Aug. 10, 1965 J. MOSCHETTA ETAL 3,199,118

WATER CONSERVATION MEANS IN FLUSH-TYPE TOILET TANKS

Filed Jan. 8, 1963 6 Sheets-Sheet 1

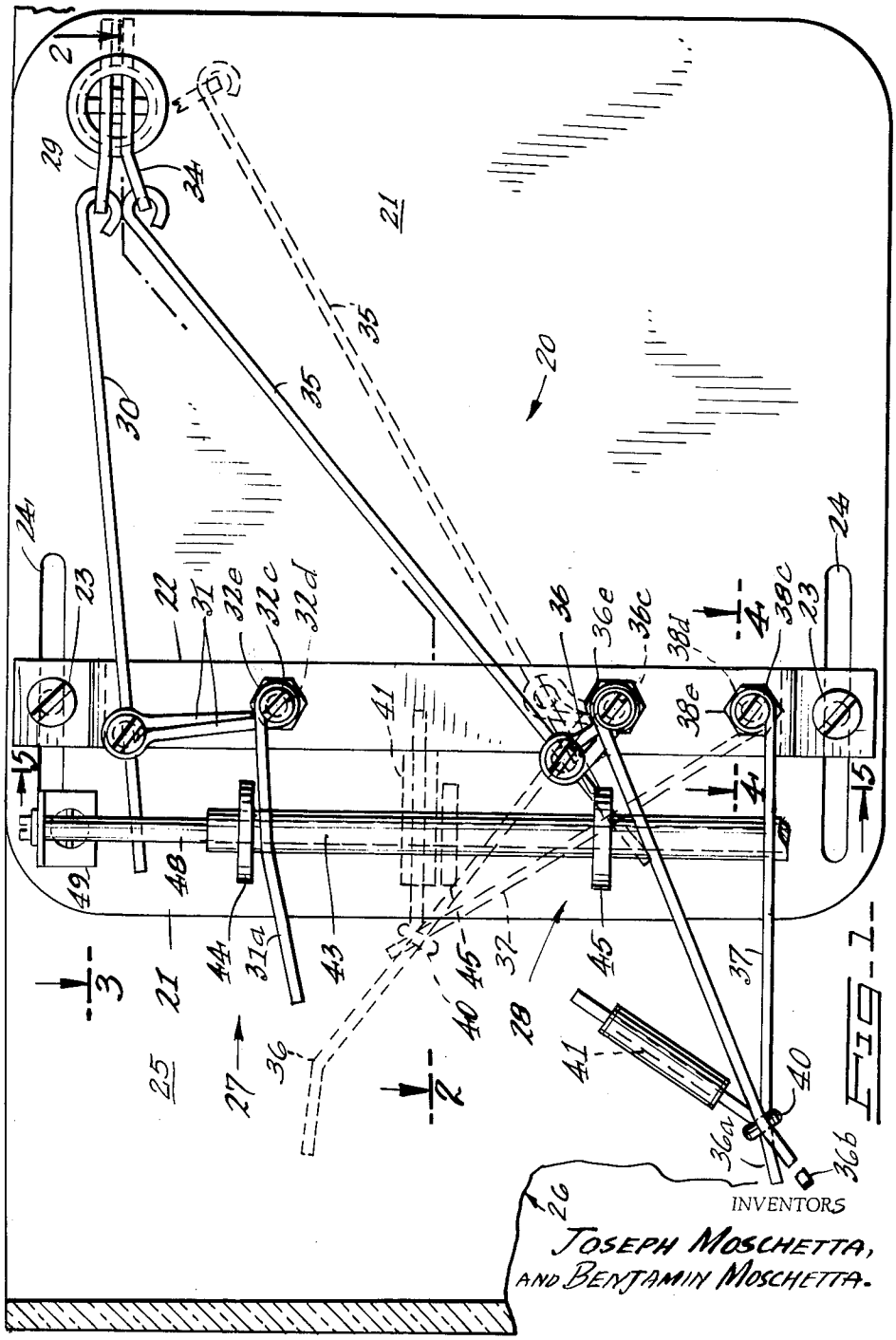


FIG. 1

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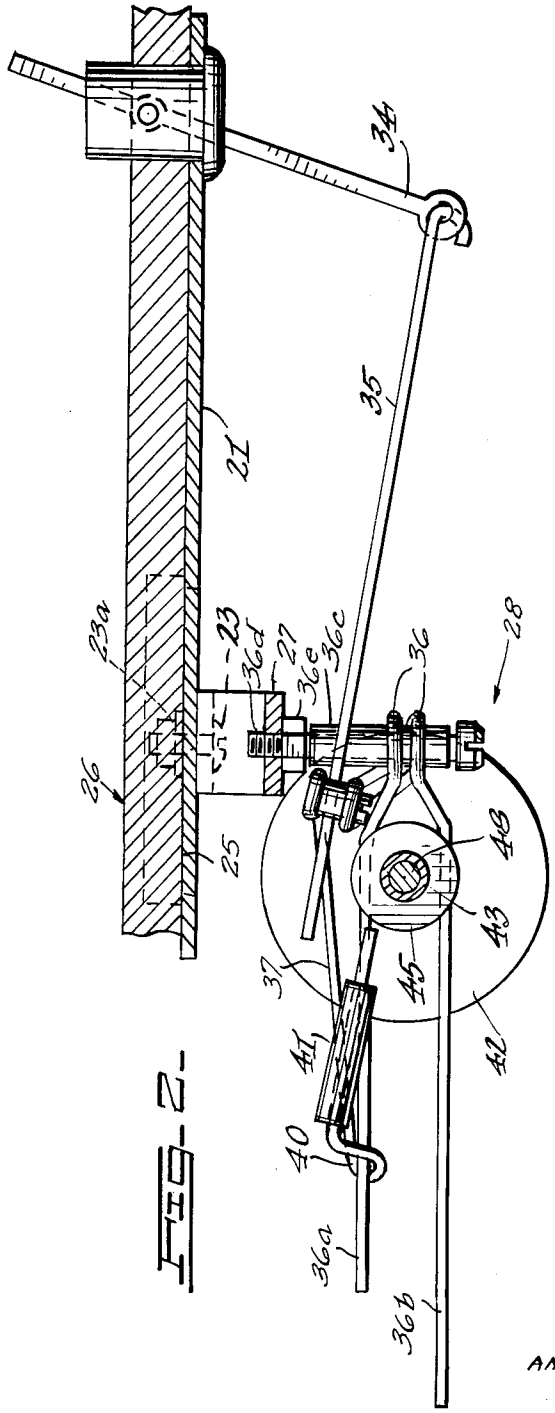


FIG. 2.

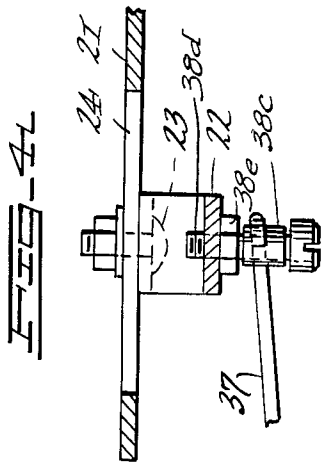


FIG. 4.

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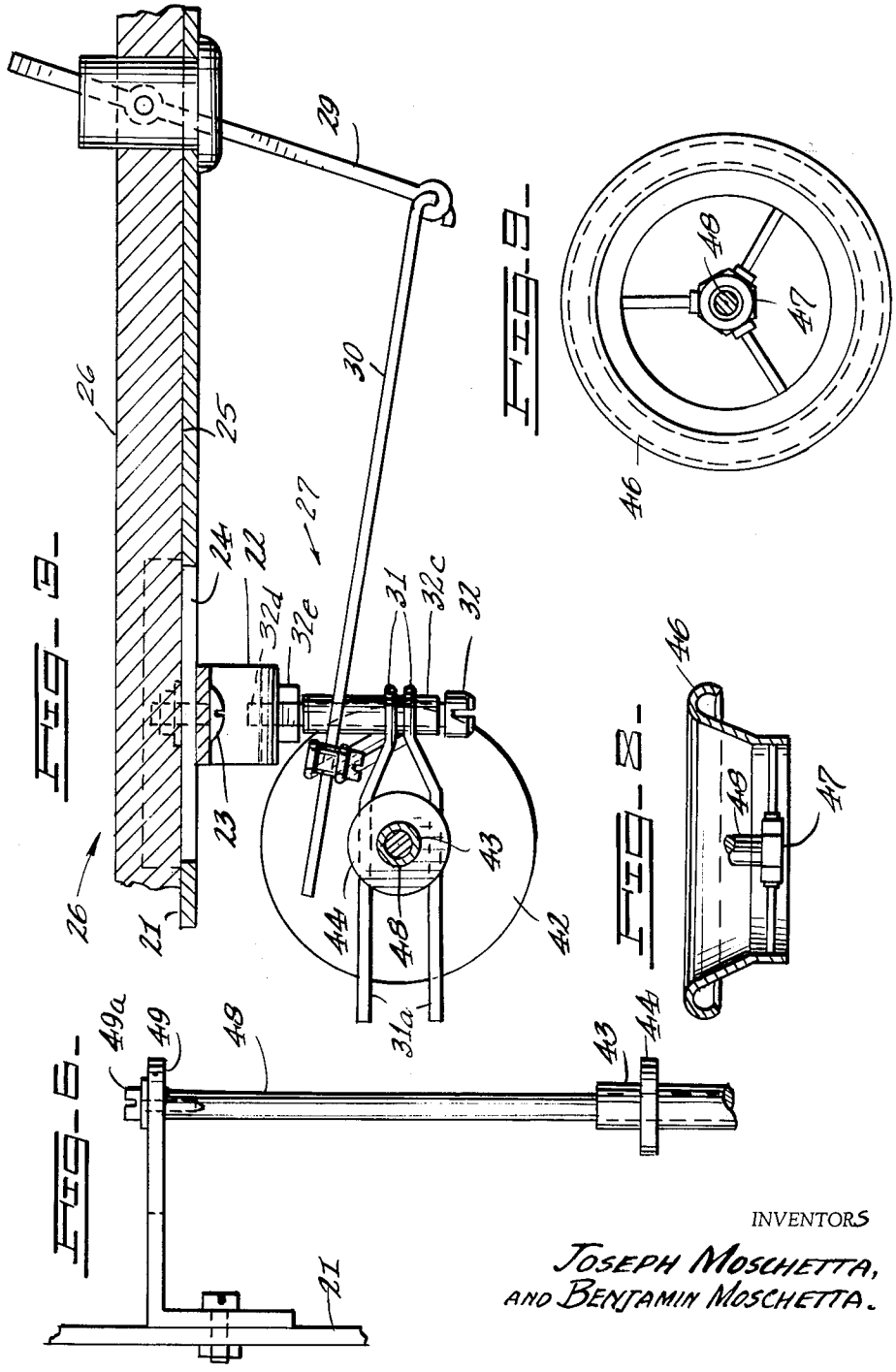
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WATER CONSERVATION MEANS IN FLUSH-TYPE TOILET TANKS

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WATER CONSERVATION MEANS IN FLUSH-TYPE TOILET TANKS

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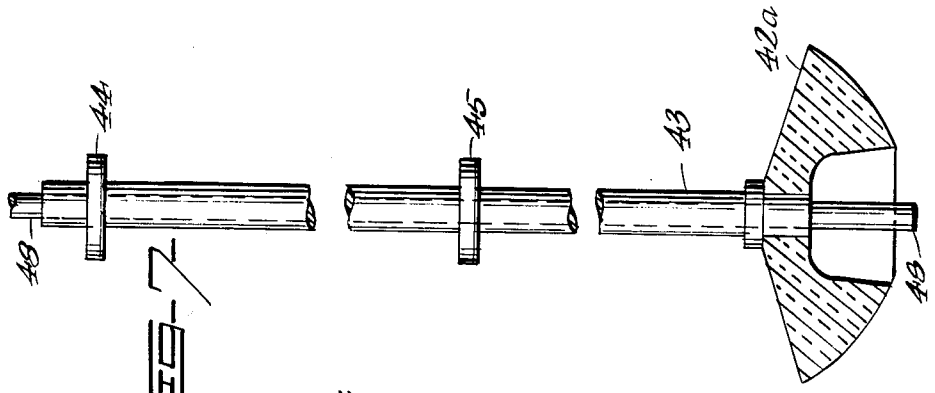


FIG. 7

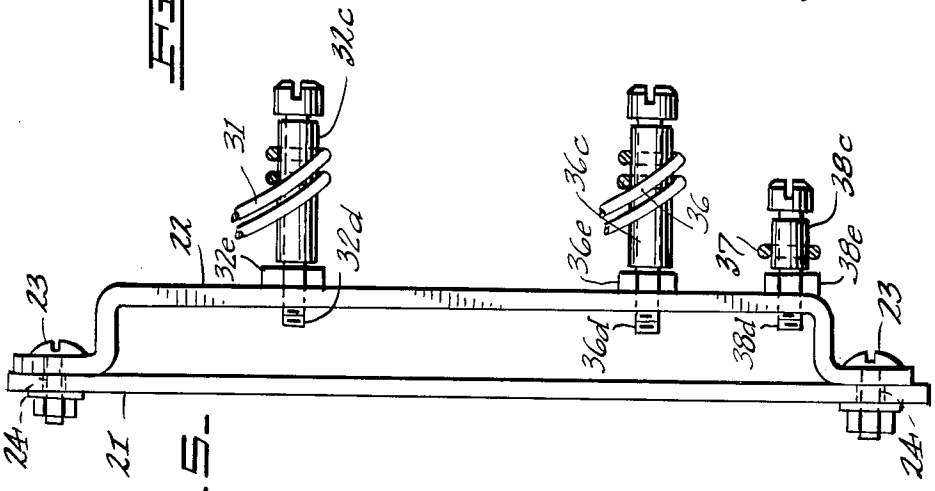


FIG. 5

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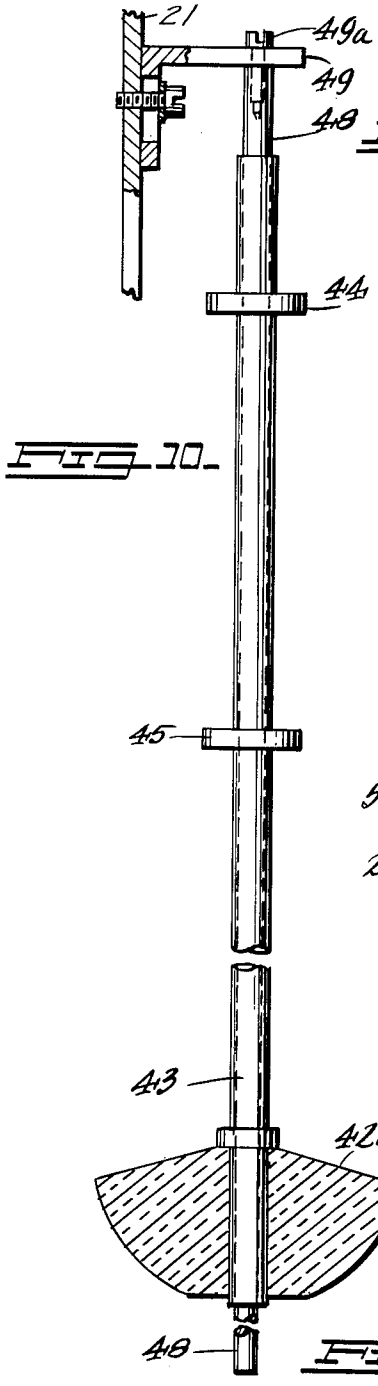


FIG. 10

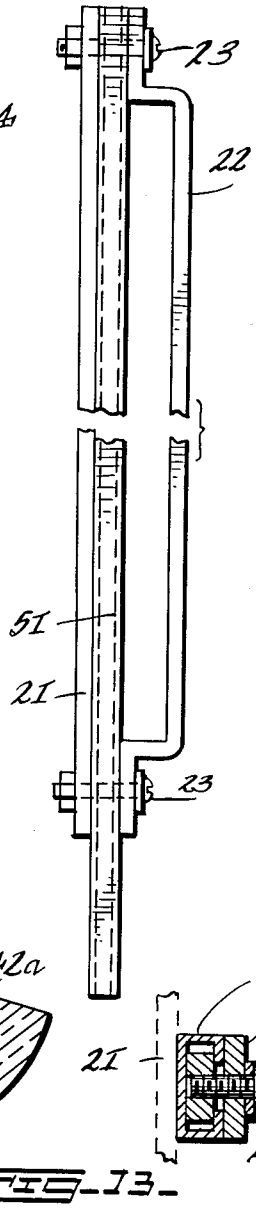


FIG. 11

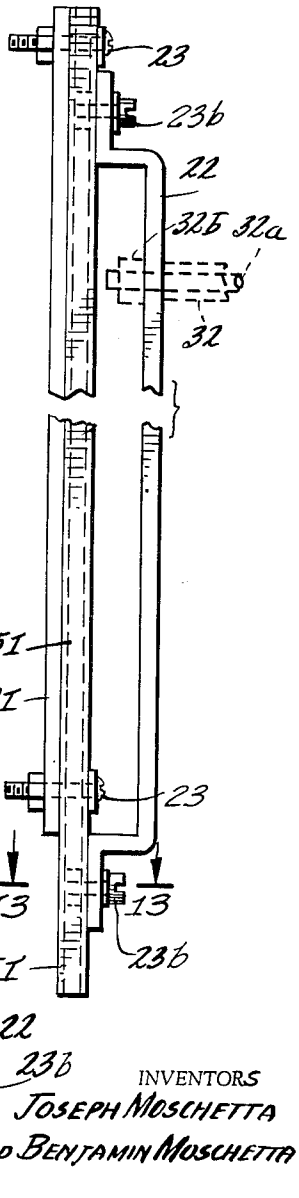


FIG. 12

FIG. 13

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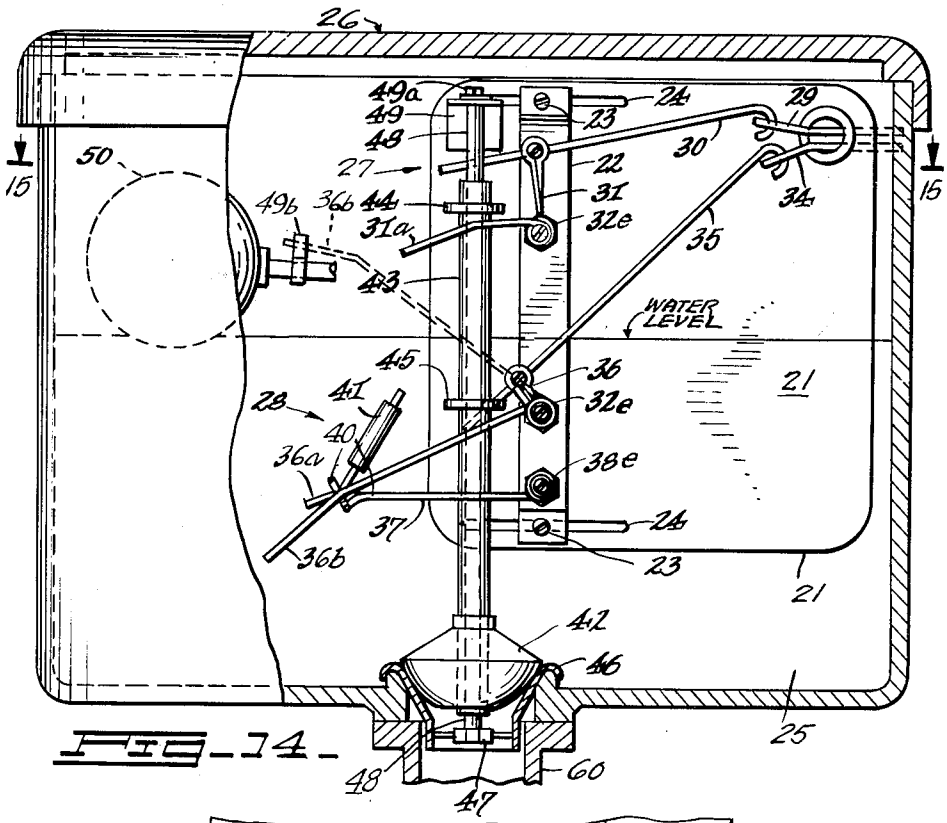


FIG-14-

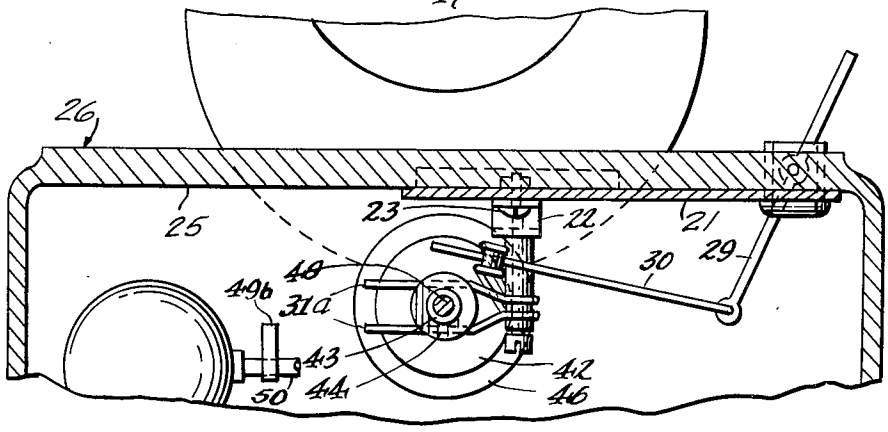


FIG-15-

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3,199,118
WATER CONSERVATION MEANS IN FLUSH-TYPE TOILET TANKS

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Filed Jan. 8, 1963, Ser. No. 250,110
1 Claim. (Cl. 4—67)

The present invention relates to flush type toilets and more particularly it relates to the conservation of water used to flush toilet tanks.

A principal object of the present invention is to provide operating means to permit use of selective quantities of water in flushing operation, as, for example, the entire water contents within the toilet tank would be used to flush solid matter, whereas only one-half of the entire water content of the tank would be used to flush urine.

Another object of the present invention is to provide water conservation means in flush type toilet tanks wherein there would be a plurality of lever controls, each of which activates separate control mechanisms for dispensing a different amount of water quantity.

A still further object of the present invention is to provide a water conservation means in flush type toilet tanks which can be readily mounted within existing conventional tanks.

Other objects and advantages of the invention will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawing wherein a satisfactory embodiment of the invention is shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claim.

In the drawings:

FIGURE 1 is a front elevational view showing the embodiment of the present invention.

FIGURE 2 is a cross sectional view taken along the lines 2—2 of FIGURE 1.

FIGURE 3 is a cross sectional view taken along the lines 3—3 of FIGURE 1.

FIGURE 4 is a cross sectional view taken along the lines 4—4 of FIGURE 1.

FIGURE 5 is a cross sectional view taken along the lines 5—5 of FIGURE 1 showing the adjustable bracket.

FIGURE 6 is a side elevational view of a flush ball guide rod and associated parts.

FIGURE 7 is a front elevational view thereof with the flush ball valve shown in cross section.

FIGURE 8 is a side cross sectional view through a flush valve seat which forms a part of the present invention.

FIGURE 9 is a top elevational view thereof.

FIGURE 10 is an elevational view similar to FIGURE 7 showing a modified construction of flush ball valve.

FIGURE 11 is a view similar to FIGURE 5 showing a modified construction thereof.

FIGURE 12 is an elevational view similar to FIGURE 11 showing a modified positioning of relative parts.

FIGURE 13 is a cross sectional view taken along the lines 13—13 of FIGURE 12.

FIGURE 14 is a front elevational view of a toilet tank shown partly in cross section and shown embodying the present invention.

FIGURE 15 is a cross sectional view taken along the lines 15—15 of FIGURE 14.

According to this invention, the numeral 20 represents a water conservation mechanism for flush type toilet tanks, as shown in the assembly views of FIGURES 1 and 14 in the drawings. The water conservation mechanism 20 includes a base plate 21, an adjustable bracket 22 which

is attached by means of machine screws 23 extending through slots 24 machined in the base plate 21, and retained by nuts 23*a*, thereby securing the adjustable bracket to the base plate. The base plate 21 is mounted upon the inside wall 25 of toilet tank 26, substantially as shown in FIGURES 2 and 3 of the drawing. On the adjustable bracket 22 various fulcrums of the present mechanism are mounted. As may be seen from FIGURES 1, 2, 3, and 5 of the drawing, there are two distinct flushing mechanisms 27 and 28 respectively. The mechanism 27 is utilized for the full flushing operation whereas the mechanism 28 is used for the one-half full flushing operation. A lever 29 and connecting linkage 30 is formed in the mechanism 27 and is very like a throttle stop, as used in automotive construction. This type of linkage allows for any adjustment that might be necessary in the mechanism. The lever 29 which activates the full flush mechanism 27 is connected to the linkage 30 which in turn is connected to the arm 31 which is formed with a pair of tines 31*a*. The arm 31 is mounted to rotate with a swiveling sleeve 32*c* which is pivoted upon a bolt 32*d* secured upon the adjustable bracket 22 by means of a nut 32*e*. In reference to the mechanism 28 which is utilized to flush only one-half of the contents of the tank 26, the latter differs substantially in a number of respects from the mechanism 27 above described. In the latter instances, just as above, there is a lever 34 which operates a linkage 35 to swivel an arm 36 in a manner similar to the lever 29, the linkage 30 and arm 31. At the end of arm 36 there are a pair of tines 36*a* and 36*b*; the arm 36 is mounted to rotate with a swivelling sleeve 36*c* pivoted on a bolt 36*d* held to adjustable bracket 22 by means of a nut 36*e*.

Referring again to FIGURES 1, 5, and 14 it may be seen that trip linkage 37 is mounted to rotate with a swivel sleeve 38*c* and the trip linkage 37 is controlled by the tine 36*a* upon which it slides due to the fact that the tine 36*a* is hooked around by the linkage 37, as shown at 40 in FIGURES 1 and 14. The linkage 37 has a rubber covered extension 41, as shown in FIGURES 1 and 2. The tine extension 36*b* is longer than the tine extension 36*a*. The shorter tine 36*a* is used in conjunction with the linkage 37, while the longer tine 36*b* which is somewhat extended and bent slightly downward is used in conjunction with a float ball rod 50. A flush ball valve 42 made of standard design similar to the one shown in FIGURE 7, may be used with the present device. Because of the added weight of a plastic lift tube 43 and a full flush lift washer 44 and a half flush washer 45, it may be necessary to install an air chamber 42*a*, as shown in FIGURE 7 of the drawings, to increase the buoyancy of the flush ball, yet under certain conditions the flush ball valve 42 may be similar in design to the solid flush ball valve 42*a*, shown in FIGURE 10 of the drawing, wherein there is no air chamber. The tube 43 must be long enough for the upper end thereof to be located at all times above the water level in the tank 26. A plastic seat 46, shown in FIGURES 8, 9, and 14, may be mounted over the old flush valve seat and may be provided with a lower guide support 47 into which the bottom end of the guide rod 48 is secured. The plastic seat 46 may be cemented to the old flush valve seat and a bracket 49 secured to the upper part of the base plate 21 as shown in FIGURES 6, and 16 may serve to hold a screw 49*a* which is secured to the upper end of the guide rod 48 so maintain the guide rod in a vertical position as is substantially indicated. The swivelling sleeve 38*c* is supported rotatably free upon a bolt 38*d* which is secured to the adjustable bracket 22, and a nut 38*e* is affixed upon the bolt securing the same. It may be readily seen that the threaded bolts 32*d*, 36*d* and 38*d* fit into threaded openings made in the bracket 22 and the nuts serve as lock nuts therewith. The tines 31*a* and the arm

31 are welded to the swivelling sleeve 32*c*, while the tines 36*a* and 36*b* and the arm 36 are welded to the swivelling sleeve 36*c*. The arm 37 is also welded to the swivelling sleeve 38*c*. FIGURES 11, 12, and 13 show a modified construction wherein an extruded aluminum channel 51 is mounted between the bracket 22 and baseplate 21. The extruded aluminum channel 51 may be mounted to the base plate 21 by means of the same screws 23 as shown in FIGURE 11. In the event the adjustable bracket 22 is required to be moved vertically into a position as illustrated in FIGURE 12, the machine screws 23 are utilized only to secure the channel 51 to the baseplate 21, while the adjustable bracket 22 is secured to the channel 51 by means of new screws 23*b*. As shown in FIGURE 10, the bracket 49 carries a separate adjustable member in order to make possible the vertical adjustment of shaft 48. It will now be recognized that in actual practice the two flush mechanisms 27 and 28 are two entirely separate and distinct units. To effect a normal flush of the toilet tank 26, the lever 29 is activated by the operator causing the linkage 30 to be moved sideways causing the tines 31*a* to pivot upwardly, engage the full flush lift washer 44, causing the lift tube 43 to rise, disengage the flush ball valve 42 from the seat 46 and to release the water outward from the tank 26 into flush pipe 60. Upon the release of lever 29 by the operator, the mechanism 27 returns to its normal position. When the water level in the tank 26 has reached the point where flotation of the flush ball valve 42 is no longer possible, the ball valve 42 falls back upon the flush valve seat 46, closing the same. The tank 26 is then refilled. This operation is very similar to that of conventional toilet tanks. It will be noted that the operation of the mechanism 27 did not affect the half flush mechanism 28. Moving the lever 34 initiates the half flush operation. As linkage 35 follows the lever 34, the tines 36*a* and 36*b* begin to pivot upwardly with the swivelling sleeve 36*c*, and the loop 40 slides on the tine 36*a* so that the linkage 37 also begins to pivot and to move upwardly. As the tines rise, they engage the half flush lift washer 45. In FIGURE 1 the rotation of the tines 36*a* and 36*b* as well as the link 37 about their respective sleeves is shown in phantom lines. As the action continues the half flush washer 45 and the rubber covered projection 41 meet, to discontinue the further rise of the lift tube 43, the rubber covered projection 41 rests on and above the washer 45, and as the water drains from the tank 26 through the valve seat 46 and as the water level becomes lower, a trip arm 49*b* on the float ball rod 50, as shown in FIGURES 14 and 15, engages the tine 36*b* during the downward travel of the flush ball valve 42. This action continues as the water level drops. At the point where the flotation of the flush ball valve 42 is no longer possible, due to the pressure of the trip arm 49*b*, upon the tine 36*b*, the flush ball valve 42 returns to its neutral position, closing the flush valve seat. Should both levers 29 and 34 be accidentally simultaneously moved by the operator, the half flush mechanism 28 will take precedence. The trip arm 49*b* on the float ball rod 50 may be adjusted horizontally and vertically. The adjustment of the trip arm 49*b* controls the amount of water used in the half flush operation.

The advantages of water saving over toilet tanks of conventional design now in existence is discernible. The saving in water consumption would be of great help to the ever growing water problem everywhere. Since there is also a growing sewage problem, this area would also benefit. The present invention may be readily installed in toilet tanks presently in use as a replacement and in new toilet tanks without any changes to the overall design and manufacture of toilet facilities.

What we claim as new and desire to protect by Letters Patent in the United States is:

A toilet flush tank comprising, in combination, a water reservoir, a mounting base mounted on the inner side of a wall of said reservoir, an inlet opening to deliver water into said reservoir, an outlet opening to flush said reservoir, a valve seat in said outlet opening, a flush ball over said valve seat normally closing said outlet opening, an upright stationary shaft in said reservoir, one end of said shaft held in said valve seat with the other end held in said valve seat with the other end held to a stationary bracket, a tubing slidably mounted over said shaft, said flush ball secured to the bottom of said tubing, a pair of washers, one washer secured to an upper portion of said tubing with the other washer secured to a substantially lower portion, operating means connecting the upper and lower washers, said operating means pivotally mounted to said base, said operating means being selectively operated to raise said slidably mounted tubing and said flush ball respectively above said valve seat to open said valve to empty said reservoir, said means for selectively operating said tubing comprising a pair of hinging arms, one arm in said pair connecting the undersurface of said upper washer, and the other arm contacting the undersurface of said lower washer, means for flushing said toilet including a pair of handles and connecting linkage, each handle in said pair by its respective linkage being operatively connected to one of said hinging arms, the selective operation upon one or the other of the handles in said pair operating the upper or the lower washer in said tubing to move said tubing in a vertical plane and a stop on the hinging arm would contacts the lower washer, said stop when the arm is operatingly effective to empty part of the contents of the tank being positioned over and above said lower washer to restrain the movement of said tubing to which said washer is mounted as an integral part thereto.

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