

FLUSHING APPARATUS FOR WATER CLOSET BOWLS.

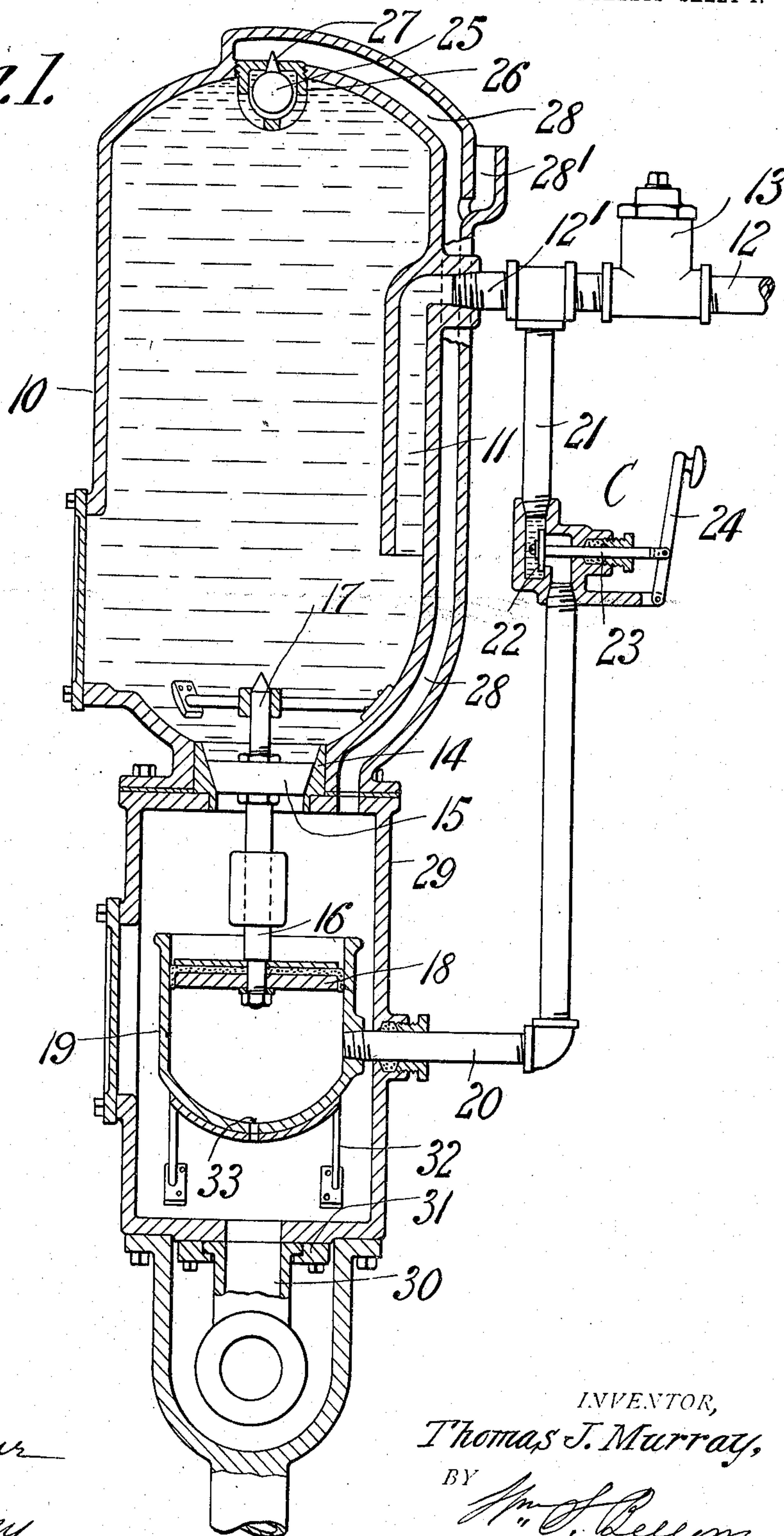
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2 SHEETS—SHEET 1.

Fig. 1.



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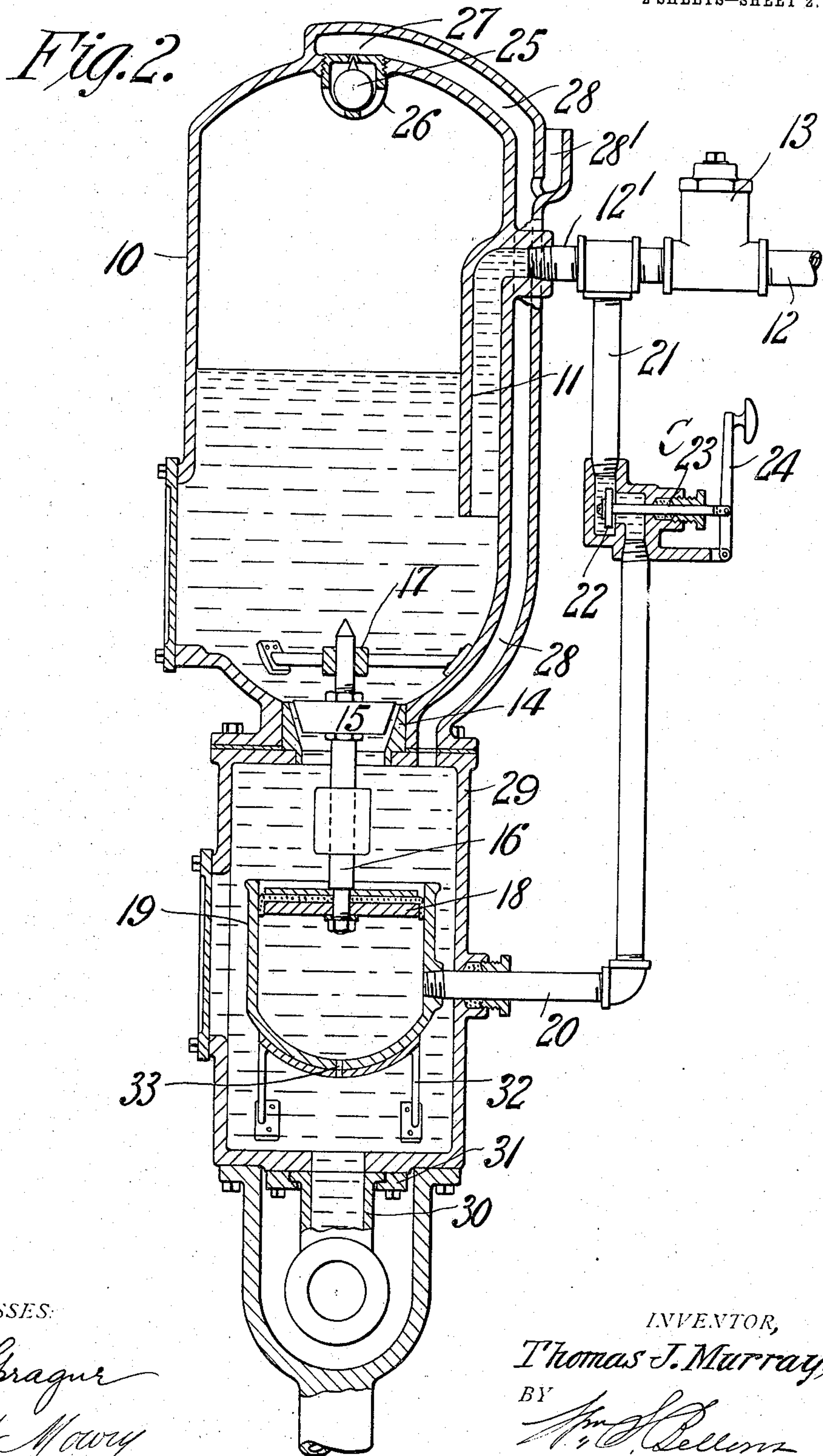
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FLUSHING APPARATUS FOR WATER-CLOSET BOWLS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, THOMAS J. MURRAY, a citizen of the United States of America, and resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Flushing Apparatuses for Water-Closet Bowls, of which the following is a full, clear, and exact description.

This invention relates to flushing devices for water-closets and more particularly to that class thereof in which water accumulates in a tank under pressure and is permitted to flow into the bowl upon the release action of a valve, and it has for one of its objects the provision of such a device in which the release valve is controlled by a device which is adapted to be operated by hand and which permits water under pressure to act directly upon said valve.

My invention has, furthermore, for its object the combination with a receiver, of a drain-chamber into which the water from the receiver will pass as permitted by a valve mechanism interposed between these two elements.

My invention has also for its object the improved construction and organization of some of the component elements as will be hereinafter described, and the means of attainment of which will be particularly pointed out in the claims.

The invention has been clearly illustrated in the accompanying drawings in which similar characters denote similar parts, and in which—

Figure 1 represents a longitudinal central section of a flushing device embodying my invention, and Fig. 2 is a similar view illustrating the parts in their flushing or active positions.

Briefly stated, the present device comprises a receiver-tank connected directly with the water supply under pressure, and having at its upper portion a float valve which is closed by the rise of the water within the same. Disposed in conjunction with this receiver-tank is a drain-chamber which is connected directly with the bowl of a water-closet, and into which the water from the receiver-tank enters after passing a valve, the opening action of which is effected by water pressure admitted by a manually operated controller, while at the same time

means are provided whereby the valve actuating pressure water will find a gradual exit into the drain-pipe in such a manner as to permit the valve to close slowly so that the action of the valve closing will be retarded as desired.

Referring to the drawings, the numeral 10 denotes a receiver-casing preferably provided with a splash-wall 11 and connected with a suitable water supply under pressure by means of a pipe 12 which may have a pressure regulating valve 13 of ordinary construction.

Disposed in the bottom of the receiver-tank 10 is a valve-seat 14 adapted to receive a valve 15 which is secured upon a stem 16 guided for vertical movement in a bearing 17 attached to, or constituting a part of the receiver-casing 10. The lower end of the valve-stem 16 carries a piston 18 preferably of the "cup-leather" type which is movable in a pressure cylinder 19 connected by a pipe 20 with the controlling device indicated herein in a general way by C, and connected with the main water supply by a pipe 21. The controlling device comprises a valve secured to a longitudinally movable stem and operable by a hand lever whereby said valve may be pushed from its seat to permit water under pressure to pass from the pipe 21 into the pipe 20. The valve with a stem 23 are of the self closing type, but, if desired, a spring or weight may be employed to accomplish that purpose.

Disposed within the roof of the receiver-tank 10 is a valve 25 shown herein as a ball contained within a cage 26 and adapted to be raised to close a vent opening 27 as the water reaches the top of the tank 10, it being understood, of course, that the vent passage 27 will permit the air to escape from the receiver-tank as fresh water enters the same through the pipe 12'. The opening 27 is in communication with a passage 28 leading to a drain-chamber 29 adapted to receive the water passing the valve 15, and standing in constant open communication with the bowl of the water-closet, as for instance, by a pipe 30 held in place thereon by a flange 31. Hence it will be seen that any leakage of water through the opening 27 will be conducted into the drain-chamber 29, and be from thence allowed to escape through the pipe 30 to the bowl. It will, therefore, also

be understood that the water entering the drain-chamber 29 directly from the receiver-tank 10 by passing the valve 15 will also be drained in a like manner, this body of water constituting the flush for the bowl.

The pressure cylinder 19 may be supported within the drain-chamber 29, as for instance, by a bracket 32, and it is provided with a vent 33 at its bottom to permit the water in said cylinder, after it has performed its function in raising the valve 15, to gradually escape and thus permit the valve 15 to close in as slow a manner as controlled by the size of the opening 33.

The operation of my improved flushing device can be readily ascertained by a comparison of Figs. 1 and 2 of the drawings, Fig. 1 representing the parts in their position ready to operate while in Fig. 2 the hand lever 24 is manually operated to open the control-valve to establish a flushing action during which the parts assume positions as here shown. Referring to Fig. 1 it will be seen that the receiver-tank 10 is completely filled with water under pressure introduced therinto through pipes 12 and 12', the valve 25 at its top being closed by virtue of the water pressure within said tank.

When now pressure is exerted upon the handle 24 to open the control valve 22, as shown in Fig. 2, water under pressure is permitted to pass through the pipe 21, past the valve 22 and through the pipe 20 into the pressure cylinder 19 which it will fill, and where it will serve to force the valve 15 upward and from its seat by virtue of the area of the piston 18 being greater than that of the valve 15. The pressure on the other side of the piston is (in the position shown in Fig.

1,) *nil* because the drain-chamber is connected by the passage 28 with the open air, as at 28', at a point sufficiently high to prevent the water in seeking its level in the receiver 10 from splashing out. As soon as valve 15 has been raised from its seat, the water in the tank 10 will immediately flow into the drain-chamber 29 in greater volume than fresh water will be supplied to said tank through the pipe 12', and the water received by the drain-chamber can find a free and unobstructed passage through the drain pipe 31 connected with the bowl of the closet, so that in this manner water will at first be precipitated from the receiver tank into the drain-chamber inasmuch as the water supply pipe 12' is in constant and open communication with the tank. It should be noted that the drain-pipe 30 is considerably larger in area than the inlet pipe 12', so that the water will be led off the drain-chamber faster than pressure water can enter the receiver. The action of the piston 18 in raising the valve 15 from its seat will take place immediately upon the filling of the pressure cylinder 19 and as soon as the con-

trol valve 22 has been allowed to close, the water in the pressure cylinder 19 will slowly escape through the aperture 33 above mentioned, and the closing action of the valve 15 will, therefore, be retarded. Any water contained within the pressure cylinder 19, after the valve 15 has come to its closed position, will be drained from said cylinder and the pipe 20 through the aperture 33, so that these portions of the device will also be free from water while any leak which may exist in the control-valve 22 cannot work any injury to the device, as will be readily understood. After the valve 15 has come to its closed position fresh water entering the tank 10 will gradually fill the same and drive the air before it through the aperture 27 until the water in its rising movement in the tank will come in contact with the ball-valve 25 and close the aperture 27, as indicated in Fig. 1 whereupon the flushing device is again ready for use.

I claim:

1. The combination with a receiver, and a drain-chamber connected therewith, of a relief passage connecting the top of said receiver with said chamber, a cage secured to the roof of said receiver and projecting thereinto, a ball float-valve in said cage and adapted to open said passage during and by the withdrawal of liquid from said receiver, a drain-valve interposed between said receiver and said chamber for controlling the passage of liquid from said receiver to said chamber, a pressure cylinder and piston disposed within the drain chamber for opening said drain-valve, and manually-operated means for admitting pressure into said cylinder.

2. The combination with a receiver, and a drain-chamber connected therewith, of a relief passage connecting the top of said receiver with said chamber, a valve adapted to be closed by the rise of water in said receiver and adapted to open by the withdrawal of liquid therefrom, and a valve interposed between said receiver and said chamber for controlling the passage of liquid from said receiver to said chamber, a pressure cylinder disposed within said drain chamber, a piston in said cylinder for actuating said valve and a hand-operable valve for controlling the admission of pressure into said cylinder.

3. The combination with a receiver, and a valve for controlling the passage of liquid therefrom, of a pressure-cylinder having one of its ends in permanently open connection with the atmosphere, a piston in said cylinder and connected with said valve, a water supply for said tank and said cylinder and adapted to move said piston in the cylinder in one direction to unseat said valve.

4. The combination with a receiver, and a drain-chamber connected therewith, of a

valve interposed between said receiver and chamber, a pressure-cylinder comprising a piston connected with said valve and having at its bottom an aperture in constant communication with said chamber, a water supply for supplying liquid under pressure to said receiver and said cylinder, and manually operated means for controlling the pressure supply for said cylinder.

5. The combination with a receiver, and a drain-chamber connected therewith, of a valve interposed between said receiver and chamber, a pressure cylinder disposed within said chamber and comprising a piston for operating said valve in one direction, a pressure-supply for said receiver and said cylinder, a device for controlling the admission of pressure into one end of said cylinder, and an aperture in said cylinder end and in communication with said chamber for draining said controlling device and said pressure cylinder during their non-operative period.

6. The combination with a receiver having a vent aperture in the upper portion thereof, a valve for controlling the passage of liquid from the bottom of said receiver, a pressure cylinder and a piston for operating said valve, and a hand controlled valve for said pressure cylinder, of a pressure-supply for said receiver, and a float-valve disposed in the top of said receiver and adapted to close

said aperture by the rise of liquid in the receiver.

7. The combination with a receiver, and a liquid pressure supply therefor, of a gravitative-valve for controlling the passage of liquid from said receiver, a pressure-cylinder comprising a piston having a greater area than that of said valve and connected therewith, a liquid pressure supply connected with said cylinder and for raising said valve against the pressure of the liquid in said receiver, and means for controlling the passage of pressure liquid into said cylinder.

8. The combination with a receiver, and a liquid pressure supply therefor, of a gravitative-valve for controlling the passage of liquid from said receiver, a pressure cylinder comprising a piston connected with said valve, a liquid pressure supply connected with said cylinder and for raising said valve against the pressure of the liquid in said receiver, and means for controlling the passage of pressure liquid into said cylinder, and an aperture disposed in said cylinder and below said piston and for controlling the gravitative return movement of said valve.

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

THOMAS J. MURRAY.

Witnesses:

WM. S. BELLOUR,

GERTRUDE R. DRISCOLL.