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2,664,100

ANTISWEAT FLUSH TANK

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Fig. 1.

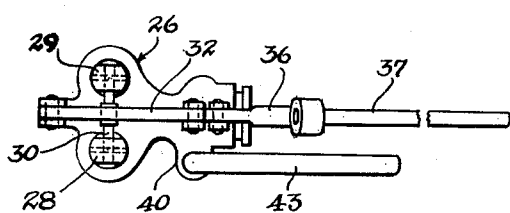


Fig. 3.

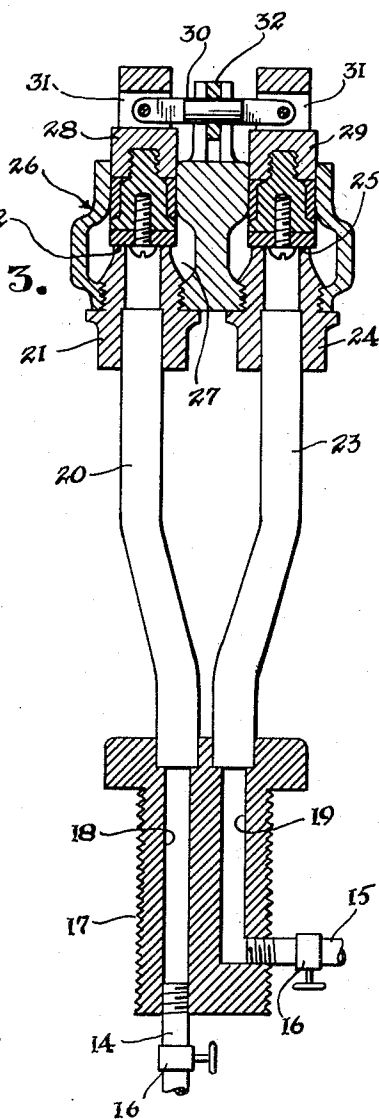
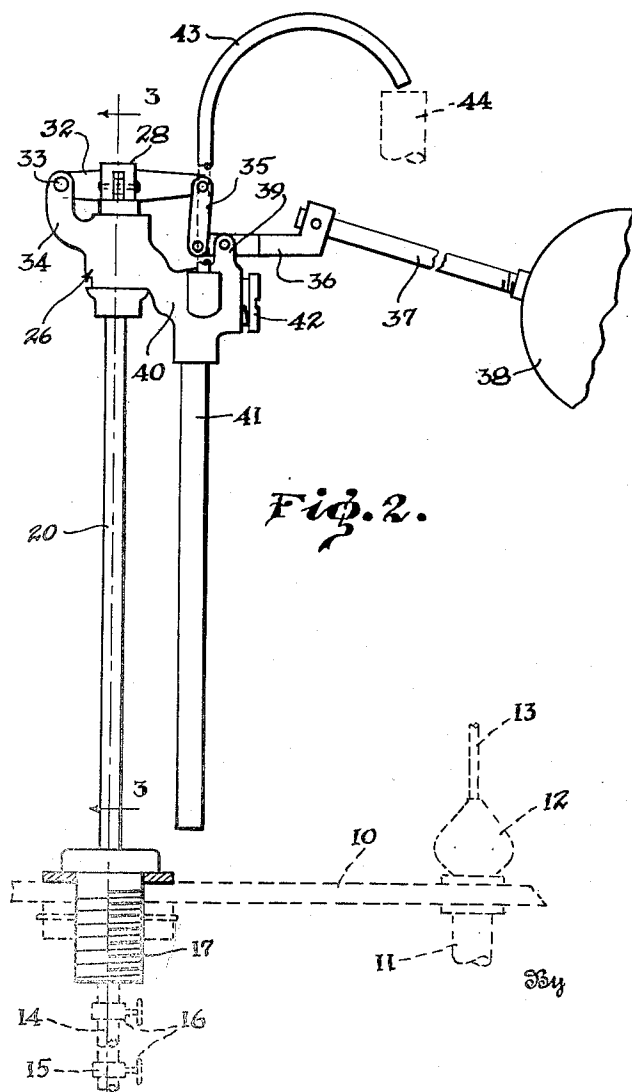


Fig. 2.



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ANTISWEAT FLUSH TANK

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1 Claim. (Cl. 137—411)

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This invention relates to improvements in flush tanks, or other tanks, in which a body of water is stored, the invention being concerned more particularly with a tank of the character described wherein provision is made for preventing condensation of the moisture in the surrounding air as a result of the cooler temperature of the walls of the tank with respect to the temperature of such air.

The flush tanks of water closets, for example, may sweat during hot weather as a result of the cooler temperature of the walls of the tank with respect to the temperature of the surrounding air. Such sweating may become excessive, and highly objectionable, when the temperature differential between the water stored in the tank and the air is substantial. Under excessive sweating conditions, the amount of water condensed out of the air may be so large that it will drip on the floor, soak into floor coverings, and seep through the floor or cracks therein and as a result cause considerable damage.

The principal object of the present invention is to avoid the above objections, this object contemplating a tank of the character generally described wherein provision is made for heating the water admitted to the tank to a temperature high enough to prevent sweating of the tank.

A further object is a tank of the character described wherein hot water from a service line is mixed with the cold water admitted to the tank to attain the results contemplated in such a manner that heating of the water in the cold water service line will be avoided.

A still further object is to provide for the heating of the water admitted to the tank in such a manner as to reduce to a minimum the use of specially designed parts.

A still further object is a novel design and arrangement of the parts of a dual valve mechanism, adapted particularly for the purpose contemplated, whereby to provide for simplicity and economy in construction and facility in assembling and disassembling the parts.

The invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a top plan view of mechanism, embodying the features of the invention, for controlling the supply of cold and hot water to a flush tank for the purpose contemplated;

Figure 2 is a side elevational view of the mechanism; and

Figure 3 is an enlarged sectional view taken along line 3—3 of Figure 2.

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The features of the invention are illustrated, by way of example, in connection with the flush tank of a water closet, the flush tank being sufficiently indicated for the purpose in view by a fragmentary showing of the bottom wall 10 thereof. The discharge pipe of the flush tank is indicated at 11 and the ball valve which controls the inlet thereof is indicated at 12, it being understood that the ball valve is connected by a stem 13 to any conventional form of trip device.

In accordance with the invention, hot water is introduced into the flush tank with the water from the cold water service line in order that the temperature of the water within the flush tank will be maintained high enough to prevent sweating of the flush tank. The hot water employed may, as in the case of the cold water, be supplied from a service line.

The cold and hot water service lines are indicated at 14 and 15, respectively, each having a valve 16 therein so that the proportions of hot and cold water may be regulated as desired.

The cold and hot water service lines are connected to the flush tank by a fitting 17, the latter having a passage 18 therethrough for the cold water and a passage 19 for the hot water.

A cold water pipe 20 (Figure 3) has its lower end connected to the fitting 17 by means of a sweat joint, or any other desired type of joint, so that the pipe communicates with the passage 18. At its upper end, the pipe 20 is connected by a similar joint to a hollow, threaded plug 21, the upper end of which provides a seat 22. A hot water pipe 23 is connected at its lower end to the fitting 17 and communicates with the hot water passage 19. At its upper end, the pipe 23 is connected to a hollow, threaded plug 24, the upper end of which provides a valve seat 25. Plugs 21 and 24 are screwed into a hollow housing 26 (Figure 3) so that the passages through the plugs may communicate with a mixing chamber 27 therein. A valve 28 is located in cooperating relation with respect to the seat 22 while a similar valve 29 is located in cooperating relation with respect to the seat 25. The two valves are pivotally connected to the opposite ends of a cross-piece 30, the ends of the latter being rectangular in cross-section and occupying slots 31 in the heads of the valves while the central portion of the cross-piece is round in cross-section.

An arm 32 is pivotally connected at its inner end by a pin 33 between upwardly extending ears 34 on the housing 26. Intermediate its ends the arm 32 is connected to the central, round portion of the cross-piece 32, as best shown in Figure 3,

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while at its outer end it is connected by links 35 (Figure 2) to one end of a lever 36. The lever 36 is mounted for rocking movements between upstanding ears 39 which are carried by a laterally extending portion 40 of the housing 26 and the outer or free end of the lever supports the rod 37 by which the float 38 is carried.

The laterally extending portion 40 of the housing is of conventional form, being hollow and providing a path of communication between the mixing chamber 27 and an outlet pipe 41 which discharges into the tank. The amount of water discharged through the outlet pipe 41 may be controlled by an adjustable plug 42 in conventional manner while a curved overflow tube 43 which communicates with the passage through the housing portion 40 discharges into an overflow pipe 44.

From the foregoing, it will be apparent that when the flush valve 12 has been lifted to permit discharge of the contents of the flush tank, the float 38, its arm 37, the connecting lever 36, links 35, arm 32, and cross-piece 30 will be operative to lift the valves 28 and 29 from the seats 22 and 25, respectively, so that hot water will be mixed with the cold water as the tank is refilled. As has been noted, the amounts of hot and cold water may be regulated so that the temperature of the tank will be maintained high enough to prevent sweating.

It will be noted that the valves 28 and 29 may rock on the pins by which they are connected to the cross-piece 30 while the latter may turn freely in the opening in the arm 32 through which it passes. Preferably the pins which connect the ends of the cross-piece with the two valves provide loose connections so that the two valves may rock independently to insure tight sealing engagement between their lower ends and the seats with which they cooperate. In this connection, it will be apparent that in the event that one of the valves closes first, the remaining movement of the actuating mechanism will be applied to the remaining valve.

The dual valve construction described has the advantage that any back flow of water from the hot water service line into the cold water service line is prevented. The features of the invention have the further advantage that the use of parts other than standard is reduced to a minimum. A

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further advantage obtained is that the parts need not be fitted to close tolerances and may be assembled and disassembled with facility.

Although the features of the invention have been illustrated and described in detail, it will be understood that various modifications thereof may be made within the scope of the appended claim.

I claim as my invention:

The combination with a toilet flush tank, of a cold water supply line extending into said tank, a hot water supply line extending into said tank, a housing mounted in said tank and to which both said supply lines are connected, said housing being provided internally with a mixing chamber, separate valves mounted in said housing for parallel reciprocating movement for controlling the flow of water from said lines into said mixing chamber, a cross member which is pivotally connected at one end to one of said valves and which is pivotally connected at its opposite end to the other of said valves to open both valves upon movement in one direction of said cross-member, a float in said tank, an arm which is mounted in said tank at one end for pivotal movement and which is connected intermediate its ends to said cross member between said valves to move said cross member upon pivotal movement of said arm, and a control linkage connected to said float to be actuated thereby and connected to the opposite end of said arm to rock said arm in a direction to open both said valves when the level of water in said tank is below the desired level.

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