Sept. 25, 1956 J. YONCHAR 2,764,179

FLOAT CONTROL ATTACHMENT FOR FLUSH TANKS

Filed July 19, 1954

FIG. 1.

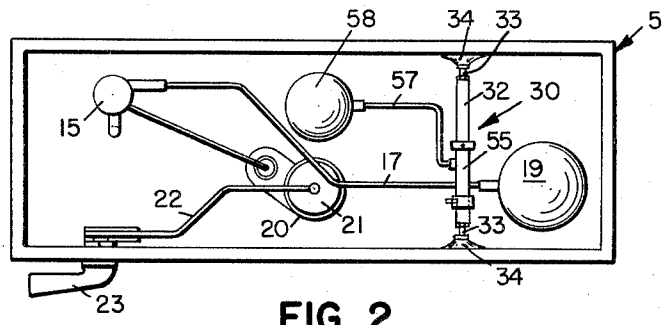


FIG. 2.

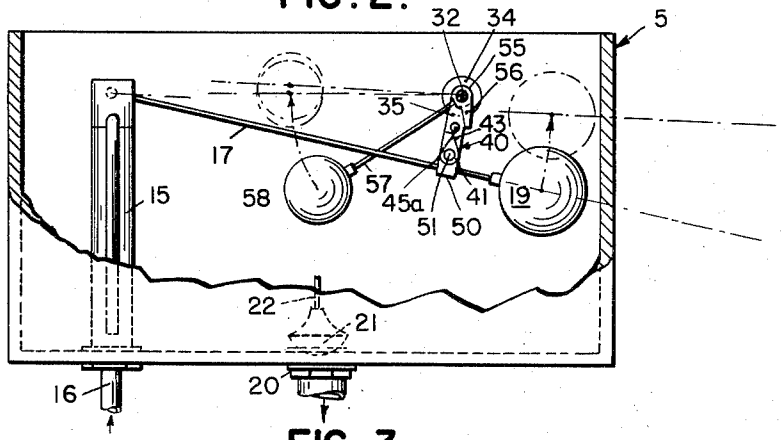


FIG. 3.

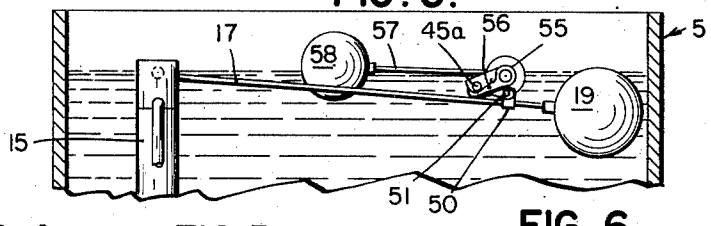


FIG. 4.

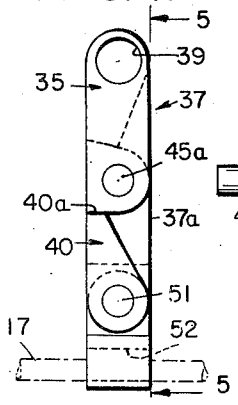


FIG. 5.

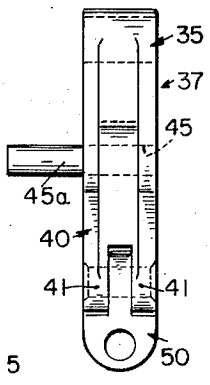


FIG. 7.

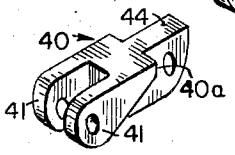


FIG. 8.

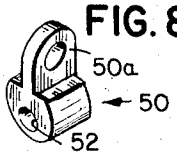
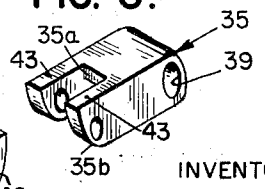


FIG. 6.



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FLOAT CONTROL ATTACHMENT FOR FLUSH TANKS

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6 Claims. (Cl. 137—417)

My invention has to do with flush tanks and relates more particularly to means for controlling the inlet of water or other liquid to the flush tank.

My invention finds its chief utility as a means for controlling the float controlled inlet to a toilet flush tank.

As is well-known, after a flush tank is emptied, as it is refilled the float controlling the inlet gradually rises with the water level and consequently gradually closes the inlet valve, thus, substantially increasing the refilling time as well as the resultant noise. While I am aware that attempts have been made in the art to provide means for maintaining the inlet valve fully open until the tank is refilled, those devices of which I am aware have not been susceptible of being readily added as an attachment to an existing flush tank and they are rather complicated in construction.

It is an object of my invention to provide, in the form of an attachment for flush tanks, an economical unit which may be easily installed and which functions to prevent the inlet valve controlling float from rising with the water level in the tank until the tank is substantially refilled.

It is a further object of my invention to provide an attachment of this character which insures that the valve controlling inlet of water to the tank will be maintained fully open until the tank is refilled and will then be suddenly closed.

Other objects and advantages will appear hereinafter.

For the purpose of explaining my invention, I shall now describe the details of one of its presently preferred embodiments, although I do not intend by such detailed description to limit the broader aspects of my invention except as they appear from the appended claims. For purposes of the ensuing description I shall refer to the accompanying drawings wherein:

Fig. 1 is a top plan view of a flush tank having my attachment installed therein;

Fig. 2 is a view, partly in longitudinal section and partly in side elevation, showing the position of the valve controlling elements when the tank is substantially empty of water;

Fig. 3 is a longitudinal section showing the relative positions of the parts when the tank is refilled;

Fig. 4 is an enlarged side elevation showing the toggle construction;

Fig. 5 is an elevational view of the toggle of Fig. 4, taken on line 5—5 of Fig. 4;

Fig. 6 is a perspective showing the top link of the toggle;

Fig. 7 is a perspective showing the bottom link of the toggle; and

Fig. 8 is a perspective of the slide link member.

Referring now to the drawings, the numeral 5 denotes a conventional flush tank having a conventional upright inlet valve casing 15, an inlet conduit 16, a float arm 17 operatively connected to the conventional inlet valve in the casing, and a conventional float 19 secured on the outer end of the float arm. The tank has a conventional

outlet 20, controlled by conventional outlet valve 21 actuated by links 22 operated by lever 23 in the conventional manner. Up to this point in this description the flush tank described is of conventional construction.

My attachment is generally denoted by the numeral 30 and comprises a shaft 32 into the ends of which are threaded screws 33 each carrying a rubber-like suction cup 34. The shaft is installed by rotating the screws 33 to force the suction cups into engagement with the side walls of the tank.

A link 35 of a toggle 37 has a transverse opening 39 to rotatably receive the shaft 32, and the other or bottom link 40 of the toggle has bifurcations 41 at its bottom end. The bottom end of link 35 also presents bifurcations 43 to receive therebetween the top end portion 44 of link 40, the links being pivoted together by pin 45 which has an end extension 45*a*. The pivotal connection of the links by pin 45 is slightly closer to side 37*a* of the toggle than to the opposite side. Links 35 and 40 present opposed shoulders 35*a*, 40*a*, which abut each other when the links are in alignment, although those portions 35*b* of the bottom end surface of link 35 are curved to permit the links to swing relative to each other in the direction of the shoulders or to the left in Fig. 2.

Between bifurcations 41 the top portion 50*a* of a slide member or link 50 fits, being pivotally held between bifurcations by pin 51. Slide member 50 has an opening or slideway 52 which slideably receives the float arm 17.

A collar 55 rotatably fits on shaft 32, the collar having a depending finger 56. An arm 57 is fixed at one end to collar 55, extending radially therefrom and carries an auxiliary float 58 at its other end.

The functional cooperation of the parts will be better understood from the following description of the operation.

First, to install the device, the main float 19 should be removed and the float rod 17 inserted through the hole 52 in the slide member, after which the float 19 is remounted onto the float arm. Then the shaft 32 is mounted in the tank above the float arm by forcing the suction cups against the tank side walls as before described.

In Fig. 2 the parts are shown in the relative positions which they occupy after the tank has been substantially emptied by opening the outlet valve 21, the main float valve 19 being shown suspended by my attachment 30 in the position which it occupies when the inlet valve is fully open. The floats are denoted in Fig. 2 by broken lines in the positions which they occupy when the tank is filled. The weight of the float and float rod, as they drop with the emptying of the tank, swings the links of the toggle into substantial alignment with the shoulders 35*a* and 40*a* in engagement, so that the main float will be held against rising with the water level until the joint of the toggle is broken, thus maintaining the tank inlet fully open. However, the auxiliary float 58 is free to rise with the water level in the tank when the tank is being refilled, and when the water level reaches full position (Fig. 3) the finger 56 of collar 55 will have been rotated by the auxiliary float into engagement with the extension 45*a* of pivot pin 45 of the toggle, causing the toggle links to swing into the collapsed position of Fig. 3 under the pressure of the float 19, the float then rising suddenly to the water level and suddenly closing the inlet valve.

I claim:

1. In a flush tank having an inlet, a valve controlled outlet, valve means controlling said inlet, a float arm operatively connected with said valve means and a float carried by said arm, said float and float arm being movable with the liquid level in said tank, the combination with said float arm of a collapsible member arranged for engagement with said arm to restrain rising movement thereof with said liquid level, auxiliary float means oper-

atively associated with said collapsible member to allow the latter to collapse and release said arm when said water level reaches a predetermined height in said tank and axially adjustable shaft means disposed transversely of said tank with its ends in frictional engagement therewith, said collapsible member being carried by said shaft means.

2. In a flush tank having an inlet, a valve controlled outlet, valve means controlling said inlet, a float arm operatively connected with said valve means and a float carried by said arm, said float and float arm being movable with the liquid level in said tank, the combination with said float arm of a collapsible member arranged for slidable engagement with said arm to restrain rising movement thereof with said liquid level, auxiliary float means operatively associated with said collapsible member to allow the latter to collapse and release said arm when said water level reaches a predetermined height in said tank and axially adjustable shaft means disposed transversely of said tank with its ends in frictional engagement therewith, said collapsible member and said auxiliary float means being carried by said shaft.

3. In a flush tank having an inlet, a valve controlled outlet, valve means controlling said inlet, a float arm operatively connected with said valve means and a float carried by said arm, said float and float arm being movable with the liquid level in said tank, an attachment for restraining rising movement of said float arm with the raising of the water level in said tank until said water level reaches a predetermined height, comprising an axially extensible shaft arranged to be positioned in said tank above said float arm with its ends bearing against opposite side walls of said tank, a pair of rigid links pivotally connected together to form a toggle, the upper one of said links being rotatably mounted on said shaft, a third link pivotally connected to the bottom end portion of the bottom one of said first mentioned links and being arranged for slidable engagement with said float arm, and means operable in response to rising of said water level to a predetermined height to collapse said toggle.

4. In a flush tank having an inlet, a valve controlled outlet, valve means controlling said inlet, a float arm operatively connected with said valve means and a float carried by said arm, said float and float arm being movable with the liquid level in said tank, an attachment for restraining rising movement of said float arm with the rising of the water level in said tank until said water level reaches a predetermined height, comprising an axially extensible shaft arranged to be positioned in said tank above said float arm with its ends bearing against opposite side walls of said tank, a pair of rigid links pivotally connected together to form a toggle, the upper one of said links being rotatably mounted on said shaft, a third link pivotally connected to the bottom end portion of the bottom one of said first mentioned links and being arranged for slidable engagement with said float arm, a collar rotatably carried by said shaft, said collar having a projecting portion laterally engageable with said toggle, and an auxiliary float member operatively connected with said collar to rotate the latter in response to raising of said water level.

5. The device of claim 3 wherein said shaft axially adjustably carries at each of its ends a suction cup for engagement with said side walls of said tank.

6. In a flush tank having an inlet, a valve controlled outlet, valve means controlling said inlet, a float arm operatively connected with said valve means and a float carried by said arm, said float and float arm being movable with the liquid level in said tank, float arm restraining means engaging said float arm and adjustably secured to said tank for restraining upward movement of said float arm, and means operable in response to rising of said water to a predetermined height to actuate said float arm restraining means to allow said arm to move upward with said float.

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