

UNITED STATES PATENT OFFICE.

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PRESSURE-RETAINING VALVE.

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This invention relates to retaining valves for air brakes, and the object is to produce a valve which, when effective, functions to maintain a definite minimum pressure, and which may be set so as to reduce brake cylinder pressure at different rates, to this minimum pressure.

For example, on a loaded car or on cars at the head of the train, the retainer would be set so that in release following an application, the brake cylinder pressure would be reduced slowly to the retained minimum pressure. On empty cars or on cars at the rear of the train a different setting would be used so that in release, brake cylinder pressure would fall rapidly to the same retained minimum.

The preferred embodiment of the invention is illustrated in the accompanying drawing, in which—

Fig. 1 is a sectional view showing in full lines the setting for free exhaust in which there is no retaining action, and in dotted lines the setting for slow blow-down to the retained pressure.

Fig. 2 is a similar view showing the setting for rapid blow-down to the retained pressure.

The body of the retainer consists of a casting 6 whose form is clearly shown in the drawing. The blow-down or relief valve 9 is mounted in a chamber 7 formed partly in casting 6 and partly in a cap 8 threaded thereinto. The blow-down valve 9 coacts with a seat member 10, fixed in casting 6. The valve 9 is guided by a pilot 11 and is urged closed by a spring 12 retained on a stem 13 fixed in cap 8. Air discharging past valve 9 passes to atmosphere through choke port 14 formed in a plug 15.

The choke port exerts back pressure on the discharging air so long as the discharge rate between valve 9 and seat 10 exceeds the effective discharge rate through port 14.

The casting 6 is formed with a passage 16 leading from a connection 17 with the triple valve exhaust port (not shown) and a passage 18 leading to an atmosphere exhaust. Between the passages 16 and 18 is a tapered seat for a cock plug 20. This has a handle 21 and a through-port 22, which in one position of the cock 20 connects the ports 16 and

18 and thus directs the triple valve exhaust port to atmosphere.

The cock plug 20 has two other operative positions. In one of these (see Fig. 2) port 22 connects passage 16 with a passage 23 which leads directly to the passage through valve seat 10. In the other position of plug 20 (see dotted line position, Fig. 1) port 22 connects passage 16 with passage 24. This leads by way of choke port 25 in plug 26 to a chamber 27, which in turn is connected by passage 28 with passage 23. Access to chamber 27 for the cleaning of choke plugs 26 is had by means of a removable threaded closing plug 29.

In the full line position of Fig. 1, there is no retaining action.

In the dotted-line position of Fig. 1, the valve 9 performs a retaining function while choke port 25 delays the blow-down. The strength of spring 12 determines the pressure retained. This is the position for loaded cars, and for cars at the head of the train.

In the position of Fig. 2, choke port 25 is by-passed and pressure is quickly blown down in release to the pressure determined by spring 12. This is the position for unloaded cars and cars at the rear of the train.

It will be observed that the pressure retained is the same in both settings, but that in one setting the exhaust is delayed so that this pressure is reached only after a longer time interval.

What is claimed is:

1. In a brake retainer the combination of a loaded valve and means for varying the flow rate through said valve.

2. In a brake retainer the combination of a loaded valve; a choke; and valve means for directing the brake cylinder exhaust alternatively directly to atmosphere, directly to said loaded valve, or to said loaded valve through said choke.

3. In a brake retainer, the combination of a loaded valve; a cock adjustable to direct discharging air to atmosphere or to said loaded valve selectively; a choke; and means controlled by said cock for interposing said choke at will in the path of air through said loaded valve.

4. In a brake retainer, the combination of

a loaded valve, arranged to be urged in an opening direction by the pressure of brake cylinder exhaust; a constriction located in the flow path beyond said valve and
5 arranged to limit the flow to a rate less than the maximum capacity of the valve; a second and smaller constriction located in the flow path in advance of said valve; and
means operable to direct the flow to the valve alternatively through the last named
10 constriction to the valve, or directly to the valve.

In testimony whereof we have signed our names to this specification.

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