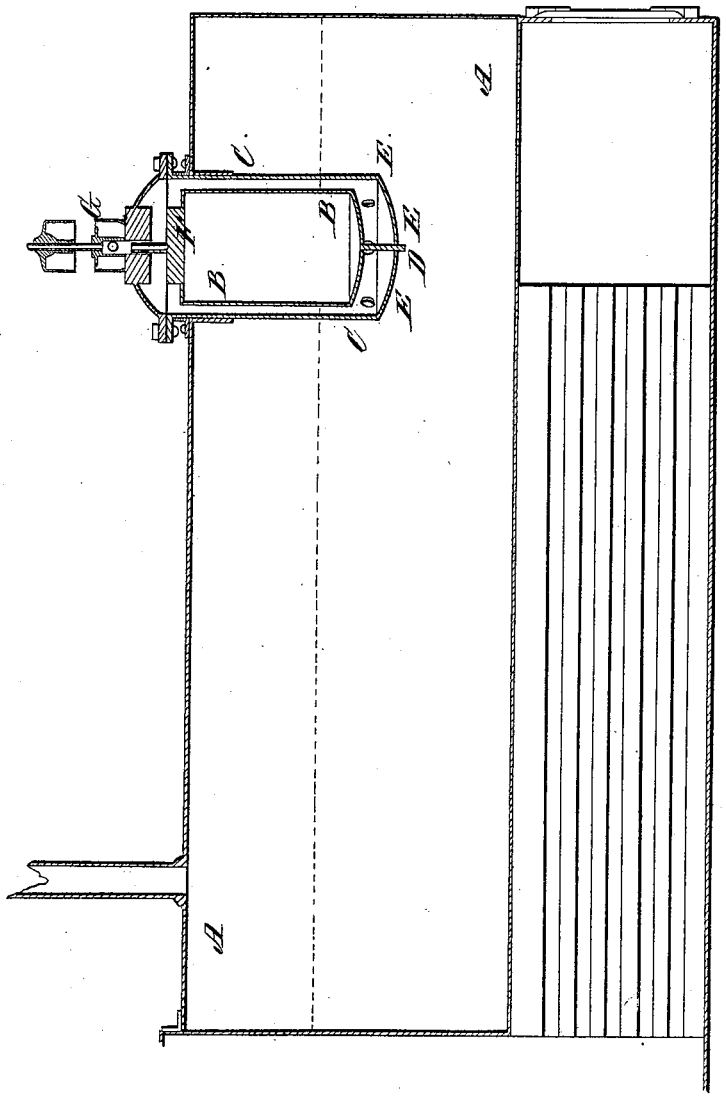
H. B. Fernald,

Steam-Boiler Indicator.

No. 5,370. Patented Nov. 13, 1847.



UNITED STATES PATENT OFFICE.

H. B. FERNALD, OF BOSTON, MASSACHUSETTS.

ALARM FOR STEAM-BOILERS.

Specification of Letters Patent No. 5,370, dated November 13, 1847.

To all whom it may concern:

Be it known that I, H. B. FERNALD, of the city of Boston, in the county of Suffolk and State of Massachusetts, have made a new and useful improvement in the manner of constructing apparatus for sounding an alarm when there is a deficiency in the height of water in steam-boilers; and I do hereby declare that the following is a full and exact description thereof.

In my improved apparatus I so arrange a float within the boiler, as that during the time that the height of water is sufficient to prevent all danger from its deficiency, a valve attached to said float shall close an aperture in the top of the boiler which aperture is surmounted by a steam whistle of the ordinary construction, while in the case of the exhaustion of water so that it does not rise to the proper water line, said float shall descend, and open the valve, admitting the steam to operate on the steam whistle, and sound an alarm.

To prevent the uncertain action of the float from the foaming of the water, I inclose said float within a cylindrical case, which has perforations at its bottom through which water is to be admitted, for the purpose of buoying up the float. This case has the effect of protecting the float from being injuriously influenced by the foaming of the water within the boiler, as said float will stand at the height of the proper water level, or nearly so, notwithstanding its varying height in the boiler; this result being dependent on the admission of the water into the case through comparatively small openings at its lower end.

The accompanying drawing shows a vertical longitudinal section of a steam boiler, furnished with my apparatus.

A, A, is the boiler, and B, B, the float, which is surrounded by a case C, C, somewhat larger in its interior diameter than that of the exterior of the float. To keep the float concentric with the case it may be furnished with a guide pin, as at D, passing through a hole in the bottom of the case; or there may be guide strips, extending up and down within the case that contains the float, which will be still more effective. E, E, are openings at the lower end of the case through which water from the boiler is to pass into it.

The weight or rather the buoyancy of the float must, of course, be such, as will just cause it to keep the valve closed which is situated at its upper end, when the water has nearly reached the lowest point to which it may be safely allowed to descend, but which will allow said valve to open by the descent of the float at the lowest allowable level of the water; at all times when the water is higher than this, the said valve will, necessarily, be firmly closed. F, is the valve on the upper end of the float, and which is intended to close the aperture leading to the steam whistle, when the water in the boiler is at the proper height, G, is the steam whistle.

Having thus fully described the nature of my improvement in the manner of ascertaining that the water in a steam boiler is so far exhausted as to require replenishing; I do hereby declare that I do not claim the employment of a float for the purpose of merely opening a steam valve; floats having been already used in various ways to operate on safety valves; but

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

The combining of a float within a steam boiler, with a case into which water is to be admitted through apertures in its lower part, and with a steam whistle, said float having a valve at its upper end, surmounted by a steam whistle; the whole being constructed, and operating in the manner, and for the purpose, herein fully made known.

H. B. FERNALD.

Witnesses:

THOS. P. JONES,

LEML. WILLIAMS.