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J. CASTELLANO

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VALVE CONTROL MEANS FOR FLUSH TANKS FOR TOILETS

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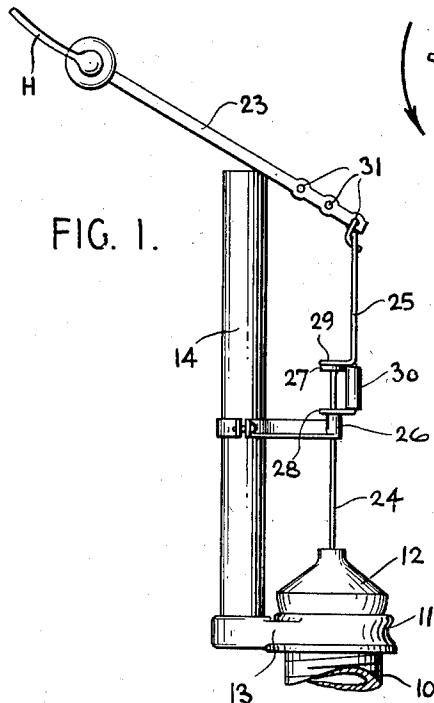


FIG. 1.

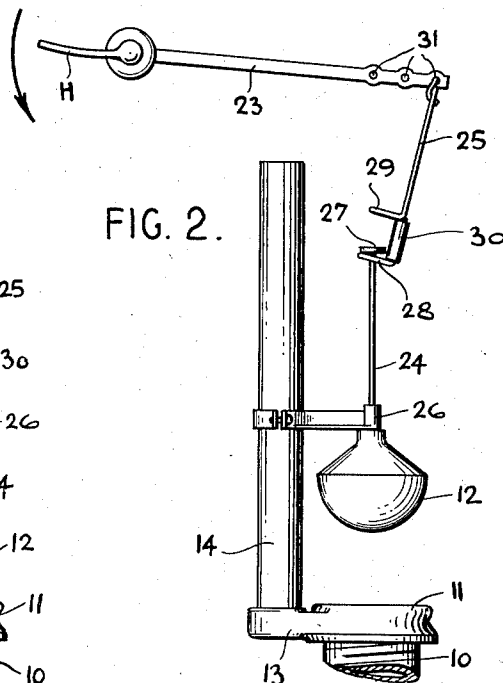


FIG. 2.

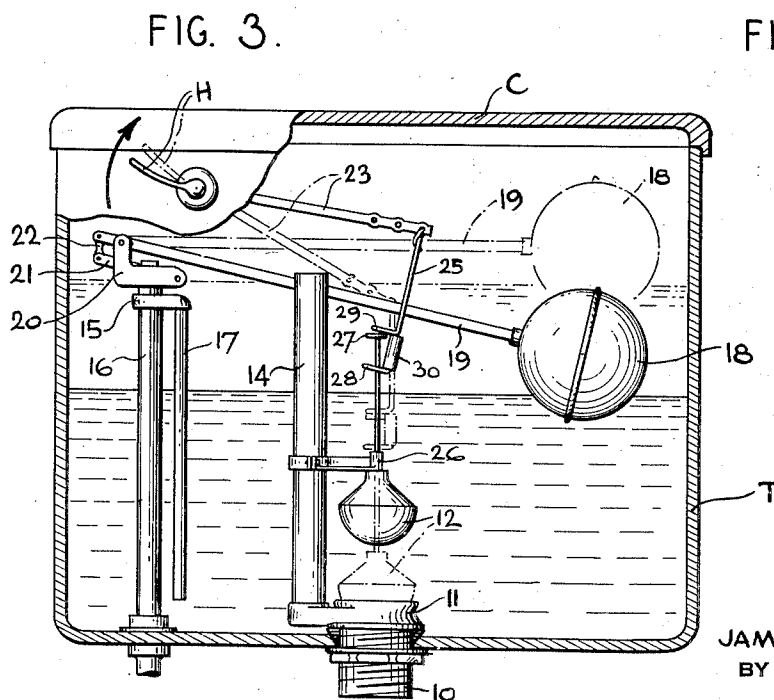


FIG. 3.

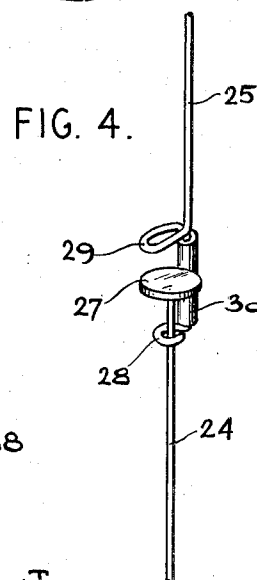


FIG. 4.

INVENTOR
JAMES CASTELLANO
BY *Mock & Blum*
ATTORNEYS

UNITED STATES PATENT OFFICE

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VALVE CONTROL MEANS FOR FLUSH TANKS
FOR TOILETS

James Castellano, New York, N. Y.

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2 Claims. (Cl. 4-67)

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This invention relates to a new and improved flush valve control means for flush tanks for toilets, its prime object being the provision of novel valve control means, whereby the amount of water discharged therefrom may be controlled. This is accomplished by a novel arrangement and construction of the valve stem and its associated wire link member, by means of which it is possible to readily stop the flushing operation at the will of the user.

Every time a conventional flush tank is operated, the water contents thereof must drop until it substantially reaches the level of the valve seat of the flush outlet at the bottom of the tank before the buoyant valve is seated, thereby concluding a single flushing operation. This means that once the tank handle is actuated most of the water in the tank is discharged, as there are no means in the conventional flush tank for controlling the amount of the discharge during a flushing operation. In the course of a single flushing operation, at least five gallons of water are discharged each time. This is obviously an extravagant and unnecessary waste of water, as in many instances only a small amount of water is required for flushing.

It is therefore the principal object of this invention to provide simple and novel valve control means for flush tanks, whereby the operator may stop the discharge of the water in the tank at any time during a flushing operation, thereby controlling the amount of water discharged at will. The said valve control means can thus be readily actuated to move the buoyant valve into its seat, when the water in the tank is at any level above the said seat.

Other and additional objects and advantages of the invention are as follows:

(a) Water is greatly conserved, without sacrificing the full requirements of complete sanitation;

(b) Overflow of the toilet bowl can be prevented when the bowl becomes stopped or clogged;

(c) The improved control means can readily be installed in all existing types of flush tanks;

(d) The said control means may be produced at low cost;

(e) The said control means are simple and effective in operation and highly effective in conserving water; and

(f) Entanglement of the valve stem is avoided.

Other objects of the invention will be set forth in the following description and drawings, in which:

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Fig. 1 is an elevational view of the essential parts of a flush assembly embodying the invention, the buoyant valve being seated in its valve seat, and the actuating handle being in its normal upward inoperative position;

Fig. 2 is a view similar to Fig. 1, but illustrating the buoyant valve in its raised or flushing position;

Fig. 3 is a vertical sectional view through a toilet tank, incorporating the improved valve control means; and

Fig. 4 is a perspective view of the improved valve stem assembled with the wire link, which constitutes the essence of the invention.

Referring to Fig. 3 of the drawing, this shows a conventional flush tank T having the usual cover C. The said tank is provided with a flushing-water outlet 10, the said outlet being centrally located at the bottom of said tank and having its lower end connected with a toilet bowl, or the like, in any conventional manner (not shown). The upper end of said flushing outlet 10 terminates in a valve seat 11, to receive the ball-type buoyant valve 12. A lateral extension or conduit 13 projects from said valve seat 11, the said extension supporting the vertical overflow pipe 14.

An inlet valve 15 controls the water supply pipe 16, and tank T is filled through the depending refilling pipe 17. The latter pipe is downwardly disposed in order to quietly fill the said tank. A hollow metal float 18 controls inlet valve 15 in the usual manner. Said float is mounted on the end of a radius arm or rod 19, the said arm or rod being pivotally mounted adjacent its opposite end in an L-shaped bracket 20. Links 21 and 22 are the operative connections between the float arm 19 and the valve 15.

Tank T also includes an operating handle H (press-down type) which is exteriorly located. The shank of said handle is operatively connected to one end of a valve-trip arm or lever 23. In the normal inoperative position shown in Fig. 1 and in the dotted line position of Fig. 3, handle H is in its extreme upward position.

What has been described thus far typically represents the conventional tank constructions. The part of the combination that comprises the invention herein resides in the novel flush valve control construction of the valve stem 24 and its associated wire link member 25.

The lower end of the vertically disposed valve stem 24 is threadedly connected to the upper end of buoyant valve 12. The said valve stem is slidably mounted in guide bracket 26 which is se-

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cured to the overflow pipe 14. The said valve stem is provided with a flat enlarged circular head 27, thus preventing the stem from becoming dislodged from guide bracket 26. Said head 27 plays an important part in the control means, as will hereinafter be described.

Head 27 of the valve stem 24 is disposed above lateral ring 28 formed at the lower end of wire link 25, the said ring being slidable along the said valve stem. A loop 29 is formed in wire link 25, said loop being disposed above ring 28 in spaced relationship thereto, and being in alignment therewith. When link member 25 is made of bendable wire, it is desirable to provide a reinforcing sleeve 30 on said link intermediate loop 29 and ring 28. However, when said link member is made of non-bendable wire, sleeve 30 may be dispensed with. The said wire link 25 pivotally depends from the end of valve lifting arm or lever 23. Said assembly is effectuated by inserting the upper end of wire link 25 into one of the three spaced eyelets 31 formed in the outer end of lever 23, and then bending the said end downwardly and around to lock the said link on said lever.

Fig. 1 shows the buoyant valve 12 seated in its valve seat 11. In this inoperative or non-flushing position, head 27 of valve stem 24 abuts the bottom of loop 29 of link member 25, and ring 28 of said link member is seated on guide bracket 26. When handle H is manually depressed downwardly in the direction shown by the arrow in Fig. 2, lever 23 and its associated link member 25 are raised, thereby unseating the ball valve 12, and thus starting the flushing operation. The said ball valve will be raised to the full position shown in Figs. 2 and 3, and the elevation of said link member is limited by the lower end of guide bracket 26. In this position, valve stem 24 will remain in its vertical position, but link member 25 will assume an angular position relative to said valve stem as shown in said figures. This change of position of link member 25 from vertical (Figs. 1 and 4—full lines) to the angular position (Figs. 2 and 3—full lines) is due to the fact that the apertured end of lever 23 circumscribes an arc in its upward and downward travel.

By reason of the buoyancy of ball valve 12, normally the said valve would remain elevated until it was drawn on to its valve seat by the suction produced by the weight of the descending water level. However, by reason of the improved construction, it is a very simple matter to overcome the buoyancy of ball valve 12 and re-seat the same when the water in the tank is at any level above valve seat 11. This can be accomplished, at any time, during a flushing operation merely by pushing handle H upwardly, in the direction of the arrow shown in Fig. 3. When this

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is done, link member 25 is returned to its vertical position and loop 29 is caused to impinge and strike against the circular head 27 of valve stem 24, thereby forcing ball valve 12 into its seat 11, and stopping the exit of the water from the tank. In this manner, the water discharge can be curtailed at any desired water level above the level of the valve seat. In other words, the ball valve 12 may be prematurely seated at any time during a flushing operation at the will of the user. Said valve 12 may be thus closed at any time before the full quantity of the water in the tank is discharged.

It will be understood that the improved valve stem and wire link member that constitute the essence of the invention may be varied without departing from the spirit of the invention. It likewise may be altered as existing installations may require.

What is claimed is:

1. In combination with a flush tank having a flush outlet and a buoyant valve for said outlet, a control unit for said buoyant valve, said unit including a stem for said valve mounted in a guide bracket for vertical reciprocation solely in the direction of length of the valve axis, a manually operative pivotally mounted arm and a rigid link member articulated with the arm, said stem extending through a lateral ring formed at the lower end of the link member and being slidable therein, said valve stem being provided with a substantially flat enlarged head at the upper end thereof to assemble said stem with said link member, a lateral projection provided on said link member above the lateral ring, said projection being spaced from said ring and in alignment therewith, said projection being adapted to strike the stem head and to prematurely seat the valve during a flushing operation, when said link member is forced downwardly.

2. A valve control unit in accordance with claim 1 in which a reinforcing sleeve is mounted on the link member intermediate the lateral ring and lateral projection.

JAMES CASTELLANO.

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