

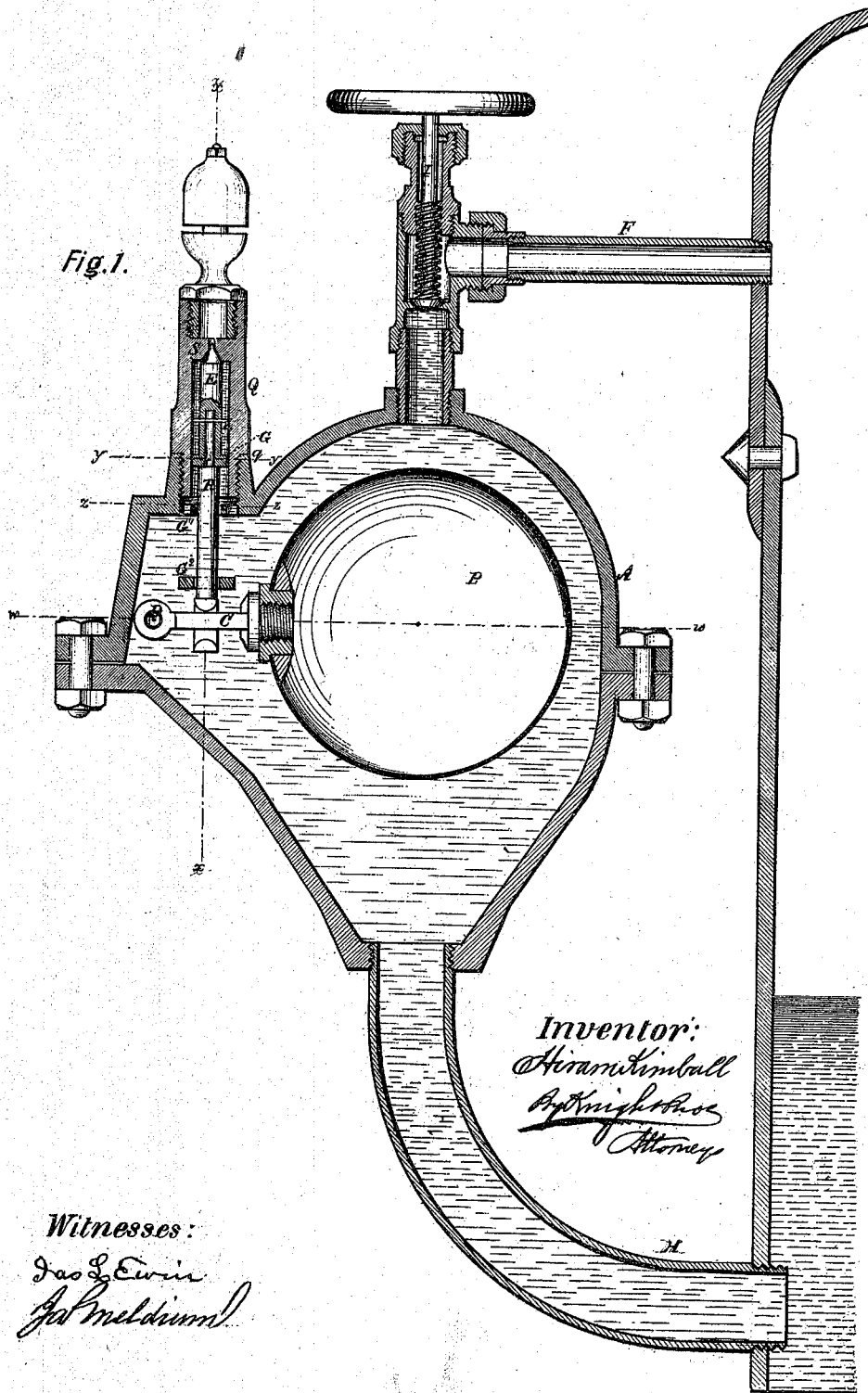
H. Kimball,

2. Sheets, Sheet 1.

Low Water Indicator.

No. 112,250.

Patented Feb. 28, 1871



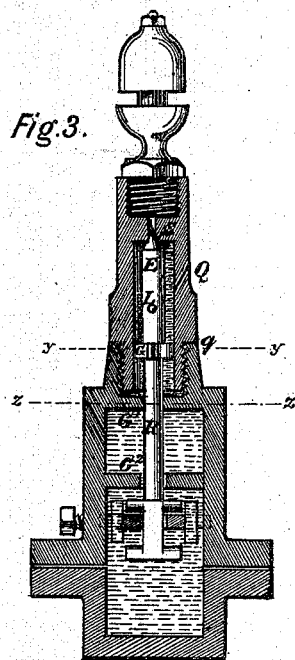
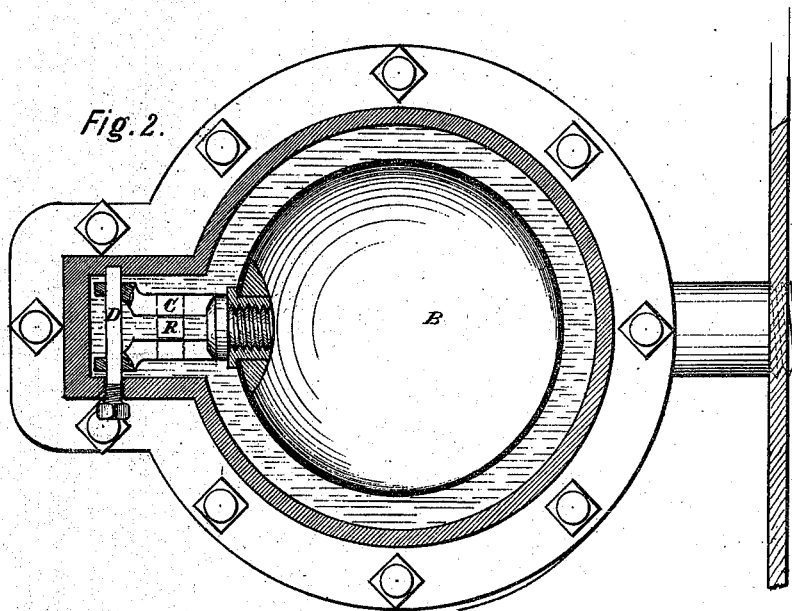
H. Kimball,

2. Sheets, Sheet 2.

Low Water Indicator.

No. 112,256.

Patented Feb. 28, 1871.



Witnesses:

Saml. Ewin
Edw. Meldrum

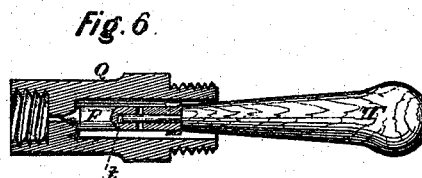


Fig. 5.



Fig. 4.



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HIRAM KIMBALL, OF RANDOLPH, VERMONT.

Letters Patent No. 112,256, dated February 28, 1871; antedated February 23, 1871.

IMPROVEMENT IN LOW-WATER INDICATORS.

The Schedule referred to in these Letters Patent and making part of the same.

I, HIRAM KIMBALL, of Randolph, in the county of Orange and State of Vermont, have invented certain Improvements in Low-water Indicators for Boilers, of which the following is a specification.

Nature and Objects of the Invention.

My invention relates in part to an improvement on that patented to me June 1, 1869, which consists essentially of a water-chamber or reservoir, located externally of the boiler above the water-line, and communicating with the interior of the boiler through a pipe at the lowest level to which the water in the boiler is desired to fall before an alarm is sounded.

The elevated chamber contains a buoy, to the upper part of which is attached a valve closing a port communicating with the atmosphere, so that, so long as the water in the boiler is at a proper height, the pressure of steam keeping the elevated chamber or reservoir full of water will cause the valve to be pressed against its seat, but the instant the water descends below the mouth of the pipe leading from the reservoir into the boiler, the water will run from the elevated reservoir, its place being supplied with steam and permitting the buoy to descend by its gravity, so that the port will be opened and steam discharged therethrough, sounding a whistle or other alarm until the boiler receives a proper supply of water.

My present improvements consist—

First, in a combination and arrangement of parts whereby the movement of the valve is rendered more certain and delicate, and the valve being guided to and from its seat in a perfectly rectilinear path, will be preserved from liability to unequal wear.

Second, in an arrangement and provision for facilitating the cleaning and grinding in of the valve, as hereinafter described.

Description of the Accompanying Drawing.

Figure 1 is a vertical longitudinal section of the improved apparatus.

Figure 2 is a horizontal section on the line *w w*, fig. 1.

Figure 3 is a vertical section on the line *x x*, fig. 1.

Figure 4 is a horizontal section on the line *y y*, figs. 1 and 3.

Figure 5 is a horizontal section at *z z*, figs. 1 and 3.

Figure 6 is an axial section of the valve-chamber, showing the valve partly in section, and illustrating the manner of grinding it into its seat.

General Description.

Having the elevated reservoir A, buoy B, valve E, &c., as before referred to, I connect the upper part of said elevated reservoir A, with the steam-dome or any part of the boiler, which, being above the water-level, is always occupied by steam by means of a small pipe,

F, provided with a stop-cock or valve, I, which ordinarily remains closed.

Now, it will be readily seen that on the stop-cock or valve I being opened, steam will enter the upper part of the reservoir, produce an equilibrium of pressure, and allow the water in the reservoir to fall to the same level as in the boiler, and produce the same action of the buoy B and valve E as though the water in the boiler had fallen so low as to allow the elevated reservoir to be filled with steam through the main pipe H. This device thus affords an almost instantaneous test of the action of the indicator.

The pipe F serves not only as a test-pipe, but also to keep the indicator in order by allowing the water in the elevated reservoir to fall quickly, and, if necessary, frequently, whereby any scale or other refuse which might otherwise lodge in the indicator will be washed out; and in case of anything lodging between the valve E and seat S, so as to prevent the valve E from closing, opening the "test-pipe" F will cause the valve E to fall, and allow the impediment to drop or pass out with the steam, whereas without the test-pipe this action can only be produced by allowing the water in the boiler to fall below the mouth of the pipe H.

In order to facilitate the cleaning of the valve and grinding it into its seat when necessary, the valve-chamber Q is made removable by means of a screw-coupling, *g*, and the valve E connected to its stem R by a socket-joint and pin, L.

In case of the valve becoming leaky, it is only necessary to screw out the valve-chamber Q and remove the pin L, when the valve E can be taken out and its seat may be readily cleansed, and, if necessary, "ground" in by inserting a tapered stick or handle, T, in the aperture *t*, which fits over the valve-stem R.

Any necessity of removing the entire apparatus from the boiler for the purpose of refitting the valve is thus entirely avoided, and hence the fitting or cleaning of the valve can be accomplished as often as required with a trifling expenditure of time or labor.

This, and other improvements herein described, are severally applicable to various other forms of indicators or alarms for steam-generators.

In order to obtain an action sufficiently powerful to be reliable by the use of only a small buoy, I employ the arrangement shown clearly in section in figs. 1, 2, and 3, to obtain a powerful leverage in the action of the buoy on the valve.

The reservoir being constructed with a small extension on one side, as shown in the drawing, the buoy B is provided with an arm, C, which plays on a pin or pivot, D.

The valve E is connected with the arm C by any device that will allow the necessary movement of the

joint as the arm C swings on the pivot D, the valve being held in line with its seat by the guides G G'. A preferred form of joint is shown in figs. 3 and 4.

By regulating the length of the arm C and the relative positions of the pivot D and valve E, any desired leverage may be obtained.

By passing the lever C through a slot in the valve-rod, and confining the valve to a strictly rectilinear path by means of the guides G, the correct seating of the valve at each movement is rendered certain, and the possibility of unequal wear and consequent leakage and cutting are avoided.

Claims.

I claim as my invention—

1. The elevated reservoir A, connecting-pipe H, test-pipe F, float B, lever C, slotted valve-stem R, and guides G G', when constructed, combined, and arranged to operate as described.

2. The removable chamber Q, and separable valve and stem R E, as and for the purpose specified.

HIRAM KIMBALL.

Witnesses:

A. R. FAULKNER,
W. E. KIMBALL.