W. V. TURNER.

TRAIN PIPE RELEASE VALVE.

APPLICATION FILED OCT. 2, 1907.

1,011,529. Patented Dec. 12, 1911.

Fig. 2.

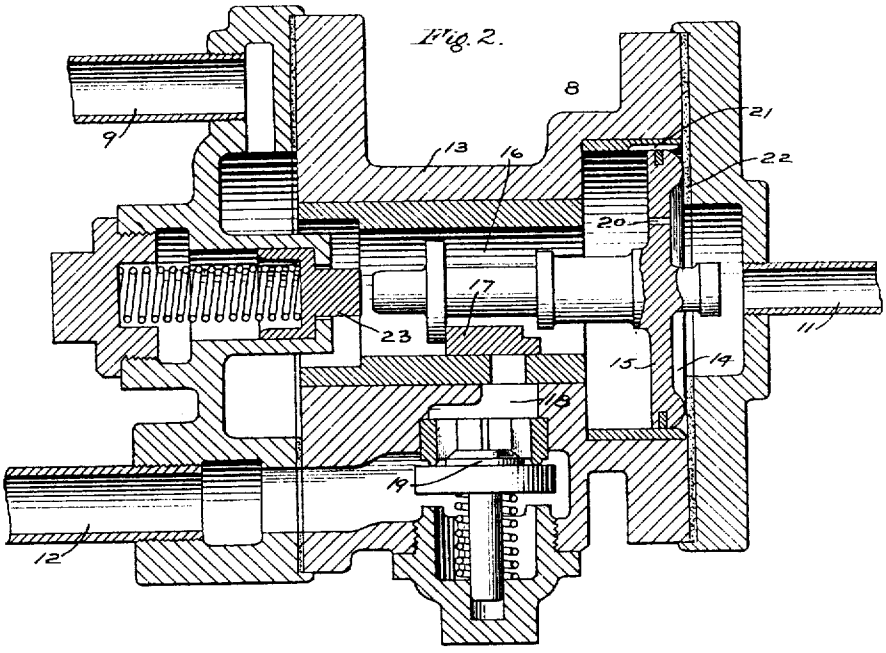
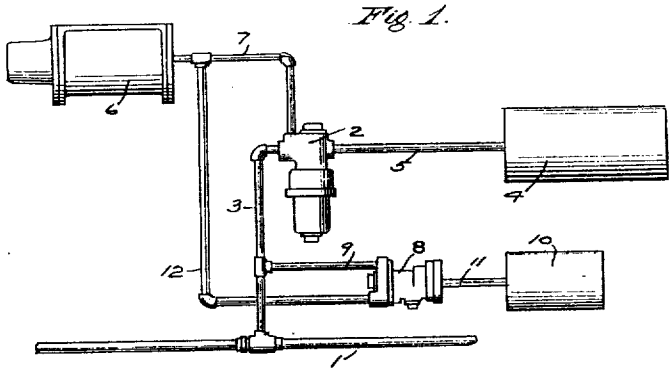


Fig. 1.



WITNESSES

J. S. Custer

Wm. M. Cady

INVENTOR

Walter V. Turner

By E. H. Wright Att'y.

UNITED STATES PATENT OFFICE.

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

TRAIN-PIPE RELEASE-VALVE.

1,011,529. Specification of Letters Patent. Patented Dec. 12, 1911.

Application filed October 2, 1907. Serial No. 395,575.

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 Train-Pipe Release-Valves, of which the following is a specification.

This invention relates to fluid pressure brakes, and more particularly to a valve device for locally venting air from the train pipe in an emergency application of the brakes, thereby producing quick serial action of the triple valves in the well known manner. Such a valve device is shown, for example, in Patent No. 448,827, wherein a valve, controlling an outlet from the train pipe, is actuated by a movable abutment, which is subject to the opposing pressures of the train pipe and a chamber.

The abutment is normally maintained in its outer position, with the valve closed by a spring, and is provided with a small equalizing port for charging the chamber on the outer face of the abutment, the port being of such size that upon gradual reductions in train pipe pressure, as made in effecting a service application of the brakes, the air flowing from the chamber to the train pipe, through the port, maintains substantial equilibrium of pressures on the abutment and so the same is not moved from its normal position, to open the vent valve. But upon a sudden reduction in train pipe pressure, as made in effecting an emergency application of the brakes, the equalizing port is too small to permit the necessary return flow of air, in order to maintain the equilibrium of pressures, and consequently the abutment moves and the valve is shifted, thereby venting the train pipe. With a construction of this character it is, however, difficult to so proportion the equalizing port, particularly on vent valves applied to cars near the head end of the train, that said port will be large enough to provide for equalization of pressures in service applications particularly where a full service reduction in train pipe pressure is made and yet be small enough to insure operation upon an emergency reduction in train pipe pressure.

One object of my invention is, therefore, to obviate the above difficulty and for this purpose the invention consists in providing means operated upon preliminary movement of the abutment for opening a by-pass or communication from the chamber to the train pipe side of said abutment, thereby checking further movement of the abutment tending to open the valve, unless a heavy reduction in train pipe pressure is made as in an emergency application of the brakes.

Another object is to provide means for closing the by-pass between the chamber and train pipe upon movement of the abutment to its inner position when an emergency reduction in train pipe pressure is made.

In the accompanying drawings, Figure 1 is a diagrammatic elevational view of a car air brake equipment with my improvements applied, and Fig. 2 a central sectional view of the improved train pipe release valve device.

According to Fig. 1, the equipment on the car may comprise the usual train pipe 1, connected to the triple valve 2 by branch pipe 3, auxiliary reservoir 4, connected by pipe 5, and brake cylinder 6, by pipe 7, to the triple valve 2. The train pipe release valve device 8 is connected to the train pipe by pipe 9 and to a supplemental reservoir 10 by a pipe 11.

The preferred form of vent valve device comprises a casing 13, having a piston chamber 14, containing a movable abutment 15, and a valve chamber 16, containing a slide valve 17, operated by the abutment 15 and controlling a port and passage 18, leading to outlet pipe 12, preferably connected with the brake cylinder. The passage 18 is provided with a check valve 19 to prevent back flow from the brake cylinder.

The valve chamber 16 is open to the train pipe through pipe 9 and the outer face of the abutment 15 is open, preferably to an air chamber 10, by way of pipe 11. The abutment 15 is provided with equalizing port 20, as in the prior construction, and in addition I provide a by-pass 21, normally closed by the seating of the abutment 15 on the gasket 22, but opened, upon preliminary movement of the abutment to establish a communication from the chamber to the train pipe side of the abutment.

In operation, the train pipe being charged to the usual normal pressure, air flows through the equalizing port 20, charging the reservoir 10 to the standard pressure, the

abutment being shifted to its outer position seating on the gasket 22. If a gradual reduction in train pipe pressure is made to effect a service application of the brakes, the return flow of air from the outer face of the abutment and the reservoir 10 is ordinarily sufficient to maintain substantial equilibrium of fluid pressure on the opposing faces of the abutment, so that no movement of the abutment and valve occurs, but, as before stated, if for any reason the reduction in pressure is greater than the equalizing port can take care of, then the abutment may be moved from its seat. The preliminary movement of the abutment, however, opens the by-pass 21, so that the flow of air from the chamber to the train pipe is increased, checking the further inward movement of the abutment tending to move the valve. A spring stop device 23 may be provided to engage the piston stem of the abutment 15, as an additional resistance to the movement of the valve by the abutment. Upon making an emergency reduction in train pipe pressure, the greater difference in pressures on the abutment is sufficient to shift the abutment to its extreme inner position, before equalization can take place, opening the vent port 18 and releasing fluid from the train pipe through vent port 18 to the brake cylinder. In this inner position, it will be noted that the by-pass 21 is closed, and consequently the higher pressure on the reservoir side of the abutment gradually equalizes through the port 20. Upon substantial equalization, the spring stop 23 returns the abutment and valve, closing the vent port 18, so that fluid will not flow from the train pipe to the brake cylinder, when the train pipe pressure is increased to release the brakes. Upon increasing the train pipe pressure the abutment is shifted to its outer normal position, as shown in Fig. 2.

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

1. A train pipe vent valve device comprising a valve for controlling the release of air from the train pipe, an actuating abutment therefor, and fluid pressure means tending to check the movement of said abutment and valve in the direction to release air from the train pipe.

2. A train pipe vent valve device comprising a valve for controlling the release of air from the train pipe, an actuating abutment therefor, and fluid pressure means tending to check the movement of said abutment thereby permitting said abutment and valve to operate only upon a sudden or emergency reduction in train pipe pressure.

3. A train pipe vent valve device comprising a valve for controlling the release of air from the train pipe, an abutment for actuating said valve, subject to the opposing pressures of the train pipe and a chamber, said chamber being open to the train pipe through an equalizing port, and a by-pass adapted to establish communication between the chamber and train pipe upon movement of the abutment from its normal position.

4. A train pipe vent valve device comprising a valve for controlling the release of air from the train pipe, an abutment for actuating said valve, subject to the opposing pressures of the train pipe and a chamber, said chamber being open to the train pipe through an equalizing port, and a by-pass adapted to establish communication between the chamber and train pipe upon movement of the abutment from its normal position, and a yielding spring device for resisting the movement of said abutment.

5. A train pipe vent valve device comprising a valve for controlling the release of air from the train pipe, an abutment subject to the opposing pressures of the train pipe and a chamber for actuating said valve, and a by-pass from said chamber to the train pipe adapted to be opened by the preliminary movement of said abutment.

6. A train pipe vent valve device comprising a valve for controlling the release of air from the train pipe, an abutment subject to the opposing pressures of the train pipe and a chamber for actuating said valve, and means for opening communication from said chamber to the train pipe upon the preliminary movement of said abutment, and for closing said communication upon a further movement of said abutment.

7. A train pipe vent valve device comprising a valve for controlling the release of air from the train pipe, an abutment subject to the opposing pressures of the train pipe and a chamber for actuating said valve, and having a preliminary movement relative to said valve, and a by-pass from said chamber to the train pipe adapted to be opened by the preliminary movement of said abutment.

8. A train pipe vent valve device comprising a valve for controlling the release of air from the brake pipe, an actuating abutment therefor having an equalizing port, and means operating upon preliminary movement of the abutment tending to check the further movement of said abutment and valve.

In testimony whereof I have hereunto set my hand.

WALTER V. TURNER.

Witnesses:
R. F. EMERY,
WM. M. CADY.