

G. WESTINGHOUSE. Jr.

AIR-BRAKE VALVE.

No. 172,064.

Patented Jan. 11, 1876.

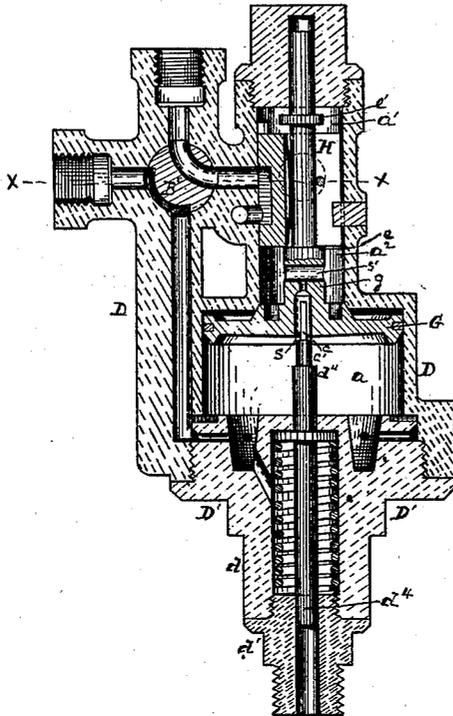


FIG. 1.

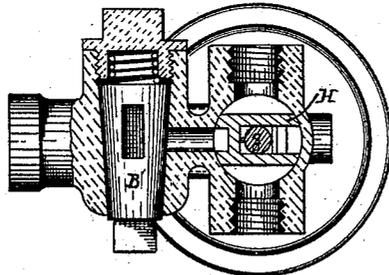


FIG. 2.

Witnesses.

*Claudius S. Parker*  
*J. E. Boggs.*

Inventor

*George Westinghouse Jr.*  
*by George H. Christy*  
*his Atty.*

# UNITED STATES PATENT OFFICE.

GEORGE WESTINGHOUSE, JR., OF PITTSBURG, PENNSYLVANIA.

## IMPROVEMENT IN AIR-BRAKE VALVES.

Specification forming part of Letters Patent No. 172,064, dated January 11, 1876; application filed December 18, 1875.

To all whom it may concern:

Be it known that I, GEORGE WESTINGHOUSE, Jr., of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Air-Brake Valves; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a longitudinal sectional view of my improved valve; and Fig. 2 is a transverse sectional view through the line  $x x$ , Fig. 1.

My present invention relates to an improvement in the valve device patented to me October 5, 1875, by Patent No. 168,359. It is intended for the same purpose as therein set forth, performs the same function, and includes only such changes in construction and operation as hereinafter set forth.

The valve-case D is the same, inclosing a like piston-chamber,  $a$ , valve-chamber,  $a^1$ , and communicating passage  $a^2$ ; also the screw-cap D', with its air grooves and ports, and tubular extension  $d$ , and stem-guide  $d^1$ ; also the stem  $d^4$ , with its collar and spring; also the piston G, with its stem  $g$ , valve H, cock B', and the passages and ports which lead from and to such valve and cock, and from and to an auxiliary reservoir, brake-cylinder, and brake-pipe.

All these devices, having by the prior patent become a part of the prior state of the art, need not here be more fully described.

My present improvement dispenses with the side port  $s$  in the valve-case, and provides for an air-port (herein also lettered  $s$ ) directly through the piston G, with one or more lateral ports,  $s'$ , open; thence into the passage  $a^2$ . The end of the port  $s$  next the chamber  $a$  is made large enough for the insertion of a stem,  $c$ , of a somewhat less diameter, such stem  $c$  being connected by an enlargement,  $c'$ , to the end of the stem  $d^4$ . The smallest part  $e$  of this compound stem is of the diameter of the smaller part of the port  $s$ , (or preferably a little less,) so that as the piston G makes a downstroke,  $c$  will enter the smaller

part of  $s$ , and clean out any dust, dirt, or other obstruction which may have lodged therein.

The enlargement  $c'$  of the compound stem is of such length, size, and position relative to the piston G and the adjacent end of the port  $s$  that when the devices are in the position shown, (the brakes then being "off" and the train in running condition,) such end of  $s$  will be open for the free passage of air from the brake-pipe to the auxiliary reservoir; but with a diminution of air-pressure in the chamber  $a$  the back pressure of air from the auxiliary reservoir will shift the piston G, so that the port  $s$ , slipping onto the enlarged part  $c'$ , will be closed thereby, and the escape of air cut off in advance of the opening of the communication from the auxiliary reservoir to the brake-cylinder; and that this may be done without having to overcome any resistance from the slide-valve H, I make the distance between the collars  $e e'$  a little greater than the length of the valve, as shown. Hence the port  $s$  will be closed before the valve H begins to move for applying the brakes, and will be kept closed until the valve H shall have been brought back to the proper position for a full release of the brakes. Consequently the valve H can be operated as may be desired in applying and releasing the brakes, and in graduating the brake-pressure, without leakage or loss at the air-supply port  $s$ , and with such port always closed.

As the piston G continues its stroke it engages the end of the part  $d^4$  of the compound stem, with the operation and result stated in the patent above cited.

It is not necessary that the port  $s$  should be of a reduced size at any point; but I prefer to make it as small as practicable for supplying the amount of compressed air desired, in order that there may be as small an escape as possible when the back pressure on the piston G is brought into effective operation.

I claim herein as my invention—

1. The sliding piston G, having an air-port,  $s$ , closed and opened by sliding onto and off of a stem,  $c'$ , and in combination therewith, substantially as set forth.
2. The sliding piston G, having an air-port,

s, in combination with the compound stem *c* and *c' d'*, substantially as set forth.

3. The slide-valve H, made shorter than the distance between its end bearings, in combination with the port *s* and stem *c'*, relatively arranged with reference to the operation of the valve H, while the port *s* is closed, substantially as set forth.

In testimony whereof I have hereunto set my hand.

GEORGE WESTINGHOUSE, JR.

Witnesses:

JAMES M. CHRISTY,  
GEORGE H. CHRISTY.