(No Model.)

A. LOHBILLER.

SAFETY VALVE.

No. 440,315. Patented Nov. 11, 1890.

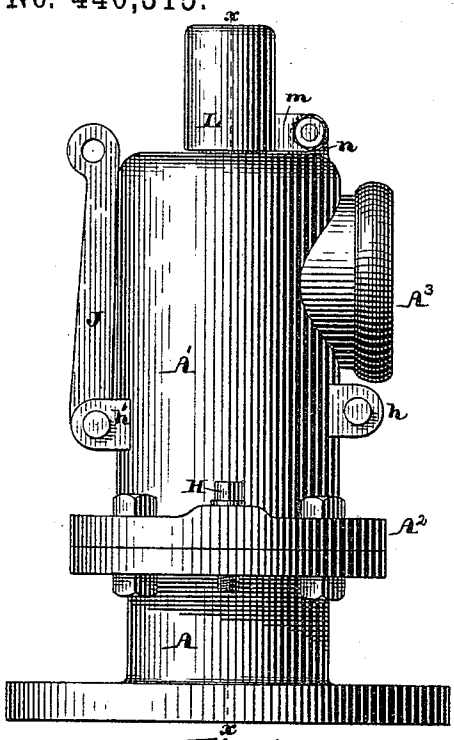


Fig. 1.

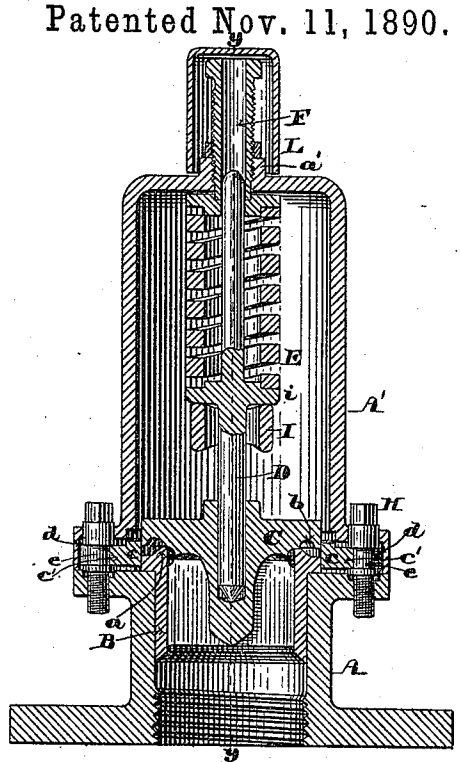


Fig. 2.

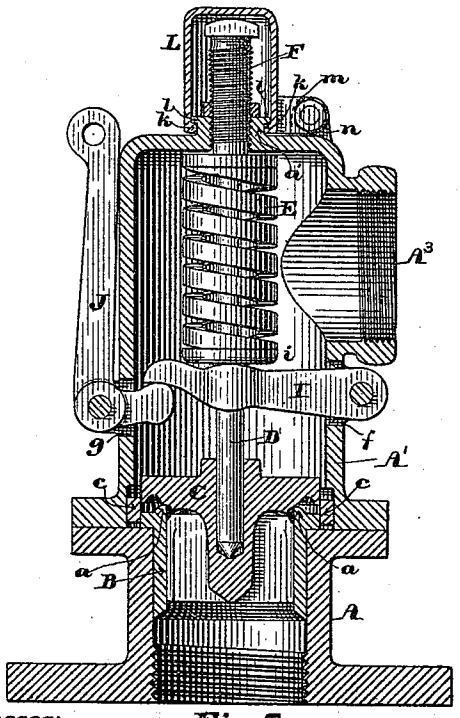


Fig. 3.

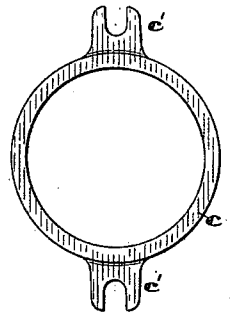


Fig. 4.



Fig. 5.

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UNITED STATES PATENT OFFICE.

ANTON LOHBILLER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE AMERICAN STEAM GAGE COMPANY, OF SAME PLACE.

SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 440,315, dated November 11, 1890.

Application filed July 15, 1890. Serial No. 358,812. (No model.)

To all whom it may concern:

Be it known that I, ANTON LOHBILLER, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Safety-Valves, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to safety-valves, and to that particular class of safety-valves which are known as "lock-up" safety-valves; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the drawings, and to the claims hereinafter given, and in which my invention is clearly pointed out.

Figure 1 of the drawings is an elevation of a safety-valve embodying my invention. Fig. 2 is a vertical section on line x x on Fig. 1, with portions of the valve-spindle shown in elevation. Fig. 3 is a vertical section on line y y on Fig. 2, with the valve-spindle, spring, spring-adjusting screw, and the levers for lifting the spindle shown in elevation. Fig. 4 is a plan of the adjustable ring for regulating the escape of steam when the valve is lifted, and Fig. 5 is an edge view of the same.

In the drawings, A is the base or lower section of the casing, in the center of which is firmly secured the flanged bushing B, upon the upper end of which is formed the raised annular seat a.

C is the valve fitted to said seat and provided with the usual guide-ribs to fit the interior of the bushing B, and provided on its under side near its periphery with the annular groove b, of a well-known construction, the exterior diameter of said valve corresponding to the diameter of the flange of the seat-supporting bushing B, as shown in Figs. 2 and 3.

Surrounding the flange of the bushing B and the valve C is fitted the annular ring c, so as to be freely movable vertically without rotation about the axis of said valve, and provided at opposite sides with two slotted ears c' c', as shown in Figs. 4 and 5.

A′ is the upper casing bolted to the base or lower casing A so as to inclose the valve-spindle D and spring E, and has fitted to a threaded opening in its upper end the tubular screw F, in which the upper end of the spindle D has a bearing, said screw serving as a means of adjusting the tension of the spring E in a well-known manner. The flange A^2 of the casing A′ is increased in thickness on two opposite sides, as shown in Fig. 1, and has formed in the under sides of said thickened portions two recesses or pockets d d, into which the ears c' c' of the ring c project, as shown in Fig. 2.

Two studs H H, each provided with a circumferential groove e to receive a forked ear c' of the ring c, and having one end portion threaded and the opposite end fitted to receive a wrench or other means of rotating the same, are screwed into the base A and project upward through holes in the flange of the casing A′, as shown in Figs. 1 and 2.

The casing A′ is provided with the branch outlet-pipe A^3 and two slots f and g in opposite sides of its vertical wall and with outwardly-projecting ears h and h', as shown. To the ears h is pivoted the lever I, having near its inner end an opening for the passage of the spindle D, and constructed and arranged to bear at each side of said opening against the under side of the collar i, secured to or formed in one piece with said spindle, as shown in Figs. 2 and 3. To the ears h' is pivoted the elbow-lever J, the short arm of which engages with the under side of the lever I at its inner end, as shown in Fig. 3, and serves as a means of removing the pressure of the spring from the valve by hand when it is desired to have the valve blow off before the limit of pressure at which it is set to blow off is reached.

L is a cap to inclose the set-screw F, the same being provided on opposite sides at its lower end with two inwardly-projecting segmental lips k k, which engage with the under sides of two similar lips l l, projecting outward from the hub a', surrounding the screw F, and also provided with the ear m, which may be bolted or secured by a padlock to the ear n, cast upon and projecting upward from the upper end of the casing A′, as shown in Figs. 1 and 3, partly in dotted lines.

The lower end of the spindle D is stepped in the socket of the valve C in a well-known manner.

I am aware that valves having annular grooves in their under sides have been used in combination with adjustable wings or flanges for regulating the opening for the escape of steam when the valve is lifted, and therefore I do not claim, broadly, such a combination; but so far as I am aware such regulating ring or flange has been constructed and arranged to be adjusted to a higher or lower level by rotating it about the axis of the valve, and in order to adjust it the outer casing had to be revolved about its axis in the case of the flange being formed upon the inner surface of the casing, or said casing had to be removed in the case of the ring being screwed upon the valve seat or base in order to give access to the ring for revolving the same. Both of these constructions are objectionable, the first because the upper casing, which usually carries the levers for operating the valve, should always remain in the same position in order that the lever may be operated from a given standpoint by pulling a cord, and this could not be done if the casing was revolved about its axis, unless at each adjustment the casing was given an entire revolution, which would be entirely impractical, and the raising or lowering of said casing would diminish or increase the tension of the spring, and thus materially affect the pressure at which the valve would blow off. The second form of construction is objectionable because of the fact that in order to remove the upper casing to adjust the ring, steam has to be shut off from the safety-valve, and when the ring has been adjusted and the casing has been replaced and steam-pressure admitted to the valve, if the adjustment is found to be unsatisfactory the casing has to be again removed and the ring be again adjusted, and perhaps this may have to be repeated several times before the proper adjustment is obtained, so that the valve will close after blowing off before the pressure is reduced too low.

I am aware that a valve has been used in combination with a ring screwed to the valve seat or bushing and provided with teeth in its periphery in combination with a casing having an opening in its side opposite said ring, which opening is closed by a plug, and when it is desired to adjust said ring the plug must be removed from said opening, and the ring is then adjusted by introducing a pointed implement through said opening to engage with the teeth on said ring and serve as a lever to move said ring about its axis; but this has been found to be unreliable, for the reason that the threads corrode or become gummed up, so that any tool that can be inserted in the opening in said casing to engage with the teeth on the ring would be inadequate to move the ring. By my invention these objections are entirely overcome. The ring can be adjusted and readjusted as many times as may be desired without shutting off steam or removing any parts of the valve. The ring is not fitted so close to the valve or seat-flange as to be liable to become stuck thereto; but if that were possible the means of moving it are such that there never would be any trouble about its being readily adjusted by means of the screw-studs H H.

Another advantage of my construction is that the studs H H serve the double purpose of adjusting the ring *c* and a means of registering the upper casing centrally upon the base as their upper portions are turned to fit accurately-reamed holes in the flange A^2.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination, in a safety-valve, of a valve provided in its under side with an annular groove, a seat-bushing having a flange of the same diameter as the valve, an adjustable ring surrounding said valve and seat-flange without being connected to either, and circumferentially-grooved screw-studs for raising or depressing said ring to regulate the opening for the escape of steam and the time of closing said valve after blowing off.

2. In combination with the base A, the seat *a*, and the valve C, the ring *c*, provided with the slotted ears *c′ c′*, the casing A′, provided with the recesses *d d*, reamed holes through its flange above said recesses, and the circumferentially-grooved screw-studs H H, set in threaded holes in the base A and serving the double purpose of adjusting said ring *c* and registering the casing A′ centrally upon the base A, substantially as described.

3. The combination of the base A, the flanged bushing D, having formed thereon the seat *a*, the valve C, provided with the groove *b* and having a diameter corresponding to the diameter of the flange of the bushing D, the ring *c*, provided with the slotted ears *c′ c′* and arranged to surround said valve and set-flange without being connected to either, the casing A, provided with recesses *d d* to receive the ears *c′ c′* of the ring *c*, and the grooved screw-studs H H, set in threaded holes in the base A, engaging by their grooves the slotted ears *c′ c′* and projecting through and above the flange A^2 of the casing, substantially as and for the purposes described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 9th day of July, A. D. 1890.

ANTON LOHBILLER.

Witnesses:
N. C. LOMBARD,
WALTER E. LOMBARD.