W. V. TURNER.

TRIPLE VALVE.

APPLICATION FILED APR. 1, 1905. RENEWED JAN. 4, 1907.

931,238. Patented Aug. 17, 1909.

Fig. 1.

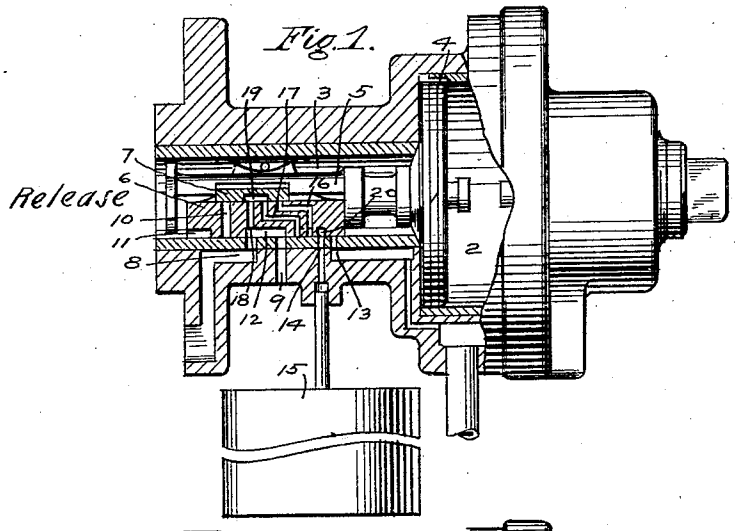


Fig. 2.

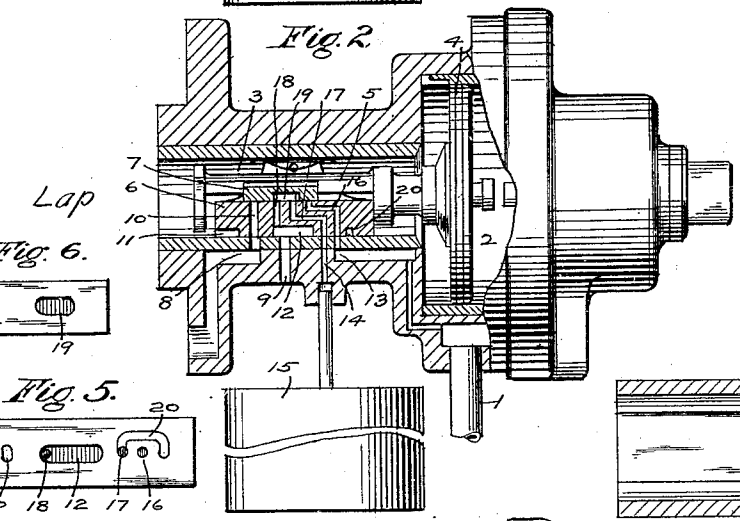


Fig. 6.

Fig. 5.

Fig. 4.

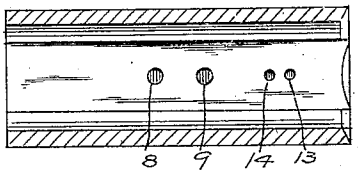
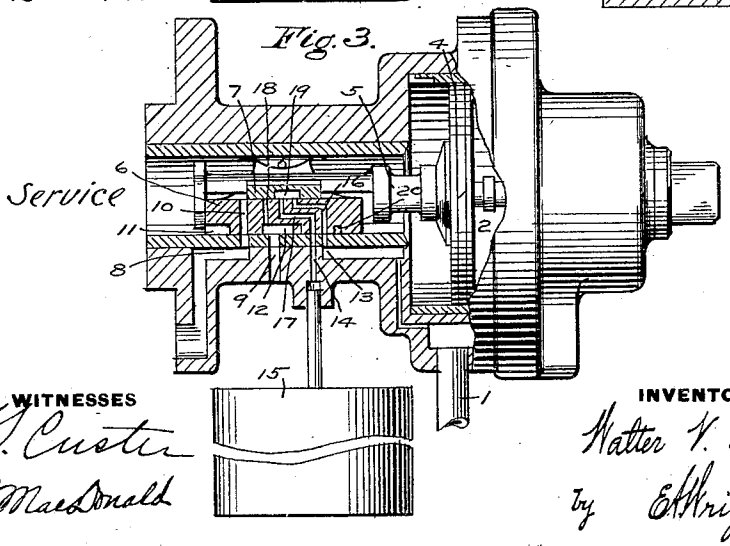


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

WALTER V. TURNER, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO THE WESTINGHOUSE AIR BRAKE COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

TRIPLE VALVE.

No. 931,238. Specification of Letters Patent. Patented Aug. 17, 1909.

Application filed April 1, 1905, Serial No. 253,310. Renewed January 4, 1907. Serial No. 350,819.

To all whom it may concern:

Be it known that I, WALTER V. TURNER, a citizen of the United States, residing at Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Triple Valves, of which the following is a specification.

This invention relates to automatic fluid pressure brakes, and more particularly to the triple valve device, the main object being to provide an improved means for locally venting the train pipe on each car in service applications and thereby secure an accelerated action of the brakes.

With this object in view, the invention comprises a valve device operated by a gradual reduction in train pipe pressure in service applications for opening communication from the train pipe to a small expansion chamber and adapted to exhaust said chamber to the atmosphere upon the lap movement of the valve, whereby the local reduction or venting of the train pipe may be secured for accelerating the action, not only at the first but also at each subsequent graduation.

In the accompanying drawing, Figure 1 is a section of a triple valve device embodying my improvement, and showing the valve in normal release position; Figs. 2 and 3 similar views showing the valve in lap and service positions respectively; Fig. 4 a plan view of the main slide valve seat; Fig. 5 a face view of the main slide valve; and Fig. 6 a face view of the small graduating slide valve.

As shown in the drawing, my invention is applied to a triple valve device of the usual type having train pipe connection 1, piston chamber 2, valve chamber 3 adapted to communicate with the auxiliary reservoir, piston 4, piston stem 5, main slide valve 6 and auxiliary or graduating slide valve 7, the main valve seat being provided with the brake cylinder port 8 and exhaust port 9, and the main slide valve with service port 10, emergency port 11 and exhaust cavity 12, all of which may be of the usual construction.

According to my improvement, additional ports 13 and 14 are located in the valve seat, the former communicating with the train pipe and the latter with the small expansion chamber 15, while the main slide valve is provided with ports 16, 17 and 18, and the graduating slide valve with a cavity 19. A cavity or extension 20 of port 17 connects with port 14 in release position of the valve, so that the chamber 15 is normally open to atmospheric pressure through ports 17, 19, 18, 12 and 9, while the train pipe vent port 13 is closed.

The system being charged to its normal degree of pressure, when a gradual reduction in train pipe pressure is made for a service application of the brakes the piston moves outward carrying the graduating slide valve with it a slight distance, sufficient to uncover the service port 10, to close the upper end of port 18 and to connect ports 16 and 17, then the head of the stem engages the main slide valve and carries the same outward to service application position, (Fig. 3) in which the port 10 registers with the brake cylinder port 8, while ports 16 and 17 register respectively with the train pipe vent port 13 and the port 14 leading to the small expansion chamber. Air then flows from the auxiliary reservoir to the brake cylinder in the usual way and the train pipe air expands into the chamber 15, thereby causing a local reduction in the train pipe, which operates in the well known manner to accelerate the action of the brakes.

As soon as the train pipe discharge is closed at the brake valve, the auxiliary reservoir pressure diminishes to a point slightly below that of the train pipe, whereupon the piston and graduating valve move inward to lap position, as shown in Fig. 2, in which the service port 10 and port 16 are closed and the cavity 19 connects the ports 17 and 18. The air under pressure which has expanded from the train pipe into the chamber 15 then exhausts to the atmosphere through ports 14, 17, 19, 18, 12, and 9, so that upon the next graduation, as the piston and graduating valve move out for again opening communication from the auxiliary reservoir to the brake cylinder, the cavity 19 connects ports 16 and 17 and communication is again established between the train pipe and the expansion chamber. This causes a second local venting of the train pipe by expansion into chamber 15, thereby producing the accelerated action of the brakes at each graduation. The expansion chamber and ports are made

of the proper capacity to give the desired degree and rate of reduction in the train pipe pressure. The brakes may be released by increasing the train pipe pressure in the usual manner, thereby moving the valve to release position, Fig. 1, in which the brake cylinder is open to the atmosphere through port 8, exhaust cavity 12, and exhaust port 9, and the expansion chamber 15 is also open to the atmosphere through ports 14, 20, 16, cavity 19, port 18, cavity 12, and exhaust port 9, as before described.

An emergency application may be produced by making a sudden reduction in train pipe pressure sufficient to cause the complete traverse of the valve to the usual emergency position, in which port 11 registers with the brake cylinder port 8, and while I have illustrated my improvement as applied to a plain type triple valve, it will be obvious that the same may be employed with the ordinary standard quick-action triple valve, or that any other mechanism for producing quick-action in emergencies may be employed, if desired.

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

1. A triple valve device comprising a movable abutment or piston subject to train pipe pressure, a main valve having ports for controlling communication from the auxiliary reservoir to the brake cylinder, and an auxiliary valve controlling ports in the main valve and operated by said piston and having means for controlling communication from the train pipe to an expansion chamber.

2. A triple valve device comprising a piston subject to train pipe pressure, a main valve, a graduating valve operated by said piston and having a movement relative to the main valve and ports adapted to open communication from the train pipe to an expansion chamber when in service position.

3. A triple valve device comprising a piston subject to train pipe pressure, a main valve, an auxiliary valve operated by the piston and having a movement relative to the main valve for controlling communication from the train pipe to an expansion chamber and from said chamber to the atmosphere.

4. In a fluid pressure brake, the combination with a train pipe, auxiliary reservoir and brake cylinder, of an expansion chamber and a valve device comprising a main valve for controlling the brake cylinder exhaust, a piston and auxiliary valve mounted on and having a movement relative to the main valve for controlling communication from the train pipe to the expansion reservoir.

5. In a fluid pressure brake, the combination with a train pipe, auxiliary reservoir and brake cylinder, of an expansion chamber and a valve device comprising a main valve for controlling the brake cylinder exhaust, a piston and auxiliary valve having a movement relative to the main valve for controlling communication from the train pipe to the expansion reservoir, and from said chamber to the atmosphere.

6. In a fluid pressure brake, the combination with a train pipe, auxiliary reservoir and brake cylinder, of an expansion chamber and a valve device comprising a piston subject to opposing pressures of the auxiliary reservoir and train pipe, a main valve for controlling the brake cylinder exhaust, a graduating valve having a movement relative to the main valve and adapted in service position to open communication from the train pipe to said expansion chamber.

7. In a fluid pressure brake, the combination with a train pipe, auxiliary reservoir and brake cylinder, of an expansion chamber and a valve device comprising a piston subject to opposing pressures of the auxiliary reservoir and train pipe, a main valve for controlling the brake cylinder exhaust, a graduating valve having a movement relative to the main valve and adapted in service position to open communication from the train pipe to said expansion chamber, and in lap position to open communication from the expansion chamber to the atmosphere.

8. In a fluid pressure brake, the combination with a train pipe, auxiliary reservoir and brake cylinder, of an expansion chamber, and a valve device comprising a main valve having ports for opening communication from the train pipe to the expansion chamber in service position, and a graduating valve and piston having a movement relative to the main valve for controlling said ports.

9. In a fluid pressure brake, the combination with a train pipe, auxiliary reservoir and brake cylinder, of an expansion chamber, and a valve device comprising a main valve having ports for opening communication from the train pipe to the expansion chamber in service position, and from said chamber to the atmosphere in release position, and a piston and graduating valve having a movement relative to the main valve for controlling the said ports.

10. In a fluid pressure brake, the combination with a train pipe, auxiliary reservoir and brake cylinder, of an expansion chamber, and a valve device comprising a main valve having ports adapted in service position to communicate with the train pipe, the expansion chamber and the exhaust, and a piston and graduating valve having a movement relative to the main valve for controlling said ports.

11. A triple valve device, comprising a main valve, and an auxiliary valve having a movement relative to the main valve for

controlling communication through the main valve from the train pipe to an expansion chamber.

12. In a fluid pressure brake, the combination with a train pipe, auxiliary reservoir, and brake cylinder, of an expansion chamber, and a valve device comprising a main valve, and an auxiliary valve subject to auxiliary reservoir pressure and having a movement relative to the main valve for controlling communication from the expansion chamber to the atmosphere.

In testimony whereof I have hereunto set my hand.

WALTER V. TURNER.

Witnesses:
R. F. EMERY,
J. B. MACDONALD.