

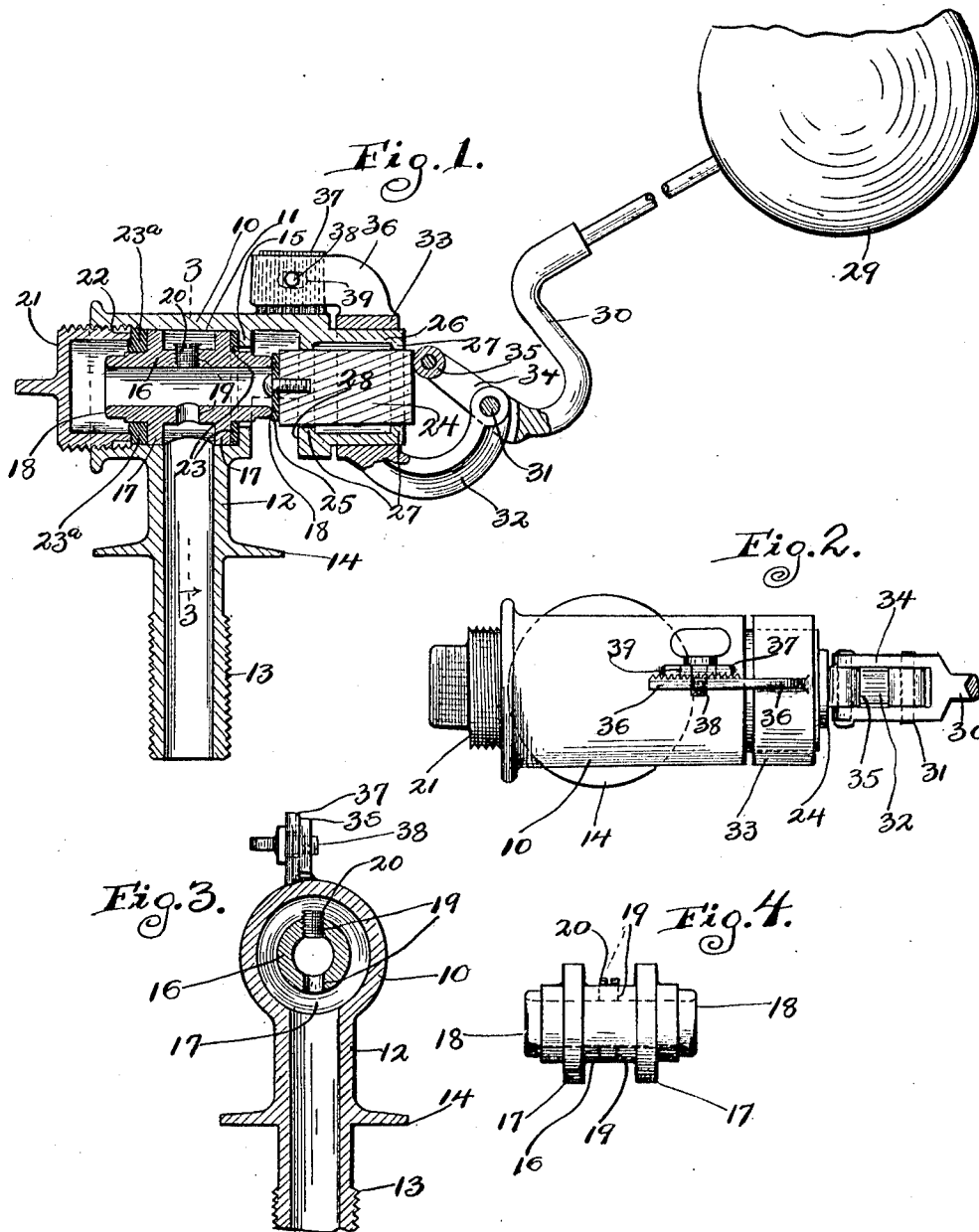
J. F. JENNINGS.

VALVE.

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969,874.

Patented Sept. 13, 1910.



Witnesses:—
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UNITED STATES PATENT OFFICE.

JOHN F. JENNINGS, OF CLEVELAND, OHIO.

VALVE.

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To all whom it may concern:

Be it known that I, JOHN F. JENNINGS, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Valves; and I 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 pertains to make and use the same.

This invention relates to valves and particularly to float controlled valves for flushing tanks.

One of the objects of the invention is the provision of a valve which is very simple in construction and durable, consisting of few parts which are not liable to get out of order.

A further object is to provide a valve which admits the water to the tank in such a manner that the undesirable noise common to most valves in use at the present time, due to the rush or rapid flow of water into the tank is eliminated, and at the same time to provide means whereby the rate of flow can be adjusted to suit the varying conditions of water pressure.

A further object is to provide means for avoiding hammering or pounding of the column of water in the service or supply pipe against the valve when the latter is closed by the float.

A further object is to provide means whereby adjustments may be made to vary the quantity of water in the tank necessary to close the valve and also for accommodating different thicknesses of packing or other parts which may become worn by use.

In carrying out my invention I provide a valve adapted to be supported in the flush tank and having a chamber or compartment which is connected to the inlet or supply pipe and containing a tubular member extending longitudinally of the compartment over the inlet opening, one end projecting beyond the compartment and serving as the valve seat. The tubular member is provided intermediate its ends with one or more openings which admit the water to the interior thereof, the water passing through the open end of the tubular member to the flush tank. The valve consists of a plunger which is supported in line with

the tubular member, one end being adapted to abut against the end of the latter, when shifted by the float.

The rate of flow of water into the tank depends for a certain service pressure upon the size and number of the openings in the wall of the tubular member, and the number of openings can be increased or decreased to suit the conditions of pressure. As the size of the opening or openings is comparatively small the tank will fill slowly and consequently practically noiselessly.

Between the end of the tube opposite the valve seat and the end of the compartment is a space in which air is trapped when the valve is closed, and this air serves as a cushion to overcome the hammering or pounding of the water column in the supply pipe just after the valve is closed.

Both ends of the tubular member are preferably constructed alike so that in case the valve seat at one end of the tubular member becomes worn from use, the latter can be removed and turned end for end so as to present a new valve seat to the valve.

The float is supported on a valve operating lever which is fulcrumed on a bracket adjustably mounted on the end of the casting, the end of the lever engaging the end of the plunger valve. In case it is desired to vary the water level in the tank or to accommodate the valve to different thicknesses of parts such as packing, the bracket can be adjusted so as to cause the end of the lever to engage the end of the valve in the desired manner.

The invention may be further briefly summarized as consisting of certain novel combinations and arrangement of parts and details of construction which will be described in the specification, and set forth in the appended claims.

For better understanding of my invention reference is had to the accompanying drawings in which—

Figure 1 is a vertical sectional view of a valve equipped with my invention; Fig. 2 is a plan view of the same, parts being omitted; Fig. 3 is a vertical section taken approximately along the line 3—3, Fig. 1 looking in the direction indicated by the arrow; and Fig. 4 is a view of the tubular valve seat detached.

Referring to the figures of the drawing

10 represents the main valve casing, the head or main portion of which is substantially cylindrical in outline and is horizontally arranged when the valve is in position. The casing has a chamber or compartment 11 on the lower side of which is an integral inlet pipe or tubular projection 12 having a threaded lower portion 13 adapted to be screwed into the end of the service or supply pipe and provided above the threaded portion with a flange 14 adapted to bear against the bottom of the tank, not shown. The chamber 11, which is provided at one side of the inlet pipe 12 with an internal flange 15, contains a tubular member 16 which extends longitudinally thereof and is located directly over the inlet opening. This member 16 is provided with two parallel spaced external flanges 17 which fit closely the inner cylindrical wall of the chamber and is provided with ends 18, one of which extends through the opening formed by the internal flange 15 and serves as a valve seat. The flanges 17 are located on each side of the inlet opening, the distance between the flanges being substantially the diameter of the inlet opening. The cylindrical wall of the tubular member is provided intermediate the flanges 17 with inlet openings 19, two being here shown. In this instance one of the openings is closed by a threaded plug 20.

The tubular member is held tightly in position against the internal flange 15 by means of a hollow plug or cap 21 which is threaded externally and is screwed into the internally threaded end 22 of the chamber. Between the internal flange 15 and the adjacent flanges 17 of the tubular member and between the opposite flange 17 and the end of the hollow plug 19 are interposed packing washers 23 and 23^a which prevent a leakage of water into the chamber between the flanges 17 and the cylindrical wall of the chamber.

It is seen that the external flanges of the tubular member and the cylindrical walls of the latter and of the chamber intermediate the flanges form an annular passageway into which the water from the inlet pipe passes and that the only outlet for the water to the interior of the tubular member is through the openings 19 in the wall thereof. Located in position to engage the valve seat 18 is a valve 24, in this case a plunger valve, provided on its face with suitable pad 25 of yieldable material. The valve 24 is slidably mounted in a passageway 26 in a valve supporting portion 27 which is integral with the casing and is spaced a short distance from the internal flange 15 through which the valve seat extends. Between the flange 15 and the adjacent face of the portion 27 is an annular passageway having at the bottom an opening 28 through which the water

passes from the mouth of the tubular member 16 into the tank.

The float 29 is mounted upon a lever 30 which is pivoted at 31 on the outer end of an arm 32 forming a part of a sleeve-like bracket 33 adjustably mounted upon the reduced portion of the valve supporting portion 27. The lever 30 has a bifurcated end 34 which carries a roller 35 which engages the end of the plunger valve 24 and presses the same inward against the valve seat when the water rises in the tank. The sleeve 33 is provided with an arm 36 which extends at right angles over the casing and engages a lug 37 extending upward from the top of the casing, the arm 36 being held in engagement with the lug by means of a screw 38, which passes through an elongated slot 39 in the lug 37. The adjacent faces of the lug and arm 36 are serrated so that the bracket can be held in any desired adjusted position. Thus it will be seen that when the main outlet of the tank is opened the water will flow from the tank lowering the float 29 and carrying the roller 35 on the end of the lever away from the end of the valve. Consequently, the pressure of the water in the service pipe will force the valve away from the valve seat causing the water to flow into the tank. Since the water must pass through the opening or openings in the wall of the tubular member in passing into the latter, it is evident that the flow of water will be practically noiseless. Also the rate of flow can be adjusted to suit the varying conditions of water pressure by plugging or unplugging one or more of the openings 19. While I have shown only two openings 19 it is apparent that more may be provided if desired. It will also be apparent that the cushion formed by the air which will be trapped in the space at the end of the chamber 11 opposite the valve seat, will prevent the undesirable hammering or pounding of the water in the service pipe common to many valves in use at the present time.

If it is desired to vary the quantity of water which is normally retained in the tank or if it is desired to change the position of the lever to make adjustments for wear or for different thicknesses of parts which may be substituted for others worn by use, or if it is desired to change the degree of pressure of the lever against the valve all that is necessary is to adjust the position of the bracket 33.

In case the tubular valve seat becomes worn, it can be removed and turned end for end since both ends are constructed alike, and the life of the valve seat is thereby practically doubled.

I do not desire to be confined to the exact details shown but aim in my claims to cover

all modifications which do not involve a departure from the spirit and scope of my invention.

What I claim is,—

5 1. In a valve for flushing tanks the combination of a casing open at each end and provided with an inlet and an outlet port intermediate the said ends, said casing being provided with an interior annular flange
10 between the inlet and outlet ports, a tubular member of less diameter than the interior diameter of the casing arranged within said casing so as to span said inlet opening, said tubular member being provided with a pair
15 of spaced annular flanges of the same diameter as the interior diameter of the casing and with openings arranged between said flanges, a plug arranged to screw into one end of the valve casing and clamp said
20 valve seat against the annular flange in said casing, a piston valve arranged to slide freely in the opposite end of said casing and extend beyond the end of said casing, a float operatively supported from said casing and
25 means operatively connected with said float and adapted to come in contact with said valve and hold the same on the valve seat when the float is in its highest position.

30 2. In a valve for flushing tanks the combination of a casing open at each end and provided with an inlet and an outlet port

intermediate the said ends, said casing being provided with an interior annular flange between the inlet and outlet ports, a removable
35 tubular valve seat having a series of openings extending over the inlet and provided with a pair of spaced flanges intermediate the ends thereof, a plug arranged to screw into one end of the valve casing and clamp
40 said valve seat against the annular flange in said casing, a piston valve arranged to slide freely in the opposite end of said casing and extend beyond the end of said casing, a collar slidably mounted on said casing, a lug formed on said casing adjacent to
45 said collar, an arm secured to said collar and adjustably connected to said lug, a bracket arm secured to said collar, a float lever pivoted on said bracket and having its free end arranged to come in contact
50 with said valve, a roller mounted on the end of said lever in contact with said valve and a float mounted on the opposite end of said lever substantially as described.

In testimony whereof, I sign the foregoing
55 specification, in the presence of two witnesses.

JOHN F. JENNINGS.

Witnesses:

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