

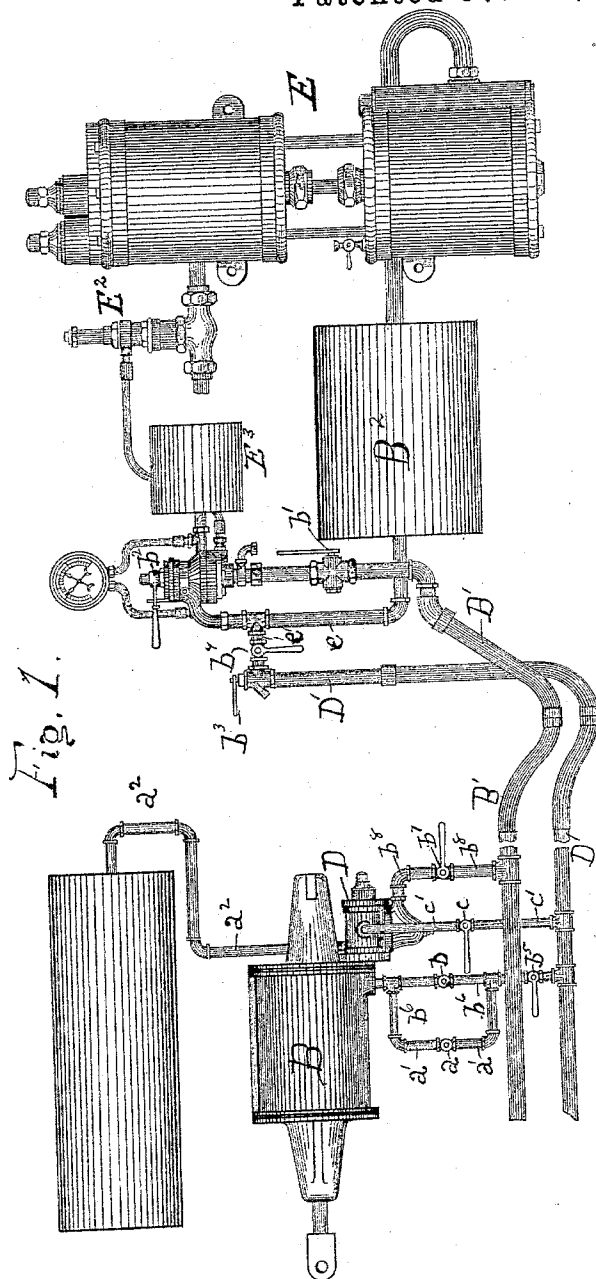
(No Model.)

2 Sheets—Sheet 1.

H. S. GRAEBING.
AIR BRAKE FOR RAILWAY CARS.

No. 569,823

Patented Oct. 20, 1896.



WITNESSES:

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Wm. M. C. Stevenson

INVENTOR

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ATTORNEY.

(No Model.)

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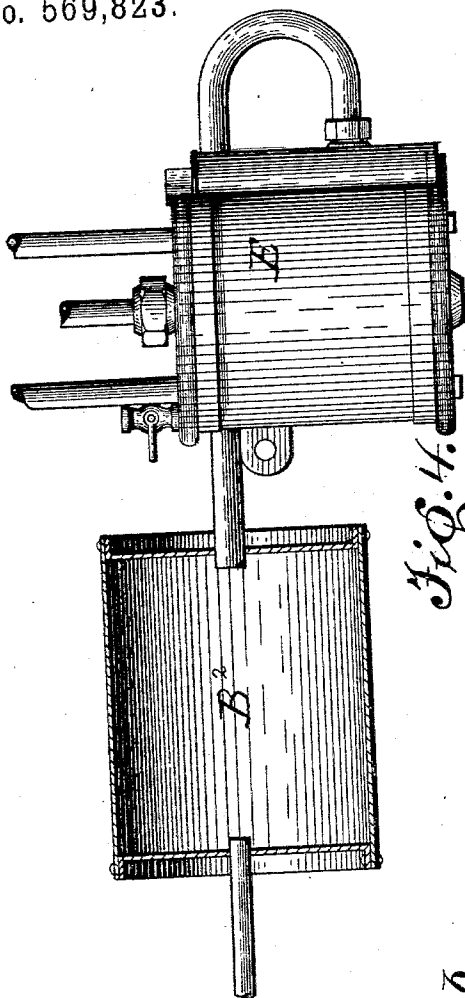


Fig. 4.

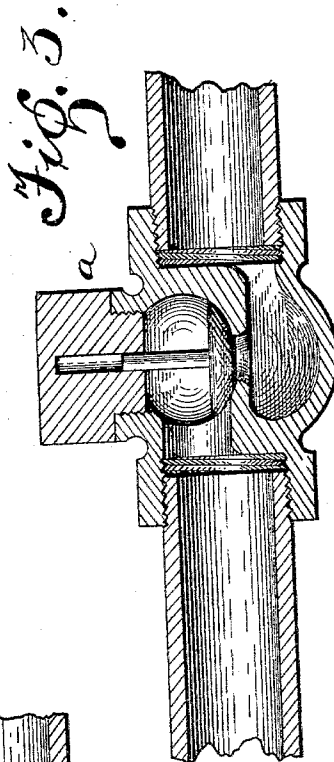


Fig. 3.

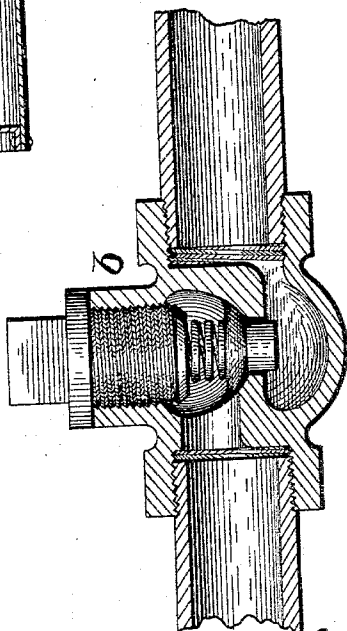


Fig. 2.

Witnesses:
A. R. Appleman
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Inventor:
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By J. H. Stevenson Atty

UNITED STATES PATENT OFFICE.

HENRY S. GRAEBING, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO JAMES OLLIFFE, SR., AND JAMES OLLIFFE, JR., OF SAME PLACE.

AIR-BRAKE FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 569,823, dated October 20, 1896.

Application filed February 28, 1895. Serial No. 540,114. (No model.)

To all whom it may concern:

Be it known that I, HENRY S. GRAEBING, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Air-Brakes for Railway-Cars; 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to a direct air-brake system adapted to be used as an auxiliary to and in combination with an automatic system, whereby the brakes can be applied by either the automatic or quick system or by the direct, or by both, as may be required.

The object of my invention will be fully set forth in the following specification.

In the accompanying drawings, Figure 1 is a diagrammatic view of the system as it will appear when in position on the locomotive and car. Figs. 2 and 3 are sectional views, on enlarged scale, of valves used in the direct system. Fig. 4 is a view, partly in section, of the main air-reservoir and the pump.

Similar letters of reference indicate similar parts in the several figures.

So far as the automatic system is concerned it is only necessary to refer to the several parts in a general way.

A is the auxiliary reservoir, B the brake-cylinder, D the triple valve, B' the train-pipe, b^3 the connecting-pipe between the train-pipe and triple valve, B² the main reservoir, E the pumps, b^2 the engineer's brake-valve, E² the pump-governor, and E³ the engineer's brake-valve reservoir, all connected together and acting in the usual manner.

D' is the direct-air train-pipe, and it is connected to the pipe e by a short pipe e' , provided with a shut-off valve b^4 . The pipe e connects the main air-reservoir with the engineer's brake-valve b^2 . From the pipe D' a pipe b^6 leads to the brake-cylinder and is provided with a spring-pressure valve b , set to withstand not less than fifteen (15) pounds pressure, and it may be considerably more, if desired. A pipe a' leads from and into the

pipe b^6 around the pressure-valve b and is provided with an ordinary check-valve a . From the exhaust-opening of the triple valve D a pipe c' leads to the pipe D' and is provided with a stop-cock c^2 .

b^3 is a two-way cock in the pipe D' and is manipulated by the engineer to exhaust air from the pipe D'.

b^5 and b' are stop-cocks in the pipes leading from the train-pipes and, with the stop-cock c^2 , are intended to cut the car out should anything go wrong with the brakes; or the direct system can be cut out and the automatic used alone.

In operation when the automatic system is used the cock b^4 is closed and the valve b^3 operated to exhaust air from the pipe D'. In the event it should be desirable to retain a limited pressure on the brakes, as when descending a grade, the engineer is enabled to regulate this pressure by means of the valve b^3 , and the use of retaining-valves on each car, which have to be operated by the brakemen in automatic systems, is thereby avoided and the engineer has the sole control of his train.

When it is desired to use the direct system, the cock b^3 is turned to close the exhaust from pipe D', and the cock b^4 is opened. Air will then pass from the main reservoir B² through pipes e , e' , D', b^6 , and a' , past the check-valve a to the brake-cylinder B, when it will set the brakes, and the pressure can be kept up indefinitely by use of the pump. By simply closing the cock b^4 this pressure can be practically retained on the brakes, and if the auxiliary reservoirs have been exhausted they can be recharged without releasing the brakes. In order to partially release the brakes, the cock b^3 is turned to exhaust from pipe D', (the cock b^4 being closed,) when the air in the brake-cylinder will pass out through pipe b^6 , past the pressure-valve b into pipe D', until the pressure in the brake-cylinder is reduced to permit the valve b to be seated by its spring. The air will also exhaust through the triple valve in the ordinary manner.

The special advantages of the pressure-valve are as follows: In the event the train should break the brakes will be set by the automatic system, but the air will at once

begin to escape past the pressure-valve *b* and through the direct air-pipe *D'*, but a pressure of fifteen pounds or more will be retained in the brake-cylinders, (this depending on the pressure requisite to lift the valve *b* from its seat,) and this is usually sufficient to stop a train. Another advantage is that it assists the triple valve to exhaust in the event the brake-cylinder should be overcharged to such an extent as to prevent the movement of the triple valve to open the exhaust. In the automatic system this occasionally happens and it is necessary to bleed the auxiliary reservoir to reduce the pressure in the brake-cylinders sufficiently to enable the pressure in train-pipe to move the triple valve.

In the event it is required to make an emergency stop either the automatic or the direct system may first be used to apply the brakes, and then the other system may be immediately used. The effect will be that the pressure in the main reservoir and that in the auxiliary reservoir will be utilized to apply the brakes and the train will be quickly stopped.

Having thus described my invention, I claim—

1. A fluid-pressure brake system, comprising an ordinary automatic system and a direct-air system, the latter consisting of a direct-air train-pipe communicating with the main air-reservoir, a cock controlling admis-

sion of air to said train-pipe, a branch pipe leading from the train-pipe to the brake-cylinder, a pressure-valve *b* in the branch pipe, a pipe leading from and into the branch pipe around the pressure-valve and provided with a check-valve opening to admit air to the brake-cylinder, and an engineer's valve *b*³ to exhaust from the direct-air train-pipe, substantially as described.

2. A fluid-pressure brake system, comprising an ordinary automatic system, and a direct-air system, the latter consisting of a direct-air train-pipe communicating with the main reservoir, a cock controlling admission of air to said direct-air train-pipe, a branch pipe leading from said train-pipe to the brake-cylinder, a pressure-valve *b* in the branch pipe, a pipe leading from and into the branch pipe around the pressure-valve and provided with a check-valve, a pipe leading from the exhaust-opening of the triple valve to the direct-air train-pipe, and an engineer's valve *b*³ to exhaust from the direct-air train-pipe, substantially as described.

In testimony that I claim the foregoing I hereunto affix my signature, in the presence of two witnesses, this 10th day of December, A. D. 1894.

HENRY S. GRAEBING. [L. S.]

In presence of—

FRANK L. KOHEN,
S. D. KARNs.