J. W. CLOUD.

TRIPLE VALVE.

APPLICATION FILED APR. 26, 1905. RENEWED JAN. 4, 1907.

931,271. Patented Aug. 17, 1909.

Fig. 1.

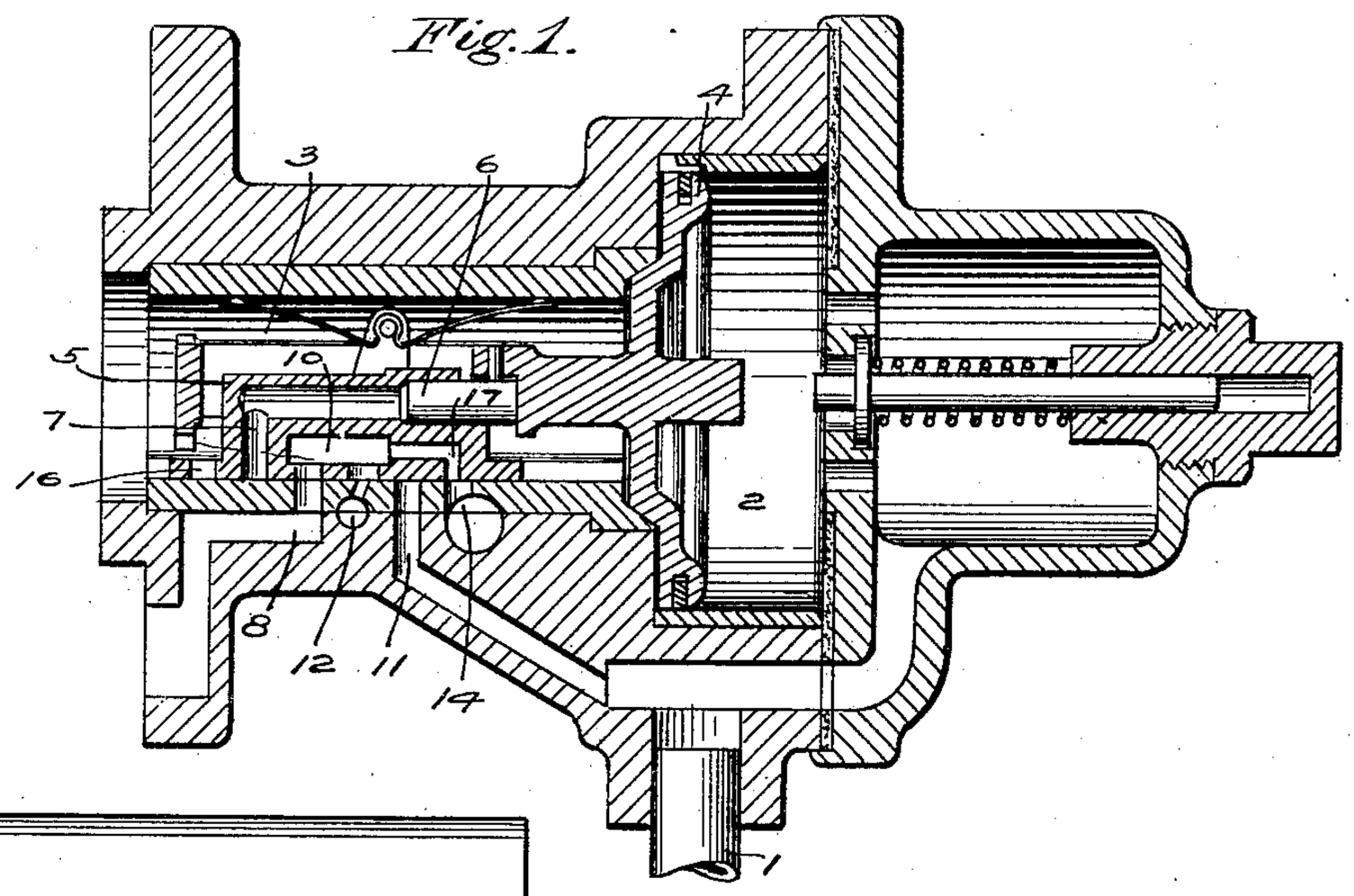


Fig. 2.

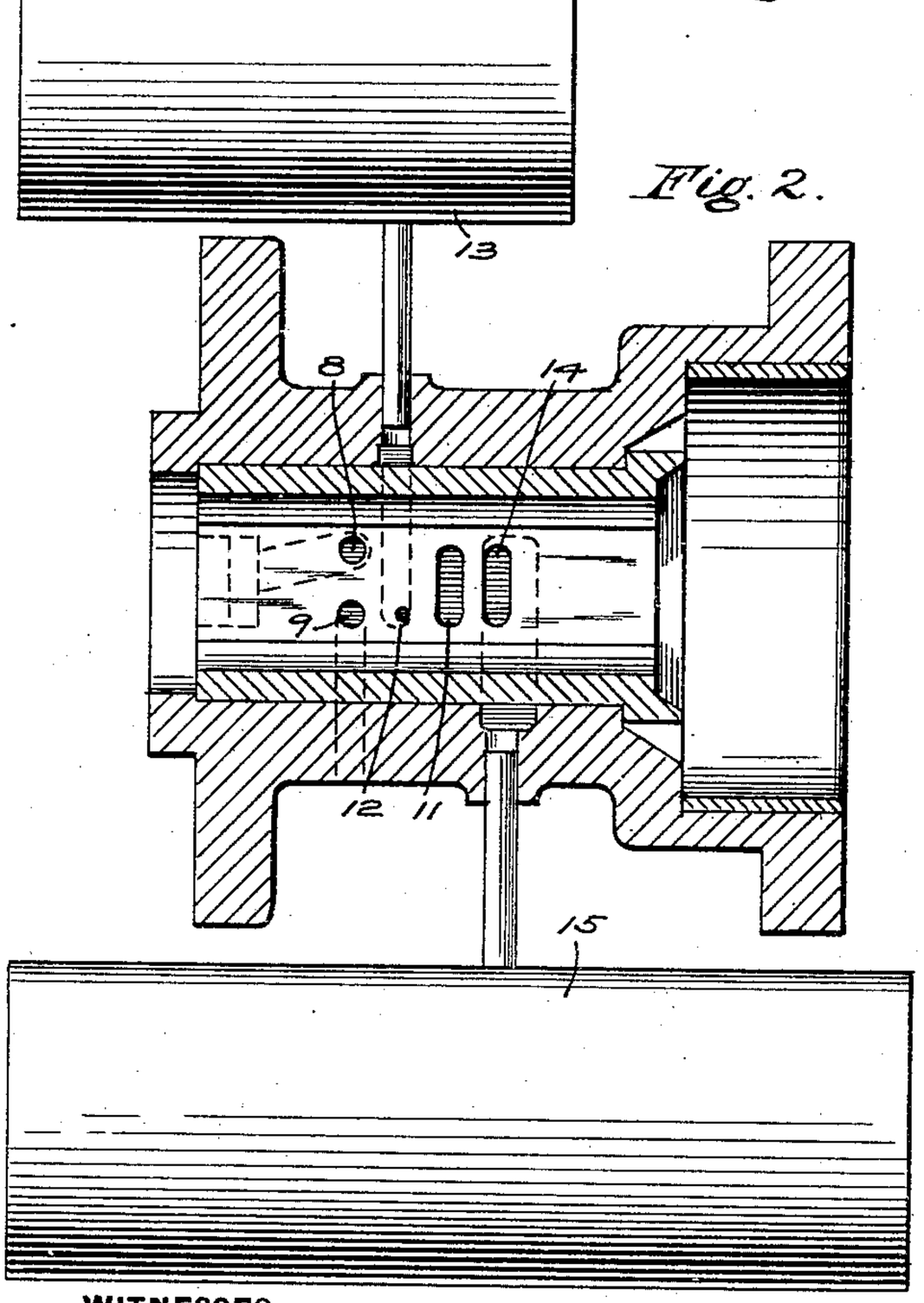
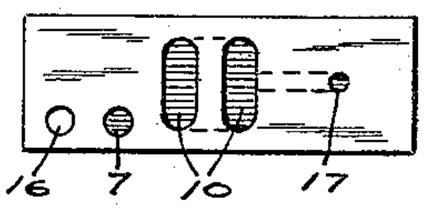


Fig. 3.



WITNESSES

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TRIPLE VALVE.

No. 931,271. Specification of Letters Patent. Patented Aug. 17, 1909.

Application filed April 26, 1905, Serial No. 257,468. Renewed January 4, 1907. Serial No. 350,824.

To all whom it may concern:

Be it known that I, JOHN WILLS CLOUD, a citizen of the United States, residing in London, England, 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, and is in the nature of an improvement on the construction disclose in my copending application, Serial No. 232,121, the principal object being to provide improved means for locally venting the train pipe on each car in service applications and thereby secure an accelerated action of the brakes.

Another object is to provide improved means for making a larger local reduction in train pipe pressure on each car for causing quick action of the brakes in emergency applications.

The invention therefore comprises a triple valve device having ports adapted, in service application position, to open a restricted communication from the train pipe to a small chamber which is normally subject to atmospheric pressure, and a second feature comprises a larger port adapted in emergency position to open communication from the train pipe to a larger chamber.

In the accompanying drawing, Figure 1 is a longitudinal sectional view of a triple valve device embodying my improvements; Fig. 2 a horizontal section thereof showing the arrangement of ports in the valve seat; and Fig. 3 a face view of the slide valve.

As shown in the drawing, my invention is applied to a triple valve device of the ordinary construction having train pipe connection 1, piston chamber 2, valve chamber 3 adapted to communicate with the auxiliary reservoir, piston 4, main slide valve 5, and graduating valve 6 controlling service port 7 in the slide valve, the valve seat being provided with brake cylinder port 8 and exhaust port 9, and the slide valve with exhaust cavity 10 and emergency port 16, all of which may be substantially of the usual construction and well understood in the art.

In addition to the usual ports, and in accordance with my invention, the valve seat is provided with a train pipe port 11, a restricted port 12 leading to a small chamber 13, and a port 14 communicating with a larger chamber 15. In the slide valve is located a small additional port 17 communicating with the exhaust cavity 10 and adapted to register with the large vent port 14 in normal release position of the valve. In this position the exhaust cavity also communicates with the brake cylinder port B, the exhaust port 9 and the small vent port 12, so that the brake cylinder and both expansion chambers 13 and 15 are normally open to the atmosphere. When a gradual reduction in train pipe pressure is made for a service application, the piston and valve move outward to service position, in which the graduating valve 6 opens the service port 7, which then registers with brake cylinder port 8, thereby opening communication from the auxiliary reservoir to the brake cylinder in the usual way. In this position also the cavity 10 in the slide valve connects the ports 11 and 12 in the valve seat, thereby establishing communication from the train pipe through the restricted vent port 12 to the small expansion chamber 13. Air then flows from the train pipe to the small chamber and causes a local reduction in train pipe pressure until the pressure in the expansion chamber equalizes with that of the train pipe, after which the local reduction ceases. In the meantime, air from the auxiliary reservoir flows to the brake cylinder, and after the train pipe discharge is closed at the brake valve the triple piston moves to lap position with the graduating valve closing the service port in the usual manner. Further reductions may be made for increasing the brake cylinder pressure, but it will be observed that there will be no local venting of the train pipe at the triple valve during subsequent graduations, as the train pipe pressure equalizes into the small expansion chamber at the first graduation. By this means the initial movement of the slide valve to the service position is accelerated by the local venting of the train pipe into the

small expansion chamber upon each car, but the subsequent graduations which involve the movement of the piston and graduating valve only are effected by the train pipe reduction made at the brake valve in the usual way, so that the further graduations may be made as fine as desired and the brake cylinder pressure controlled as accurately as with the standard apparatus.

An emergency application of the brake may be effected at any time by making a sudden reduction in train pipe pressure sufficient to cause the first triple valve to move outward to its emergency position, in which the port 16 in the slide valve registers with the brake cylinder port 8 and the cavity 10 connects the ports 11 and 14, thereby opening communication from the train pipe through the large port to the large expansion chamber 15. The wave of reduction produced by the sudden expansion of the train pipe pressure into this chamber causes the movement of the next succeeding triple valve to its emergency position by the well known serial action, thereby securing quick action of all the triple valve devices.

The brakes may be released by increasing the train pipe pressure in the usual manner, thereby causing the inward movement of the triple valve to normal release position, in which the brake cylinder and both expansion chambers are open to the atmosphere as before described.

It will be apparent that the feature of my invention for securing quickened service applications may be employed without the emergency feature, or that either may be used independently.

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 subject to the opposing pressures of the auxiliary reservoir and train pipe and a valve operated by said abutment for controlling communication from the auxiliary reservoir to the brake cylinder and from the train pipe to a small closed chamber.

2. A triple valve device comprising a movable abutment subject to the opposing pressures of the auxiliary reservoir and train pipe and a valve operated by said abutment and having ports adapted in service position to open communication from the auxiliary reservoir to the brake cylinder and from the train pipe to a small closed chamber.

3. A triple valve device comprising a movable abutment subject to the opposing pressures of the auxiliary reservoir and train pipe and a valve operated by said abutment having ports adapted in service position to open communication from the auxiliary reservoir to the brake cylinder and from the train pipe to a small chamber, and in release position to open communication from the small chamber to the atmosphere.

4. A triple valve device comprising a piston subject to the opposing pressures of the train pipe and auxiliary reservoir and a valve operated by said piston and having ports adapted in emergency position to open communication from the auxiliary reservoir to the brake cylinder and from the train pipe to a large closed chamber.

5. A triple valve device comprising a piston subject to the opposing pressures of the train pipe and auxiliary reservoir and a valve operated by said piston and having ports adapted in emergency position to open communication from the auxiliary reservoir to the brake cylinder and from the train pipe to a large closed chamber, and in release position to open communication from the brake cylinder 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 slide valve having ports for controlling communication from the auxiliary reservoir to the brake cylinder, and from the train pipe to the expansion chamber, and a piston subject to the opposing pressures of the train pipe and auxiliary reservoir for operating said valve.

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 train pipe pressure, and a valve operated by said piston and having ports for controlling communication from the auxiliary reservoir to the brake cylinder, from the train pipe to the expansion chamber and from the brake cylinder and 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 a service port for opening communication from the auxiliary reservoir to the brake cylinder and another port for opening communication from the train pipe to the expansion chamber in service position, a graduating valve and piston operated by variations in train pipe pressure and having a movement relative to the main valve for controlling the service port.

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 slide

valve subject to auxiliary reservoir pressure and having ports adapted to open communication from the auxiliary reservoir to the brake cylinder and from the train pipe to the expansion chamber in service application position, and a piston subject to train pipe pressure for operating said valve.

In testimony whereof I have hereunto set my hand.

JOHN WILLS CLOUD.

Witnesses:
OSCAR J. F. THORPE,
EDWARD FLET.