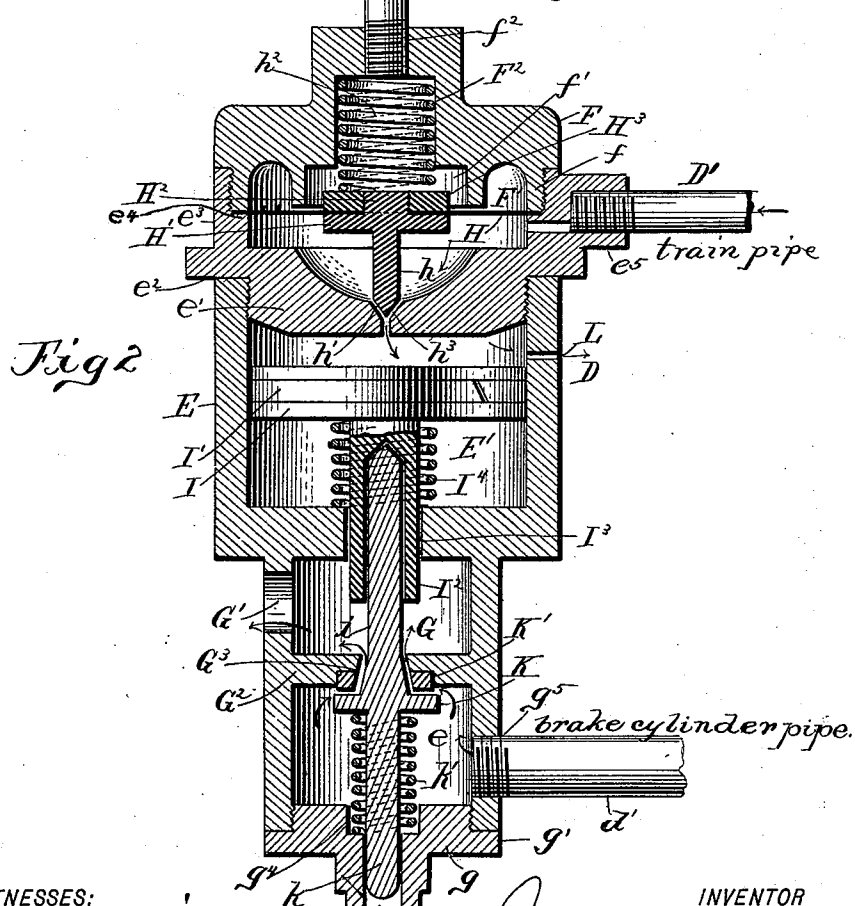
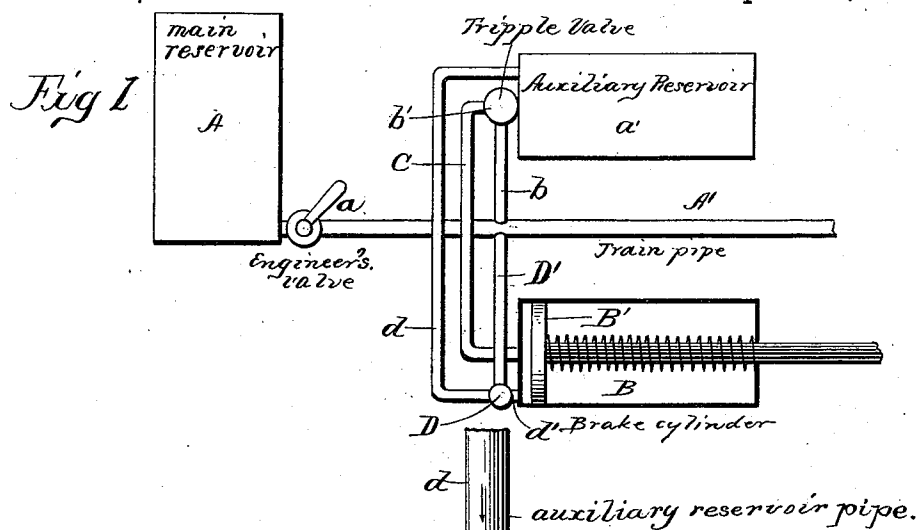


(No Model.)

J. G. SARVENT.
RELEASING VALVE FOR AIR BRAKES.

No. 518,199.

Patented Apr. 10, 1894.



WITNESSES:

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JOSEPH G. SARVENT, OF SOUTH ENGLEWOOD, ILLINOIS.

RELEASING-VALVE FOR AIR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 518,199, dated April 10, 1894.

Application filed May 5, 1893. Serial No. 473,129. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH G. SARVENT, a citizen of the United States, residing at South Englewood, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Releasing-Valves for Air-Brakes; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to that general class of valves for air brakes which are used for "bleeding" the brake cylinder; and my object is to provide a valve which will operate more quickly and positively, thereby preventing the delay in starting a train, and producing many advantageous results which will be thoroughly appreciated in the art.

To this end my invention consists of certain novel features of construction and combination and arrangement of parts fully described hereinafter and finally embodied in the claims.

Referring to the accompanying drawings which represent a valve in which the essential features of my invention are embodied: Figure 1 represents a diagrammatical view of a braking system in which my releasing valve is embodied; Fig. 2 an enlarged longitudinal section of the releasing valve.

The reference letter A indicates the main reservoir which is of the usual type and arranged on the engine in connection with suitable mechanism for maintaining the requisite air pressure therein.

A' is the train pipe controlled by the engineer's valve *a*, and extending throughout the train.

a' is the auxiliary reservoir which is in connection with the train pipe and arranged one on each car.

B is the brake cylinder, and B' its piston. Communicating with the train pipe A' and extending to the end of the auxiliary reservoir *a'*, is a pipe *b* which is connected to the triple valve *b'*, said valve being in turn connected to the auxiliary reservoir. The aux-

iliary reservoir and brake cylinder are connected to each other by way of the pipe C which is connected to the valve *b'* and to the brake cylinder. By means of the triple valve *b'* and the pipes *b* and C, the auxiliary reservoir is charged with air, and by properly varying the relative pressure of air in such reservoir and in the train pipe, the brake cylinder is charged and the brakes applied.

All of the above is old and well-known in the art and may be of any preferred style or form; for example the Westinghouse apparatus now in common use.

My improvement and its relation to the above described parts will now be disclosed.

The reference letter D indicates the releasing valve which is connected by way of a pipe D' to the train pipe, and by way of a pipe *d* to the auxiliary reservoir, a short pipe *d'* being provided by which communication with the brake cylinder is effected. The valve is formed of a main body or shell E cast in one piece and having the two chambers E' and *e* formed therein. The upper end of the chamber E' is internally threaded to receive the cap *e'* which is firmly screwed thereto. This cap is provided with a shoulder *e²* which bears against the upper edge of chamber E' and insures an air-tight joint, and has a flange *e³* formed on its upper side so as to be axially coincident with the side of the chamber E'. Formed in the upper edge of the flange *e³* is an enlarged screw threaded recess or cavity *e⁴* into which the end piece F having a correspondingly reduced lower end *f*, is screwed. The end piece F has formed in its interior an annular circumferential chamber F' and a second annular chamber F² extending nearly to its highest edge and having its mouth *f'* enlarged as shown in the drawings. Formed in the center of the end piece F and axially coincident to the chamber F², is a tapering screw threaded opening *f²* into which is screwed the pipe *d*, leading from the auxiliary reservoir; while the train pipe connection D' enters the valve by way of a second threaded opening formed in the extension *e⁵* in the cap *e'*. The chamber *e* is arranged directly below the chamber E' and is formed integral therewith. The chamber *e* is formed with a counter chamber G above it, which counter chamber communi-

cates with the outer air by way of a vent opening G' . The chambers G and e are divided by means of the wall or partition G^2 having an opening G^3 , a valve being provided by which said opening is controlled. This however will appear hereinafter. Screwed immovably into the lower end of the chamber e , is the cap g , which has an annular flange g' arranged to bind against the lower edge of the chamber and effect an air-tight joint. Formed in the center of the cap g and projecting downwardly therefrom, is a projection g^2 having a passage g^3 formed therein, said passage having its upper extremity enlarged into the cavity g^4 . The short pipe d' leading to the brake cylinder, communicates with the chamber e by way of the screw threaded opening g^5 . Formed in the side of the chamber E' just below the cap e' , is a vent orifice L designed for the escape of air, as will more fully appear hereinafter.

The reference letter H indicates an annular flexible or movable diaphragm formed of any convenient and suitable material, preferably sheet metal, and secured in the space occurring between the end piece F and cap e' by clamping between the edges e^4 and f of the end-piece and cap. Arranged on the lower side of the diaphragm H and in its center, is a plate H' provided with a screw-threaded stud H^2 , which extends up through the diaphragm and is provided with an enlarged nut or plate H^3 by which the plate H' is firmly and rigidly secured in place. Formed integral with or securely fastened to the under side of the plate H' and projecting downwardly is a plug or valve h provided with a pointed end h' which is adapted to normally fit into the tapering recess h^3 formed in the center of the cap e' , a spring h^2 being provided and arranged in the cavity or chamber F^2 with its lower end bearing against the upper side of the diaphragm, by which the plug is normally seated in the recess h^3 . By referring to Fig. 2 it will be seen that the pipe from the auxiliary reservoir opens into the valve above the diaphragm and that it has no connection with the body of the valve owing to such diaphragm, and that the pipe from the train-pipe opens into the valve below the diaphragm and communicates with the body of the valve by way of the opening h' and then only when the opening is uncovered by the plug h . Located in the chamber E' and movable vertically therein, is a piston I provided with suitable packing I' and a hollow piston rod I^2 . The piston rod I^2 extends downwardly through an opening I^3 in the lower end of the chamber E' and into the chamber G , the said chamber and piston rod being so relatively arranged that the end of the rod will always occur in the chamber. A spring I^4 is arranged to embrace the piston rod and operates to keep the piston normally raised.

Fitting in the hollow portion of the rod I^2 is a stem k , which extends downwardly through

the enlarged opening G^3 in the wall G^2 and is formed integral with the valve K just below the said opening G^3 . The valve K is formed of a circular plate of metal of a size large enough to thoroughly cover the opening G^3 , and is arranged to bear against a ring K' of hard rubber fitting firmly in a rabbet-groove formed in the opening G^3 . By means of this valve the communication between the chamber e and counter chamber G , is regulated. Formed integral with the lower side of the plate-valve K , is a second stem k extending downwardly into the passage g^3 of the cap g ; a spring k' being provided and arranged around the stem k , whereby the valve K is kept normally closed. By referring to Fig. 2 it will be seen that the valve stem i owing to its connection with the piston rod I^2 , will move in unison with its downward movements, and that the upward movement of such stem will be insured by the spring k' , thus keeping the rod I^2 and stem i in continual engagement.

The preferred construction of my invention having been fully set forth, I will now proceed to describe its use and mode of operation.

The operation of the parts shown in Fig. 1 is the same as ordinarily, and does not require any detailed description; the mechanism being arranged so that by varying the pressure of air in the train pipe, the air will operate the valve b' fill the brake cylinder by way of pipe C , and apply the brakes. When the brakes are applied the pressure of air in the train pipe and auxiliary reservoir is the same, and as this pressure is communicated to either side of the diaphragm of valve D , the pressure on one side will counterbalance that on the other, and the plug-valve h remains seated, thereby cutting off all communication of the train-pipe with the chamber E' . Now to release the brakes the pressure of the air in the train-pipe is increased to a degree that will cause the pressure below the diaphragm to be sufficient to raise the diaphragm against the pressure above it and that of its spring. This will unseat the valve h and allow the air from the train-pipe to pass into the chamber E' and act on the piston I and cause it to move downwardly against its spring, carrying with it the valve-stem i , which movement is followed by the unseating of the valve K against the tendency of spring k' ; the stem k moving downwardly in the passage. This downward movement of the piston I and valve K is arrested by the stem k engaging at its lower end with the lower end of the passage g^3 . As hereinbefore explained, the chamber e is in direct communication with the brake cylinder by way of the pipe d' , therefore when the valve K has been opened the air will immediately escape through the aperture into the chamber G and out into the outer atmosphere by way of the vent in such chamber. After the brake cylinder has been emptied of its air, the pressure in the train-pipe is re-

duced so that it will allow that of the auxiliary reservoir, to close the valve *h* and the parts will resume their normal position by means of their springs, such of the compressed air as remains in the chamber *E'* being expelled by way of the vent opening *L*. When the brakes are to be applied the pressure in the train-pipe is reduced, thus operating the valve *b'* to open communication between the auxiliary reservoir and brake cylinder, which will of course be followed by even a tighter seating of the valve *h*, and consequently the valve *K* will not be affected.

The braking system shown by Fig. 1 is substantially the same as the present Westinghouse system, and it is in connection with this system that I have described my valve. It is obvious however that it could be applied to any or all systems wherein a valve of its nature is needed.

By referring to Fig. 2 it will be seen that the chamber *e* is divided from the chamber *E'* by means of the counter chamber *G*, which counter chamber is in direct and easy communication with the outer air. This is so arranged that there will be no possible communication between the two chambers, thereby preventing the air from the train pipe from passing *via* the valve into the brake cylinder, or the air from the brake cylinder from leaking through into the chamber *E'* and thereby affecting the operating of the valve.

Having thus described my invention, what I claim as new is—

1. A releasing valve for air brakes, comprising a casing, a flexible diaphragm therein and constructed so that no air can pass it, an opening in the casing from the auxiliary reservoir and above the diaphragm, a valve below and actuated by the diaphragm and kept normally closed by the pressure of air in the auxiliary reservoir, an opening in the casing

from the train pipe and between the diaphragm and its valve, a valve commanding an opening from the brake cylinder to the atmosphere, and means by which the last named or brake cylinder valve may be operated by the pressure of air in the casing, whereby upon creating in the train pipe a pressure superior to that in the auxiliary reservoir the diaphragm actuated valve will be opened and the air from the train pipe allowed to operate to open the brake cylinder valve and the air in the brake cylinder allowed to escape, thus releasing the brakes, substantially as described.

2. A releasing valve for air brakes, comprising a casing, a flexible or movable diaphragm therein and constructed so that no air can pass it, a valve commanding an opening from the brake cylinder, to the atmosphere an opening in the casing from the auxiliary reservoir and on one side of the diaphragm, an opening in the casing on the other side of the diaphragm and from the train pipe and means in connection with the brake cylinder valve, and actuated by the air from the train pipe whereby, owing to a normal superior pressure on the auxiliary reservoir side of the diaphragm, the brake cylinder valve is kept normally closed, and whereby upon creating in the train pipe a pressure superior to that of the auxiliary reservoir, the diaphragm will be operated to allow the air from the train pipe to open the brake cylinder valve and thereby allow the air in the brake cylinder to escape, thus releasing the brakes, substantially as described.

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

JOSEPH G. SARVENT.

Witnesses:

JOHN COOPER,
WILLIAM H. NAY.