

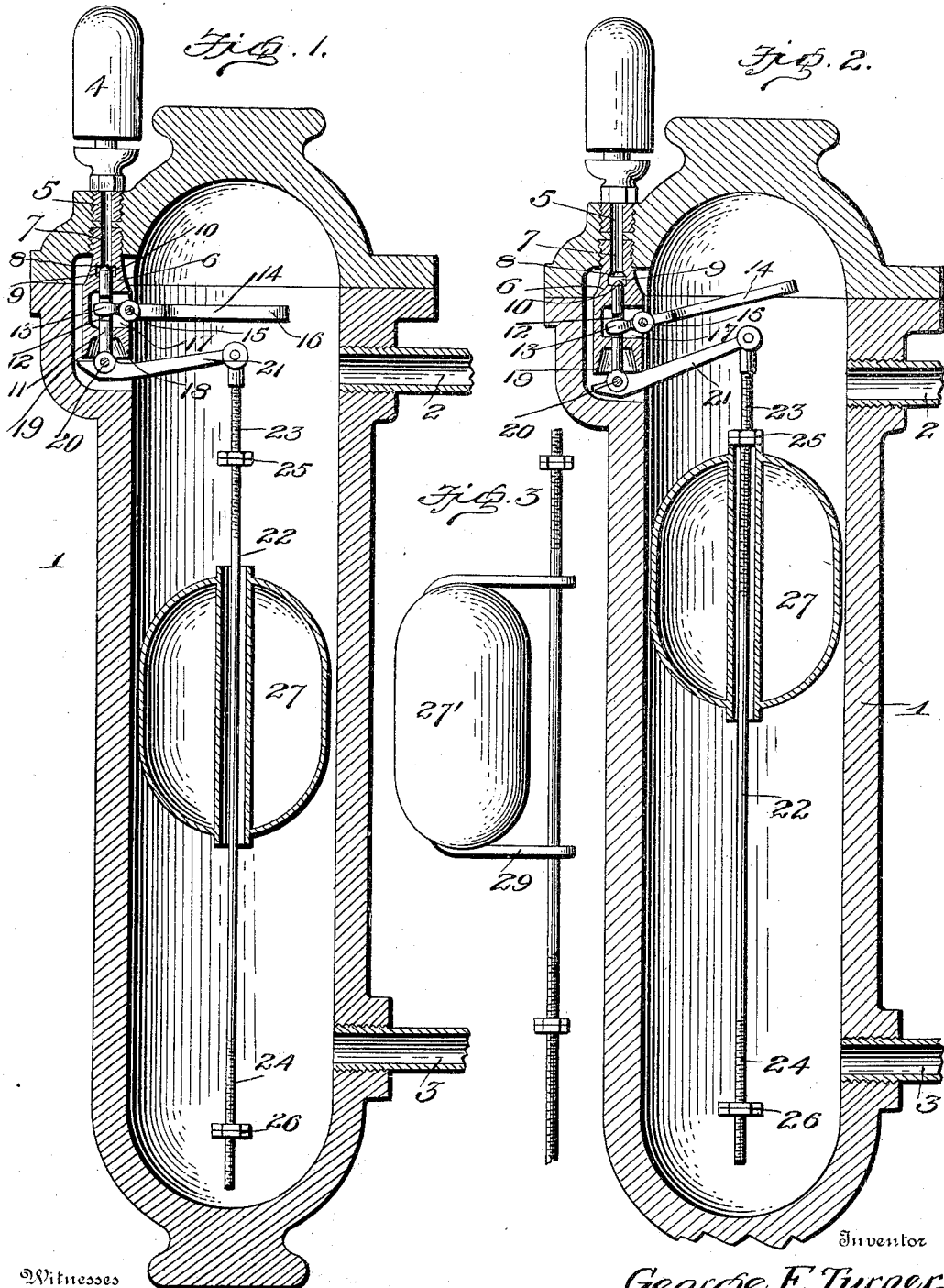
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G. E. TURNER.
HIGH OR LOW WATER ALARM.

(Application filed Mar. 11, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

GEORGE E. TURNER, OF MARION, OHIO.

HIGH OR LOW WATER ALARM.

SPECIFICATION forming part of Letters Patent No. 688,902, dated December 17, 1901.

Application filed March 11, 1901. Serial No. 50,652. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. TURNER, a citizen of the United States, residing at Marion, in the county of Marion and State of Ohio, have invented certain new and useful Improvements in High or Low Water Alarms; and I do 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. This invention relates to improvements in high and low water alarms of that class in which an upright casing is connected to the boiler and is in communication therewith at the steam and water spaces thereof by suitable tubes or connecting-pipes, and a float and valve mechanism in said casing controls the sounding of an alarm.

The object of the present invention is to provide an alarm device of this character in which the contact devices operated by the float are adjustably mounted, so as to provide for the accurate and sensitive operation of the parts at the proper periods, and to adapt the device to be set to establish a new limit for the high and low water lines whenever it may be found necessary or desirable.

A further object of the invention is to provide means for holding the valve securely to its seat to prevent the sounding of an alarm at an improper time, while adapting said valve to freely open when the float reaches the limit of its upward and downward movements and actuates the valve connections; also, to generally simplify and improve the construction and increase the practical efficiency of alarm devices of this character.

With these objects in view the invention consists in certain novel features of construction and combination of parts, which will be hereinafter more fully set forth, and particularly defined in the appended claim.

Figure 1 is a central vertical section of a high and low water alarm device embodying my invention, showing the normal position of the parts. Fig. 2 is a similar view showing in full and broken lines the arrangement of the parts when the valve is open to sound the high and low water alarms, and Fig. 3 is a detail view showing a modified form of float.

Referring now more particularly to the drawings, the numeral 1 represents the cylin-

drical casing of the alarm device, which is secured in practice in an upright position to the exterior of the boiler and is in communication with the interior of the boiler at the high and low water lines through the medium of connecting tubes or pipes 2 and 3. As shown, the pipes 2 and 3, respectively, enter the upper and lower portions of the casing 1 in the usual manner.

4 represents a steam-whistle of any well-known or approved form, connected to the top of the case by means of a screw-threaded tube 5 and having suitably attached to its upper end the aforesaid whistle.

In the upper portion of the casing is located a valve-chamber 6, provided at its upper end with a threaded tube 7, which is threaded into the top of the casing in line with the whistle-tube 5 and is in open communication therewith. Below this tube the valve-chamber is provided with a valve-seat 8 and below said seat with a steam-port 9. A valve 10, having a stem 11, slides vertically in the valve-chamber and controls the port 9, and said stem is slotted, as shown at 12, to receive the bifurcated end 13 of an arm 14, pivoted at 15 to said casing and carrying a counterbalance 16. The arm 14 extends through an opening 17, formed in the side of the valve-chamber 6, and its bifurcated end straddles the slotted or reduced portion of the valve-stem and is adapted to bear against the upper shoulder thereof to normally hold the valve seated under the action of the counterweight. The arm 14 therefore has, in effect, a slot-and-pin connection with the valve-stem, which enables it to move freely in an arcuate path, as the counterweight swings up or down, without binding upon or interfering with the free vertical movement of the valve-casing. The lower end of the valve-stem is formed or provided upon opposite sides of its axial line with fulcrum-points 18 and 19, and to the lower end of the valve-stem is jointed, as at 20, a horizontally-disposed operating-lever 21, which is adapted to contact with said fulcrum-points 18 and 19 to operate the valve, as hereinafter described.

22 represents an operating-rod vertically disposed within the casing 1 and connected at its upper end to the outer end of the lever

21. The upper and lower ends of the rod are screw-threaded, as shown at 23 and 24, and arranged thereon are nuts 25 and 26, forming adjustable contacts. A hollow float 27, preferably made of copper, is formed with a central guide-tube to receive the rod 22, and said float is adapted to slide freely on said rod between said contacts 25 and 26.

The operation is as follows: The counterweight 16 normally counterbalances the weight of the valve 10, lever 21, and rod 22 and operates to hold the valve normally seated to prevent it from casually unseating and allowing steam to pass to the whistle and sounding a false alarm when the water is at the proper level. As the boiler is filled with water water runs into the alarm-casing and raises the float. When the water in the boiler is feeding too fast and rises above the normal high-water level, the float within the alarm-casing moves upwardly to its highest point and comes in contact with the contact-piece 25 and elevates the rod 22. This causes the outer end of the lever 21 to be raised and brought into contact with the fulcrum-point 18, whereby the valve-stem is drawn downwardly against the resistance offered by the counterbalance 16 and the valve is opened, allowing steam to pass through the port 9 to the whistle, whereupon the high-water alarm is sounded. As the water within the boiler recedes and falls to its normal level the float descends within the alarm-casing and allows the parts to assume the normal position shown in Fig. 1. In case the water within the boiler falls below the low-water level the float upon reaching the limit of its downward movement contacts with the contact-piece 26 and causes the rod 22 to be drawn downwardly. By this means the outer end of the lever 21 is drawn down, while the inner end thereof bears against the fulcrum-point 19, and the pull of the rod and lever causes the valve-stem to be drawn downwardly and to uncover the port 9, whereupon steam passes through said port to the whistle and sounds the low-water alarm. The rod 22 is held in proper relation and prevented from swinging unduly beyond the perpendicular by the float, thus adapting said parts to guide each other in their operation under the rise and fall of the water.

By the construction of the valve mechanism hereinbefore described it will be seen that as the valve is normally held to its seat by the counterweight no leakage of steam through the port 9 can possibly occur, and hence false sounding of the alarm when the water is at a proper level will be effectually

avoided. The construction of the casing with the oppositely-disposed fulcrum-points with which the lever 21 contacts insures the proper operation of the valve under the action of the float in the rising and falling of the water and provides a sensitive construction of the parts which adapts the valve to freely open and close as the float contacts with or recedes from one of the adjustable contacts on the rod 22, thus obviating all liability of binding or hanging of the parts and reducing the number of connecting elements between the float and valve to the minimum. The adjustable contacts 25 and 26 may be adjusted up or down on the rod 22 to cause the valve of the alarm device to be operated at the proper periods and to set new limits for the water-levels, if desired. The advantages of the invention will be readily understood from the foregoing description.

In Fig. 3 of the drawings I have shown a modification in which the float 27', instead of being mounted directly on the rod 22, is arranged at one side thereof and connected thereto by upper and lower arms 29. The operation of this construction will be readily understood by reference to the drawings.

Changes in the form, proportion, and minor details of construction may be made within the scope of the invention without departing from the spirit or sacrificing any of the advantages thereof.

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

In a high and low water alarm, the combination of a casing, an alarm device, a valve-chamber connected with the casing and in communication with the alarm device and provided at its upper end with a port and at its lower end with oppositely-disposed fulcrum-points, a valve slidably mounted in said chamber and controlling the passage of steam through said port, a pivoted counterbalance movably connected with the stem of the valve, an operating-rod provided with contacts, a float slidable on the rod and adapted to engage said contacts, and a lever connected to the upper end of the rod and to the lower end of the valve-stem and adapted to rock upon the lower end of the stem and engage said fulcrum-points, substantially as set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GEO. E. TURNER.

Witnesses:

JOHN H. CLARK,
HARRY C. THOMPSON.