W. L. FOSTER.

AUTOMATIC CONTROL FOR BOILER FEED PUMPS.

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1,302,350. Patented Apr. 29, 1919.

Fig. 1

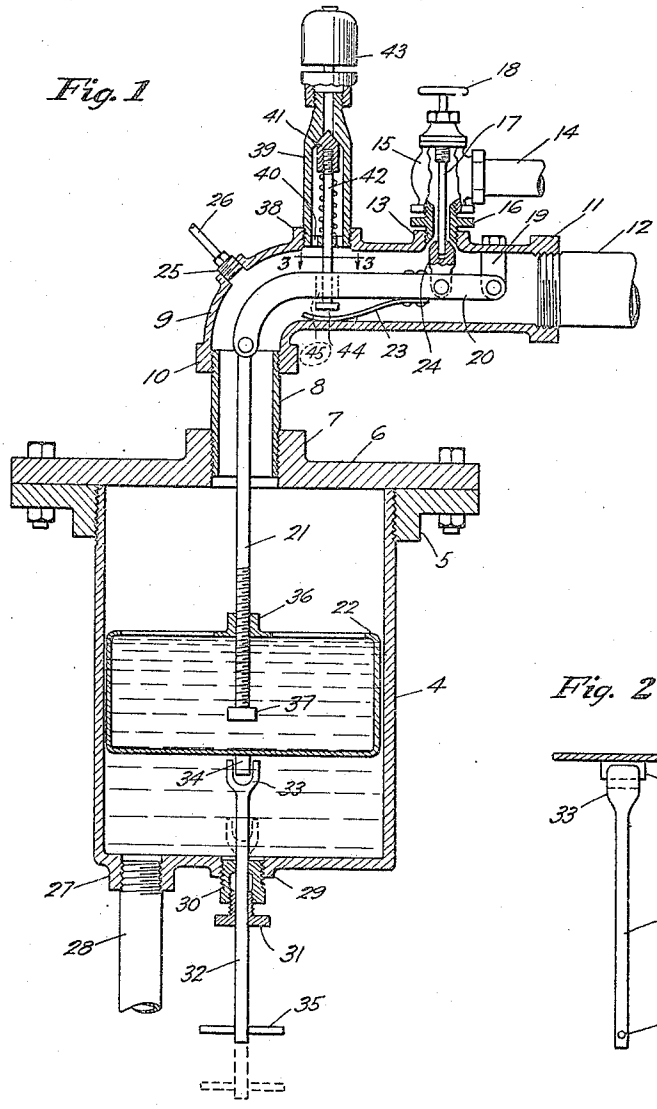
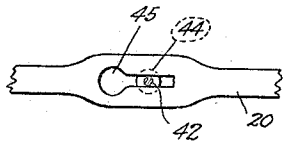


Fig. 2

Fig. 3



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UNITED STATES PATENT OFFICE.

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AUTOMATIC CONTROL FOR BOILER FEED-PUMPS.

1,302,350. Specification of Letters Patent. Patented Apr. 29, 1919.

Application filed March 20, 1918. Serial No. 223,659.

To all whom it may concern:

Be it known that I, WALTER L. FOSTER, a citizen of the United States, residing at Whittier, in the county of Los Angeles and State of California, have invented new and useful Improvements in Automatic Controls for Boiler Feed-Pumps, of which the following is a specification.

This invention relates to means for adjusting the automatic pump control disclosed and claimed in my application for patent entitled Automatic pump control for boiler feed Serial Number 175,085, filed June 16, 1917.

It is an object of this invention to provide means for adjusting the control, so that it will operate at selected water levels. It is another object to provide means of the character described, which does not require taking down the control in order to make the adjustments.

I accomplish these objects by means of the embodiment of my invention illustrated in the accompanying drawing, in which:

Figure 1 is a central sectional view through the regulator. Fig. 2 is a detail showing a side view of the adjusting rod. Fig. 3 is an enlarged fragmentary view of the regulator lever showing the means for connecting the whistle thereto.

An equalizing chamber is indicated by 4. The equalizing chamber is cylindrical in form and has the lower head preferably formed integral therewith. The upper end of the equalizing chamber is threaded and mounted thereon is a flange 5 provided with bolt holes which register with bolt holes in a removable head 6. A nipple 7 is formed on head 6, and secured to the nipple is a section of pipe 8. Secured to the pipe section 8 is an elbow 9.

The elbow 9 is preferably of special construction, and has one long arm. At the end of the elbow are wrench holds 10 and 11. Connected to the elbow 9 is a section of pipe 12 which is adapted to be connected to the steam dome of a boiler.

Formed in the elbow 9 is a nipple 13 for connection to the steam piping of the feed pump. The boiler feed pump piping is indicated by 14, and interposed between the nipple 13 and the piping 14 is a valve casing 15. The valve casing 15 is connected to the nipple 13 by means of a reversible valve seat member 16. A valve stem 17 is engaged by means of threads with the valve casing, so that it may be moved up or down. The stem 17 extends through the nipple 13, and at the upper end is provided with a convenient hand hold 18 for operation of the stem in adjusting the position of the same.

Disposed within the elbow 9 is a post 19, which is preferably removably secured to the elbow. Pivotally secured to the post 19 is a lever 20. Pivotally secured to the end of lever 20 is a connecting rod 21, which carries a bucket float 22 at its lower end. Secured to the under face of lever 20 is a leaf spring 23, which bears at its free end against the elbow 9, and tends to move the lever 20 upwardly. Pivotally secured to the lever 20 between its ends is a valve 24, which seats upon the reversible seat 16. The valve 24 has a bore formed therein in which is slidably disposed the valve stem 17, whereby the valve is guided in a straight line in its movement and also limited as to its closed position.

The bucket float 22 is open at the top, so that it may be filled with water. When the bucket 22 is entirely submerged in the water, its weight is comparatively small and the leaf spring 23 will raise the lever 20 so that the valve 24 may be closed as far as the stem 17 will permit. As soon as the water level drops so that part of the bucket is above the water, the added weight becomes so great that the tension of spring 23 is overcome and the bucket float is moved downwardly, thereby moving the valve 24 from its closed position and admitting more steam to the feed pump.

In order to provide for convenient assembling and disassembling of the lever mechanism, I have provided a threaded aperture in the elbow 9, which is closed by a plug 25. Plug 25 has a threaded bore in which is disposed the pipe 26 of a steam gage.

The lower head of the equalizing chamber is formed with a nipple 27 in which is disposed a pipe 28 adapted to communicate with the boiler below the water level. At the center of the lower head there is a nipple 29. Disposed in nipple 29 is a gland plug 30 having a recess for packing. Secured in the packing recess by means of threads is a gland member 31. Extending through the gland is an adjusting rod 32,

which is bifurcated at its upper end as indicated by 33, so that it may straddle a lug 34 formed on the bottom of the bucket 22. The lower end of the adjusting rod is provided with a handle 35 which makes it convenient to turn. It will be noted that the bucket 22 has at the center thereof a hub 36 which is internally threaded. The connecting rod 21 is threaded at its lower end and engaged with the thread on the tubular extension 36. The bucket 22 may be raised or lowered by turning the bucket on the connecting rod 21. A nut 37 on the lower end of the connecting rod prevents the bucket from being detached from the connecting rod.

It is obvious that the control may be adjusted to keep the water at a selected level by moving the bucket up or down upon the connecting rod 21. This is conveniently done by moving the adjusting rod 32 upwardly until it touches the bottom of the bucket or the lug 34, then turning it until it straddles the lug, and finally rotating the bucket so that it is moved upwardly and downwardly to the desired position upon the connecting rod 21. The adjusting rod 32 is then withdrawn to its lower position as shown in dotted lines in Fig. 1.

I have also provided a low water whistle as a part of my regulator. The elbow 9 is provided with a nipple 38 which is internally threaded. A tubular valve seat member 39 is screwed into the nipple. A spider 40 guides the valve stem upon the end of which is a valve 41. A spring 42 upon the valve stem tends to hold the valve closed. The valve 41 controls the flow of steam to a whistle 43. The stem 42 is provided with a head 44 disposed below the lever 20. Cut in the lever 20 is a key hole 45 through which the stem 42 extends. The head 42 is of such size that it will pass through the enlarged part of the key hole, but will be prevented from being withdrawn through the contracted portion.

The whistle structure is assembled with the regulator by passing the head 45 through the enlarged portion of the key hole before the tubular seat 39 is screwed into position. This may be done by tilting the stem 42 in inserting it into the elbow 9. The stem and tubular member are then placed in upright position and the tubular member screwed into place. The head 44 will then be in such position that it cannot be withdrawn from the lever 20.

When due to lack of water the bucket 22 drops, it draws the lever 20 downwardly into its lowest position engaging the head 44 of the valve stem and drawing the valve 41 off its seat permitting steam to pass and sound the whistle.

What I claim is:

1. In a boiler feed control, an equalizing chamber having a bucket therein, a connecting rod upon which said bucket is adjustably mounted, and an adjusting rod slidably extending into the equalizing chamber disposed so as to be engaged at will with the bucket to adjust its position on said rod and to be withdrawn therefrom after adjustment.

2. In a boiler feed control, an equalizing chamber, a connecting rod having a threaded end mounted in said chamber, a bucket mounted on said threaded end, said bucket being provided with a lug on its underside, and an adjusting rod slidably extending through the equalizing chamber so as to be rotated and moved axially, said rod being provided with fingers to engage said lug for adjusting the position of the bucket on the rod.

In witness that I claim the foregoing I have hereunto subscribed my name this 13th day of March, 1918.

WALTER L. FOSTER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."