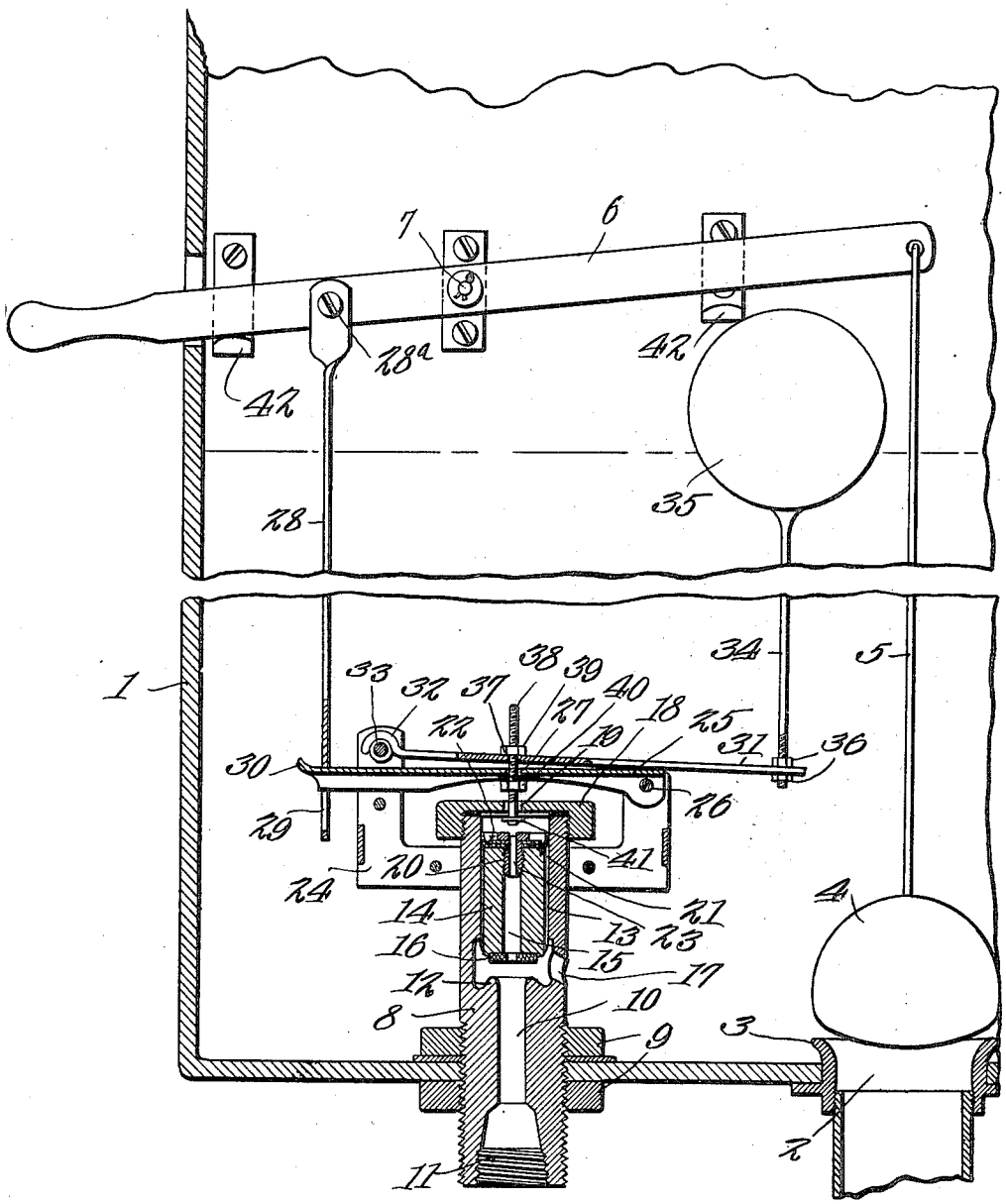
C. T. PACKER.

FLUSHING TANK VALVE MECHANISM.

APPLICATION FILED APR. 30, 1915.

1,160,441. Patented Nov. 16, 1915.



Clyde T. Packer

Inventor,

Witnesses

J. R. Gomez

Monroe E. Miller

by C. A. Snow & Co.

Attorneys.

UNITED STATES PATENT OFFICE.

CLYDE T. PACKER, OF BRADDOCK, PENNSYLVANIA.

FLUSHING-TANK VALVE MECHANISM.

1,160,441. Specification of Letters Patent. Patented Nov. 16, 1915.

Application filed April 30, 1915. Serial No. 25,039.

To all whom it may concern:

Be it known that I, CLYDE T. PACKER, a citizen of the United States, residing at Braddock, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Flushing-Tank Valve Mechanism, of which the following is a specification.

The present invention appertains to flushing tanks, and relates more particularly to the water inlet controlling means thereof.

It is the object of the invention to provide a novel and improved valve mechanism for flushing tanks, whereby the same will operate in a highly efficient, desirable and practical manner.

As a more specific object, the invention aims to provide a valve mechanism of the nature indicated, wherein the valve is closed by the water pressure, means being provided for relieving the water pressure whereby the valve will be unseated by the water pressure, so that the valve is both seated and unseated by the water pressure and which enables the mechanism to be simply and quickly operated for either establishing or shutting off the flow of water.

Another specific object of the invention is the provision of a unique means whereby the water pressure is made to seat and unseat the valve at the proper times.

It is also within the scope of the invention to provide a flushing tank valve mechanism having the features above noted, and which is comparatively simple, and inexpensive in construction, which may be readily taken apart to enable the device to be cleaned, repaired or examined, and which will possess a high degree of utility.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention is illustrated in its preferred embodiment in the accompanying drawing, wherein the figure is a sectional view of the flushing tank structure embodying the improved valve mechanism, portions being broken away and the parts being positioned to allow the water to flow from the tank through the flushing pipe, and to enter the tank through the valve structure.

In the drawing, there is delineated a fragmental portion of an ordinary flushing tank 1, which has a water outlet 2 through which the water flows into the flushing pipe in the usual manner, there being a valve seat 3 surrounding the outlet 2 within the tank 1. The outlet 2 is usually provided in the bottom of the tank, and a buoyant ball valve 4 is mounted over the opening 2 to normally seat upon the seat 3, for closing the said outlet. The valve 4 is carried by a rod or stem 5 which has its upper end loosely connected to one arm of an actuating lever 6 which is fulcrumed, as at 7, to the tank 1. This lever 6 is adapted to be operated in any suitable manner for raising the valve 4 to unseat the same and allow the water to gush or flow rapidly out through the outlet 2 into the flushing pipe as usual.

The valve structure embodies an upright tubular valve casing 8 which is engaged through the bottom of the tank, and upon which a pair of nuts 9 are threaded above and below the bottom of the tank, for clamping the casing 8 to the tank bottom. The lower end of the casing 8 depends from the bottom of the tank, and is interiorly threaded, as at 11, for the reception of the end of the water supply pipe, whereby the water supply pipe may be conveniently attached to the valve structure. The casing 8 has a restricted longitudinal bore 10 between its ends, and forming an upwardly facing valve seat 12 at the upper end of the bore 10. The casing 8 has a counter bore 13 above the valve seat 12 and bore 10.

A plunger 14 is slidable longitudinally within the counter bore 13 above the valve seat 12, and is provided with a longitudinal bore 15 extending from end to end. An apertured packing 16 is embedded within the lower end of the plunger 14 to seat upon the valve seat 12. The plunger 14 serves as a valve to normally close the passage through the valve casing 8, between the bore 10 and the lateral outlet 17 with which the casing 8 is provided adjacent or immediately above the valve seat 12, and at the lower or inner end of the counter bore 13.

A cap 18 is threaded over the upper end of the casing 8, and is provided with a central aperture 19 forming an outlet port for the chamber within the casing 8 between the valve plunger 14 and the cap 18,

said chamber being in communication with the bore 10 by means of the bore 15 extending through the valve or plunger.

A screw 20 is threaded through the upper or outer end of the bore 15 of the valve, and a leather cup packing 21 is seated against the upper or outer end of the valve 14, and is clamped thereagainst by means of the head of the screw 20, a metal washer 22 being preferably disposed between the packing 21 and the head of the screw 20. The screw 20 has a duct 23 extending therethrough from end to end, whereby the bore 15 is not closed. The packing 21 bears against the walls of the counterbore 13 and closes the space between the valve and said walls.

A bracket 24 of suitable construction is carried by the valve casing 8 adjacent the upper end of the said casing, and a lever 25 has one end fulcrumed, as at 26, to one end of the bracket 24, and extends across the upper end of the valve casing. The lever 25 is provided with an aperture 27 above the aperture or outlet port 19.

The lever 25 is operatively connected to the actuating lever 6, and to this end, a hanger 28 has its upper end pivoted, as at 28^a, to that arm of the lever 6 remote from the arm to which the valve rod 5 is pivoted, and the hanger or bar 28 is provided adjacent its lower end with a slot 29 through which the free end of the lever 25 projects loosely. The free end of the lever 25 is preferably bent or curved upward, as at 30, to prevent the hanger or bar 28 from slipping off of the end of the lever 25.

A third lever, preferably formed from a bar, and designated 31, is provided at one end with a curved portion 32 seated upon a fulcrum member 33 carried by that end of the bracket 24 opposite the fulcrum 26 of the lever 25, whereby the lever 31 is fulcrumed upon the bracket 24. The lever 31 extends in a direction opposite to the direction in which the lever 25 extends, and is disposed above the lever 25. The free end of the upper lever 31 projects beyond the fulcrum of the lower lever 25, and a stem or rod 34 of a float 35 has its lower end engaged through the free end portion of the lever 31. Nuts 36 are threaded upon the lower end portion of the stem or rod 34 and seat against opposite sides of the lever 31, to adjustably attach the stem or rod 34 to the lever 31. The lever 31 has an aperture 37 above and in alinement with the aperture 27 of the lever 25.

A stem or spindle 38, which is disposed vertically, is threaded through the aperture 37 and extends loosely through the apertures 27 and 19, and a pair of nuts 39 and 40 are threaded or adjustably mounted upon the stem 38. The nut 39 is disposed above and seats upon the lever 31, while the nut 40 is disposed below and arranged to seat against the lever 25. The stem 38 carries a controlling valve 41, of disk-like form, at its lower end and which is seatable upwardly against the cap 18 to close the aperture or port 19.

In operation, when the parts are in normal position, the valve 4 is lowered onto the seat 3 to close the outlet 2, and retain the water within the tank, and the lever 6 is thereby swung to raise the hanger or bar 28. This will allow the lever 25 to swing upwardly and be engaged by the nut 40, and the tank 1 being filled with water will cause the float 35 to be lifted for swinging the lever 31 upwardly. The nut 39 of the stem 38 in seating upon the lever 31 will carry the stem 38 upwardly, and this will seat the valve 41 to close the port 19. Consequently, the water which enters the casing 1 through the bore 10, is free to flow upwardly through the bore 15 of the valve 14, and will enter the chamber above the valve, and since the active area of the upper or outer end of the valve is greater than the active area of the lower or inner end of the valve, the valve will be moved downward by the pressure of the water, assisted by the gravity of the valve, to seat the valve against the seat. This will close the passage between the bore 10 and outlet 17 of the valve casing 8, and the further flow of water into the tank is prevented. It is to be noted that the only thing that is necessary to seat the valve 14, is to unseat the relatively small valve 41, so that the float 35 does not actually enter into the act of seating the main valve 14, but the water pressure is utilized for this purpose. Now, assuming that the parts are in normal position with the tank filled with water, when the lever 6 is actuated to unseat the valve 4, the water will gush out through the outlet 2, and the hanger 28 being depressed will depress the lever 25. The lever 25 will therefore seat upon the nut 40 and force the stem 38 downwardly, to unseat the valve 41, and this relieves the water pressure between the valve 14 and cap 18, since the water is free to flow outwardly through the port 19. The water pressure in being relieved above the valve, will cause the valve 14 to be unseated by the water pressure, or due to the water flowing inwardly through the bore 10, as will be evident, and the water is then free to flow from the bore 10 through the outlet 17 of the valve casing into the tank for filling the same. As soon as the flushing action of the water has ceased, the valve 4 will be seated by gravity, and the water will continue to flow into the tank through the valve casing, until the float 35 is raised as above described.

The cardinal feature of the invention resides in the fact that the water controlling

valve is seated as well as unseated by the water pressure, whereby little effort on the remainder of the mechanism is necessary for controlling the water valve. Another salient feature of the invention is the means employed for seating and unseating the valve 41 whereby the water pressure is brought into play for either seating or unseating the water valve. The other advantages and attributes of the mechanism are thought to be obvious from the foregoing taken in connection with the drawing, without further comment being necessary.

What is claimed as new is:

In a device of the character described, an upright valve casing having a lower bore providing a water inlet, an upper counter bore, a valve seat between the bore and counter bore, a water outlet adjacent the valve seat, and an upper closure having an outlet port, a valve slidable within said counter bore and having a bore therethrough communicating with the first mentioned bore, a bracket carried by the valve casing, a pair of superposed levers fulcrumed to said bracket and projecting in opposite directions one above the other, a float connected to the upper lever, means for depressing the lower lever, a stem engaged through said levers and said port and having a lower valve for closing said port when the first mentioned lever is raised, and nuts threaded upon the stem above and below the levers whereby when the upper lever is raised, the stem is raised and when the lower lever is depressed, the stem is lowered.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CLYDE T. PACKER.

Witnesses:
J. L. WAGNER,
RAY DAVIS.