

*N<sup>o</sup> 78,781.*

*Patented June 9, 1868.*

*Fig. 1.*



Amstons To  
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# United States Patent Office.

THOMAS P. AKERS, OF NEW YORK, N. Y.

*Letters Patent No. 78,781, dated June 9, 1868.*

## IMPROVEMENT IN STEAM AND WATER-INDICATORS FOR BOILERS.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, THOMAS P. AKERS, of New York city, in the State of New York, have invented an Improved Boiler-Alarm; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application:

Figure 1 is an elevation of my improved alarm, showing the parts in position for sounding an alarm at either low water or high pressure of steam.

Figure 2 is a vertical central section of the improved alarm, together with a side view of the plate Z and the studs R, R', and S, to which the alarm is made fast.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of a low-water and high-pressure indicator for steam-boilers, in which the adjusting-parts are so constructed and arranged as to be locked in their adjusted position, independent of any covering or other surrounding devices, and in the combination of the parts composing it, together with the arrangement of the parts.

To enable others skilled in the art to make and use my improved boiler-alarm, I will proceed to describe its construction and operation.

In fig. 1, A represents a tube, which I propose to make of brass or any other suitable metal, and which should be about eighteen inches long. About the end of this tube is fitted a collar, *m*, which is provided with a base, *a* and *a'*, and made fast to the boiler by means of screws, which pass through the said base, as represented in fig. 1. On each side of the collar *m* there are jam-nuts to hold it firmly in its place. At the other end of the tube A is a collar, *n*, similar to *m*, which is large enough to permit the tube A to move forward and back through it, according as the tube expands or contracts. This collar, like *m*, is provided with a base, which is made fast to the plate Z, by means of screws, and is intended simply to act as a support and guide for the tube A. There is also fitted on the tube A, an annular collar, *w*, which is provided with an arm, H, jointed to the short arm of the lever I. The collar *w* is held in its place by jam-nuts on each side of it, as represented in the drawing.

The levers I and K are pivoted to the plate Z, by means of the studs R and R', which are fastened to the said plate Z by nuts tapped and screwed on behind; as represented in fig. 2. These levers, I and K, are connected by means of a bar, *z*, which is jointed thereto; as represented in fig. 1. The rod O has one of its ends jointed to the lever K at *p*, and its other end passes through the lever L, and is provided with a nut, T, which is tapped and screwed upon it. The nut T has eight recesses, and the end of the lever L is provided with a square hole, corresponding with these recesses, through which a bolt passes, and is fastened securely in its place by means of the lock V.

To the end of the tube A is attached an elbow, *g*, on the top of which is screwed what is usually called a T, (which in the drawing is marked C,) from which the connection with the boiler, above the line of high water, is made. In the part C is inserted, at the top, an ordinary steam-whistle, E. Above the steam-whistle E, and supported by the same standard, is a shell, F, containing a spiral spring, W, as shown in fig. 2. This spiral spring, W, rests on the nut X, which is tapped on the stem Y of the valve Y', and is compressed and held down by the cap G, which is tapped and screwed on to the shell F. The cap G is provided with recesses, as shown in fig. 1, and marked *g g g*. The whistle is provided with a valve, Y', which seats downward, as shown in fig. 2, and is kept closed by the spiral spring W. On the top of the stem Y of the valve Y' is screwed the part M, which is slotted so as to receive the lever L.

Above the cap G of the shell F, and enclosing the part M, is a ring or collar, N, which has in it a groove to match the slot in the part M, in which the lever L rests when in position. The ring or collar N is provided with a curved arm, which fits into the recesses *g g g* of the cap G, and passes down through an eye, *n'*, which is made fast in the whistle E. The lever L is perforated at L', so as to admit a cord, by pulling which the whistle may be sounded at any time. The head of the bolt U is made to fit into the recesses of the nut T, so that it cannot be screwed on or off when the bolt is in its place. The lever L has a joint at *r*, so constructed



as that the lever becomes rigid, when either end of it is depressed, but yields when the end L' is elevated.

The object of this invention is twofold. In the first place it affords certain and reliable means of indicating low water and high pressure of steam, and in the second place its mechanical construction is such that it cannot be tampered with or put out of order, when it is once adjusted and locked, without destroying some part of its mechanism.

Having explained the mechanical construction of my invention, a very few words will suffice to show its operation.

When the water in the boiler falls below the plane in which the tube A lies, the water in the tube will run into the boiler, and the tube will be filled with steam. The steam being of a greater heat than the water, the tube A will expand, and being held firmly in its place at one end, by the collar *m*, which is made fast to the boiler, it must of course expand in the other direction. This expansion will communicate motion to the short arm of the lever I, which motion will be multiplied in proportion to the relative lengths of the short and long arms, and transmitted first to the lever K, and thence to the lever L, which will open the valve of the whistle thus allowing the steam to escape and sound an alarm.

Again, when the steam-pressure upon the valve Y' exceeds the pressure of the spiral spring W, which act as before explained, upon the same valve in the reverse direction, the valve will again open, allowing the steam to escape and give an alarm, as before.

Finally, by elevating the end L' of the lever L, the valve may be opened, and the whistle sounded at any time.

What I claim as new, and desire to secure by Letters Patent, is—

1. A low-water and high-pressure indicator, in which the adjusting-parts are so constructed and arranged as to be locked in their adjusted position, independent of any covering or other surrounding devices, substantially in the manner shown and described.
2. The combination of the expansible tube A, with the levers I and K, the jointed lever L, and the part M, together with their connections and fastenings, substantially as and for the purpose set forth.
3. The combination of the inverted valve Y', the valve-stem Y, the nut X, the cap G, the spiral spring W, and the whistle E, substantially as shown and described.
4. The tube A, and the levers I, K, and L, with their connections and fastenings, when combined with the inverted valve Y', the valve-stem Y, the nut X, the cap G, and the spiral spring W, whereby to produce the double effect of indicating low water and excessive pressure of steam, substantially as herein set forth.

In witness whereof, I hereto set my hand, this 22d day of May, A. D. 1868.

THOS. P. AKERS.

Witnesses:

JOHN C. ANDERSON,  
P. D. RODDEY.