H. W. LEVERING.

MEANS FOR CLOSING VALVES.

APPLICATION FILED APR. 3, 1911.

1,094,796. Patented Apr. 28, 1914.

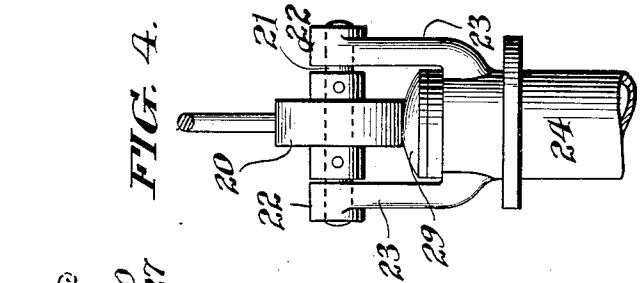


FIG. 4.

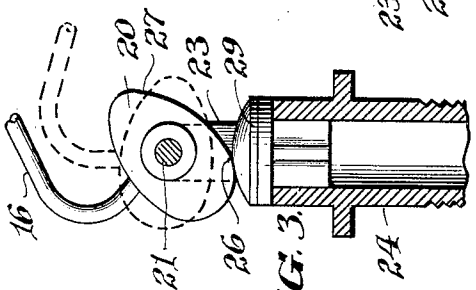


FIG. 3.

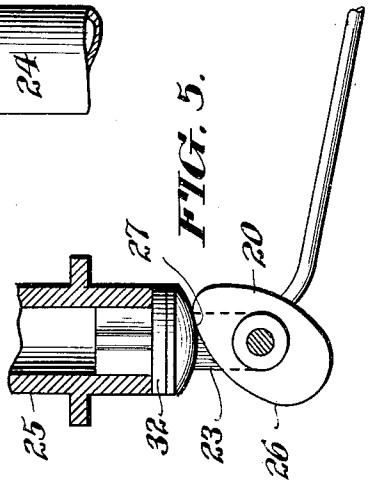


FIG. 5.

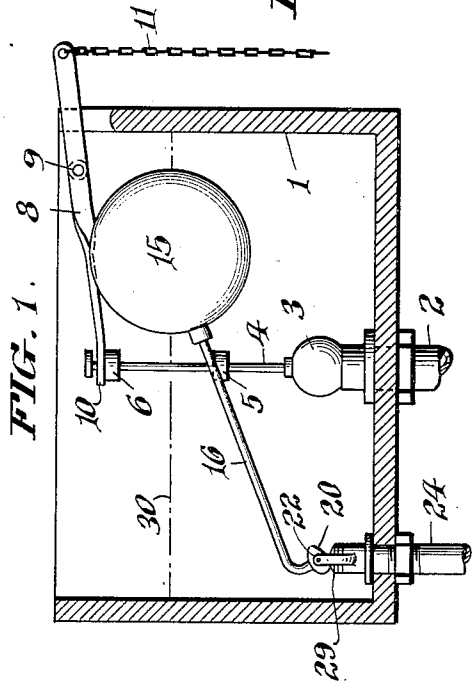


FIG. 1.

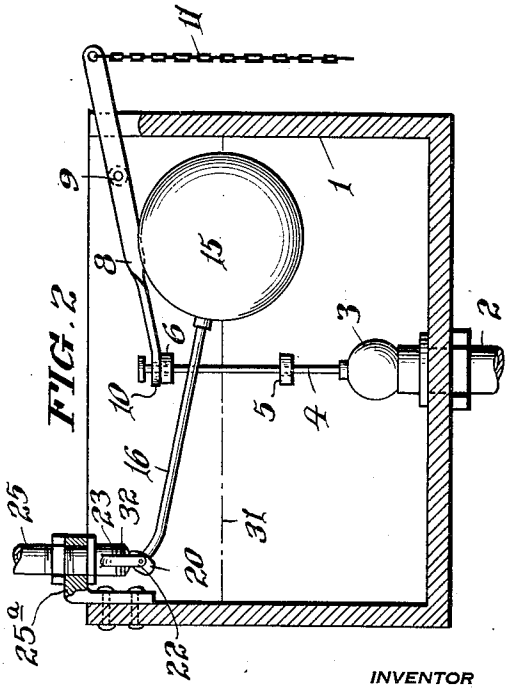


FIG. 2.

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MEANS FOR CLOSING VALVES.

1,094,796. Specification of Letters Patent. Patented Apr. 28, 1914.

Application filed April 3, 1911. Serial No. 618,686.

To all whom it may concern:

Be it known that I, HENRY W. LEVERING, a citizen of the United States, residing in Philadelphia, county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Means for Closing Valves, of which the following is a specification.

My invention relates to means for closing valves, but more particularly to means for closing the valves by means of which the flow of water into the flush tanks of water closet apparatus is controlled.

It has for its object to provide a construction for this purpose which may be said to be reversible and which is adapted for use whether the inlet for the water is located at the bottom or at the top portion of the tank.

By the employment of the construction embodying my invention, I am enabled to decrease the number of different kinds of valve operating means which otherwise it would be necessary to have on hand.

Further objects of my invention will be set forth in the detailed description thereof which follows or will be apparent from such description.

In the embodiment of my invention I have provided a lever or arm having at one end a float and at the other a cam having two actuating portions, one of which actuating portions operates to close the valve when the water inlet is at the bottom of the tank and when the water has reached a pre-determined height in the tank and the other one of which operates to close the valve when the water inlet is located at the top of the tank and when the water has reached a pre-determined height therein.

In order that my invention may be more readily understood, I have illustrated convenient forms of embodiment thereof in the drawings which accompany this application, but it will be understood that changes in the details of construction may be made within the scope of the claims without departing from my invention.

In the drawings:—Figure 1 is a sectional view of a tank having the water inlet at the bottom thereof and showing in side elevation the operating mechanism of the tank; Fig. 2 is a similar view in which the inlet for the water is located at the top of the tank; Fig. 3 is a view showing a portion of an inlet pipe in section, the valve being shown in side elevation and the valve operating cam being shown in two different positions; Fig. 4 is an elevation of a portion of the inlet pipe, the cam, and means for supporting the same looking toward the left in Fig. 3, the cam lever or arm being shown in section; and Fig. 5 is a sectional view of a portion of the inlet pipe shown in Fig. 2 with the cam in position to close the valve.

Referring to the drawings:—1 designates the flush tank; 2 an outlet pipe leading from the tank; and 3 a valve for closing the pipe 2.

In the construction shown the valve 3 is buoyant so that when once lifted from its seat upon the end of the pipe 2 it is sustained by the water in the tank at a position above its seat until the water in the tank falls to a level near the top of the pipe 2. The valve 3 is carried upon a valve stem or rod 4 guided in brackets 5 and 6 upon a side of the tank.

8 designates a lever pivoted at 9 and having connection at its inner end, as indicated at 10, with the upper end of the valve rod or stem 4.

11 designates a chain or similar device connected to the outer end of the lever 8 and by means of which movement of the said lever about its pivot 9 may be caused for the purpose of raising or lifting the valve 3 from its seat upon the upper end of the pipe 2 to permit the flow of water from the tank through the said pipe.

15 designates a ball upon the outer end of a lever 16 which ball is adapted to float upon the water which enters the tank 1. A cam 20 is secured to the opposite or inner end of the arm or lever 16 which cam and lever 16 are connected to a pivot or shaft 21 which is pivoted or journaled in bearings 22 in the ends of the brackets 23 formed upon the ends of the inlet pipes 24 and 25. The cam 20 is oblong in shape, being somewhat smaller at one end than at the other, as is illustrated in the drawings, and is secured at a point substantially near its center to the pivot 21. The cam is provided with two operating points or regions 26 and 27.

When the cam of the construction shown is employed in connection with an inlet lo-

cated at the bottom of the tank, as illustrated in Fig. 1 of the drawings, the portion 26 thereof is adapted to contact with the valve 29 and close the same when the water has entered the tank and has reached a pre-determined height indicated by the dotted line 30 in Fig. 1 of the drawings.

Referring to Fig. 1, when the valve 3 is opened the water escapes from the tank 1 and permits the falling of the float 15 and the consequent pivotal movement of the cam 20 in Fig. 1 so as to bring the intermediate portion thereof opposite the valve 29.

Movement of the ball 15 downwardly is limited by the bottom of the tank and by reason of the size of the ball the lever 16 in Fig. 1 is not permitted to move downwardly a sufficient distance to bring the actuating part 27 of the cam into contact with the valve 29 so that the pressure of the water within the inlet pipe 24 causes the valve 29 to open and the water is permitted to flow into the tank 1 until it again reaches the level indicated in said Fig. 1 at which time the ball 15 is raised to a sufficient height to cause the actuating part 26 of the cam 20 to close the said valve.

It is to be understood that the water flows more rapidly through the outlet pipe 2 than it does through the inlet pipe 24 in consequence of which the water falls in the tank 1 to a level co-incident with or near the top of the outlet pipe 2 at which time the valve 3 falls into or upon its seat at the upper end of the pipe 2 and closes the same so as to prevent the further flow of the water therethrough.

Referring to Fig. 2 it will be observed that the end of the inlet pipe 25 is located at the top of the tank, being supported by a bracket 25^a secured to the side of the tank. In this case the actuating part 27 of the cam operates to close the valve 32 when the water reaches the position indicated by the dotted line 31 in said Fig. 2. When the valve 3 in Fig. 2 is opened the water escapes rapidly through the outlet pipe 2 so as to permit the float 15 to fall to a lower position causing pivotal movement of the cam 20 so that the intermediate portion thereof occupies a position opposite the valve 32. When the cam is in such position the downward pressure of the water in the inlet pipe 25 upon the valve 32 causes the opening thereof and permits the entrance of water into the tank 1. When the water in the tank has been lowered to a point co-incident with or near the upper end of the outer pipe 2 the valve 3 drops into or upon its seat on the said pipe and closes the same after which the water again fills the tank 1 carrying the float 15 back to its position shown in Fig. 2 in which position the actuating part 27 of the cam 20 closes the valve 32 and shuts off the further flow of the water through the inlet pipe 25.

Having thus described my invention, I claim:—

1. The combination of a valve with valve closing means comprising a member pivotally supported in proximity to said valve and having portions upon opposite sides of its pivot which are adapted to contact with the valve to close the same, one of said portions being adapted to close the valve when the said member and valve are mounted in one position and the said member is moved pivotally in one direction and the other of said portions being adapted to close the valve when the said member and valve are mounted in reversed position and said member is moved pivotally in the same direction.

2. The combination of a valve with valve closing means which means comprises an oblong member pivoted at its center and having portions upon opposite sides of its pivot which are adapted to contact with the valve to close the same, one of the said portions being adapted to operate against the valve when the said member and valve are mounted in one position and the said member is moved pivotally in one direction and the other of said portions being adapted to operate against the valve to close the same when the said member and valve are mounted in reversed position and said member is moved in the same direction, and means for causing movement of the said pivotal member.

3. The combination of a valve adapted to control the issue of water into a water closet tank with means for closing the said valve which means comprises a lever having a float at one end thereof which is adapted to be lifted by the water entering the said tank and the said lever having at its end opposite said float a cam member pivoted in proximity to the valve, the said cam member having operating surfaces upon opposite sides of its pivot one of which is adapted to operate against the valve to close the same when the said cam member and the valve are mounted in one position and the said cam member is pivotally moved in one direction and the other of said surfaces being adapted to operate to close the valve when the said cam member and valve are mounted in a reversed position and said cam member is moved pivotally in the same direction.

4. In a device for controlling the issue of water into a water closet tank, a valve, means for closing the valve, said valve adapted to be located at the bottom or the top of said tank, the said means comprising a lever or arm having upon one end a float which is adapted to be lifted by the entry of water into the said tank and the opposite end of the said lever being provided with a cam, means for pivotally supporting the said cam in proximity to said valve, the

said cam having valve actuating portions located upon opposite sides of its pivot, one of the said actuating portions adapted to operate to close the valve when the valve is located at the bottom of the tank when the said float is lifted and the other of the said actuating portions adapted to operate to close the valve when it is reversed and located at the top of the tank when the float is lifted.

5. In a device for controlling the issue of water into a water closet tank, a valve, means for closing the valve, said valve adapted to be located at the bottom or the top of said tank, the said means comprising a lever or arm having a float connected at its outer end which is adapted to be lifted by the flow of water into the said tank, and a cam of oblong shape rigidly connected to the said lever or arm at its opposite inner end, the said cam being pivoted at its center, means for supporting the said pivoted cam in proximity to said valve, the said cam being provided with portions adjacent to its opposite ends and upon the opposite sides of its pivot, one of which portions is adapted to contact with the valve when located at the bottom of the tank to close the same when the float is lifted and the other of the said portions adapted to contact with the valve when in reversed position and located at the top of the tank to close the same when the said float is lifted, and the intermediate portion of the said cam being situated opposite the valve when the said float is in its lower position, whereby the pressure of the water from the water supply occasions the opening of the valve to permit the entry of the water into the said tank to raise the said float and thereby close the valve.

In testimony that I claim the foregoing as my invention, I have hereunto signed my name this 31st day of March, A. D. 1911.

HENRY W. LEVERING.

In the presence of—
EDWARD J. FISHER,
CARRIE E. KLEINFELDER.

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