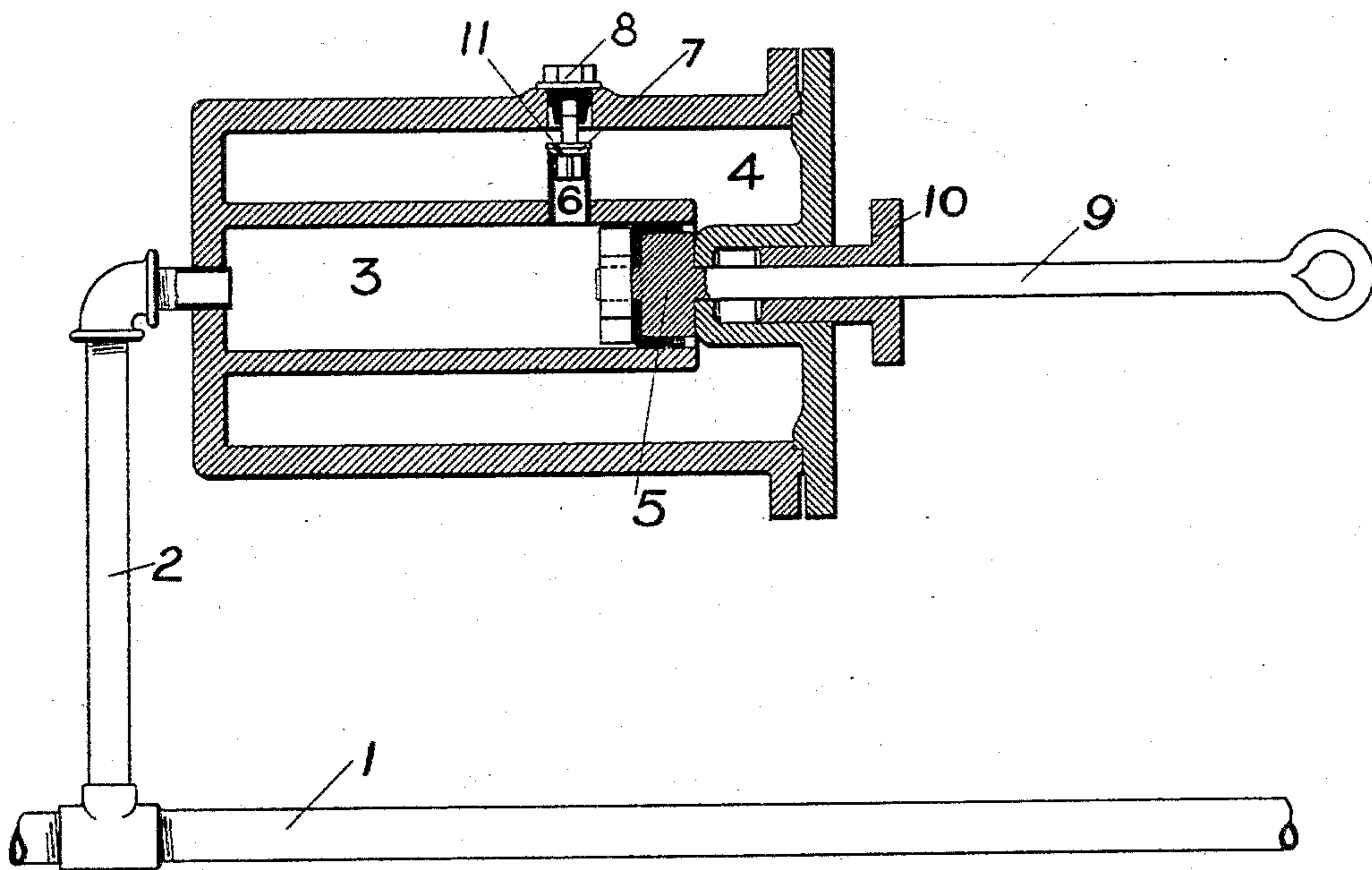


(No Model.)

A. P. MASSEY.  
AIR BRAKE.

No. 414,717.

Patented Nov. 12, 1889.



WITNESSES:

*H. G. Manning.*  
*F. L. Massey.*

INVENTOR:

*Albert P. Massey*



# UNITED STATES PATENT OFFICE.

ALBERT P. MASSEY, OF WATERTOWN, NEW YORK.

## AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 414,717, dated November 12, 1889.

Application filed May 23, 1889. Serial No. 311,789. (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.

My invention relates to an improvement in the means for actuating car-brakes, and is for the purposes of insuring a quick release and to prevent "leaking on."

The drawing is a sectional view of the invention.

In the drawing, 1 is a train-pipe attached to the body of a car, as is common with brakes actuated by fluid-pressure.

2 is a branch pipe connecting the train-pipe with one end of cylinder 3. A reservoir 4 is connected with the opposite end of cylinder 3, and a piston 5, with one side exposed to the pressure in the reservoir, is fitted to the cylinder.

6 is a port leading from the cylinder 3 to the reservoir 4. A check-valve 7 is located in port 6, which permits air to pass only from cylinder 3 to reservoir 4, except as hereinafter described. 11 is a leakage-groove in said check-valve. A cap 8 gives access to valve 7. The piston-rod 9 may be connected with any of the systems of levers used for applying brakes.

10 is a gland for packing the piston-rod. The piston is shown in the end of the cylinder, where it should be when brakes are off. The port 6 is located near the end of the cylinder, so that no air can pass from the train-pipe to the reservoir until the piston has reached nearly the end of its stroke.

The operation of the apparatus is as follows: If the car were connected with the Westinghouse system of automatic brakes, a certain pressure would be maintained in train-pipe 1, which could be varied at will by a suitable valve and pump on the locomotive. As one end of cylinder 3 is in open communication through pipe 2 with pipe 1, the same pressure would always obtain in cylinder 3 that was in train-pipe 1. With the piston in

the position shown air would pass through port 6 and check-valve 7 to reservoir 4 until the pressure in the reservoir was equal to that in the cylinder. The piston 5 would then have the same pressure on both sides, and therefore be in equilibrium. If, now, the pressure should be reduced in the cylinder, the piston would no longer be in equilibrium, but would be moved by the excess of pressure in the reservoir and produce a tension on piston-rod 9 equal to the difference between the pressures in the reservoir and the train-pipe, and if piston-rod 9 were connected with the brake-levers it would apply the brakes with that force. As there would be open communication between cylinder 3 and the valve on the locomotive, the engineer could vary the pressure in the cylinder at will, and therefore vary the brake-pressure at will. To release the brakes, it would be necessary to increase the pressure in the train-pipe. This would force the piston 5 back to nearly the end of its stroke before uncovering port 6, and would therefore release the brakes before any air could pass through the port 6 and reach the reservoir 4. This insures a quick release. If the train-pipe should be ruptured from any cause, the pressure would be immediately reduced to zero in cylinder 3, and the brakes consequently applied with full force automatically. When a car is cut off from a train, if the cocks in the ends of the train-pipe are first closed, the pressure in the train-pipe would be maintained and the brakes would remain off; but if there was a slight leak the pressure in the cylinder would be gradually reduced and a gradual strain be brought on the piston and brake-levers, or what is called "leaking on" would occur. To obviate this, the check-valve is fitted loosely or with a small groove cut in it, so that a slight leakage would occur from the reservoir to the cylinder. Therefore, if the pressure were reduced very slowly in the train-pipe, the air in the reservoir would leak by the check-valve and equilibrium be maintained on both sides of piston 5. When the brake is applied in actual service, the piston passes port 6 before the slack of the brakes is taken up, and then the check-valve is open on both



sides to the reservoir; hence the reservoir-pressure against the piston cannot leak off and is maintained indefinitely.

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

In a car-brake, a double-acting piston, a cylinder; a passage located in the wall of the cylinder near one end, so that the piston will pass it in the early part of its stroke, and a  
10 check-valve containing a leakage-groove lo-

cated in said passage, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 20th day 15 of May, A. D. 1889.

ALBERT P. MASSEY.

Witnesses:

HENRY W. BOYER,

MICHAEL J. MORKIN.