G. J. GIBNEY.

WATER ALARM FOR STEAM BOILERS.

APPLICATION FILED MAR. 22, 1911.

1,022,936. Patented Apr. 9, 1912.

Fig. 1.

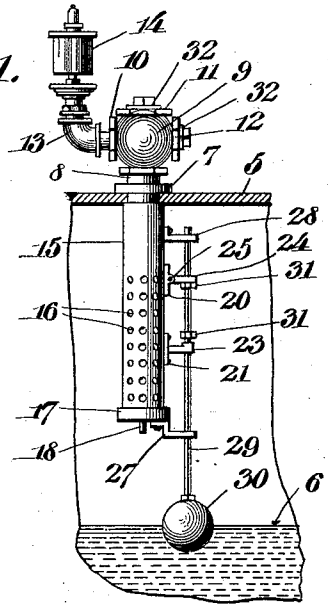


Fig. 2.

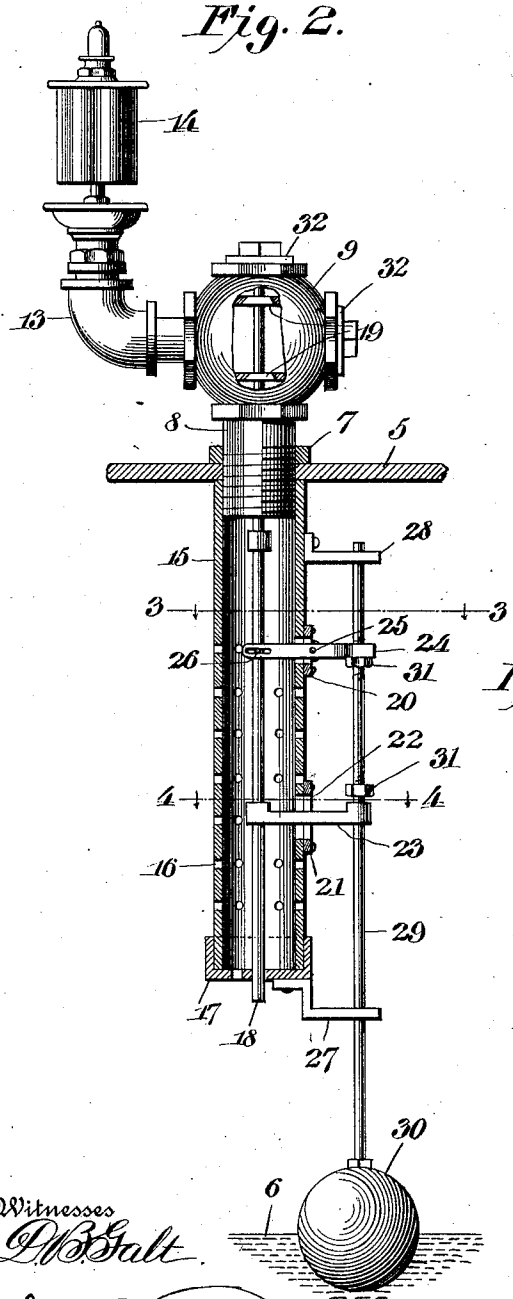


Fig. 3.

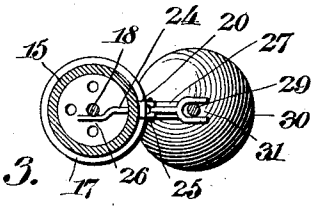
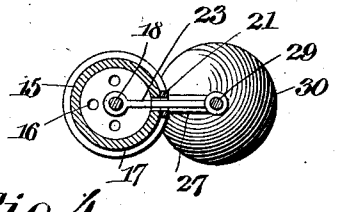


Fig. 4.



Witnesses

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WATER-ALARM FOR STEAM-BOILERS.

1,022,936. Specification of Letters Patent. Patented Apr. 9, 1912.

Application filed March 22, 1911. Serial No. 616,143.

To all whom it may concern:

Be it known that I, GILBERT J. GIBNEY, a citizen of the United States, residing at Mobile, in the county of Mobile and State of Alabama, have invented new and useful Improvements in Water-Alarms for Steam-Boilers, of which the following is a specification.

The invention relates to automatic signaling devices, and more particularly to the class of water level alarms for steam boilers.

The primary object of the invention is the provision of an alarm of this character, in which an audible signal will be sounded on the raising and lowering of the water level within a steam boiler, thus obviating the loss of life and damage to property.

Another object of the invention is the provision of an alarm in which an attendant will be warned of either high or low level existing within a steam boiler by the sounding of an audible alarm, thereby enabling such attendant to rectify the variation in the level within said boiler for preventing the explosion thereof, to avoid the possible loss of life and property.

A further object of the invention is the provision of an alarm which will operate instantaneously with accuracy on a maximum or minimum change of the water level within a steam boiler, the alarm being disposed outside of the latter, and is capable of being installed on various types of steam boilers, without requiring alteration to the same.

A still further object of the invention is the provision of an alarm in which the cooperating parts thereof will be protected, so as to avoid choking up or the filling thereof with sediment, which would necessarily interfere with the proper working of the alarm.

A still further object of the invention is the provision of an alarm which is constructed of two parts, and that will be thoroughly reliable and efficient in operation, and inexpensive in manufacture.

With these and other objects in view, the invention consists in the construction, combination and arrangement of parts, as will be hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claims hereunto appended.

In the drawings: Figure 1 is a fragmentary vertical longitudinal sectional view of a steam boiler with the alarm mounted thereon constructed in accordance with the invention. Fig. 2 is a vertical sectional view through the alarm device, the same being on a slightly enlarged scale. Fig. 3 is a sectional view on the line 3—3 of Fig. 2. Fig. 4 is a sectional view on the line 4—4 of Fig. 2.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings by numerals, 5 designates a portion of a steam boiler, and 6 the proper water level line therein, the boiler being provided at its top with a suitable perforated internally threaded boss 7, to which is adapted to be connected an automatic high and low water alarm, as will be hereinafter more fully described. This automatic alarm comprises a tube section 8 having opposite externally threaded ends, to the outer one of which is connected a casing or shell 9 of a balancing valve, the same being formed with outlet nipple extensions 10, 11 and 12, respectively, and connected to the nipple extension 10 is an elbow 13 supporting an alarm whistle 14 of any ordinary well-known construction, the same being operable by exhaust steam admitted thereto in the usual well-known manner, while the nipple extension 11 is adapted for connection with a steam pump (not shown). Also the nipple extension 12 is adapted for connection with a steam conduit (not shown). The tube 8, at its inner end, is threaded into the boss 7 on the boiler 5, so that the said tube 8 will protrude interiorly of the boiler, for a purpose as will be hereinafter more fully described.

Arranged vertically within the boiler 5 and detachably threaded to the inner end of the tube 8 is a cylindrical hollow barrel 15, the latter being constructed preferably from brass and is provided in its wall, near the free end thereof, with a plurality of perforations 16 which permit the entrance of the steam into the said barrel. The free end of the barrel 15 has connected thereto

a perforated cap or head 17, the same containing a central guide opening through which works a movable valve stem 18, the latter carrying valves 19 which are normally seated within the valve casing or shell 9 for shutting off the flow of steam therethrough to the alarm whistle, hereinbefore described.

Formed externally on the barrel 15, at one side thereof are bearings 20 and 21, the latter being provided with an elongated opening 22, through which is passed an arm 23, the same being fixed to the valve stem 18, while the bearing 20 is formed with a suitable opening, through which is passed a rocking arm 24, the latter being connected to the bearing by means of a pivot 25 intermediate its ends. This rocking arm 24 is also loosely connected to the valve stem 18 by means of a pivot 26, the arms 23 and 24 being designed, for a purpose as will be hereinafter more fully described.

Secured to the head or cap 17 is an L-shaped guide bracket 27, and also secured to the barrel 15, near its upper end, is a further guide bracket 28, in which latter and the bracket 27 is slidably mounted a movable float rod 29, the lower end of which is formed with a hollow float body 30 which is adapted to rest upon the surface of the water level 6 within the steam boiler, and is adapted to rise and fall with the water column within the latter.

Adjustably threaded upon the float rod 29, between the arms 23 and 24, are abutment or striker nuts 31, the same being adapted to contact with the said adjacent arms alternately on the rise and fall of the water level within the boiler 5, so as to automatically unseat the valves 19 within the valve shell or casing 9, thus permitting the steam pressure within the boiler 5 to operate the alarm whistle, for the sounding thereof to indicate to an attendant the alteration or variation in the water level 6 within the steam boiler.

In the operation of the device, when the water column within the steam boiler 5 is at the proper level 6, the valves 19 will be sustained seated in the valve shell or casing 9, thus shutting off the exhaust of steam through the barrel 15 to the alarm whistle 14 and the steam pump and main connected with the said valve casing. Now, upon the rise of the column of water within the boiler 5, the float 30 will be lifted with the water column moving the float rod 29 upwardly, causing the striker nut 31 to contact with and rock the arm 24, thus moving the valve rod 18 downwardly within the barrel 15, thereby unseating the valves 19 within the valve shell or casing 9, so that the steam pressure within the barrel 15 will enter the said valve casing or shell 9, and thence cause the operation of the alarm whistle 14 for the sounding thereof, thus indicating to an attendant that the water column has risen within the steam boiler 5 beyond the proper water level 6 therein. On the fall of the water column within the steam boiler 5, the float 30 will descend, causing the float rod 29 to move downwardly, thus the striker nut 31 will contact with the arm 23. At the same time, the striker nut, contiguous to the rocking arm 24 will move away from the same, and on the downward movement of the arm 23, the valve rod 18 will simultaneously move therewith, retracting the valves 19 from their seats within the valve casing 9, so that steam within the barrel 15 will cause the sounding of the alarm whistle 14, thereby indicating to the said attendant that the water column within the steam boiler 5 has become lowered from the proper water level 6 therein.

The nipple extensions 11 and 12 on the valve casing or shell 9 are adapted to be normally closed by means of detachable plugs 32.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation, and therefore the same has been omitted.

What is claimed is:

1. The combination with a steam boiler body, of a tube threaded therein and extending internally and externally thereof, a valve casing fixed to the external end of the tube, an alarm element communicating with the valve casing, a barrel connected with the internal end of said tube and provided with perforations near its free end, a perforated cap closing the free end of the said barrel, a movable valve stem working within said barrel and having valves normally closing the valve casing, brackets fixed to the barrel and cap respectively, a movable float rod supported by the said brackets, a float fixed to the lower end of the said float rod, a rocking arm pivotally connected with the barrel and the valve rod, a second arm fixed to the valve rod spaced from the rocking arm, and striker members carried by the float rod between the said arms and adapted to alternately engage therewith.

2. The combination with a steam boiler body, of a tube threaded therein and extending internally and externally thereof, a valve casing fixed to the external end of the tube, an alarm element communicating with the valve casing, a barrel connected with the internal end of said tube and provided with perforations near its free end, a perforated cap closing the free end of the said barrel, a movable valve stem working within said barrel and having valves normally closing the valve casing, brackets fixed to the barrel and cap respectively, a movable float rod supported by the said brackets, a float fixed

to the lower end of the said float rod, a rocking arm pivotally connected with the barrel and the valve rod, a second arm fixed to the valve rod spaced from the rocking arm, and adjustable striker nuts carried by the said float rod and alternately engageable with the arms.

In testimony whereof I affix my signature in presence of two witnesses.

GILBERT J. GIBNEY.

Witnesses:
E. C. CHAMBLESS,
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