

(No Model.)

J. H. CROSBY.

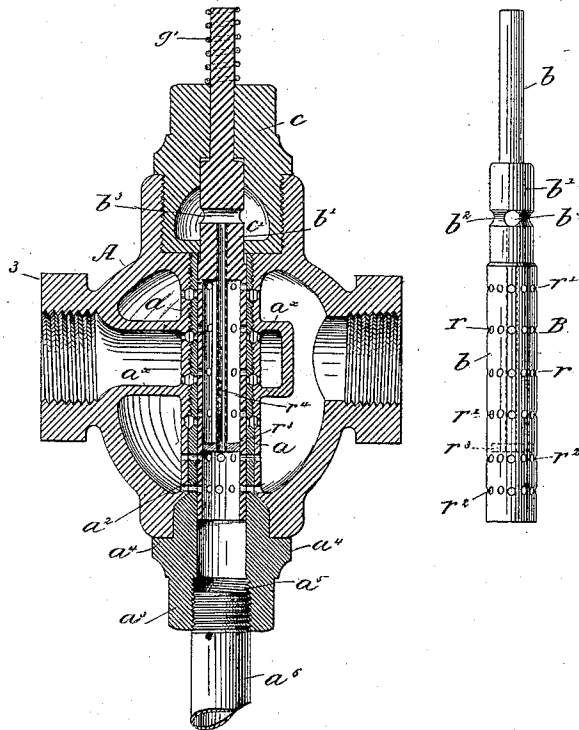
VALVE.

No. 344,724.

Patented June 29, 1886.

Fig: 1.

Fig: 2.



Witnesses:

John A. Reymie

Fred L. Emery.

Inventor;

James H. Crosby

by Crosby & Gregory

Attys.

# UNITED STATES PATENT OFFICE.

JAMES H. CROSBY, OF BOSTON, MASSACHUSETTS.

## VALVE.

SPECIFICATION forming part of Letters Patent No. 344,724, dated June 29, 1886.

Application filed November 5, 1885. Serial No. 181,973. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES H. CROSBY, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Valves, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to valves, and has for its object to improve the construction of the same, in order that steam may be prevented from escaping into the atmosphere at the point where the valve-stem enters the usual cap or nut of the valve case or shell.

In accordance with my invention, I have provided the valve case or shell with a perforated sleeve, which receives within and has co-operating with it a cylindrical valve-piston, also provided with perforations to co-operate with the perforations in the said sleeve. The shell or case referred to is provided with a nut or cap, through which the valve-stem is extended, the said cap being so shaped as to form a chamber for the reception of escaping steam, the said steam being conveyed therefrom into the exhaust-pipe by a pipe or channel extended through the center of the valve.

My invention consists, essentially, of a valve case or shell, a cylindrical tubular valve-piston perforated to constitute steam inlet, outlet, and exhaust ports, and having a central channel, combined with a chambered cap for the said valve shell or case, and with a sleeve fixed in the said case or shell and provided with perforations to co-operate with perforations of the said valve-piston, as will be described.

Figure 1 is a vertical section of a valve-case and its piston embodying my invention, and Fig. 2 an enlarged detail of the valve-piston.

The valve herein shown is especially adapted to be used in connection with the automatic signal apparatus described in United States application Serial No. 176,371, dated September 7, 1885, to which reference may be had, the valve herein shown replacing the valve used in the said application.

The valve case or shell A, herein shown as provided with threaded arms or ends 1 and 3, has a central cylindrical wall, *a*, and a diaphragm or wall, *a*<sup>x</sup>, encircling the wall *a*, the said wall *a* being screw-threaded at its interior,

and provided with perforations preferably made in annular grooves or channels of the wall, the said perforations constituting steam-ports in a manner to be described. The threaded wall *a* has screwed into it a perforated sleeve, *a*<sup>2</sup>, having a base, *a*<sup>3</sup>, provided with a threaded socket, *a*<sup>4</sup>, to receive the exhaust-pipe *a*<sup>5</sup>, and the said base also has a flange, *a*<sup>4</sup>, to meet one end of the case or shell A when the sleeve *a*<sup>2</sup> is screwed into the threaded wall *a*. The perforations in the sleeve *a*<sup>2</sup> are also preferably made through annular grooves, the said perforations co-operating with the perforations of the threaded wall *a*. The sleeve *a*<sup>2</sup> receives within it the cylindrical valve-piston B, (see Fig. 2,) composed of a hollow tube or portion, *b*, provided with perforations made preferably in grooves, the said perforations co-operating with the perforations of the wall *a* and the sleeve *a*<sup>2</sup> to form the steam inlet, outlet, and exhaust ports of the said valve, the valve-piston B having a solid neck, *b*<sup>1</sup>, provided with an annular groove, *b*<sup>2</sup>, and a diametrical channel or opening, *b*<sup>3</sup>. The perforations at *r* *r* form the steam-inlet ports, the perforations at *r*<sup>1</sup> *r*<sup>1</sup> the outlet-ports, and the perforations at *r*<sup>2</sup> *r*<sup>2</sup> the exhaust-ports. The lower outlet-port *r* is separated from the exhaust-ports *r*<sup>2</sup> by a partition, *r*<sup>3</sup>, tapped at its center to receive a pipe, *r*<sup>4</sup>, which is extended through the center of the valve-piston and enters the neck *b*<sup>1</sup>, and is made to communicate with the opening or channel *b*<sup>3</sup>, thus placing the said channel in communication with the exhaust-pipe *a*<sup>5</sup>. The valve-stem is extended through a cap or nut, *c*, screwed to the shell or case A and recessed to form a chamber, *c*<sup>1</sup>, the said chamber receiving that portion of the steam which escapes upward.

In the operation of my improved valve, when used in connection with the apparatus shown and described in application Serial No. 176,371, the valve will occupy the position shown in Fig. 1—that is, with the steam-ports *r* and *r*<sup>1</sup> closed and the exhaust-ports *r*<sup>2</sup> open, one of the pins moved by the clock being supposed to be in a depression of the code-cam as therein described, thus allowing a spring, *g*<sup>1</sup>, to raise the valve into the position herein shown. When one of the pins referred to engages a projection of the code-cam, the valve-piston herein described will be depressed from the po-

sition shown in Fig. 1 far enough to place the ports  $r$  and  $r'$  of the said valve-piston into position to register with the perforations of the wall  $a$  and the sleeve  $a^2$ , the exhaust-ports  $r^2$  being then closed. With the valve-ports in the last-mentioned position the steam enters the valve shell or case at the end 3 and passes through the inlet-ports  $r$  and out by the outlet-ports  $r'$  and the end or arm 1 to the piston-cylinder, to operate the piston therein, as described in the said application. When the said valve is raised by the spring  $g'$ , common to the said application, the ports  $r$  and  $r'$  are raised out of line with the co-operating perforations of the wall  $a$  and the sleeve  $a^2$ , and the exhaust-ports  $r^2$  are placed in line with their co-operating perforations of the said wall and sleeve, thus allowing the steam to exhaust through the said exhaust-ports into the pipe  $a^b$ . That portion of the steam which passes upward is received in the chamber  $c'$ , from whence it finds its way to the exhaust-pipe  $a^b$

through the channel  $b^3$  and pipe  $r^4$ , thus preventing escape of steam into the room.

It is obvious that my valve, with slight modifications in the manner of connecting the same, is adapted to be used wherever a simple and efficient valve is required.

I claim—

In a valve, a valve shell or case having a perforated inner wall,  $a$ , and a perforated sleeve,  $a^2$ , inserted in the said wall, combined with a chambered nut or cap, and with a tubular valve-piston provided with ports  $r$   $r'$   $r^2$ , and a pipe or passage,  $r^4$ , to operate substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

J. H. CROSBY.

Witnesses:

E. W. BURDETT,  
J. H. CHURCHILL.