Water is supplied to a water storage tank through a float-actuated fill valve and a primary control valve of a flush control unit which provides for selecting either a full flush or a partial flush of the water in the tank into the toilet bowl. The primary control valve determines whether water flows directly into the tank or to a secondary control valve connected by a tube to a water-actuated cylinder which is effective to close the flush valve member after a partial flush. The secondary control valve is actuated by movement of the float support rod connected to the fill valve and cooperates with the primary control valve to assure proper filling of the bowl after either a full flush or partial flush. The control unit also provides for reversing between a full flush and a partial flush at any time, and for providing antisiphon protection in the fill line, in addition to accommodating a wide pressure variation in the fill line.

17 Claims, 13 Drawing Figures
TOILET OPERATING AND CONTROL SYSTEM

BACKGROUND OF THE INVENTION

There have been many various types of flushing mechanisms or systems either proposed or used on a water closet or toilet for controlling the flow of water from the water storage tank into the bowl within the base of the toilet. A number of the systems provide for selecting either a full flush of substantially all of the water in the tank into the bowl or a partial flush wherein only part of the water in the tank flows into the bowl to provide for a savings in water usage. The reduction in the water used during a partial flush is desirable in that it reduces the cost of the water being supplied or a reduction in the cost of operating a water supply pump. In addition, the reduction in the water delivered to the sewage discharge line is especially desirable in a private sewage system using a septic tank from which the effluent is directed into a leach bed installed within a non-porous clay-type soil. That is, the reduction in the water supplied to the tank lessens the chance of the effluent percolating upwardly onto the ground surface producing a noxious gas.

Examples of toilet flush systems incorporating water saving devices or mechanisms are disclosed in U.S. Pat. Nos. 2,939,152, 3,041,630 and 3,365,730. It has also been proposed to control the operation of the flushing mechanism by a valve which is manually actuated and which is sometimes supplied with water from the water supply line. For example, such hydraulically controlled flush systems are disclosed in U.S. Pat. Nos. 2,760,204, 3,088,122, 3,466,674 and 3,546,715.

With any flush system incorporating a water saving mechanism, it is desirable to provide for refilling the bowl with water to a predetermined level after either a full flush or a partial flush. Commonly, when the flush valve closes after a full flush, water is supplied to the bowl through a line which extends from the float actuated fill valve to a tank overflow pipe or passage which by-passes the flush valve. This water is supplied to the overflow passage while the tank is filling and until the float returns to its upper level when it closes the water inlet valve. Sometimes, the water flow from the float valve to the overflow passage is regulated by an adjustment screw in the water fill valve and is set so that sufficient water flows from the fill valve through the overflow passage and into the bowl to refill the bowl during a full flush. When a partial flush is selected in those systems providing for a partial flush, the fill valve does not remain open or actuated for a sufficient time to provide for proper refilling of the bowl. Thus the bowl does not receive sufficient water to provide for a proper syphon action within the trap of the toilet during the next successive flush. As a result, a double flush is frequently required to remove solid matter from the bowl, thus defeating the advantages of the water saving mechanism.

SUMMARY OF THE INVENTION

The present invention is directed to an improved system for controlling the flushing of water from a water storage tank of a toilet into the bowl, and which provides for selecting either a full flush or a partial flush. In addition, the system provides for reversing the selection at any time during a flushing operation, and also provides for substantially the same flow of water into the bowl after either a full flush or a partial flush to assure a predetermined water level within the bowl. The flush system of the invention further provides for conveniently adjusting the volume of water which is used during a partial flush and is effective to operate properly with wide variations in pressure in the water supply line. The flush system is also adapted to be conveniently installed within the tank of existing toilet units and to provide for anti-siphon protection in addition to dependable trouble-free service.

In accordance with an illustrated embodiment of the invention, a float-actuated water-fill valve has a discharge outlet which is connected to a main control valve of a flush control unit. The main control valve includes a spool-type valve member which is moved axially in response to pivoting a lever for selecting a full flush or to depression of a push button when selecting a partial flush. The valve member controls whether the incoming water flows directly into the tank or to a second valve which is connected to control a fluid cylinder attached to a pivot-type flush valve member. The second control valve also includes a spool-type valve member which is actuated by a link rod adjustable connected to the float support rod of the water-fill valve. The second control valve determines whether the incoming water received from the main control valve, flows directly into the tank or to the fluid cylinder for actuating the flush valve.

Other features and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevation view of a toilet incorporating a water-fill and flush system constructed in accordance with the invention, and with a portion of the tank broken away to illustrate the general arrangement of the major components;

FIG. 2 is a plan view of the toilet shown in FIG. 1 and with a portion of the tank cover broken away;

FIG. 3 is an enlarged section through the water storage tank and showing the flush control unit in elevation;

FIG. 4 is an elevational view of the inner end of the control unit shown in FIG. 3;

FIG. 5 is an enlarged vertical section of the flush control unit as taken generally on the line 5—5 of FIG. 2;

FIG. 6 is a radial section taken generally on the line 6—6 of FIG. 3;

FIG. 7 is a fragmentary section taken generally on the line 7—7 of FIG. 3;

FIG. 8 is an enlarged elevation view of the flush valve control mechanism shown in FIGS. 1 and 2 and with portions broken away;

FIG. 9 is a fragmentary section taken generally on the line 9—9 of FIG. 8;

FIG. 10 is a fragmentary section of a flow regulator for the bowl refill line which extends to the overflow pipe;

FIG. 11 is a fragmentary section of a modified form of a flush control unit constructed in accordance with the invention;

FIG. 12 is an elevational view similar to FIG. 8 and showing a modified form of flush valve control mechanism constructed in accordance with the invention; and

FIG. 13 is a plan view of the mechanism shown in FIG. 12.
DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1 and 2, a toilet includes a base 15 which defines a bowl 16 and an integral trap (not shown) adapted to provide for a water level L within the bowl 16. A generally rectangular box-like tank 20 is mounted on the base 15 and receives a removable cover 22, and water is supplied to the tank 20 through a line 24 having a shutoff valve 26. The line 24 is connected by a fitting to the base of a diaphragm-type water inlet fill valve 30 which is actuated by pivotal movement of an arm or rod 32 supporting a float 34, in a conventional manner. A flush valve or seat member 36 connected the tank 20 to the base 15 and defines a passage which is normally covered by a flexible rubber valve member 38 which seats on the upper rim of the member 36.

A vertical overflow tube or pipe 41 projects upwardly from the flush valve seat member 36 and is adapted to receive a flow of water directly from the water inlet fill valve 30 through a flexible bowl refill tube 42. Preferably, the water flow through the tube 42 is controlled by a regulator 44 (FIG. 10) which is supported by a metal clip-type bracket 46 mounted on the upper end portion of the overflow pipe 41. The regulator 44 includes an adjustable regulating screw 47 which projects into a water flow passage 48 to control the flow of water into the pipe 41.

In accordance with the present invention, a flush control unit 50 controls the flow of water into the tank 20 from the fill valve 30 and also controls the actuation of the flush valve member 38. The control unit 50 includes a control valve 52 formed by a valve body 53 defining a cylindrical bore or chamber 54. The valve body 53 is supported by a tubular shaft 56 rotatably supported by a tubular bushing 58 extending through a hole formed within the front wall of the tank 20. A bracket 61 (FIGS. 3 and 5) is mounted on the bushing 58 and is secured by a nut 62 which is threaded onto the bushing 58. The bracket 61 projects into a slot 63 formed within the valve body 53 to restrain the valve body 53 from rotating with the support shaft 56.

A full-flush operating lever 65 is secured to the forward end portion of the shaft 56 and defines a bore 66. A push button 68 is positioned within the bore 66 and is secured to the forward end portion of an actuating rod 69 extending within the tubular shaft 56. A compression coil spring 72 is mounted on the rod 69 and normally urges the push button 68 to an outwardly projecting position as shown in FIGS. 3 and 5.

A spoon-like valve member 74 is slidable supported within the bore 54 of the valve body 53 and surrounds the tubular shaft 56. A counter-bore 77 is formed within the valve member 74 and receives a pin 78 which extends radially through the actuator rod 69 and through diometrically opposed slots 79 formed within the tubular shaft 56. The slots 79 limit the movement of the cross pin 78 and the corresponding movement of the push button 68. When the push button 68 is depressed, the cross pin 78 engages the annular shoulder 82 forming the end of the counterbore 77 and shifts the valve member 74 from its forward position (FIG. 5) to a rearward position (not shown) adjacent the inner end wall of the valve body 53.

A circumferential groove 84 is formed within the outer surface of the valve member 74, and somewhat smaller circumferential grooves 86 are formed within the end portions of the valve member 74. The grooves 86 receive corresponding resilient O-rings which form watertight seals between the valve member 74 and the valve body 53. A pair of diametrically spaced ears 91 are formed as an integral part of the valve member 74 and are adapted to project rearwardly through corresponding openings (not shown) within the rear wall of the valve body 53 when the valve member 74 is moved rearwardly in response to depression of the push button 68.

Each of the ears 91 has a sloping cam surface 92 which is adapted to engage a corresponding cam surface 94 (FIG. 3) formed on an actuating member 95 mounted on the rearward end portion of the tubular shaft 56. A screw 97 secures the actuating member 95 to the projecting end portion of the tubular shaft 56 so that the actuating member rotates with the shaft 56 when the operating lever 65 is rotated. A laterally extending slot 98 (FIGS. 3 and 4) is formed within the actuating member 95 and receives one end portion of a flush control arm or rod 100. The rod 100 is pivotally supported by a screw 102 (FIG. 4) which extends through a flattened portion of the rod 100 and which is supported by the actuating member 95.

A cylindrical roller 104 (FIG. 5) is mounted on the rearward end portion of the rod 100 and is located within a recess formed in the actuating member 95. The roller 104 is adapted to be engaged by a downwardly and inwardly sloping cam surface 106 formed on the inner end portion of the actuator rod 69. As shown in FIG. 8, the opposite end portion of the rod 100 is flattened and has a series of holes 107. A flexible chain 108 has one end connected within one of the holes 107 and its opposite end connected to a loop 109 molded as an integral part of the flush valve member 38. Thus the rod 100 is pivoted upwardly and the flush valve member 38 is pulled upwardly from the seat member 36 to an open position in response to either counterclockwise rotation of the flush lever 65 (FIG. 1) or depression of the push button 68.

Referring to FIGS. 3 and 6, a tubular fitting 111 is formed as an integral part of the valve body 53 and receives one end of a flexible tube or line 112. The opposite end of the line 112 is connected to a rigid water discharge tube 114 (FIG. 1) projecting downwardly from the water inlet fill valve 30. As shown in FIGS. 3 and 7, the fitting 111 includes a laterally projecting check valve 115 having a tube 116 which receives a ball-type valve member 117 urged against an annular seat member 118 by a compression coil spring 121. As will be explained later, the check valve 115 serves as an antisiphon protector to prevent water within the tank 20 from being sucked into the water supply line 24 under abnormal water pressure conditions.

A substantially rigid water fill tube 122 projects downwardly from the valve body 53 and opens into the lower portion of the tank 20. Another fitting 123 (FIGS. 3 and 6) is formed as an integral part of the valve body 53 and projects laterally to receive one end portion of a flexible tube or line 124. The opposite end portion of the line 124 connects with a fitting 127 (FIG. 8) molded as an integral part of the body 128 of a secondary flush control valve 130. Preferably, the valve body 128 is molded of a plastics material and is formed as an integral part of a cylindrical tube 132 which is mounted on the overflow pipe 41. The tube 132 is rig-
idly secured by a screw 134 extending through opposing clamping projections 136 of the tube 132. A pair of diametrically located studs or pins 138 are molded as an integral part of the lower end portion of the tube 132 and receive corresponding ears 139 formed as an integral part of the flexible rubber valve member 38. Thus the axis of the aligned studs 138 forms the pivot axis of the valve member 38.

Referring to FIG. 9, a spoon-like valve member 142 is slidably supported within a vertical cylindrical chamber formed within the valve body 128 and includes a circumferential groove 143 within its lower end portion. The upper end portion of the valve member 142 has a hole for receiving a hook-shaped lower end portion 144 of a wire-like connecting link 145. The upper end portion of the link 145 is adjustably secured to a U-shaped spring clip 146 which is rotatably connected by a rivet 147 to another U-shaped spring clip 148 mounted for adjustment on the float support rod 32.

The valve body 128 includes another integral fitting 152 (FIGS. 8 and 9) which receives one end portion of a flexible tube or line 153 (FIG. 1). The opposite end portion of the line 153 connects with the upper end portion of a water-actuated fluid cylinder 155. The cylinder 155 includes an upper cylindrical section 156 which has a pair of diametrically opposite and outwardly projecting pins 157. The pins 157 are snap-fitted into corresponding spring-like fingers 158 molded as an integral part of the tubular support member 132. The cylinder 155 also includes a lower section 162 which is telescopically received within the upper section 156. A hook-shaped connector 163 projects from the lower end of the cylinder section 162 and engages the U-shaped loop 109 of the rubber valve member 38, adjacent the lower end of the chain 108. A hole 166 is formed within the middle portion of the lower cylinder section 162 and provides for the discharge of water, as will be explained later.

As mentioned above, the flush system of the present invention provides for selecting either a full flush or a partial flush depending on the amount of solids within the bowl. When a full flush is selected, the control lever 65 is depressed downwardly in a conventional manner so that the tubular shaft 56 and the actuating member 95 rotate to pivot or lift the rod 100. The upward movement of the rod 100 pulls upwardly on the chain 108 which is effective to pull or strip the rubber flush valve member 38 upwardly from the seat member 36. The water in the tank 20 flows into the bowl 16 to provide the flushing action.

As the water within the tank 20 drops from the upper level L1, the float 34 descends and operates the diaphragm fill valve 30 so that water flows through the fill tube 114 and the tube 112 to the control valve 52. Since the valve member 74 is in its forward position (FIG. 5), the inflow of water flows through the groove 84, through the fill tube 122 and into the tank 20. Commonly, the tank 20 holds approximately three gallons, and the water flowing into the tank during a full flushing operation, and before the flush valve 38 closes, is approximately three-quarters gallon. Thus three and three-quarters gallons are used to perform a full flush. Included as part of the water flowing into the tank during a full flush, is the water which flows through the tube 42 from the fill valve 30 to the overflow pipe 41.

After the water within the tank 20 drops to a lower level L2, the flush valve member 38 loses its buoyancy and drops to a closed position seated on the seat member 36. While the water is refilling within the tank 20 to the upper level L1, the water flow through the tube 42 and into the overflow pipe 41 is sufficient to refill the bowl 16 with water up to the level L.

When a partial flush is selected, the push button 68 is depressed inwardly against the bias of the spring 72 so that the cam surface 106 on the inner edge of the actuating rod 69 rolls over the top of the roller 104 and depresses downwardly on the inner end portion of the rod 100. The rod 100 pivots on the screw 102 and lifts the chain 108 and flush valve member 38 to its open position which is the same as for a full flush. The depression of the push button 68 also causes the pin 78 to engage the inner annular shoulder 82 of the valve member 74 and thereby shift the valve member rearwardly to a position adjacent the inner end wall of the valve body 53.

As the water from the diaphragm fill valve 30 enters the valve body 53 through the fitting 111, most of the water is directed by the groove 84 within the valve member 74 to the water passage within the fitting 123 and through the line 124 to the secondary control valve 130. The water flow through the line 124 is discharged out of the open bottom of the valve body 128 and into the tank 20. When the water level within the tank 20 approaches an intermediate level L0, which is approximately halfway between the upper level L1 and the lower level L2, the valve member 142, which is moving downwardly with the float support rod 32, arrives at the position shown in FIG. 9. In this position, the groove 143 within the valve member directs a substantial portion of the water flowing through the line 124 into the line 153 connected to the fluid cylinder 155.

The flow of pressurized water into the cylinder 155 is effective to extend the lower cylinder section 162 which returns the rubber flush valve member 38 to a closed position on the seat member 36. The water which continues to flow into the cylinder 155 is discharged through the hole 166 and into the tank 20. As the water level rises from the level L2 towards the upper level L1, the valve member 142 moves upwardly with the float support rod 32 so that the water flows directly into the tank through the open bottom of the valve body 128 instead of flowing into the tank through the hole 166.

As a result of the water flow regulation provided by the main control valve 52 and the secondary control valve 130, the water inflow for refilling the tank 20 after a partial flush, is significantly slower than the water inflow into the tank 20 after a full flush. Thus a longer time is required to raise the float 34 to its upper position when the diaphragm fill valve 30 closes. This longer refill time provides for a sufficient water flow through the tube 42 and into the overflow pipe 41 to refill the bowl 16 until the water reaches the level L1. The lower level L2 of water resulting from a partial flush, may be conveniently adjusted simply by adjusting the vertical position of the valve member 142 relative to the float support rod 32. This is accomplished simply by adjusting the wire link 145 longitudinally within the spring clip 146.

After a partial flush, the valve member 74 of the main control valve 52, remains in its rearward position adjacent the inner end wall of the valve body 53. If a full flush is subsequently selected, the downward depression of the operating lever 65 produces rotation of the
actuating member 95 as mentioned above. When the actuating member 95 rotates, the cam surfaces 94 on the actuating member 95 engage the corresponding cam surfaces 92 on the valve member 74 and shift the valve member 74 to its forward position (FIG. 5) within the valve body 53. In this position, the valve member 74 directs substantially all of the water flowing through the line 112 into the tank 20 through the fill line 122.

As mentioned above, the check valve 115 shown in FIGS. 3 and 7, provides an anti-siphon protection. That is, in the event that the pressure within the water supply line 24 and within the tubes 112 and 114 drops below atmospheric pressure, the ball 117 will retrace from the seat member 118 so that air is bled into the water supply line. Thus the water within the tank 20 is prevented from being sucked back through the water supply tube 122 and into the water supply line 24.

Referring to FIG. 11 which shows a modification of a flush system constructed in accordance with the invention, the main control valve 52 includes a valve body 53a having an integral tubular fitting 123a for receiving the flexible tube or line 124. In addition, the tubular fitting 123a includes a laterally projecting tubular fitting 172 which receives one end of a flexible tube or line 174. The opposite end of the line 174 connects with another or a second regulator 44 (FIG. 10) which also has a regulating screw 47 to provide for controlling the flow of water from the fitting 172 through the line 174 and into the overflow pipe 41. The addition of the line 174 and the second regulator 44 provides for precisely selecting the water flow into the overflow pipe 41 after a partial flush, regardless of the fluctuation of the pressure of the water within the water supply line 24. That is, the flow of water through the line 174 may be used to supplement the flow of water through the line 42 when the water line pressure is very low, so that the water within the bowl 16 is assured of returning to the level L after a partial flush.

Referring to FIGS. 12 and 13 which show another embodiment of the invention, the flexible rubber flush valve member 38 is closed after a partial flush by an actuator 180. The actuator 180 includes a sector shaped housing 182 which is molded of a plastics material and integrally with a tube 184 secured to the lower portion of the overflow pipe 41 by a clamping screw 186. A secondary flush control valve 188 is molded integrally with the housing 182 and functions in the same manner as the secondary control valve 130 referred to above in connection with FIGS. 8 and 9. That is, the control valve 188 includes a tubular housing 189 which receives the spool type valve member 142.

As mentioned above, the valve member 142 is connected by a link rod 145 to the spring clamp 146 which is pivotally connected to the float support arm or rod 32 by the spring clip 148. The valve housing 189 has a discharge or an outlet port 192 which connects or opens into the sector shaped chamber defined by the actuator housing 182. Another port 193 extends from the housing chamber directly into the tank 20.

A substantially flat and rigid vane 195 is pivotally supported within the housing 182 by a shaft 196 rotatably supported by aligned holes formed within the housing 192 and within a generally flat cover member 198 (FIG. 13) secured to the housing 182 by a series of screws 199. An actuating arm 202 includes a U-shaped portion 204 which has its end portions rigidly secured to the corresponding projecting end portions of the shaft 196. An arm or finger portion 206 projects from the U-shaped portion 204 and has a slot 207 which slidably receives a pin 208 extending through the loop or projection 109 of the flush valve member 38. The finger portion 206 also has a hole for receiving the lower end portion of the flexible chain 108. As mentioned above in connection with the embodiment shown in FIG. 8, the tube 184 includes outwardly projecting aligned pins or studs 210 which are molded integrally with the tube 184 and form a pivot support for the flush valve member 38.

The operation of the flush valve control mechanism shown in FIGS. 12 and 13 is similar to the operation of the mechanism shown in FIG. 8. That is, to effect either a full flush or a partial flush, the float 195 is effective to pivot the vane 195 and the rigidly connected arm 202 in a clockwise direction (FIG. 12), thereby closing the valve member 38 onto the seat member 36. The water within the housing 182 and on the opposite side of the vane 195 flows out of the relief port 193 and into the tank 20. The water which leaks through the clearance space surrounding the valve member 142 and the vane 195, flows into the tank 20 so that the float support arm 32 slowly rises. After the valve member 142 rises above the inlet port 192 within the housing 182, the water from the line 124 flows directly into the tank 20 through the open bottom of the valve housing 189. Valve member 38 is opened or pivoted upwardly by raising the arm or rod 100 which lifts the chain 108 as explained above. If a partial flush is selected, water flows through the line 124, into the housing 189 and is discharged out of the open bottom of the housing 189. As the float 34 and its support arm 32 descend, the valve member 142 is positioned so that the groove 143 directs the inflowing water through the housing 189 and into the actuator housing 182.

From the drawings and the above description, it is apparent that a toilet incorporating a flush control system constructed in accordance with the present invention, provides desirable features and advantages. For example, the system provides the important feature of refilling the bowl 16 with water to the desired level L after either a full flush or a partial flush so that a subsequent flush performs properly and produces the necessary siphon action with the trap of the toilet base 15. As another important feature, the flush system of the invention provides for switching from a full flush to a partial flush, or vice versa, at any time during a flushing operation. Thus if during a full flush, it is observed that all of the solids are removed from the bowl 16, the system can be converted to a partial flush simply by depressing the push button 68. On the other hand, if it is observed that a partial flush is not sufficient to remove all the solids from the bowl 16, the system can be converted to a full flush simply by depressing the lever 65.

Another feature is provided by the convenient adjustment for changing the amount of water flowing from the tank 20 into the bowl 16 during a partial flush. That is, the water level L, may be conveniently and quickly changed simply by adjusting the position of the valve actuator link 145 within the spring clip 146. As mentioned above, this adjustment determines at which position the float 34 will cause the water flowing through the line 124 to be directed into the actuator 180 or into the fluid cylinder 155 for closing the flush valve member 38.
It is also apparent that the flush system of the invention may be conveniently mounted on an existing toilet simply by installing the support tube 132 or 184 and the attached components on the conventional overflow pipe 41 and by replacing the conventional lever actuated flush mechanism with the flush control unit 50.

The components of the flush system of the invention also provide for dependable, trouble-free service, and the entire system will operate properly on wide variations of water line pressure, for example, from a low pressure of 20 psi to a high pressure of over 60 psi.

While the forms of apparatus herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise forms of apparatus, and that changes may be made therein without departing from the scope and spirit of the invention. For example, it is apparent that the flush valve seat member 36 and the overflow tube 41 may be molded of a plastics material and formed as an integral part of the support tube 132 or 184 and the corresponding secondary flush control valve 130 or 180.

The invention having thus been described, the following is claimed:

1. In a toilet system including a bowl and a water storage tank connected by a passage, means for supplying water to a predetermined level within said tank, flush means for controlling the flow of water from said tank through said passage and into said bowl, means for supplying water to said bowl while water is being supplied to said tank and after said passage is closed, means for providing a predetermined water level within said bowl, and control means for actuating said flush means to provide for selecting a full flush or a partial flush of the water within said tank into said bowl, the improvement wherein said means for supplying water to said bowl effectively supplies generally the same volume of water to said bowl after a partial flush as is supplied to said bowl after a full flush to assure substantially said water level within said bowl after either a partial flush or a full flush.

2. A toilet system as defined in claim 1 wherein said flush means includes a flush valve member, said control means include a fluid actuator connected to said flush valve member, said actuator having means movable between a first position and a second position for closing said flush valve member, and means for supplying water to said actuator to effect closing of said flush valve member.

3. A toilet system as defined in claim 2 wherein said fluid actuator comprises a fluid cylinder having a first section slidably received within a second section.

4. A toilet system as defined in claim 2 wherein said fluid actuator comprises a housing, an actuating member supported within said housing for oscillatory movement, and means connecting said actuating member to said flush valve member.

5. A toilet system as defined in claim 2 wherein said means for supplying water to said fluid actuator comprise a control valve including a movable control valve member, said means for supplying water to said tank include a water inlet valve and a float member, said water inlet valve being actuated by said float member, and including means connecting said float member to said control valve member for moving said control valve member in response to movement of said float member.

6. A toilet system as defined in claim 1 wherein said control means for actuating said flush means are effective to provide for reversing the selection of a full flush and a partial flush at any time during a flushing operation.

7. A toilet system as defined in claim 1 wherein said control means includes a main control valve, said means for supplying water to said tank includes a float actuated water inlet valve, first conduit means connecting said water inlet valve to said main control valve, second conduit means connecting said main control valve to said flush means, means for directing water from said main control valve into said tank, and said main control valve being effective to control the proportional flow of water to said tank and to said flush means.

8. A toilet system as defined in claim 7 wherein said flush means includes a rubber-like flush valve member, means pivotally supporting said flush valve member, a fluid actuator connected to pivot said flush valve member, said second conduit means being connected to said fluid actuator, a secondary control valve within said second conduit means, and means for actuating said secondary control valve in response to a changing water level within said tank.

9. A toilet system as defined in claim 8 wherein said secondary control valve includes a spool-like valve member movable to provide for selectively directing water into said tank or into said fluid actuator.

10. A toilet system as defined in claim 7 wherein said main control valve includes a valve body, tubular shaft means supported for rotation within said valve body, a manually actuated lever connected to provide for rotation of said tubular shaft, a control rod extending through said tubular shaft, a push button connected to move said control rod axially within said tubular shaft, an arm secured to said tubular shaft, means connecting said arm to said flush means to effect actuation of said flush means and a flow of water from said tank into said bowl in response to rotation of said tubular shaft, and means for pivoting said arm relative to said tubular shaft in response to depression of said push button and axial movement of said control rod.

11. In a toilet system including a bowl and a water storage tank connected by a passage, means for supplying water to a predetermined level within said tank, flush means for controlling the flow of water from said tank through said passage and into said bowl, means for supplying water to said bowl while water is being supplied to said tank and after said passage is closed, and control means for actuating said flush means to provide for selecting a full flush or a partial flush of the water within said tank into said bowl, the improvement wherein said control means comprises a control valve connected to receive water from said water supplying means, a manually actuated pivot lever connected to actuate said control valve, and a manually depressible push button supported by said pivot lever and also connected to actuate said control valve.

12. A toilet system as defined in claim 11 wherein said control valve includes a spool-like valve member supported for axial movement within a valve body, means for moving said valve member in one direction in response to depressing said push button and means for moving said valve member in the opposite direction in response to pivoting said lever.
13. In a toilet system including a bowl and a water storage tank connected by a passage, means for supplying water to a predetermined level within said tank, a flush valve for controlling the flow of water from said tank through said passage and into said bowl, means for supplying water to said bowl while water is being supplied to said tank and after said passage is closed, and control means for actuating said flush valve to provide for selecting a full flush or a partial flush of the water within said tank into said bowl, the improvement comprising a fluid actuator connected to effect closing said flush valve, said control means include a manually actuated main control valve connected to receive water from said water supplying means and to supply water to said fluid actuator, a secondary control valve connected to control the flow of water from said main control valve to said fluid actuator, and means for actuating said secondary control valve in response to a change in the water level within said tank.

14. A toilet system as defined in claim 13 and including an overflow pipe projecting upwardly within said tank and connected to said bowl, and means for mounting said secondary control valve on said overflow pipe.

15. A toilet system comprising a bowl and a water storage tank connected by a passage, a flush valve for controlling the flow of water from said tank through said passage and into said bowl, a water inlet valve, a float member connected to actuate said inlet valve, a fluid actuator connected to control operation of said flush valve, a main control valve connected to receive water from said water inlet valve and to supply water to said fluid actuator, a secondary control valve connected to control the flow of water from said main control valve to said fluid actuator and being actuated by movement of said float member, and means for manually operating said main control valve for selecting a partial flush or a full flush of the water within said tank into said bowl.

16. A toilet system as defined in claim 15 including means defining an overflow passage extending from said tank to said bowl, a conduit connecting said water inlet valve to said overflow passage, and an adjustable regulator within said conduit for controlling the flow of water from said inlet valve to said bowl after said flush valve is moved to a closed position.

17. A toilet system as defined in claim 15 including means defining an overflow passage extending from said tank to said bowl, a conduit connecting said main control valve to said overflow passage, and an adjustable regulator within said conduit for controlling the flow of water from said main control valve to said bowl after said flush valve is moved to a closed position.