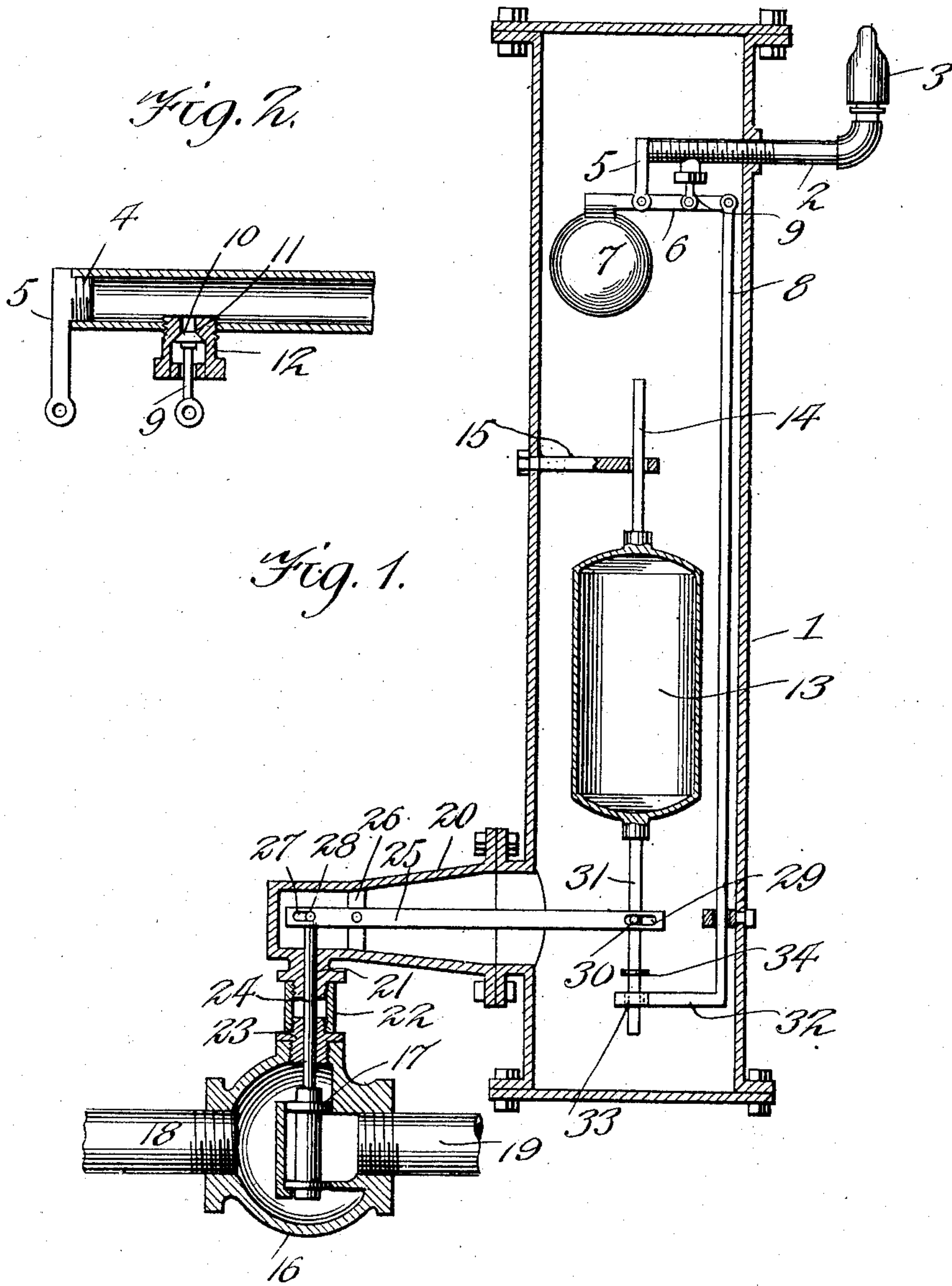


T. R. WHITTAKER.
FEED WATER REGULATOR AND ALARM.
APPLICATION FILED APR. 13, 1907.

905,614.

Patented Dec. 1, 1908.



Inventor
Thomas R. Whittaker

Witnesses
J. A. Adams Jr.
H. Allen

By Victor J. Evans
Attorney

UNITED STATES PATENT OFFICE.

THOMAS R. WHITTAKER, OF LAWRENCE, MASSACHUSETTS.

FEED-WATER REGULATOR AND ALARM.

No. 905,614.

Specification of Letters Patent.

Patented Dec. 1, 1908.

Application filed April 13, 1907. Serial No. 368,000.

To all whom it may concern:

Be it known that I, THOMAS R. WHITTAKER, a citizen of the United States, residing at Lawrence, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Feed-Water Regulators and Alarms, of which the following is a specification.

The invention relates to an improvement in feed water regulators and alarms for steam boilers, in the use of which the extremes of water levels are indicated by an audible alarm and the feed valve automatically controlled.

The main object of the present invention is the provision of independent alarm controlling means within the water column of a steam boiler, the respective means being arranged for operation by the buoyancy of the fluid within the column and both arranged for the sounding of the same alarm when operated.

A further object of the invention is the connection between the feed valve and one of the alarm controlling means, whereby the feed valve is automatically regulated by the alarm controlling means.

The invention will be described in the following specification, reference being had particularly to the accompanying drawings, in which:—

Figure 1 is a view in section partly in elevation illustrating the preferred form of feed water regulator and alarm, Fig. 2 is an enlarged longitudinal section partly in elevation of a portion of the alarm connection with the water column.

Referring particularly to Fig. 1 my improved alarm mechanism is mounted for operation in the water column 1, and comprises a pipe section 2 projecting through the wall of the column and provided at its outer or free end with an alarm, as a whistle 3. The inner end of the pipe section 2 is closed by a plug 4 arranged for threaded engagement with the end of the section and carrying a depending fulcrum arm 5.

6 represents a lever pivotally supported on the fulcrum arm 5, said lever carrying at one end a float 7 and being provided at the opposite end with a depending rod 8, for a purpose hereinafter described. Intermediate the connection of the rod 8 and the fulcrum the lever 6 is connected to a valve stem 9 carrying at its inner end a valve 10 arranged to close an opening 11 in a valve plug 12 seated

in an opening formed in the pipe section 2. The valve is arranged for closing upon a relatively upward movement of the stem, so that upon elevation of the float 7 due to the buoyancy of the liquid the valve stem 9 will be moved in a downward direction to permit the steam within the water column to pass through the section 2 and sound the alarm 3.

A float 13, hereinafter termed the controlling float is mounted for movement within the column, said float being provided with an upwardly extending guide rod 14 mounted for movement through an opening in an arm 15 secured to the wall of the column, whereby the float is guided in movement. The float 13 is the controlling float for the liquid, and is so disposed with relation to the normal level of liquid desired as to operate for the purposes to be explained to prevent under ordinary circumstances the depression or elevation to any material degree of the normal level of the liquid. In order to provide for this effective control by the float 13 I construct the same so that it will automatically regulate a feed water valve, and will also automatically sound the alarm upon the abnormal depression of the water level.

For the feed valve controlling function of the float 13 I arrange the feed valve casing 16 adjacent the water column, which casing contains the feed valve 17, of any desired type, and is in communication with the service pipe 18 and feed pipe 19.

A housing extension 20 is secured to the wall of the water column in an appropriate manner, said housing being in open communication with the interior of the column and closed at its outer or free end. Directly above the feed valves 17 the housing is formed with a depending tubular offset 21, connected through the medium of a threaded sleeve 22 of appropriate length with a casing plug 23 threaded in an opening in the upper portion of the casing in alinement with the valves. The valves 17 are provided with a stem 24 extending through the casing 16, the plug 23, the sleeve 22, the tubular offset 21, and terminating within the housing. A lever 25 is pivotally supported within the housing upon a transverse bar 26, the relatively outer end of which is slotted at 27 to receive a pin 28 projecting from the valve stem 24, the relatively inner end of the lever being also slotted at 29 to receive a pin 30 projecting from a rod 31 depending from the float 13.

The lower end of the rod 8 is formed with a laterally projecting arm 32 formed in the relatively free end with a guide opening 33 to receive the end of the rod 31, the rod above the opening being provided with a disk 34 so disposed that in the descent of the float said disk will engage the arm 32 of the rod 8 and depress the rod.

In operation, in the preferred form, the normal level of liquid in the column, and, therefore, in the boiler, is controlled by the float 13, as when said level has been reached the elevation of the float due to its buoyancy will close the valves 17 and cut off the supply. Upon the depression of the float 13, due to the lowering of the level of the water, the valves 17 are opened to admit a further supply. In the event of the closing of the valves 17 under the operation of the float should be ineffective to shut off the water supply, as by the presence of a foreign body at the valve seat, or the sticking of the valve in operation, an excessive level of the water will be readily indicated by the alarm, as by the rising in the water level the float 7 will be elevated, the valve 10 opened, and the alarm sounded by the steam pressure accumulated in the column. If the supply from the service pipe is ineffective for any reason to overcome the pressure within the boiler, in which event the opening of the valve 17 by the float is without result, the level of the water in the column will continue to fall until the disks 34 of the float rod 31 engage the arm 32 of the rod 8, thereby moving said rod downward and again opening the valve 10.

The construction described provides a

simple device in which the level of the water in the boiler is automatically maintained, the construction including a means whereby an extreme level of water above or below the normal will automatically sound an alarm in the event of improper control of the feed valves.

Having thus described the invention what is claimed as new, is:—

The combination with a water column casing, of a pipe section projecting within the casing, an alarm carried by said pipe section, a lever movably supported by the pipe section, said pipe section being formed with an inlet, a valve controlling said inlet, a float carried by one end of the lever, a connection between the valve and lever, said connection operating in opposition to the movement of the float, a rod connected to the end of the lever opposite the float and depending within the casing, a float mounted below the lever within the casing, a guide for the upper end of the lower float and secured within the casing, means carried by the rod to guide the lower end of the float, means carried by the lower float to engage and depress the rod upon a predetermined movement of said float, and a valve controlling connection extending from the lower float and operated by the movement of said float in both directions.

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

THOMAS R. WHITTAKER.

Witnesses:

JOHN L. FLETCHER,
K. ALLEN.