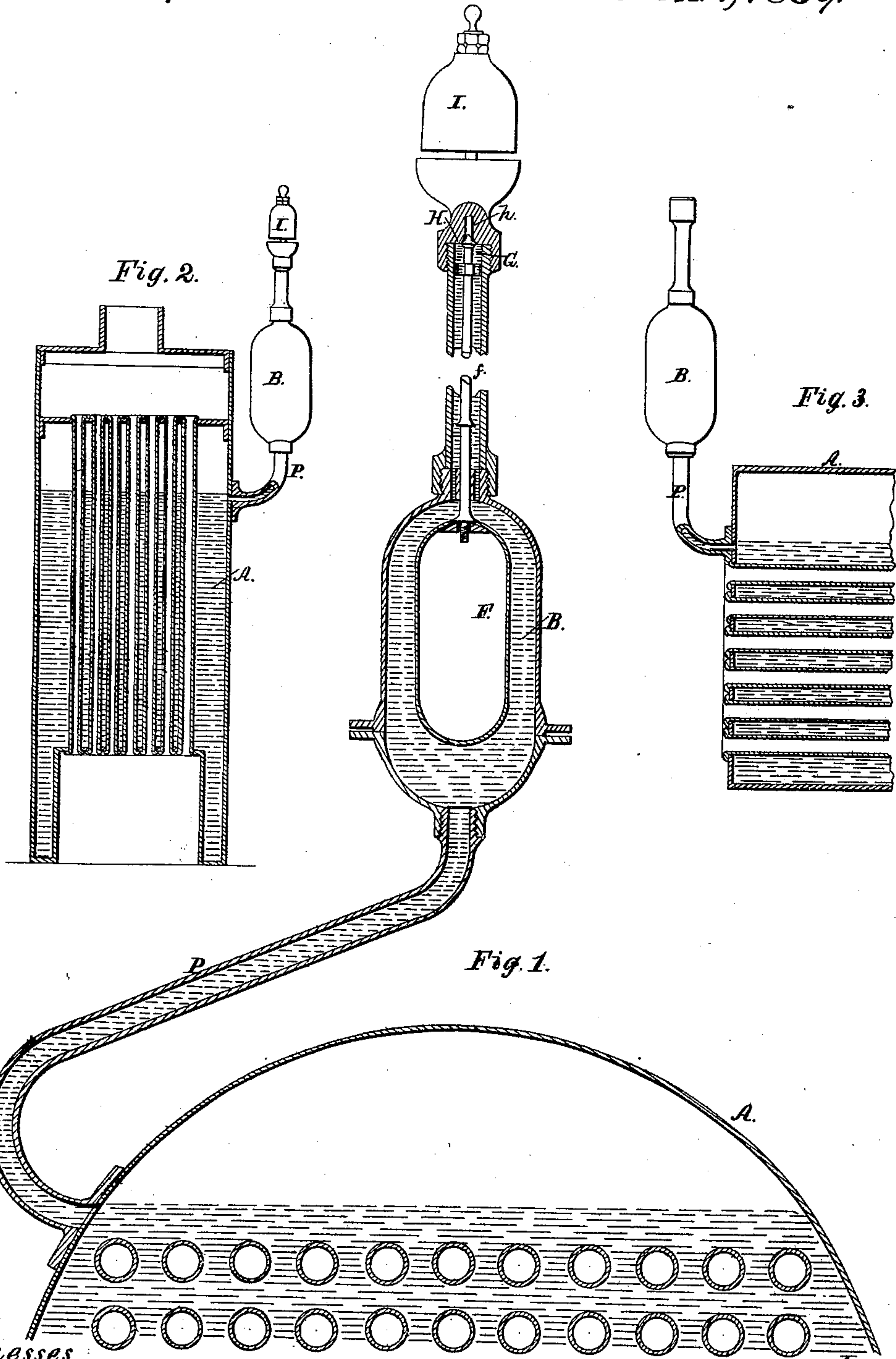


H. Kimball.
Indicators.
N^o 90,853. Patented Jun. 1, 1869.



Witnesses.

W. B. Deming
John Grinnell

Inventor.

Hiram Kimball
by Knight Bros. Attys.

United States Patent Office.

HIRAM KIMBALL, OF RANDOLPH, VERMONT.

Letters Patent No. 90,853, dated June 1, 1869.

IMPROVEMENT IN LOW-WATER INDICATORS FOR BOILERS.

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, HIRAM KIMBALL, of Randolph, in the county of Orange, and State of Vermont, have invented a new and useful Safety-Attachment for Steam-Generators; and that the following is a sufficiently full and exact description thereof, to enable one skilled in the art to which my said invention appertains, to carry it into effect, reference being had to the accompanying drawings, which are made a part of this specification.

My device 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 can properly be allowed to descend.

The elevated chamber contains a buoyant cylinder, to the upper part of which is attached a valve, closing a port which communicates 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 reservoir full or partially full of water, will cause the valve to be pressed against its seat, but the instant the water descends below a proper level, the water will run from the elevated reservoir, and its place will be supplied by steam, permitting the cylinder to descend by its gravity, so that the port will be opened and steam discharged therethrough, sounding a whistle, or other alarm, which cannot be stopped until the boiler receives a proper supply of water.

The apparatus may be attached to a boiler of any description, in any convenient position to effect the purpose stated.

In the drawings—

Figure 1 represents a vertical section of my apparatus, illustrating its application to the side of a horizontal boiler.

Figures 2 and 3 are elevations, showing it in its application to the side of a vertical boiler and the end of a horizontal boiler, the boilers being represented in section to show the height of water.

Similar letters of reference indicate corresponding parts in the several views.

A may represent a boiler, of any construction, to which an external chamber, or reservoir, B, is connected by a pipe, P, communicating with the interior of the boiler, at the lowest level to which it is deemed safe or proper for the surface of the water to descend.

Within the reservoir B is a buoyant cylinder, F, from the top of which projects a rod, f, carrying a valve, G, which, when the buoyant cylinder F is elevated by being surrounded with water in the reservoir B, will be pressed upward against its seat H, so as to close the port or aperture h therein.

It will be apparent that so long as the water within the boiler is maintained at a proper level, that is to

say, above the opening of the pipe P, the steam-pressure will keep the reservoir B constantly full of water, and the aperture h closed; but if the surface of water within the boiler descends below the opening of the pipe P, the water within the reservoir will instantly descend into the boiler, and steam taking its place will permit the cylinder F to fall, the effect of which is to withdraw the valve G from its seat H, and cause a discharge of steam through the aperture h, so as to sound a whistle, I, or any other alarm which may be provided.

As the interior of the reservoir is inaccessible to the engineer, the alarm will continue until a proper quantity of water is again supplied to the boiler, but as soon as the surface of the water rises above the mouth of the pipe P, water will be forced up into the chamber, taking the place of the steam therein, and causing the aperture h to be closed, as before.

In practice, the buoyant cylinder should be made of as large size as the capacity of the reservoir will properly permit.

The reservoir can be made of any capacity to receive a buoy of necessary size and power, and can readily be connected to any boiler by tapping a hole through the end or side thereof, for the reception of the pipe P.

The buoyant cylinder differs in effect from an ordinary float, in that it is wholly submerged, so that the entire force of its flotation or displacement may be used.

It is proposed to use two of the attachments connecting with the boiler at different heights, one to serve as an indicator in ordinary pumping, the other to indicate if the water is dangerously low.

The apparatus cannot be tampered with or controlled by the engineer.

While the boiler is under pressure, the alarm must continue until water is supplied to a proper level.

It is simple, and cheap of construction, and certain in its operation, and in the event of leaking of the buoy, or any other derangement, the effect will be to open the discharge-orifice, and thus indicate that attention is required, instead of leaving it closed, as is the effect of some apparatus devised for the same general purpose.

Having thus described my invention,

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

The combined arrangement of the elevated chamber B, buoyant cylinder F, valve G, and connecting-pipe P, substantially as herein set forth.

HIRAM KIMBALL.

Witnesses:

OCTAVIUS KNIGHT,
WM. H. BRERETON, Jr.