

G. H. CROSBY.
Safety-Valve.

No. 160,167

Patented Feb. 23, 1875.

Fig. 1.

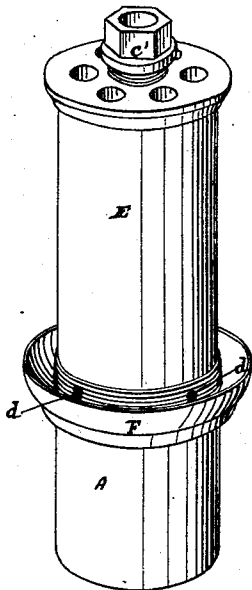


Fig. 2.

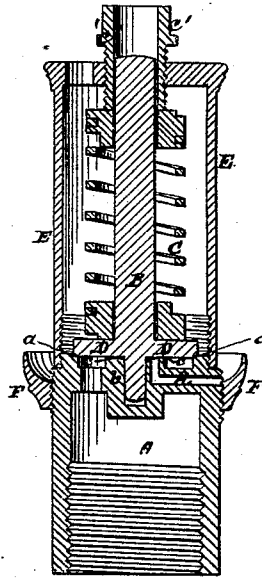
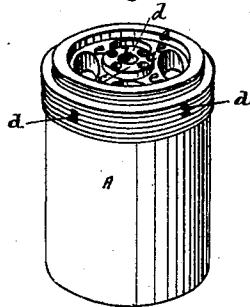


Fig. 3.



Witnesses.

Evell A. Sick,
John Raymond

Inventor.

Geo. H. Crosby by
attys Pollock & Bailey

UNITED STATES PATENT OFFICE.

GEORGE H. CROSBY, OF SOMERVILLE, MASSACHUSETTS.

IMPROVEMENT IN SAFETY-VALVES.

Specification forming part of Letters Patent No. **160,167**, dated February 23, 1875; application filed February 2, 1875.

To all whom it may concern:

Be it known that I, GEORGE H. CROSBY, of the city of Somerville, county of Middlesex, State of Massachusetts, have invented certain new and useful Improvements in Safety-Valves, of which the following is a specification:

This invention is directed to safety-valves in which, after the main valve is raised, the initial pressure requisite for that purpose is increased more or less, as desired, by a differential pressure, which will prevent the valve from closing until the pressure in the boiler has decreased to a point considerably below that at which the valve opened. This differential pressure is obtained by means of an auxiliary steam-discharge, opened for escape of steam by the lifting of the main valve, and provided with outlets adjustable in size with relation to the steam-inlet of said discharge. Such a valve is described and claimed in my Letters Patent dated January 26, 1875, and my present invention is an improvement on said valve.

My improvements can best be explained and understood by reference to the accompanying drawing, in which—

Figure 1 is a perspective view of a safety-valve embodying my improvements. Fig. 2 is a vertical central section of the same. Fig. 3 is a perspective view of the shell and valve-seat, uncovered.

A is the shell, of ordinary construction, except in the particulars hereinafter noted, formed at top with valve-seat *a*, and center-bearing *b*, for the valve-spindle B, which is compassed by the spring C. The spring bears against the valve D below, and the compressing-nut *c'*, above. This nut is hollow, for the passage of the upper end of the valve, and screws in the perforated head of a cylinder, E, which at its lower end screws on the valve-shell, as shown in Fig. 2. In lieu of the cylinder E, the spring may be held and the spindle guided by a cross-head, adjustable on standards rising from the valve-shell, in the usual way. The boss in which the bearing *b* of the valve-spindle is formed has an upper face, *c*, which, when the valve is down, is covered by and in contact with said valve. From the upper face of the boss extend passages *d*,

through the supporting-arms *e* of said boss, and out through the shell A, as seen in Fig. 2. Steam entering these passages from the upper face of the boss will pass through said passages and out from the side of the shell. The size of the outlets in the side of the shell can be controlled in various ways; in this instance, by an encompassing internally screw-threaded sleeve, F, engaging a screw-thread on the exterior of the shell. By the movement of this sleeve the outlets can be more or less closed, as desired. The sleeve is of cup shape, or has an upturned annular flange, which directs upward the escaping steam.

The boss, with its auxiliary steam-discharge, answers to the supplemental chamber and its outlets described in my aforesaid Letters Patent.

When the valve rests upon this boss, the steam-passages therein are closed, and the area of the valve upon which the initial pressure of steam exerts itself is reduced proportionately to the surface covered by the boss. When this initial pressure is sufficient to open the valve, the area of the valve exposed to the steam action is increased; but at the same time an additional and auxiliary steam-escape is also brought into play, and the difference in size between the outer and inner ends of the steam-passages constituting said escape, will determine the degree of differential pressure which will be exerted on the valve, in addition to the pressure available to raise the valve in the first instance.

The valve arrangement described is advantageous in that I use but one valve for the two purposes of controlling the main discharge and the auxiliary escape, the flat under face of the valve resting on and covering the upper face of the boss. This reduces the expense of manufacture, and simplifies the construction. I find, also, that the valve will, when thus arranged, open more readily.

Having now described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. The boss for auxiliary steam-escape, in combination with the main valve, which, when in position on its seat, rests on top of, and in contact with, the upper face of said boss, and

covers the steam-inlet therein, substantially as shown and set forth.

2. In combination with the auxiliary steam-escape passages opening out from the side of the valve-shell, the adjustable sleeve encompassing said shell, and operating to regulate the size of the outlets, substantially as shown and described.

3. The sleeve encompassing and adjustable upon the valve-shell, and provided with an upturned flange or rim, which directs upward the steam escaping from the lateral openings in the shell, substantially as shown and set forth.

4. The combination of the valve-shell, valve, central boss, auxiliary steam-escape passages, and means for increasing or decreasing at pleasure the sizes of the outlet ends of said passages, under the arrangement and for operation as shown and set forth.

In testimony whereof I have hereunto signed my name this 30th day of January, A. D. 1875.

G. H. CROSBY.

Witnesses:

LYMAN B. MESTON,
SAML. W. CLIFFORD, Jr.

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