To all whom it may concern:

Be it known that I, JOHN F. MASON, a citizen of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented a certain new and useful Water-Closet-Controlling Apparatus, of which the following is a specification.

The object of my invention is to provide a device of this kind in which the water supply pipe leading to the closet tank may be automatically controlled so that it will be shut off when the water in the tank has reached a certain pre-determined level, and also so that the valve will be automatically opened when the water within the tank has been drawn out.

More specifically, it is my object to provide a valve device for this purpose of simple, durable and inexpensive construction, in which the contacting surfaces of the valve corresponding to the ordinary valve seat will be in contact with a portion of the casing both when the valve is open and when it is closed so that said contacting surfaces will not be in such position where there will be any direct contact with the water, and, therefore, they will be protected from incrustation or deposits from the water.

My invention is further to provide a valve closing means which is actuated by the pressure of the water and not by a float device so that the valve may be closed even though there is considerable friction between the valve and the valve casing.

A further object is to provide improved means for opening the tank to discharge the contents thereof.

My invention consists in the construction, arrangement, and combination of various parts of the device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 shows a vertical sectional view of a tank having my improvements applied thereto, and—Fig. 2 shows a sectional view taken on a horizontal center of the inlet pipe and the valve.

Referring to the accompanying drawings, I have used the reference numeral 10 to indicate a water tank of ordinary construction. Extended through the bottom of the tank is a water supply pipe 11. Mounted within the tank is a valve casing comprising a cylindrical body portion 12 and an enlarged, globular central portion 13. Leading to this part 13 is a hollow screw threaded extension 14 into which the supply pipe 11 is screwed. The upper end of the cylinder 12 is open and the lower end is closed. Slidingly mounted within the cylinder 12 is a valve 15 formed hollow and open at both ends. Near its central portion is a series of openings 16 and at its top is an outwardly flared portion 17. The structure of the valve and the casing is such that when the valve is in the position shown in Fig. 1, the water from the supply pipe 11 will enter the interior of the part 13 between the valve and said part, and the flow of water from the supply pipe 11 through the valve will be cut off. Then, when the valve 15 is moved downwardly, the opening 16 will lie within the globular portion 15 of the casing and water may flow through said openings and through the valve to discharge through the upper end of the valve. It is obvious that when the valve is in the position shown in Fig. 1, the contact surfaces of the valve and its casing corresponding to the valve seat of an ordinary valve, will be protected from direct contact with the water, thus preventing the formation of incrustation or deposits thereon, and also, when the valve is in an open position, the same contacting surfaces will be in engagement with different parts of the valve casing and will also be protected from direct contact with the water.

Arranged at the upper end of the valve is a float device comprising a body portion 18 having an opening only at the central portion of its bottom. The parts of the float adjacent to said opening are inclined downwardly and inwardly at 19 and are designed to engage the outwardly flared portion at the upper end of the valve as shown in Fig. 1. Arranged within the float 18 is a cylindrical chamber formed by the vertical wall 20. This chamber communicates with the opening in the bottom of the float but the space between the wall 20 and the exterior of the float is air tight and it is this portion of the device that constitutes the float proper. Within the chamber formed by the wall 20 is a series of inwardly projecting fingers 21 for purposes hereinafter made clear.

The operation of this device is as follows: Assuming that there is no water within the
tank, and assuming, further, that the valve is at its lower limit, then water will flow through the supply pipe 11 and will surround the valve and pass through the openings 16 and upwardly through the valve and out into the water tank through the opening in the bottom of the float device. When the water in the tank reaches a level where it will engage the float device, the said float device will rise with the water until the parts 19 thereof engage the part 17 of the valve, and a water tight joint is formed between said parts. Then the pressure of the water will soon fill the chamber on the interior of the float device and it will press upwardly on the top of said chamber with sufficient force to raise the valve until it reaches a point where the openings 16 are above the part 13, as shown in Fig. 1. Then the water contained within the inner chamber of the float device will slowly drain out through the discharge opening 22 in the valve, till the pressure within said chamber is equal to the pressure in the body of the tank. When the water is drawn from the tank, the float device will move downwardly and the fingers 21 thereof will engage and rest upon the top of the valve, and, as the water recedes, the weight of the float device and the valve combined will move the valve downwardly. I have also provided improved means for drawing off the water from the tank as follows: Mounted in the bottom of the tank is a cylindrical casing 13 extended from a point above the bottom of the tank to a point below it. This casing is designed to be connected to a pipe leading to the closet bowl. Slidingly mounted in said casing 13 is a valve device 24 cylindrical in shape and formed hollow and open at both ends. At a point spaced apart from the lower end of the valve 24 is a series of openings 25, and at the top of the valve 24 is an arm 26 connected with a lever 27. When the valve 24 is in the position shown in Fig. 1, it is obvious that the water contained within the tank may flow through the openings 25 and down through the discharge pipe. However, when the lever 27 is released, the valve 24 will move downwardly and the openings 25 will be contained within the valve casing 13, thus preventing the flow of water downwardly through the valve 24. In the event that the level of the water within the tank should rise above the upper end of the valve 24, the surplus water would flow off through the valve 24 and prevent the tank from overflowing.

The valve of the water supply device has several advantages over valves of the ordinary construction in that the portions of the valve that form valve seats are protected from the water both when open and closed. Furthermore, the pressure of the water upon the valve is equal in all directions thus preventing side strains or binding of the valve; and, furthermore, the pressure of the water is utilized in moving the valve upwardly to its closed position instead of the relatively light pressure afforded by the use of an ordinary float, as the floating feature of my improved valve is intended only for the purpose of forming a water tight connection between the valve and the float device. For this reason, the said float device may be made very small and inexpensive.

I claim as my invention.

1. In a device of the class described, a valve casing, a tube slidingly mounted in the valve casing, said parts being so arranged that when the tube is in its lowered position, water will flow upwardly through it, and when in its elevated position, the flow of water through it will be stopped, a float, said float having a water chamber therein open at its lower end, said tube being admitted into said open lower end, and said parts being so arranged that when the float is elevated it will engage with the tube and form a water tight connection with it so that water within said water chamber cannot escape between the tube and the bottom of the water chamber, and so that the pressure of the water within the tube and water chamber will tend to elevate the float and carry the said tube upwardly with it.

2. In a device of the class described, the combination of a tube slidingly mounted for vertical movement, means whereby water will flow upwardly through the tube when the tube is at its downward limit of movement and whereby said flow will be interrupted when the tube is moved upwardly, an outwardly flared portion at the upper end of the tube, a float, a water chamber within the float having an opening in its bottom, and the sides surrounding the opening inclined downwardly and toward the center of the opening, said outwardly flared portion of the upper end of the tube being extended through said opening for the purposes stated.

3. In a device of the class described, the combination of a tube slidingly mounted for vertical movement, means whereby water will flow upwardly through the tube when the tube is at its downward limit of movement and whereby said flow will be interrupted when the tube is moved upwardly, an outwardly flared portion at the upper end of the tube, a float, a water chamber within the float having an opening in its bottom, and the sides surrounding the opening inclined downwardly and toward the center of the opening, said outwardly flared portion of the upper end of the tube being extended through said opening, and fingers arranged within the water chamber of the
4. In a device of the class described, the combination of a cylindrical valve casing open at its top and closed at its bottom and having an enlarged circular chamber formed in its central portion, a water supply pipe communicating with said chamber, a cylindrical valve within the valve casing open at its upper end and having its upper end flared outwardly and also having a series of openings near its central portion, said parts being so arranged that when the cylindrical valve is at its lower limit of movement, water may pass from the circular chamber of the valve casing through the openings in the valve and upwardly through the valve, and when the valve is in its elevated position, the flow of water through the valve will be stopped, a float device comprising an air tight chamber and a water chamber, the water chamber having an opening in its bottom and having its sides inclined downwardly and toward the center of the opening, said sides being designed to engage the under surface of the flared portion at the top of the valve, means for limiting the downward movement of the float relative to the valve, and said valve being provided with a drain opening.

Des Moines, Iowa, Feb. 26, 1909.

JOHN F. MASON.

Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."