April 24, 1956 A. J. LUZYNSKI 2,742,928

ANTIKNOCK FITTING

Filed Jan. 26, 1953

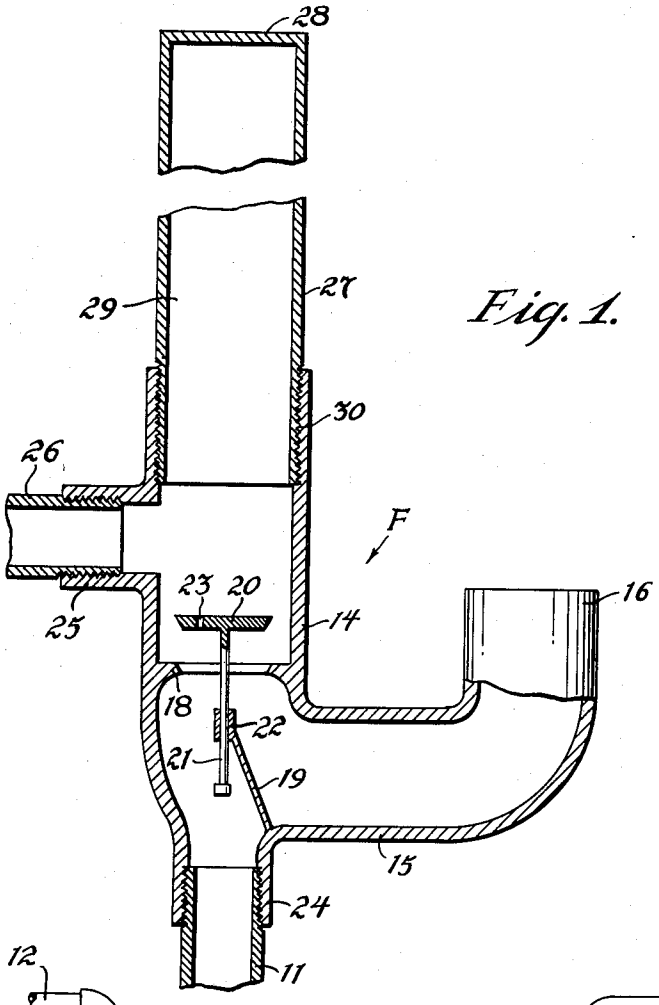
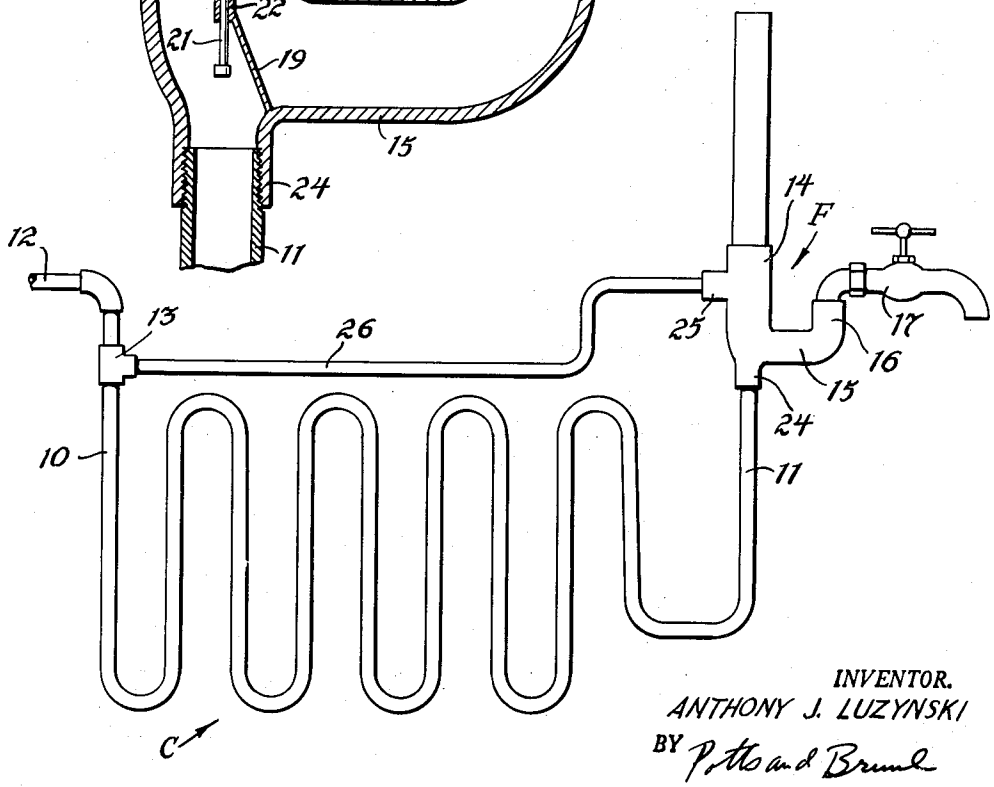


Fig. 1.

Fig. 2.



INVENTOR.
ANTHONY J. LUZYNSKI
BY Potts and Brumbaugh
HIS ATTORNEYS

United States Patent Office

2,742,928

Patented Apr. 24, 1956

2,742,928

ANTIKNOCK FITTING

Anthony J. Luzynski, Philadelphia, Pa.

Application January 26, 1953, Serial No. 333,025

3 Claims. (Cl. 137—533.21)

The present invention relates to a water fitting designed for anti-knock purposes and is concerned primarily with a device which positively insures the complete elimination of knocking or hammering when hot water is drawn from a faucet.

It is now the common practice to provide hot water by utilizing coils which are heated with the cold water supply communicating with the intake end of the coil and hot water being drawn off the outlet of the coil. Ordinarily a faucet is connected to this outlet end and it has been found that a knocking or hammering is created particularly immediately after the faucet is closed. While attempt has been made to eliminate this hammering, the now known devices have not proven satisfactory and the present invention has in view as its foremost objective the provision of a fitting that will positively and completely obviate this undesirable feature.

A further object of the invention is to provide a fitting of the character indicated which consists essentially of a casing that defines a main chamber that includes a valve seat and a baffle, the upper edge of which is spaced from the valve seat. Directly below the valve seat there is an intake connection that is connected to the hot water coil. The casing extends outwardly from one side of the baffle and is provided with a connection to which a faucet is adapted to be connected. The casing is continued up above the valve seat and at one side is formed with a by-pass connection. Above this by-pass connection there is another connection to which a pressure chamber is connected. The by-pass is connected to the cold water supply and a valve that cooperates with the valve seat is mounted in a guide that is carried by the baffle.

Another important object of the invention is to provide, in a fitting of the character indicated, a valve member that is formed with a small aperture through which water passes so that a slight amount of the cold water will be mixed with the hot water while the latter is drawn from the casing.

With the foregoing arrangement and with the valve in closed position on its seat, when the faucet is open the hot water will pass upwardly from the coil into the casing at the connection of the coil thereto and up and around the baffle beneath the valve and out through the faucet. As this action takes place, a small amount of cold water is drawn through the aperture in the valve member and mixed with the hot water. When the faucet is shut off a certain amount of back pressure is created. This back pressure raises the valve member from its seat and permits the hot water, together with any steam or air which may be entrapped therein, to pass upwardly into the pressure chamber. When a normal condition is restored, the weight of this water as well as that of the cold water supply, together with the pressure of any air or steam which may be present in the pressure chamber, forces the valve member back onto the valve seat.

From the foregoing it is apparent that the valve member is raised and lowered from its seat and must be guided

during these movements. Thus another object of the invention is to provide in a fitting of the character indicated, a valve member having a stem that is slidably received in a guide that is carried by the baffle.

Various other more detailed objects and advantages of the invention, such as arise in connection with carrying out the above noted ideas in a practical embodiment, will in part become apparent and in part be hereinafter stated, as the description of the invention proceeds.

The invention therefore comprises an anti-knock fitting that consists essentially of a casing having an upwardly extending cylindrical portion and an outwardly extending conduit communicating therewith. The upwardly extending cylindrical portion is provided with a valve seat immediately above the joinder of the outwardly extending conduit thereto. Below this valve seat is an inclined baffle having an upper edge spaced from the valve seat. Cooperating with the valve seat is a valve member formed with an aperture and having a stem that is received in a guide carried by the baffle. Below the joinder of the outwardly extending conduit there is an intake connection to which a hot water coil is adapted to be connected. At the free end of the outwardly extending conduit there is a faucet connection, while above the valve seat there is a by-pass connection. A pressure chamber is mounted on the upper end of the upwardly extending portion of the casing above the by-pass connection. From this by-pass connection a by-pass extends and is connected to the cold water supply.

For a full and more complete understanding of the invention, reference may be had to the following description and accompanying drawing wherein:

Figure 1 is a vertical section through the fitting of this invention and associated conduits as well as the pressure chamber with the latter being broken away, and

Figure 2 is a diagrammatic illustration showing how this fitting is connected with the heating coils and the cold water supply.

Referring now to the drawing wherein like reference characters denote corresponding parts and, first, more particularly to Figure 2, a heating coil is therein illustrated and referred to, in its entirety, by the reference character C, the coil C includes an intake at **10** and an outlet at **11**. A cold water supply is represented at **12** and is connected to the intake **10** with a by-pass connection being indicated at **13**. The fitting of this invention is referred to in its entirety by the reference character F and is connected to the upper end of the outlet **11**.

Referring now more particularly to Figure 1, the fitting F comprises a casing including an upwardly extending cylindrical portion **14** with which communicates an outwardly extending conduit **15** which terminates at a connection **16** to which a faucet or other suitable, comparable device may be connected. Such a faucet is represented at **17** in Figure 2.

The upwardly extending portion **14** of the fitting F is formed with a valve seat **18** immediately above the joinder of the conduit **15** thereto. A baffle **19** is shown as having its lower edge connected to the casing at the bottom of the conduit **15** and this baffle **19** is inclined over into the upwardly extending casing part **14** with its upper edge being spaced from the valve seat **18**. A valve member **30** takes the form of a disk valve having a stem **21** that is received in a guide **22** that is carried by the baffle **19** at its upper edge. This valve member **20** is adapted to assume either the upraised position relative to the valve seat **18** which is illustrated in Figure 1 or be seated thereon as will be later described. The valve disk **20** is formed with an aperture **23** through which cold water is adapted to pass when the valve is in closed position.

The fitting F is formed with a connection at **24** to which

the upper end of the outlet **11** of the coil C is adapted to be connected such as by being threaded therein in the manner illustrated in Figure 1.

Above the valve seat **18**, the upwardly extending portion **14** of the casing is formed with a by-pass connection **25**. A by-pass conduit **26** has one end secured to this connection **25** and its other end to the by-pass connection **13**.

Carried by the upper free end of the upwardly extending casing part **14** is an elongated cylindrical member **27** having a closed end **28** which provides a pressure chamber **29**. This member **27** may be mounted in the casing part **14** in any preferred manner such as by the screw threads represented at **30**.

Operation

Under normal conditions the disk valve **20** is in closed position on the valve seat **18**. When the faucet **17** is opened, hot water will be drawn from the outwardly extending conduit. In order for this action to take place, the hot water must pass upwardly from the coil outlet **11** and around the upper edge of the baffle **19** beneath the valve disk **20**. As the hot water so passes, a small amount of cold water will be drawn through the aperture **23** and mixed therewith.

When the faucet **17** is closed, a back pressure is immediately created. This back pressure raises the valve disk **20** from its seat and permits hot water to pass upwardly through the casing part **14** and into the pressure chamber **29**. Some of it, of course, may be diverted back through the by-pass **26**. As the normal pressure is restored at faucet **17**, on conduit **15**, the valve disk **20** will again be seated on the valve seat **18** due to the pressure in the chamber **29** which is greater than the pressure at the faucet **17**. At this time, the excess pressure in the chamber **29** will force water through the by-pass **26** and around the heating coils, thus causing a circulation of water instead of a sudden stop. It is this manner of accommodating the back pressure which eliminates the hammering or knocking.

From actual experience it has been found that ordinarily there will be no air in the pressure chamber **29**. However, should any air or steam become entrapped therein, the operation of the device is actually enhanced and improved rather than being impaired by the presence of such air or steam. However, the device does not depend for its operation on the presence of air in the pressure chamber. It will operate satisfactorily either with or without air being entrapped therein.

While a preferred specific embodiment of the invention is hereinbefore set forth, it is to be clearly understood that the invention is not to be limited to the exact constructions, devices and designs illustrated and described because various modifications of the details may be provided in putting the invention into practice within the purview of the appended claims.

What is claimed is:

1. In an anti-knock fitting, a cylindrical casing having an inlet and an outlet, a conduit near the inlet of said casing outstanding laterally therefrom, a valve seat in said casing adjacent to the wall of said conduit nearest the outlet, a baffle having one end joined to the wall of said conduit adjacent to the inlet with the other end thereof being inclined toward the center of said casing in adjacent spaced relationship with said valve seat, a valve disk cooperating with said valve seat on the side thereof opposite from said conduit, guide means for said valve disk, a faucet connection at the free end of said conduit, a by-pass connection on said casing adjacent to the valve seat and valve disk on the outlet side thereof, and a connection for a pressure chamber in the outlet end of said casing.

2. In an anti-knock fitting, a cylindrical casing having an inlet and an outlet, a conduit near the inlet of said casing outstanding laterally therefrom, a valve seat in said casing adjacent to the wall of said conduit nearest the outlet, a baffle having one end joined to the wall of said conduit adjacent to the inlet with the other end thereof being inclined toward the center of said casing in adjacent spaced relationship with said valve seat, a valve disk cooperating with said valve seat on the side thereof opposite from said conduit, the disk being provided with an aperture therein, guide means for said valve disk, a faucet connection at the free end of said conduit, a by-pass connection in said casing adjacent to the valve seat and valve disk on the outlet side thereof, and a connection for a pressure chamber in the outlet end of said casing.

3. In an anti-knock fitting, a cylindrical casing having an inlet and an outlet, a conduit near the inlet of said casing outstanding laterally therefrom, a valve seat in said casing adjacent to the wall of said conduit nearest the outlet, a baffle having one end joined to the wall of said conduit adjacent to the inlet with the other end thereof being inclined toward the center of said casing in adjacent spaced relationship with said valve seat, a valve disk cooperating with said valve seat on the side thereof opposite from said conduit, the disk being provided with an aperture therein, guide means for said valve disk carried by said baffle, a faucet connection at the free end of said conduit, a by-pass connection in said casing adjacent to the valve seat and valve disk on the outlet side thereof, and a connection for a pressure chamber in the outlet end of said casing.

References Cited in the file of this patent

UNITED STATES PATENTS

357,128	Loretz	Feb. 1, 1887
1,643,082	Nickell	Sept. 20, 1927
2,518,212	Wilson	Aug. 8, 1950