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J. H. THOMPSON

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BACK-FLOW CHECK FITTING OR UNION

Filed Nov. 12, 1925

FIG. 1.

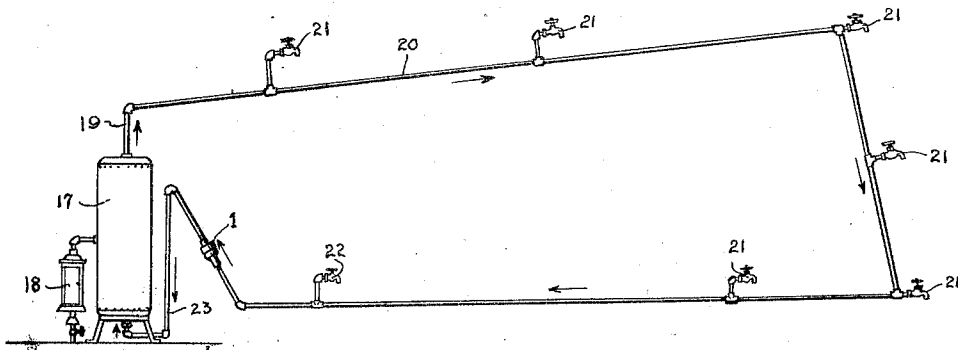


FIG. 2.

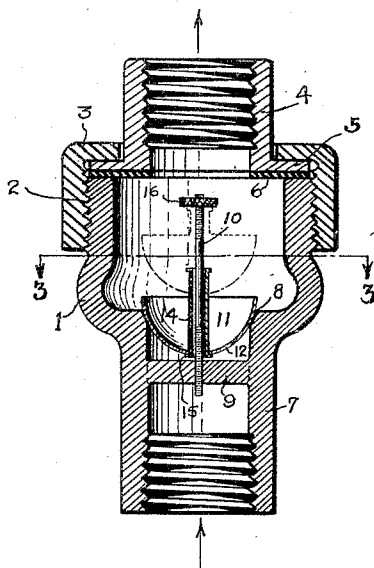
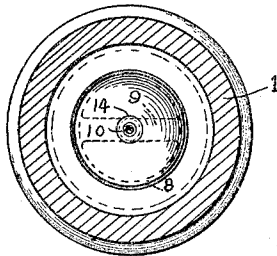


FIG. 3.



BY

John H. Thompson
INVENTOR
Richey & Watts
HIS ATTORNEYS

UNITED STATES PATENT OFFICE

JOHN H. THOMPSON, OF ELYRIA, OHIO

BACK-FLOW CHECK FITTING OR UNION

Application filed November 12, 1925. Serial No. 68,514.

My invention is an improvement in devices used to prevent back-flow of water in domestic hot water systems as for instance when a faucet remote from the hot water outlet of the boiler is opened.

An object of my invention is to construct a device of the above named character whereby water may be drawn from a multiplicity of outlets in a domestic hot water pipe line and whereby the cooler water in the boiler is prevented from flowing back into the pipe line when water is drawn from the line at a point remote from the hot water outlet of the boiler.

Another object of my invention is to provide a device of the above named character which consists of a minimum number of parts which are extremely simple of construction and inexpensive to manufacture.

Another object of my invention is to provide a device of the above named character which is not dependent upon being positioned in a horizontal plane for operation, but which will operate in any position in which it is placed in the pipe line.

Other objects and advantages of my invention will become more apparent from the following description of an embodiment of my invention, reference being made to the accompanying drawings in which like characters are employed to designate like parts throughout the same.

Fig. 1 is a diagrammatic view of a domestic hot water heater and boiler and a hot water dispensing pipe line connected thereto showing a multiplicity of valved outlets in circuit at intervals in the pipe line, and showing my back-flow check in position.

Fig. 2 is a central longitudinal section of my back-flow check, and,

Fig. 3 is a section thereto of my device taken on line 3—3 of Fig. 2.

Referring more particularly to Figs. 2 and 3, I have provided an outer casing 1 which is screw threaded at 2 to receive a lock thimble 3. An internally threaded pipe union 4 having an annular shoulder 5 is clamped between the thimble 3 and the casing 1 against a backing 6. The lower end 7 of the casing 3 is preferably of smaller diameter than the

remaining portion of the casing and is internally threaded to receive the end of a pipe line.

The bore of the end 7 extends upwardly within the casing and terminates in a valve seat 8. A spider 9 is formed integrally within and spans the bore of the end 7, as shown more clearly in Fig. 2 and is provided with a threaded opening which is adapted to receive a threaded end of a rod 10. It will be seen that the rod 10 may be adjusted vertically with respect to the spider at various heights if desired.

Freely slidable therealong and concentric with the rod 10 is a hollow sheet metal valve member 11 which is preferably formed of a single sheet of metal, having arcuate bottom and side walls 12. A tube 14 is secured centrally of the valve member 11 by any suitable means such as by soldering or welding as shown at 15 and its upper end extends above the flat top surface of the valve member. The side walls of the valve member 11 are so shaped as to seat snugly upon the annular seat 8 formed within the casing 1, when the valve member 11 is at its lowermost position along the rod 10. When in this position it will be noted that the bottom of the valve member is spaced from the upper surface of the spider 9 and that the tube 14 is of sufficiently larger diameter than that of the rod 10, that there will be a restricted communication between the enlarged chamber formed within the casing 1 and the chamber formed within the lower end 7 of the casing, so that a very small quantity of back-flow may at all times pass between the tube and the rod from the enlarged chamber to the smaller chamber. In this manner a thin film of water between the inner surfaces of the tube 14 and the rod 10 will materially aid in the movement of the valve along the rod.

The upper end of the rod 10 is threaded to receive an adjusting nut 16, whereby the movement of the valve member 11 along the rod 10 may be limited to various distances. In Fig. 2 I have shown the valve member 11 in its upward position against the nut 16 as indicated by dotted lines.

It will be observed that by novel construc-

tion I have provided a back-flow check device which will operate efficiently regardless of the angle in which it is placed in the pipe line, preferably at the return section of the pipe line which leads to the lower portion of the boiler 17. The usual gas or other heater 18, as shown in Fig. 1 is connected to the boiler to supply a quantity of heated water therein. When hot water is introduced into the boiler 17, it will be understood that it will assume a higher level than the cooler water and will consequently be discharged from the boiler through a pipe 19 connected to the uppermost part of the boiler. Connected to the pipe 19 is a distributing pipe 20 which may follow the course shown in a diagrammatic way in Fig. 1. A series of valved outlets or spigots 21 are provided in the pipe line 20 at intervals and the course of the water through the pipe line is indicated by the arrows. For the purpose of illustration spigot 22 will be referred to hereinafter as that being most remote from the hot water outlet of the boiler 17, since the flow of water from the boiler as indicated by the arrows will reach this spigot last upon its return toward the boiler. I have illustrated my device at 1 in Fig. 1 as being connected in the pipe line between the spigot 22 and the boiler 17, and although I have shown it in one angular position, it is obvious that by my novel construction of back-flow check apparatus that the device will be equally operative in any angular position.

In use my device operates as follows:

When the device is placed in the pipe line as indicated at 1 Fig. 1 and when the upper part of the boiler 17 contains hot water and the lower part relatively cool water, it will be observed that an unimpeded circulation of water is obtained from the top of the boiler through the pipes 19 and 20, through the lower end of the device 7, around the spider 9 and thence upwardly against the valve member 11, whereby the flow of the water will cause the valve member 11 to unseat from the seat 8 and travel along rod 10, thereby providing complete communication between the bore formed in the lower end 7 of the casing 1 and the enlarged chamber of casing 1. The water will continue upwardly and out of the casing 1 through the coupling 4 and thence through pipe 23 back to the bottom of the boiler 17. In its travel, as I have just described, and wherein all the spigots are closed, it will be seen that the water will be slightly cool by the time it reaches the bottom of the boiler 17, whereupon it is reheated and passes on through the pipe line as has just been described.

When a spigot 21 is opened, as, for instance, the first one encountered by the water in its travel from the boiler 17, additional hot water will pass on to the additional spigots 21. In this event there will be slight tendency for flow of cool water from the bottom

of the boiler into the lines 23 and 20, but as a spigot remote from the top of the boiler 17 is open, as for example spigot 22 is opened, which is, in the present illustration, the most remote from the discharging end of the boiler, there will be a great tendency for back-flow of cold water from the bottom of the boiler 17 into the pipe lines 23 and 20, since the spigot 22 is closer to the return end of the boiler. Upon such tendency of the cold water to flow back into the lines 23 and 20 the force of the water will act against the inside surface of the valve member 11 to seat the valve 11 against the seat 8.

It is one of the purposes of my invention to provide such means whereby to prevent this tendency of the cold water to flow back into the pipe lines 23 and 20 when the spigot 22 is opened.

It is to be understood that various changes may be made in the construction of my device without departing from the spirit thereof or the scope of the subjoined claims.

I claim:

1. In a liquid circulation system, a back flow check device comprising a hollow body, a guide rod supported within the body, a valve seat formed within the body, and a valve having a passage to receive and be slidable upon said guide rod whereby the valve is adapted to seat upon said valve seat, said passage being formed by an elongated tube having a greater diameter than said rod and being open to said hollow body on both sides of said valve, whereby a slight amount of liquid may flow therethrough in either direction to lubricate said rod and insure a free sliding of said valve thereon at all times.

2. A back flow check device comprising a coupling member having an enlarged opening therein, a guide rod disposed within the opening, an arcuate annular valve seat formed in the member, a valve comprising a hollow semi-spherical resilient portion the convex walls of which are adapted to seat upon the valve seat, and a tubular bearing extending from the resilient portion within the walls of the semi-spherical portion and adapted to slide upon the guide rod.

In testimony whereof I hereunto affix my signature this 2nd day of November, 1925.

JOHN H. THOMPSON.