

Feb. 28, 1928.

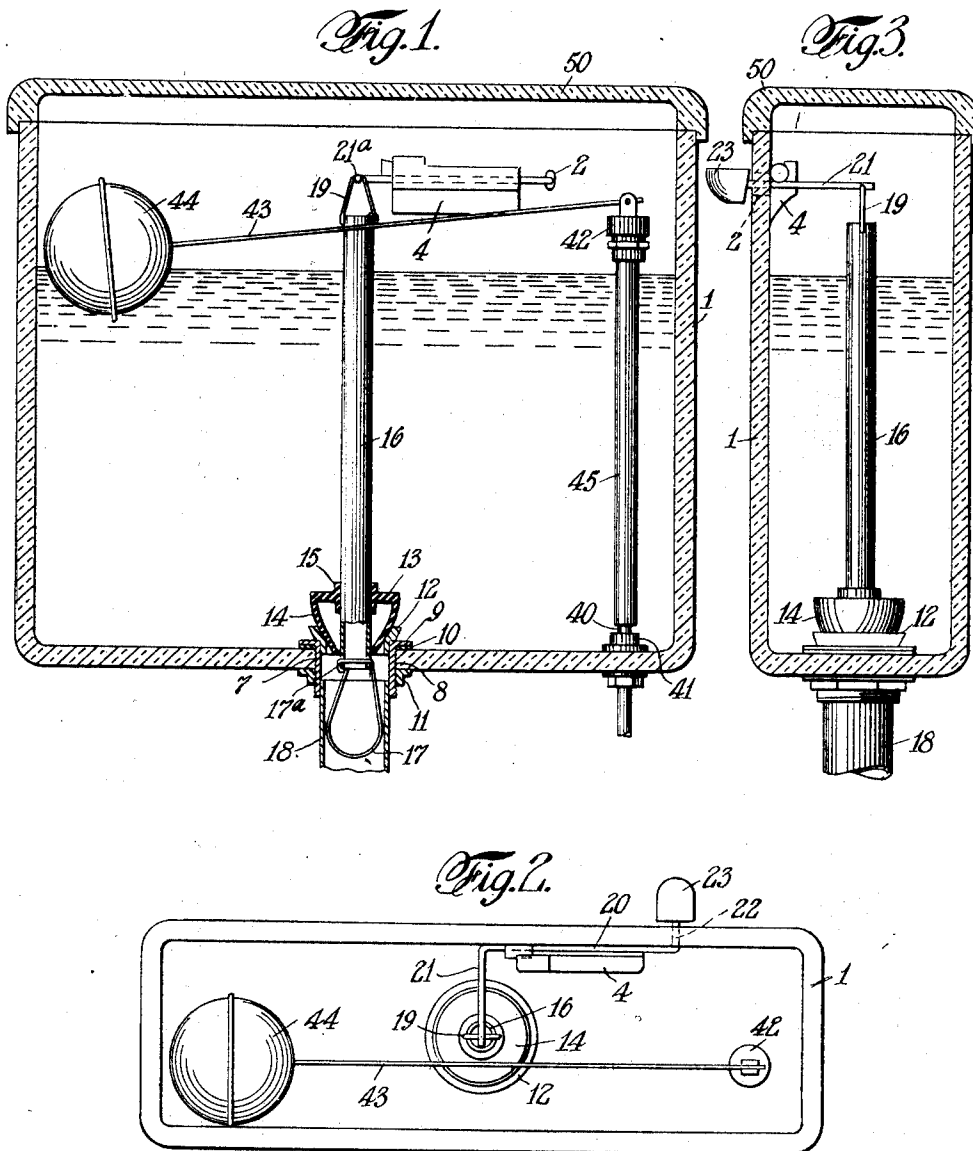
P. HAAS

1,660,922

FLUSHING APPARATUS

Filed May 10, 1927

2 Sheets-Sheet 1



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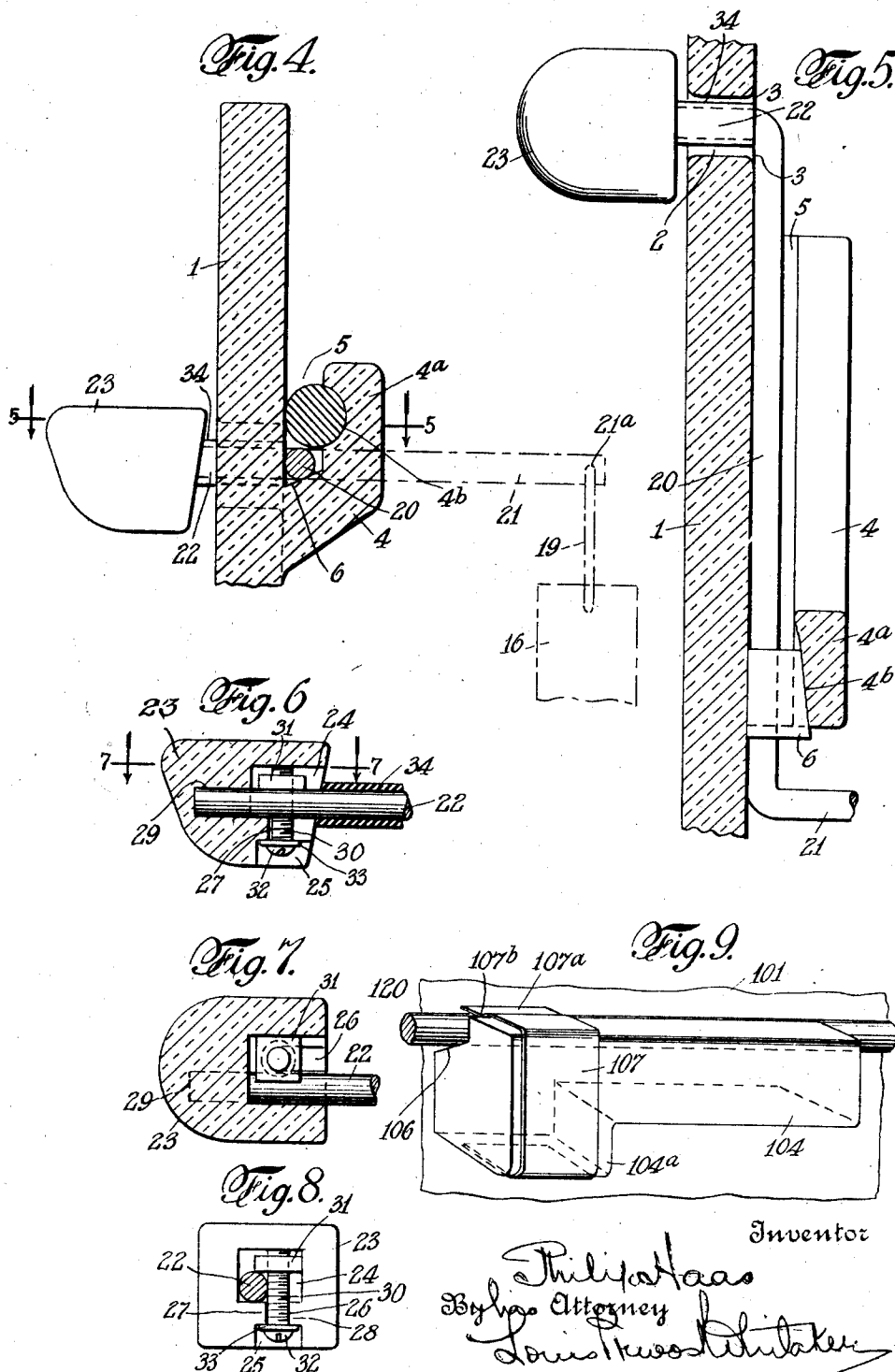
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FLUSHING APPARATUS

Filed May 10, 1927

2 Sheets-Sheet 2



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FLUSHING APPARATUS.

Application filed May 10, 1927. Serial No. 190,184.

My invention consists in the novel features hereinafter described, reference being had to the accompanying drawings which show one form in which I have contemplated embodying my invention and a slight modification thereof, and said invention is fully disclosed in the following description and claims.

The object of my invention is to provide a flushing tank and flushing valve mechanism therefor of extremely simple construction, in which the supporting means of the valve operating mechanism is formed as a part of the tank and preferably of porcelain or earthenware, the apparatus being so simple that the parts can be shipped to the point of use with the flushing tank and placed in operative position by anyone without the use of tools, and without the necessity of calling in skilled labor.

My invention also consists in the novel features of construction and combination of parts hereinafter fully described and particularly pointed out in the claims.

Referring to the drawings,

Fig. 1 is a sectional view of the flushing tank and flushing mechanism therefor embodying my invention.

Fig. 2 is a top plan view of the same with the cover removed.

Fig. 3 is a vertical transverse sectional view through the tank.

Fig. 4 is an enlarged sectional view of a portion of the tank showing the means for supporting the rock shaft of the valve operating mechanism, and holding it in operative position.

Fig. 5 represents a horizontal sectional view on the line 5-5 of Fig. 4.

Fig. 6 is a vertical sectional view of the finger piece forming part of the valve operating mechanism.

Fig. 7 is a horizontal sectional view on line 7-7 of Fig. 6.

Fig. 8 is a rear elevation of the finger piece with the operating arm shown in section.

Fig. 9 is a detail perspective view illustrating a slightly different form of support for the rock shaft and a different form of retaining means therefor.

In the ordinary flushing tank which is now almost entirely made of porcelain or earthenware, it is customary to provide an aperture in a lateral wall, generally the front wall, for the shaft of an operating device act-

ing upon a lever supported within the tank and connected with the flushing valve. This necessitates the use of a bearing sleeve in the aperture, means for supporting the lever within the tank, and requires a skilled operator to assemble the parts and place them in operative relation and adjustment.

In carrying out my present invention I provide the tank indicated at 1, formed preferably of porcelain or earthenware, with an aperture, 2, in its front wall, which is slightly elongated vertically, and has its edges rounded as indicated at 3. On the inner face of the front wall of the tank, I provide a longitudinally disposed bracket indicated at 4, which is preferably formed integrally, that is to say in one piece with the front wall, and is provided on its upper face with a longitudinal recess, 5, having its bottom, 6, inclined forwardly and downwardly toward the front wall of the tank. This bracket is so located that the bottom, 6, of the recess is in substantial alignment with the center of the aperture, 2, and is disposed between said aperture and the longitudinal center of the front wall. The outer longitudinal flange of the bracket is preferably extended upwardly at the end of the bracket remote from the aperture, 2, as indicated at 4^a, and the inner face of said wall is provided with a curved tapering recess, 4^b, as indicated in Figs. 4 and 5, to receive a retaining plug or wedge, 6, which is preferably of compressible material as cork, rubber or wood, which may be gently pressed into the space between said recess, 4^b, and the front wall of the tank, as indicated in the said Figs. 4 and 5. The tank is provided at the bottom with the usual centrally located aperture, 7, in which is secured a threaded sleeve, 8, having a flange, 9, at its upper end, engaging a shoulder, 10, held in place by the usual nut, 11, said fitting being provided with a valve seat, which is preferably formed of non-corrodible material, and is indicated at 12. 13 represents the flushing valve which is preferably hollow, closed at its upper end and open at its lower end, and provided with curved or substantially spherical seat engaging portions indicated at 14. The upper end of the valve is provided with an aperture having a flange or collar, 15. The valve is preferably constructed of soft rubber so as to conform to the valve seat and make a water tight joint therewith. 16 is a vertical hollow

valve stem and overflow pipe, which is preferably formed of celluloid or other suitable material, which is strong and light and not effected by the water, and the said tubular stem, 16, is passed through the collar, 15, and the aperture in the upper end of the valve, and is held in operative relation with the valve by friction. The valve stem is provided at its lower end with a depending guide indicated at 17, loosely engaging the flushing discharge aperture formed by the valve seat, the fitting, 8, and the flushing pipe, 18, which leads to the usual closet bowl. This depending portion is conveniently provided by forming two oppositely disposed holes in the lower end of the hollow valve stem, and passing a wire therethrough, one end of which is secured as at 17^a, by bending it around the lower edge of the tube, the other end of the wire being bent downwardly at the other side of the tube and upwardly to form a loop, as indicated in Fig. 1 for example. This is a very simple and inexpensive way of providing the valve stem with a depending device which holds the valve substantially in axial alignment with the valve seat during its vertical movements, and prevents it from swinging out of alignment with the seat. The upper end of the valve stem, 16, is provided with an attaching device which is preferably in the form of a hook, for attaching it to the valve operating mechanism. This hook is preferably applied by forming apertures in the opposite sides of the valve stem, 16, and passing a piece of wire therethrough, one end of which is secured by bending it downward around the upper edge of the valve stem, while the other end is bent upwardly and downwardly to form the hook indicated at 19. The valve actuating mechanism comprises a rock shaft, 20, provided at one end with a lifting lever, 21, and at the opposite end with an operating arm, 22. This device is preferably formed of one piece of metal rod, preferably brass or other suitable metal, and the outer end of the lifting arm, 21, is provided with an aperture or eye, to engage the hook, 19, of the valve stem. The rock shaft, 20, is adapted to be supported in the bearing bracket, 4, and lies in the groove or recess, 5, thereof, being supported by the inclined bottom, 6, of the groove or recess, which tends to force it toward the front wall of the tank. The outer end of the operating arm, 22, extends through the aperture, 2, in the front wall of the tank, and is provided exteriorly with a finger piece, 23, which is also formed preferably of porcelain so as to present a harmonious and pleasing appearance. The inner face of the finger piece is provided with a recess, 24, and a smaller recess, 25, which also opens through the bottom of the finger piece, the two recesses being connected by a narrow

slot, 26, forming oppositely disposed shoulders, 27 and 28, as clearly shown in Fig. 8, for example. The upper recess, 24, is also provided with a recess, 29, in its rear wall, having its lower portion in substantial alignment with the shoulder, 27, to receive the end portion of the operating arm which is detachably and adjustably secured thereto in any desired manner. In the present instance and for economy, I find it convenient to connect the finger piece to the operating arm by means of an ordinary stove bolt, indicated at 30, provided with a nut, 31, engaging the upper face of the operating arm, 22, and having its head, 32, located in the lower recess, 25, and provided with a washer, 33, preferably inserted between the head of the bolt and the shoulders, 27 and 28, of the porcelain finger piece. By this means the porcelain finger piece can readily be secured to the metal operating arm without danger of breaking the porcelain and in a manner which permits the porcelain finger piece to be readily molded, while the retaining means, to wit, the stove bolt and nut are entirely concealed. The portion of the operating arm between the rear face of the finger piece and the rock shaft which extends through the aperture, 2, in the front wall of the tank, is preferably provided with a tubular bumper indicated at 34, and preferably formed from a piece of rubber tubing for the purpose of providing an elastic or cushioning material between the operating arm and the edges of the aperture, 2, to prevent noise in the operation of the device.

In assembling the valve operating means, it will be seen that the operating arm, rock shaft and valve lifting arm, which as before stated are preferably formed of one piece of stock, (preferably round brass rod) can be inserted through the aperture, 2, by first inserting the valve lifting arm, 22, therethrough from the outside, and then passing the rock shaft through the aperture, 2, and then passing the operating arm through said aperture and bringing the rock shaft close against the inner face of the front wall of the tank and inserting it in the longitudinal recess, 5, therein, after which the retaining wedge, 6, (which may be an ordinary cork or rubber stopper, for example) is pressed into position between the front wall of the tank and the recess, 4^b, as clearly shown in Figs. 2, 4 and 5, where it will be retained by friction and will hold the rock shaft against accidental displacement. The hook, 19, at the upper end of the valve stem, 16, is then engaged with an aperture, 21^a, as indicated in Figs. 1, 2 and 4, the valve being placed in engagement with the valve seat.

The tank, 1, is provided with any suitable means for supplying water and maintaining a predetermined level thereof, which may be of any desired character. I have shown an

inlet pipe, 40 (Fig. 1) supported by a filling, 41, in the bottom of the tank and provided at its upper end with an inlet valve, 42, float lever, 43, and float, 44, and a discharge pipe, 45, surrounding the inlet pipe and discharging adjacent to the bottom of the tank, but these devices form no part of my present invention and will not be more particularly described.

In Fig. 9, I have shown a slightly modified form of bearing bracket and retaining means for the rock shaft. In this figure, 101 represents the front wall of the tank which is provided with the integral porcelain or earthenware bracket, 104, having a longitudinal groove or recess, 106, with an inclined bottom, 106, as previously described to receive and serve as a bearing for the rock shaft, 120. In this instance I have shown the bracket, 104, provided with a downwardly extending projection, 104^a, and a metal clip, 107, is slipped over this portion of the bracket having a portion, 107^a, extending over the recess, 106, and rock shaft, 120, and a shoulder, 107^b, to engage the bearing recess, 106, as shown, to prevent the accidental displacement of the rock shaft.

It will be seen that my improved flushing valve mechanism can be manufactured cheaply, and is of such simple construction that anyone can assemble it. When the parts are placed in operative position, the rock shaft will be held from endwise movement by the engagement of the operating arm in the aperture, 2, and will be held in the bearing bracket by the retaining means described.

Assuming that the tank is filled to the predetermined water level a flushing operation may be produced by simply depressing the finger piece, 23, this will depress the outer end of the operating arm, 22, and rock the shaft, 20, raising the outer end of the lifting arm, 21, and raising the valve, 13. The water in the tank will immediately begin to run out and the hollow valve being filled with air will remain suspended in the water, so long as it is immersed therein, being also partly counterbalanced by the porcelain finger piece, 23. As soon as the water level is below the valve, and the water no longer supports it the weight of the valve and its stem will cause the valve to again engage its seat. The parts are so constructed however that the seat is not fully closed until a sufficient amount of water collects in the tank to press down on the valve and force it into engagement with the seat, and previous to its final seating a small amount of water will seep through between the valve and its seat, providing an afterfill. As soon as the tank is substantially full, the pressure of water on the valve will hold it closed and no more water will pass through the outlet.

I prefer to form the rock shaft in one piece with the operating arm and valve lifting

arm, as it makes a very cheap and efficient device which can easily be inserted through the aperture, 2, and it will also be understood that in case of slight variations in the position of the axis of the flushing valve seat, due to irregularities in the porcelain or earthenware, the valve lifting arm can be readily bent in one direction or the other to bring its outer end in alignment with the axis of the valve seat.

The tank, 1, is also provided with the usual cover, also of porcelain or earthenware, as indicated at 50, in Figs. 1 and 2.

What I claim and desire to secure by Letters Patent is:—

1. In a flushing mechanism, the combination with a tank having a wall provided with an aperture therein, a horizontal bearing bracket on the inner face of the wall provided with a longitudinal bearing recess in substantial alignment with said aperture, and a flushing valve seat in the bottom of the tank, of a valve engaging seat, a rock shaft engaging said bearing recess, and provided at one end with a valve lifting arm, and at the other end with an oppositely extending operating arm projecting outwardly through said aperture, the engagement of said operating arm with the walls of said aperture holding the rock shaft against longitudinal movements, and connections from said lifting arm to the flushing valve.

2. In a flushing mechanism, the combination with a tank having a wall provided with an aperture therein, a horizontal bearing bracket on the inner face of the wall provided with a longitudinal bearing recess in substantial alignment with said aperture, and a flushing valve seat in the bottom of the tank, of a valve engaging seat, a rock shaft engaging said bearing recess, and provided at one end with a valve lifting arm, and at the other end with an oppositely extending operating arm projecting outwardly through said aperture, the engagement of said operating arm with the walls of said aperture holding the rock shaft against longitudinal movements, and connections from said lifting arm to the flushing valve, a finger piece of greater diameter than said aperture secured to said operating arm, said rock shaft, operating arm and lifting arm being formed of one piece of metal of a diameter less than that of said aperture, and adapted to be introduced into operative position by inserting said parts through said aperture and dropping the rock shaft into said bearing recess.

3. In a flushing mechanism, the combination with a tank having a wall provided with an aperture therein, a horizontal bearing bracket on the inner face of the wall provided with a longitudinal bearing recess in substantial alignment with said aper-

ture, and a flushing valve seat in the bottom of the tank, of a valve engaging seat, a rock shaft engaging said bearing recess, and provided at one end with a valve lifting arm, and at the other end with an oppositely extending operating arm projecting outwardly through said aperture, the engagement of said operating arm with the walls of said aperture holding the rock shaft against longitudinal movements, and connections from said lifting arm to the flushing valve, and a retaining device for detachably engaging said bracket and extending above a portion of the rock shaft for holding the shaft against accidental displacement.

4. In a flushing mechanism, the combination with a tank having a wall provided with an aperture therein, a horizontal bearing bracket on the inner face of the wall provided with a longitudinal bearing recess in substantial alignment with said aperture, and a flushing valve seat in the bottom of the tank, of a valve engaging seat, a rock shaft engaging said bearing recess, and provided at one end with a valve lifting arm, and at the other end with an oppositely extending operating arm projecting outwardly through said aperture, the engagement of said operating arm with the walls of said aperture holding the rock shaft against longitudinal movements, and connections from said lifting arm to the flushing valve, and a wedge retaining device adapted to be inserted between portions of said bracket and the wall of the tank, above said shaft to hold said shaft against accidental displacement.

5. In a flushing mechanism, the combination with a tank having a wall provided with an aperture therein, a horizontal bearing bracket on the inner face of the wall provided with a longitudinal bearing recess in substantial alignment with said aperture, and a flushing valve seat in the bottom of the tank, of a valve engaging seat, a rock shaft engaging said bearing recess, and provided at one end with a valve lifting arm, and at the other end with an oppositely extending operating arm projecting outwardly through said aperture, the engagement of said operating arm with the walls of said aperture holding the rock shaft against longitudinal movements, and connections from said lifting arm to the flushing valve, said tank being formed of earthenware and having the said bracket formed integrally therewith, said bracket being provided with a portion extending above the bearing recess, and having the face thereof adjacent to the inner face of the adjacent tank wall provided with a recess of gradually decreasing depth, and a wedge retaining device of compressible material adapted to be inserted between said recess and the tank wall to confine the rock shaft in the said bearing recess.

6. In a flushing mechanism, the combination with a tank having a wall provided with an aperture therein, a horizontal bearing bracket on the inner face of the wall provided with a longitudinal bearing recess in substantial alignment with said aperture, and a flushing valve seat in the bottom of the tank, of a valve engaging seat, a rock shaft engaging said bearing recess, and provided at one end with a valve lifting arm, and at the other end with an oppositely extending operating arm projecting outwardly through said aperture, the engagement of said operating arm with the walls of said aperture holding the rock shaft against longitudinal movements, and connections from said lifting arm to the flushing valve, said tank being formed of earthenware and said bracket being formed integrally therewith, said bracket having a portion remote from the said tank wall aperture extending above the said bearing recess and having its face adjacent to the tank wall, and provided with a recess having a curved bottom and of gradually decreasing depth, and a tapering wedge plug of compressible material adapted to be inserted between said recess and the tank wall, above said shaft to prevent the accidental displacement of the shaft.

7. In a flushing mechanism, the combination with a tank having a wall provided with an aperture therein, a horizontal bearing bracket on the inner face of the wall provided with a longitudinal bearing recess in substantial alignment with said aperture, and a flushing valve seat in the bottom of the tank, of a valve engaging seat, a rock shaft engaging said bearing recess, and provided at one end with a valve lifting arm, and at the other end with an oppositely extending operating arm projecting outwardly through said aperture, the engagement of said operating arm with the walls of said aperture holding the rock shaft against longitudinal movements, and connections from said lifting arm to the flushing valve, said operating arm being provided with a finger piece provided with a recess to engage the outer end of said arm, and means for detachably securing said finger piece to said arm, said means permitting said finger piece to be adjusted longitudinally of said arm.

8. In a flushing mechanism, the combination with a tank having a wall provided with an aperture therein, a horizontal bearing bracket on the inner face of the wall provided with a longitudinal bearing recess in substantial alignment with said aperture, and a flushing valve seat in the bottom of the tank, of a valve engaging seat, a rock shaft engaging said bearing recess, and provided at one end with a valve lifting arm, and at the other end with an oppositely extending operating arm projecting outwardly through said aperture, the engagement of said op-

erating arm with the walls of said aperture holding the rock shaft against longitudinal movements, and connections from said lifting arm to the flushing valve, said operating arm being provided with a finger piece provided with a recess to engage the outer end of said arm, and means for detachably securing said finger piece to said arm, said means permitting said finger piece to be adjusted longitudinally of said arm, and a tubular bumper of elastic material surrounding the said operating arm within the tank wall aperture.

9. In a flushing mechanism, the combination with a tank having a wall provided with an aperture therein, a horizontal bearing bracket on the inner face of the wall provided with a longitudinal bearing recess in substantial alignment with said aperture, and a flushing valve seat in the bottom of the tank, of a valve engaging seat, a rock shaft engaging said bearing recess, and provided at one end with a valve lifting arm, and at the other end with an oppositely extending operating arm projecting outwardly through said aperture, the engagement of said operating arm with the walls of said aperture holding the rock shaft against longitudinal movements, and connections from said lifting arm to the flushing valve, said tank and bearing bracket being formed in one piece of earthenware said operating arm being provided with a finger piece provided with a recess to engage the outer end of said operating arm, and having its inner face provided with recessed portions to ac-

commodate a bolt and nut for clamping said operating arm in adjusted position to said finger piece.

10. In a flushing mechanism, the combination with a flushing tank of earthenware having its front wall provided with a vertically elongated aperture, and the inner face of said wall provided with an integral bearing bracket provided with a horizontal recess on its upper face in substantial alignment with said aperture, said tank having its bottom provided with a flushing valve seat and valve for engaging said bearing recess, of a rock shaft provided at one end with an operating arm for engaging said aperture, and at the other end with a valve lifting arm extending above the axis of the valve seat, said rock shaft and arms being formed of one piece of metal of a diameter permitting said parts to be inserted through said aperture, said bracket having a horizontally grooved portion above the said recess adjacent to the front wall of the tank, a compressible wedge plug, adapted to be inserted between said grooved portion of the bracket and the tank wall to hold the said shaft in the bearing recess, an earthenware finger piece detachably secured to the operating arm outside of the tank, said arm being provided with a tubular bumper within said aperture, and connecting means for detachably connecting said valve lifting arm with the flushing valve.

In testimony whereof I affix my signature.

PHILIP HAAS.