

F. Raynsford, 2. Sheets, Sheet. 1.

Indicator.

No. 108828.

Patented Nov. 1. 1870.

Fig. 1.

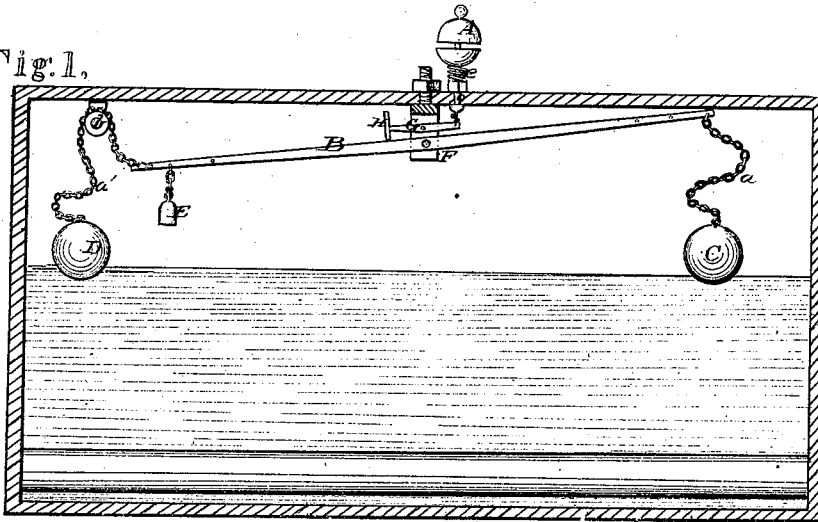
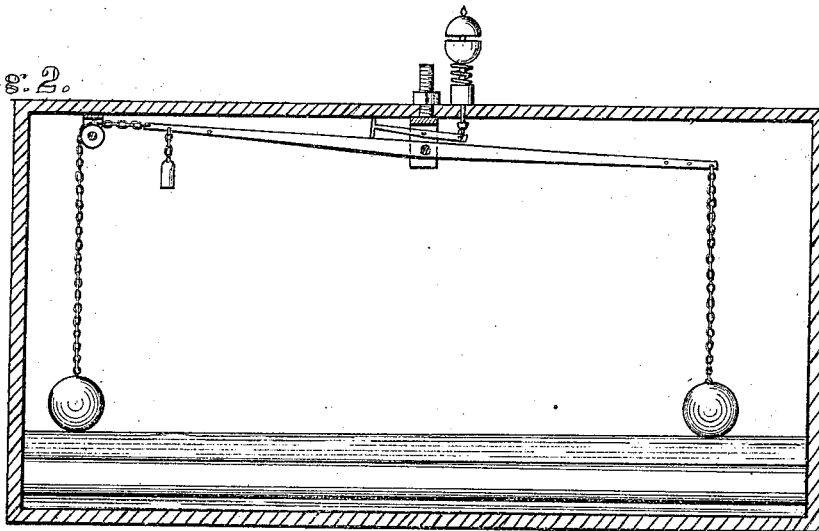


Fig. 2.



Witnesses.

E. W. Anderson

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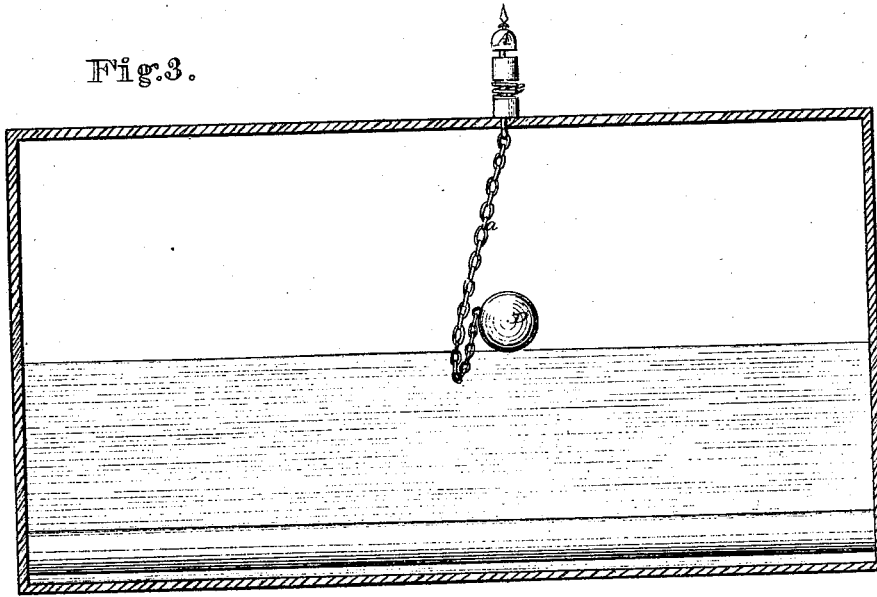
F. Raynsford, 2. Sheets, Sheet. 2.

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Fig. 3.



Witnesses.

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FREDERICK RAYNSFORD, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR TO HIMSELF AND C. L. BOUCHARD, OF SAME PLACE.

Letters Patent No. 108,828, dated November 1, 1870.

IMPROVEMENT IN LOW-WATER INDICATORS.

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, FREDERICK RAYNSFORD, of Grand Rapids, in the county of Kent and State of Michigan, have invented a new and valuable Improvement in Low-water Indicators for Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a central vertical section of my invention, showing the operation above low water.

Figure 2 is a similar sectional view, showing the position of the parts at or below the low-water line.

My invention relates to automatic alarms for indicating low water in steam-boilers, and consists, chiefly, in the construction and novel arrangement of devices, whereby the floats are attached to the valve-rod which opens the throttle of the alarm-whistle.

The letter A of the drawing designates a steam-whistle attached to the upper part of a steam-boiler.

B represents a long lever, to one end of which is attached a float, C, by means of a chain, *a*.

To the other end of the lever B a similar float, D, is attached by means of a chain, *a'*, passing over a pulley, *b*.

E represents a counterbalancing-weight, attached to that end of the lever B which should descend when the weight of the suspended floats is supported by the water in the boiler.

F represents a forked support secured to the upper part of the boiler.

The lever B is pivoted or hinged to this support or hanger, and immediately above it is pivoted to the same hanger a short lever, G.

The short arm of the lever G is attached to the end of the valve-rod *c*, which operates the throttle-valve of the steam-whistle.

This valve may be closed by means of a coiled

spring, *e*, or the long arm of the lever G may be weighted, to produce the same effect.

H is a stop attached to the long arm of the lever G, and designed to prevent the long arm of the lever B from rising above the pulley, and the valve-rod from being drawn downward more than may be necessary.

The valve-rod *c* and stop H may be attached directly to the lever B, and the lever G dispensed with.

The levers are employed and thus arranged to secure power and certainty of action. For the same reason, two floats are employed instead of one. But, when the power thus obtained is sufficient to open the valve, a single float may be employed, and it may be suspended from the valve-rod itself, as shown in Figure 3.

The chief object thus designed to be accomplished is to keep the valve-rod and its connections stationary until the low-water point is reached, and then to secure an immediate and certain opening of the throttle.

I do not claim an arrangement of floats and levers adapted to operate an alarm for the purpose of indicating the low-water point; but

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

1. In combination with the valve-rod *c*, operating the valve of an alarm-whistle, the coil-spring *e*, long lever B, pulley *b*, chains *a a'*, and floats C D, as specified.

2. In combination with the valve-rod *c*, closing the throttle when operated by the coil-spring *e* or weighted lever G, the combined float and weight C, suspended from the valve-rod by a chain, *a*, and arranged to operate as and for the purposes specified.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

FREDERICK RAYNSFORD.

Witnesses:

E. W. ANDERSON,
HENDERSON WILLARD.