H. E. MARCHAND.

Valve for Steam and Air-Brakes.

No. 163,089. Patented May 11, 1875.

Fig. 1.

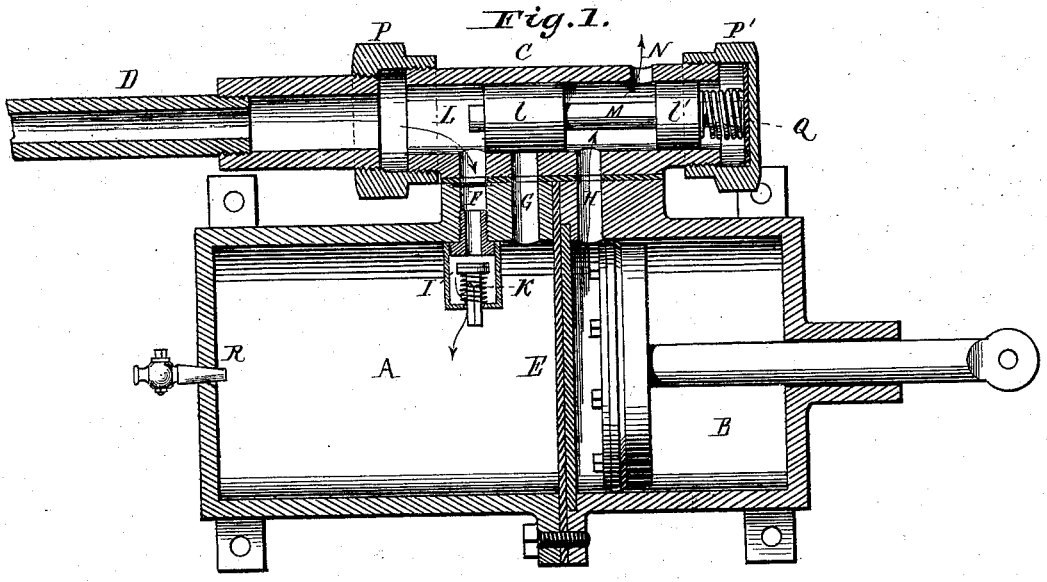


Fig. 2.

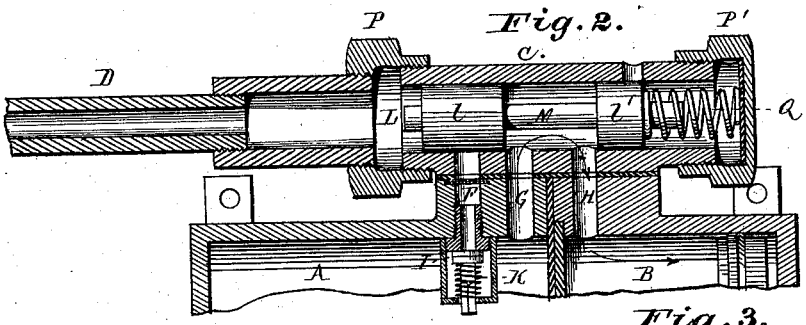


Fig. 4.

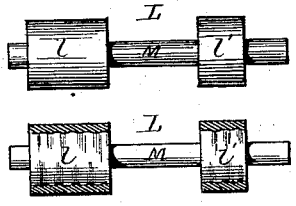
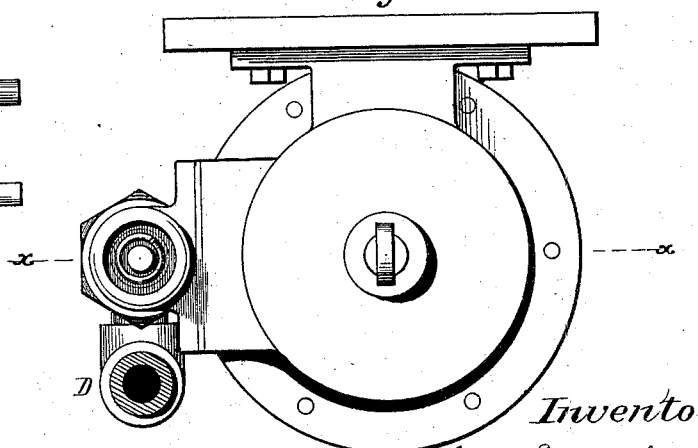


Fig. 3.



Attest:

W. S. Coombs

J. T. Booth.

Inventor.

Henry E. Marchand

by his atty

James L. Norris.

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE

HENRY E. MARCHAND, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN VALVES FOR STEAM AND AIR BRAKES.

Specification forming part of Letters Patent No. **163,089**, dated May 11, 1875; application filed November 11, 1874.

To all whom it may concern:

Be it known that I, HENRY E. MARCHAND, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Valves for Steam and Air Brakes, of which the following is a specification:

My invention relates to certain improvements in that class of air-brakes in which the brake is set by relieving the pressure in the conducting-tube, which releases a valve and allows it to be thrown forward, establishing communication between the piston-cylinder and a reservoir containing compressed air, which, operating against the piston, applies the brakes. My present invention is intended to improve upon the Letters Patent granted to me October 6, 1874, No. 155,738, wherein is employed a three-seated or triple valve, in connection with the air-reservoir and piston-cylinder. My invention consists in a new and improved duplex valve, which operates in combination with the said reservoir and piston-cylinder, said valve being made with but two seats and one chamber or port, instead of two, as heretofore, whereby the brake may be much more rapidly and readily set or applied, and all liability of the air to pass between said valve and the valve-box will be avoided, as hereinafter fully described.

In the drawings, Figure 1 is a sectional view of my apparatus, showing the position of the valves when the brakes are thrown off. Fig. 2 represents a similar view, showing the position of the valves when the brakes are applied. Fig. 3 represents an end view of the apparatus, and Fig. 4, detached views of the duplex valve.

A represents the reservoir for the compressed air, and B the piston-cylinder. The air-reservoir A communicates with the valve-box C, which is connected to a suitable air-pump by means of a pipe or hose, D. The air-reservoir and cylinder are formed with flanges at the edges where they join, and are united in any convenient manner, a diaphragm, E, of suitable material being interposed between the two, as shown. To one side of the cylinder and reservoir a valve-chest, *c*, is secured, communicating with said reservoir and cylinder by means of ports F G H. Said valve-chest is, preferably, made separate from the cylinder and bolted or otherwise secured to the same, the surface being properly leveled or faced for the purpose. The upper end of the port F in the reservoir is countersunk, and a disk of wire-gauze set therein to prevent ashes, cinders, or other injurious substances from finding their way into the reservoir and piston-cylinder. To the lower part of said port is applied a valve, I, opening inwardly and provided with a spiral spring, *k*, by which it is kept to its seat. The port F is the induction-port through which the air is forced into the reservoir. G is the eduction-port leading into the valve-chest immediately below the valve, and H is a port connecting the valve-chest with the piston-cylinder, which serves as an induction or eduction port to the same, as occasion may require. The improved valve is represented by the letter L, and it consists of two solid sections, *l l'*, bolted or formed upon a stem or rod, M, so as to leave a single port or chamber between them. Said sections are coated with lead or other suitable soft metal, and accurately turned to fit the valve-chest. The front section, *l*, is of sufficient length to close the port G when the valve is in position shown in Fig. 2. The valve-chest is cylindrical in its interior to correspond with the shape of the valve, and is provided with an eduction-port, N, for the escape of the air when the piston is thrown back. The valve may be inserted at either end of the valve-chest, before the heads P P′ are applied, a spiral spring, Q, being placed behind the valve at the end over the piston-cylinder, as shown, in order to press the valve forward when the pressure in the tube D is relieved. Either head of the valve-chest may be connected to the pump by means of a suitable tube or hose, D, as will be evident. R represents a tube provided with a cock leading from the reservoir, by means of which the same may be emptied of compressed air when desired. In practice, this tube is extended upward to the platform of the car so as to be under the control of the brakeman.

The operation of my apparatus is as follows: The parts being suitably connected, air is forced into the valve-chest, and from the same into the reservoir. The air forces the

duplex valve to the end of the valve-chest, and then takes its way through the port F, into the reservoir. The valve at the lower end of the port F closes automatically when the pressure in the valve-chest is relieved, or partially relieved, and prevents the escape of air through said port. The reservoir being thus charged, the brakes are ready to be put on. This is done by altogether relieving the pressure in the pipe D, the spring throwing the valve L forward so as to establish communication between the ports G and H, allowing the compressed air to act upon the piston, thus setting the brakes.

What I claim is—

The duplex valve L, working in a valve-chest, C, in combination with the ports F G H, reservoir A, and piston-cylinder B, substantially as herein described.

In testimony that I claim the foregoing, I have hereunto set my hand.

HENRY E. MARCHAND.

Witnesses:
JAMES L. NORRIS,
JOS. L. COOMBS.