July 19, 1927. 1,636,559

C. B. HAINES

BOILER WATER FEEDER

Filed July 14, 1926

Fig. 1.

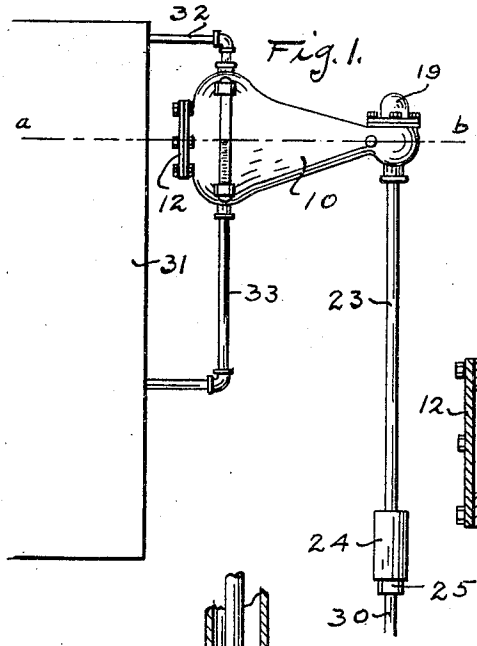


Fig. 2.

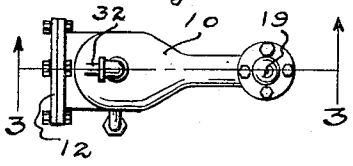


Fig. 3.

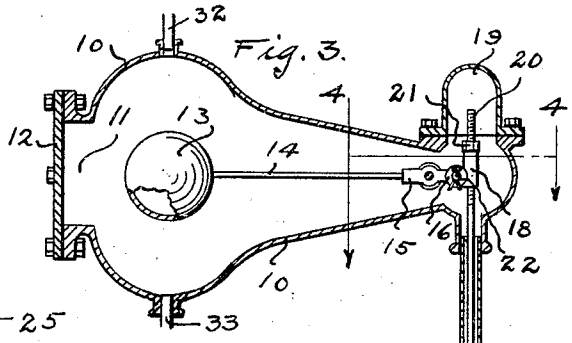


Fig. 4.

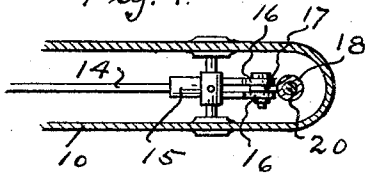


Fig. 5.

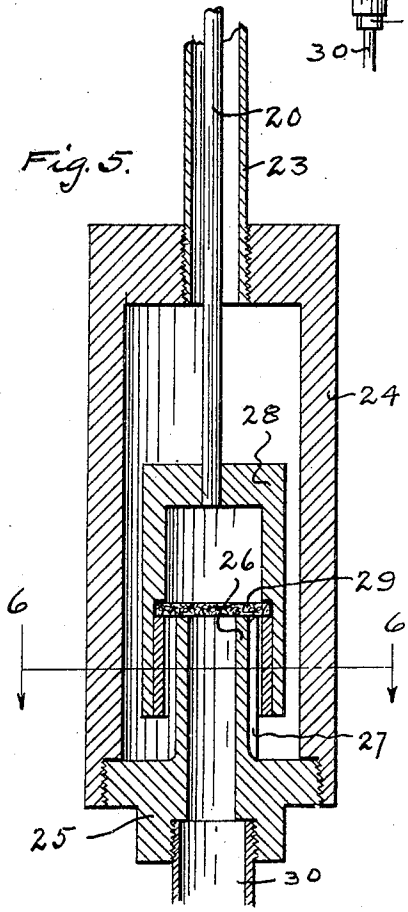
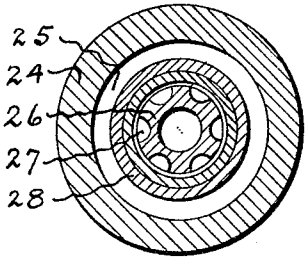
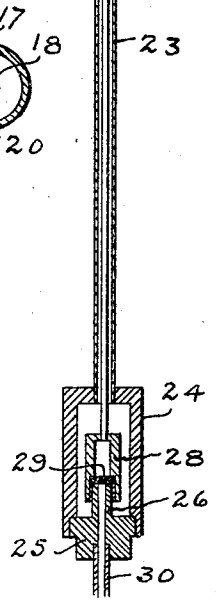


Fig. 6.





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UNITED STATES PATENT OFFICE.

CHARLES B. HAINES, OF INDIANAPOLIS, INDIANA.

BOILER WATER FEEDER.

Application filed July 14, 1926. Serial No. 122,338.

This invention relates to means for automatically controlling the water level in a steam boiler, whereby a predetermined water level may be maintained in the boiler by such means permitting water to enter the boiler when the level drops and shutting off the water when the level is again reached.

I am aware of the fact that such means, commonly designated as boiler feeders, have been produced heretofore, but such feeders have not always proved entirely reliable on account of the water control mechanism sticking at the critical period when water is required.

My invention was conceived to overcome such faults and embodies a structure extremely simple in operation, having few moving parts, and capable of being produced at a low cost.

The primary feature contributing to the great success of my invention is the placing of the water control valve so that steam or hot water does not come in contact with the valve seat.

The invention is described with reference being made to the accompanying drawing, in which—

Fig. 1, is a side elevation of the feeder as attached to a boiler;

Fig. 2, a top plan view of the feeder;

Fig. 3, an enlarged vertical section through the feeder on the line 3—3 in Fig. 2;

Fig. 4, a transverse section through a portion of the feeder on the line 4—4 in Fig. 3;

Fig. 5, a still further enlarged vertical section through the lower valve chamber of the feeder; and

Fig. 6, a transverse section through the valve chamber on the line 6—6 in Fig. 5.

Like characters of reference indicate like parts throughout the several views of the drawing.

I form a housing 10 having an opening 11 at one end with the cover plate 12, through which opening 11, the float 13 may be inserted. To the float 13 is attached the float rod 14 having its other end secured in the bracket 15 pivotally carried between the sides of the housing near the rear end of the housing.

The bracket 15 has the two ears 16 projecting rearwardly to receive therebetween the lug 17 extending forwardly from carriage 18. The housing 10 has a removable cover plate 19 over the rear end, which may be removed to give access to the parts there below.

A valve rod 20 passes through the carriage 18 and has an adjusting nut 21 screw-threadedly carried on the rod 20 whereby the valve rod 20 may be raised or lowered. The lug 17 is pivotally carried between the ears 16 by the pin 22.

A pipe 23 of relatively small diameter is depended from the rear of the housing 10, and carries a valve chamber 24 at its lower end at a substantial distance below the housing 10.

Fitted in the lower end of the chamber 24 is the plug 25 having a hole therethrough terminating in a centrally, upwardly disposed nozzle 26, the top of which serves as a valve seat. It is to be noted that this nozzle 26 is fluted on its outer surface by the recessed portions 27.

The valve rod 20 extends freely downwardly through the pipe 23 into the chamber 24 and carries on its lower end the valve 28, being in effect, an inverted cup to fit loosely over and downwardly around the nozzle 26.

A valve disk 29, preferably made of leather, though it may be rubber or a composition material, is carried within the valve 28 to act as a closure of the nozzle 26 when the valve 28 is dropped onto the nozzle.

A water supply pipe 30 is connected to the under side of the plug 25. Although the valve 28 fits over the nozzle 26 as a means of guiding the valve, a slight lifting of the disk 29 off of the nozzle will permit water to flow from the nozzle and down through the nozzle recesses 27 into the valve chamber 24 and thence upwardly into the housing 10.

The housing 10 is connected to the boiler 31, as in Fig. 1, by the upper steam pipe 32 and the lower water pipe 33 so that the level of the water in the housing 10 may be the same as within the boiler 31 as indicated by the line *a—b*.

Any drop in the level *a—b* will permit the float 13 to drop accordingly, which action causes the valve rod 20 to be raised thereby raising the disk 29 off the nozzle end to permit water to flow into the housing 10 and thence into the boiler 31 by the pipe 33 until

the level *a*—*b* rises again to elevate the float 13 sufficiently to seat the disk 29 on the nozzle 26 to shut off the water.

As the nozzle 26 and its closing disk 29 is at the end of the small pipe 23, below the water line *a*—*b* at a considerable distance, steam does not contact these parts and the water about the parts does not become heated as it does not circulate to and from the boiler. As the disk 29 and the nozzle 26 are kept cool, there is no occasion for the disk 29 to become vulcanized to the nozzle 26 or to deteriorate through any heating effects.

I claim:

In a boiler water feeder, a housing adapted to be mounted in relation to a boiler to encompass normal boiler water level fluctuations, a float within the housing, a pivoted bracket in the housing, a float rod secured to the bracket and carrying the float, a pipe of relatively small diameter depended from the housing, a valve chamber carried on the lower end of the pipe, a valve nozzle projecting upwardly into said chamber, a valve having a sleeve fitting around said nozzle as a guide, a valve disk carried within said valve adapted to close the end of said nozzle with the valve in its lowered position, said nozzle being connected to a water supply under pressure, a valve rod carrying said valve and extending through said pipe into said housing, a head carrying said valve rod and pivotally connected to said float rod bracket whereby said valve is lifted as said float drops, and means for adjusting the vertical position of the valve in relation to the float, said nozzle having recessed passages in its outer face to permit water to enter said valve chamber between said nozzle and said valve sleeve whereby all entering water is discharged upwardly into said float chamber.

In testimony whereof I affix my signature.

CHARLES B. HAINES.