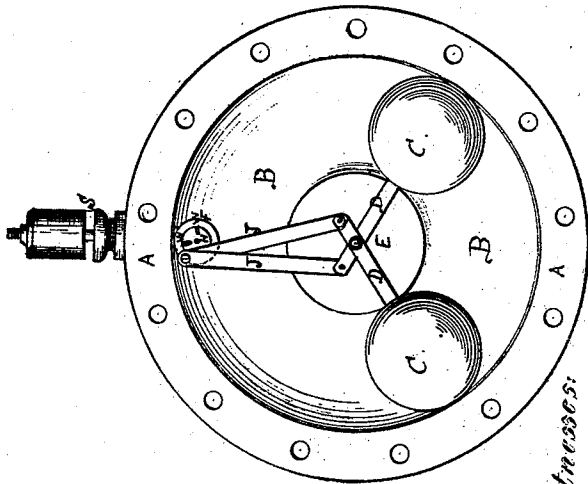
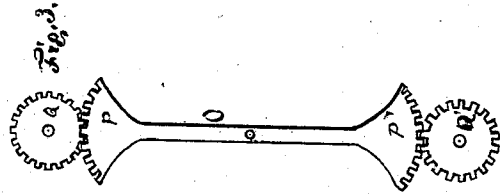
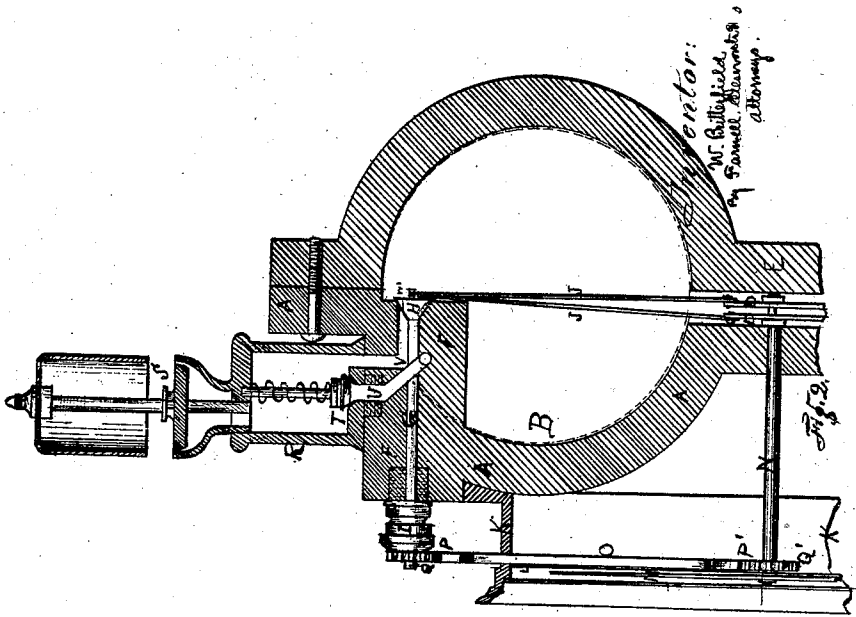


W. Butterfield,

Steam Indicator.

No. 104265.

Patented June 14, 1870.



Witnesses:
G. H. Frost
L. R. Darwell.

United States Patent Office.

WILLIAM BUTTERFIELD, OF MADISON, WISCONSIN, ASSIGNOR TO HIMSELF AND WILLIAM H. WORDEN, OF SAME PLACE.

Letters Patent No. 104,265, dated June 14, 1870.

HIGH AND LOW-WATER INDICATOR.

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, WILLIAM BUTTERFIELD, of Madison, in the county of Dane and State of Wisconsin, have invented a new and useful High and Low-water Indicator and Steam-Alarm; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawing forming part of this specification.

Figure 1 is a side elevation of my improved indicator, the rear portion of the case being removed to show the interior.

Figure 2 is a transverse vertical section of the same, in the line *x x*, fig. 1.

Figure 3 is a detached plan view of the lever and pinions by which the index-finger of the register is operated.

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

My invention consists—

First, in the combination of parts with the rotary valve, whereby the height of the water in the boiler is indicated upon a register, while the valve simultaneously permits the escape of steam to a whistle to denote a high or low stage of water.

Secondly, in the combination of two floats, and their levers and connecting-arms, with the case and the slotted valve, for the purpose of rendering the valve more sensitive and perfect in its operation.

Thirdly, in the peculiar construction of the case of the indicator to receive the valves and steam-ports within a small space, and whereby two floats are employed within a small compass to operate the valve, for determining the height of water in the boiler.

Lastly, in the arrangement of parts of the device to be hereinafter more fully described.

In the accompanying drawing—

A is the metallic case or shell of my improved indicator, secured to a steam-boiler in such a manner as to communicate with the water and steam-space of the same.

The shell A is constructed in two parts, so formed that when secured together, an annular space, B, is formed between them, as shown in fig. 1.

C C are spherical floats, of a size corresponding to the annular space B, and pivoted by the arms D, which cross each other, to the center E of the shell, as shown.

F is a boss cast in the upper portion of the shell, and projecting into the annular space B.

This boss is perforated centrally to receive the stem G of the valve H.

The valve-stem passes outward through the boss, and through a nut, I, attached to the outer face of the same.

The valve H upon the inner end of the stem is connected eccentrically to the two crossed arms D, by means of the pivoted connecting-rods J, and is consequently rotated within its seat as the floats rise and fall.

K is the register shown in section, fig. 2, provided with the graduated dial L and index-finger M, in the usual manner, the latter being hung upon the central shaft N.

O is a lever extending within the register, and pivoted to the upper side of the same.

It is provided upon its ends with segmental racks P P', engaging with pinions Q Q', secured respectively to the valve-stem G, and shaft of the index-finger.

R is a valve-chamber attached to the upper side of the boss F, upon the outside of the shell, and carrying the steam-whistle S.

This chamber contains the spring valve T having its seat in the upper end of the steam-port U, which port extends through the boss and communicates with the annular space B.

V is a second steam-port, also communicating with the valve-chamber, but entering the latter upon one side of the valve T.

The operation is as follows:

As the floats D are raised and lowered by the water in the space B, the valve H and its stem are rotated and communicate motion to the index-finger of the register through the medium of the pinions and rack-bar previously described.

By this arrangement, the height of the water is at all times accurately measured upon the dial.

If, however, the water rises too high within the boiler, the valve H is turned until the radial port W therein registers with the port V in the boss, when the steam escapes from the annular space B through the valve-chamber and blows the whistle.

A low stage of water is determined in a similar manner, that is to say, when the floats fall, the radial port W' in the valve registers with the port V, and the steam escapes to the whistle.

It will of course be understood that the high or low stage of the water, when the whistle is blown, is recorded upon the dial by the index-finger.

When the pressure of steam within the boiler exceeds the proper amount, it raises the valve T, and escapes through the port U to the whistle.

By constructing the case with the two steam-ports arranged as previously described, opening directly into a common chamber containing the safety-valve, I do away with the necessity of separate pipes communicating from the boiler or exterior chamber with the whistle and safety-valve.

I do not claim broadly the use of a float to operate a disk-valve provided with two ports, one indicating

high and the other low water, as I am aware the same is not new.

Having thus described my invention,

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

1. The combination of the pivoted toothed bar O and pinions Q Q with the rotary valve H, and index-finger of the register, for the purpose specified.

2. The combination of the floats C C, pivoted arms D D, and connecting-rods J J, with the case A, and slotted valve H, as herein shown and described, for the purpose specified.

3. The shell A, constructed with the boss F, for the valves and ports, and with the annular space for the reception of the spherical floats, substantially as described and shown, for the purpose specified.

4. The arrangement, with relation to the case A, of the ports U V, valve-chamber R, and valves H T, as herein shown and described.

WILLIAM BUTTERFIELD.

Witnesses:

O. E. WOODBURY,
CARL SCHMID.