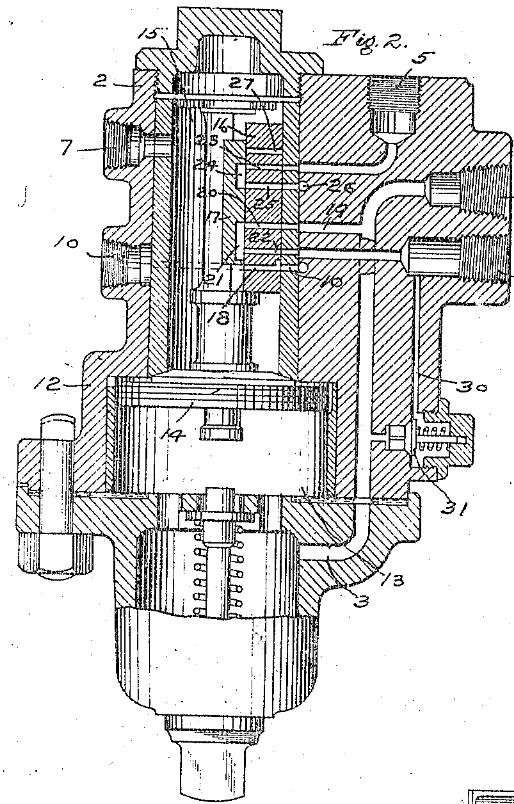
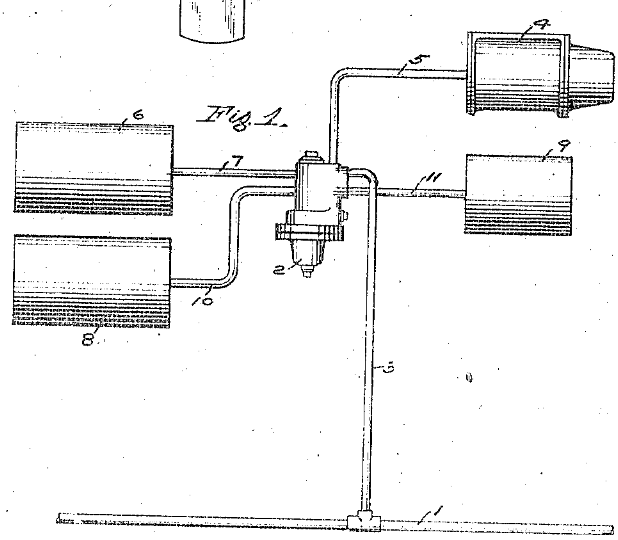
W. V. TURNER.

GRADUATED RELEASE BRAKE.

APPLICATION FILED NOV. 14, 1907.

965,616. Patented July 26, 1910.





WITNESSES

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UNITED STATES PATENT OFFICE.

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

GRADUATED RELEASE-BRAKE.

965,616. Specification of Letters Patent. Patented July 26, 1910.

Application filed November 14, 1907. Serial No. 402,127.

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 Graduated Release-Brakes, of which the following is a specification.

This invention relates to fluid pressure brakes, and more particularly to apparatus for grading down the pressure in the brake cylinder after an application of the brakes.

As a means for effecting a partial release of the fluid in the brake cylinder, it has heretofore been proposed to employ a valve device, such as a triple valve device, which is adapted to be operated by a momentary or graduated increase in train pipe pressure to open the brake cylinder exhaust port and release a certain amount of air from the brake cylinder, and having means for then automatically closing said exhaust to cut off the further escape of air from the brake cylinder. This momentary or graduated increase in train pipe pressure, or pressure wave, as it may be called, diminishes more or less in force as it proceeds toward the rear end of the train, and thus on very long trains there is some liability that the valve devices at the rear end of the train may not be operated to fully open the brake cylinder exhaust port, and to that extent renders the graduated release uncertain.

The principal object of my invention is, therefore, to provide means for securing a more nearly simultaneous and positive action of the graduated release devices throughout the train. I attain this object by providing means for venting a quantity of air to the train pipe, upon movement of the graduated release valve device to open the brake cylinder exhaust port. The increase in train pipe pressure thus caused, then assists the movement of the succeeding valve device, thus accelerating the serial action of the valve devices throughout the train.

In the accompanying drawing, Figure 1 is a diagrammatic view of a car air brake equipment embodying my improvements; and Fig. 2 a central sectional view of a triple valve device, having means for graduating the release of the brakes, and with a preferred form of my invention applied thereto.

According to the construction shown in Fig. 1 of the drawing, the car air brake equipment comprises a triple valve device 2, connected to the train pipe 1, by branch pipe 3, to the brake cylinder 4, by pipe 5, and to auxiliary reservoir 6, supplemental reservoir 8, and release reservoir 9, by pipes 7, 10 and 11 respectively.

As shown in Fig. 2 of the drawings, my invention may be employed in connection with a triple valve device comprising a casing 12, having the piston chamber 13, containing the triple valve piston 14, and valve chamber 15, containing the main slide valve 16, and auxiliary slide valve 17, mounted thereon and adapted to have movement relative thereto.

The train pipe being supplied with air in the usual way, the triple valve piston assumes its release position and the main slide valve chamber and auxiliary reservoir are charged by way of the usual feed groove around the triple valve piston. A through port 18 is provided in the main slide valve 16, and in the release position registers with port 10, leading to the supplemental reservoir, so that this reservoir is charged to the standard train pipe pressure. The release reservoir 9 is also charged from the train pipe through a port 19, which registers with a port 20 in the main slide valve, cavity 21 in the auxiliary valve 17, and port 22, which registers with passage 11, opening into the release reservoir 9.

The brake cylinder is open to the exhaust through brake cylinder port 5, port 23 in the main slide valve, cavity 24 in the auxiliary valve, and port 25, which registers with exhaust port 26.

An application of the brakes may be effected in the usual manner, by reducing the train pipe pressure, whereupon the auxiliary slide valve 17 uncovers the through supply port 27 in the main slide valve, and the main valve moves so that port 27 registers with brake cylinder port 5. The brakes being applied, if it is desired to graduate off the pressure in the brake cylinder, the train pipe pressure is momentarily increased in the usual manner, thereby causing the triple valve piston 14, and the main and auxiliary slide

valves to be shifted to the release position. In this position the ports 20 and 22 register with train pipe passage 19 and release reservoir passage 22, respectively, and are connected by cavity 21 in the auxiliary slide valve, so that fluid stored in the release reservoir at the standard pressure is vented to the train pipe. In this manner the train pipe pressure is increased, thereby assisting the prompt movement of the succeeding triple valve to release position, so that the serial action of the triple valves throughout the train is hastened and a more positive action thereof is obtained.

In the release position, the supplemental reservoir port 10 registers with the through port 18 in the main slide valve, so that air flows from the supplemental reservoir to the auxiliary reservoir, increasing the pressure on the auxiliary reservoir side of the piston sufficiently to shift the same outwardly and with it the auxiliary valve 17, which thereupon closes the supplemental reservoir port 10, the release reservoir port 11 and brake cylinder port 5, thereby cutting off the further release of air from the brake cylinder. Further grading down of the pressure in the brake cylinder may be effected in a similar manner, if desired, as will be readily understood.

I may in some cases provide a direct charging passage for the release reservoir, such as the passage 30, connecting the train pipe passage 3 with the passage 11, leading to the release reservoir, the passage being provided with a check valve 31 to prevent back flow of air from the release reservoir to the train pipe.

It will now be apparent that I have provided simple and efficient means whereby graduated release of the brakes on long trains may be readily obtained throughout the train.

Though I prefer to employ a separate reservoir for increasing the train pipe pressure, I may, in some cases, utilize a single reservoir or other source of pressure for supplying fluid to the opposite sides of the abutment 14.

My invention may be applied to various other constructions adapted to graduate the release of the brakes, and the auxiliary valve may be dispensed with, if desired, though by its use a more sensitive device is obtained.

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 brake cylinder, of a valve device operated by an increase in train pipe pressure for first opening and then closing the exhaust from the brake cylinder and local means for increasing the pressure on the train pipe side of said valve device.

2. In a fluid pressure brake, the combination with a train pipe and brake cylinder, of a valve device operated by an increase in train pipe pressure for opening and then closing the exhaust from the brake cylinder and for increasing the pressure on the train pipe side of said valve device.

3. In a fluid pressure brake, the combination with a train pipe and brake cylinder, of a valve device operated by an increase in train pipe pressure for opening the exhaust from the brake cylinder, and for supplying fluid to the opposite sides of said valve device, for increasing the train pipe pressure and for closing the brake cylinder exhaust port.

4. In a fluid pressure brake, the combination with a train pipe, brake cylinder, auxiliary reservoir and a supplemental reservoir or source of pressure, of a valve device having a movable abutment operated by variations in train pipe pressure, valve means actuated by said abutment for controlling the release of air from the brake cylinder, for increasing the pressure on the train pipe side of said abutment, and for supplying air from said supplemental reservoir to the other side of the abutment to cut off the release of air from the brake cylinder.

5. In a fluid pressure brake, the combination with a train pipe, brake cylinder, auxiliary reservoir and a supplemental reservoir or source of pressure, of a valve device having a movable abutment, and valve means operated by said abutment upon an increase in train pipe pressure, for releasing air from the brake cylinder, for supplying air to the train pipe side of said abutment, and for opening communication from said supplemental reservoir to the other side of said abutment to cut off the release of air from the brake cylinder.

6. In a fluid pressure brake, the combination with a train pipe and brake cylinder, of a valve device having a movable abutment operated by variations in train pipe pressure, a main valve and an auxiliary valve actuated by said abutment for controlling the release of air from the brake cylinder, and the admission of fluid under pressure to the opposite sides of said abutment.

7. In a fluid pressure brake, the combination with a train pipe and brake cylinder, of a valve device having a movable abutment operated by variations in train pipe pressure, a main valve, and an auxiliary valve having a movement relative to said main valve, said valves being actuated by said abutment for controlling the release of air from the brake cylinder and for increasing the fluid pressure on the opposite sides of said abutment.

8. In a fluid pressure brake, the combination with a train pipe, brake cylinder, supplemental reservoir and an additional source

of fluid pressure, of a valve device operated by variations in fluid pressure for controlling the release of air from the brake cylinder and communication from said additional source to the train pipe side, and from said supplemental reservoir to the opposite side of said abutment.

9. In a fluid pressure brake, the combination with a train pipe, brake cylinder, supplemental reservoir and an additional source of fluid pressure, of a valve device having a movable abutment operated by variations in train pipe pressure, a main valve actuated by said abutment, and an auxiliary valve actuated thereby for controlling the release of fluid from the brake cylinder and communication from said additional source to the train pipe side of said abutment and from said supplemental reservoir to the opposite side of said abutment.

10. In a fluid pressure brake, the combination with a brake cylinder, of valve means operating upon a graduated increase in train pipe pressure for releasing air from the brake cylinder and for supplying air to the train pipe, and means for returning said valve means to cut off the release of air from the brake cylinder.

In testimony whereof I have hereunto set my hand.

WALTER V. TURNER.

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