

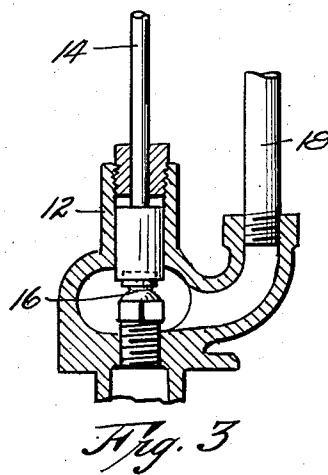
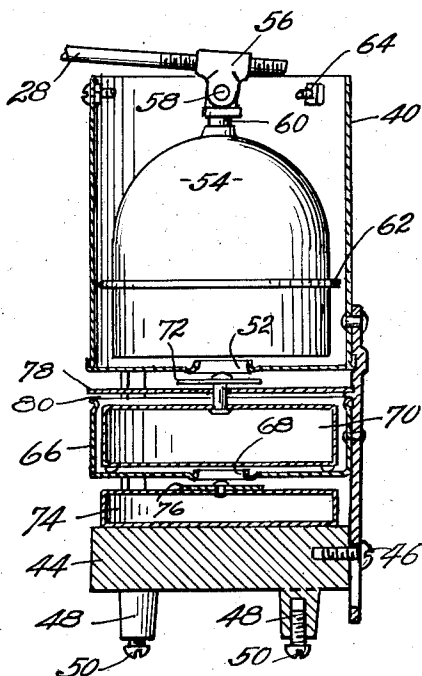
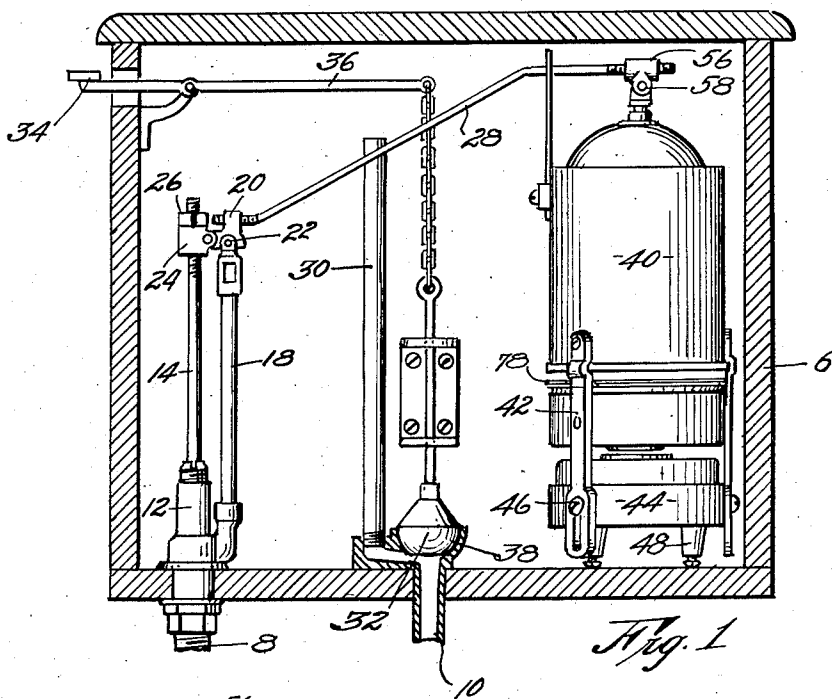
May 12, 1936.

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2,040,272

FLOAT VALVE

Filed Dec. 6, 1934



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## UNITED STATES PATENT OFFICE

2,040,272

## FLOAT VALVE

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Application December 6, 1934, Serial No. 756,218

3 Claims. (Cl. 137—104)

This invention relates to flush boxes for toilets and particularly the means therein for controlling the action of the ordinary valve that is located within the water supply pipe of the said box.

The primary object of this invention is to provide a toilet flush box having means for opening the supply pipe valve only after the water within the tank of the flushbox proper has entirely escaped through the outlet port of the flush box, whereby the wasting of water that is usually experienced is eliminated because of the structure contemplated by this invention which insures that no water can pass into the flush box tank when the outlet port thereof is open.

A yet further object of this invention is to provide means for opening and closing the valve in the inlet pipe of a toilet flush box that comprises a series of floats, some of which are positioned within suitable receptacles having valved openings whereby one of the floats which is operably connected with the supply pipe valve will be maintained in an elevated position to keep the said valve closed until all of the water in the flush box tank has escaped through the outlet port thereof.

A large number of minor objects of this invention will appear during the course of the following specification, referring to the accompanying drawing, wherein:

Figure 1 is a vertical section through a toilet flush box made to embody the present invention.

Fig. 2 is an enlarged, vertical section through the novel float assembly, and,

Fig. 3 is an enlarged, detailed, sectional view through the supply pipe valve.

The toilet flush box of the character wherein this invention is best embodied comprises a tank 6 having a water inlet pipe and outlet pipe 8 and 10 respectively. The water supply, or inlet 8, is provided with a supply valve 12 of conventional type and includes an operating rod 14 which, when raised and lowered, will open and close the passage through valve 12, as shown in Fig. 3. The lower end of rod 14 will rest upon seat 16 to close the valve in the ordinary fashion and when the valve is open, water will pass into the pipe 18 which serves as a supporting standard for head 20 which is pivotally mounted as at 22. This head 20 is joined to collar 24 carried beneath adjustable nut 26 on rod 14 and is also attached to connecting rod 28 that extends to the float structure, as illustrated.

An overflow tube 30 joins outlet pipe 10 and a valve or closure member 32 opens and closes outlet pipe 10 as the manually operable trip 34 is manipulated. Suitable linkage 36 joins closure 32

and trip 34 and when closure 32 is lifted from its seat 38, the water in tank 6 will escape through pipe 10. In most instances the ordinary flushbox allows water to enter through its supply pipe while the outlet pipe is still open. This is objectionable because of the amount of water actually wasted and because of the noise incident to the passing of water through the tank as it is being emptied.

The means for operating valve 12 allows tank 6 to empty to a level slightly above outlet pipe 10 before valve 12 is opened. This valve is then kept open by the novel flow structure until the normal water level of the full tank is reached.

The means referred to is shown clearly in Figs. 1 and 2 and comprises a receptacle 40 which is held in an elevated position by adjustable legs 42 that are attached to base 44 through the use of screws or other suitable mediums 46. Legs 48 may be used to carry base 44 and these legs should have adjustable feet 50 which, with legs 42, will allow proper relation to be established between the floats. An outlet port 52 is formed in the bottom of receptacle 40 and a dome-shaped upper float 54 is disposed within receptacle 40 and attached to rod 28 by the bearing 56. The bearing is pivotally joined as at 58 to stem 60 of float 54 to allow free movement.

Float 54 has an annular bead 62 formed thereon which engages stops 64 in the event the rising water has a tendency to lift float 54 too high. A tray 66 is mounted below receptacle 40 and has an outlet opening 68 formed in the bottom thereof. An intermediate float 70 that carries a plate 72 is disposed within tray 66 and when this intermediate float rises, plate 72 will close outlet port 52 of receptacle 40. A lower float 74 is carried between tray 66 and base 44 and is confined in that position by legs 42. A plate 76 on lower float 74 closes outlet opening 68 when float 74 is lifted by the water. A top 78 keeps water from dropping into tray 66 from receptacle 40, yet allows water to flow into the tray through the opening 80 formed between tray 66 and top 78.

The relative positioning of the three floats as just set down insures that valve 12 will not be opened until the water within tank 6 is practically all passed therefrom after the manipulation of trip 34 which opens outlet pipe 10. This action is insured because there is water both in receptacle 40 and tray 66 when tank 6 is being emptied. Lower float 74 is held in a raised position by the water in tank 6, but when the water level passes below lower float 74, it will drop by gravity to the position shown in Fig. 2, thereby opening outlet

port 68 and allowing water to pass from tray 66. Immediately upon evacuating the tray, intermediate float 70 will drop and open outlet port 52 by withdrawing plate 72 therefrom. As soon as this action takes place, the water in receptacle 40 will quickly pass therefrom to allow dome-shaped float 54 to drop and, through the medium of connecting rod 28 and other associated members, valve 12 will be opened to start the flow of water into tank 6. As the water flows into tank 6, closure 32 will of course keep it from passing out through outlet pipe 10, lower float 74 will be lifted to close outlet opening 68 prior to filling tray 66, and when this said tray is filled, float 70 will be raised to close port 52 and then water will flow over the top of receptacle 40 to lift float 54 and, thereby, close valve 12.

Obviously, valve 12 will not be closed until the water level has passed the top of receptacle 40, and since this top is below the top of the outlet tube 30, the tank will be properly filled without the loss of water. The dome-shaped float has a substantially flat bottom and, as a result thereof, quick displacement will occur and movement of the float with a relatively small amount of water in receptacle 40 will render the mechanism efficient.

Having thus described the invention, what is claimed as new and secured by Letters Patent is:

1. In a flush box having a water inlet and outlet pipe respectively in connection therewith, and a valve in each pipe respectively; means within the box for opening and closing the valve in the inlet pipe comprising a receptacle having an open top and an outlet port formed therein, a float in the receptacle having connection with said inlet pipe valve, a tray below the receptacle having an outlet opening formed therein, a float within the tray having a plate thereon for closing the

outlet port in the receptacle, and a float below said tray having a plate thereon for closing the outlet opening in the said tray.

2. In a flush box having a water inlet and outlet pipe respectively in connection therewith, and a valve in each pipe respectively; means within the box for opening and closing the valve in the inlet pipe comprising a receptacle having an outlet port formed therein, a float in the receptacle having connection with said inlet pipe valve, a tray below the receptacle having an outlet opening formed therein, a float within the tray having a plate thereon for closing the outlet port in the receptacle, and a float below said tray having a plate thereon for closing the outlet opening in the said tray, said receptacle having an open top disposed at the water line of the tank when the latter is full whereby the float in the receptacle is moved to the valve closing position only after the tank has been filled.

3. In a flush box having a water inlet and outlet pipe respectively in connection therewith, and a valve in each pipe respectively; means within the box for opening and closing the valve in the inlet pipe comprising a pair of open top receptacles one above the other and each having a float therein and a hole formed in the bottoms thereof, and a lower float beneath the lowermost receptacle adapted to close the hole in the lower receptacle when raised by floatation, said float of the lower receptacle adapted to close the hole in the upper receptacle when raised by floatation, said float in the upper receptacle being operably connected to the said valve of the inlet pipe, and a top plate positioned in spaced relation between said pair of receptacles whereby water from the upper receptacle is directed away from the lower receptacle.

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