B. J. MINNIER.

PRESSURE RETAINING VALVE.

APPLICATION FILED DEC. 30, 1908.

925,211. Patented June 15, 1909.

Fig. 1.

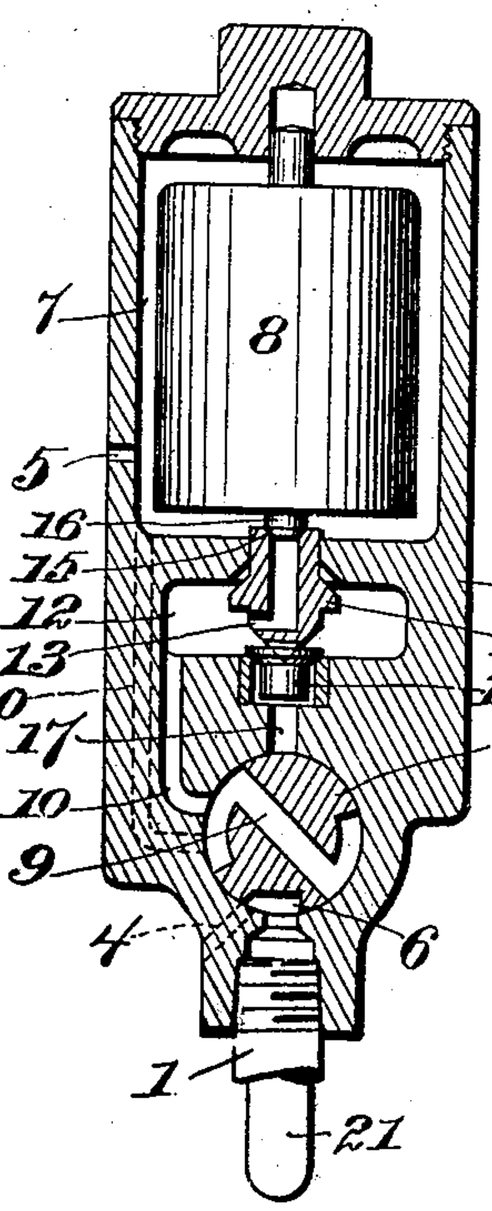


Fig. 2.

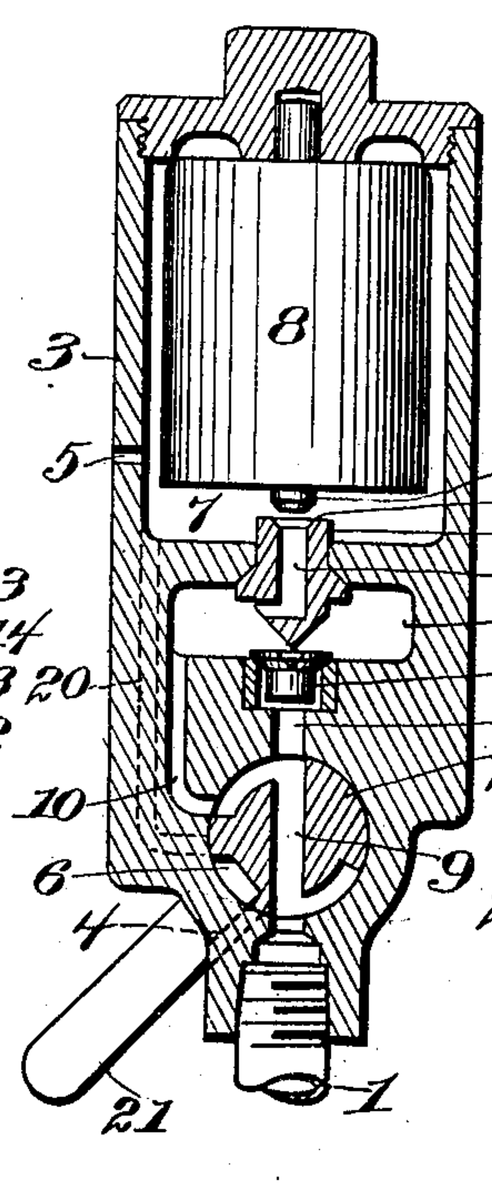
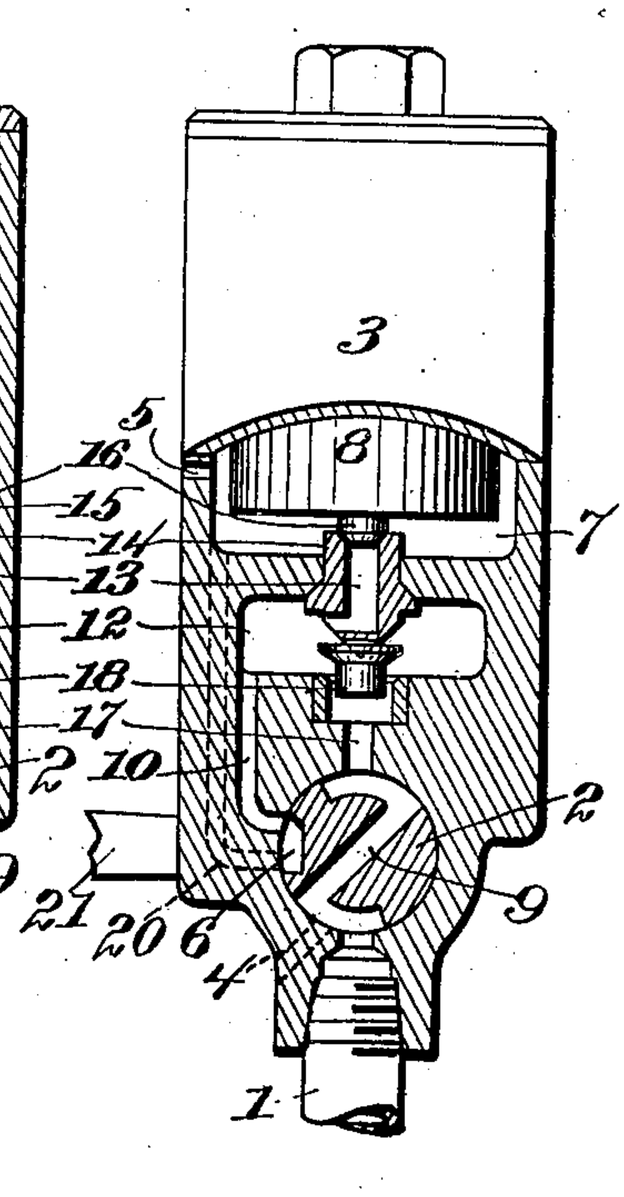


Fig. 3.



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UNITED STATES PATENT OFFICE.

BLYTHE J. MINNIER, OF WATERTOWN, NEW YORK, ASSIGNOR TO NEW YORK AIR BRAKE COMPANY, A CORPORATION OF NEW JERSEY.

PRESSURE-RETAINING VALVE.

No. 925,211. Specification of Letters Patent. Patented June 15, 1909.

Application filed December 30, 1908. Serial No. 470,002.

To all whom it may concern:

Be it known that I, BLYTHE J. MINNIER, a citizen of the United States, residing in Watertown, in the county of Jefferson and State of New York, have invented an Improvement in Pressure-Retaining Valves, of which the following description, in connection with the accompanying drawings, is a specification, like figures on the drawings representing like parts.

The present invention relates to a pressure retaining device of that class which is used in connection with the automatic air brake system where it is desirable to retain an excess pressure in the brake cylinders in certain cars of the train. It is desirable, moreover, in cases where a train is made up of empty and loaded cars to retain a greater excess of pressure in the brake cylinders of the loaded cars than in those of the empties.

It is the purpose of the present invention to arrange the pressure retaining device so that it can be placed in selective positions, viz., in the normal or inoperative position with the exhaust open directly to the air, and in other positions in which different amounts of pressure are retained in the cylinder when the exhaust at the triple valve is opened.

In accordance with the invention, the pressure is retained above the normal by the use of a load on a valve or valves such, for example, as a weight, and there is a controlling valve arranged to control selectively two or more ports, each of which is capable of being opened by the pressure so long as it is sufficient to overcome the load, there being, however, different areas subjected to the pressure to overcome the load, in accordance with the position of the controlling valve.

Figure 1 is a vertical section of a pressure retaining valve embodying the invention, showing the controlling valve in its normal position with the direct exhaust open to the air; Fig. 2 is a similar view showing the controlling valve in the position in which the maximum excess pressure is retained; and Fig. 3 is a similar view showing the controlling valve in a third position in which a lesser excess pressure is retained.

The pressure retaining device is connected with the exhaust pipe 1 leading from the triple valve at the brake cylinder, the final exhaust being controlled by a controlling valve 2 contained in a valve casing 3, the said casing having a direct exhaust outlet 4 and a supplemental exhaust outlet 5. In normal position, the controlling valve opens direct communication between the exhaust pipe 1 and the direct exhaust port 4 through the agency of a valve pocket 6 which, as shown in Fig. 1, laps the pipe 1 and duct 4. In this condition the pressure retaining device is not called into operation, the brakes operating in the normal way.

If an excess of pressure is to be retained, the direct exhaust duct 4 is closed and communication is opened with the supplemental exhaust duct 5, the arrangement being such that a certain load must be overcome by the pressure before the air can escape through the port 5. To this end, the valve is provided with intermediate ports each controlled by a valve, and the said valves are equally loaded preferably by means of a single weight, the tendency of which is to keep them seated. In the construction shown the port 5 consists of an opening through the wall of a chamber 7 which contains a weight 8 arranged to be lifted by the pressure when communication is opened between the exhaust pipe 1 and the chamber 7.

In order that different degrees of pressure may be retained, the arrangement is such that different areas are subjected to the pressure in accordance with the position of the controlling valve 2, so that less pressure is required to lift the weight when the valve is in one position than when it is in another.

Referring to Fig. 2 in which the controlling valve is shown in position to retain the maximum pressure, the port 9 which extends across through the body of the valve 2, is in a position to connect the exhaust pipe 1 with a duct 10 leading to a small chamber 12 below the chamber 7. Communication is established between the chamber 12 and the chamber 7 through a duct 13 formed in an intermediate piece 14 which is capable of vertical movement for a purpose to be hereinafter described. The duct 13, however, is provided at the top with a valve seat 15 normally closed by means of a valve 16 which is herein shown as a taper valve connected directly with the weight 8. In this case the pressure acts on the small area of the valve 16 in order to open the same and allow the air to flow through the chamber 7 to the exhaust port 5. As shown in Fig. 2, the

pressure of the air admitted to chamber 12, lifts the member 14 from the position shown in Fig. 1, and also lifts the weight to uncover the port 13 and allow the pressure to exhaust through port 5. As soon as the pressure drops to the amount which is to be retained, the weight will fall, closing the duct 13, and stopping the exhaust. The amount of pressure retained, therefore, depends upon the relation of the area of the valve to the weight. In order that a lower pressure may be retained, the valve 2 is arranged to open communication with the chamber 12 through a duct 17 which is closed by a valve 18, the said valve normally being held seated by the weight 8 acting through the member 14, as best indicated in Fig. 1. By moving the valve 2 to the position shown in Fig. 3, communication is established through the duct 9, and the valve 18 will be lifted under less pressure than is required to lift the valve 16 owing to the greater area exposed by the valve 18. With the valve 18 open, communication is established between the chamber 12 and the chamber 7 through ducts 10 and 20 which terminate adjacent to the valve 2 and are lapped by the pocket when the valve is in this position. By using the movable member 14, the same weight is utilized to control both valves, and the structure is very simple and compact. In cars where pressure is to be retained, the handle 21 is turned from its normal, or inoperative position, to the desired position for retaining a higher or lower pressure, the pressure retained depending upon the area of the valve exposed thereto.

Claims.

1. In a pressure regulating valve, an exhaust port; automatic valves controlling communication with said exhaust port, said valves having different areas subjected to the pressure of the escaping air; and means for causing the escaping air to act on said valves selectively.

2. In a pressure retaining valve, a controlling member consisting of a three-way cock interposed between the brake cylinder exhaust and the pressure retaining valve; a chamber provided with an exhaust port and with ducts controlled by said valve leading to said chamber; supplemental valves having different areas subjected to pressure and controlling said ducts respectively; and a weight arranged to act on both the said valves.

3. In a pressure retaining device, a movable member having a port; a valve to close said port; a weight acting on said valve; a valve of different area adapted to close another port, said valve being also acted on by said weight through said movable member; and means for connecting the exhaust from the triple valve with said ports respectively, each of said ports communicating with an exhaust port.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

BLYTHE J. MINNIER.

Witnesses:
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