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AUTOMATIC VALVE DEVICE FOR AIR BRAKES.

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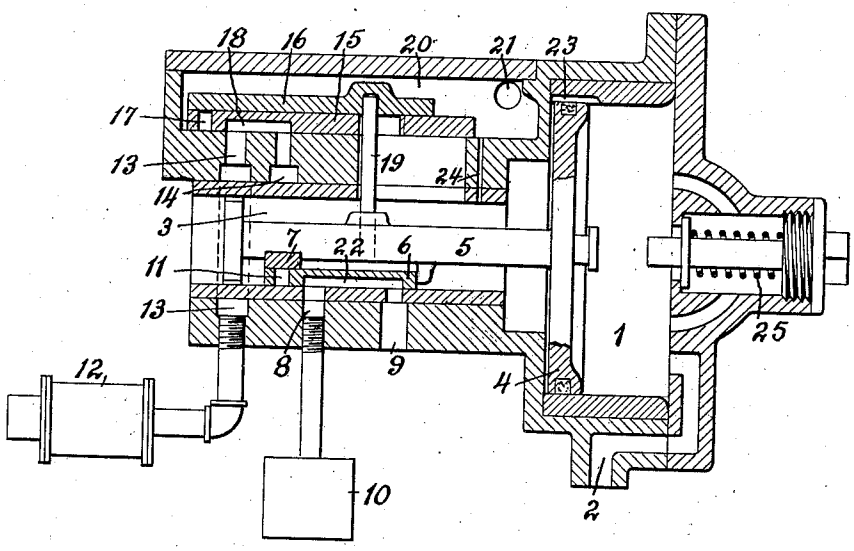

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UNITED STATES PATENT OFFICE.

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AUTOMATIC VALVE DEVICE FOR AIR-BRAKES.

1,037,443. Specification of Letters Patent. **Patented Sept. 3, 1912.**

Application filed April 13, 1911. Serial No. 620,890.

To all whom it may concern:

Be it known that I, MURRAY CORRINGTON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Automatic Valve Devices for Air-Brakes, of which the following is a specification.

This invention relates to air brakes or other fluid pressure brakes, and more particularly to the automatic valve device, commonly called a triple valve device adapted to be located upon each car or vehicle of the train and operating in response to variations in train pipe pressure to control the supply of fluid under pressure to, and its release from the brake cylinder.

The object of my invention is to provide an improved valve device of this character which shall operate in response to variations in train pipe pressure to supply fluid under pressure from an additional or independent source to the brake cylinder.

With the standard triple valve devices as commonly used, the supply for the brake cylinder is drawn from the auxiliary reservoir, the pressure in which is also employed for opposing the train pipe pressure upon the triple valve piston and thereby effect the desired operation of the triple valve. As is well known, therefore, the auxiliary reservoir must be of a certain limited capacity bearing a certain relation to the volume of the brake cylinder in order to produce the desired or permissible degree of braking pressure corresponding to certain reductions in train pipe pressure. Owing to this necessary limited volume of the auxiliary reservoir and the losses which occur in practice from leakage and other causes, it sometimes happens that the braking force is depleted to a dangerous degree.

According to my improvement, an auxiliary reservoir, or an auxiliary pressure chamber, may be employed for assisting in the operation of the valve device, but the supply for the brake cylinder is taken from an additional source, such as a supplemental reservoir which may be charged by an independent compressor or from the train pipe or in any other desired manner, the important feature being that this additional source of supply may have a large and practically unlimited capacity so that the braking pressure is always available to any extent desired and never becomes depleted to the danger point.

One form of my improved valve device is illustrated in section in the accompanying drawing, and comprises a casing having piston chamber 1, with train pipe connection 2, and the valve chamber 3, communicating at its open end with the auxiliary reservoir, or an auxiliary pressure chamber which may be of smaller size than the usual auxiliary reservoir which is used as a supply for the brake cylinder.

The piston 4 is connected by stem 5, with the usual main and graduating valves 6 and 7, having port 11, and cavity 22, for controlling exhaust port 9, and a port 8, which may lead to an expansion chamber 10. The casing may also be provided with a valve chamber 20, containing a main valve 15, and an auxiliary or graduating valve operated by the same piston 4, through a stem 19. Port 17, and cavity 18 may be located in the valve 15, for controlling the supply to the brake cylinder through service port 13, and the release therefrom through exhaust port 14.

21 indicates a connection from the valve chamber 20 to a main reservoir, storage reservoir, pipe line, supplemental reservoir or other additional source of fluid pressure. If preferred, the supplemental reservoir may be charged from the train pipe through feed grooves 23 and 24. The service port 17, for the brake cylinder, should be so designed as compared with service port 11, for the expansion chamber that the proper ratio of volumes and rate of flow shall be preserved, the valves being so positioned that these ports shall open concurrently and the desired degree of pressure accumulate in the brake cylinder at the same time that the corresponding amount of reduction takes place in the pressure chamber by expansion into chamber 10.

When the train pipe pressure is reduced for the purpose of making a service application of the brakes, the piston 4 moves out under the preponderance of the pressure, in the auxiliary pressure chamber, first closing the feed groove 23, as the graduating valves 7 and 16 move upon main slide valves 6 and 15 to uncover ports 11 and 17 respectively; then upon further outward movement of the

piston, the main valves are moved to close the exhausts and open the respective service ports so that, as air from the pressure chamber is reduced by expansion through ports 11 and 8, into the chamber 10, air under pressure from the additional source flows at the desired rate through service ports 17 and 13 into the brake cylinder 12, and accumulates therein at substantially the same rate as in the old standard brake equipment. When the pressure on the auxiliary side of the piston diminishes to a point slightly less than that of the train pipe, the piston and graduating valves return to lap position closing ports 11 and 17 and thereby cutting off the supply to the brake cylinder and also the further reduction in the auxiliary pressure chamber. Additional graduations may be made in a similar manner. For releasing brakes, the train pipe pressure is increased in the usual way, moving the piston and valves back to the normal position in which the cavity 22 in valve 6 connects ports 8 and 9, for releasing fluid from the expansion chamber to the atmosphere, and the cavity 18 establishes communication from the brake cylinder and port 13 through exhaust port 14 to the atmosphere.

When a sudden and excessive reduction is made in train pipe pressure, to produce an emergency application, the piston makes a full traverse, compressing the spring 25, and moving the valves to open wide ports 8 and 13, whereby air under pressure flows from the additional source to the brake cylinder very rapidly, and charges the same to the maximum degree of pressure which may be derived from said source, thus providing the shortest possible stop for emergencies.

While I have shown my improvement applied in connection with a plain type of triple valve device, it will be understood that the same may also be used with any suitable or preferred type of quick action mechanism for producing a serial venting of the train pipe and more rapid action of the brakes throughout the train.

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, auxiliary pressure chamber, expansion chamber, and a valve and abutment subject to the opposing pressure of the train pipe and pressure chamber for supplying fluid from the pressure chamber to the expansion chamber, of an additional source of supply, a brake cylinder and another valve operated by said abutment for supplying fluid for the additional source to the brake cylinder.

2. In a fluid pressure brake, the combination with a train pipe, auxiliary pressure chamber, and expansion chamber, of a brake cylinder, an additional source of pressure supply, and a valve device comprising an abutment operating in response to variations in train pipe pressure, and main and auxiliary valves actuated by said abutment for controlling the supply of fluid from the pressure chamber to the expansion chamber and the release from said chamber to the atmosphere, and another valve also actuated by said abutment for controlling the supply of fluid from the additional source to the brake cylinder.

3. In a fluid pressure brake, the combination with a train pipe, auxiliary pressure chamber, and expansion chamber, of a brake cylinder, an additional source of pressure supply, and a valve device comprising a movable abutment subject to the opposing pressures of the train pipe and pressure chamber, and two sets of main and auxiliary valves actuated by said abutment for simultaneously controlling the supply of fluid to the expansion chamber and to the brake cylinder.

4. In a fluid pressure brake, the combination with a train pipe, auxiliary pressure chamber, and expansion chamber, of a brake cylinder, an additional source of pressure supply, and a valve device comprising a movable abutment subject to the opposing pressures of the train pipe and pressure chamber, and main and auxiliary valves actuated by said abutment for simultaneously controlling the supply of fluid from the pressure chamber to the expansion chamber and from the additional source to the brake cylinder, and for controlling the release from the expansion chamber and from the brake cylinder to the atmosphere.

In testimony whereof I have hereunto set may hand.

MURRAY CORRINGTON.

Witnesses:
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