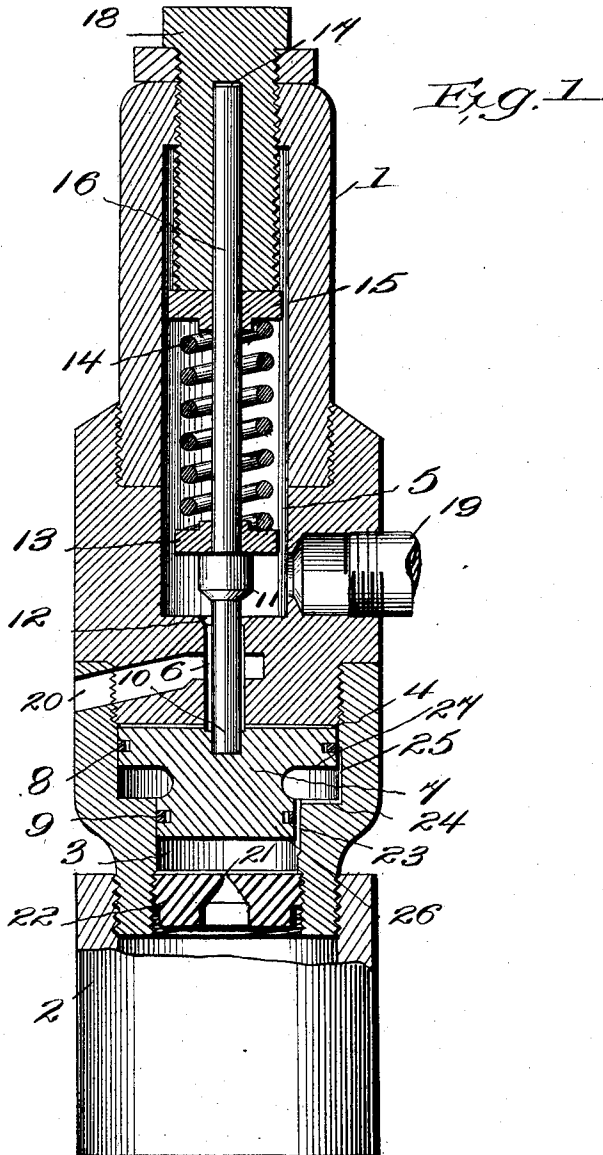


F. E. MARTIN.
RETAINING VALVE.
APPLICATION FILED NOV. 28, 1911.

1,043,122.

Patented Nov. 5, 1912.

2 SHEETS—SHEET 1.



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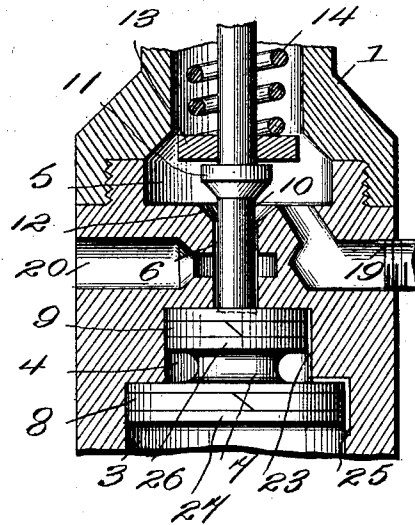
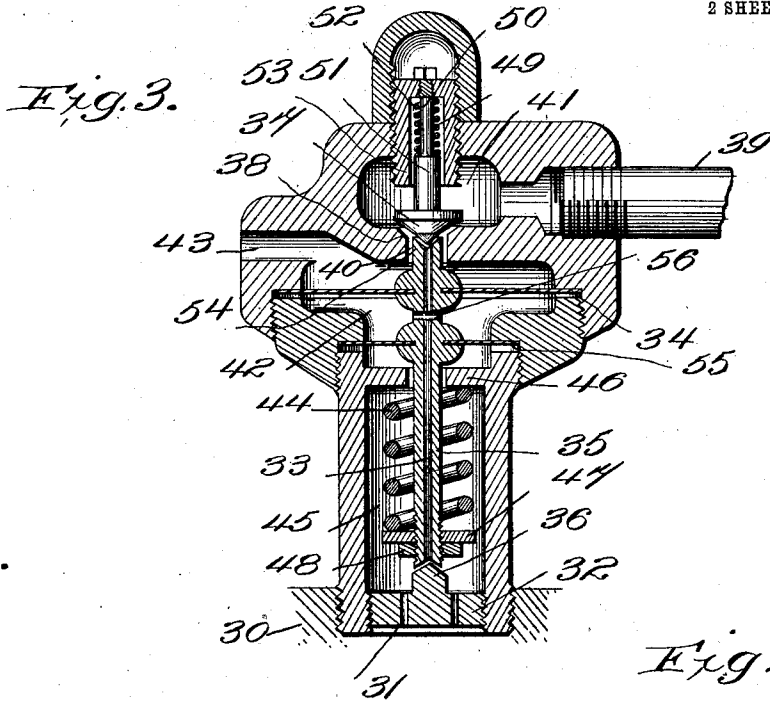
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UNITED STATES PATENT OFFICE.

FREDERICK E. MARTIN, OF BONAMI, LOUISIANA.

RETAINING-VALVE.

1,043,122.

Specification of Letters Patent.

Patented Nov. 5, 1912.

Application filed November 28, 1911. Serial No. 662,885.

To all whom it may concern:

Be it known that I, FREDERICK E. MARTIN, a citizen of the United States, residing at Bonami, in the parish of Calcasieu and State of Louisiana, have invented certain new and useful Improvements in Retaining-Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in retaining valves to be used in connection with the existing air-brake systems, and has for its object to provide devices of that nature which will be simple in operation, comparatively inexpensive, and which will not readily get out of order.

With these and other objects in view the invention consists in the novel details of construction and combinations of parts more fully hereinafter disclosed and particularly pointed out in the claims.

Referring to the accompanying drawings forming a part of this specification in which like numerals refer to like parts in all the views:—Figure 1 is a vertical section of my invention; Fig. 2, a section view of some of the parts shown in Fig. 1, but having the double piston inverted; Fig. 3, a vertical section view of a slightly modified form.

My invention as shown in Fig. 1 comprises a casing 1, the lower part of which connects at 2 with the train pipe or with the usual auxiliary reservoir. The casing is adapted to provide the chambers 3, 4 and 5, of which the chambers 4 and 5 have a communicating passage 6.

Located within the chambers 3 and 4 is a double piston 7 having the packing rings 8 and 9. A rod 10 is provided within the communicating passage 6 which has mounted on it a valve 11 adapted to seat in the recess 12. Seated against the member 11 is a collar 13 against which rests a spiral spring 14, the other end of which bears against a similar collar 15. The end 16 of the rod 10 rides in a groove 17 in the adjusting screw 18 which regulates the tension of the spring 14. Connected to the casing 1 is an exhaust pipe 19 of a triple valve, not shown in the drawing. 20 is the ordinary exhaust. It is therefore evident that when the train pipe air is sufficient to overcome the spring 14 air passes through the aperture 21 in the plug 22 screwed in

the end of the casing 1, and acts upon the lower face 26 of the differential piston 7 to start said piston upward. After the differential piston has thus moved upwardly a sufficient distance to uncover the lower ends of the groove 23, the air will pass through the grooves 23, 24 and 25, and act upon both faces 26 and 27 of said piston, thereby causing a sudden shifting of said piston to its upper position, as shown in Fig. 1. Consequently the rod 10 will be moved upwardly by the piston to cause an advantageously quick opening of the valve 11; the collar 13 being pressed upwardly against the tension of the spiral spring 14. This operation allows of the exhaust from the pipe 19 to enter the casing passing around the rod 10 through the outlet 20 to the atmosphere.

When the train pipe pressure is reduced for any reason, such as when the brakes are applied, the spring 14 overcomes the resistance of the train pipe pressure against the faces 26 and 27, and forces collar 13 downwardly seating the member 11 against its seat 12, also forcing the rod 10 and consequently the piston 7 against the screw-plug 22. During the initial movement of the piston 7, the enlarged portion 27 thereof will uncover the upper end of the groove 25, whereupon the air will be free to escape from beneath both faces 26 and 27 of said piston through the grooves 23, 24 and 25 and the passages 6 and 20 to the atmosphere. This causes the triple-valve exhaust to be cut off, and retains the brake cylinder pressure until the train pipe pressure should again become sufficient to overcome the spring 14, resulting in the previous operation and opening the triple exhaust.

The two operating pressures of this retaining valve are regulated by the difference in size of the ends of the piston. This piston in Fig. 2 is shown in elevation and also of the inverted type having the grooves 23 and 25 located within the casing 1. The manner of the operation of the parts in Fig. 2 is the same as the operation in Fig. 1.

In Fig. 3 the pressure from the train pipe passes through the perforations 31 in the screw-plug 32, and channel 33, to the diaphragm 34, such diaphragm giving a tight fit which is nearly impossible in the piston case, thereby holding the rod 35 from its seat 36. This serves to raise the valve 37 from its seat 38 and allow of the exhaust

from the triple valve pipe 39 to pass through the passage 40 connecting the chambers 41 and 42 through the passage 43 to air. When pressure from the train pipe gets below a pre-arranged amount the spiral spring 44 in the chamber 45, operating between the extension 46 and collar 47, held on the rod 35 by a nut 48, withdraws the stem 35, and permits the valve 37 to be seated by a spring 49 mounted upon the rod 50 on the stem 51 of the valve 37 and located in the recess 52 in a screw plug 53; thereby shutting off the flow of exhaust from the triple valve pipe 39. Should the pressure become still lower the spiral spring 44 forces diaphragm 34 farther down, thus seating the lower part of rod 35 upon its seat 36 and draws the upper end 54 of rod 35 away from the valve 37, causing the air pressure in chamber 42 to exhaust to atmosphere. With the pressure out of chamber 42 the train pipe pressure is effective only against the smaller diaphragm 55, and consequently it will take a much higher pressure to open the valve than that at which it closed. 56 is a perforation which connects the chamber 42 with the channel 33 of the rod 35.

It is therefore evident from all forms shown that with this valve attached to the ordinary air-brake equipment the engineer can, by working his train pipe pressure below a pre-arranged amount, close the triple exhausts on each car and the brakes will stay set until the train pipe and auxiliaries have been recharged to a pre-arranged pressure, when the retaining valve will open and allow brakes to release, and with the train pipe and auxiliaries charged the brakes are ready to set again. The engineer can when the train pipe is only partially recharged set brakes by causing a reduction in train pipe pressure, just the same with this retaining valve in action as not in action.

It is obvious that those skilled in the art may vary the details of construction and the arrangement of parts without departing from the spirit of my invention.

What I claim is:—

1. In an air-brake mechanism, a casing providing chambers, one of said chambers connecting with the train pipe; a double piston operable in two of said chambers and exposed to train pipe pressure; a valve in another of said chambers; connections between the double piston and valve; a triple valve pipe communicating with said valve chamber; and exhaust passages communicating with said piston and valve chambers, substantially as described.

2. In an air-brake mechanism, a casing providing chambers, one of said chambers

connecting with the train pipe; a double piston operable in two of said chambers and exposed to train pipe pressure; a valve in another of said chambers; a spring for normally holding said valve seated; connections between the double piston and valve; a triple valve pipe communicating with said valve chamber; and exhaust passages communicating with said piston and valve chambers, substantially as described.

3. In an air-brake mechanism, a casing providing chambers, one of said chambers connecting with the train pipe; a double piston of different diameters operable in adjacent chambers and exposed to train pipe pressure; a valve in the other of said chambers; a spring for normally holding said valve seated; connections between the double piston and valve; a triple valve pipe communicating with said valve chamber; and exhaust passages communicating with said piston and valve chambers, substantially as described.

4. In an air-brake mechanism, a casing providing chambers, one of said chambers connecting with the train pipe; a double piston of different diameters operable in adjacent chambers and exposed to train pipe pressure; said casing having its walls constructed to provide a passageway between said double piston chambers; a valve in the other of said chambers; a spring for normally holding said valve seated; connections between the double piston and valve; a triple valve pipe communicating with said valve chamber; and exhaust passages communicating with said piston and valve chambers, substantially as described.

5. In an air-brake mechanism, a casing providing chambers, one of said chambers connecting with the train pipe; a double piston of different diameters operable in adjacent chambers and exposed to train pipe pressure; said casing having its walls constructed to provide a passageway between said double piston chambers; a valve in the other of said chambers; a spring for normally holding said valve seated; an adjusting screw for regulating the tension of said spring; connections between the double piston and valve; a triple valve pipe communicating with said valve chamber; and exhaust passages communicating with said piston and valve chambers, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

FREDERICK E. MARTIN.

Witnesses:

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W. C. STEWART.