March 31, 1959 R. W. STUMP 2,879,522

PUSH-BUTTON FLUSH TANK CONTROL

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FIG. 1

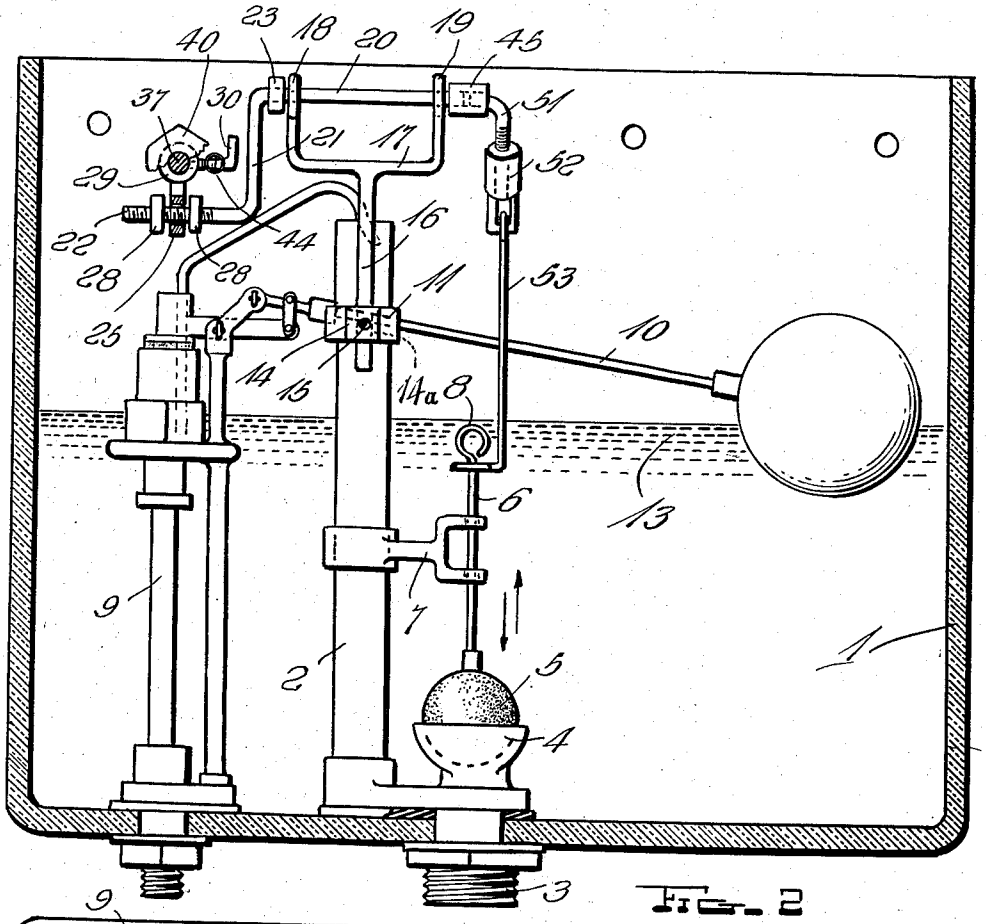


FIG. 2

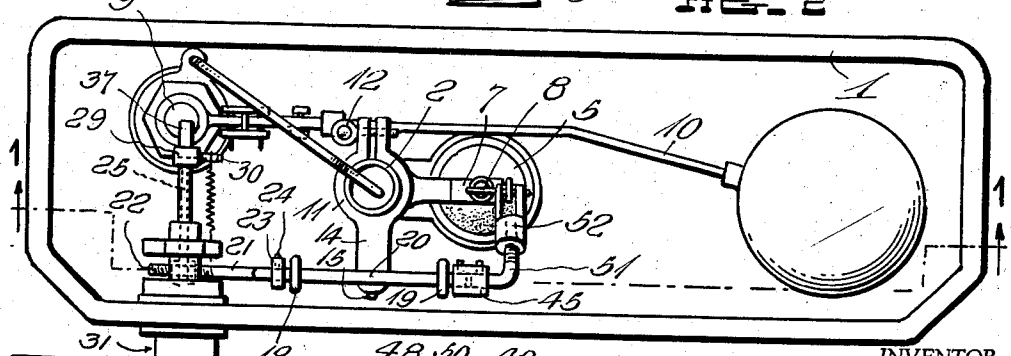


FIG. 11



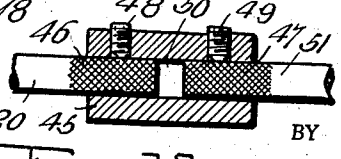


FIG. 10

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FIG. 3

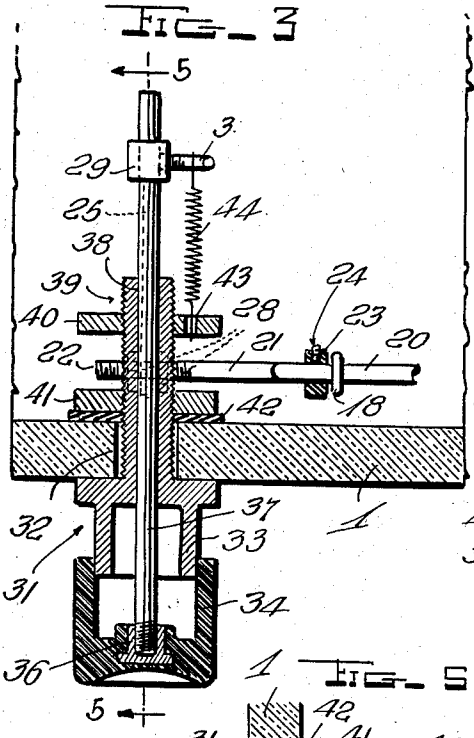


FIG. 4

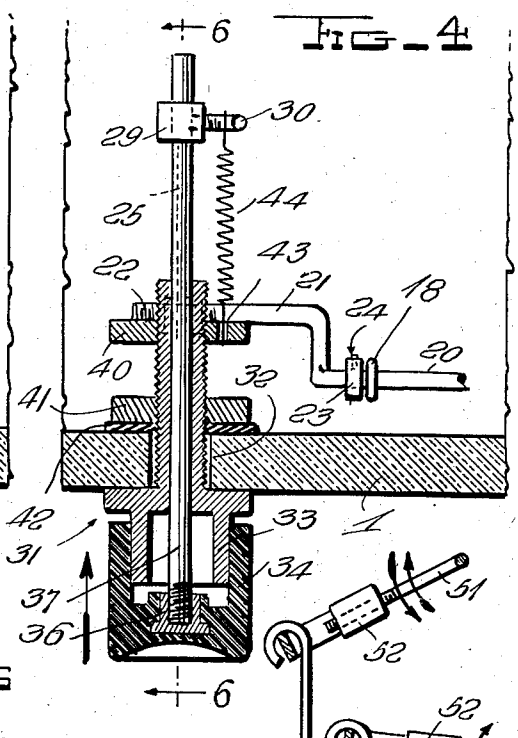


FIG. 5

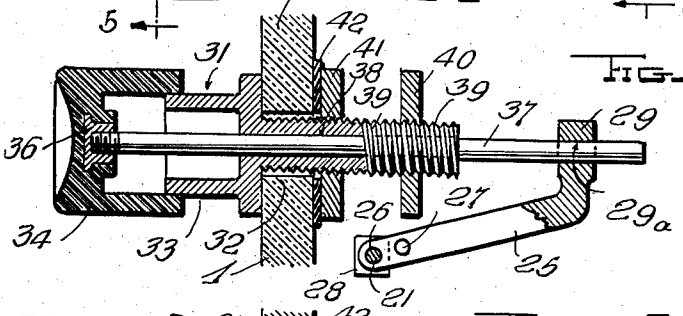


FIG. 7

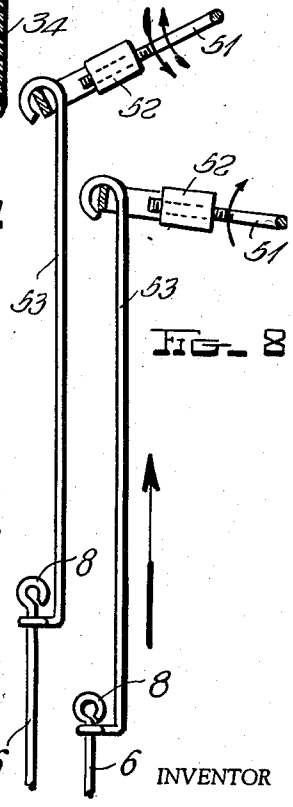
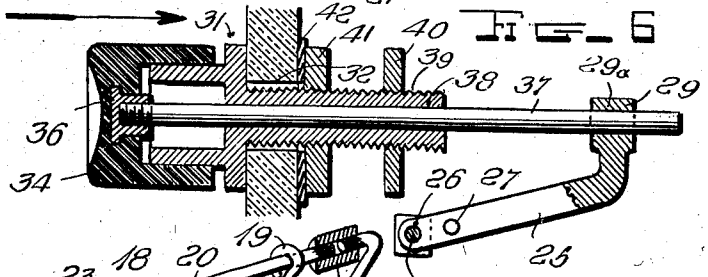


FIG. 8

FIG. 6



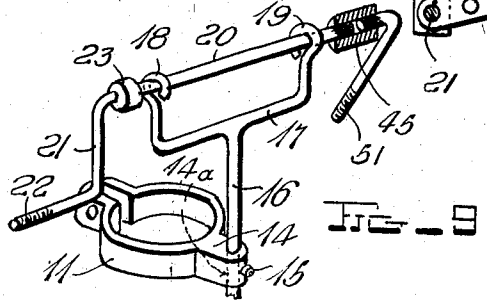


FIG. 9

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United States Patent Office 2,879,522
Patented Mar. 31, 1959

2,879,522

PUSH-BUTTON FLUSH TANK CONTROL

Richard W. Stump, York, Pa.

Application January 27, 1958, Serial No. 711,442

12 Claims. (Cl. 4—67)

My invention relates broadly to flush tanks, and more particularly to a push-button control mechanism for controlling the operation of flush tanks.

One of the objects of my invention is to provide a set of parts which may be readily utilized for converting a coventional hand lever operated flush tank control mechanism into a push-button type of control.

Another object of my invention is to provide an assembly of parts which may be readily installed in association with a conventional flush tank mechanism for effecting the operation of the flushing valve through the push-pull operation of a push-button located in the same position with respect to the tank normally occupied by a hand lever control device.

Another object of my invention is to provide an assembly of parts for use with a conventional flushing valve in a conventional flush tank by which a push-pull button located in the position normally occupied by an angularly movable hand lever may be adjustably connected with the flushing valve for insuring the precision operation of the valve upon actuation of the push-button control.

Another object of my invention is to provide a link assembly which may be readily installed in a conventional flush tank with provision for adjustments between the links to insure the reliable operation of a flushing valve upon push-pull movement of a control button located with respect to the tank in the same position normally occupied by a conventional hand lever actuator.

Still another object of my invention is to provide a linkage assembly for interconnecting a push-pull actuating button in a flush tank with a flushing valve where the portion of the linkage assembly intermediate the push-pull actuating button and the flushing valve is wholly supported and guided by adjustable bracket means adjustably connected with the overflow tube of the tank, permitting accurate adjustment of the linkage assembly upon installation and insuring reliable control of the flushing valve upon actuation of the push-pull actuating button.

A further object of my invention is to provide a construction of attachable push-pull button for flush tanks which may be formed from metal or plastic and personalized by a monogram or insignia selected by the owner.

Other and further objects of my invention reside in the production of a set of parts for flush tanks adapted to be readily installed in lieu of conventional flush tank actuators for providing push-pull control for the flush tank in lieu of the conventional angular movement of a hand lever all as set forth more fully in the specification hereinafter following by reference to the accompanying drawings in which:

Fig. 1 is a vertical sectional view through a flush tank taken on line 1—1 of Fig. 2, showing the assembly of parts constituting the means for converting a push-pull action into oscillatory movement of a crank for functioning a ball valve in accordance with my invention;

Fig. 2 is a top plan view of the assembly illustrated in Fig. 1;

Fig. 3 is an enlarged fragmentary transverse sectional view through the push-pull control mechanism of the flush tank operating means, the view illustrating the outwardly projecting position of the push-button preparatory to the operation of the valve;

Fig. 4 is a view similar to the view illustrated in Fig. 3, but showing the actuated position of the push-button for operating the valve control mechanism;

Fig. 5 is a longitudinal sectional view through the push-button control mechanism with certain parts shown in elevation, the view being taken substantially on line 5—5 of Fig. 3 and showing the push-button in the outward projecting position;

Fig. 6 is a longitudinal sectional view taken substantially on line 6—6 of Fig. 4 with certain of the parts shown in side elevation and illustrating the depressed or actuated position of the push-button;

Fig. 7 is a view showing the linkage which connects the crank member of the valve operating mechanism of my invention with the ball valve, the view illustrating the position of the linkage in the unactuated position of the ball valve;

Fig. 8 is a view similar to the view shown in Fig. 7 but illustrating the displacement of the crank lever and the linkage when raising the ball valve;

Fig. 9 is a perspective view illustrating the manner of mounting the adjustable parts in the set of parts of my invention on the flush tank overflow-tube and illustrating particularly how the parts may be raised or lowered in position with respect to the overflow-tube;

Fig. 10 is a view of the coupling means I provide for adjustably coupling the crank member which raises or lowers the ball valve with the end of the operating shaft which imparts angular movement to the crank member; and

Fig. 11 is a perspective view of the removable button showing the form in which the button is molded to display a personalized monogram on the front thereof.

My invention is directed to a linkage assembly which may be merchandised as a convenient package and the parts utilized to readily convert existing hand lever operated flush tank control systems into a push-button push-pull type of control, where the push-button is located in the same position with respect to the tank as is normally occupied by an angularly shiftable hand lever. The linkage assembly of my invention is supported from a bracket adjustably mounted on the overflow tube of the conventional tank and the linkage adjustably connected at one end with the push-pull actuating button and at the other end adjustably coupled with the flushing valve. By reason of the mounting the linkage assembly on the conventional overflow tube, the distribution of forces for actuating the flushing valve may be equalized so that actuation of the push-pull button insures reliable operation of the flushing valve. A multiplicity of adjustments are provided for the linkage assembly in the system of my invention to insure the proper installation of the set of parts in flush tanks of various constructions. That is to say, the set of parts of my invention have been developed to meet a wide variety of different conditions found in flush tank installations of various descriptions, and yet insure operation of the flush valve by push-pull actuation of the operating button.

Moreover, the installation of my invention may be readily made in flush tanks as initially manufacture and distributed where the set of parts include such adjustments as will meet conditions found in widely differing flush-type constructions.

The push-button type of construction lends itself par-

ticularly well to an ornamental form of push-button which may be molded from plastic or metal to include therein a monogram or initial, thereby enabling a personalized attribute to be given to each individual installation. Thus builders of groups of houses may obtain from stock a push-button of a particular monogram or initial suitable as a designation for the individual acquiring any particular property. The push-button in the assembly of my invention is readily installable by merely screwing the push-button into position.

Referring to the drawings in more detail, reference character **1** designates a conventional flush tank having a vertically extending overflow-tube **2** disposed therein connected with a discharge pipe **3** through the ball valve seat **4** which is adapted to receive ball valve **5**. The ball valve **5** includes a conventional ball valve rod **6** which extends vertically within the flush tank projecting slidably through the ball valve guide **7** which is mounted on the vertically extending overflow-tube **2**. The ball valve rod **6** is provided with a head **8** on the upper extremity thereof. The flush tank **1** includes the conventional water inlet pipe **9** and the float valve control mechanism **10** for controlling the amount of water **13** which is admitted to the tank **1**. The overflow-tube **2** is engaged by a clamp **11** which may be raised or lowered in position thereon and selectively clamped in the desired position by adjusting screw **12** which passes through the jaws of a bifurcated portion of the clamp **11**. The clamp **11** includes a forwardly projecting arm **14** having a vertically disposed bore **14***a* therein through which the vertical portion **16** of a T-shaped support slidably extends and is set in position by means of adjustable set screw **15**. The T-shaped support **16** includes a lineally extending head **17** constituting the top portion of the T and terminating in eyes **18** and **19** on the ends of upwardly projecting arms extending from the T. These eyes **18** and **19** extend in a clockwise and counterclockwise direction looking at the end of the T from the left-hand end of the flush tank. The eyes **18** and **19** are disposed in planes extending normal to the lineally extending head **17** of the T-shaped support which are spaced in parallel relation to each other and symmetrically separated on opposite ends of the stem of the T-shaped support **16**. An oscillatory shaft **20** extends through the eyes **18** and **19** and is supported therein in a position capable of rocking movement, viewing the shaft from either end of the T. The shaft **20** extends beyond eye **18** and has a crank **21** formed on the end thereof which terminates in a screw-threaded end **22** extending on an axis spaced from, but parallel with, the axis of shaft **20**. A stop **23** constituted by a sleeve having a set screw **24** therein may be selectively set in position on the extension of shaft **20** beyond eye **18** for positioning shaft **20** and crank **21** with respect to the T-shaped support **16**. The screw-threaded end **22** of crank **21** passes through either of the apertures **26** or **27** provided in lever arm **25** extending in a plane normal to the axis of the screw-threaded end **22** of crank **21**. When the screw-threaded end **22** of crank **21** is selectively positioned through either of the apertures **26** or **27** it is confined therein by means of nuts **28** which engage the opposite sides of lever arm **25**. The lever arm **25** extending in a plane normal to the axis of the screw-threaded end **22** of crank **21** terminates in a head **29** having a lineally extending bore **29***a* therein through which the slidable rod **37** extends and is adjustaby secured therein by means of set screw **30**.

A fitting **31** is provided, adapted to fit into the conventional aperture **32** in tank **1** in the position normally occupied by an angularly shiftable hand-lever. This fitting **31** is provided with a forwardly projecting cylindrical guide **33** over which a hollow handle **34** is adapted to telescope. This hollow handle **34** may have a variety

of ornamental shapes and may be molded from plastic or metal and may have a molded insignia **35** in the front thereof, as indicated in Fig. 11, in order to personalize the installation for the house-owner. The hollow handle **34** has an internally screw-threaded insert **36** therein into which the screw-threaded end of rod **37** may be engaged. In lieu of the insert **36** the plastic or metal button **34** may be directly screw-threaded to receive the end of rod **37**. The buttons may be stocked according to each letter of the alphabet so that as owners change, a replacement button may be readily installed. The fitting **31** includes a hollow bore **38** extending axially thereof for receiving and guiding the slidable rod **37**. The exterior of the fitting **31** is formed into an externally screw-threaded sleeve, indicated at **39**, adapted to receive the internally screw-threaded adjustable nuts **40** and **41**. The adjustable nut **41** serves in coaction with gasket **42** to secure the fitting to the front of the flush tank. The nut **40** is adjustable upon screw-threads **39** and serves as a carrier for tension-spring **44** which has one end thereof extending through aperture **43** in adjustable nut **40** and the other end thereof connected to set screw **30** in head **29** of the lever arm **25** for tensioning the forward projection of the button or hollow handle **34** for yieldingly biasing button **34** forwardly in the position illustrated in Figs. 2, 3 and 5.

The other end of the shaft **20** extends beyond eye **19** of the T-shaped support **16** and terminates in a knurled end **46** shown more clearly in Fig. 10. A coupling sleeve **45** is slipped over the knurled end **46** of the shaft **20** and is selectively set in position therein by means of a set screw **48**. The other end of coupling **45** receives the knurled end **47** of the crank member **51** which fits into the interior **50** of the coupling **45** and is maintained therein by means of set screw **49**. Crank member **51** terminates in a screw-threaded end on which there is rotatably engaged the adjustable screw-threaded end member **52** having a slotted opening therein which receives the upper end of depending link **53** which engages head **8** on the ball valve rod **6**.

It will be seen that there are a multiplicity of adjustments available in the set of parts of my invention, enabling the parts to be applied to flush tanks of a variety of different makes; that is to say, the entire assembly of parts may be raised and lowered on the overflow-tube **2** by adjustment of clamp screw **12**. The T-shaped support **16** may be raised or lowered by adjustment of set screw **15** before the assembly is installed in the tank. Stop **23** is adjustable by means of set screw **24** to symmetrically locate shaft **20** in eyelets **18** and **19**. Crank **21** is adjustable with respect to the lever **25** by engagement of either of the apertures **26** or **27** by screw-threaded end **22** of crank **21**. Set screw **30** provides an adjustment for properly setting rod **37** with respect to the lever arm **25**. Set screws **48** and **49** in coupling **45** permit adjustment of the angular position of crank member **51** with respect to shaft **20**. The adjustable end member **52** is adjustable on the screw-threaded end of crank member **51** to control the effective length of link **53** with respect to link **6**. These adjustments may be made when the set of parts are installed and remain fixed for the entire life of operation of the assembly. Wide tolerances are provided to meet different conditions encountered in different flush tank installations.

The installation of the set of parts is very simple and the set of parts may be purchased as a package and installed in lieu of worn or antiquated installations. Moreover, the parts are already installable in new equipment in mass production.

While I have described my invention in certain of its preferred embodiments, I realize that modifications may be made and I desire that it be understood that no limitations upon my invention are intended other than may be imposed by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. A flush-tank control mechanism comprising in combination with a flush-tank having a vertically extending interiorly disposed overflow tube, a bracket member adjustably mounted on said tube and wholly supported thereby adapted to be raised or lowered in a vertical direction with respect thereto in a position spaced from the inner wall of said tank, support means carried by the upper end of said bracket member and disposed in a vertical plane spaced from the inner wall of said tank, a shaft member horizontally journaled in said support means, a crank connected with one end of said shaft member in a position beyond one end of said support means, a push-button supported with respect to the wall of said tank and displaceable inwardly and outwardly with respect thereto in a lineal direction normal to the axis of said shaft member, means interconnecting said push-button with said crank whereby movement of said push-button angularly moves said crank and said shaft member, a crank member coupled with the other end of said shaft member beyond the other end of said support, a flush valve in said tank, a link extending upwardly from said flush valve and means interconnecting said last mentioned crank member with said link whereby angular movement of said shaft member operates to raise said flush valve upon an inward lineal movement of said push-button.

2. A flush-tank control mechanism as set forth in claim 1 in which the means interconnecting said last mentioned crank member with said link includes an adjustable coupling member permitting the selective orientation and setting of said crank member with respect to the last mentioned end of said shaft member for controlling the operation of said flush valve with respect to the actuation of said push-button.

3. A flush-tank control mechanism as set forth in claim 1 in which said support means is substantially T-shaped, and where the horizontal extremities of said support means terminate in eyes through which said shaft member extends and within which said shaft member is rotatable.

4. A flush-tank control mechanism as set forth in claim 1 in which said support means is substantially T-shaped and where the horizontal extremities of said support means terminate in loops, one of which extends clockwise and the other of which extends counterclockwise in planes substantially parallel to each other and normal to the axis of said shaft member, said shaft member extending through said loops and being journalled therein for rotation.

5. A flush-tank control mechanism as set forth in claim 1 in which the means interconnecting said push-button and said crank includes a rod member which extends through the wall of said tank and wherein an arm extends forwardly from said rod member toward the interior of the front wall of said tank and a connection between the extremity of said arm and said crank for angularly shifting said crank through an arc as said push-button is displaced inwardly.

6. A flush-tank control mechanism as set forth in claim 1 in which the means interconnecting said push-button and said crank includes a rod member which extends through the wall of said tank and connects with said crank and spring means connected with said rod member for biasing said push-button to an outward position beyond the front of said tank subject to an inward actuating movement by force applied against the exterior face of the push-button.

7. A flush-tank control mechanism as set forth in claim 1 in which the means interconnecting said push-button and said crank includes a rod member which extends through the wall of said tank and connects at its inner end with said crank, and wherein said push-button is detachably connected with the outward extremity of said rod member, said push-button being constituted by a body of molded material having an identifying insigne in the outer end thereof.

8. A flush-tank control mechanism as set forth in claim 1 in which said shaft member includes an adjustable stop means fastened thereto in a position located between said crank and one end of said support means for maintaining said shaft member in a prearranged lineal position with respect to said support means during the operational movement thereof.

9. A flush-tank control mechanism as set forth in claim 1 in which the means interconnecting said push-button and said crank is a rod member and wherein there is an adjustable means are interposed between said crank and one end of said rod member whereby the angular distance through which said crank moves upon displacement of said push-button may be selectively set.

10. A flush-tank control mechanism as set forth in claim 1 in which there are adjustable means interconnecting said support means and said bracket member whereby said support means may be raised or lowered with respect to said bracket member independently of the adjustment of said bracket member with respect to said tube.

11. A flush-tank control mechanism as set forth in claim 1 in which the means interconnecting said last mentioned crank member and said link includes an adjustable member for selectively fixing the effective length of said crank member with respect to said link.

12. A flush-tank control mechanism as set forth in claim 1 in which the means interconnecting said push-button with said crank includes a rod member which extends from said push-button through the wall of said tank and in which there is an arm adjustably secured to the inner portion of said rod member interiorally of the tank and wherein said arm extends downwardly at an acute angle with respect to the axis of said rod member and adjustably connects with the end of said crank for displacing said crank as said push-button is displaced inwardly for angularly moving said shaft member, and spring means for biasing said rod member and the push-button thereon to a position displaced outwardly from the front of said tank.

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