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2,595,937

WATER SUPPLY INLET MEANS FOR TOILET FLUSH TANKS

Filed March 1, 1946

2 SHEETS—SHEET 1

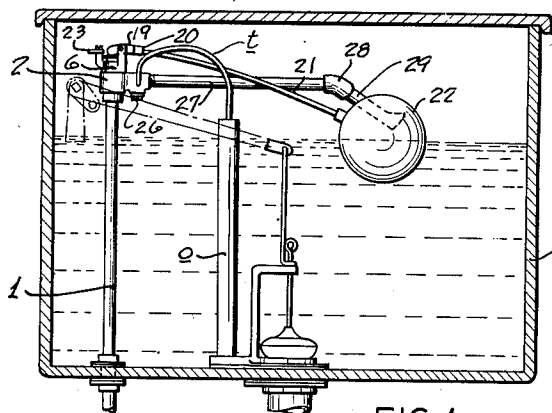


FIG. 1.

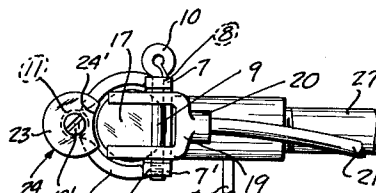


FIG. 4.

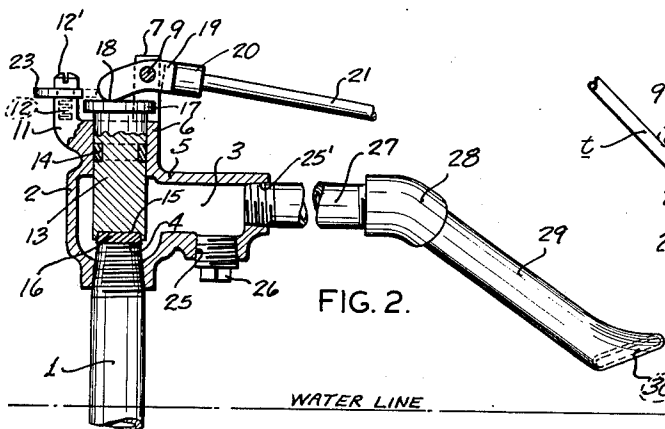


FIG. 2.

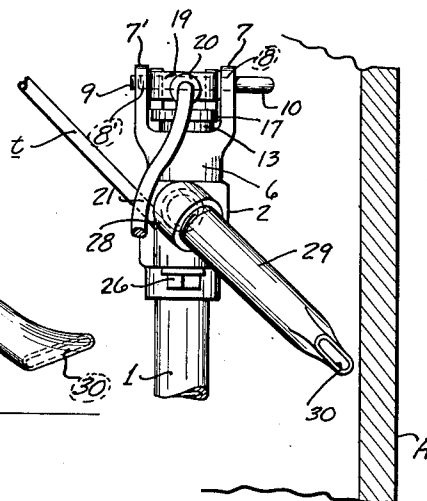


FIG. 3.

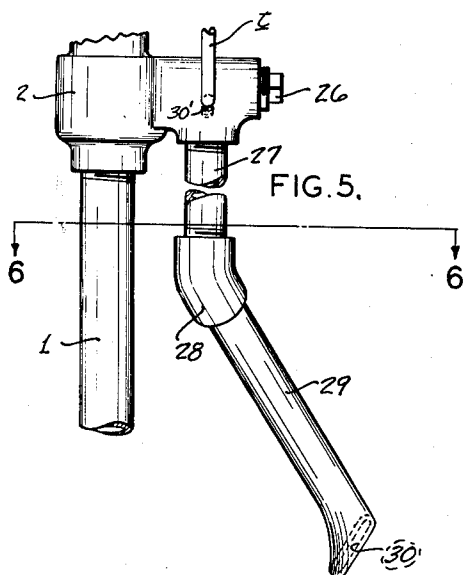


FIG. 5.

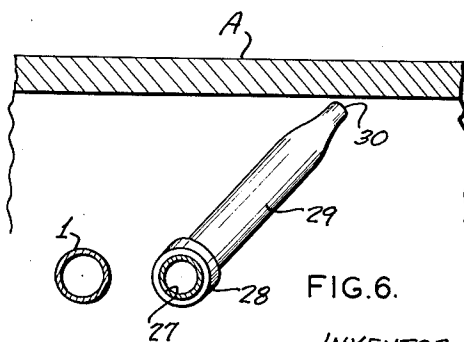


FIG. 6.

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2 SHEETS—SHEET 2

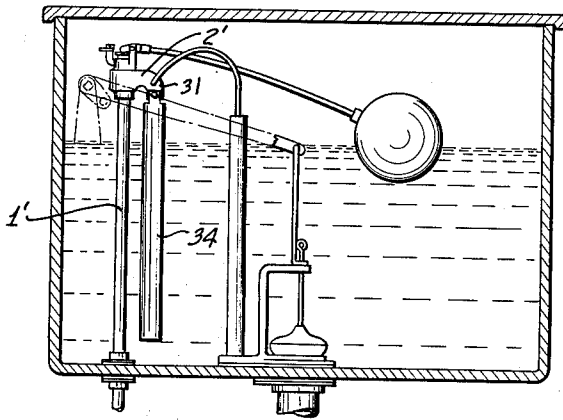


FIG. 7.

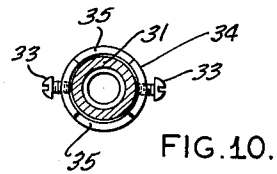


FIG. 10.

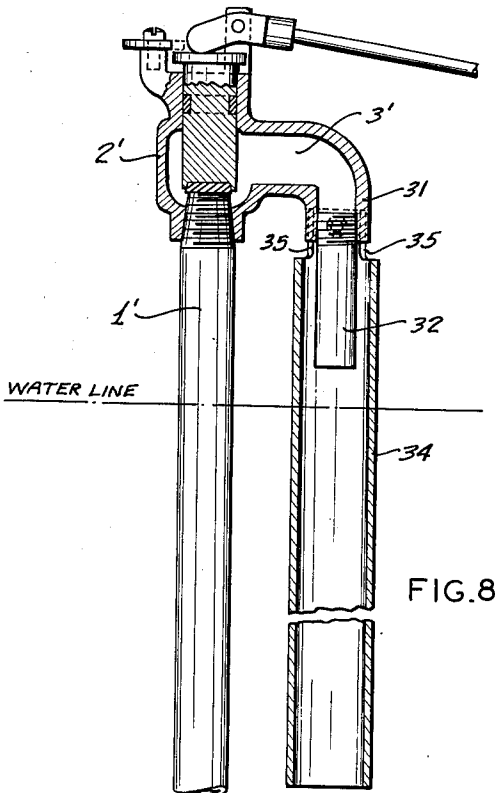


FIG. 8

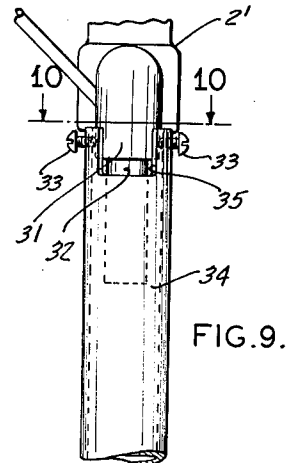


FIG. 9.

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WATER SUPPLY INLET MEANS FOR TOILET
FLUSH TANKS

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Application March 1, 1946, Serial No. 651,164

1 Claim. (Cl. 137-104)

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This invention relates in general to certain new and useful improvements in toilet flush tanks and, more particularly, to water inlet means for such tanks.

The primary object of the present invention is to provide an improved type of water inlet means for a toilet flush tank which is simple and inexpensive in construction and may readily be installed in any type of flush tank of conventional design.

It is a further object of the present invention to provide anti-syphoning water inlet means for toilet flush tanks which can be installed in such a manner as to comply with building code regulations in this respect, wherever such building code regulations may be in force.

It is a further object of the present invention to provide water inlet means for toilet flush tanks having ball cock mechanism which may be readily dismantled for cleaning, repair, or replacement and, at the same time, is provided with safety locking means to prevent the accidental discharge of water in case of breakage.

It is an additional object of the present invention to provide water inlet means for a toilet flush tank having a unique anti-syphoning silencer which substantially eliminates the flowing noises which normally issue from a flush tank when it is filling up after having been flushed.

It is also an object of the present invention to provide an anti-syphoning silencer of the type stated which may be readily installed on substantially all ball cocks of conventional types and designs without expensive or elaborate alterations thereof.

And with the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claim.

In the accompanying drawings (two sheets):

Figure 1 is a vertical sectional view of a toilet flush tank having water inlet means installed and constructed with and embodying the present invention;

Figure 2 is an enlarged vertical sectional view of the water inlet means forming a part of the present invention;

Figure 3 is an end elevational view of the water inlet means;

Figure 4 is a top plan view of the water inlet means;

Figure 5 is a fragmental front elevational view of the water inlet means illustrating the water inlet tube in vertical rather than horizontal position;

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Figure 6 is a horizontal sectional view taken along line 6-6 of Figure 5;

Figure 7 is a vertical sectional view of a toilet flush tank having a modified form of water inlet means including an anti-syphoning silencer;

Figure 8 is a vertical sectional view of the modified form of water inlet means including the anti-syphoning silencer;

Figure 9 is a fragmentary side elevational view of the water inlet means including an anti-syphoning silencer; and

Figure 10 is a horizontal sectional view taken along line 10-10 of Figure 9.

Referring now in more detail and by reference characters to the drawings, A designates a toilet flush tank of substantially conventional design having a vertical supply pipe 1 provided at its upper end with a preferably cast-bronze valve body 2, having an interior chamber 3. It should be noted that the upper end of the supply pipe 1 projects upwardly into the chamber 3 and is cut off at its end to provide a valve seat 4. The upper wall 5 of the valve body 2 is provided with an upwardly projecting vertical sleeve 6 which is disposed in co-axial alignment with and above the supply pipe 1. Integrally formed upon one side of the sleeve 6 are a pair of spaced parallel upward projections 7, 7' forming, with the sleeve, a bifurcated yoke and being provided with horizontally aligned apertures 8, 8', the latter being of somewhat smaller diameter and being integrally threaded for receiving the threaded end of a pintle 9 which extends horizontally between the projections 7, 7', and through the aperture 8, being at its extended end provided with an eye 10 for facilitating its manual removal when necessary. Also formed integrally with and extending upwardly from the sleeve 6 on the opposite side and more or less midway with respect to the projections 7, 7', is a boss 11, being bored and tapped downwardly from its upwardly presented horizontal flat face to receive a threaded stud 12 having an enlarged head 12'.

Shiftably mounted in the sleeve 6 is a valve plug 13 provided intermediate its ends with an annular sealing ring 14 for snug fitting engagement with the interior faces of the sleeve 6 to prevent water leakage. Upon its under face, the plug 13 is provided with an upwardly extending somewhat frusto-conical recess 15 for retentively receiving a solid disk type washer or valve closure element 16, the recess 15 and the washer 16 being somewhat larger in diametrical size than the supply pipe 1, so as to fit down smoothly and tightly thereagainst. At its upper end, the valve plug 13 extends beyond the sleeve 6 and is in-

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tegrally provided with a diametrically enlarged flat topped end-portion 17 adapted to bear against the cam-like end face 18 of a rocker fitting 19 pivoted upon the pintle 9 between the projections 7, 7' and being provided at its end with an integrally threaded socket portion 20 for receiving a rod-like float arm 21 conventionally provided at its outer end with a float ball 22. It should be noted in this connection that the upper flat face of the end-portion 17, within its normal operating range, is always below the plane of the top face of the boss 11, for purposes presently more fully appearing.

Rotatably mounted between the upper horizontal face of the boss 11 and the head of the threaded stud 12 is a safety locking disk 23 being of circular contour for a substantial distance around its outer periphery as at 24, and for the remainder of its periphery being provided with an inwardly curved arcuate portion 24'. It should be noted in this connection that the relieved portion of indentation 24' is of slightly greater radius than the radius of the periphery of the valve plug end section 17, and is so located that when the disk 23 is rotated the theoretical center of indentation 24' can be brought into coincidence with the center line of the valve plug 13 and will just clear the edge or peripheral margin of the valve plug section 17. It will be evident, that when the disk 23 is in this latter position as shown in Figure 4, the pintle 9 may be withdrawn and the rocker fitting 19 removed. Thereupon, the valve plug may readily be lifted out of place for repair or replacement. It will, of course, be obvious that the water pressure in the supply line 1 must necessarily be turned off when the valve plug is removed. When the valve plug has been released, the disk 23 may be rotated through approximately 180°, whereupon the non-indented or circular portion 24 will overlie the adjacent edge of the valve plug end section 17 and act as a rotating element or lock therefor. Inasmuch as the pintle 9 frequently becomes corroded, there is an ever-present danger that at some time the pintle 9 may give way when the valve plug 13 is under pressure, and under such circumstances the valve plug will be lifted by water pressure until it is stopped against the disk 23. The only result, therefore, is to cause water to flow through the valve into the tank A without doing any damage.

The chamber 3 extends horizontally outwardly from the region of operative engagement between the supply pipe 1 and valve plug 13, and is provided with downwardly and sidewardly opening discharge apertures 25, 25', both integrally threaded with threads of the same pitch for interchangeably receiving a plug 26 and a discharge tube 27, the latter being threadedly provided at its outer end with an angularly extending outlet pipe 29 having fan tail discharge orifice 30. The chamber 3 is further provided, in one of its side walls, with a tapped aperture 30' extending inwardly and downwardly therethrough at an angle of approximately 45°, for receiving a conventional refill tube *t* which may be bent over and conventionally inserted into an overflow pipe *o*. Where the installation is to be made in a locality in which the building code requires anti-syphoning construction, the discharge tube 27 is threaded into the aperture 25' and the plug 26 threaded into the aperture 25. The outlet pipe 29 is furthermore set at approximately an angle of 45° to the horizontal substantially as shown in Figures 2 and 3, so that the spray of inlet

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water issuing from the fan tail orifice 30 will be directed against the back wall of the tank A and will not tend to splash upwardly, but will be directed smoothly and with a relatively small amount of discharge noise downwardly into the lower portion of the tank. It should be noted, however, that the length of the discharge pipe 29 is such that the fan tail orifice 30 will be permanently disposed above the water line so that no water in the tank can be accidentally syphoned or sucked back into the supply line when the water system is drained for repairs or other purposes, or when, for any other reason, there is a negative pressure exerted on the supply line 1, which would ordinarily cause syphoning action in conventional types of equipment. Where, for any reason, it is desired to install the discharge tube 27 in vertical position, the position of such discharge tube 27 and the plug 26 may be reversed so that the discharge tube is threaded into the aperture 25, in which case the installation is completed in the manner shown in Figures 5 and 6. Of course, it will be understood that in this position the water supply means does not possess anti-syphoning characteristics, but in some localities the building codes do not require anti-syphoning installations, and some plumbers believe that a fully immersed discharge orifice results in more silent operation. Consequently, the water supply means of the present invention is uniquely flexible in that it can be employed to meet either type of requirement as the case may be.

A modified form of water inlet means of the type illustrated in Figures 7 to 10, inclusive, may be provided comprising a vertical supply pipe 1', a valve body 2', having a valve chamber 3', all substantially similar to the previously described inlet means. The valve chamber 3', however, is provided at its outer end with an integrally formed downwardly directed discharge sleeve 31 internally threaded for receiving a short tubular outlet pipe 32, terminating at its lower end substantially above the normal water line. Disposed concentrically around the outlet pipe 32, and dependingly supported from the disposed sleeve 31 by means of diametrically opposed set screws 33 is an open bottomed silencer tube 34 of substantially larger diametral size than the outlet tube 32 and being provided with two diametrically juxtaposed U-shaped slots or openings 35 extending downwardly from the upper peripheral margin of the silencer tube 34 for a substantial distance below the lowermost extremity of the discharge sleeve 31 so as to provide free communication between the interior of the silencer tube 34 and the outside atmosphere.

When water flows from the chamber 3' downwardly through the outlet pipe 32, it will fall through the larger interior of the silencer tube 34 and flow thence into the tank. It has been found experimentally that the flowing and gushing noises of the water will be almost completely dissipated in the silencer tube and as a result will be practically inaudible at any appreciable distance from the tank proper. When, however, the tank is normally filled, the lowermost portion of the outlet pipe 32 will still be above water level so that when the water system to which the supply pipe 1' is connected is drained or is otherwise placed under negative pressure which would tend to produce syphoning action in conventional types of inlet mechanisms, any suction which will be exerted through the outlet pipe 32 will be dissipated through the slots 35 and water will not be

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syphoned or sucked back from the tank itself. It should be pointed out in this connection that the silencer tube 34 and its associated short-length outlet pipe 32 may be readily and quickly installed on almost any existing type of ball cock with a minimum of labor and will render such ball cocks both anti-syphoning and substantially silent in operation.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the water supply inlet means for toilet flush tanks may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

For use with a toilet flush tank, water supply means comprising a supply pipe, float ball actuated means, said valve means being provided with a chambered body having a downwardly directed discharge sleeve, an outlet pipe mounted snugly in, and dependingly supported from, said sleeve and terminating at a point substantially above the normal water level in the tank, and an open-bottomed silencer tube of greater diameter than the outlet pipe disposed concentrically therearound and extending downwardly for immersion at its lower end in the water within the tank, said outlet pipe extending a substantial distance within said silencer tube, said silencer tube being provided with two diametrically juxtaposed U-shaped slots extending downwardly from the up-

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per peripheral margin thereof for a substantial distance below the lowermost extremity of the discharge sleeve, said slots being spaced upwardly from the lower end of said outlet pipe and providing upwardly presented ears engaged with said sleeve.

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