

(No Model.)

W. A. KITTS.  
HIGH OR LOW WATER ALARM.

No. 503,606.

Patented Aug. 22, 1893.

Fig. 1.

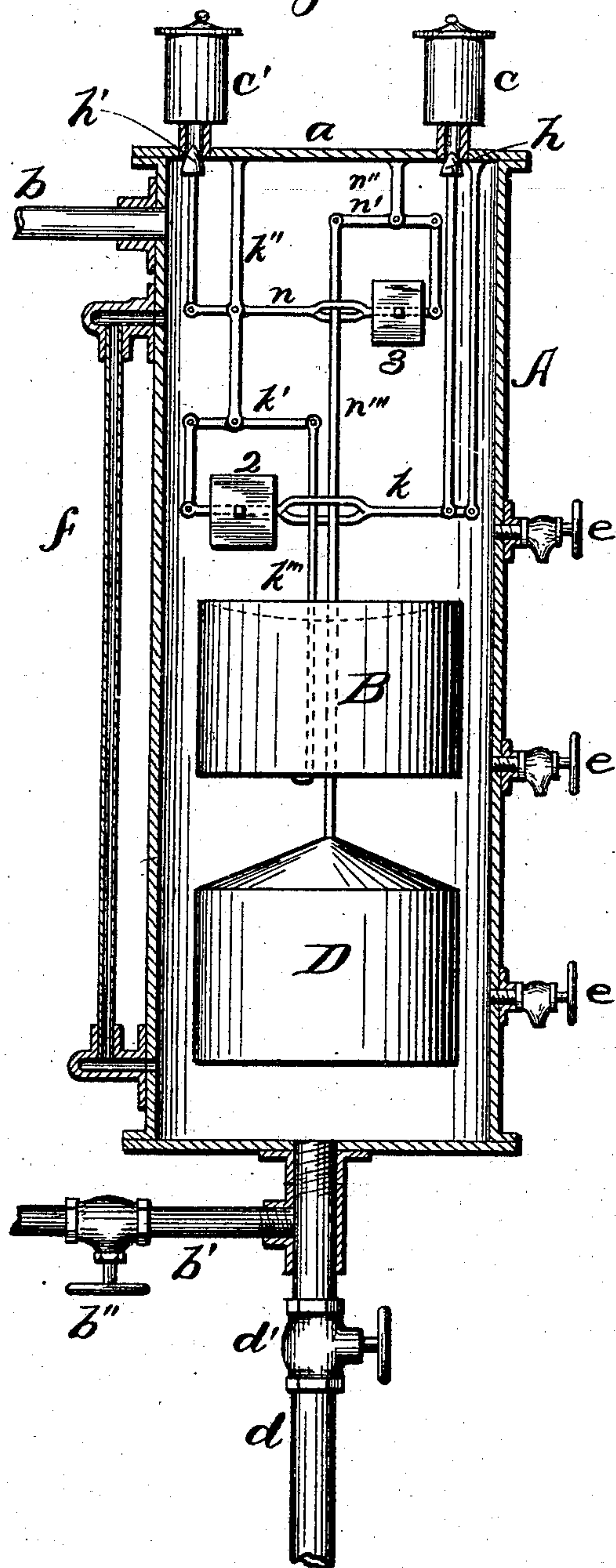


Fig. 2.

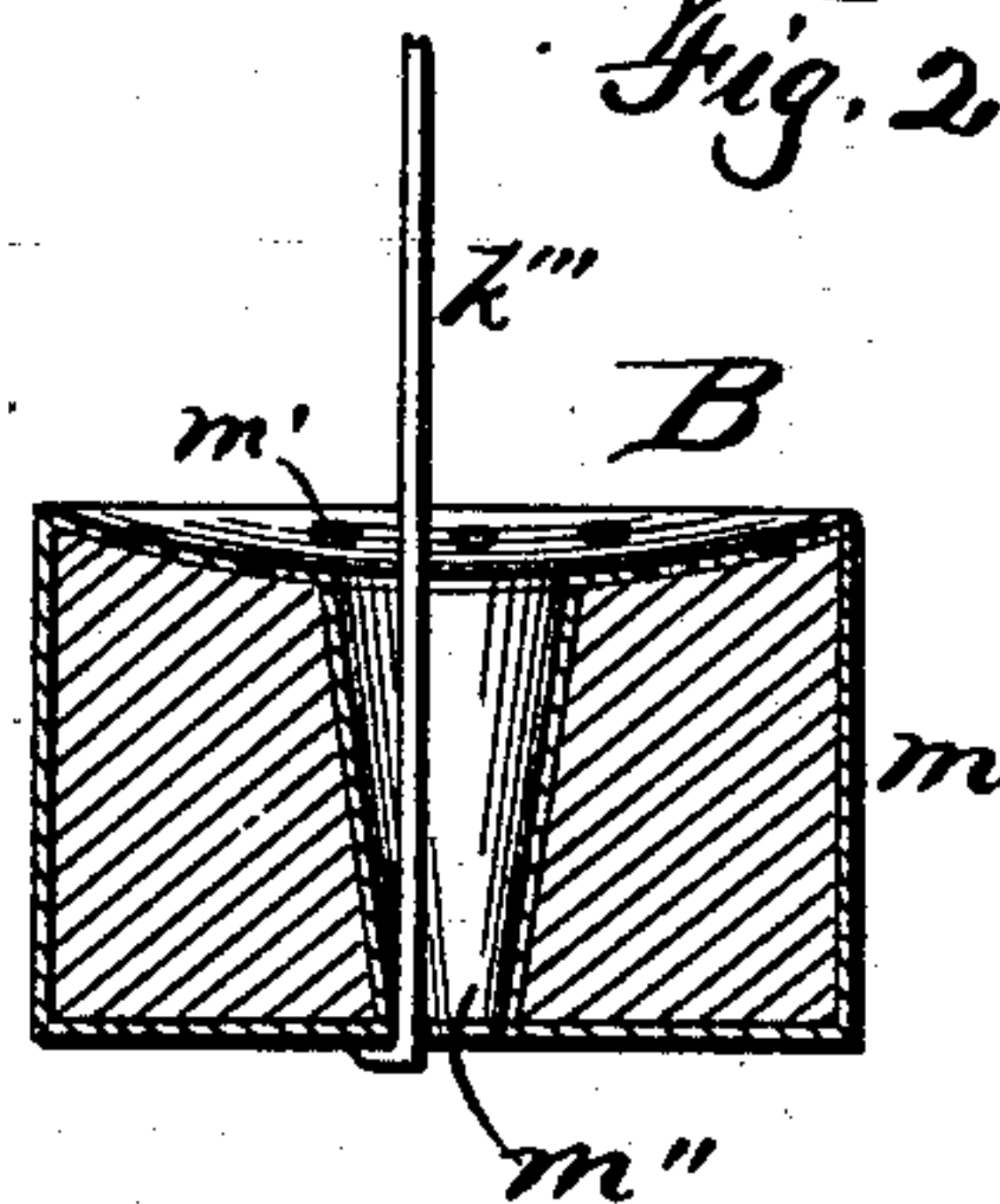
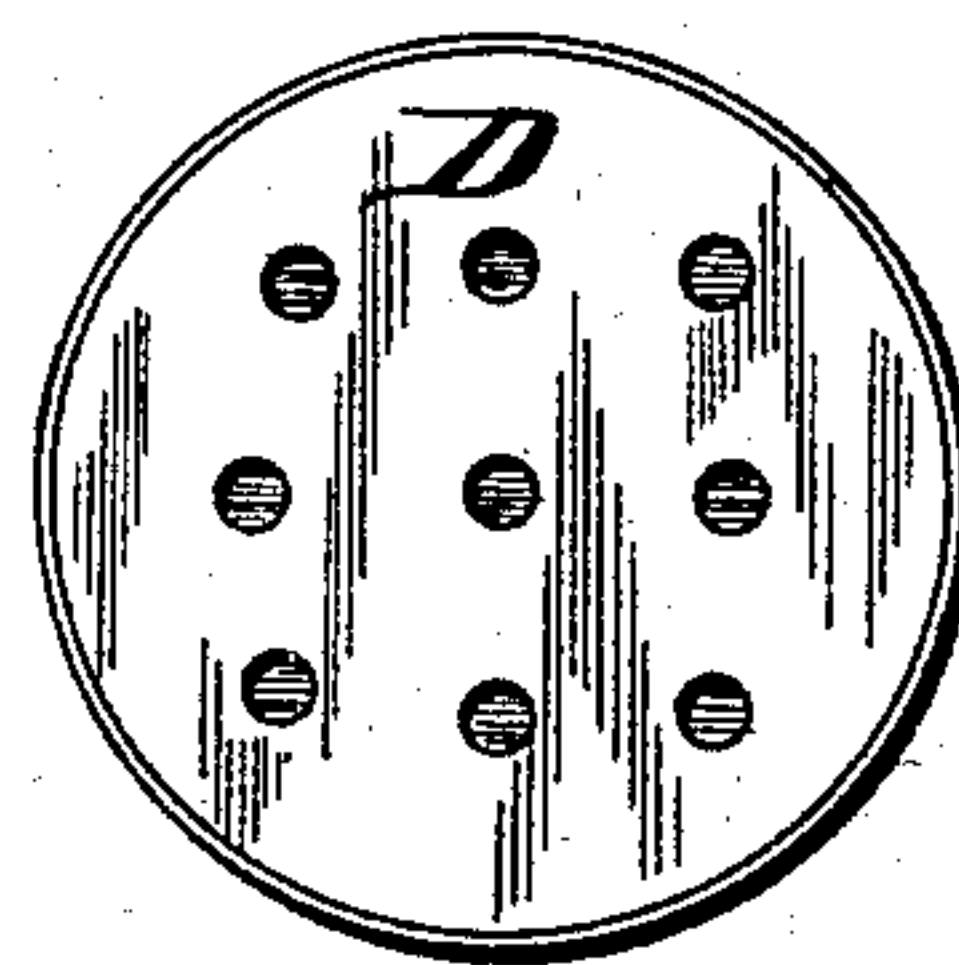


Fig. 3.



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# UNITED STATES PATENT OFFICE.

WILLARD A. KITTS, OF OSWEGO, NEW YORK.

## HIGH OR LOW WATER ALARM.

SPECIFICATION forming part of Letters Patent No. 503,606, dated August 22, 1893.

Application filed June 13, 1892. Serial No. 436,422. (No model.)

*To all whom it may concern:*

Be it known that I, WILLARD A. KITTS, of Oswego, in the county of Oswego, in the State of New York, have invented new and useful  
5 Improvements in High or Low Water Alarms, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to high or low water  
10 alarms, which are provided with an automatic alarm actuating device, or devices, mounted within the cylindrical body, which is secured in an upright position upon and exterior to the boiler and connected thereto by pipes, one  
15 connected to the steam chamber, and the other to the water chamber therein.

My object is to produce a high or low water alarm, in which the alarm whistles are connected to and operated both for being held  
20 closed, or opened, by a system of levers and weights and counterweights, the weights being always maintained, when immersed, at substantially a physical unit, and when such relation is destroyed by the variation of the  
25 water level in the boiler, the effect of the counter balance is overcome, and an alarm is given; said weights, counter-weights and the lever systems being mounted and inclosed within a cylindrical casing exterior to the  
30 boiler and connected by piping to both the steam and water chambers therein, so that the water level in the alarm casing is always the same as that of the boiler.

My invention consists in the several novel  
35 features of construction and operation hereinafter described and which are specifically set forth in the claims hereunto annexed. It is constructed as follows, reference being had to the accompanying drawings, in which—

40 Figure 1, is a vertical transverse sectional elevation of the alarm, complete. Fig. 2, is a vertical transverse section of the upper weight. Fig. 3, is a plan view of the bottom of the lower weight.

45 Like letters and figures of reference indicate corresponding parts wherever they occur.

A—, is an upright cylinder, closed and made steam-tight by the heads —a—, —a'— and mounted upon and connected to the boiler by  
50 the pipes —b—b'— of which the pipe —b— is connected to the steam chamber therein,

and the pipe —b'— to the water chamber thereof.

In the head —a— the whistles —c—c'— are secured; and in the head —a'— the blow-off  
55 pipe —d— is secured, the pipe —b'— being shown as tapped into the pipe —d—, for convenience and to avoid unnecessary tapping and the shut-off cocks —b''— and —d''— are  
60 mounted in these pipes, so that when the blow-off cock is closed, the pipe —b'— is open, and vice versa, the cock —b''— is closed when it is desired to open the blow-off cock.

The pipes —b— and —b'— respectively conduct steam and water from the boiler into the  
65 alarm cylinder, so that the water level therein is always substantially the same as that in the boiler. Gage cocks —e— are also mounted in said cylinder; as is also a water glass —f— in the usual manner.

7c Valves —h—h'— normally close the whistles. The valve —h— of the high-water whistle —c— is provided with a stem which is connected to a lever —k— which is pivoted at one end to a suitable support, within the cylinder,  
75 and its opposite end is connected to another lever —k'— which is pivoted upon a hanger —k''— attached to the head —a—, and the weight —B— is supported by the rod —k'''— connected to the lever —k'—. A counterbal-  
80 ance weight —2— is mounted upon the lever —k—.

The weight —B— consists of an outer cylindrical shell, or casing —m—, closed at the bottom and provided with a concave perforated top —m'—, and it is also provided with  
85 a central vertical aperture —m''— shown as frusto-conical in outline, opening through both top and bottom, the walls of which opening may project slightly above the upper face  
90 of said top, if desired, to create a dam around said aperture. This casing is filled with a core constructed, or compounded of such materials as will not be charred or burned or injuriously affected by steam, but which will be  
95 more or less absorbent of water, as, for instance, a compound composed of magnesia and asbestos, all, so that said weight will, in use, be of the specific gravity of a physical unit, as compared with the density of water,  
100 or substantially so.

The counterbalance —2— is lighter than



the weight —B— when out of the water, and is so set upon the lever as to be overbalanced by the weight —B— when the latter is out of water; and thus, when it is so overbalanced, said weight will operate to hold the valve —h— closed. This weight is normally at substantially the water line of the boiler and cylinder, and when the water rises above said line, it becomes submerged and loses its weight, whereupon the counterbalance operates to depress the lever —k—, open the valve and sound the alarm, for high water.

The valve —h'— of the lower water whistle, is provided with a stem which is connected to a lever —n—, pivoted upon the hanger —k''—, which is connected to a lever —n'— supported by a hanger —n''—, to which the rod —n'''— is connected upon which the weight —D— is suspended. This may be termed the low-water weight, and consists of the outer casing, a perforated bottom, a convex top, and a core of the same absorbent material as the other weight, so that when submerged this weight is also a physical unit, or substantially so. When the water lowers in the boiler and cylinder, so that this weight is only partly submerged, it will over-balance the counterbalance weight —3— upon the lever —n— and open the valve —c'— and sound the alarm, for low water. When the weight —D— is submerged it is substantially inert, and then the counterbalance —3— holds the valve —c'— closed.

When the weight —B— is submerged, the high-water alarm continues until the water in the boiler and cylinder lowers sufficiently to permit said weight to overcome the counterbalance —2— and close the valve —c—; and when the weight —D— is not submerged the low-water alarm will continue to sound until the water rises high enough in the boiler and cylinder to permit the counterbalance —3— to close the valve —c'— by over-balancing the weight —D—.

In blowing off the cylinder, I close the cock —b''— and open the blow-off cock —d'—, and the water and steam which are forced through the central aperture in the weight —A—, will effectually clean off the top of the weight —B—, removing all sediment which may have lodged thereon.

It will be seen that the perforated concave top of the weight —B— will catch the condensation, dripping from the top of the alarm cylinder, and conduct it into the core, and thus, maintain it at substantially its normal specific gravity, by replacing the evaporation; and that the bottom of the weight —D— being perforated, its specific gravity is always maintained.

Any other well known alarm signaling devices can be used in place of the whistles, and can be connected to the alarm mechanism within the cylinder by ordinary means.

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

1. A low water alarm consisting of a cylin-

der connected to the steam and water chambers of a boiler, and an alarm signal connected to the cylinder, in combination with a lever mounted within the cylinder and connected to the alarm, a weight upon said lever, normally holding the alarm closed, a preponderant weight which is substantially a physical unit, when submerged, connected to said lever to operate said alarm and normally supported at substantially the plane of the low water line in the boiler, and consisting of a cylinder perforated in an end, and a core of absorbent material inclosed within the cylinder.

2. A high water alarm consisting of a cylinder connected to the steam and water chambers of a boiler, and an alarm signal connected to the cylinder, in combination with a lever mounted within the cylinder and connected to the alarm, a weight upon said lever to actuate the alarm, a preponderant weight connected to said lever to hold the alarm closed and normally supported at substantially the plane of the high-water line in the boiler, and consisting of a cylinder closed at the bottom, and having a concaved and perforated top, and a core of absorbent material inclosed within the cylinder, so that said preponderant weight is substantially a physical unit, when submerged.

3. A high and low water alarm for steam boilers, consisting of an upright cylinder connected to the steam and water chambers of a boiler, a lever mounted within the cylinder and connected to the high-water alarm, a weight connected to said lever to open the alarm, a preponderant weight connected to said lever to hold the alarm closed, and normally supported at substantially the plane of the high-water line in the boiler and consisting of a cylindrical shell closed at the bottom and having a concaved and perforated top, and provided with a vertical central aperture, and a core of absorbent material within said shell, another lever mounted within the cylinder and connected to the low-water alarm, a weight upon this lever normally holding the alarm closed, and a preponderant weight connected to said latter lever and supported at substantially the plane of the low-water line in the boiler, consisting of a shell perforated in one end and closed in the other end, and a core of absorbent material inclosed within the shell, and together constituting substantially a physical unit, when submerged.

4. The combination with the cylinder A, of the weight B provided with a central vertical aperture, and its supporting rod operatively connecting it to a high-water alarm mechanism, and the lower weight D, and its supporting rod passing through the aperture in the upper weight and operatively connected to a low-water alarm mechanism.

5. In an alarm system, a weight —B—, consisting of a cylinder closed at the bottom, and having a concaved and perforated top, and provided with a vertical central aperture, and



filled with a core of absorbent material, not injuriously affected by steam or water.

6. In high or low water alarms, a weight for actuating the alarm composed of a cylinder, 5 perforated in an end, containing a core of absorbent material such that the specific gravity of said weight is substantially a physical unit, when submerged.

7. The combination with the cylinder, of 10 the low-water weight provided with a conical top, a high-water weight above the former,

provided with a central aperture to discharge steam and water upon the low-water weight, and a blow-off cock and pipe connected to the bottom of the cylinder.

In witness whereof I have hereunto set my hand. 15

WILLARD A. KITTS.

In presence of—

J. W. SMITH,

HOWARD P. DENISON.