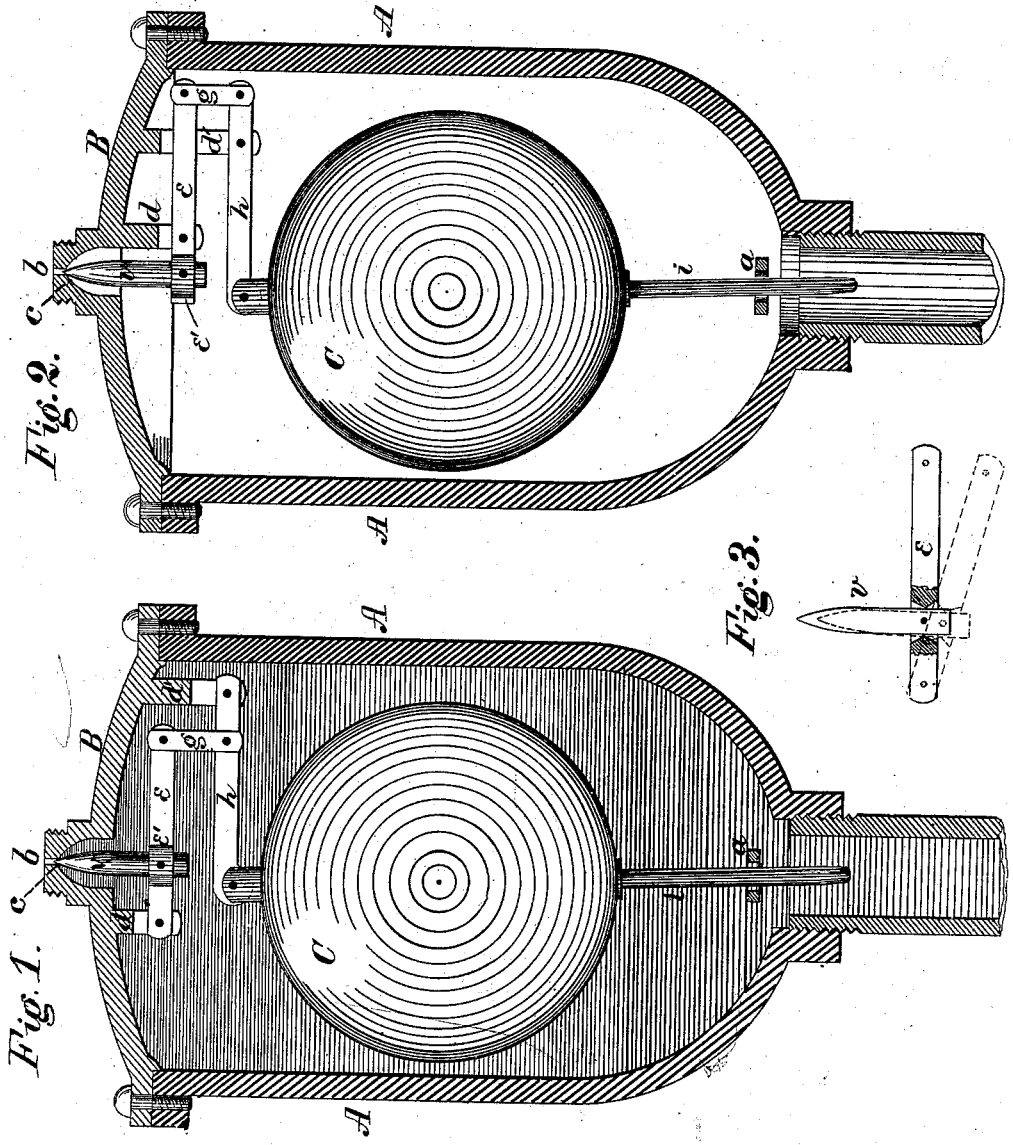
T. BINGHAM & T. J. McTIGHE.

Low Water Signal for Steam Boilers.

No. 201,588. Patented March 26, 1878.



Witnesses

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UNITED STATES PATENT OFFICE.

THOMAS BINGHAM AND THOMAS J. McTIGHE, OF PITTSBURG, PA.

IMPROVEMENT IN LOW-WATER SIGNALS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **201,588**, dated March 26, 1878; application filed June 21, 1877.

To all whom it may concern:

Be it known that we, THOMAS BINGHAM and THOMAS J. McTIGHE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Low-Water Signals for Steam-Boilers; and we 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, in which—

Figure 1 is a longitudinal vertical section, showing the hereinafter-described relation of the cap, the valve, and compound lever-connection with the float. Fig. 2 is a similar view, showing a modification in the arrangement or mutual relation of the levers.

This invention relates to low-water alarms or signals of that class in which a float inclosed in a chamber is, by the rise and fall of the water, caused to operate a valve leading to a steam-whistle; and it consists in connecting the valve and float by a system of compound levers in the hereinafter-described connection with the cap of the chamber, whereby the chamber-walls are free from all irregularities or resting-places for the mud and scale of steam-boilers.

In the drawings, A designates the casing or chamber, having cylindrical sides and rounded bottom, terminating in an outlet for connections, and its interior is sheer and smooth throughout. A perforated guide-piece, *a*, crosses above the outlet.

A cap, B, is constructed to fit the chamber A, having a vent, *b*, at the top and valve-seat *c* recessed into its inner face, diverging to allow a little oscillation of the valve. The cap B has two slotted guide-posts and pivot-bearings, *d d'*, arranged as shown in the drawings. Pivoted in the slot in guide-post *d* is a simple lever, *e*, having the enlargement *e'*, which is perforated to a double conical shape, as seen in Fig. 3, and in this is pivoted a valve, *v*, as shown in the same figure. By this means, as the lever *e* turns about its pivot or fulcrum, the valve has room to play into its seat, and in opening gravity will still cause its point to fall toward the center line, and in this manner the valve cannot stick. At the other end of lever *e* a vertical link, *g*, is pivoted, being also pivoted below to a second lever, *h*, which, in turn, is pivoted to the post *d'*, and at its other end is pivoted to the top of float C, which has a guide-rod, *i*, projecting downwardly through guide *a*. By this means a powerful compound leverage is obtained in a very small space, a nearly straight pull on the valve is effected, while the interior of the chamber is absolutely free from obstructions. This last is a very important—a very essential—characteristic of our invention, for every projection or recess in such devices affords a lodgment to mud and scale, and the accumulation of these will, in the course of time, be sure to interfere with the functions of the working parts. This interference might occur at the very moment of danger, the device would fail to give warning, and an explosion scatter death and destruction all around; hence the importance of preventing any such formations. The cap has a nipple outside for the attachment of a whistle.

The whole device is attached to a boiler by a vertical pipe, in two parts, meeting in a bushing, which screws into the boiler. The lower end of the pipe projects into the boiler to the point at whose level it is desired that the signal will operate. So long as the boiler-water is above this level it will be forced upward into the chamber, maintaining the float and keeping the valve shut; but when the water-level falls below the pipe end the water drops out of the chamber, and the float, being no longer maintained, drops with it, and by means of the levers the valve is opened, and the steam rushes out and sounds the alarm-whistle.

The cap, its vent *b*, valve-seat *c*, and the two depending combined pivot-bearings and slotted guides *d d'* are all in one integral piece, to make construction cheap and prevent the danger of leakage apt to occur by riveting or piecing.

We claim—

In a low-water signal apparatus having the float and valve connected by a system of le-

vers, substantially as shown, the combination, with the valve-lever *e*, pivoted to the valve *v*, and the lever *h*, pivoted to the float, of the depending fulcra *d d'*, integral with the cap B, the fulcrum *d* supporting the lever *e* and the fulcrum *d'* supporting the lever *h*, as shown and described.

In testimony that we claim the foregoing we have hereto set our hands this 20th day of June, A. D. 1877.

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Witnesses:
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