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FLUSHING VALVE FOR WATER CLOSETS.

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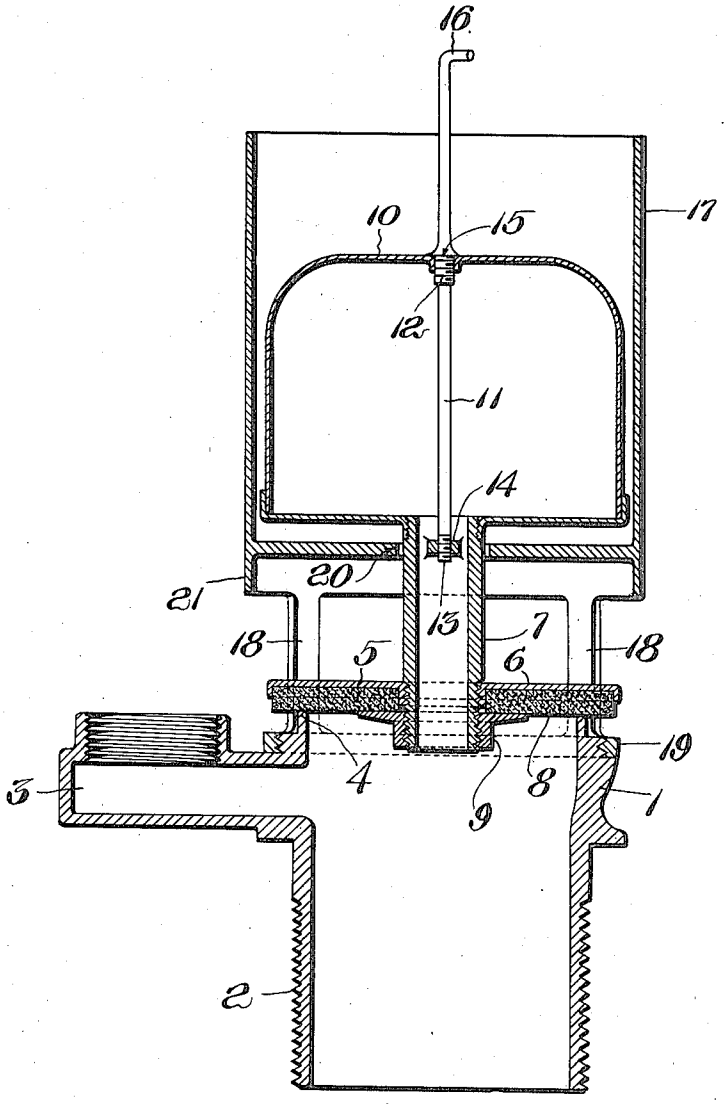
1,283,473. Patented Nov. 5, 1918.



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FLUSHING-VALVE FOR WATER-CLOSETS.

1,283,473. Specification of Letters Patent. Patented Nov. 5, 1918.

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To all whom it may concern:

Be it known that I, ANDREW F. CURTIN, a citizen of the United States, residing at Medford, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Flushing-Valves for Water-Closets; 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.

The present invention relates to flushing valves for water-closets, and has for its object to improve and simplify the construction of such valves so as to increase their efficiency and render them positive in action, having no parts liable to bind or get out of order, or interfere in any way with the operation of the valve. With this and other objects in view, as will hereinafter appear, the invention consists in the valve described in the following specification and subsequently defined in the claims.

In the accompanying drawing, which illustrates the preferred embodiment of the invention, the figure is a vertical sectional view of the improved flushing valve. The hollow body portion of the valve, which is indicated at 1, is open at the top, and has depending therefrom a spud 2, which is adapted to project through a hole in the bottom of the flushing tank and is externally threaded for connection with a flushing pipe leading to the closet bowl. As usual the open top of the valve body constitutes the inlet and the opening at the lower end of the spud the outlet of the valve. A hollow arm 3 projects laterally from the valve body and is provided at the top with a threaded opening to receive the lower end of an overflow pipe. The tank, the overflow pipe, and the flushing pipe are of the usual type and are not shown in the drawing. Surrounding the inlet opening is an annular valve seat 4 against which a valve proper 5 is adapted to be normally seated. The valve proper comprises a disk 6 secured to the lower threaded end of a hollow valve stem 7 and is provided with a gasket 8, of leather, to insure a water tight joint between the valve and the valve seat. The gasket is held in place on the under side of the disk by means of a threaded follower 9 screwed onto the projecting end of the valve stem. Secured to the top of the valve stem is a hollow float 10 which may be of any suitable construction and is provided with a rod 11 which extends vertically therethrough and is threaded at 12 and 13 for engagement with threaded apertures in the top of the float and in a cross-bar 14 in the valve stem, respectively. The threads at 12 and 13 are of the same pitch thus permitting the rod 11 to be screwed into the cross-piece 14 and into the top of the float simultaneously. A shoulder 15 is provided on the rod 11, adjacent the threaded portion 12, which bears firmly against the top of the float when the rod is screwed into place. The rod extends above the shoulder 15 and is bent sharply at 16 to form a hook adapted to be connected by a suitable link or chain to the usual lever by means of which the valve is operated to flush the bowl. The float is contained within a float chamber 17 in which it is adapted to move to control the closing of the valve. The float chamber 17 is supported above the valve by upright arms 18 which rise from a collar 19 internally threaded and screwed onto the body portion of the valve and which serve to guide the upward and downward movements of the valve disk. The bottom of the float chamber is provided with an opening 20 through which the valve stem passes freely. The top of the chamber is open and the cylindrical side wall thereof extends below the bottom, providing a skirt 21 which closely surrounds the edge of the valve disk when it is in wide open position and protects it from the force of the outrush of water. The side wall extends upwardly a sufficient distance to cause its top edge to be flush with the top of the float when the float is in its highest position. The normal level of the water in the flushing tank is well above the open top of the float chamber and therefore the float chamber is normally filled. The opening in the bottom of the float chamber is slightly larger than is necessary to permit the movement of the valve stem therethrough in order to permit the gradual escape of the water from the chamber after the valve has been opened and water level in the tank has receded below the top of the chamber. Normally the valve is held seated against the buoyancy of the submerged float by its own weight and the weight of the parts connected therewith and by the pressure of the water in the tank upon the valve disk.

The operation of the device is as follows:

When the closet bowl is to be flushed the valve is lifted in the usual manner, the float is raised to the top of the float chamber and the water flows down around the float and up through the opening 20 around the valve stem into the bottom of the float chamber. As soon as the valve is lifted the water in the flushing tank will start to flow down through the valve body and through the flushing pipe to the closet bowl. The buoyancy of the float holds the valve open after it has been lifted to its full height. When the tank has been emptied and the bowl has been flushed the float chamber will still be nearly filled with water and the float will hold the valve disk in raised position temporarily, but as the water escapes from the float chamber through the opening 13 around the valve stem the valve disk will move slowly toward its seat. The closing of the valve will therefore be governed entirely by the recedence of the water in the float chamber and inasmuch as the outlet is restricted the water will escape slowly and consequently the valve will move gradually toward its seat. The closing of the valve will thus be delayed until after the water has been emptied from the tank and ample time has been allowed for the proper refill of the bowl. Finally the valve disk will be brought gently and noiselessly into engagement with its seat.

The duration of the closing movement of the valve is determined by the area of the outlet of the float chamber which may be so proportioned as to produce the proper amount of retardation. It has been preferred to provide for the escape of the water from the float chamber through the opening 13 around the valve stem as it is desirable to have the valve stem slide loosely through the bottom of the chamber to prevent cramping.

It will be seen that a slow and gradual closing of the valve and consequently a proper refill of the bowl is secured by the means herein described. The retarding means is located entirely outside of the valve body so that there will be no obstruction to the flow of water therethrough. A simple and durable construction has been provided in which there are no parts liable to be injured by wear or to get out of order. The possibility of any interference with the effective operation of the valve due to the binding or cramping of parts has been eliminated. The valve may be easily assembled before the float chamber is screwed onto the valve body and the float chamber may be easily removed from the body when desired thus rendering both the float and the valve disk easily accessible. It is apparent that a valve constructed as above described may be cheaply and easily manufactured.

Having thus described the invention, what is claimed as new is:

1. A flushing valve for water-closets having, in combination, a hollow body portion having an inlet and an outlet, a valve normally closing said inlet, a float connected with the valve, a float chamber in communication with the flushing tank so that the water fills said chamber when the tank is filled and recedes gradually in said chamber when the tank is emptied to retard the closing of the valve.

2. A flushing valve for water-closets having, in combination, a hollow body portion having an inlet and an outlet, a valve normally closing said inlet, a float connected with the valve, a float chamber having an inlet through which said chamber is filled when the flushing tank is filled and a restricted outlet through which the water may flow after the water in the tank has receded to a predetermined level, but not in sufficient quantity to permit the closing of the valve until after the tank has been emptied.

3. A flushing valve for water-closets having, in combination, a hollow body portion having an inlet and an outlet, a valve normally closing said inlet, a float connected with the valve, and a float chamber adapted to be filled with water and having means governing the closing of the valve independently of the level of water in the flushing tank after the water in the tank has receded below a predetermined level.

4. A flushing valve for water-closets having, in combination, a hollow body portion having an inlet and an outlet, a valve normally closing said inlet, a float connected with the valve, a float chamber removably secured to said body portion and provided with openings for permitting an unrestricted flow into said chamber after the flushing tank has been filled to a certain level and a restricted flow from said chamber after the water in the tank has receded to a predetermined level.

5. A flushing valve for water-closets, having, in combination, a hollow body portion having an inlet and an outlet, a valve normally closing said inlet, and means for supporting the valve out of the path of the outflowing water when the valve is opened.

ANDREW F. CURTIN.