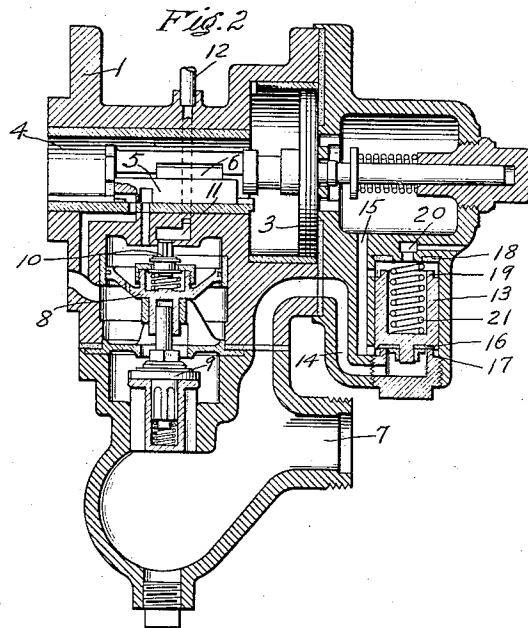
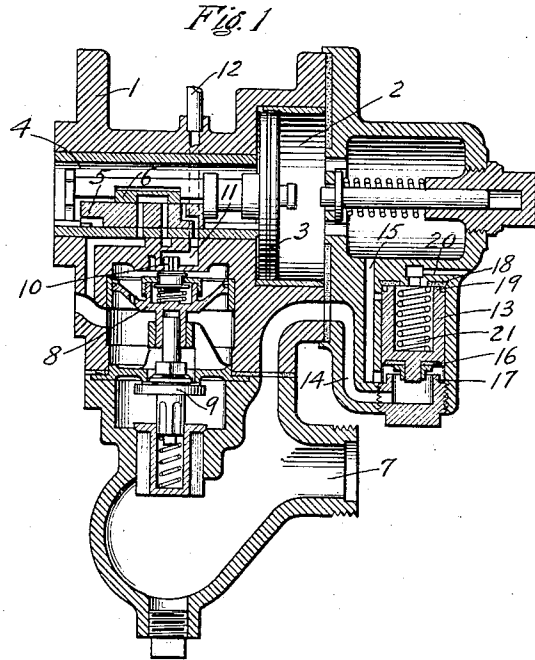


W. V. TURNER.
FLUID PRESSURE BRAKE.
APPLICATION FILED JUNE 25, 1913.

1,177,663.

Patented Apr. 4, 1916.



WITNESSES

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INVENTOR

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Att'y.

UNITED STATES PATENT OFFICE.

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

FLUID-PRESSURE BRAKE.

1,177,663.

Specification of Letters Patent.

Patented Apr. 4, 1916.

Original application filed September 20, 1911, Serial No. 650,483. Divided and this application filed June 25, 1913. Serial No. 775,688.

To all whom it may concern:

Be it known that I, WALTER V. TURNER, a citizen of the United States, residing at Edgewood, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Fluid-Pressure Brakes, of which the following is a specification.

This invention relates to fluid pressure brakes and is a division of application of Walter V. Turner, Serial No. 650,483, filed September 20, 1911.

Valve devices for locally effecting a reduction in train pipe pressure have heretofore been constructed to operate when the rate of reduction in train pipe pressure exceeded a predetermined degree and such a device is satisfactory under certain conditions, but more particularly in connection with recent development in fluid pressure brakes, it is desirable to provide a valve device which is operative, not according to the rate of reduction in train pipe pressure but only when the train pipe pressure has been quantitatively reduced to a certain predetermined degree.

The principal object of my invention is to provide a valve device of the above character which is operative to effect a reduction in fluid pressure for initiating an emergency application, upon a predetermined reduction in train pipe pressure.

In the accompanying drawings, Figure 1 is a central sectional view of a triple valve device with my improvement applied thereto, showing the parts in normal release position; and Fig. 2 a similar view, showing the parts in emergency application position.

While my invention is shown applied to a triple valve device of the ordinary type, so as to simplify the description, it will be understood that its use is of special importance with certain types of modern fluid pressure brakes, such as that described in application Serial No. 650,483 hereinbefore referred to and also with electro-pneumatic brake apparatus such as that described in my prior application Serial No. 645,615, filed August 23, 1911.

According to the drawings, my improvement is shown applied to a triple valve device of the type covered by Patent No.

917,194, granted April 6, 1909, in which a higher degree of pressure is obtained in the brake cylinder in an emergency application than is obtained in a service application of the brakes.

The triple valve device may comprise a casing 1 having the usual piston chamber 2 containing triple valve piston 3 and valve chamber 4 containing a main slide valve 5 and graduating valve 6 adapted to be operated by the piston 3 upon a reduction in pressure in the train pipe 7 to effect an application of the brakes. The quick action emergency valve mechanism of the triple valve device comprises a piston 8 for operating a quick action valve 9 and said piston carries a valve 10 adapted to control communication from a passage 11 leading to a supply pipe 12 to one side of the piston 8.

According to my improvement, a valve piston 13 controls communication from the train pipe passage 14 to passage 15 which opens into the triple valve piston chamber 2. The valve piston is adapted to seat in opposite extreme positions, a lower seat 16 being provided for engagement with a seat ring 17 and an upper seat 18 being provided for the seat ring 19 of the valve piston. An atmospheric exhaust port 20 opens to the upper side of the valve piston and a spring 21 acts on the valve piston in opposition to train pipe pressure on the lower side of same. The spring 21 is adjusted to the pressure at which it is desired to permit the train pipe pressure to reduce before the operation of the valve piston is effected, say for example, 30 pounds.

With no fluid in the train pipe, the spring 21 seats the valve piston on its lower seat and communication is then cut off from the train pipe to the triple valve device. Upon an increase in train pipe pressure to a predetermined degree, which is greater than the closing pressure because only a restricted area of the valve piston is subject to train pipe pressure in the seated position, the valve piston is lifted from its seat, instantly exposing the full area thereof to train pipe pressure. The sudden increase in pressure on the valve piston then quickly and positively shifts the same to its upper seat in which communication from the train pipe

passage 14 to the triple valve piston passage 15 is opened and communication from the triple valve piston chamber to the atmospheric exhaust port 20 is closed. Fluid under pressure is now free to flow from the train pipe to the triple valve piston in the usual manner.

Whenever from leakage or other cause, the train pipe pressure falls below the pressure for which the valve piston is adjusted to operate, the spring 21 acts to shift the valve piston 13 to its lower seat, thus opening communication from the triple valve piston chamber to the exhaust port 20 so as to cause a sudden reduction in pressure on the triple valve piston 3 and its consequent movement to emergency position. This movement also causes communication to be cut off from the train pipe, so that leakage from the triple valve to the train pipe is prevented.

It will now be apparent that by means of my improvement, the automatic valve device is shifted to emergency position upon a predetermined reduction in train pipe pressure and by reason of the seating of the valve piston in its opposite final positions, leakage is prevented and a positive and prompt movement of same to open communication from the train pipe to the automatic valve device is secured.

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

1. In a fluid pressure brake, the combination with a train pipe and a valve mechanism operated upon a reduction in fluid pressure for effecting an emergency application of the brakes, of a valve device normally subject to atmospheric pressure and operating upon a predetermined reduction in train pipe pressure for venting fluid from said valve mechanism to operate the same without venting fluid from the train pipe.

2. In a fluid pressure brake, the combination with a train pipe and a valve mechanism operated by a reduction in fluid pressure for effecting an emergency application of the brakes, of a valve device subject to the opposing pressures of the train pipe and a spring having its resistance effective to balance a corresponding train pipe pressure and operating upon a predetermined reduction in train pipe pressure for venting fluid from said valve mechanism to operate the same without venting fluid from the train pipe.

3. In a fluid pressure brake, the combination with a train pipe and a valve mechanism operated upon a reduction in fluid pressure for effecting an emergency application of the brakes, of a valve device subject to the opposing pressures of the train pipe and a spring and adapted upon a predetermined reduction in train pipe pres-

sure to seat and cut off communication from the train pipe to said valve mechanism and to also vent fluid solely from said valve mechanism to operate the same to effect an emergency application of the brakes.

4. In a fluid pressure brake, the combination with a train pipe and a valve mechanism operated upon a reduction in fluid pressure for effecting an emergency application of the brakes, of a valve device subject to the opposing pressures of the train pipe and a spring and adapted upon a predetermined reduction in train pipe pressure to seat and cut off communication from the train pipe to said valve mechanism and to also vent fluid only from said valve mechanism to operate the same to effect an emergency application of the brakes, said valve device being operated upon a predetermined increase in train pipe pressure for opening said communication and for cutting off the venting of fluid from said valve mechanism.

5. In a fluid pressure brake, the combination with a train pipe and a valve mechanism normally subject to train pipe pressure and operated by a reduction in fluid pressure for effecting an emergency application of the brakes, of a valve device subject to the opposing pressures of the train pipe and a spring for controlling communication from the train pipe to said valve mechanism and having one position for opening a vent port for venting fluid solely from said valve mechanism to effect an emergency application of the brakes, in which the train pipe communication is closed and another position in which the vent port is cut off from said valve mechanism and the train pipe communication is opened.

6. In a fluid pressure brake, the combination with a train pipe and a valve mechanism normally subject to train pipe pressure and operated by a reduction in fluid pressure for effecting an emergency application of the brakes, of a valve device subject to the opposing pressures of the train pipe and a spring and operated upon a predetermined increase in train pipe pressure for opening communication from the train pipe to said valve mechanism and upon a predetermined decrease in train pipe pressure for closing said communication and for opening a vent port for venting fluid solely from said valve mechanism to operate the same to effect an emergency application of the brakes.

7. In a fluid pressure brake, the combination with a train pipe and a valve mechanism normally subject to train pipe pressure and operated by a reduction in fluid pressure for effecting an emergency application of the brakes, of a valve device subject to the opposing pressures of the train pipe and a spring and adapted to seat and

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expose a restricted area to train pipe pressure, said valve device being operated upon a predetermined increase in train pipe pressure for opening and exposing an increased area thereof to train pipe pressure and also establishing communication from the train pipe to said valve mechanism.

8. In a fluid pressure brake, the combination with a train pipe and a valve mechanism normally subject to train pipe pressure and operated by a reduction in fluid pressure for effecting an emergency application of the brakes, of a valve device subject to the opposing pressures of the train pipe and a spring and adapted to seat and expose a restricted area to train pipe pressure, said valve device being operated upon a predetermined increase in train pipe pressure for opening and exposing the full area to train pipe pressure and also establishing communication from the train pipe to said valve mechanism, a predetermined reduction in train pipe pressure being adapted to close the train pipe communication and open a

vent port for venting fluid from said valve mechanism to operate the same.

9. In a fluid pressure brake, the combination with a train pipe and a valve mechanism subject to train pipe pressure and operated upon a reduction in fluid pressure for effecting an emergency application of the brakes, of a valve device subject to the opposing pressures of the train pipe and a spring and operated upon a predetermined reduction in train pipe pressure for venting fluid from said valve mechanism, said valve device being adapted to finally seat and expose a restricted area to train pipe pressure and being operated upon a predetermined increase in train pipe pressure to lift from the seat and expose a larger area to train pipe pressure.

In testimony whereof I have hereunto set my hand.

WALTER V. TURNER.

Witnesses:

A. M. CLEMENTS,
S. W. KEEFER.