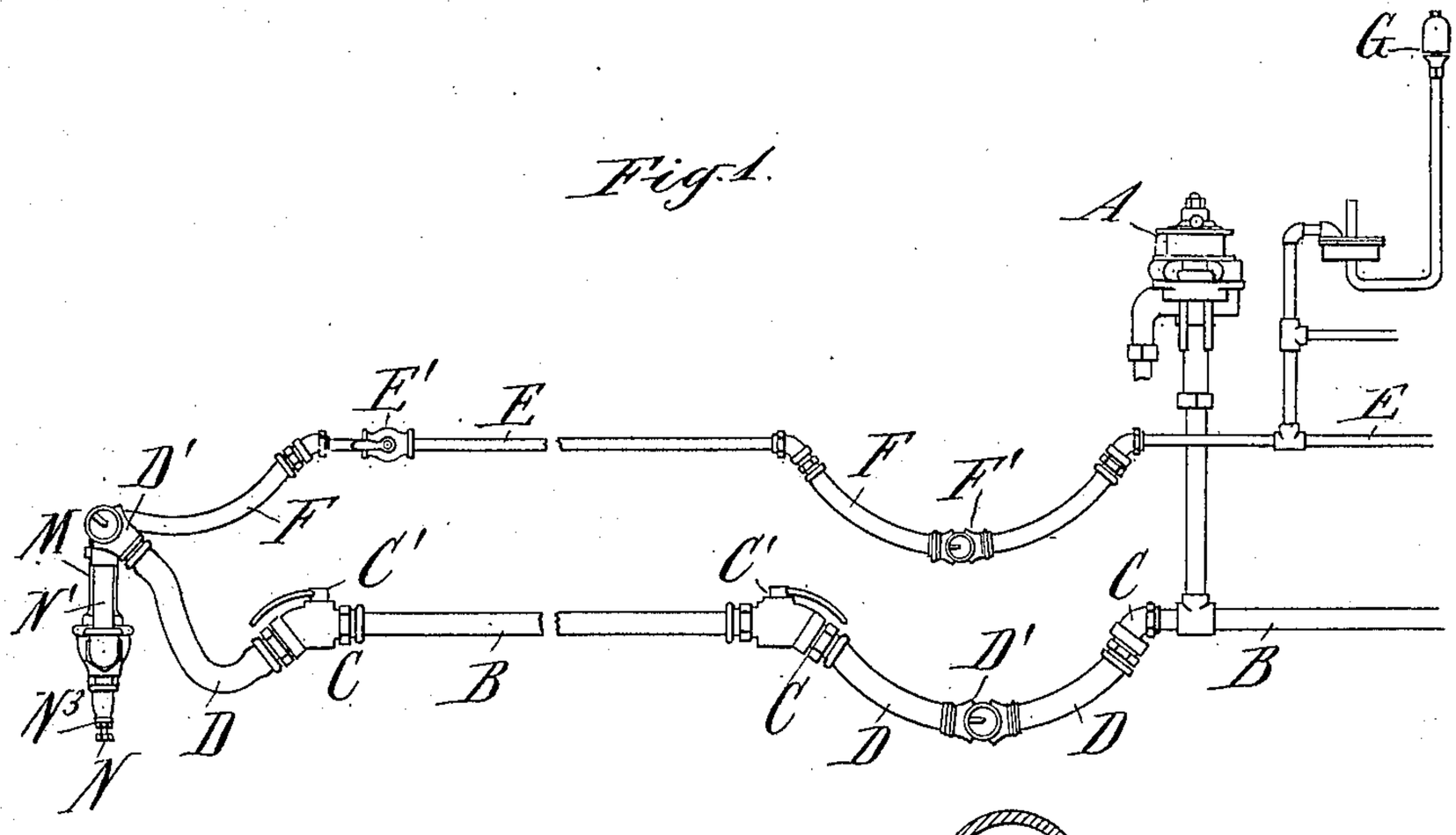
E. B. POWERS.

AIR BRAKE.

APPLICATION FILED FEB. 27, 1908. RENEWED NOV. 20, 1908.

918,470. Patented Apr. 13, 1909.

Fig. 1.



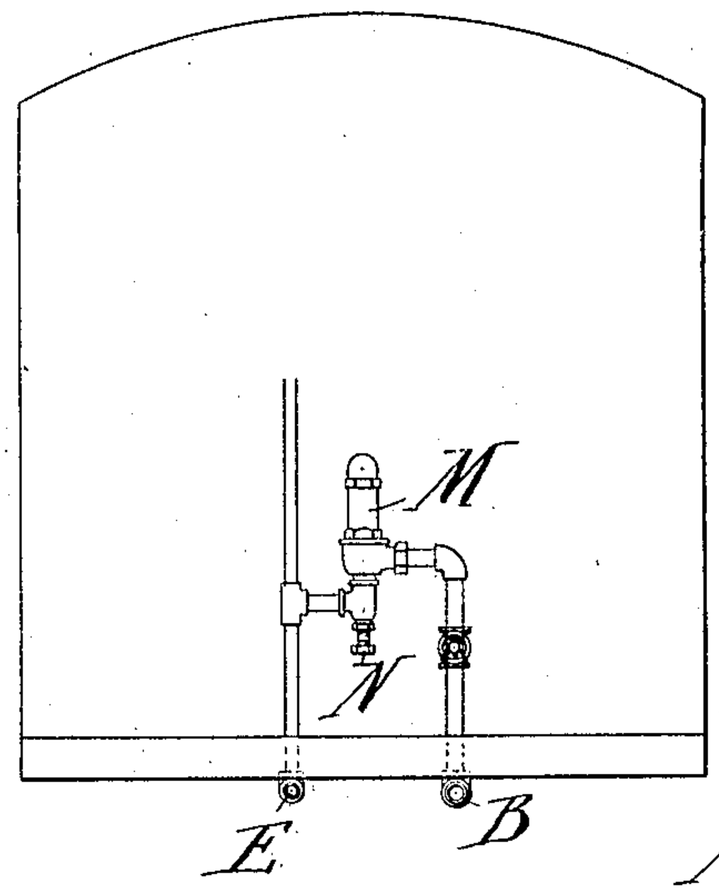
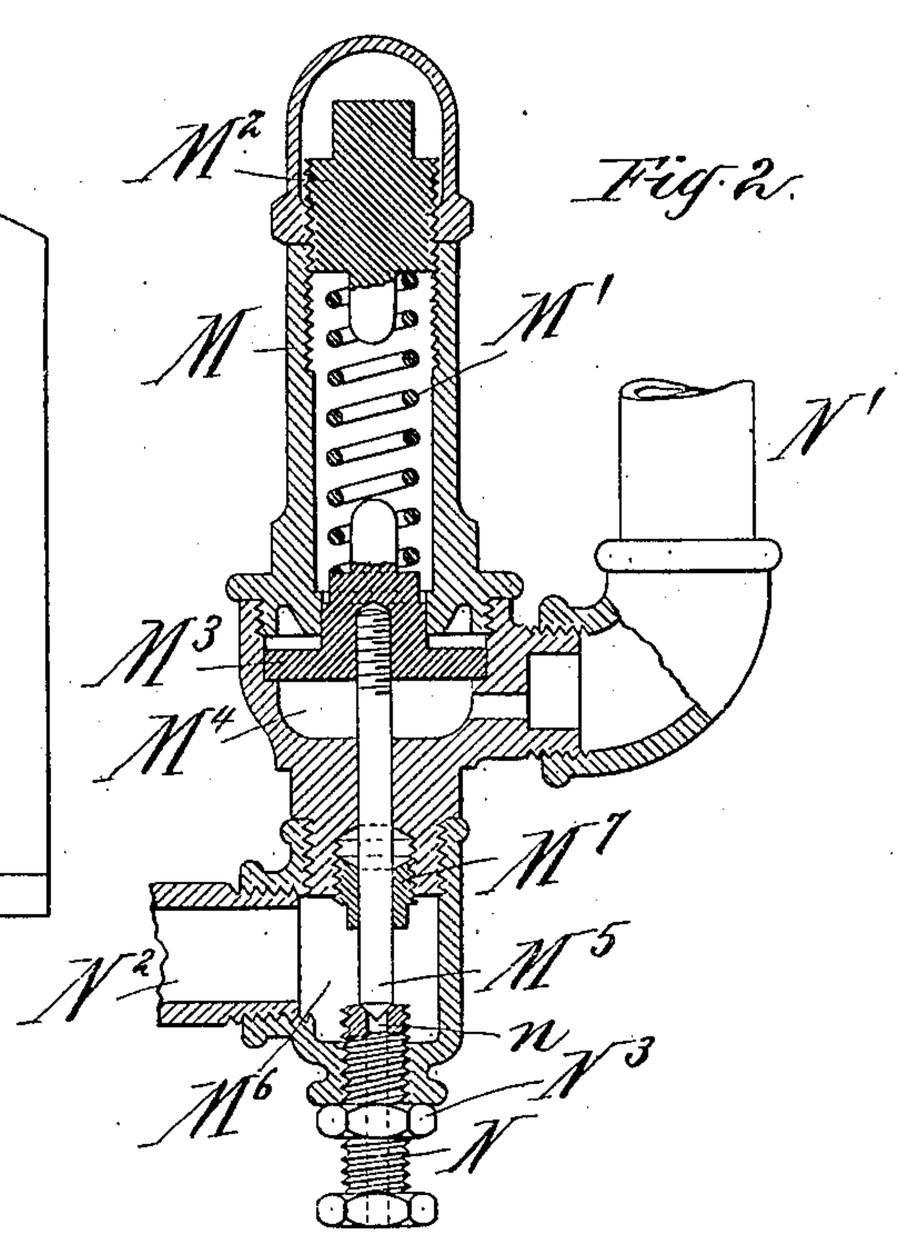


Fig. 3.

Fig. 2.



Witnesses:
F. J. Greene.
L. M. Eichtag

Inventor:
Edmund B. Powers,
by his attorney,
Charles R. Searle.

UNITED STATES PATENT OFFICE.

EDMUND B. POWERS, OF NEW YORK, N. Y., ASSIGNOR TO THE POWERS RAILWAY SAFETY APPLIANCE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

AIR-BRAKE.

No. 918,470. Specification of Letters Patent. Patented April 13, 1909.

Application filed February 27, 1908, Serial No. 418,022. Renewed November 20, 1908. Serial No. 463,713.

To all whom it may concern:

Be it known that I, EDMUND B. POWERS, a citizen of the United States, residing in the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Air-Brakes, of which the following is a specification.

The invention relates to brake-systems for railway trains in which the brakes are operated by changes of air-pressure in the train-pipe, and in which an air-signal pipe forms part of the equipment.

The object of the invention is to provide simple, efficient, and easily installed means by which the engineer may test the entire length of train-pipe and signal-pipe for obstructions therein, and which will also automatically actuate the engineer's whistle-signal to indicate pressures above the normal in the air-brake system.

The invention consists in certain novel features of construction and arrangement by which the above objects are attained, to be hereinafter described and pointed out in the claims.

The accompanying drawings form a part of this specification.

Figure 1 is a diagrammatic elevation of a portion of the usual air-brake system, showing the present invention applied thereto. Fig. 2 is a vertical axial section, partly in elevation, on a larger scale than the preceding figure, showing the construction of the signal actuating valve. Fig. 3 is a rear elevation showing the invention as a fixed attachment to a car.

Similar letters of reference indicate like parts in all the figures.

A is the engineer's brake valve, located in the cab, and B is the train-pipe extending as usual beneath each car of the train, having angle fittings C with angle-cocks C^1 therein, joined between cars by flexible hose connections D and hose couplings D^1, and E is the usual air-signal pipe, including the engineer's signal whistle G and having cocks E^1 and hose connections F with hose couplings F^1; these portions of the system together with the reservoirs, valves, brake-cylinders, and other brake mechanism, not shown, may be understood to constitute the ordinary automatic brake equipment.

The result attained by my invention is to permit the engineer to test at any time both the train-pipe and signal-pipe for obstructions therein, usually caused by a closed angle-cock C^1 or signal-cock E^1. Increasing the pressure in the train-pipe above the normal blows the whistle G if both the train-pipe and signal-pipe be clear throughout from the locomotive to the rear end of the train. The mechanism employed comprises a casing M which I term the signal-valve, removably connected by pipes N^1 N^2 having couplings constructed to engage corresponding couplings D^1 and F^1 on the rear terminals of the train-pipe and signal-pipe. In the upper portion of the casing and arranged axially thereof is a helical spring M^1 abutting at the upper end against a screw-plug or follower M^2 and at the lower end against a piston M^3 arranged to rise and sink in an upper chamber M^4, and exerting its force to depress the piston. Extending downwardly from the piston is a pin M^5 passing through a lower chamber M^6, in communication with the signal-pipe through the pipe N^2, and having its lower end tapered to serve as a closure for the axial opening *n* in a tubular screw-plug N through which communication with the external air is afforded when the pin-valve M^5 is lifted. The upper chamber M^4 is in communication with the train-pipe through the pipe N^1, and the escape of air between the chambers M^4 and M^6 is prevented by the stuffing-box M^7 surrounding the pin. A check-nut N^3 on the screw-plug N permits the latter to be closely adjusted and held with its valve-seat properly presented for closure when the piston M^3 is in the depressed position.

Under normal conditions the downward pressure of the spring M^1 is sufficient to overcome the lifting force of the air-pressure in the train-pipe acting on the under face of the piston and hold the pin-valve to its seat, but when the pressure in the train-pipe exceeds the resistance offered by the spring, the piston is lifted carrying with it the pin M^5, allowing the air under pressure in the signal-pipe to escape through the opening *n* and, by the consequent lowering of pressure in the signal-pipe, sound the whistle G. The engineer may induce this increase of pressure below the piston at any time by throwing his brake-lever to the "release" position and if the whistle fail to respond it is evident an obstruction exists either in the train-pipe or signal-pipe.

Any sufficient increase in train-pipe pressure will sound the whistle; thus the invention serves automatically to draw the attention of the engineer to the fact that he is carrying an excess pressure in the brake system, which although indicated by the air-pressure gage may not have been previously noted.

The signal-valve may be easily and quickly connected to the couplings of the train-pipe and signal-pipe hose at the rear end of the train, and may be supported by any suitable hanger, not shown, engaged with the rear platform or other portion of the car, or the apparatus may be permanently installed at each end of each car, as indicated in Fig. 3, in such case all but the one at the extreme rear end will be shut out during a run.

The signal-valve may be set to operate at any desired increase over the normal train-pipe pressure, the screw-plug M^2 permitting the adjustment to be easily and accurately made. It will be observed that the signal-pipe pressure is practically of no effect in the operation of the apparatus; this is an important feature in that the operation does not depend on the difference between the pressure in the train-pipe and that in the signal-pipe but is entirely independent of the latter and is controlled by changes in the train-pipe pressure alone.

I claim:—

1. In an apparatus of the character set forth, a casing, means movable therein by train-pipe pressure, a valve in said casing actuated by said means and controlling an opening in said casing from the signal-pipe to the external air, and a spring in said casing acting upon said means in opposition to said train-pipe pressure, whereby excess pressure in said train-pipe lifts said valve and opens communication between said signal-pipe and external air.

2. In an apparatus of the character set forth, a casing, means movable therein by train-pipe pressure, a valve in said casing actuated by said means and controlling an opening in said casing from the signal-pipe to the external air, a spring in said casing, acting upon said means in opposition to said train-pipe pressure, whereby excess pressure in said train-pipe lifts said valve and opens communication between said signal-pipe and external air, and means for varying the force of said spring.

3. In an apparatus of the character set forth, a casing having a chamber in communication with the train-pipe and a chamber in communication with the signal-pipe, and an escape opening from the latter chamber through said casing, a piston in such train-pipe chamber acted upon by train-pipe pressure, a valve in such signal-pipe chamber, connected to said piston and arranged to control said opening, and yielding means for moving said piston to close said opening in opposition to the train-pipe pressure.

4. In an apparatus of the character set forth, a casing having a chamber in communication with the train-pipe and a chamber in communication with the signal-pipe, a valve-seat in the latter chamber having an escape opening therein extending through said casing, a piston in such train-pipe chamber acted upon by train-pipe pressure, a pin-valve in said signal-pipe chamber, connected to said piston and arranged to co-act with said valve-seat and control said opening, and a spring in said casing for moving said piston and pin-valve to close said opening in opposition to the train-pipe pressure.

5. In an apparatus of the character set forth, a casing having a chamber in communication with the train-pipe, and a chamber in communication with the signal-pipe, a valve-seat in the latter chamber having an escape opening therein extending through said casing, a piston in such train-pipe chamber acted upon by train-pipe pressure, a pin-valve in said signal-pipe chamber, connected to said piston and arranged to co-act with said valve-seat and control said opening, a spring in said casing for moving said piston and pin-valve to close said opening in opposition to the train-pipe pressure, and a screw-plug in said casing for adjusting the pressure of said spring on said piston.

6. In an apparatus of the character set forth, a casing having an upper and lower chamber therein, a piston in said upper chamber, a pipe leading from the latter below said piston to the train-pipe, a spring in said casing above said piston, a screw-plug in said casing for adjusting the pressure of said spring on said piston, a pin-valve on said piston, a pipe leading from said lower chamber to the signal-pipe, and a tubular screw extending through said casing into said lower chamber and carrying a seat for said valve.

In testimony that I claim the invention above set forth I affix my signature, in presence of two witnesses.

EDMUND B. POWERS.

Witnesses:
CHARLES R. SEARLE,
F. J. GREENE.