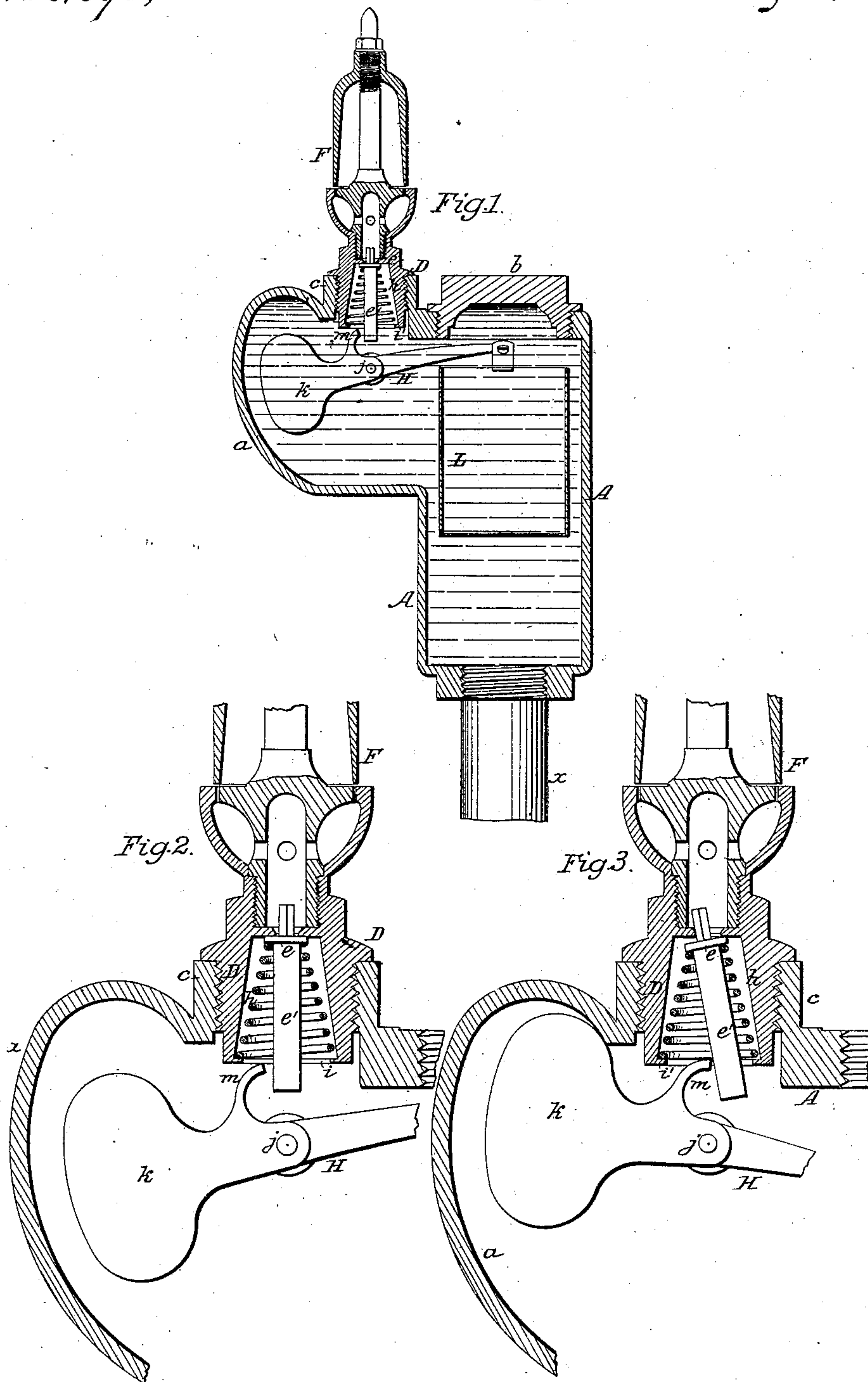


*C. S. Watson,*  
*Steam Boiler Indicator,*  
*No 103,690,* *Patented May 31, 1870.*



Witnesses.  
*Wm. A. Steel.*  
*Geo. B. Harding.*

Inventor.  
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# United States Patent Office.

CHARLES S. WATSON, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 103,690, dated May 31, 1870; antedated January 29, 1870.

## IMPROVEMENT IN LOW-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, CHARLES S. WATSON, of Philadelphia, Pennsylvania, have invented an Improved Low-Water Indicator for Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention consists of a low-water indicator for steam-generators, constructed and operating as fully described hereafter, and connected to the boiler by a single tube, instead of by two tubes, as in most apparatus of this class; it not being necessary to attach it to the head of the boiler, as usual, as it can be arranged at any convenient point adjacent to or at a distance from the boiler, and even, if desirable, in a separate apartment.

In order to enable others skilled in the art to make and apply my invention, I will now proceed to describe its construction and operation, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a sectional view of my improved low-water indicator for steam-boilers, and

Figures 2 and 3, detached views of the same, drawn to an enlarged scale.

A represents a cylindrical metal casing, closed at the top by a screw-plug, *b*, and connected, at its lower end, to a tube, X, (shown by red lines, fig. 1,) which communicates with a steam-generator, and projects downward into the same to the low-water line.

At one side of this casing is a hollow projection, *a*, having, at the top, a threaded branch, *c*, into which is screwed a plug, D, formed at the lower end of a steam-whistle, F, of ordinary construction, the plug D being recessed, for the reception of a valve, *e*, adapted to a seat, *f*, and retained in its seat by means of a conical spring, *h*, which rests upon a ledge, *i*, of the plug, and bears against the under side of the said valve.

The valve *e* is provided with a stem, *e'*, which projects below the lower end of the plug D; and to a pin, *j*, at a point beneath this valve-stem, is hung a lever, H, connected at one end to a sheet-metal cup, L, open at the top, while at its opposite end there is an enlargement, *k*, of sufficient weight to counterbalance and raise the said cup, as seen in fig. 1.

The lever H is provided with a lug or dog, *m*, which, as long as the cup L remains elevated, is free from contact with the valve-stem *e'*, but which, when the said cup descends, is arranged to strike and turn the valve-stem laterally, as shown in fig. 3, slightly compressing the spring *h*, and opening the valve *e* sufficiently to permit steam to pass, between

the same and its seat, to the whistle, as will be hereafter described.

The operation of the apparatus is as follows:

When the water is at a proper height in the boiler, the lower open end of the tube X is submerged in the same, and the water, owing to the pressure within the boiler, fills the said tube, as well as the whole interior of the indicating apparatus, as seen in fig. 1.

So long as the apparatus remains thus filled with water, the weight *k* will maintain the cup L in an elevated position, and the lug *m* free from contact with the valve-stem *e'*; but, should the water in the boiler descend to a point below the end of the tube X, steam will enter the latter, and will pass upward through the same into the apparatus, the water, as it is displaced, returning, through the tube X, into the boiler.

The cup L will, however, remain filled with water, and this addition to its weight will enable it to counterbalance the weight *k*, and to descend and turn the lever H to such an extent that the lug *m* shall strike and turn the valve-stem *e'*, thus causing the valve *e* to be opened sufficiently to permit steam to pass into and blow the whistle F, and warning the attendant of the low condition of the water in the boiler.

On replenishing the boiler, the pressure of steam will again cause the water to rise through the tube X, and fill the apparatus, the steam within the latter either becoming condensed, or passing off through the whistle F, until the valve *e* is closed, on the releasing of the stem by the falling of the weight *k* and corresponding rising of the cup L.

In apparatus of this class, as heretofore constructed, it has been customary to have two points of communication with the boiler, in order that the water admitted into the apparatus may be maintained at precisely the same level as that within the boiler.

It is essential, also, that such apparatus should be placed at a point level with and adjacent to the boiler, which requirements render their use, in many instances, extremely inconvenient.

This objection I have overcome entirely in my improved indicator by having but one point of connection with the boiler, namely: through the tube X, which plan enables me to place the apparatus at any convenient point, either adjacent to or remote from the boiler, and even, if desired, in a separate apartment.

Among the other advantageous features of my improvement may be mentioned its simplicity and its regular automatic action.

Inasmuch as the stem of the valve *e* is in a ver-

tical position, the valve is not liable to be drawn from its seat, as is the case when the stem is inclined or horizontal.

I claim as my invention, and desire to secure by Letters Patent—

1. The cup or vessel L, lever H weighted at one end, valve *e*, and casing A, combined and arranged substantially as herein described.

2. The casing A, with its projections *a* and *c*, and

detachable cap *b*, adapted for the reception of the lever, cup and valve, substantially as specified.

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

CHAS. S. WATSON.

Witnesses:

HARRY SMITH,  
JOHN A. HURLEY.