M. GARL.

HOT WATER HEATER VALVE.

APPLICATION FILED DEC. 5, 1911.

1,040,306.

Patented Oct. 8, 1912.

Fig. 2.

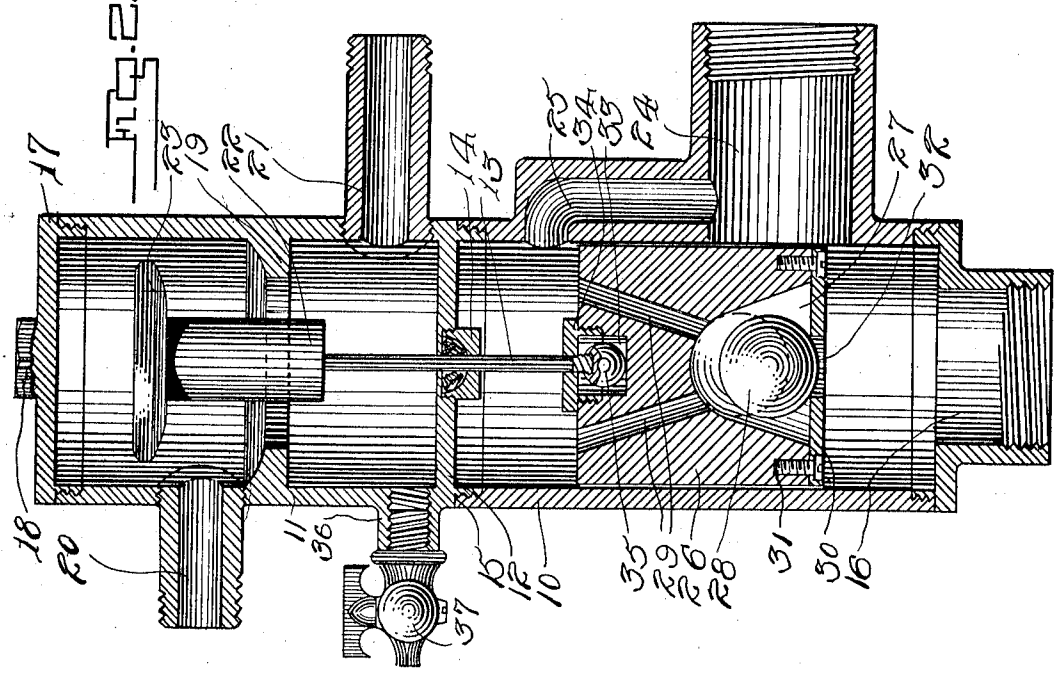
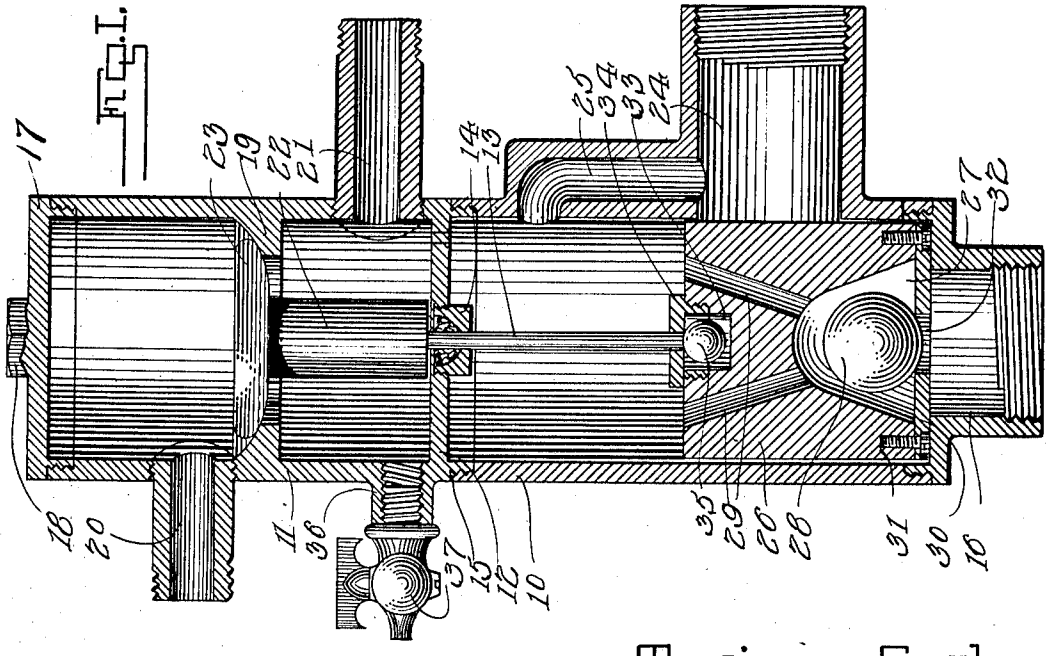


Fig. 1.



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WITNESSES

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UNITED STATES PATENT OFFICE.

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HOT-WATER-HEATER VALVE.

1,040,306. Specification of Letters Patent. Patented Oct. 8, 1912.

Application filed December 5, 1911. Serial No. 664,038.

To all whom it may concern:

Be it known that I, MANIOUS GARL, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Hot-Water-Heater Valves, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to hot water heaters and has special reference to a valve of the type used to control the flow of gas to the heater, the valve being operable through the control of the water flow of the water outlet pipe.

The principal object of the invention is to improve the general construction of devices of this character.

A second object of the invention is to improve the construction of a valve of this character so that the gas will be turned on full even though the water may be drawn off very slowly.

With the above and other objects in view, the invention consists in general of certain novel details of construction, and combinations and arrangements of parts as will be hereinafter fully described, illustrated in the accompanying drawings, and specifically claimed.

In the accompanying drawings, like characters of reference indicate like parts in the several views, and Figure 1 is a vertical median section of the valve showing the same closed. Fig. 2 is a similar section showing the valve open.

This invention consists of a substantially cylindrical casing comprising a lower member 10 and an upper member 11, the latter having a diaphragm 12 across its lower end, said diaphragm being provided with a centrally exposed opening for the reception of a valve stem 13, a suitable gland 14 surrounding the opening so that the stem will be compact to prevent the passage of contents of the valve from one side of the diaphragm to the other. These portions 10 and 11 are united by a screw joint 15 and screwed upon the lower end of the portion 10 is a water inlet nipple 16 internally pipe threaded for the reception of an end of a water supply pipe. The upper end of the portion 11 is provided with a cap 17 screwed thereon, said cap having the usual hexagonal boss 18 arranged to serve as a nut to screw the cap in position. Between the upper and lower ends of the member 11 there is provided an internal flange 19 forming a valve seat the valve being preferably concaved on its upper side. Threaded into the member 11 above the valve seat 19 is a gas supply nipple 20 while below the valve seat 19 is a delivery nipple 21 adapted for communication with a suitable burner by means of a pipe not here shown. Above the diaphragm 12 the valve stem 13 is enlarged as at 22 and upon the upper end of this enlarged portion is a valve 23 which has its edges shaped to conform to the valve seat 19 so that it closes tightly when resting thereon. Leading from one side of the member 10 is a water outlet 24 and this water outlet is provided with a by-pass 25 which opens into the chamber of the valve casing at a point above the water outlet 24. Within the casing 10 is a plunger 26 which is of slightly smaller diameter than the casing and is provided at its lower end with a frusto-conoidal opening or recess 27, the upper end whereof is mounted to form a seat for a ball valve 28. Leading from the rounded upper end of this recess 27 is a plurality of ports 29. The ball 28 is held in the recess 27 by means of a plate 30 and screwed over the mouth of the recess by means of screws 31 and this plate 30 has a centrally disposed opening 32 for the purpose hereinafter to be described. In the upper end of the plunger 26 is a cylindrical recess 33 which is closed by a cap 34 having a centrally disposed opening therein wherethrough passes the lower end of the valve stem 13, a ball 35 being screwed upon this lower end to prevent the valve stem 13 from pulling out of the opening in the member 34. This ball 35 is of a diameter less than the depth of the recess 33 so that the stem 13 has a certain amount of play with reference to the member 26.

Projecting from one side of the member 11 adjacent the diaphragm 12 is a nipple 36 whereto is fitted a pet cock 37 of the ordinary type.

In the operation of this device as soon as the valve is opened which controls the flow of water out of the pipe 24 the balance between the pressure on top of the plunger 26 and that below the plunger 26 is broken. Now if the valve be opened but very slightly such as would be the case were the same to

leak the difference in pressure would be sufficient to lift the plunger 26 since the ball 28 would lift slightly and permit water to flow into the recess 27 and thence to the upper side of the plunger through the ports 28. In this manner the plunger 26 would remain on its seat since there would be no tendency for it to lift. If, however, the valve be opened sufficiently wide such as when drawing water to greatly affect the difference in pressure the first action would be that the ball 28 would lift and seat itself in the upper end of the recess 27, thus closing the ports 29. The plunger 26 would then lift the valve 23 from its seat and it will be observed that by reason of the peculiar disposition of the ports a very slight opening of the pipe 24 will cause the pipe 20 to open full. This can be seen by reference to Fig. 2. As the water is drawn off from the pipe 24 it passes from above the plunger through the by-pass 25 until the plunger is lifted sufficiently so that water will pass out directly from the chamber of the casing 10 into the pipe 24 without flowing through the by-pass, the water flowing from the inlet 16 beneath the plunger. When the outflow of water from the pipe 24 is checked the weight of the plunger 26 will pull down upon the valve seat 23 until the same seats or nearly seats when the pressure on the upper side of the valve seat due to the gas will be in excess of the pressure on the underside and the gas will force the valve firmly into its seat since the movement of the ball 35 in the chamber 33 will readily permit such action. In the event of any accumulation of water in the portion 11 the same may be drawn off through the pet cock 37.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

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

In a valve of the class described, a casing, a diaphragm extending across said casing and dividing the same into chambers, a water inlet communicating with one of the chambers, a water outlet leading from the water chamber with which the water inlet communicates, a gas inlet communicating with the second chamber, a gas outlet leading therefrom, a valve seat between the gas inlet and the gas outlet in the second chamber, a valve adapted to seat on said valve seat, a stem for said valve extending through said diaphragm, a water valve connected with the lower end of said stem and adapted to close the water inlet pipe, a by-pass leading from the water outlet and opening into the water chamber on the side of the water valve opposite the inlet, said water valve being provided with ports extending from the inlet side through the opposite side to afford communication between the inlet and the by-pass, and a valve controlling said ports, said water valve having a recess in the end adjacent the gas valve, said recess being threaded at its outer end, a cap fitted in the threaded portion of said recess and provided with an opening wherethrough said stem passes, and an enlarged end on said cap having less dimensions than the recess whereby sliding movement of the same through the cap is permitted.

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

MANIOUS GARL.

Witnesses:

ETHEL SIRDEFIELD,

EDWIN F. VORIS.