

F. ALDRICH.
LOW WATER ALARM.
(Application filed Apr. 3, 1900.)

(No Model.)

Fig. 1.

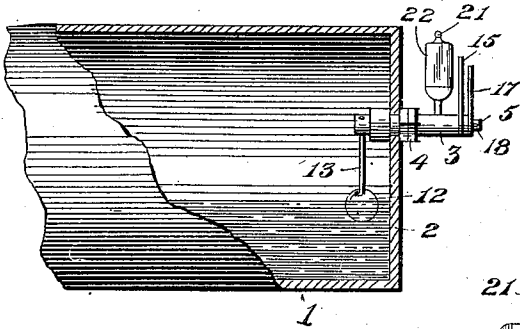


Fig. 2.

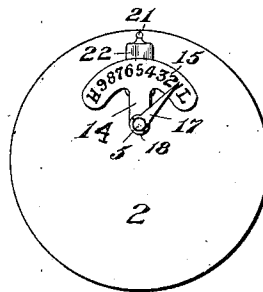


Fig. 3.

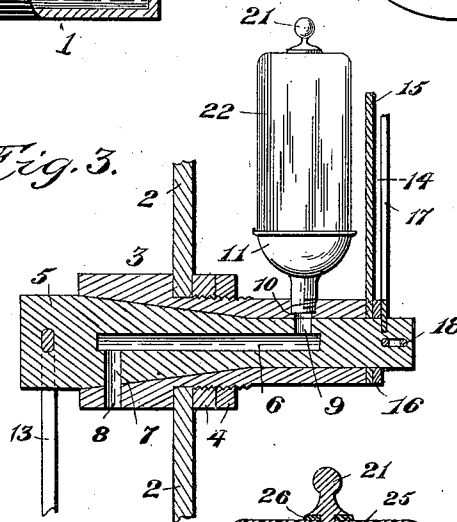


Fig. 5.

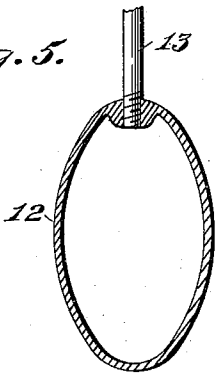


Fig. 4.

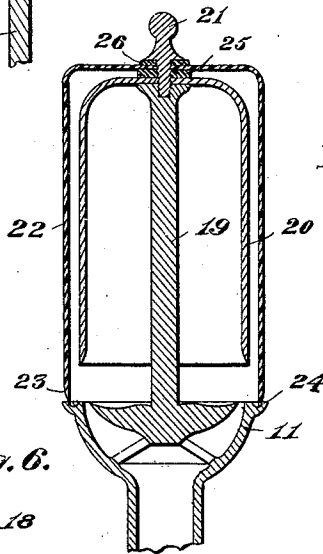


Fig. 6.



Witnesses:

E. C. Duff
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per

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UNITED STATES PATENT OFFICE.

FRANK ALDRICH, OF DETROIT, MICHIGAN.

LOW-WATER ALARM.

SPECIFICATION forming part of Letters Patent No. 664,111, dated December 18, 1900.

Application filed April 3, 1900. Serial No. 11,334. (No model.)

To all whom it may concern:

Be it known that I, FRANK ALDRICH, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Low-Water Alarms; and I 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 appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in automatic alarms for steam-boilers and also in providing means of such a character as will make it necessary for the attendant or engineer to make known the fact of his carelessness in allowing the water to become too low in the boiler whenever it occurs; and my invention consists in the improved construction and arrangement of parts hereinafter described, and more particularly pointed out in the claims.

It has been found heretofore with signal-whistles for boilers that when the water is at high or low water mark in the boiler the engineer may in some instances plug the valve to prevent sounding of the whistle, while in other cases when the boiler is at a long distance from the superintendent he cannot hear the sound of the whistle, and the engineer will not make known the fact of his carelessness in subjecting the boiler to liability of explosion, while, again, the whistle, if heard, may not be understood by the superintendent as sounding the signal of danger. In view of these facts I have connected with my other improvements in alarms for steam-boilers means whereby it is made impossible for the whistle to sound at low-water mark without the knowledge being conveyed to the superintendent. In carrying out my system I provide a glass hood which at all times closely envelops the whistle, rendering it air-tight, and therefore making it impossible for the whistle to sound until the hood is broken, when it is necessary for the engineer to at once apply to the superintendent for a new hood, each of which is marked differently, and serves to show the measure of neglect by the engineer.

Referring to the drawings, Figure 1 is a side

view, broken away to show a sectional part thereof, with my invention applied thereto. Fig. 2 is a front view of the boiler, showing a device for indicating the amount of water in the boiler. Fig. 3 is a sectional view showing the faucet-valve between the sleeve and the shaft when in position for admitting steam to pass into the whistle when the water in the boiler is at low-water mark. Fig. 4 is a sectional view of the whistle with a hood covering the same. Fig. 5 is a vertical section of the float, and Fig. 6 is a U-shaped spring-key used in the end of the inner tube.

Like figures of reference refer to corresponding parts in each view of the drawings.

1 represents a steam-boiler of ordinary construction. Through the head 2 of the boiler I secure my low-water alarm, which consists, in part, of an outer tubing or sleeve 3, secured within the boiler-head near its upper portion by passing it through the head from the inside to the front side and holding it in place by means of nuts 4, which are screwed on the sleeve one after the other, coming in contact with the head 2, and thereby rigidly holding the sleeve in position. The sleeve is provided with an enlarged conical opening or hole through its entire length, which gradually decreases in size from the end within the boiler to near its outer end. A conical shaft 5, which is adapted to closely fit within the sleeve 3, is inserted therein with its inner and outer ends projecting beyond the sleeve. About two-thirds of the length of the shaft 5 is provided with an opening 6 through its longitudinal center, which communicates with a lateral opening 7, that extends outward at right angles with the opening 6, which registers with an opening 8 through the sleeve 3 whenever the shaft 5 is turned into position to enable it to do so. The front portion of the opening 6 also registers with an opening 9, that extends upward through the shaft 5 at right angles to the opening 6, which communicates with an opening 10, passing through the sleeve, and in which a whistle 11 is secured in front of the boiler-head 2.

Within the boiler a float 12 is secured to the shaft 5 by means of a connecting-rod 13. This float is preferably elliptical in form and may be made of sheet copper, steel, or any other suitable material and be filled with cork

or other light matter and the air exhausted from its interior before the rod 13 is attached thereto to produce a vacuum in making a complete float. This float, being rigidly attached to the shaft 5 and resting upon the surface of the water within the boiler, is carried up and down by the rise and fall of the water, turning the conical shaft 5 in its movements.

On the front or outer end of the sleeve 3 there is rigidly secured a standard 14, which rises to near the top of the boiler and is provided on its upper end with a crescent-shaped dial 15, on the front of which figures or other characters are placed to indicate the height or depth of the water in the boiler.

A washer 16 is placed over the outer end of the shaft 5, which comes in contact with and presses against the lower portion of the standard 14. Outside of this washer there is rigidly secured to the shaft 5 and turning with it a pointer 17, which extends upward to the crescent-shaped dial, indicating at all times by its position on the dial as the shaft is turned the depth of water in the boiler.

A flexible U-shaped key is passed through the shaft 5 near its outer end and presses against the washer 16. This key is made of spring-steel or other suitable material adapted to hold the shaft 5 closely within the sleeve 3 and to take up any wear of the shaft or looseness on account of expansion of the sleeve by making a constant longitudinal traction upon it and at the same time producing only such a degree of strain as will enable the shaft at all times to turn freely within the sleeve as the float is moved up and down by the rise and fall of the water.

The whistle 11 is constructed in the usual form, being provided with an upwardly-extending standard 19, upon which a bell 20 is rigidly secured by means of a screw-pin 21. In my improved construction of signal I place a hood 22 over and entirely envelop the bell 20, the lower edge 23 of the hood resting in a groove 24 of the cup of the whistle, thereby making the chamber of the whistle substantially air-tight. In securing the hood 22 to the standard a packing 25, of leather, felt, or other soft material, is first placed upon the dome of the bell, and after the hood is seated in position over the bell another soft packing 26 is laid on the hood over the screw-opening to avoid the accident of breaking the hood when the screw-pin 21 is inserted, fastening all of the parts rigidly and securely together.

In operation the float 12 in the boiler rests upon the surface of the water, turning the shaft 5 and the indicator 17, so that the depth of the water in the boiler can always be understood. When the water is reduced in the boiler to the danger-point, the float upon its surface will settle down, turning the shaft 5 so that its opening 6 will register with open-

ing 8 in the sleeve 3 within the boiler and opening 10 outside of the boiler, thus admitting a rush of steam from the boiler into the whistle. The whistle being confined within the glass hood 22, the hood will almost instantly become shattered and broken by the pressure of steam and give vent to the whistle, when it will sound, notifying the engineer, who, after again filling the boiler with water, is required to apply to the superintendent for another hood to place over the whistle, and thus expose the fact of his negligence in allowing the water to run down to the danger-point in the boiler.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An alarm for steam-boilers having openings forming valves communicating with the interior of the boiler and with a whistle, a whistle provided with a glass hood, the steam from the boiler passing through the openings breaking the hood and causing the whistle to sound, as and for the purpose set forth.

2. An automatic alarm for steam-boilers having a conical shaft within a sleeve in the head of the boiler, the ends of the shaft being closed and a longitudinal opening through part of its center adapted to communicate with openings in the sleeve within and without the boiler and with a glass hood, the steam from the boiler breaking the hood and causing the whistle to sound, as and for the purpose set forth.

3. In combination with an alarm for steam-boilers having a shaft operated by a float and openings through the shaft to a whistle, of a whistle covered by a glass hood, the steam from the boiler coming in contact with and breaking the hood and causing the whistle to sound, as and for the purpose set forth.

4. In combination with a steam-boiler alarm having a sleeve with a conical shaft operated by a float in the boiler, the shaft and sleeve having openings communicating with a whistle, of a dial secured to the end of the sleeve and a pointer to the end of the shaft, the whistle having a glass hood seated in its cup below, as and for the purpose set forth.

5. In combination with a steam-boiler alarm operated by a float within the boiler opening a valve communicating with the whistle, of a glass hood secured to a standard over the whistle and its sides extending below the bell and seated in the cup of the whistle, as and for the purpose set forth.

In testimony whereof I have signed my name in presence of two witnesses.

FRANK ALDRICH.

Witnesses:

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