No. 779,598. PATENTED JAN. 10, 1905.

C. B. HARRINGTON.

AUTOMATIC RETAINING AND RECHARGING VALVE FOR AIR BRAKES.

APPLICATION FILED MAR. 7, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

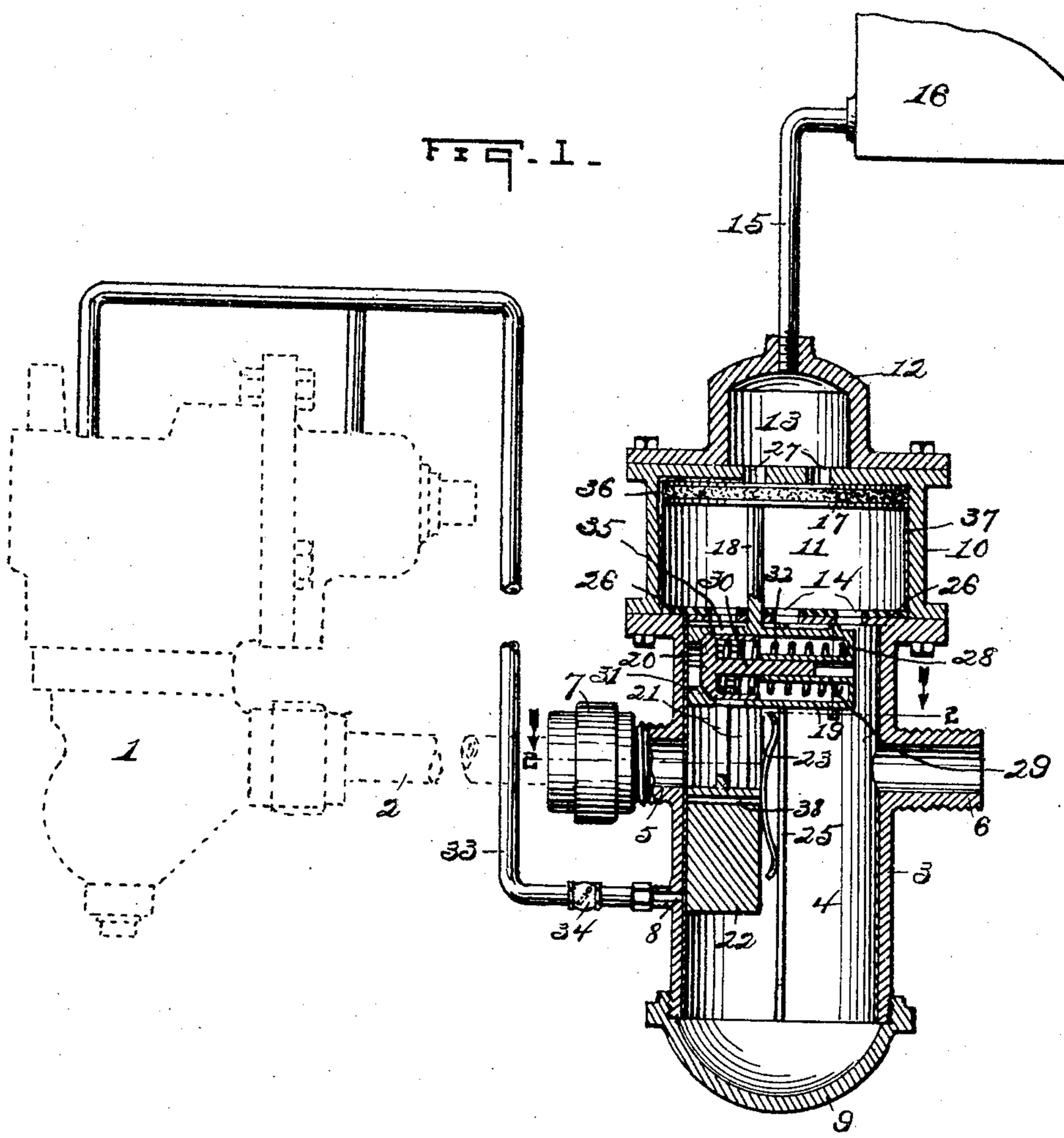

Fig. 2.

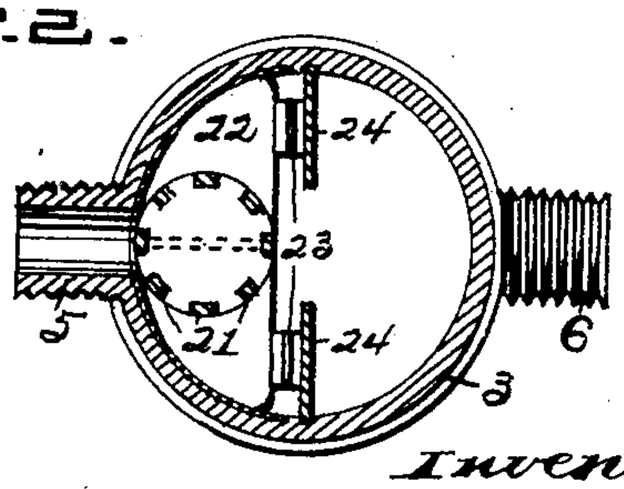

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Fig. 3.

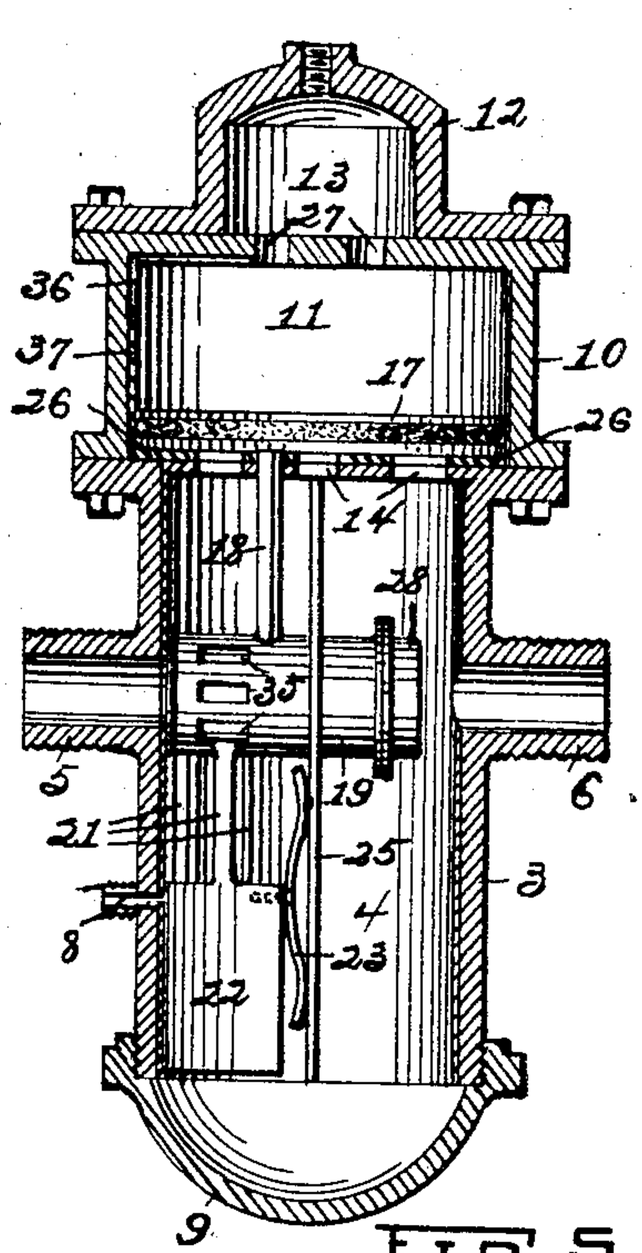


Fig. 4.

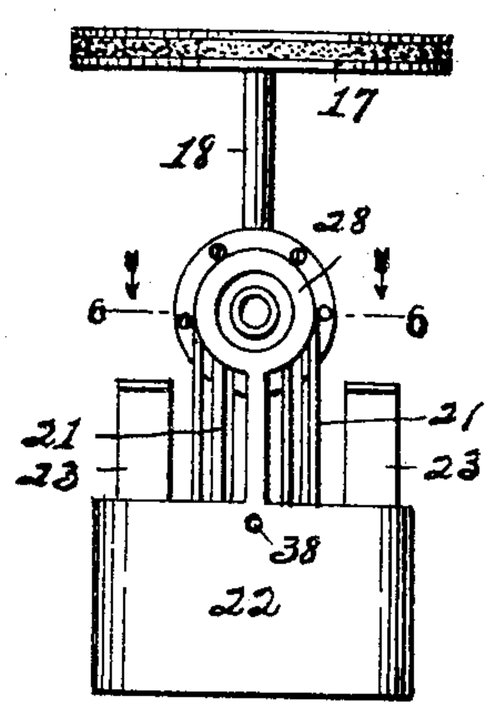


Fig. 5.

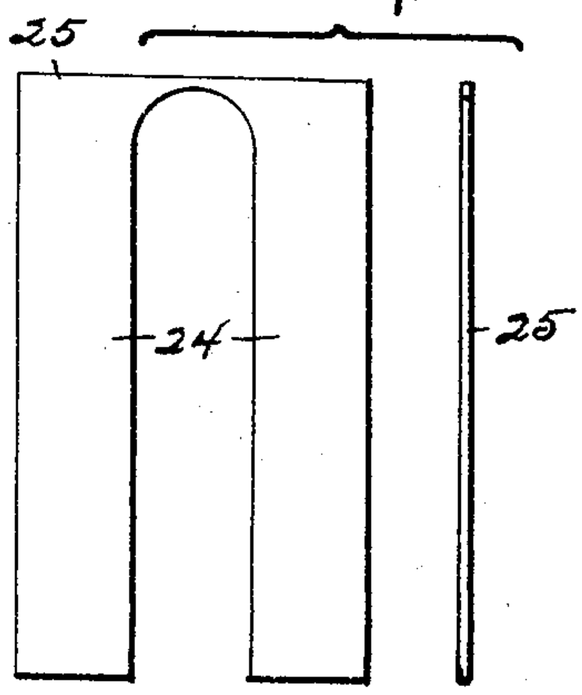
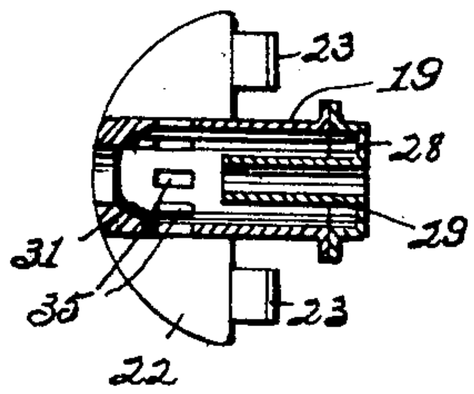


Fig. 6.



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No. 779,598. Patented January 10, 1905.

UNITED STATES PATENT OFFICE.

CLAUDE BROOK HARRINGTON, OF McMECHEN, WEST VIRGINIA, ASSIGNOR OF ONE-HALF TO HARRY A. UHLER, O. L. SIMMS, AND WILLIAM J. DUFFY, OF McMECHEN, WEST VIRGINIA.

AUTOMATIC RETAINING AND RECHARGING VALVE FOR AIR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 779,598, dated January 10, 1905.

Application filed March 7, 1904. Serial No. 196,810.

To all whom it may concern:

Be it known that I, CLAUDE BROOK HARRINGTON, a citizen of the United States of America, and a resident of McMechen, county of Marshall, and State of West Virginia, have invented certain new and useful Improvements in Automatic Retaining and Recharging Valves for Air-Brakes, of which the following is a specification.

My invention relates to new and useful improvements in air-brakes, and more particularly to a novel construction of retaining and recharging valve for air-brakes; and it consists in the particular construction, arrangement, and combination of parts, which will hereinafter be fully described.

The object of my invention is to provide a retaining-valve which retains the brakes set throughout the entire train and which is provided with means whereby the reservoirs may be recharged without releasing the brakes.

A further object of the invention is to provide means controlled by the engineer whereby a train may at all times and under all conditions be held in absolute control.

In describing my invention in detail reference is herein had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a view of my invention, partly in vertical section, showing the parts composing my invention and the manner of connecting it with the ordinary train-line and triple valve, also showing the train-line open and unobstructed. Fig. 2 is a cross-section on the line 2 2, Fig. 1. Fig. 3 is a vertical section similar to that illustrated in Fig. 1, showing the train-line closed and the parts in recharging position. Fig. 4 is an elevation of the valves with piston attached. Fig. 5 shows an elevation and an edge view, respectively, of the yoke-shaped guide; and Fig. 6 is a cross-section on the line 6 6, Fig. 4.

Referring to said drawings, in which like reference-numerals designate like parts throughout the several views, 1 indicates the ordinary triple valve in connection with which my invention operates, the same being mounted on the train-line 2, leading to said triple valve.

3 indicates a casing inclosing a valve-chamber 4, said casing having oppositely-disposed tubular arms 5 and 6, through which communication is had with the train-line, said arms being coupled to said train-line in any suitable manner, but preferably by means of couplings or unions 7, as shown. A port-opening 8 is also provided in said casing 3, through which communication is had with the triple valve 1 in a manner to be hereinafter explained. A cap 9 is fitted over the lower end or bottom of said casing 3, as shown. Secured to the upper end of said casing 3 is a cylindrical shell or casing 10, inclosing a piston-chamber 11, and mounted on said casing 10 is a cap 12, inclosing therein a storage-chamber 13. Ports 14 serve as communicating passages between the valve-chamber 4 and the piston-chamber 11. Connected with said cap 12 is a pipe 15, which leads to a reservoir 16, which serves as an auxiliary storage-reservoir for the storage-chamber 13. As is apparent, the storage-chamber might be made of a size suitable for holding the necessary volume of air, and the said reservoir would in that case be rendered unnecessary. However, I prefer to employ said reservoir, as shown.

17 indicates a piston mounted on a piston-rod 18 for operation in said piston-chamber 11. Attached to the lower end of said piston-rod, which projects through into said valve-chamber, is a cylindrical check-valve casing 19, inclosing a check-valve 20, and suspended from said check-valve casing by ribs 21 is a slide-valve 22, to the inner face of which is secured two bent steel springs 23, which bear against and slide upon the separated longitudinal arms 24 of a yoke-shaped guide 25, which is clearly shown in Fig. 5, said guide being suitably supported in a stationary position in said valve-chamber 4 and adapted for allowing the valve-casing 19 to slide between its said arms 24.

Port-openings 27 are provided in the top of the casing 10 for allowing communication between the piston-chamber 11 and the storage-chamber 13. Rubber gaskets are provided over the upper face of the casing 3 to form a seat for the piston.

A cap 28 is secured over the front end of the valve-casing 19, the same being provided with an inwardly-projecting sleeve 29, in which is movably supported the stem 30 of said check-valve 20. 31 indicates a seat for said check-valve, in which said valve is normally held by a light tension-spring 32, which is fitted about the stem 30 and sleeve 29, as shown in Fig. 1.

A pipe 33 leads from the port 8 in the valve-casing 3 to the triple valve 1, the same being divided, as shown, so as to connect with the triple valve on opposite sides of the triple piston thereof. A check-valve 34 is provided in said pipe 33, the purpose of which is to allow of the passage of air therethrough in a rearward direction only.

In the cylindrical valve-casing 19 just in front of the seat 31 are a plurality of ports 35 for the passage of air from the triple-valve side when said check-valve 20 is in line with the line-passage through the arm 5.

Now the operation of my invention is substantially as follows: The present invention being located on the train-line in front of the triple valve, the air is permitted to pass unobstructed through the valve-chamber 4 to the triple valve in the usual manner, and the parts composing the invention all assume the positions shown in Fig. 1. The air passing through the valve-chamber 4 at train-line pressure passes through the ports 26 to the under side of the piston 17 and forces said piston to the top of the chamber 11, then by means of a feed-groove 36 in the bushing 37 of the piston-chamber 11 passes around the piston 17 through ports 14 to the storage-chamber 13, thence through pipe 15 to the reservoir 16. Said reservoir, as hereinbefore mentioned, serves as an auxiliary to the storage-chamber 13 and is charged in the manner just mentioned to the full train-line pressure. To apply the brakes, the air is reduced in the train-line, leaving a greater pressure upon the top of the piston 17 than is in the valve-chamber below, which forces said piston down upon the rubber seat or gasket 26, closing communication between said train-line and the storage-chamber 13. This action at the same time moves the valves attached to or suspended from said piston downward, bringing the check-valve 20 into a position closing the train-line against the passage of air to the triple valve and also bringing the port 38 in the slide-valve in communication with the port 8, as shown in Fig. 3. Any further reduction of air is made by air flowing from the triple valve, past the check-valve 20, through the ports 35 in the check-valve casing.

In order to recharge the ordinary auxiliary reservoirs, the engineer's brake-valve is moved to running position, allowing a gradual flow of air governed by feed-valve attachment into the train-line. This gradual increase of air passes through the port 38, which registers with the port 8 in the casing 3, thence into the pipe 33, through the check-valve 34, and to the triple valve on opposite sides of the triple piston at equal pressures, allowing the ordinary auxiliary reservoir to be recharged to the pressure maintained in reservoir 16 without moving the triple valve to release position.

To release the brakes, the brake-valve is moved to full-release position, allowing the free passage of the excess pressure stored in the main reservoirs on the engine, thus increasing the train-line pressure to a greater pressure than that maintained in the storage-reservoir 16 and moving the valves in the valve-chamber 4 back to release position, as shown in Fig. 1, whereupon the train-line to the triple valve is left unobstructed.

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

1. In an automatic retaining and recharging valve for air-brakes, the combination with a train-line and a triple valve, of a valve-chamber, a piston-chamber communicating with said valve-chamber, two connected movable valves in said valve-chamber, one of said valves a check-valve for preventing the passage of air in a rearward direction only, the other a slide-valve provided with a recharging-port therethrough, a port in said valve-chamber which is adapted to register with the said recharging-port to allow air to pass to the triple valve after an application of the brakes, a piston-chamber, a piston in said piston-chamber, the piston-rod attached to said movable valves, a storage-chamber above said piston-chamber, communicating ports between said storage-chamber and the piston-chamber, a feed-groove in said piston-chamber, a reservoir auxiliary to said storage-chamber, a pipe leading from the port in the valve-chamber to the triple valve on opposite sides of the triple piston for the passage of air to the auxiliary reservoir for said triple valve, and a check-valve in said pipe, substantially as described.

2. In an automatic retaining and recharging valve for air-brakes, the combination with a train-line and triple valve, of a valve-chamber on said train-line between the main reservoirs and the triple valve, a piston-chamber in communication with said valve-chamber, a storage-chamber in communication with said piston-chamber, a reservoir auxiliary to said storage-chamber, a feed-groove in said piston-chamber, a piston in said piston-chamber, a check-valve mounted in said valve-chamber to act with said piston, a slide-valve also mounted to act with said piston, a recharging-port communicating with said valve-chamber, a recharging-port in said slide-valve, said recharging-ports adapted for automatically registering when the train-line is closed by said check-valve, and a pipe leading from the re-

charging-port in the valve-chamber to said triple valve on opposite sides of the triple piston thereof, substantially as and for the purposes set forth and described.

3. In an automatic retaining and recharging valve for air-brakes, the combination with a train-line and with a triple valve, of a valve-chamber mounted on said train-line in front of said triple valve, a normally unobstructed passage for the train-line pressure of air through said valve-chamber, a piston-chamber above said valve-chamber, communicating ports between said chambers, a storage-chamber above said piston-chamber, a piston movable in said piston-chamber, a feed-groove in said piston-chamber for the passage of air by said piston when it occupies a raised position; a check-valve casing movably supported in said valve-chamber by the piston-rod, a spring-controlled check-valve in said casing, ports in said casing, a recharging-port in said valve-chamber, a slide-valve for normally holding said recharging-port closed, ribs connecting the check-valve casing with said slide-valve, a recharging-port through said slide-valve, said port adapted to be automatically brought into communication with the first-mentioned recharging-port for recharging the reservoir connected with said triple valve, a divided pipe connecting said first-mentioned port with said triple valve on opposite sides of the triple piston thereof, and a check-valve in said pipe, all substantially as and for the purposes set forth and described.

4. In a recharger for air-brakes, the combination with a train-line and triple valve, of a valve-chamber having ports interposed in the train-line, means for storing air under pressure of the air in the train-line, means actuated by the stored air for controlling the ports of the valve-chamber when pressure in the train-line is reduced, means for establishing communication between the valve-chamber and the connections of the triple valve on opposite sides of the piston of said triple valve.

5. In a recharger for air-brakes, the combination with a train-line and a triple valve, of a valve-chamber having ports, means for connecting the valve-chamber to the train-line, means for storing air under the pressure of the air in the train-line when charging, means actuated by the stored air when the pressure in the train-line is reduced, and valves carried by the air-actuated means for controlling the ports of the valve-chamber, and connections for establishing communication with the valve-chamber and the triple valve on opposite sides of the piston of the triple valve.

6. In a recharger for air-brakes, the combination with a train-line and a triple valve, of a valve-chamber in communication with the said train-line; a piston-chamber above the valve-chamber of greater diameter than the valve-chamber, means for storing air above the piston; a seat at the junction of the valve and piston chambers, to arrest the piston, the exposed area of the piston being greater on its upper surface than on its lower surface when the said piston is seated; valves carried by the piston for controlling the passages of the valve-chamber; and conductors for the triple valve on opposite sides of the piston of the triple valve.

7. In combination with the train-line of an air-brake system; a valve-chamber in communication with the train-line; a piston-chamber above the valve-chamber and an interposed shoulder; a piston working in the piston-chamber and adapted to contact with the shoulder, whereby the area of the piston exposed is greater on its upper surface than on the lower surface; and means whereby the area of the piston exposed on the lower surface may be increased by lifting the said piston from the seat; valves carried by the piston; and suitable connections between the valve-chamber and a triple valve on opposite sides of the piston to said triple valve.

8. In combination with a train-line and a triple valve of an air-brake system; a combined valve-chamber and piston-chamber in communication with the train-line; means for storing compressed air at the end of the piston-chamber remote from the valve-chamber; a shoulder interposed between the piston-chamber and valve-chamber; means whereby the stored air causes the piston to travel into contact with the shoulder, the inner surface of the said piston having an interposed area reduced with respect to the exposed area of the outer surface; valves carried by the piston for controlling the passages from the valve-chamber; an air-conductor pipe leading from the valve-chamber and communicating with the air-supply of the triple valve on the opposite sides of the piston of the triple valve.

9. In combination with a train-line and triple valve of an air-brake system; a combined valve-chamber and piston-chamber in communication with the train-line; means for storing compressed air at the end of the piston-chamber remote from the valve-chamber; and a shoulder interposed between the piston-chamber and valve-chamber; means whereby the stored air causes the piston to travel into contact with the shoulder, the inner surface of the said piston having an exposed area reduced with respect to the exposed area of the outer surface; valves carried by the piston for controlling the passages from the valve-chamber; an air-conductor pipe leading from the valve-chamber and communicating with the air-supply of the triple valve on opposite sides of the piston of the triple valve; and a check-valve in said pipe.

Signed by me in the presence of two subscribing witnesses.

CLAUDE BROOK HARRINGTON.

Witnesses:

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H. E. DUNLAP.