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Elder et al.

[11] **3,766,571**

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[54] **PLURAL FLUSH TOILET VALVE APPARATUS**

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[52] **U.S. Cl.** ..... **4/37**, 4/34, 4/53, 4/56, 4/67 A, 4/DIG. 1

[51] **Int. Cl.** **E03d 1/14**, E03d 1/22, E03d 1/33

[58] **Field of Search** ..... 4/34, 37, 53, 56, 4/67 A, 67, 249, DIG. 1; 137/395, 398, 423

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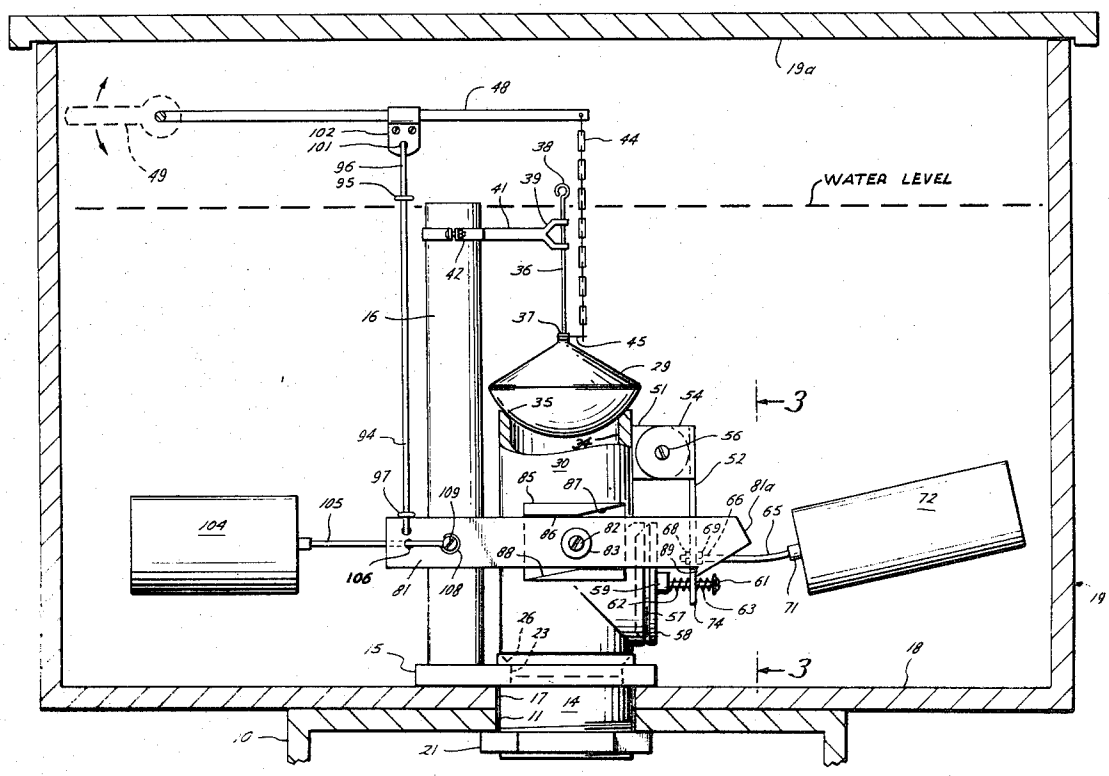
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Assistant Examiner—Stuart S. Levy
Attorney—Carl B. Fox, Jr.

[57] **ABSTRACT**

Toilet valve apparatus having an upstanding tube seated at its lower end into the seat normally provided for the tank dump valve, and providing at its upper end an elevated tank dump valve seat. The tube has a side inlet which is closed by a disc valve. A float opens and closes the disc valve at the side inlet of the tube to open same when all of the water from the tank is to be discharged, and a second float operates a latching lever which latches the disc valve closed in response to water level in the tank. Operation of the tank handle in the normal direction, i.e., downwardly, opens the tank dump valve which operates in a normal manner, but causes discharge of only a smaller part of the tank water since the tank dump valve is located at an elevated level at the top of the tube. Operation of the tank handle in the un-normal direction, i.e., upwardly, causes opening of the disc valve to open the side inlet of the tube whereby a larger part of the tank water is dumped.

4 Claims, 3 Drawing Figures



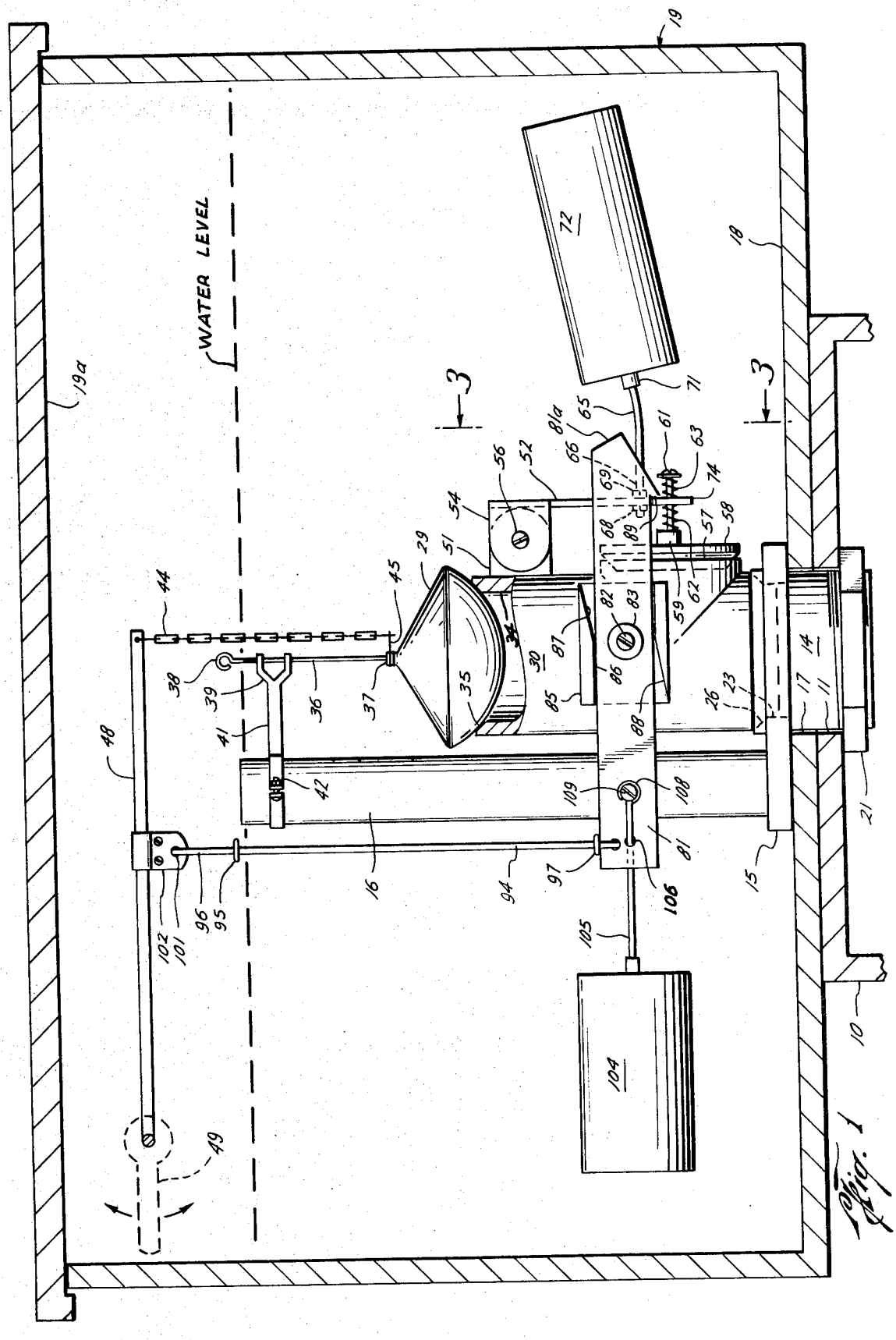

WATER LEVEL
19
19a
18
72
71
3
3
81a
65
66
61
63
74
69
68
89
57
58
56
52
54
51
29
45
44
38
39
36
37
35
30
87
82
83
59
62
86
85
88
26
23
17
11
14
48
41
42
46
109
108
16
94
97
81
106
15
21
10
105
104
102
101
96
95
49
1

Fig. 1

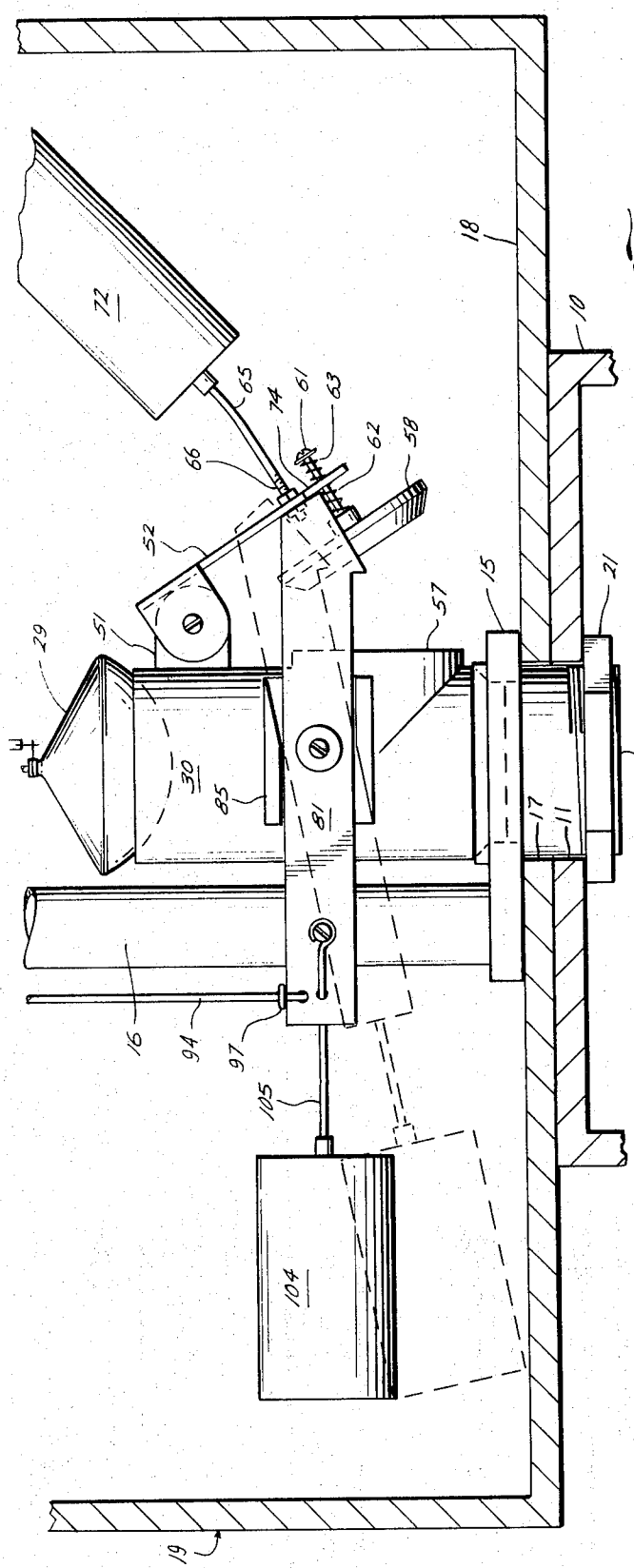

72
65
74
61
63
62
58
66
52
18
10
57
15
21
29
51
30
85
81
14
17
11
16
94
97
105
104
19

Fig. 2

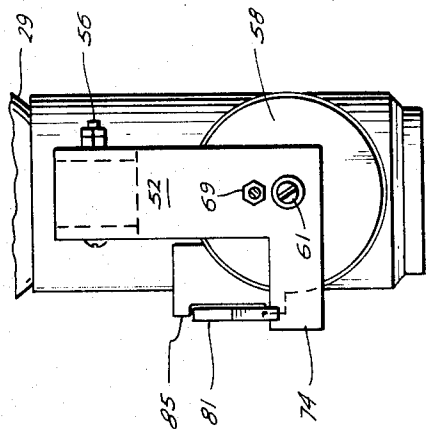

29
56
58
52
69
61
85
81
74

Fig. 3

PLURAL FLUSH TOILET VALVE APPARATUS

SUMMARY OF THE INVENTION

Waste of water and unnecessary loading of sewer systems is caused by the flushing of toilets, substantially a full tank of toilet water being used each time the toilet is flushed. On many occasions, less than the entire tank contents of water could be employed for flushing without serious effect on the efficiency or completeness of flushing, so that less water would be utilized and less water would flow into the connected sewage system. A principal object of the invention is to provide a toilet flushing apparatus which may selectively be employed to dump either about one-half of the toilet tank water or to dump substantially all of the toilet tank water. Other apparatuses for this purpose have been developed, but have not been efficient and are not commonly used.

The prior art includes U.S. Pat. Nos. 519,337; 1,767,043; 1,960,864; 1,963,211; 2,237,294; 2,351,672; 2,505,091; 2,526,294; and 2,864,095; showing apparatuses of other form. No apparatuses shown in the foregoing patents is of the nature herein disclosed and claimed.

The subject apparatus has a tube which elevates the seat of the normal dump valve of the toilet. The tube has a side inlet closed by a disc valve which is opened upon one movement of the toilet tank handle to dump most of the water in the tank. When the normal float valve of the toilet is operated, only a portion, usually about half, of the tank water is dumped for flushing of the toilet. The partial tank dump is preferably provided by normal tank handle operation, while the full tank dump is provided by un-normal or reverse tank handle operation. In this way, the partial tank dump is what occurs upon natural operation, without forethought, while the full tank dump is occasioned by an unnatural handle movement which is most cases would be intentionally done.

Two floats, one operating a latching lever, control the disc valve at the tube side inlet. The lever is moved to unlatch th disc valve by un-normal tank handle movement, one float then causing opening of the disc valve, and when the water level has lowered sufficiently, the other float causes release and relatching of the disc valve in closed position.

Other objects and advantages of the invention will appear from the following detailed description of the preferred form of apparatus shown in the accompanying drawings.

BRIEF DESCRIPTIONS OF THE DRAWINGS

FIG. 1 is a side elevational view of a preferred form of apparatus according to the invention, the toilet water tank in which the apparatus is installed being shown in vertical cross section.

FIG. 2 is a side elevational view showing the lower portion of the apparatus shown in FIG. 1 in moved position.

FIG. 3 is a partial elevational view taken at line 3—3 of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in detail and describing the preferred embodiment of the apparatus shown therein, the rear tank support flange or platform of a

toilet bowl body is indicated by reference numeral **10**. The support flange has an opening therethrough, indicated by reference numeral **11**. The large lower nipple **14** extending downward from the base **15** of standpipe **16** is disposed through opening **11**. The lower exterior of nipple **14** is threaded and the nipple is affixed in place through opening **11** and through opening **17** through the bottom **18** of tank **19** by a nut **21**. Openings **11** and **17** are of the same size and are placed in register, opening **17** above opening **11**, and the nipple **14** inserted therethrough and the nut **21** secured, this structure holding the tank **19** firmly scured on support flange **10** of the toilet bowl. Tank **19** has cover **19***a*.

Standpipe base **15** has therethrough a circular opening **23**, of the same size and in register above the internal bore of nipple **14**, and which terminates upwardly in upwardly divergent conical seat **26** formed within an upstanding ring formation around the upper end of opening **23**. Seat **26** is the seat upon which a tank dump valve **29** would normally seat to prevent outflow of water from the tank, lifting of valve **29** permitting outflow of water from the tank. According to the invention, however, a tube **30** is provided which has a lower end adapted to seat upon seat **26** and, therebelow, to extend a short distance into opening or bore **23**. The tubular passage **34** through tube **30** terminates upwardly in a conical seat **35** which is of the same form as seat **26**, and valve **29** is disposed removably threagainst. Tube **30** is affixed to seat **26** by any suitable sealer/adhesive, such as General Electric silicone sealant No. RTV102, or Dow-Corning SILASTIC (trademark) silicone rubber sealer-adhesive.

A rod **36** is screwed into the upper end of dump valve **29**. The upper end of rod **36** is in the form of loop **38**, the rod passing through openings through a yoke **39** of fitting **41** which is clamped by screw **42** around the upper end of standpipe **16**. A chain **44** connected to loop **45** attached at the upper end of valve **29** beneath shoulder **37** is connected at its upper end to the inner end of bar **48**, the crank bar which is pivotally moved upwardly and downwardly by movements of crank handle **49** of the toilet tank, in the customary manner. When handle **49** is moved downwardly, the opposite or inner end of bar **48** is pivotally moved upward, thereby raising valve **29** off of its seat. Rod **36** slides freely upwardly through the yoke openings. When handle **49** is released, it resumes its horizontal position as shown, and valve **29** is lowered onto seat **35** as the water level in tank **19** lowers to that level.

The described operation of valve **29**, handle **49** and bar or rod **48** is as customary upon the flushing of a standard toilet valve. The difference is that the dump valve **29** is disposed at an elevated position and seats on seat **35** which is upward with respect to the normal seat **26**. Since the upper end of tube **30** and seat **35** are elevated above the bottom of tank **19**, only the water above the upper end of tube **30** flows out when the toilet is flushed, the water below this level remaining in the tank.

The apparatus is also adapted for full flushing of the toilet by the outflow or dumping of most of the water in the tank. Tube **30** has a side fitting **51** on which is pivotally supported a valve hinge **52**. The hinge has a pair of opposite yoke elements **54** having openings therethrough, a screw **56** passing through these openings and an opening through fitting **51** to hingedly secure hinge **52** to fitting **51**. Hinge **52**, then, may be

moved pivotally outwardly and inwardly with respect to tube 30.

A circular disc valve 58 has a center thickened part 59 having a tapped opening at its center into which is screwed a screw 61. A pair of springs 62, 63 are at either side of the lower end of hinge 52 which has an opening therethrough to receive screw 61. A rod 65 is threaded at its end 66 and passes through another opening through hinge 52 to be secured by nuts 68, 69. The other end of rod 65 is threaded and is screwed into internally threaded nipple 71 of a float 72.

Hinge 52 has a forwardly projecting lower end 74. A latching lever 81 is pivotally connected to a side of tube 30 at screw 82. Washer 83 is disposed beneath the head of the screw. Lever 81 is affixed to tube 30 at an integral formation 85, outwardly rectangular, which at its outer face has therein a slot 86 opposite ends of the sides of which are sloped at 87, 88 to form limits for the pivotal movement of lever 81.

A shoulder 89 at the lower side of the end of lever 81 toward float 72 is adapted to latch over projecting hinge end 74. When the right hand end of lever 81 is down as shown in FIG. 1, then shoulder 89 prevents hinge 52 from moving pivotally outwardly in response to upward bias caused by float 72 immersed in water within tank 19. When the right hand end of lever 81 is pivotally moved upwardly, shoulder 89 is moved up to release hinge 52 whereby the float 72 raises disc valve 58 away from side opening 57.

Movements of lever 81 are controlled by a rod 94 the lower end of which is connected through an opening at the left end of lever 81, the upper end of rod 94 being secured by a loop 95 thereof around a second rod 96 the lower end of which is looped around rod 94 at 97. The upper end of rod 96 is bent and engaged into an opening 101 at the lower portion of clip 102, which is secured about bar 48. A float 104 carried by rod 105 is connected to the left hand end of lever 81 by inserting an offset bend of rod 105 through an opening 106 in the lever and securing the loop of rod end 108 to lever 81 by screw 109.

In the operation of the toilet, the standpipe 16 functions in the normal manner to convey overflow water resulting from over filling from the tank and to convey afterflow of the inlet water valve (not shown) from the tank.

The operation of the herein disclosed apparatus for dumping the upper portion, approximately one-half, of the water in tank 19 upon flushing of the toilet has been described. When all of the water is desired to be dumped for a more effective flush where, for example, solid or bulky wastes are to be disposed of, the handle 49 instead of being pushed down, which is the normal movement thereof, is pulled upwardly, pushing down on rod 96 the lower loop end 97 pushing down on the left hand end of lever 81 to push float 104 downwardly. This elevates the right end of lever 81 to unlatch shoulder 89 from forward projection 74 of hinge 52 so that submerged float 72 may elevate hinge 52 and the flap valve 58 connected thereto. Water then flows out through side inlet 57 to the level of the bottom edge of the inlet.

The end of lever 81 is angular at 81*a* to form a stop to prevent reclosing of valve 58, the projection 74 resting thereagainst after float 72 has elevated the valve 58 from its seat. Float 104 lowers the right end of lever 81 to a position to engage lever end 81*a*, after the disc valve has been moved out by float 72. The valve stays in this position until such time as the water level in the tank has dropped so that float 104 moves downwardly, this again raising the right hand end of lever 81, and projection 74 moving below lever end 81*a* as valve 58 is closed by the weight of float 72. The valve 58 reseats to close inlet 57 and, upon the inflow of water to again fill tank 19 the latch shoulder 89 comes to rest over projection 74 to relatch the valve 58 in closed condition. The water inflow then refills the tank up to the level of the upper end of the standpipe 16 so that the toilet is in condition for either form of flushing, either the depression of handle 49 to dump water down to the upper end of tube 30, or the raising of handle 49 to dump water down to the lower side of opening 57.

The flushing of the toilet is not complicated for the user. For normal flushing which with this apparatus would involve use of about half of the tank water, down to the top of tube 30, the normal flushing movement of handle 49 downwardly is employed. On the other hand, if a stronger flushing action using more water is desired or required, handle 49 is moved upwardly so that substantially all of the tank water, down to the bottom of inlet 57, will be used.

While a preferred embodiment of the apparatus has been described and shown in the drawings, many modifications thereof may be made by a person skilled in the art without departing from the spirit of the invention, and it is intended to protect by Letters Patent all forms of the invention falling within the scope of the following claims.

We claim:

1. Toilet valve apparatus, for use in water closet toilets having a water tank disposed to dump flush water into the toilet bowl, comprising tube means disposed vertically upwardly from the drain outlet of the tank and sealed therewith, exterior handle means mounted on said tank having interior operating bar means moved upward from neutral position by one movement of said handle means and moved downward from neutral position by opposite movement of said handle means, float valve means seated on the upper end of said tube means in said neutral and downward positions of said operating bar means and connected to said operating bar means to be unseated and open the upper end of said tube means when said operating bar means is moved upward, a side inlet into said tube means, hinged valve means closing said side inlet, latch means actuated by a first float to hold said hinged valve means closed when said first float is below the water level in the tank, said latch means being connected to said operating bar mean and being moved by downward movement of said operating bar means to release said hinged valve means to permit said hinged valve means to open, a second float biasing said hinged valve means to open when said second float means is below the water level in the tank, said first float means being below said second float means, whereby when the handle means is moved to move said operating bar means upward said float valve means is opened to dump tank water down to the upper level of said tube means, and when the handle means is moved to move said operating bar means downward said hinged valve means is opened to dump tank water down to the lower edge of said side inlet.

2. The combination of claim 1, wherein said operating bar is moved upwardly when said handle is moved

down, said operating bar being moved downwardly when said handle is moved up, whereby relatively less flush water is dumped when the handle is moved in normal downward movement, and relatively more flush water is dumped when the handle is moved in unnormal upward movement.

3. The combination of claim 2, wherein said hinged valve comprises a circular disc valve hingedly connected to said tube means above said side inlet, said latch means comprising a lever pivotally mounted whereby its opposite ends move upwardly and downwardly and having shoulder means facing inwardly at the lower side of one end, said shoulder means engaging over the hinge of said disc valve when said disc valve is closed at said side inlet, said first float and said operating bar being connected to the other end of said lever.

4. The combination of claim 3, wherein said connection of said lever to said operating bar comprises a first rod extending from said lever and a second rod extending from said operating bar, the other end of each rod being looped around the other rod, said second rod loop engaging said lever to push it down when said operating bar is moved downward.

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