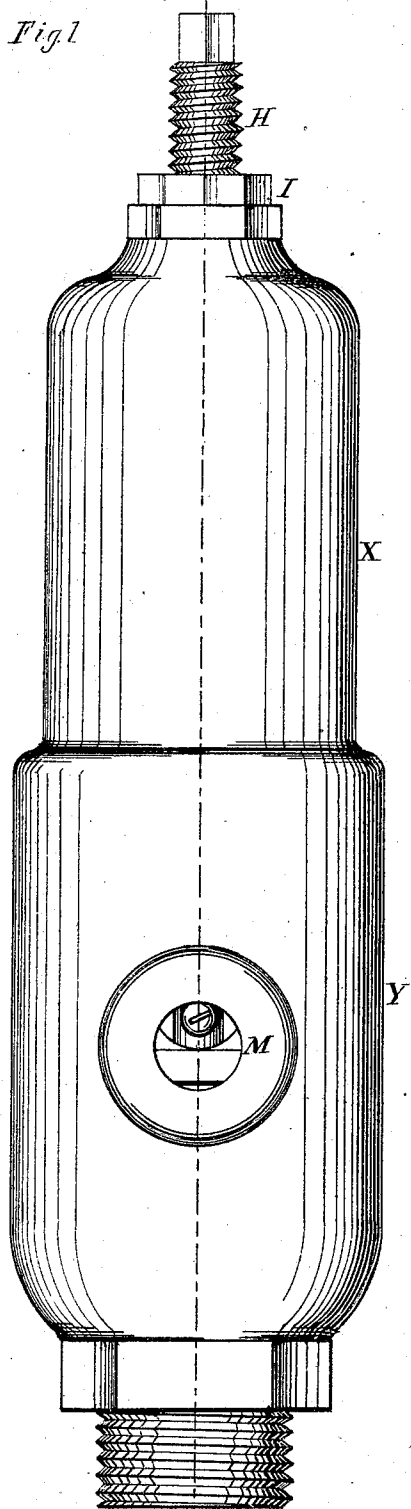


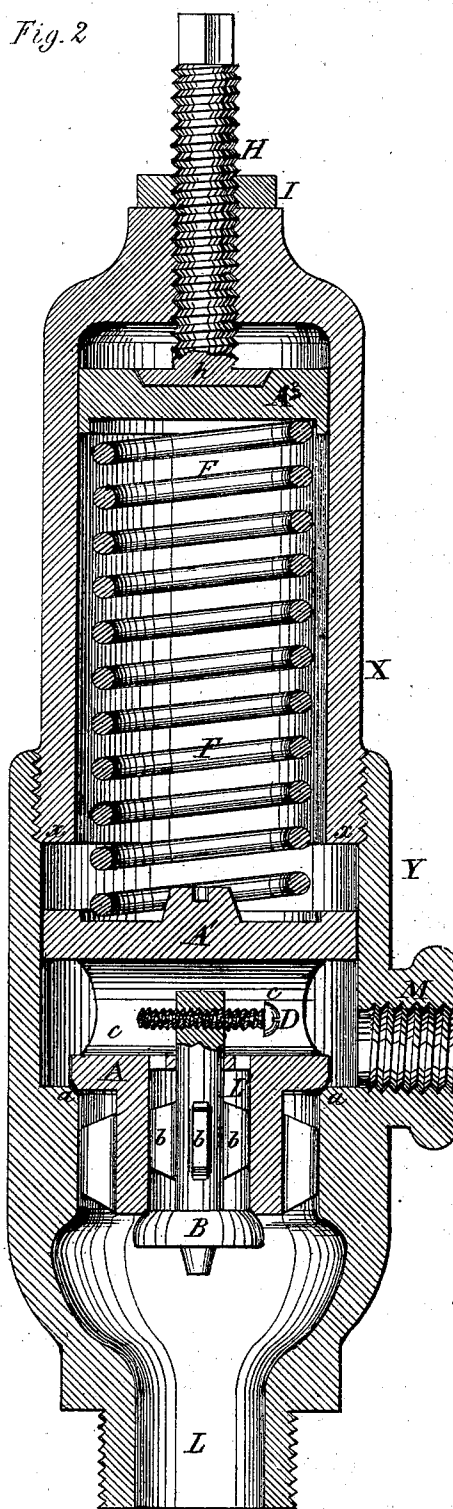
GEORGE HIBBERD.
 Improvement in Safety and Vacuum Valves.
 No. 120,519. Patented Oct. 31, 1871.

Fig. 1



Witnesses.
 Jas L Ewin
 Walter Allen

Fig. 2



Inventor.
 Geo. Hibberd
 By *Amos*

UNITED STATES PATENT OFFICE.

GEORGE HIBBERD, OF WHEELING, WEST VIRGINIA.

IMPROVEMENT IN SAFETY-AND-VACUUM VALVES.

Specification forming part of Letters Patent No. 120,519, dated October 31, 1871.

To all whom it may concern:

Be it known that I, GEORGE HIBBERD, of Wheeling, in the county of Ohio and State of West Virginia, have invented a new and Improved Automatic Safety-and-Vacuum Valve, of which the following is a specification:

My invention is more particularly designed for application to kitchen, bath, and other similar boilers supplied with water under a head of pressure and not intended to be subjected to great steam pressure. It comprises a valve so adjusted by means of a spiral spring as to yield to any excess of pressure within the boiler, and a vacuum-valve arranged within the said steam-pressure valve, and kept in closed position by the boiler-pressure under ordinary circumstances, being forced open by atmospheric pressure when this exceeds the interior pressure, so as to prevent collapse, the whole being inclosed in a vertical case.

Figure 1 is an elevation of the valve. Fig. 2 is a central vertical section of the same partly in elevation.

X is the upper cylinder of the casing, which screws within the lower part Y thereof so as to form a shoulder, *x'*, preventing the too great upward motion of the valve A. F is a vertical spiral spring, and A¹ A² flanged disks receiving the ends of the same. The upper disk A², by means of a screw, H, working through the upper part of the casing, is caused to compress the spring F sufficiently to resist any required pressure. The lower is formed on the valve A. *h* is a swiveled disk fitting in a corresponding cavity in the disk A², and forming the bearing-surface of the screw H. This screw, when the proper compression of the spring F is attained, is secured by a lock-nut, I. The steam-pressure valve A, when in normal position, rests on the seat *a* near the lower part of the valve-case Y, and has a central tubular opening, L', which, when the boiler is in operation, is closed by the vacuum-valve B, which is provided with wings *b* to act as guides, and has a pin or screw, D, to limit its downward motion. *c c* is a transverse opening, admitting air to the vacuum-valve, and allowing the insertion and removal of the pin D.

The valve-seats have small bearings, and the bearing-surfaces of the valves are rounded. M is a neck, with the threaded opening for receiving a pipe to admit air and carry off any steam or water which may escape; and L the neck by which the apparatus is connected to the boiler.

The spring F is compressed, by means of the screw H, so as to exert a pressure on the valve A somewhat exceeding—say, by from five to ten pounds—the interior boiler-pressure caused by the head of water, the lock-nut I serving to prevent disturbance of the adjustment. In case the internal pressure exceeds that to which the valve has been adjusted, this increased pressure, acting on the under surface of the valve A and overcoming the resistance of the spring F, will force the valve up, driving out through the opening M the steam or hot water until the upward and downward pressures balance each other, when the valve will be automatically closed. If from any cause a partial vacuum should be formed within the boiler the pressure of the atmosphere through the openings M L' on the valve B will force said valve downward until arrested by the pin D, allowing air to enter until an equilibrium is restored. I propose to form below the valve-seat an additional neck for communication with the boiler.

I claim as my invention—

1. The combination and relative arrangement of the connected valves A B, transverse opening *c*, transverse neck M, and pin D, to admit of the ready attachment or removal of the valve B, as herein set forth.

2. The valve A A¹, cylinder X, and casing Y, constructed and arranged as herein shown, so that the shoulder *x* at the lower end of the cylinder X will constitute a permanent stop to limit the upward motion of the valve, in combination with the adjusting-screw H to graduate the pressure upon the valve without changing the position of the stop *x*.

GEORGE HIBBERD.

Witnesses:

JOHN B. FARMER,
JAMES BODTRY.

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