

(No Model.)

J. G. HIMLER.
PLUNGER VALVE.

No. 552,707.

Patented Jan. 7, 1896.

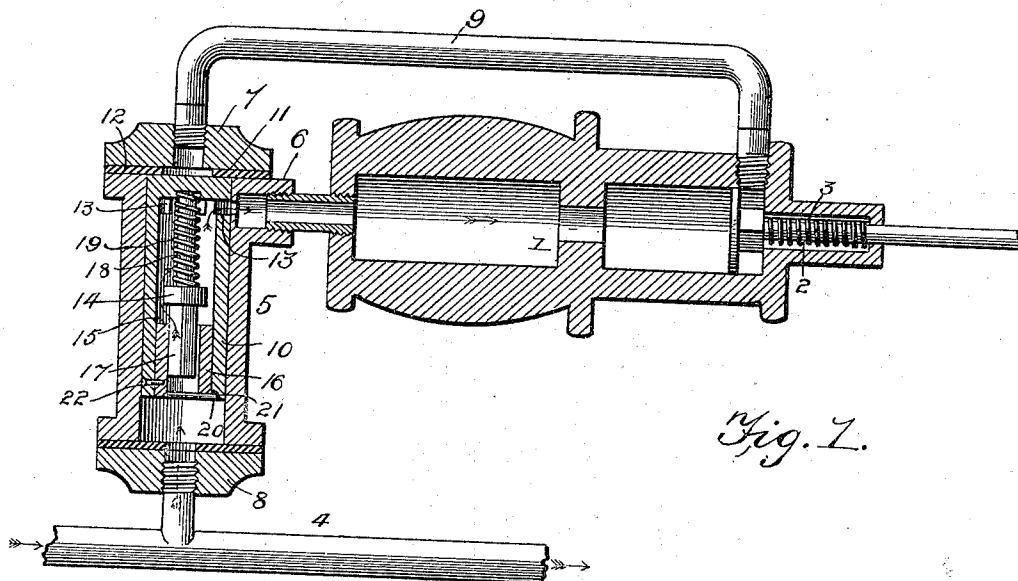


Fig. 1.

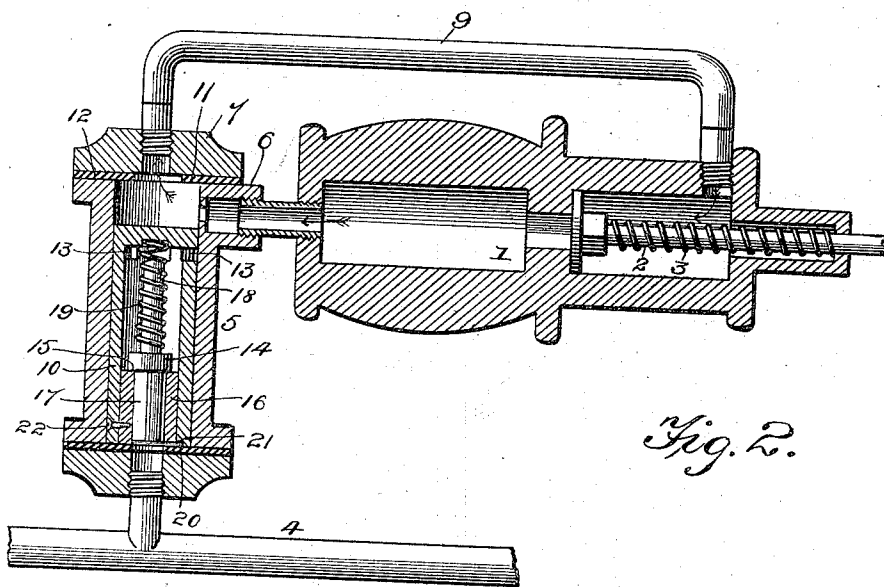


Fig. 2.

Witnesses

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JOSEPH G. HIMLER, OF LATROBE, PENNSYLVANIA.

PLUNGER-VALVE.

SPECIFICATION forming part of Letters Patent No. 552,707, dated January 7, 1896.

Application filed July 16, 1895. Serial No. 556,179. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH G. HIMLER, a citizen of the United States, residing at Latrobe, in the county of Westmoreland and State of Pennsylvania, have invented a new and useful Plunger-Valve, of which the following is a specification.

My invention relates to valves, and particularly to a device adapted for use in connection with air-brake systems, the objects in view being to provide means for exhausting the brake-cylinder with rapidity in order to avoid loss of time in relieving the wheels of the train from the pressure of the brake-shoes, said means being so constructed as to allow the free transmission of pressure from the train-pipe to the cylinder to actuate the piston and apply the brakes.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a longitudinal section of a device constructed in accordance with my invention applied in operative relation with the members of a fluid-pressure-brake system, the valve being shown in the position which it assumes in order to allow the transmission of pressure from the train-pipe to the brake-cylinder. Fig. 2 is a similar view showing the parts in the positions which they assume when the brake-cylinder is exhausted.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a brake-cylinder, 2 the piston operating therein and provided with a return-spring 3, and 4 represents a train-pipe, between which and the brake-cylinder is arranged the valve 5 embodying my invention. The valve-casing is in communication by means of a lateral port 6 with the end of the brake-cylinder and is provided at its ends with removable caps 7 and 8, the former of which is provided with an opening from which extends a conductor 9, communicating at the opposite end with the brake-cylinder upon the opposite side of the piston. Thus communication is established between the valve-casing and the brake-cylinder upon both sides

of the plane of the piston. The coupling between the train-pipe and the valve-casing enters the latter through an opening in the center of the cap 8.

Arranged within the valve-casing is a plunger-valve 10, having a closed upper end adapted to bear against a seat 11, formed at the upper end of the casing by means of a washer 12 secured between the upper end of the casing and the cap 7. The seating of the valve at its upper end closes communication between the casing and the conductor 9, and the valve, which is hollow or cylindrical in construction, is provided with lateral ports 13, which communicate with the lateral port 6 of the casing when the valve is seated. Arranged within this main or plunger valve is a check-valve 14 adapted to fit a seat 15 at the inner end of a bushing 16, fitted in the lower end of the main valve. The check-valve is provided with a fluted or channeled guide 17 and a stem 18, upon which is coiled an actuating-spring 19, whereby the check-valve is normally held seated. The bushing is provided at one side with a stud 20 to engage a notch 21 in the end of the main valve and thereby limit the insertion of the bushing, which is secured in place by means of a screw or equivalent fastening device. (Indicated at 22.)

This being the construction of the improved valve mechanism the operation thereof is as follows: To apply the brakes pressure is introduced into the train-pipe, thereby forcing the main valve to its seat at the end of the casing remote from the point of communication with the train-pipe to close communication between the casing and one end of the brake-cylinder and open communication between the interior of the main valve and the lateral port in the casing. This pressure also unseats the check-valve, which is located within the main valve, and allows the pressure to be communicated directly through the bore of the main valve to the brake-cylinder to force the piston forward against the tension of the return-spring. When it is desired to release the brakes the pressure in the train-pipe is reduced, thereby allowing the check-valve to close and the main valve to return to its normal position, in which it is unseated, thereby opening communication between the

casing of the valve and both ends of the brake-cylinder, whereby the pressure at one side of the plane of the piston is communicated directly to the other side of the plane thereof, thus equalizing the pressure upon both sides of the piston and allowing the spring to return the piston to its normal position without delay.

In the construction illustrated in the drawings the main-valve casing is arranged in a vertical position, whereby the main or plunger valve is actuated by gravity and is returned to its normal or unseated position by that force; but it is obvious that other means for normally maintaining the main valve unseated may be employed, said means being yielding in order to provide for the seating of the main valve when exposed to the train-pipe pressure.

By the means above described the parts of the brake mechanism are adapted to operate effectively with an air-tight brake-cylinder, thus avoiding the loss of pressure due to leakage, which frequently occurs in the ordinary practice.

It will be understood that various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. In a fluid pressure brake system, the combination with a brake-cylinder, of means for connecting opposite ends of the cylinder, whereby pressure upon opposite sides of the piston is equalized when communication is open, and valve-mechanism for controlling communication between the ends of the cylinder, said valve-mechanism being normally in position to open communication and being exposed to train-pipe pressure whereby when the pressure in the train pipe is increased communication between the ends of the cylinder is cut-off, and communication between the train-pipe and one end of the cylinder is opened, substantially as specified.

2. In a fluid pressure brake system, the combination with a brake-cylinder, of a valve casing in communication with the brake-cylinder upon both sides of the plane of the piston operating therein, said casing being adapted to receive train-pipe pressure, a valve adapted when seated to cut-off communication between the two ends of the cylinder and between the casing and one end of the brake-cylinder and normally held unseated to provide communication with both ends thereof, said valve being adapted to be seated by train-pipe pressure, substantially as specified.

3. In a fluid pressure brake system, the combination with a brake-cylinder, of valve mechanism having a casing in communication with the brake-cylinder upon both sides of the plane of its piston and adapted to receive train-pipe pressure, and a valve operating in the casing and adapted when seated to cut off

communication between the two ends of the cylinder and between the casing and one end of the brake-cylinder and open communication between the casing and the other end of the cylinder, said valve being actuated by train-pipe pressure and being adapted to be unseated when the train-pipe pressure is reduced, substantially as specified.

4. In a fluid pressure brake system, the combination with a brake cylinder, of a valve mechanism having a casing in communication with both ends of the brake cylinder and adapted to receive train-pipe pressure, a main valve mounted to slide in the casing and adapted when seated to close communication between the casing and one end of the brake-cylinder, said valve being exposed at one end to train-pipe pressure and having a bore adapted when the valve is seated to communicate with the other end of the brake-cylinder, and a check-valve carried by the main valve to close the bore thereof and adapted to be opened by train-pipe pressure when the main valve is seated, the main valve being normally held unseated, substantially as specified.

5. In a fluid pressure brake system, the combination with a brake-cylinder, of a valve casing in communication at one end with opposite ends of the brake-cylinder and provided at one end with a valve seat surrounding a port in communication with one end of the brake-cylinder, a hollow main valve mounted to slide in the casing, and having a closed end adapted to fit said seat in the casing and lateral openings adapted to communicate with a port in communication with the other end of the brake-cylinder, the end of the main valve opposite to said closed end being exposed to train-pipe pressure, and a check-valve arranged to control the passage through the bore of the main valve and adapted to be opened by train-pipe pressure when the main valve is seated, substantially as specified.

6. In a fluid pressure brake system, the combination with a brake-cylinder, of a valve mechanism having its casing in communication with the opposite ends of the brake-cylinder, a gravity main valve arranged in the casing and adapted when seated to cut-off communication between the two ends of the casing and between the casing and one end of the brake-cylinder, said valve having a bore adapted to communicate with the other end of the brake-cylinder when the valve is seated, said main valve being exposed to train-pipe pressure and being normally held unseated, and a check-valve controlling the passage through the main valve and adapted to be opened by train-pipe pressure, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOSEPH G. HIMLER.

Witnesses:

CHARLES M. WILLIAMS,
HENRY BAIR.