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THERMAL REGULATOR FOR FLUSH TANKS

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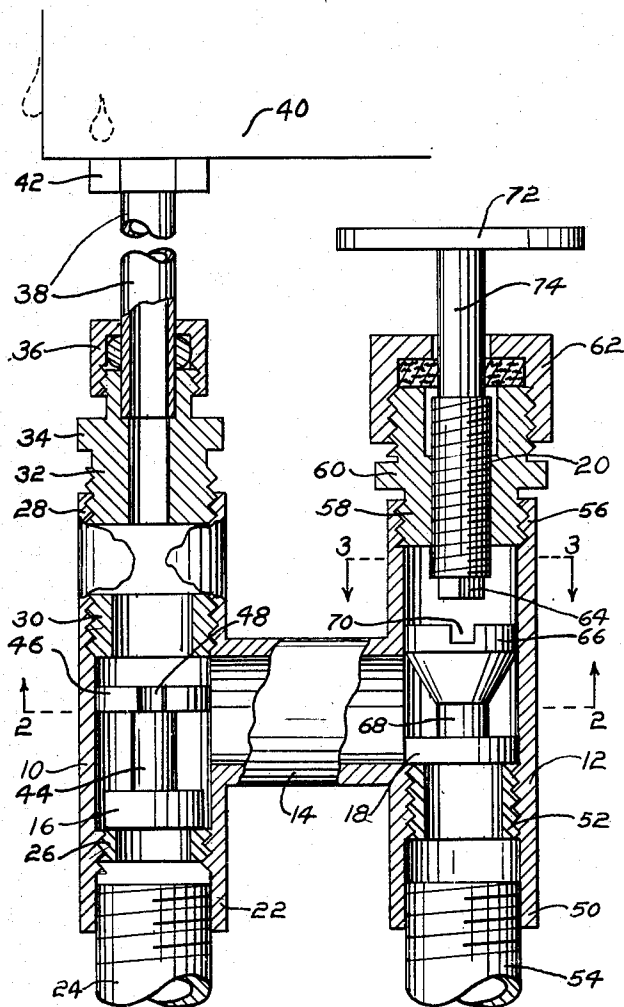


Fig. 1.

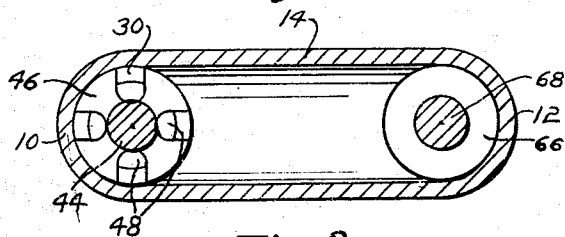


Fig. 2.

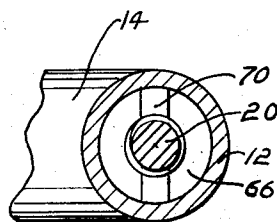


Fig. 3.

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THERMAL REGULATOR FOR FLUSH TANKS

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3 Claims. (Cl. 137-111)

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This invention is a pipe fitting used in combination with storage or flush tanks of toilet bowls where drip from condensation on the outer surface of the tank drops upon the floor, and this improved fitting is provided with a hot water supply connection in addition to the conventional cold water supply connection wherein a small amount of hot water is introduced into the cold water entering the tank after the toilet bowl is flushed.

The object of this invention being, to remove the chill from cold water entering a flush tank of a toilet bowl, so that the water in the tank is substantially at room temperature whereby condensation and drip resulting therefrom is substantially eliminated.

Another object of the invention is to provide a pipe fitting through which a small amount of hot water may be introduced into cold water entering a toilet bowl flush tank that may be installed in cold water supply connections of flush tanks now in use.

Another object of the invention is to provide a pipe fitting through which hot water may be introduced into cold water entering a toilet bowl flush tank in which check valves are provided for preventing cold water passing into the hot water supply or hot water passing into the cold water supply as a result of unexpected increased pressure in either the hot or cold water supply lines.

A further object of the invention is to provide means in a combination pipe fitting which supplies both hot and cold water to the flush tank of a toilet bowl, for regulating the amount of hot water introduced into the cold water in proportion to the amount of cold water being supplied to the tank.

A still further object of the invention is to provide a combination pipe fitting having valves therein, through which hot water is introduced into cold water passing into a flush tank of a toilet bowl, which is of a simple and economical construction.

With these and other objects and advantages in view the invention embodies a pipe fitting having a pair of parallel tubular valve chambers therein with a cross connection between the chambers and spaced from the ends thereof, with valve seats and vertically slidable valve members and with means for adjusting the travel of the valve member in the hot water side of the fitting, positioned in the said chambers, and also with suitable pipe connections and packing glands at the ends of the chambers.

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The construction and operation of the combination fitting will be readily understood from the following description taken in connection with the drawings, wherein:

Figure 1 is a vertical section through the fitting with parts shown in elevation and with the fitting installed in the cold water supply connection of a toilet bowl flush tank, the lower corner of which is shown.

Figure 2 is a cross section taken on line 2-2 of Figure 1 looking upward.

Figure 3 is a sectional plan taken on line 3-3 of Figure 1.

Referring now to the drawings wherein like reference characters denote corresponding parts the improved combination fitting of this invention comprises a valve body having a plurality of valve chambers with a cold water tubular section 10, a hot water tubular section 12, a cross connection 14, a valve 16 in the section 10, a valve 18 in the section 12, and an adjusting screw 20.

The lower end 22 of the section 10 is threaded internally and a cold water supply pipe 24 is threaded into the end thereof. A valve seat 26 is also threaded into the lower end 22 and the seat is positioned above the end of the pipe 24 whereby cold water supplied through the pipe 24 passes through the opening through the valve seat 26. The upper end 28 of the section 10 is also threaded internally and a bushing 30 which provides a stop is threaded into the upper end. The bushing 30 is turned down to the position shown in Figure 1 so that it adjusts the movement of the valve 16, and a plug 32 with a nut formation 34 on the outer surface and with a packing gland 36 on the outer end is threaded into the upper end, providing a connection for a tube 38 which connects the upper end of the section 10 to the lower end of a toilet bowl flush tank, as indicated by the numeral 40, the tube being secured in the tank by a lock nut 42.

The valve 16 is provided with a stem 44 and a disc 46 with slots 48 therethrough is provided at the upper end of the stem, to form a guide to facilitate reciprocating travel of the valve.

The lower end 50 of the section 12 is also threaded internally with a threaded bushing 52 positioned to provide a valve seat therein, and with a hot water supply pipe 54 threaded in the lower end. The upper end 56 of the section 12 is also threaded internally and a plug 58 with a nut formation 60 thereon is threaded into the upper end thereof. A packing gland 62 is threaded on the end of the plug 58 and the adjusting screw 20 is threaded through the plug. The inner end

of the adjusting screw 20 is provided with a stud 64 that is positioned to engage an upper guide disc 56 on the upper end of a stem 58 of the valve 18, whereby the travel of the valve may be adjusted to admit a comparatively small amount of hot water as the valve operates. The disc 66 of the valve 18 is provided with a screw driver slot 70 whereby the valve may be rotated with a screw driver to grind the valve on the valve seat, and the adjusting screw 20 is provided with a hand wheel 72 at the upper end of a stem 74 so that the stud 64 may be moved upwardly or downwardly to limit the travel of the valve 18.

With the water pressure of the hot and cold water supply pipes equalized the release of pressure on the upper sides of the valves resulting from flushing the tank, relieves the valves so that both valves open, admitting both hot and cold water to the tank, and in normal operation of the device only a small amount of hot water will be required to remove the chill from the cold water, so that the adjusting screw 20 may be set relatively close to the guide disc 66; however, should more hot water be required, the valve may be opened accordingly.

With the parts arranged in this manner excess pressure on one side of the fitting, such as steam in the hot water supply line, will open the valve 16, and with the pressure acting on the upper side of the valve 16, the excess pressure will have a tendency to urge the valve 16 against the seat 26, so that the valve functions as a check valve preventing the steam entering the cold water supply. By the same means excess or high pressure in the cold water supply will not pass into the hot water supply line.

From the foregoing description it is thought to be obvious that the combination hot and cold water mixing fitting of this invention constructed in accordance with this invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof, and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out the invention in practice, except as claimed.

Having thus fully described the invention what I claim as new and desire to secure by Letters Patent, is:

1. A combination hot and cold water fitting for toilet bowl flush tank supply connections comprising a housing having a pair of spaced parallel bores extended therethrough with a cross connection positioned midway between the ends of the housing and providing communicating means between the bores, valve seats in the housing with one of the valve seats positioned in each of the bores thereof, vertically slidable valves in the bores positioned to coact with the said valve seats, stems extended upwardly from the valves, guide discs on the upper ends of the stems, supply connections extended from the lower ends of the bores, plugs with bores therethrough threaded in the upper ends of the bores of the housing, an outlet connection extended through the bore of one of the said plugs, the guide disc of the valve in the bore in which the plug having

the outlet connection therethrough is positioned having openings therethrough, and an adjusting screw threaded in the bore of the plug in the upper end of the other bore of the housing and positioned to coact with the valve in the said bore to limit the opening movement of the valve.

2. In a combination hot and cold water fitting for supply connections of flush tanks, the combination which comprises a housing having a pair of spaced bores extended therethrough with a cross connection midway between the ends of the housing and providing communicating means between the bores, the upper and lower ends of said bores being threaded internally, rings threaded in the lower ends of the bores providing valve seats, vertically slidable valves in the bores positioned to coact with the said valve seats, one of said bores having a hot water supply connection extended from the lower end and the other having a cold water supply connection extended therefrom, said valves having stems with guide discs on the upper ends and the guide disc in the bore having the cold water connection having slots therethrough, a bushing threaded in the upper end of the bore of the cold water connection and spaced above the said valve guide disc, plugs with bores therethrough threaded in the upper ends of the bores, an outlet connection extended through the bore of the plug in the upper end of the bore of the cold water connection, and an adjusting screw having a hand wheel on the outer end threaded through the bore of the plug in the upper end of the bore of the hot water connection and positioned to limit opening travel of the valve in said bore.

3. In a combination hot and cold water mixing fitting, the combination which comprises a housing having a pair of spaced bores extended therethrough with a cross connection positioned substantially midway between the ends of the housing and providing communicating means between the bores, valve seats in the housing with one of the valve seats positioned in each of said bores therein, vertically slidable valves having guide discs on the upper ends of stems extended therefrom in the bores and positioned to coact with the said valve seats, supply connections extended from the lower ends of the bores, plugs having nut formations on the outer surfaces and packing glands on the upper ends threaded in the said bores of the housing, one of said plugs having a bore therethrough with an outlet connection extended therefrom and the other of said plugs having a threaded bore extended therethrough, and an adjusting screw having a hand wheel on the outer end threaded in the bore of said plug and positioned to coact with the valve guide disc of the bore to limit opening travel of the said valve.

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