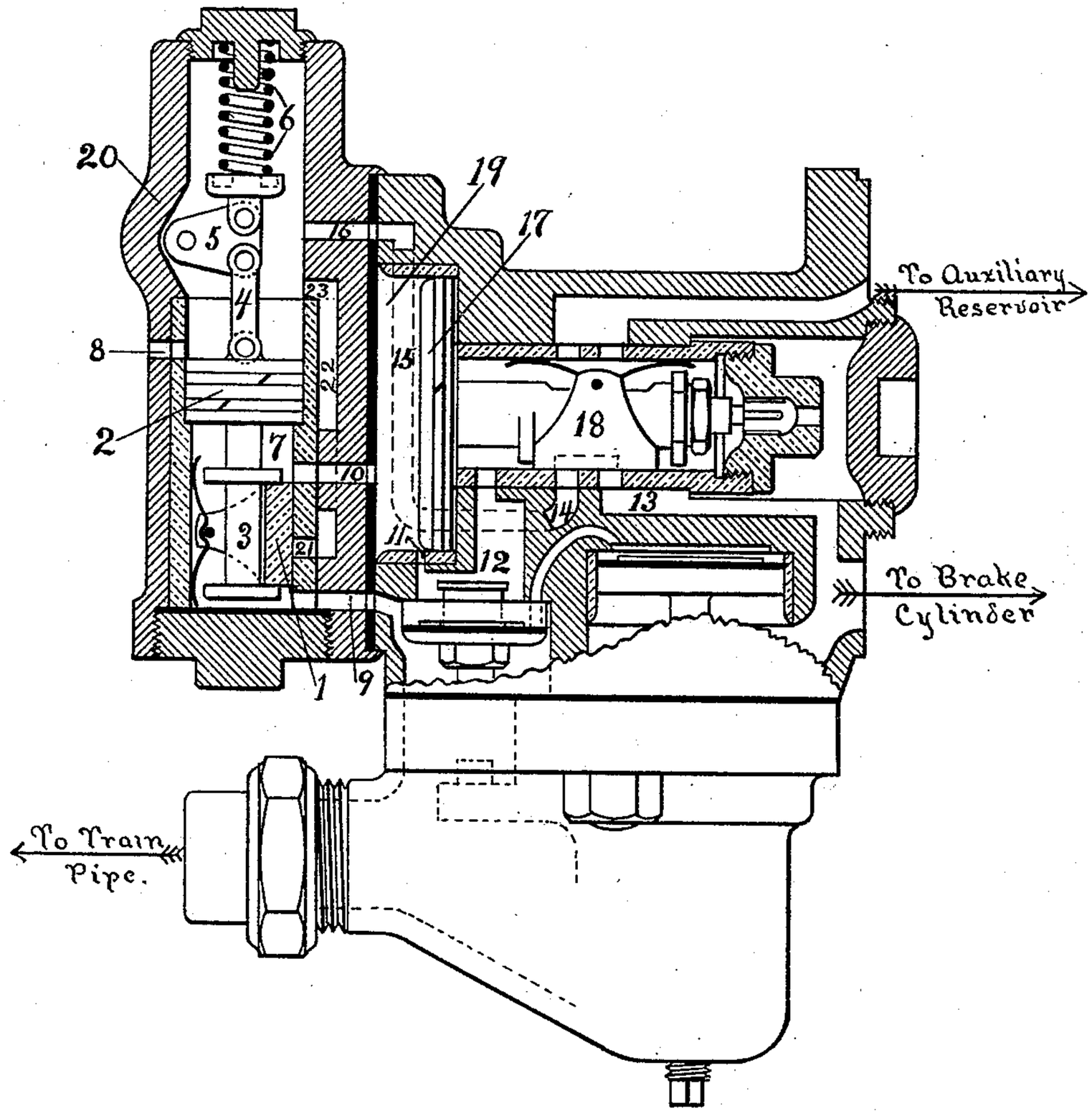
(No Model.)

A. P. MASSEY.

AIR BRAKE.

No. 451,409. Patented Apr. 28, 1891.



WITNESSES:

F. L. Massey.

R. D. McKay

Albert P. Massey

INVENTOR

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALBERT P. MASSEY, OF WATERTOWN, ASSIGNOR TO THE EAMES VACUUM BRAKE COMPANY, OF NEW YORK, N. Y.

AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 451,409, dated April 28, 1891.

Application filed October 13, 1890. Serial No. 368,043. (No model.)

To all whom it may concern:

Be it known that I, ALBERT P. MASSEY, a citizen of the United States, residing in the city of Watertown, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Air-Brakes, of which the following, taken in connection with the accompanying drawing, is a specification.

The object of my invention is to provide means in an automatic fluid-pressure railway-brake system whereby the speed of trains descending long and heavy grades may be controlled without the employment of the usual pressure-retaining valve for the retention of a determined low pressure in the brake-cylinders.

The accompanying drawing is a view, partly in longitudinal section and partly in elevation, of my improvement applied to an ordinary quick-action fluid-pressure-brake valve, commonly called a "triple valve." My improvement is shown as replacing the ordinary head or cap of the triple valve, although it is not necessarily placed in this position.

In the drawing, 2 is a piston exposed on one side to the pressure of air in the train-pipe and on the other side to the pressure of spring 6, exerted through bell-crank 5 and links 4. This piston opens and closes port 8. Slide-valve 1, which is moved by means of the lugs or projections on piston-rod 3, opens and closes ports 10 and 21. The pressure of spring 6 upon the upper side of piston 2 is such that until the train-pipe pressure is increased a certain predetermined amount above the normal the downward pressure will exceed the upward pressure and piston 2 will be held against the projection in the cylinder which is shown in the drawing. By using the bell-crank 5 to transmit the pressure of spring 6 to the piston 2 I am enabled to keep the spring-pressure on the upper side of piston 2 practically constant, for as the piston 2 moves up and spring 6 is compressed the piston leverage increases, while the spring leverage decreases. In fact I adjust the angle between the leverages of bell-crank 5 so that the resistance of the spring decreases slightly as the piston rises, in order that the piston may not travel its full downward stroke without a material reduction in the air-pressure below it.

While in the position shown in the drawing there is an open passage from the train-pipe through port 9, around valve 1 and through port 10 to cylinder 19, and thence through the triple valve to the auxiliary reservoir, in the usual manner. There is also an open passage for the exhaust from the brake-cylinder through port 13, under slide-valve 18 through port 14 15 16, and thence through the chamber above piston 2 and port 8 to the atmosphere. Thus my invention in no wise interferes with the functions of the triple valve in ordinary braking.

The operation of my invention in accomplishing the object claimed is as follows: When the pressure in the train-pipe is increased a predetermined amount above the normal—say ten or fifteen pounds—the pressure on the under side of piston 2 will exceed that of spring 6 on the upper side and it will move upward. The first thing done will be to close the exhaust-port 8 and the feed-port 10, thus preventing the higher-pressure air from passing to the triple valve, but without producing any change in the triple valve itself. A little further upward movement will cause the slide-valve 1 to open port 21, and thus allow a little air to pass through port 21 22 23 to the chamber above piston 2, which is a portion of the exhaust-passage from the brake-cylinder. Therefore the air will pass through port 16 15 14 under slide-valve 18 and through port 13 to the brake-cylinder and apply the brakes with whatever pressure may be in the chamber above piston 2. The amount of air which will pass into the chamber above piston 2 is determined by the excess of the pressure below piston 2 over the pressure of spring 6 on said piston, for when air which passes through port 21 22 23 has added sufficient pressure on top of piston 2 to that already exerted by the spring it will cause the piston 2 to descend until port 21 is closed, but not far enough to open exhaust-port 8. Thus the brakes will have been applied with a slight pressure equal to the difference between the train-pipe pressure and the pressure exerted by spring 6 on piston 2. A further increase in the train-pipe pressure

will cause the piston 2 to move up again and allow a little more air to pass through port 21 and apply the brakes a little harder. Should the train-pipe pressure be now decreased somewhat, but not below the predetermined pressure necessary to overcome spring 6, piston 2 will move down and allow air to escape through port 8, when the pressure in the brake-cylinder will be reduced until the train-pipe pressure will overcome the spring-pressure and that of the air still remaining above piston 2 and cause piston 2 to rise sufficiently to close exhaust-port 8 again, thus retaining a reduced pressure in the brake-cylinder. Should the train-pipe pressure be now reduced to the normal, the piston 2 will return to the position shown in the drawing, thus opening port 8 and releasing the brakes, and also opening port 10, so that the train-pipe pressure has again access to the triple valve for the purpose of actuating it in the usual way. Further, it will be noticed that while this apparatus is in action the auxiliary reservoir will be charged to its normal limit, and therefore in case of a hose bursting or of the parting of the train the brakes will be automatically applied with the highest pressure. The engineer can also at any time apply the brakes in the normal way.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the triple valve and its casing, of a supplemental shell or chamber attached thereto, a brake-cylinder exhaust-passage leading to said chamber, a connecting-passage from the train-pipe to said exhaust-passage through said chamber, a port to the triple-valve piston, a valve controlling said connecting-passage and triple-valve port, and a piston connected to said valve operated by train-pipe pressure, substantially as and for the purpose described.

2. The combination, with the triple valve and its casing, of a supplemental shell or chamber attached thereto, a brake-cylinder exhaust-passage leading to said chamber, a connecting-passage from the train-pipe to said exhaust-passage through said chamber, an exhaust-port from said chamber, a port to the triple-valve piston, a valve controlling said connecting-passage and triple-valve port, and a piston connected to said valve operated by train-pipe pressure, and also itself controlling the exhaust-port, substantially as and for the purpose described.

3. The combination, with the triple valve and its casing, of a supplemental shell or chamber attached thereto, a brake-cylinder exhaust-passage leading to said chamber, a connecting-passage from the train-pipe to said exhaust-passage through said chamber, a port to the triple-valve piston, a valve controlling said connecting-passage and triple-valve port, a piston connected to said valve operated by train-pipe pressure, and a spring connected to said piston through a rocking lever attached to said piston and spring, so that the lever-arm of the spring grows shorter as the piston rises, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 17th day of September, A. D. 1890.

ALBERT P. MASSEY.

Witnesses:
HENRY W. BOYER,
HARRY G. MANNING.