

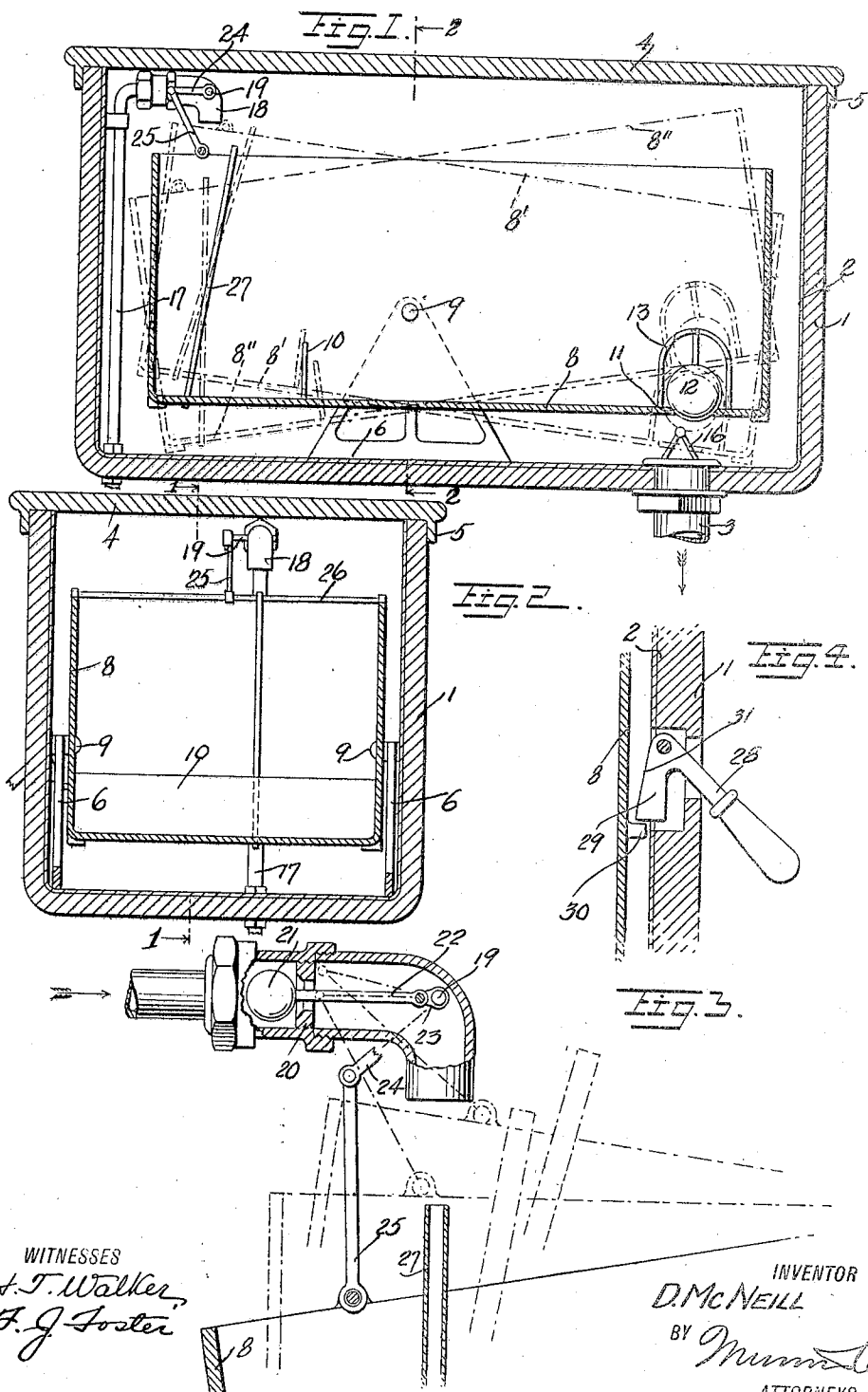
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FLUSH TANK

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WITNESSES
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UNITED STATES PATENT OFFICE.

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FLUSH TANK.

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To all whom it may concern:

Be it known that I, DENNIS McNEILL, a citizen of the United States, and a resident of Huntington, in the county of Cabell and State of West Virginia, have invented a new and Improved Flush Tank, of which the following is a full, clear, and exact description.

This invention relates to improvements in flush tanks, an object of the invention being to provide a tank of this character which will do away with the floating lift valves, wires and rubber balls generally used in tanks of this character, so that the danger of the tank getting out of order is very slight.

A further object is to provide a flush tank, which will be very simple and practical in construction and operation, durable and efficient in use, and comparatively inexpensive to manufacture.

With these and other objects in view, the invention consists in certain novel features of construction and combinations and arrangements of parts as will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings:

Figure 1 is a view in longitudinal section through my improved tank on the line 1—1 of Figure 2, the dotted lines indicating the various positions of the tilting tank;

Figure 2 is a view in transverse section on the line 2—2 of Figure 1;

Figure 3 is an enlarged fragmentary sectional view illustrating the details of the mechanism controlling the supply valve, the dotted lines indicating the various positions assumed by this mechanism; and

Figure 4 is an enlarged sectional detail view of the releasing mechanism.

Referring in detail to the drawings, I have used the reference numeral 1 to designate a substantially rectangular box or casing, which is lined with metal, as indicated at 2. An outlet pipe 3 communicates with the bottom of the box adjacent one end thereof, said pipe being secured into the box in any approved manner and leading to the usual bowl (not shown). 4 represents the usual removable cover for the casing provided with a peripheral flange 5, which engages with the casing to hold the cover against lateral displacement. Adjacent each side of the casing, brackets 6 are mounted

upon the floor thereof. These brackets are closer to one end of the casing than they are to the other and a tilting rectangular tank 8 is pivotally mounted between the brackets in any approved manner, as indicated at 9. The pivotal point of connection between the tank and the brackets is below the center of gravity of the tank and is nearer one end of the tank than the other, so that the tendency of the same would ordinarily be to tilt when full of water.

A relatively low transverse partition 10 extending across the bottom of the tank is located between the pivotal center of the tank and the nearest end wall. Adjacent the other end of the tank, an outlet opening 11 is formed in its bottom, this opening normally registering with the outlet pipe 3. The walls of the opening are ground in any approved manner to provide a valve seat upon which a ball valve 12 is normally seated. A cage 13 around the ball valve permits upward movement thereof to allow a flow of water through the opening 11, but prevents the ball from rolling away from its seat in any lateral direction. A valve opening mechanism in the form of a frame 16 is secured to the outlet pipe and when the tank is tilted is engageable with the ball 12 to push the same away from its seat and allow a flow of water.

It will be noted that the end walls of the tank 8 are spaced an appreciable distance from the end walls of the casing 1, so that the tank is free to tilt in either direction. In the opposite end of the tank from the outlet pipe 3, an inlet pipe 17 is provided, this pipe extending up into the casing between the end walls of the casing and tank. An outlet spout 18 is provided at the outlet end of the inlet pipe 17. Any suitable mechanism for controlling the flow of water through the spout 18 may be provided. I have shown a short shaft 19 mounted transversely of the spout and a valve seat 20 within the spout against which a valve 21 is adapted to seat, the pressure of water from the inlet pipe normally seating this valve. A valve stem 22 connected to the valve 21 is pivoted to a crank arm 23 carried by the shaft 19. One end of this shaft 19 projects outside of the spout and carries a relatively long crank arm 24. A link 25 is pivotally connected to the free end of the crank arm 24 and to a cross bar

26 extending across the top of the tank 8 directly under the spout.

An angularly disposed overflow pipe 27 is mounted in the tank and extends through the bottom thereof, for a purpose which will be more fully hereinafter explained. In order to hold the tank against tilting when it is full of water, a handle lever 28 is pivotally mounted in one wall of the casing 4 and includes an inwardly presented catch 29 engageable with a lug 30 fixed to the tank 8 to prevent tilting of the tank. This handle may be manually operated to permit the passage of the lug 30 and the consequent tilting of the tank. The catch 29 is so constructed that when the lug 30 has passed the catch in its upward movement, it is free to ride back again, automatically tilting the catch as it returns, and causing the catch to again fall into locking position. This is accomplished by virtue of a cam surface 31 which is engaged by the lug 30 upon its descent.

The operation of the flush tank is as follows: Assuming that the tank is full of water, it will normally be held in horizontal position, indicated in full lines in Figure 1, by the catch 29 engaging the lug 30. In order to flush the tank, the handle 28 is moved upwardly pulling the catch 29 inwardly and allowing the tank to tilt, the lug 30 riding up past the catch. As the tank tilts to the position indicated in dotted lines at 8' in Figure 1, the valve operating device 16 will engage the ball valve 12 forcing the same upwardly while the water runs out through the opening 11 in the tank and through the discharge or outlet pipe 3, this opening being in registration with the pipe as aforementioned.

It will be noted that the partition 10 serves to trap a small amount of water in the other end of the tank so that after most of the water has been dispensed from the tank, the water trapped by the partition 10 will act as a counter-balance and tilt the tank the other way. As the tank is again tilted to the position, indicated in dotted lines at 8'', the valve 12 will be gravitationally seated. This movement of the tank also operates through the medium of the crank arms 23 and 24 to push the valve stem 22 inwardly, unseating the valve 21 and allowing a flow of water through the spout 18 to refill the tank. It will be seen that when the tank is in the position, indicated in dotted lines at 8'', the pipe 27 is directly under the spout 18 so that part of the water flowing from the spout passes through the pipe 27 into the casing 1 and out through the pipe 3, thus supplying the small quantity desired for filling the water trap in the bowl beneath. After a sufficient amount of water has flowed into the tank, the weight of the water will restore the same to horizontal position where

it is locked by the catch 29. This return movement of the tank to the position shown in full lines in Figure 1, operates through the medium of the mechanism above described to restore the shaft 19 to its normal position and at the same time to reseal the valve 21. It will be noted that the initial tilting of the tank to the position shown in dotted lines at 8' does not effect an opening of the valve 21, but rather tends, through the medium of the operating mechanism, to more firmly hold the valve in closed position.

Although I have illustrated one of the preferred embodiments of my invention, it will be evident that various slight changes and alterations might be made in the general form and arrangement of the parts described without departing from the invention, and hence I do not wish to limit myself to the precise details set forth, but shall consider myself at liberty to make such slight changes and alterations as fairly fall within the spirit and scope of the appended claims.

In addition to the other purpose above set forth for the pipe 27, it might be noted that this pipe serves to silence the flow of water from the spout 18 into the tank since the water flows around outside of the pipe into the tank with practically no noise.

I claim:

1. In a flush tank, a tilting water receptacle adapted to tilt in one direction by gravity when filled, a valve controlled outlet for partially emptying the receptacle when the latter is tilted, manually operable means normally holding said receptacle against gravitational tilting, a water trap in said receptacle containing water, and acting as a counter-balance to tilt the receptacle in the other direction when it is partially emptied, means whereby this last mentioned tilting of the tank causes flooding of the same, said means including an inlet pipe, a valve in the pipe, a crank shaft in the pipe and with which the valve stem is connected, and means for connecting the crank shaft with the receptacle.

2. In a flush tank, a tilting water receptacle adapted to tilt in one direction by gravity when filled, said receptacle having adjacent one end an outlet, a normally closed valve for said outlet opened by the tilting of the receptacle, means for holding the receptacle from tilting, a water trap in the receptacle containing water and acting as a counterbalance to tilt the receptacle in the other direction when it is partially emptied, a valved water inlet pipe discharging in the receptacle, and valve operating means connected with the tank to open and close the valve by the tilting of the tank.

3. In a flush tank, a casing, a receptacle pivoted in the casing and having at one end an outlet and provided with a partition forming a trap at the other end, a normally

closed valve for the said outlet adapted to be opened by the tilting of the receptacle, a water inlet pipe discharging into the receptacle, a valve in the said pipe, and means 5 connected with the receptacle for opening and closing the valve by the tilting of the receptacle. valve controlled inlet for the receptacle, means for operating the valve when tilted 10 in one direction, and an overflow pipe mounted in the receptacle and adapted to lie below the inlet pipe when the receptacle is tilted to operate the said valve as and for the purpose set forth.

DENNIS McNEILL.

4. In a flush tank, tilting receptacle, a