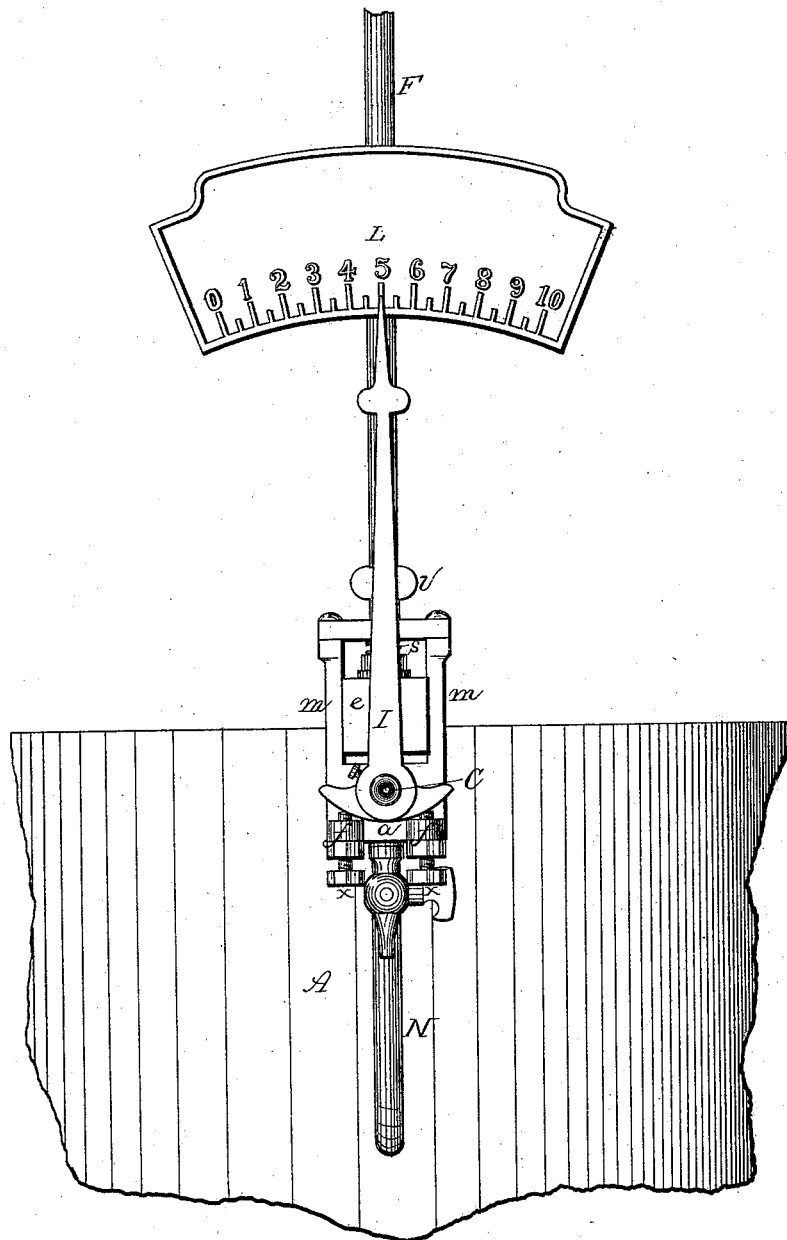


W. STARKEY.  
Indicator for Steam-Boilers.  
No. 217.245. Patented July 8, 1879.

Fig. 1.



Witnesses:

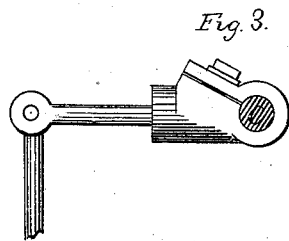
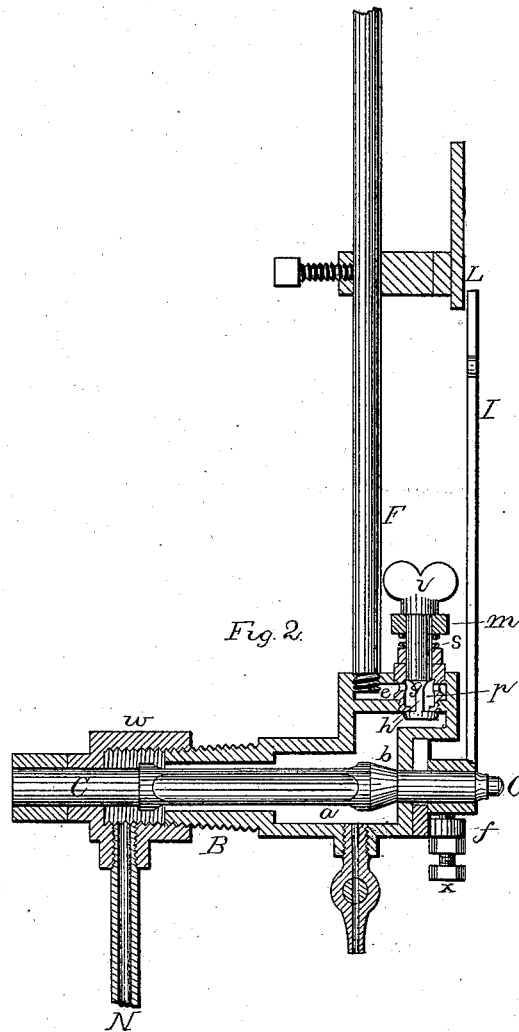
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*W. S. O'Connell.*

Inventor:

*Wm. Starkey.*  
*per*

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*att'y.*

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# UNITED STATES PATENT OFFICE.

WILLIAM STARKEY, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO J. GEARY LOGAN AND B. F. BOYD, OF SAME PLACE.

## IMPROVEMENT IN INDICATORS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **217,245**, dated July 8, 1879; application filed January 9, 1879.

### *To all whom it may concern:*

Be it known that I, WILLIAM STARKEY, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Indicators and High or Low Water Alarms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in water-indicators and signals; and it consists in an attachment of an apparatus to the outside of a steam-boiler, through which passes a partially-fluted oscillating shaft, having at its protruding end, within the boiler, a float, and on the other end an indicator, which, by the rising or falling of the float on the water within the boiler, constantly shows the status of the water, and also causes an alarm to be sounded by steam introduced through the fluted part of the shaft when the water has fallen below a certain point, as will be fully described hereinafter.

The accompanying drawings represent my invention.

Figure 1 is a side elevation of my invention. Fig. 2 is a vertical section, and Fig. 3 is a detail, of the same.

A represents a steam-boiler, and B the apparatus screwed into the boiler. Through the apparatus passes the shaft C, which shaft has on its protruding end, within the boiler, a float, D, by which, when rising or falling with the water, upon which it floats, an oscillating motion is communicated to the shaft C, so that the indicator I on its opposite end is moved to the right or left, and made to point to different grades on the scale L, according to the height of the water. The shaft C, to which the float is clamped, is partly fluted for the admission of steam into the chamber *a* through the steam-pipe N. At its passage out of the chamber *a* the shaft abruptly diminishes in diameter, and performs the function of a valve at *b*, seated in the wall of the chamber *a*, to prevent the escape of steam. On top of the chamber *a* is another smaller one, *e*, projecting over the former, and communicating there-

with by a passage in which a downward-opening valve, *h*, is seated. This valve forms the lower end of a partly-fluted stem, *g*, and is held in place by the upward pressure of the steam in chamber *a* below, and by the pressure of the spiral spring *s*, surrounding the stem *g*.

The chamber *p* within the chamber *e* is removable, and provided with openings for the passage of steam into the tube F when the valve is opened. The stem *g* passes through the upper cross-piece of a gate or frame, *m*, the sides of which, descending on both sides of the chest *e* and in front of the chamber *a*, are there united by another cross-piece under the protruding end of the shaft C. At the lower cross-piece of the gate *m* are two projections, *f*, through which pass set-screws *x*, to regulate the distance intervening between the foot of the indicator I and the gate *m*.

The foot of the indicator, which is firmly secured to the forward end of the shaft C, extends over both set-screws in the form of an arc, and presses upon the one or the other when the shaft is made to change its position by the rising or falling of the float within the boiler. When this occurs the pressure exerted upon one of the screws causes the gate *m* to be drawn downward, and with it the stem *g*, to which the valve *h* is attached, and through which the steam passes, giving the alarm.

The upper end of the indicator points to a number on the arched scale, and may be adjusted so that the slightest variation in the status of the water within the boiler, causing a vibration of the shaft, is thereby indicated. So long as the position of the indicator shows a sufficiency of water in the boiler, the foot of the indicator need not be in contact with the set-screws in the gate; but whenever the stage of the water sinks below the safety-line, the extended movement of the shaft causes the foot of the indicator to bear upon one of the screws, by which the valve *h* is opened and the alarm sounded. On top of the stem *g* a suitable handle, *v*, is affixed, for raising and turning the valve *h* in its seat to free it from impediments that may prevent its proper action, and under the chamber *a* a stop-cock is placed for clearing out the chamber by blowing off steam.

The graded scale L, bearing numbers and

marks, to which the indicator points, slides on the alarm-tube F, and may be raised or lowered.

The cap or sleeve *w*, screwed over the inner end of the apparatus, gives a bearing to the shaft, and the steam-pipe N introduces steam through it into the chamber *a* along the fluted part of the shaft C. This cap is placed here to prevent sediments of the foaming water from entering the chamber, and to securely hold the pipe N.

Having thus described my invention, I claim—

1. In a water-indicator, the steam-chambers *a*, *c*, and *p*, provided with a stop-cock, constructed and arranged substantially as described.

2. In a water-indicator, the valve-stem *g*, in combination with the valve *h*, handle *v*, spring *s*, and gate *m*, arranged substantially as set forth and described.

3. In a water-indicator, the gate *m*, with its projections *f*, in combination with the regulating-screws *x*, arranged substantially as shown and described.

4. In a water-indicator, the combination of the indicator I with the set-screws *x*, substantially as described.

5. In a water-indicator, the indicator I, attached to the forward end of the shaft C, in combination with a graded scale movably attached to the alarm-tube, whereby the scale can be adjusted up and down, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 21st day of October, 1878.

WILLIAM STARKEY.

Witnesses:

ALEX. C. HERRON,  
T. F. LEHMANN.