No. 749,612. PATENTED JAN. 12, 1904.

J. J. JONES & J. E. SWANSTROM.

SUPPLEMENTAL AUXILIARY FEED FOR AIR BRAKE SYSTEMS.

APPLICATION FILED JAN. 17, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

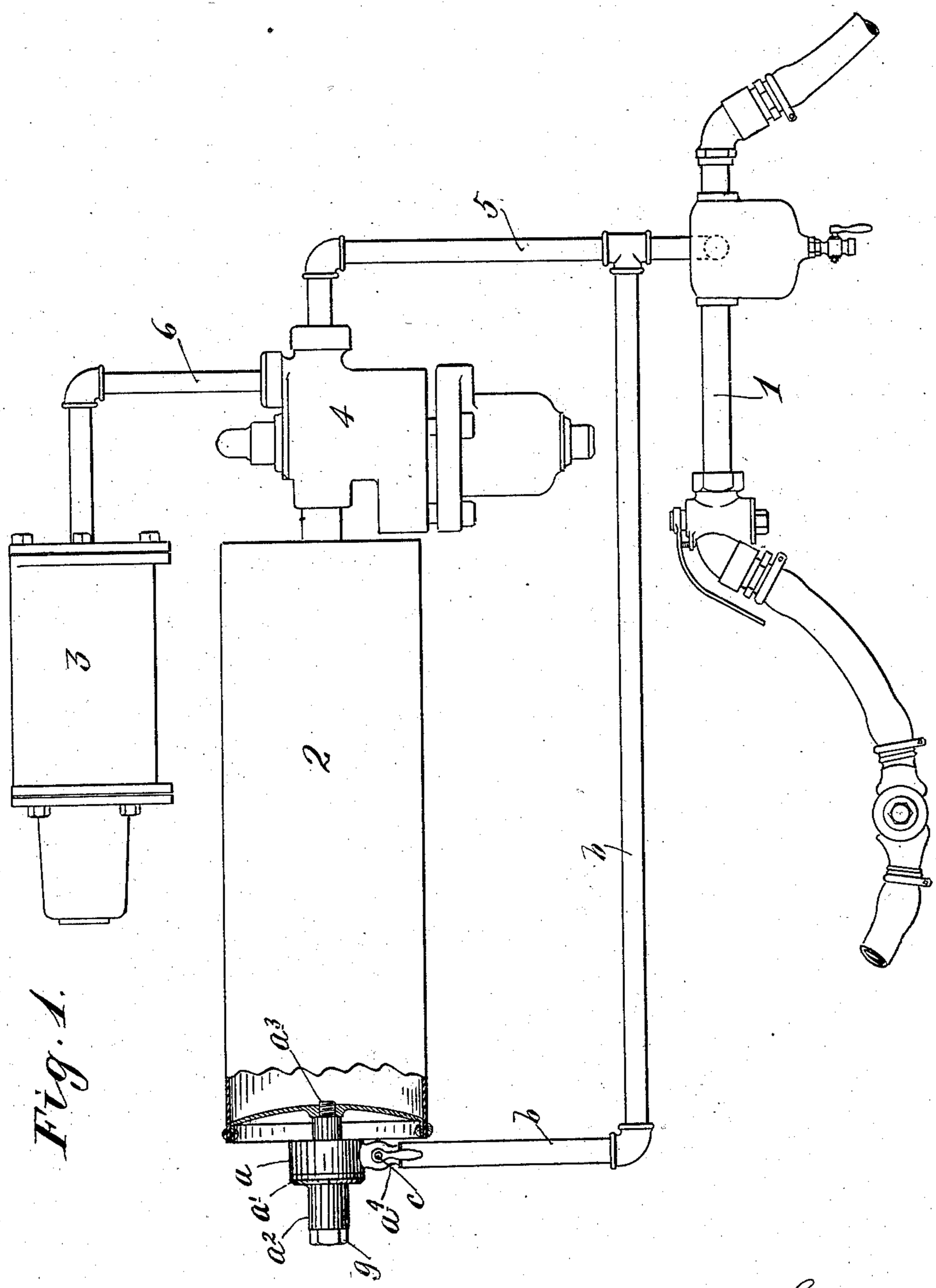

Fig. 1.

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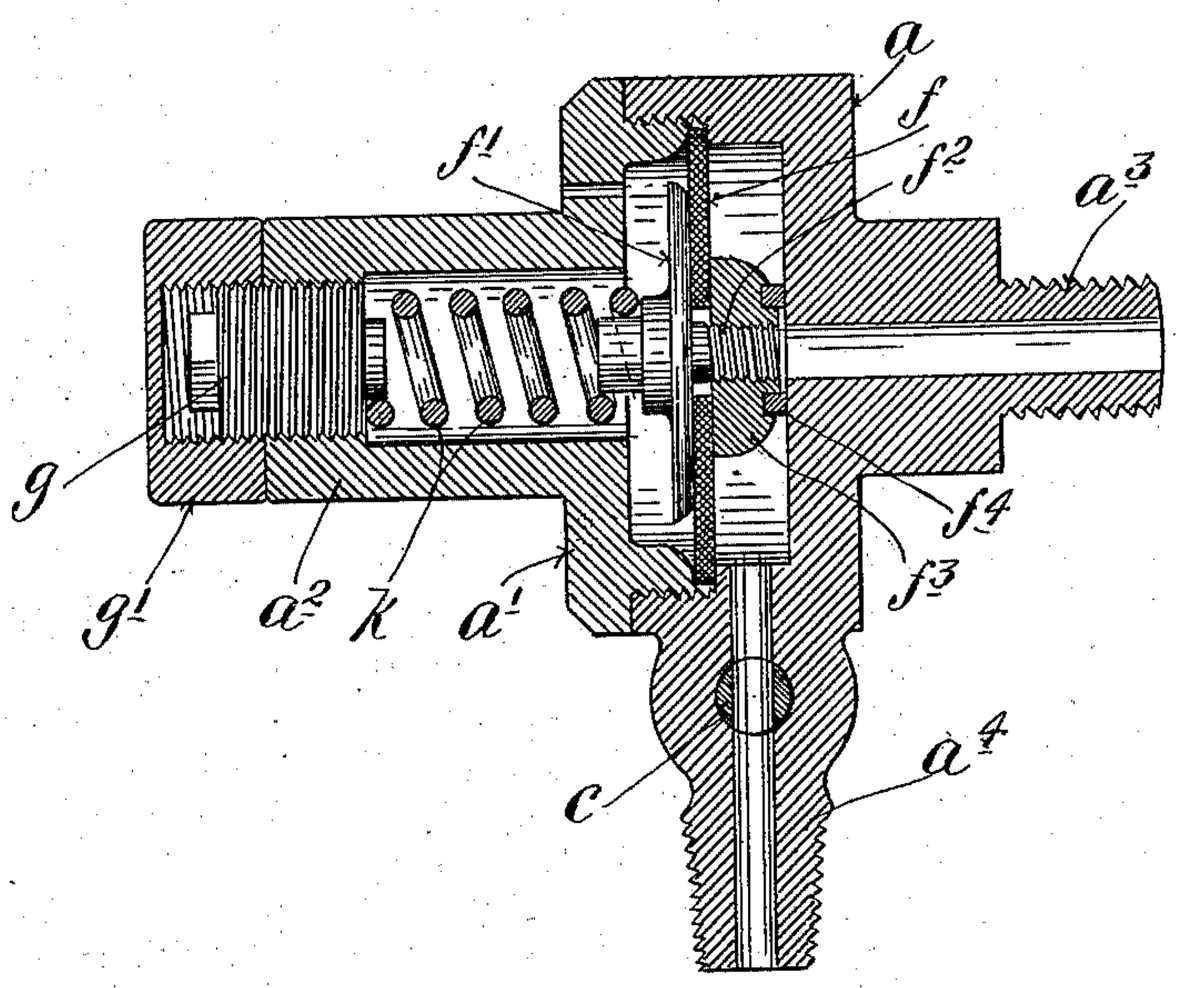
NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN J. JONES AND JOHN E. SWANSTROM, OF ST. PAUL, MINNESOTA.

SUPPLEMENTAL AUXILIARY FEED FOR AIR-BRAKE SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 749,612, dated January 12, 1904.

Application filed January 17, 1903. Serial No. 139,396. (No model.)

To all whom it may concern:

Be it known that we, JOHN J. JONES and JOHN E. SWANSTROM, citizens of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Supplemental Auxiliary Feeds for Air-Brake Systems; and we 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.

Our invention relates to air-brakes, and has for its object to provide means whereby the auxiliary reservoirs may be much more quickly charged than is at present possible.

To the above ends the invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

In the drawings like characters indicate like parts throughout the several views.

Figure 1 is a diagrammatic view with some parts shown in section and others in full, illustrating the manner of applying one of our improved supplemental charging devices for auxiliary reservoirs of air-brake systems; and Fig. 2 is a vertical section taken centrally through one of the supplemental charging-heads.

In Fig. 1 the numeral 1 indicates the train-pipe, the numeral 2 an auxiliary reservoir, the numeral 3 a brake-motor cylinder, the numeral 4 a triple valve, the numeral 5 a branch pipe leading from the train-pipe to the triple valve, and the numeral 6 a pipe leading from the triple valve to the brake-motor cylinder, all of which parts are found in the standard air-brake systems, such as the "Westinghouse" and the "New York." The actions of the triple valves of these air-brake systems is well understood by all persons familiar with air-brakes, and hence their detail construction and actions need not here be considered. For the purposes of this case it is only necessary to call attention to the following facts: Whenever the train-pipe pressure exceeds the pressure in the auxiliary reservoir, the piston of the triple valve is moved so as to open up communication between the train-pipe and the auxiliary reservoir through a restricted or capillary feed-groove within the triple valve. This feed-groove must necessarily always be very small, usually about three thirty-seconds of an inch, for if made large it would interfere with the proper actions of the triple valve in service applications, wherein the reduction in the train-pipe is usually quite slow. From this fact it results that the process of charging the auxiliary reservoirs through the triple valves is necessarily very slow, requiring usually about two minutes.

There are many times and places where the air-brakes as now constructed fall short of meeting the conditions of the service. Suppose, for instance, a train equipped with the present air-brake to be running down a very long and steep grade with a heavy load, in which case it frequently happens that the pressure in the auxiliary reservoirs, and hence in the cylinders of the brake-motor, becomes so reduced by successive applications and leakage that the brakes will not be set under proper tension. At such times it is of course very desirable that the auxiliary reservoir should be recharged; but with the present brake systems this is a very dangerous operation, since in the comparatively long interval required to recharge the auxiliary reservoirs the train is liable to get under such momentum that control thereof may be lost and the train permitted to run away. Our invention enables the recharging of the auxiliary reservoirs without danger at such times or at any other time, since the complete charging of the reservoirs may be effected in about ten seconds. This fact we have demonstrated in actual practice.

Our improved device, which we herein term a "supplemental charging device," is preferably constructed and applied as illustrated in the accompanying drawings, wherein the character *a* indicates a hollow head provided with a removable side *a'*, having screw-threaded engagement therewith and having a

sleeve extension a^2. The head a, as shown, has a screw-threaded neck a^3, which taps the auxiliary reservoir 2 at one end or at any other convenient point. Said head a' has also a depending screw-threaded stem a^4, which is connected by a pipe b to the branch pipe 5, or in any other way which gives the same communication with the train-pipe. The passage through the stem a^4 is normally open, but is adapted to be closed by an ordinary cut-out cock c in case it should be desired to throw the supplemental feed device out of action. A flange on the removable section of the head a clamps the peripheral portion of a diaphragm f against an annular internal shoulder of the said head a. This diaphragm may be of vulcanized rubber, of metal, or any suitable material.

The character f' indicates a disk which bears against the outer face of the diaphragm f and is provided with a screw-threaded stud f^2, which projects through an axial perforation of said diaphragm and is provided with a clamping-nut f^3, that clamps the inner central portion of said diaphragm. The nut f^3 carries a gasket f^4, which is normally pressed against the inner face of the head a, surrounding the axial passage of the threaded neck a^3. The said nut f^3 and its gasket f^4 afford a valve for opening up and closing communication between the auxiliary reservoir and the interior of the head a. The said diaphragm f, it will be noted, is positioned outward of the inlet-passage through the hollow stem a^4.

In the outer end of the sleeve a^2 is an adjustable screw-threaded plug g, provided, as shown, at its outer end with a cap-nut g', which serves as a lock-nut to the plug and to protect the projecting threads thereof. Compressed between the inner end of said plug g and the disk f' is a strong coiled spring k, which, acting on the diaphragm f, normally presses the gasket f^4 against the inner face of the head a and closes communication between the inner cavity of said head and the auxiliary reservoir. The diaphragm f on its inner face is always subject to train-pipe pressure, and this train-pipe pressure acts in opposition to the tension of the spring k. Seventy pounds may be considered as normal train-pipe pressure. By means of an adjustable plug the spring k is set under such tension that the valve carried by the diaphragm will be moved into an open position whenever the train-pipe pressure approaches normal, but will be closed when the train-pipe pressure is reduced below normal. This being the case, it is evident that when the train-pipe pressure is reduced either for service application or for emergency applications the valve carried by the diaphragm will close the communication between the auxiliary reservoir and the head a. When, however, it is desired to recharge the auxiliary reservoirs, the train-pipe pressure is again increased to or approximately to normal, (at which time of course the triple valve opens up communication between the train-pipe and the auxiliary reservoir through the restricted feed-groove of the triple valve,) the increasing train-pipe pressure acting on the diaphragm f will move the valve carried by said diaphragm into an opened position, thereby opening up communication between the train-pipe and the auxiliary reservoir through the relatively very large passage afforded by the auxiliary charging device, including, as shown, the pipe b, the hollow stem a^4, the hollow head a, and its neck a^3. The adjustment of the spring k is largely a matter to be determined by experiment and the conditions of the particular service to which it is applied.

From what has been above said it will of course be understood that the device described is capable of a large range of modification within the scope of my invention as herein set forth and claimed. For instance, a cylinder and a piston might be used instead of the diaphragm, although this would not be as good a construction for the purpose as the said diaphragm. We believe we are the first to provide means of any kind which is supplemental to the triple valve or similar charging-valve mechanism whereby the charging of the auxiliary reservoir of the air-brake system may be accomplished in a much less interval than is possible with the standard air-brake systems.

What we claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In an air-brake system, the combination with the train-pipe, auxiliary reservoir, brake-motor and triple valve, of a by-passage affording communication between the train-pipe and the said auxiliary reservoir, independent of said triple valve, and a supplemental valve mechanism comprising a movable member subject to train-pipe pressure and provided with a valve for opening and closing said by-passage, and a yielding pressure device acting on said movable member in opposition to train-pipe pressure, and tending to close said valve, whereby, when the train-pipe pressure is increased, to a predetermined point, said auxiliary reservoir will be charged, through said by-passage, as well as through the triple valve, substantially as described.

2. In an air-brake system, the combination with the train-pipe, auxiliary reservoir, brake-motor and triple valve, of a by-passage affording communication between the train-pipe and auxiliary reservoir, independent of the triple valve, and a supplemental valve mechanism comprising a diaphragm subject to train-pipe pressure and provided with a valve for opening and closing said by-passage, and a spring

acting on said diaphragm in opposition to train-pipe pressure, and tending to close said valve, whereby, when the train-pipe pressure is increased above a predetermined point, said auxiliary reservoir will be charged, through said by-passage, as well as through the triple valve, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN J. JONES.
JOHN E. SWANSTROM.

Witnesses:
GENEVIEVE HIRSCH,
F. D. MERCHANT.