Feb. 24, 1925. 1,527,429

J E. ERICSON

NOISELESS FLOAT VALVE

Filed Dec. 19, 1921

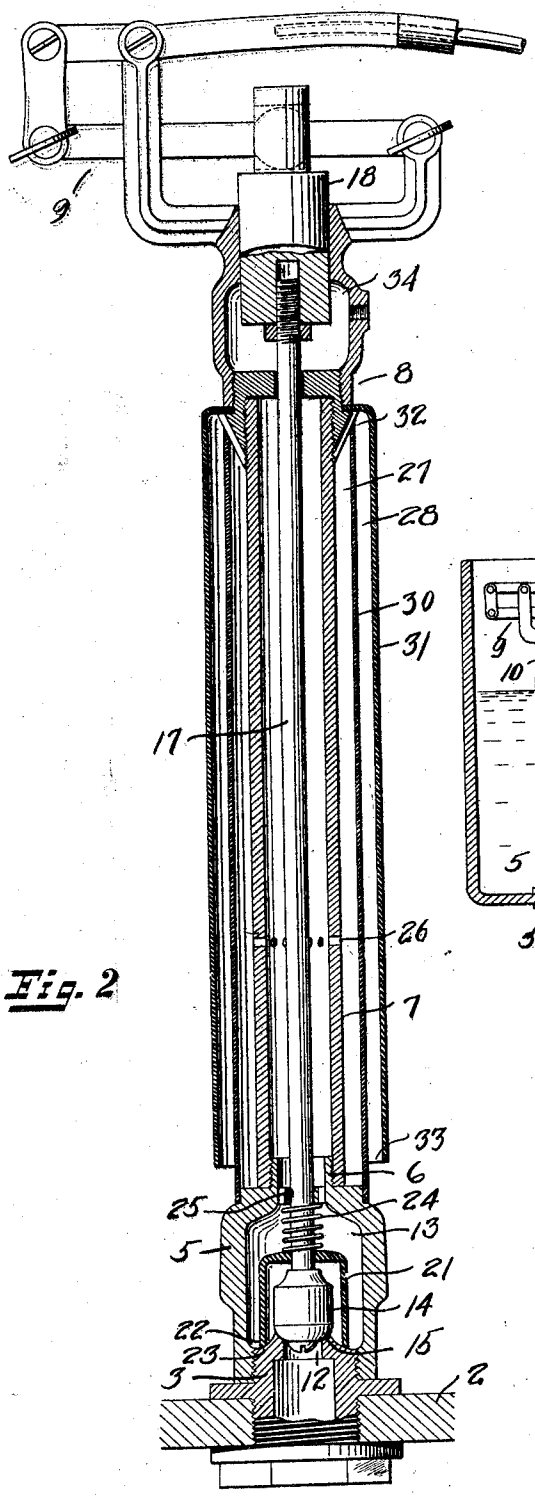


Fig. 2

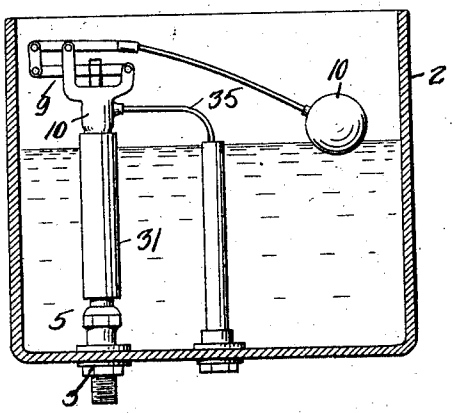


Fig. 1

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UNITED STATES PATENT OFFICE.

J EDWIN ERICSON, OF OAKLAND, CALIFORNIA.

NOISELESS FLOAT VALVE.

Application filed December 19, 1921. Serial No. 523,344.

To all whom it may concern:

Be it known that I, J EDWIN ERICSON, a citizen of the United States, and a resident of Oakland, county of Alameda, and State of California, have invented a new and useful Noiseless Float Valve, of which the following is a specification.

My invention relates to a valve for controlling the flow of water to a flush tank.

An object of the invention is to provide a valve of the character described which will enable the water to be introduced into the tank without the objectionable noise.

Another object is to provide a valve having the foregoing feature, which allows of the tank being filled very quickly.

A further object is to provide a valve of the character described which is extremely simple and economical in construction.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of my invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood that I do not limit myself to the showing made by the said drawings and description, as I may adopt variations of the preferred form within the scope of my invention as set forth in the claims.

Referring to said drawings:

Figure 1 is a sectional view taken through a flush tank showing the valve in elevation.

Figure 2 is a longitudinal sectional view of the valve and a portion of the associated parts.

As illustrated the valve is arranged in a flush tank 2 and is combined with the flanged nipple 3 which extends through the bottom of the tank and connects with the feed pipe. Secured to the nipple such as by screw-threaded engagement is a valve housing 5 to the discharge end 6 of which is fixed an outlet pipe 7. The latter supports the head 8 upon which is mounted the lever mechanism 9 connected to the float 10.

The nipple 3 is provided with an opening 12 which communicates with the chamber 13 within the casing and is adapted to be closed by a valve 14 normally resting on the seat 15. The valve 14 is provided with a stem 17 which extends through the casing 5 and pipe 7 and into the head 8 where it is adjustably secured to a cap 18 which is slidably mounted in the head and is slotted for engagement with one of the float actuated levers 9. When the float is in an elevated position the levers exert a downward pressure on the cap and cause the valve to be firmly held upon its seat, thereby cutting off the supply of water to the tank.

Slidably mounted on the stem and enclosing the valve 14 is what may be termed a secondary valve 21. The latter is in the form of a shell or inverted cup, the base 22 of which is adapted to rest on a seat 23 surrounding the seat 15 of the valve 14. A spring 24 interposed between the top of the valve 21 and the web 25 in the interior of the housing functions to resiliently retain the second valve against its seat. When the valve 21 is seated it virtually forms a substantially sealed chamber in which the valve 14 and its entire seat are contained. When both valves are seated the top of the valve 14 is spaced from the adjacent portion of the valve 21, thereby allowing the first named valve to be raised from its seat a limited amount without affecting the other valve.

In the operation of the apparatus, upon the sufficient lowering of the level of the water within the tank, and the consequent descent of the float, the valve 14 is raised until it abuts against the valve 21, the weight of the float being merely sufficient to displace said first valve. As soon however as the opening 12 is uncovered, the water from the supply pipe fills the chamber within the valve 21 and the pressure thereof causes the said valve to be raised from its seat, whereupon the water passes into the chamber 13 and thence escapes into and fills the outlet pipe 7. The pipe 7 is substantially closed by the head 8, so that the water is forced to exit therefrom through the more or less restricted openings 26 preferably formed below the middle of the pipe. Upon discharging from the pipe 7 the water enters the annular chambers 27 and 28 in the order named and thence into the tank. The chambers 27 and 28 are formed by the tubes 30 and 31 whose alternate opposite ends 32 and 33 are left open so as to provide a long circuitous path for the water.

It will be clear that the water upon entering the interior of the valve 21, loses a

large part of its energy in impinging against the walls thereof; furthermore, due to the water being forced to pass through the apertures 26 and subsequently caused to traverse the long path through the chambers 27 and 28, still more of the water's energy is lost, so that by the time it enters the tank it is in a more or less quiescent condition, and the tank is allowed to fill comparatively noiselessly.

A small space is preferably provided between the stem and the head 8 so that sufficient water may escape into chamber 34 from whence it may be discharged through the pipe 35 for refilling the closet bowl (not shown).

I claim:

1. A float-valve for flush tanks, comprising a primary valve adapted to be operated by the float and to normally close the water inlet passage to the tank, and a secondary valve enclosing said primary valve and its seat adapted to be unseated by the force of water to which it is subjected upon the unseating of said primary valve by the float.

2. A valve for controlling the flow of water to a flush tank, comprising a valve normally closing the water inlet passage to said tank and adapted to be unseated by the depression of a float within said tank, a second valve surrounding said first valve and comprising a shell mounted for longitudinal movement with respect to said first valve and provided with a seat completely surrounding the seat of said first valve, and a spring normally resiliently retaining said second valve against its seat.

3. A valve for controlling the flow of water to a flush tank, comprising an inlet passage and a primary valve normally closing said inlet passage and adapted to be unseated by the depression of a float in said tank, a stem extending upwardly from said valve and connected to said float, a shell-like valve slidably carried on said stem open at its base and enclosing said primary valve and adapted in its seated position to form a sealed chamber, and means normally resiliently retaining said shell valve in its seated position.

4. A valve for controlling the flow of water to a flush tank comprising an intake pipe and a chamber having openings respectively communicating with the interior of the tank and with said intake pipe, a valve arranged in said chamber and normally seated over said second opening, a stem for said valve extending through said first opening and adapted to be connected to a float within said tank, a second valve slidably mounted on said stem and enclosing said first valve, the base of said second valve being open and adapted when the valve is seated to surround said second opening and substantially seal the intake passage from the chamber independent of said first valve, and a spring adapted to retain said second valve seated until a limited displacement of said first valve has been effected.

5. A valve for controlling the flow of water to a flush tank, comprising an intake pipe and a chamber having openings respectively communicating with the interior of the tank and with said intake pipe, a tubular perforated member having one end leading from said first opening and having a head on its other end, a plurality of tubular members surrounding said first tubular member but spaced therefrom, and each other, the alternate opposite ends of said members being closed so as to provide a circuitous path through said members, and a valve in said chamber normally seated over said second opening and having a stem extending through said tubular perforated member.

6. A valve for controlling the flow of water to a flush tank comprising an intake pipe and a chamber having openings respectively communicating with the interior of the tank and with said intake pipe, a valve arranged in said chamber and normally seated over said second opening, a stem for said valve extending through said first opening and adapted to be connected to a float within said tank, a second valve slidably mounted on said stem and enclosing said first valve, the base of said second valve being open and adapted when said valve is seated to surround said second opening and substantially seal said intake passage from the chamber independent of said first valve, a spring adapted to retain said second valve seated until a limited displacement of said first valve has been effected, a tubular perforated member leading from said first opening and tubular members surrounding said first tubular member but spaced therefrom and each other, the alternate opposite ends of said members being closed so as to provide a circuitous path through said members.

In testimony whereof, I have hereunto set my hand at Oakland, California, this 10th day of December, 1921.

J EDWIN ERICSON.