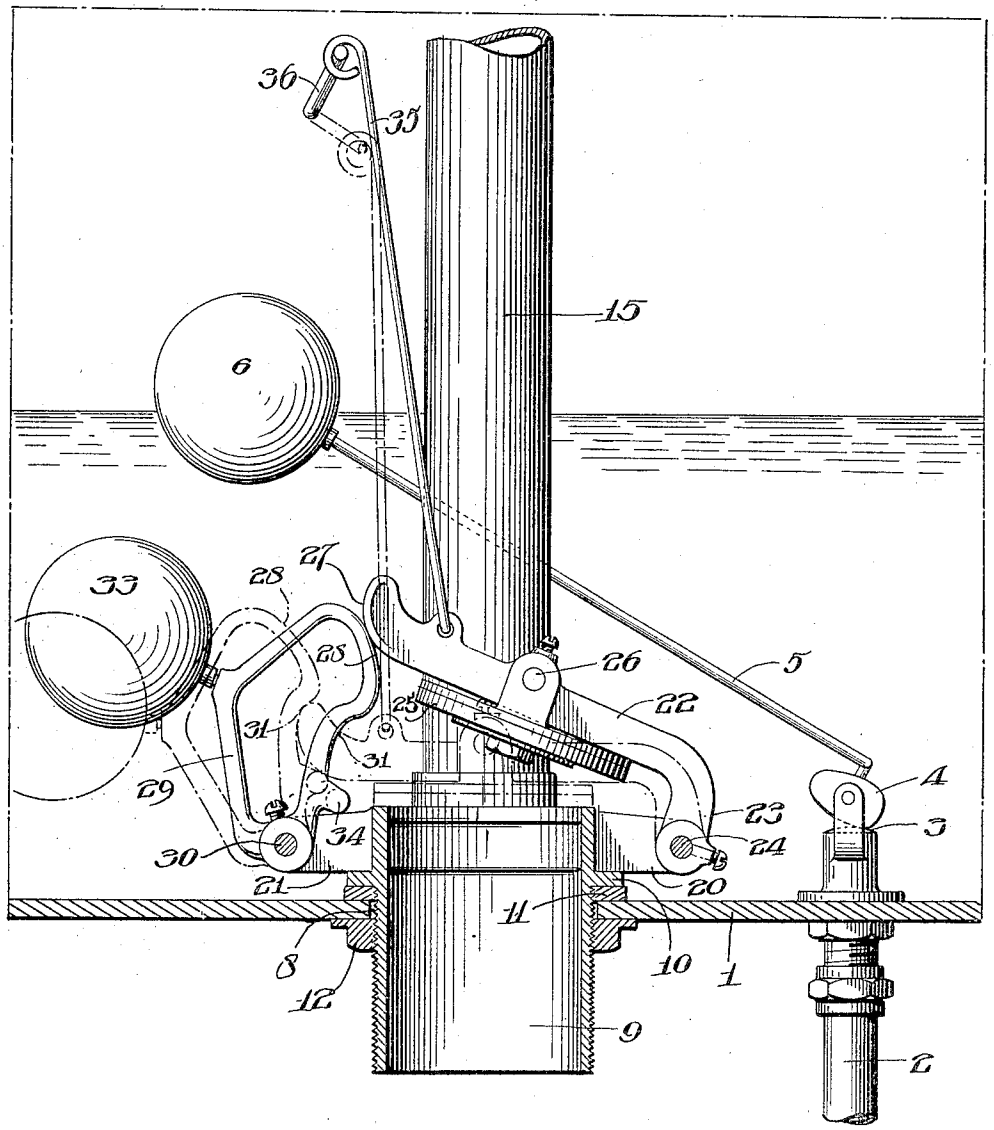
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VALVE CONTROLLING MEANS FOR WATER CLOSET APPARATUS.

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1,397,208. Patented Nov. 15, 1921.



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VALVE-CONTROLLING MEANS FOR WATER-CLOSET APPARATUS.

1,397,208. Specification of Letters Patent. Patented Nov. 15, 1921.

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To all whom it may concern:

Be it known that I, WILLIAM U. GRIFFITHS, a citizen of the United States, and a resident of the city of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Valve-Controlling Means for Water-Closet Apparatus, of which the following is a specification.

In the case of flushing apparatus for flushing water closet bowls and similar devices in which a siphon or equivalent structure is not employed, it is desirable that means be employed for holding the valve which closes the port from the flush tank into the flush pipe in open position, while the flushing action is taking place.

The object of my present invention is to provide an improved construction of means for holding such valve in open position, while the water is being emptied from the flush tank through the flush pipe to the water closet bowl or similar structure or device for the purpose of flushing the same, which construction not only operates to prevent an unnecessarily loud noise when the valve contacts with its seat, but also permits such contact to take place with such force as to cause the valve to close tightly against its seat and completely shut off the water from the flush tank to the flush pipe.

A further object of my invention is to provide a construction which may not only be cheaply and economically constructed or built, but one which is certain in its action, so as to prevent accidents and one which will always perform the functions which it is intended to perform.

In order that my invention may be readily and clearly understood, reference should be had to the accompanying drawing in which I have illustrated one form of a convenient embodiment of my invention. However, it will be understood that my said invention is susceptible of embodiment in other forms of construction within the scope of the claims.

In the drawing I have shown a vertical sectional view of the bottom portion of a flush tank, the devices embodying my invention being shown in elevation, and the sides and top of said tank being indicated by dot and dash lines.

Referring to the drawings:—

1 designates the bottom of a flush tank and 2 a water supply pipe for supplying water thereto. 3 designates a valve adapted to be controlled by means of a pivoted cam device 4 having an arm 5 connected therewith to the outer end of which a float 6 is secured. The operation of the valve 3 is well known and needs no further description here.

The bottom 1 of the flush tank is provided with an opening 8 into and through which a short section of pipe 9 projects. The lower end portion of this section of pipe is screw threaded externally whereby it is adapted to be connected with a flush pipe, the latter having a connection at its opposite or lower end with a water closet bowl or other device requiring to be flushed from time to time. The upper end of the section of pipe 9 projects a distance above the bottom 1 of the tank and is provided with a lateral flange 10 which rests upon a washer 11 which extends around the section of pipe 9 and rests upon the bottom 1 of the tank at the edge of the opening 8 therein. The annular flange 10 is drawn firmly against the washer 11 and the latter against the bottom 1 of the tank by means of the binding nut 12 in known manner.

15 designates an overflow pipe having connection with a hollow projection extending laterally from the upper end of the section of pipe 9 within the tank. The upper end of said pipe section 9 is provided with lateral projections 20 and 21. A lever 22 is provided with transversely extending portion 23, which is pivoted at 24 to the lateral projections 20.

A valve 25 is pivotally connected at 26 to the lever 22, the forward swinging end of which lever extends a distance beyond such connection. The under side of the forward end portion of said lever is curved as indicated at 27 to form a curved surface which coöperates with the curved surface 28 of the upper end portion of a skeleton arm 29 pivoted at 30 to the projections 21.

The curved surface 28 is formed upon the upper overhanging end portion of the skeleton arm 29, and the portion of said arm underneath the said overhanging portion is bent inwardly or hollowed out as indicated at 31, such inward bend beginning at a point a sufficient distance above the upper end of the section of pipe 9 which constitutes the seat for the valve 25 to permit the valve 25 to fall with such force against the said up-

per end of the pipe 9 as will cause it to tightly close the upper end of said pipe.

The said skeleton arm 29 is provided with a float 33 which when the tank is filled or partially filled with water operates to cause or tend to cause pivotal movement of said arm toward the opposing curved surface 27 upon the end portion of the lever 22. The extent of such movement of the lever 29 is limited by the stop 34 which contacts with one of the projections 21.

The valve 25 is shown as being in closed position by the dash and dot lines in the drawing in which position the forward upper end of lever 22 is situated in the recess or space underneath the overhanging upper end portion of the arm 29.

When it is desired to flush a water closet bowl or other device the valve 25 is opened by lifting lever 22 through the medium of the link 35 and the crank arm 36. In moving to open position the swinging end of lever 22 contacts with the overhanging end portion of arm 29 to cause outward pivotal swinging movement thereof. As the lever 22 moves upwardly the arm 29 moves inwardly under the influence of float 33, so that the surface 28 of the overhanging end portion of lever 29 presses constantly and firmly against the surface 27 of said lever. The arm 29 under the influence of float 33 holds the lever 22 in elevated position until the water is emptied sufficiently from the tank to permit the float 33 to fall or move downwardly toward the left (having reference to the drawing) carrying the upper overhanging projecting portion of arm 29 away from lever 22, so as to permit the surface 27 to slide downwardly over surface 28 until the said surface 27 reaches the lower end of surface 28, after which the lever 22 falls downwardly under the influence of gravity with sufficient rapidity to cause valve 25 to strike with sufficient force against the upper end of the section of pipe 9 to cause a tight and complete closure of said valve.

The surface 27 is permitted to disengage surface 28 a distance above the upper end of the section of pipe 9 just sufficient to permit the valve 25 to strike with the force necessary to effect a tight closure thereof, but not with sufficient force to produce an unnecessarily loud and objectionable noise.

I claim:—

1. The combination of a valve structure having a portion provided with a curved cam like surface, an arm provided with an overhanging projecting portion at its upper end having a curved surface adapted to contact with the curved cam like surface upon the said valve structure, the said arm being bent or extended inwardly to form a space beneath the said overhanging projecting portion to permit the said valve structure to move uninterruptedly and unretarded into closed position, and means for causing movement of the said arm in a direction toward the said valve structure, substantially as described.

2. The combination of a lever pivoted at one end, a valve connected with said lever at a point intermediate its ends, the outer swinging end of said lever projecting beyond said valve, an arm having an overhanging projecting upper end portion which is adapted to contact with the opposing swinging end of said lever, the said overhanging projecting portion terminating a distance above the seat for said valve whereby the latter may be permitted to fall through a distance sufficient to cause a complete and tight closure thereof against its seat, and means tending to cause movement of said arm in a direction toward the opposing end of the said lever, substantially as described.

3. In means for controlling the outlet valve for a water closet apparatus, the combination of a lever pivoted at one end, a valve connected with said lever at a point intermediate its ends said lever projecting beyond the said valve, means for elevating the said lever and valve from closed to open position, a pivoted arm situated adjacent to the swinging end of said lever, said arm being provided with an overhanging projecting portion at its upper end and with a hollowed out portion underneath the said overhanging projecting portion, the said overhanging projecting portion being adapted to contact with the adjacent opposing swinging end portion of said lever and terminating at a point to permit the said lever and the valve carried thereby to fall through a distance sufficient to cause contact of said valve against its seat with force sufficient to effect a tight closure thereof, and a float secured to said arm and tending to cause pivotal movement thereof in a direction toward the adjacent opposing swinging end of the said lever, substantially as described.

4. The combination of a pivotally supported valve for closing a port leading from a flush tank, said valve being adapted to be moved into and out of closed position, and a pivoted arm for holding said valve in open position after it has been opened, said arm being provided with a curved portion which contacts with a part of the valve structure and which is adapted to be gradually disengaged from the said valve structure to permit the latter to close with a slow movement until it is relatively near its closed position when it is released and permitted to fall into closed position, substantially as and for the purpose described.

5. In a structure of the character described, the combination of a pivotally supported valve structure for closing a port leading from a water tank, means for mov-

ing the said valve into open position, a pivoted arm adapted to contact with a part of the valve structure, said arm having means for regulating the descending movement of the said valve structure to a point relatively near the closing position thereof, means having connection with said arm and adapted to control the movements of the same, whereby the said arm is adapted to contact with a part of the valve structure and hold the valve in open position and to control the descending movement thereof toward its closed position to a point relatively near the closing position thereof, and the said arm releasing the said valve structure at the end of such controlled movement, substantially as and for the purpose described.

6. In a structure of the character described, the combination of a valve for closing a port leading from a water tank, a pivoted lever for supporting said valve, the outer swinging end of said lever being provided with a curvilinear cam-like surface, means for moving the said valve into open position, a pivoted arm for engaging the outer end portion of the said lever to hold it in open position, said arm having a projecting cam-acting surface at its upper inner end portion which coöperates with the said curvilinear cam-like surface of the said lever during the first part of the downward movement of the valve and controls such movement, and the said forwardly projecting surface portion of the said arm terminating so as to permit an unretarded falling movement of the said lever and valve from a point above the closed position of the latter, and a float connected with the said arm, the influence of the water in the tank thereon controlling the pivotal movement of the said arm, substantially as described.

7. In a structure of the character described, the combination of a pivoted valve structure adapted to close a port leading from a tank, means for moving said valve structure into open position, an arm pivoted at one end and contacting with said valve structure at its opposite end for controlling the closing movement of said valve structure, the said structure and arm being pivoted at points on opposite sides of the said port and being adapted to swing toward and from each other, such swinging movements being toward and from said port, and means tending to cause movement of said arm toward said structure.

8. In a structure of the character described, the combination of a pivoted lever provided with a valve adapted to close a port leading from a tank, means for moving said lever into position to open the said valve, a pivoted arm for controlling the closing movements of said lever and valve, the said lever and arm being pivoted at points on opposite sides of said port and being adapted to swing toward and from each other, such movements being toward and from said port, the said arm being provided with an overhanging cam-like portion adapted to engage the outer swinging end of said lever when the latter is in elevated position to open said valve, the said portion being adapted to release the said lever when the latter has reached a point at which the valve is situated relatively near its closed position, and means tending to cause movement of the said arm toward the said lever.

In testimony that I claim the foregoing as my invention I have hereunto set my hand this 6th day of February, 1918, A. D.

WILLIAM U. GRIFFITHS.