sectional plan view on the line 2—2, Fig. 1;

Fig. 3, is a plan view of the main cylinder showing the ports;

Fig. 4, is a sectional view through the cylinder and the valve, on the line 4—4, Fig. 5;

Fig. 5, is a sectional view on the line 5—5, Fig. 4;

Fig. 6, is a side view of the lock;

Fig. 7, is a sectional view of the lock on the line 7—7, Fig. 6;

Fig. 8, is a detached perspective view of the main valve;

Fig. 9 is an inverted perspective view of the main valve;

Fig. 10 is an enlarged sectional plan view on the line 10—10, Fig. 4, showing the valve in the closed position; and

Fig. 11 is a view, similar to Fig. 10, showing the valve shifted so as to open one of the ports to steam and the other to exhaust and the small port leading to the locking cylinder to steam.

Referring to the drawings, 1 is the starting cylinder. 2 is the piston rod having a piston located in the cylinder. 3 is a cross head which slides on the guide 4 secured, in the present instance, to the cylinder casing. A lever 5 is connected to the cross

head by a link 6 and this lever is attached to the valve stem 7, the valve 7^a of which is mounted in the chest 8 of the cylinder 1. The valve is made as shown in Figs. 8 and 9. The lever is also connected by a link 10 to one arm of a lever 11 pivoted to the frame. The other arm of the lever is connected by a bar 12 to one arm of the hand lever 13, which is pivoted at 14 and has the ordinary latch 15 which engages a segment 16. The latch has a handle 17 upon actuating which the hand lever 13 can be released and can be moved to any position desired. This hand lever is located at the cab of the locomotive.

After the ordinary reverse mechanism has been moved to a given position, the piston heretofore has a tendency to move, due to leakage, and, consequently, the cross head and the parts connected thereto were shifted from the position in which they were originally set, making the device very inaccurate, but by the use of the device of the above mentioned patent this difficulty was overcome.

The object of my present invention is to improve the construction of the power reverse mentioned in said patent and to simplify it, making the fluid which actuates the main piston to also directly actuate the latch. This object I attain by providing a port in the main valve chest and forming communication between this port and the locking cylinder so that the port will be uncovered simultaneously with the uncovering of the ports leading to the starting cylinder, but the valve is so arranged that the opposite end of the cylinder remains closed to the exhaust port, consequently, the fluid will operate the latch and release the cross head prior to the movement of the main piston. Then, as soon as the cylinder is open to exhaust, the main piston will move as it is free from the control of the latch. As soon as the piston moves to the point desired the hand lever is actuated to bring the valve to its neutral position and will hold the main piston and the fluid in the cylinder of the latch will escape, allowing the spring to return the latch into engagement with the rack bar, positively locking the parts in the positions to which they were adjusted.

18, 18^a are the ports leading from the valve chest 8 to the main cylinder 1 and these ports are V-shaped in cross-section at the valve chest, so as to wire draw the fluid
 5 as it is exhausted from the cylinder on the movement of the valve 7^a. 19 is the exhaust port and at one side of the exhaust port is a small port 21 which communicates through
 10 a pipe 22 with the cylinder 23 of the locking device 24.

The valve 7^a is formed as clearly shown in Figs. 8 and 9 and has a central exhaust passage for the ports 18 and 18^a and side passages 7^b, one at each side of a portion 7^c,
 15 which closes the port 21 when the valve is in the mid position, as shown in Fig. 10, and when the valve is moved so as to uncover either of the ports 18 or 18^a (the port 21 is uncovered) to allow fluid under pressure,
 20 which passes into the valve chest through the inlet port 25, to enter the cylinder. The small port 21 leading to the cylinder 23 of the lock 24 is uncovered, allowing the fluid to enter this port and to pass immediately
 25 to the cylinder 23, forcing the piston 26 therein down against the pressure of the spring 27 to release the latch 28, which is attached to the piston so that by the time the main piston in the cylinder 1 is ready
 30 to move forward the latch is clear of the rack 29, which is attached to the cross head 3 and located, in the present instance, under the bar 4. The latch 28 has teeth, which are arranged to mesh with the teeth of the
 35 rack 29, as fully described in the above mentioned patent.

As soon as the piston is moved to the extent desired and the valve 7^a is automatically shifted by the lever 5 so as to prevent further movement of the piston, then the small
 40 port 21 is closed and pressure in the cylinder 23 escapes to the exhaust through the small leakage groove 21^a, and the spring 27 returns the latch 28 to its locked position, engaging positively the rack bar and preventing further movement of the cross head and the
 45 piston connected thereto. Thus it will be seen that before the movement of the piston in either direction the lock is released and held out of engagement with the rack while
 50 the piston and its rod 2 are traveling, but the moment the valve 7 is shifted so as to close the ports 18 or 18^a the small port 21 is also closed and the pressure in the cylinder 23
 55 will exhaust and the spring 27 immediately brings the latch 28 into the locked posi-

tion, holding the parts rigidly in position until the hand lever is again actuated.

I claim:—

1. The combination in means for locking
 60 the reverse gear of a locomotive, of a main cylinder; a piston; a slide connected to the piston; a valve chest; a valve therein; a rod attached to the valve and connected to the slide; ports leading from the valve chest
 65 to each end of the main cylinder, said ports being V-shaped in cross section with the narrow ends toward each other; a central exhaust port; a latch for locking the slide; a cylinder considerably less in diameter than
 70 the main cylinder and having a piston therein connected to the latch; a port at one side of the exhaust port in the valve chest communicating with the small controlling cylinder; said valve being shaped to cover all
 75 three ports when in the central position and on the movement of the valve, in either direction, to uncover said ports; and hand mechanism for moving the valve so that when the valve is operated the ports will be
 80 opened and the movement of the piston in the small cylinder will release the latch, and when the valve is shifted to stop the movement of the piston the latch will immediately engage the slide, holding it in the fixed
 85 position.

2. The combination in means for locking
 the reverse gear of a locomotive, consisting
 90 of a main cylinder; a piston; a slide connected to the piston; a hand lever; a lever connected to the hand lever; a second lever connected to the slide and to the hand lever; a valve chest; a valve therein, the rod of the valve being also connected to the last mentioned lever; ports leading from the valve
 95 chest to each end of the main cylinder, said ports being V-shaped in cross-section with the narrow ends toward each other; a central exhaust port; a latch for locking the slide in the position in which it is adjusted;
 100 a cylinder having a piston therein connected to the latch; and a port at one side of the exhaust port in the valve chest communicating with the cylinder controlling the latch; a leakage groove between the said
 105 port and the exhaust port, so that the latch will be released prior to the movement of the main piston and, when the valve is shifted to stop the movement of the piston, the latch will immediately engage the slide,
 110 holding it in a fixed position.

KENNETH RUSHTON.