No. 874,565. PATENTED DEC. 24, 1907.

R. E. BRISTOW.

FLUSH TANK.

APPLICATION FILED MAR. 29, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

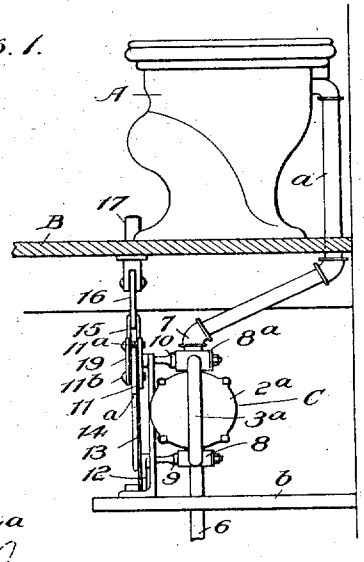


Fig. 2.

Witnesses

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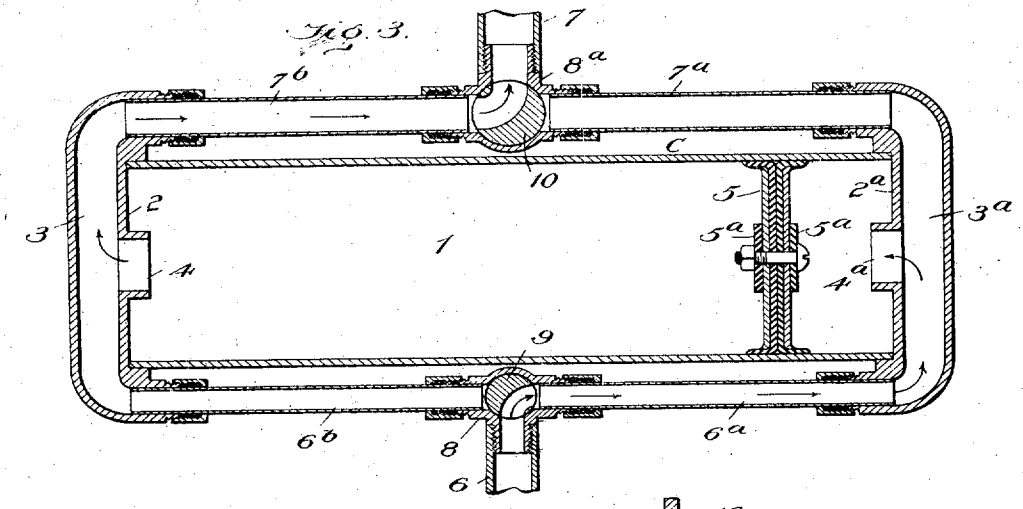
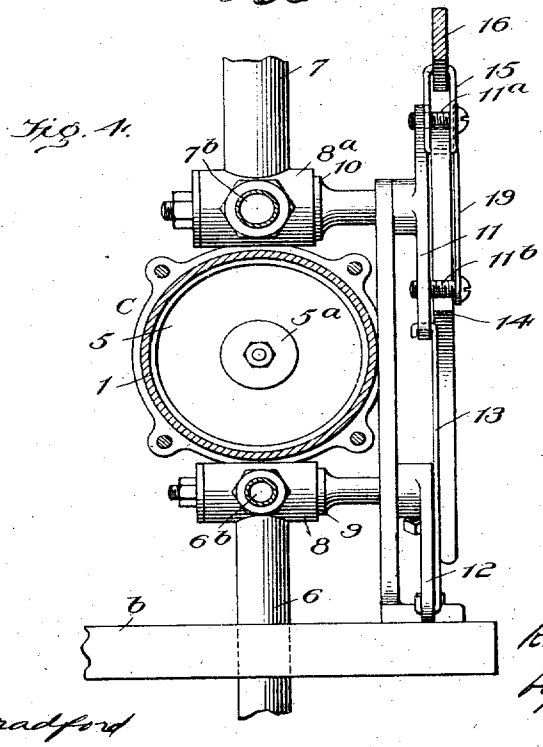


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

RALPH E. BRISTOW, OF DENVER, COLORADO, ASSIGNOR OF ONE-FOURTH TO WILLIAM BURKART AND ONE-FOURTH TO HARVEY A. WILLIAMS, OF DENVER, COLORADO.

FLUSH-TANK.

No. 874,565. Specification of Letters Patent. Patented Dec. 24, 1907.

Application filed March 29, 1907. Serial No. 365,400.

To all whom it may concern:

Be it known that I, RALPH E. BRISTOW, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Flush-Tanks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the construction of flush tanks for water-closets, which tanks are adapted to be located at a point below the bowl of the closet, as for instance beneath the floor which supports the bowl, or in the cellar of the building, and wherein the valves controlling the same are operated from a point adjacent to the bowl, whereby flush tank, piping and valve mechanism may be concealed, and the noise attendant upon the filling and emptying of the tank may be muffled, or entirely suppressed.

To this end the main feature of my invention embraces a closed cylindrical or equivalent flush tank provided with a suitable piston and having water ways leading to and from the flush-tank on opposite sides of the piston thereof, said water ways provided with suitable valves, said parts adapted to be interposed between the closet-bowl and the water supply, and valve operating mechanism adapted simultaneously to open or alternately close the valves of the water ways, whereby either a continuous flow, or an intermittent and measured volume of water may be supplied to the closet bowl at the will of the operator.

There are other, minor features of invention embracing particular combinations, and special features of elemental construction, all as will be hereinafter more fully pointed out.

In the drawings chosen for the purpose of illustrating my invention, the scope whereof is pointed out in the claims, Figure 1 is an end view of a flush-tank and valve mechanism embodying my invention, shown in connection with a closet bowl and the floor which supports the bowl. Fig. 2 is an enlarged side view of the flush-tank and valve mechanism, the dotted line showing the change of position of the valve mechanism in reversing the valves. Fig. 3 is a longitudinal central section of the flush tank, its piston, and the water-ways leading into and from the tank on opposite sides of the piston. Fig. 4 is a transverse section of the flush tank and water ways leading to and from the flush tank.

Like symbols refer to like parts wherever they occur.

I will now proceed to describe my invention more fully so that others skilled in the art to which it appertains may apply the same.

In the drawings A indicates a closet-bowl to be flushed, *a* the flush pipe leading thereto, B the floor which supports the closet-bowl, and C the flush-tank located beneath the floor B, and communicating with the bowl through the flush pipe *a*. The flush tank C may be of any suitable shape and may be supported below the bowl A in any suitable manner, as for instance upon a shelf or bracket *b* to which it may be bolted, and may be further secured against vibration by braces b', b^2. As a matter of choice the flush tank C is preferably composed of a closed cylinder 1 adapted to hold any desired number of gallons of water, and provided with heads 2, 2^a having water ways 3, 3^a which communicate with the cylinder 1 at each end thereof through ports 4, 4^a, and also provided with a suitable piston 5 having disks or gaskets 5^a, 5^a adapted to close one or the other of said ports 4, 4^a, according to the position of said piston within the cylinder.

6 indicates an inlet pipe through the medium of which connection may be made with the city water pipes, or any other water supply under suitable head or pressure, and 7 indicates an outlet pipe leading from the flush tank C to the flush pipe *a* which supplies the bowl A. Each of these inlet and outlet pipes 6 and 7 is connected, through an intermediate T coupling 8 or 8^a which constitutes a valve casing, and through suitable pipes or inlet ways 6^a, 6^b and outlet ways 7^a, 7^b with the water ways 3, 3^a in the cylinder heads 2, 2^a; and the valve casings 8, 8^a are each provided with a valve 9 or 10, by the proper manipulation of which the water from the inlet pipe may be allowed to pass either directly and without interruption from the inlet pipe 6 to the outlet pipe 7 and thence to the bowl A and continuously flush it, or may be directed alternately into and out of the cylinder 1 and thus intermittently flush the bowl A.

The stem of the outlet valve 10 is provided with a cross arm 11 carrying pins or posts 11^a, 11^b with which the valve operating mechanism engages, and the valve 9 is coupled to the valve 10 through the crank arm 12 and intermediate link or rod 13—the said valves 9 and 10 being so set with relation to each other that when one end of the tank cylinder 1 is open to the inlet pipe 6 the other end of said cylinder 1 will be open to the outlet pipe 7.

The particular mechanism devised and preferred by me for simultaneously reversing the valves 9 and 10, comprises, in addition to the coupled crank arm 12, and cross arm 11 having pins or posts 11^a, 11^b, the twin hooks 14, 14^a for alternately engaging the pins or posts 11^a, 11^b of the cross arm 11, said twin hooks being suspended by a suitable rod or link 15 from one arm of a pivoted lever, the other arm of which lever may be controlled by a push plug 17 located in the floor B adjacent to the closet bowl A, or in any other suitable manner. It will be noted that each of the twin hooks 14, 14^a is an incline or cam surface 14^b, the function of which is, on the descent of the twin hooks, to engage the adjacent pin or post 11^a or 11^b and cause twin hook 14 or 14^a to swing out of a right line so that when the hook has passed the said pin 11^a or 11^b as the case may be it shall, with certainty swing back under said pin or post and engage it on the next ascent of said twin hooks. It will also be noted that the distance between the pins or post 11^a and 11^b of cross arm 11 is slightly greater than the distance between the point of one hook 14 and the crotch of the other hook 14^a consequently when the cross arm 11 is reversed by the rise of the engaging hook the point of the other or opposite hook will pass to the inside of the opposite or free post of the cross arm when the hooks and cross arm are in line.

The construction of the devices being substantially such as hereinbefore pointed out, the valves 9 and 10 being in the position shown in Fig. 3 of the drawings and the valve mechanism (twin hooks 14, 14^a, cross arm 11 and crank arm 12) being in the position shown in Fig. 2 of the drawings, the water from the pressure supply will enter through inlet pipe 6 pass through inlet way 6^a and way 3^a and by port 4^a into the right hand end of the tank cylinder 1 thus forcing the piston 5 to the left hand and causing the water contained in the cylinder in advance of the piston to be forced out of the cylinder 1 through port 4, way 3, outlet way 7^b and outlet pipe 7 to the flush pipe *a* and bowl A. This movement of the piston to the left continues until the piston 5 reaches the left hand end of cylinder 1 and its gasket or packing 5^a closes port 4, whereupon the flow of water to the bowl A ceases. The cylinder 1 to the right hand of the piston (Fig. 3) is now filled with water which is under pressure from the water supply but which can not escape to the bowl by reason of the position of the outlet valve 10. If now it is desired to institute a continuous flow of flushing water through the bowl A, the plug 17 is operated only sufficiently to cause the twin hooks 14, 14^a to assume a position midway between those shown in full line and in dotted line, Fig. 2, which will throw open both valves 9 and 10 and give a direct passage or way for the water under pressure from the inlet pipe 6 through the ways 3, 3^a, passages or inlet ways 6^a, 6^b, and outlet ways 7^a, 7^b to and through the outlet pipes 7 and *a* to the bowl A. If, however, it is desired to intermittently supply the bowl A with water, the valves 9 and 10, and twin hooks 14, 14^a are left in the position shown in Figs. 2 and 3 until the next flushing of bowl A is required, whereupon the lever 16 is operated to raise the twin hooks 14, 14^a into the position shown in dotted lines Fig. 2, during the course of which movement of the twin hooks one thereof, 14, will engage the pin or post 11^b to the left hand in said Fig. 2 and reverse the inclination of said cross arm 11 and crank arm 12 which will give a partial rotation to the valves 9 and 10 so that the inlet pipe 6 is put in communication with the left hand end of cylinder 1, Fig. 2, through inlet ways 6^b, and way 3, and the outlet pipe 7 is put in communication with the right hand end of cylinder 1 through way 3^a and outlet way 7^a, whereupon the cylinder 1 fills from the left hand end and empties from the right hand end until such time as the piston 5 has reached the right hand end of cylinder 1 and packing 5^a has closed port 4^a when the flow of flushing water ceases, as before noted.

Whenever, after the operation of the valves 9, 10, by depressing the arm of lever 16, said lever 16 is released, the twin hook 14 will drop by gravity into the position shown in full line Fig. 2 in which position it is ready for again reversing the valves when the lever 16 is again operated.

It is to be noted that the relation of the twin hooks to the cross arm 11 and its pins or posts 11^a, 11^b is always maintained by means of the guard or guide strap 19—though other means may be provided therefor if desired; and it may be also noted that the descent of the twin hooks 14, 14^a may be effected by a spring if it is not desired to depend on gravity and the weight of the hooks, all of which is clearly within the knowledge of a skilled mechanic.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a flush-tank, the combination of a tank-chamber, a piston therefor, inlet and outlet ways which communicate with the tank-chamber on both sides of the piston,

valves for controlling said inlet and outlet ways, and means for operating said valves to cause the water to pass through said ways and the tank-chamber.

2. In a flush-tank, the combination of a tank-chamber, a piston therefor, inlet and outlet ways which communicate with the tank-chamber on both sides of the piston, valves for controlling said inlet and outlet ways, and means for operating said valves to cause the water to pass through said ways without entering the tank-chamber.

3. In a flush-tank, the combination with a tank-chamber, having inlet and outlet ways which communicate with the tank-chamber, and valves for controlling said inlet and outlet ways, said valves being coupled together, of a cross arm connected with one of said valves, and means for engaging the cross arm on opposite sides of its point of connection with the valve, for operating said valves.

4. In a flush-tank, the combination with a tank-chamber, inlet and outlet ways which communicate with the tank-chamber, and valves for controlling said ways, said valves being coupled together, of a cross arm connected to one of said valves and provided with posts on opposite sides of its connection with the valve, twin-hooks for alternately engaging each of said posts, and means for operating the twin hooks.

5. In a flush-tank, the combination with a tank-chamber, inlet and outlet ways which communicate with said tank-chamber, valves for controlling said ways, said valves being coupled together, of a cross-arm connected with one of said valves and provided with posts, twin-hooks for actuating said cross arm, and a guard for preserving the operative relation of the twin hooks and cross arm.

6. In a flush-tank, the combination of a tank-chamber, a piston therefor, inlet and outlet ways which communicate with the tank-chamber on opposite sides of the piston, valves for controlling said ways, said valves being coupled together, a cross arm connected with one of said valves and provided with posts, and twin-hooks for actuating said cross arm with said hooks provided with inclines for deflecting said hooks on their descent.

7. In a flush-tank, the combination with a tank-chamber having ports in its opposite heads, of a piston provided with gaskets for the ports of said tank-chamber, inlet ways and outlet ways which communicate with said tank-chamber through the ports in the heads thereof, valves for controlling said ways, and means for operating said valves.

In testimony whereof I affix my signature, in presence of two subscribing witnesses.

RALPH E. BRISTOW.

Witnesses:
JAS. S. SMITH,
C. E. PAGE.

Correction in Letters Patent No. 874,565.

It is hereby certified that in Letters Patent No. 874,565, granted December 24, 1907, upon the application of Ralph E. Bristow, of Denver, Colorado, for an improvement in "Flush-Tanks," an error appears in the printed specification requiring correction, as follows: In line 49, page 3, the word "with" should be stricken out; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of January, A. D., 1908.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.

valves for controlling said inlet and outlet ways, and means for operating said valves to cause the water to pass through said ways and the tank-chamber.

2. In a flush-tank, the combination of a tank-chamber, a piston therefor, inlet and outlet ways which communicate with the tank-chamber on both sides of the piston, valves for controlling said inlet and outlet ways, and means for operating said valves to cause the water to pass through said ways without entering the tank-chamber.

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4. In a flush-tank, the combination with a tank-chamber, inlet and outlet ways which communicate with the tank-chamber, and valves for controlling said ways, said valves being coupled together, of a cross arm connected to one of said valves and provided with posts on opposite sides of its connection with the valve, twin-hooks for alternately engaging each of said posts, and means for operating the twin hooks.

5. In a flush-tank, the combination with a tank-chamber, inlet and outlet ways which communicate with said tank-chamber, valves for controlling said ways, said valves being coupled together, of a cross-arm connected with one of said valves and provided with posts, twin-hooks for actuating said cross arm, and a guard for preserving the operative relation of the twin hooks and cross arm.

6. In a flush-tank, the combination of a tank-chamber, a piston therefor, inlet and outlet ways which communicate with the tank-chamber on opposite sides of the piston, valves for controlling said ways, said valves being coupled together, a cross arm connected with one of said valves and provided with posts, and twin-hooks for actuating said cross arm with said hooks provided with inclines for deflecting said hooks on their descent.

7. In a flush-tank, the combination with a tank-chamber having ports in its opposite heads, of a piston provided with gaskets for the ports of said tank-chamber, inlet ways and outlet ways which communicate with said tank-chamber through the ports in the heads thereof, valves for controlling said ways, and means for operating said valves.

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