May 4, 1937. W. J. WOOLLEY 2,079,098

AUTOMATIC WATER FEEDING DEVICE

Filed Oct. 10, 1934

Fig. 1

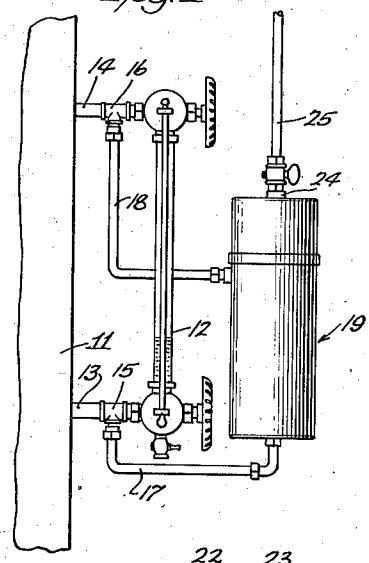


Fig. 2

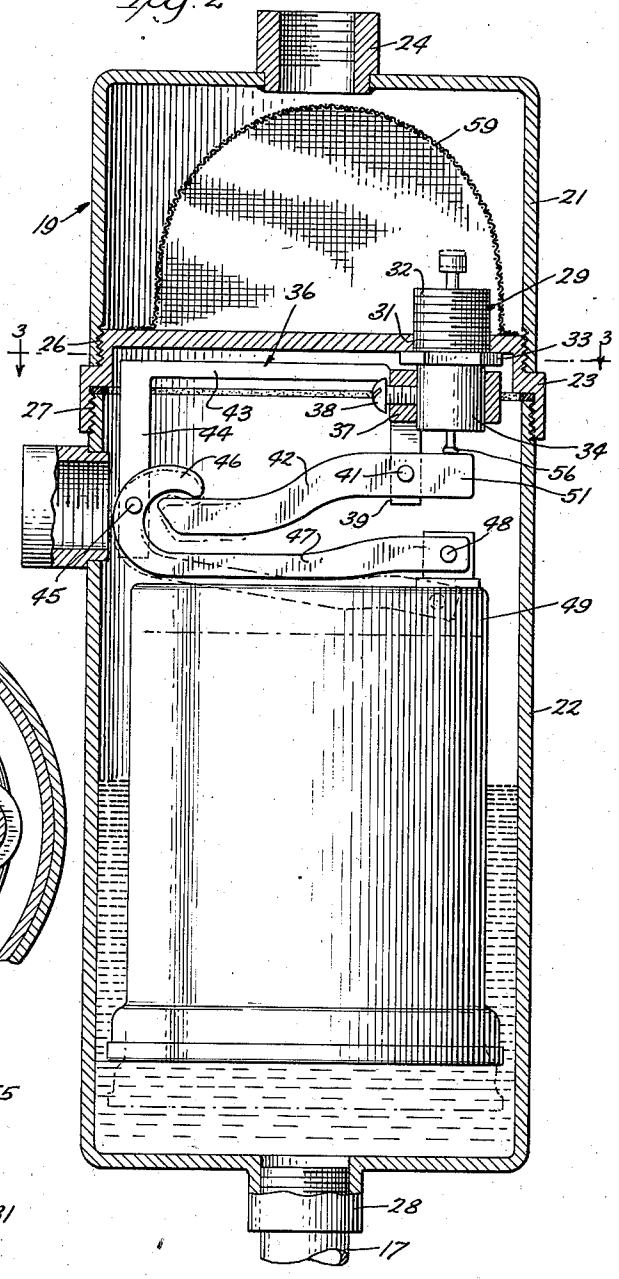


Fig. 3

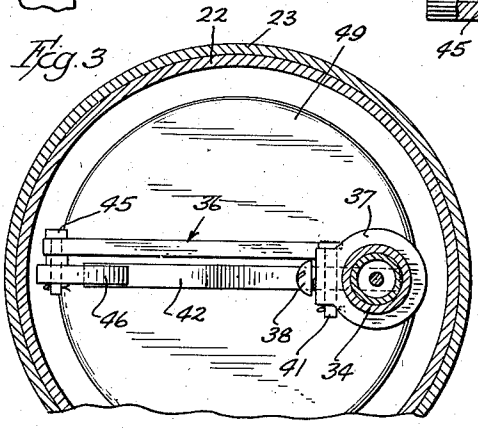
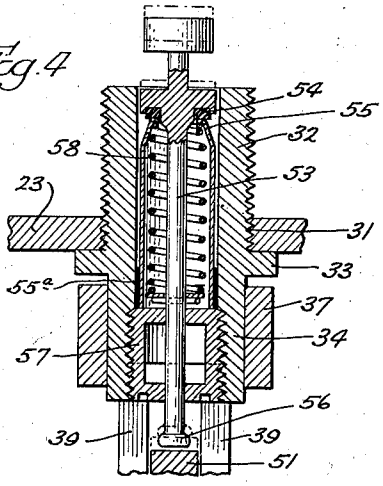


Fig. 4



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Patented May 4, 1937

2,079,098

UNITED STATES PATENT OFFICE

2,079,098

AUTOMATIC WATER FEEDING DEVICE

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Application October 10, 1934, Serial No. 747,735

4 Claims. (Cl. 137—101)

This invention relates to automatic water feeder devices for supplying water to low pressure steam boilers, expansion tanks, warm air furnaces, humidifiers and the like.

A principal object of the invention is the provision in a water feeder device of means for automatically supplying water to a boiler or the like, and for controlling and maintaining constant said water supply within the boiler or the like at a predetermined level commensurate with proper functioning of the boiler.

Another important object of this invention is the provision of a water feeder device which is compact in construction and dependable in operation, requiring no outside attention and adapted to be readily and easily installed.

A still further object of the invention is the provision of a water feeder of the above character which will allow an almost constant supply of water to the boiler or the like, in small quantities and at short intervals rather than large quantities at long intervals, thus obviating any chilling of the boiler and warding off any cracking tendencies in said boiler.

A further object of the invention is the provision of means in a water feeder of the above character for adjusting the float mechanism relative to the valve mechanism to provide for variations in the water level of the boiler as may be required.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawing, discloses a preferred embodiment thereof.

On the drawing:

Figure 1 is a side elevation of the water feeder showing its method of attachment to a boiler;

Fig. 2 is a longitudinal cross section of the water feeder proper;

Fig. 3 is a section on line 3—3 of Fig. 2; and

Fig. 4 is a cross section of the valve mechanism.

As shown on the drawing reference character 11 indicates generally a boiler having the usual water glass gauge 12 connected to the boiler by the pipes 13 and 14. Between the water gauge and the boiler each of these pipes may be provided with T's 15 and 16, for connection with tubing or piping 17 and 18 in turn connected to a water feeder unit 19 which may be spaced away from the water glass gauge in any suitable direction to provide for convenient viewing of the water gauge level when necessary.

The water feeder unit 19 may be circular and tubular in form and comprises generally a hollow upper or inlet section 21, a hollow lower reservoir section 22, and an intermediate divider member 23. The inlet section 21 is provided at its closed upper end with a nipple 24 for threaded reception with water supply pipe 25 while at its lower or open end it is threadedly engaged at 26 to the intermediate divider 23. The lower reservoir section 22 is open at its upper end and is threadedly engaged as at 27 to an adjacent portion of the intermediate divider 23, and at its closed bottom portion is provided with a tapped connection 28 for engagement with the water feeder outlet pipe 17.

A valve mechanism, generally indicated by reference character 29, is adapted to be threaded thru a tapped opening 31 in the intermediate divider member 23 located intermediate the axis and the periphery of the water feeder, and comprises a threaded upper portion 32 extending beyond the intermediate divider member and into the chamber of the upper section, a nut portion 33 shouldering against the underside of the divider member and a sleeve portion 34 extending beyond the nut portion and into the lower reservoir section.

An adjustable hanger 36 for mounting the float operating and valve opening lever is provided, being housed within the confines of the reservoir section, and consists of a collar portion 37 adapted to embrace the sleeve 34 of the valve 29 and to be rigidly held thereto by suitable means 38, and a pair of vertically disposed extensions 39 formed integral with the collar portion, and providing for a pivotal connection 41 to a horizontally disposed lever 42. Extending horizontally from the collar portion 37 at its upper end is an arm 43 formed integral with a vertical extension 44, the lower portion of which provides for a pivoted connection 45 to the hook end 46 of a horizontally disposed lever 47, the opposite end of which is pivotally mounted at 48 to a bracket on float 49.

It will be observed from Fig. 2 that the action of the float operating lever is very simple and that, as the water level drops in the reservoir section, the float drops correspondingly, causing the lever 47 to take the position shown in broken lines. In this position the hook 46 of the float lever contacting the end portion of the lever 42 rotates the latter counter clockwise about the

pivot 41 causing the extension 51 of the lever to open the valve 29, allowing the water to flow into the reservoir chamber and into the boiler, it being understood of course that the water pressure with this type of installation exceeds the steam pressure carried in the boiler.

The valve mechanism for admitting water to the reservoir or float chamber is of a well known and reliable type generally comprises a valve stem 53 having a composition gasket 54 suitably mounted in its upper portion to normally seat against the inner casing 55 of the valve, and an enlargement 56 at its lower portion serving to contact the extension 51 of the lever 42. The valve stem 53 is located suitably within the casing 55 which has a lower threaded portion 57 integral therewith that is cut away at its lower end on two sides to form suitable outlet apertures, and has a packing 55a integral therewith which contacts the sides of the inner portion of sleeve 34.

Referring specifically to Fig. 4, it will be apparent that when the water feeder is in use and the upper section 21 is filled with water, the space between the inner valve casing 55 and the upper portion 32 above the packing 55a will also be filled with water, which, in conjunction with the fact that the water also surrounds the upper portion 32, will result in the maintaining of the valve and valve seat in a cooled condition and the elimination to an extent of the possibility of corrosion thereof.

The stem 53 is normally urged into valve closing position by a spring 58 until such time when the lever 42 urges it to open the valve. The valve is easily replaceable should any part become defective, and to avoid any foreign matter from entering into the valve mechanism a noncorrodible screen 59 is placed over it and resting upon the upper surface of the intermediate divider that the water will first be filtered before entering the valve.

It is believed that the operation of the device will be fully understood from the following description.

Water enters into the upper chamber 21 through the main supply pipe 25 which may be provided with a suitable shut-off valve, and passes through the screen into the valve (assuming this to be an initial installation); from there it passes through the float chamber and into the boiler.

When sufficient water has passed into the boiler corresponding to a normal working level, the float will have raised until it reaches the full line position shown in Fig. 2 at which time the valve will be released from the extension 51 and urged into a valve closing position by spring 58 and the pressure of the water in the chamber 21, shutting off the water supply of the float chamber and consequently of the boiler. This closed position will be maintained until the transformation of the water into steam causes a drop of the water level in the reservoir or float chamber, at which time the parts assume the broken line position shown in Fig. 2. The valve will then be opened, replenishing the water supply to the boiler until the correct level has been reached, after which the valve will again close.

The equalizer pipe 18 is provided to break any vacuum which would otherwise form in the reservoir and prevent the entrance of water into said reservoir.

The water is thus fed slowly and almost constantly so that the water in the boiler is maintained at a predetermined level.

In order that the mechanism may be adjusted in accordance with the proper water level desired, the hanger 36 may be raised or lowered to provide the correct relationship of the leakage and effect a proper functioning of the inlet valve.

Because of its small size and light weight, the instant water feeder can be placed far enough away from the boiler 11 so that it will never be any warmer than room temperature as a safeguard against corrosion. Also, due to the smallness of the opening provided by the valve 29, the present device will not flood or cool the boiler during flash firing. That is, in the usual prior art devices when used with an oil or gas fired boiler, when the burner flashes on and quickly fills the system with steam, they very quickly fill the boiler up to the water line, and this added to the subsequently returned condensate fills the boiler far above its normal water line and makes it an expensive unit to heat. With the above described water feeder in a similar case, however, the boiler is replenished slowly enough to prevent such cooling and flooding while still insuring a sufficient supply of water to at least amply cover the crown sheet.

Due to the above described construction of water feeding device, the valve, screen, or any other interiorly disposed part may be easily removed for cleaning or adjustment without lowering the normal water line in the boiler.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a water feed device for a boiler or the like, a valve, a valve stem, condition responsive valve actuating means, a lever pivotally connected with said actuating means at one end and having a hook at its other end, a valve lever below the end of the hook of said first mentioned lever and in sliding contact therewith, said valve lever being in operable sliding contact with said valve stem, and mounting means for both said levers, said first mentioned lever being pivoted to said mounting means near its hook end.

2. In a water feed device for a boiler or the like, a valve, a valve stem, condition responsive valve actuating means, a lever pivotally connected with said actuating means at one end and having a hook at its other end, a valve lever below the end of the hook of said first mentioned lever and in sliding contact therewith, said valve lever being in operable sliding contact with said valve stem, and a mounting means for both said levers, said first mentioned lever being pivoted to said mounting means near its hook end, said mounting means being adjustable so as to vary the water feed of the device without affecting the operation of said valve stem.

3. In a water feed device for a boiler or the like, a valve, a valve stem, condition responsive valve actuating means, a lever pivotally connected with said actuating means at one end and having a hook at its other end, a valve lever below the end of the hook of said first mentioned lever and in sliding contact therewith, said valve

lever being in operable sliding contact with said valve stem, mounting means for both said levers, said first mentioned lever being pivoted to said mounting means near its hook end, said mounting means being adjustable so as to vary the water feed of the device, and said valve lever being so arranged that it operates only to open said valve.

4. In a water feed device for a boiler, a valve, a valve stem, mounting means, a lever pivoted to said mounting means and so arranged as to operatively bear against said valve stem, a second lever disposed below said first lever and having a hook-shaped end portion extending upwardly around one end of said first lever and slidingly engaging the upper surface thereof, the hook-shaped end portion of said second lever being pivoted to said mounting means, and a float pivotally connected to said second lever at its other end.

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