May 24, 1927. P. HAAS 1,629,914

INLET VALVE MECHANISM

Filed Nov. 16, 1926

Fig. 1.

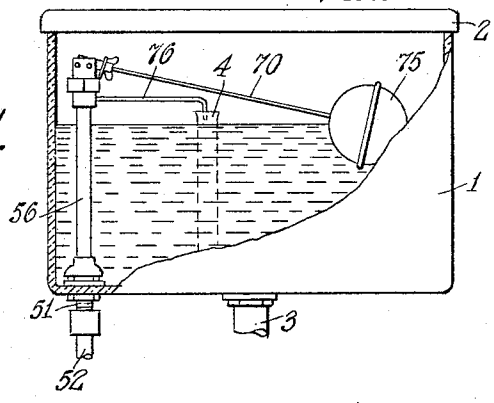
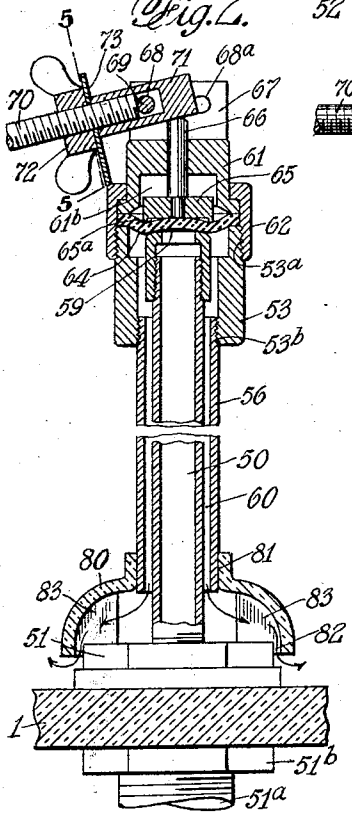


Fig. 2.



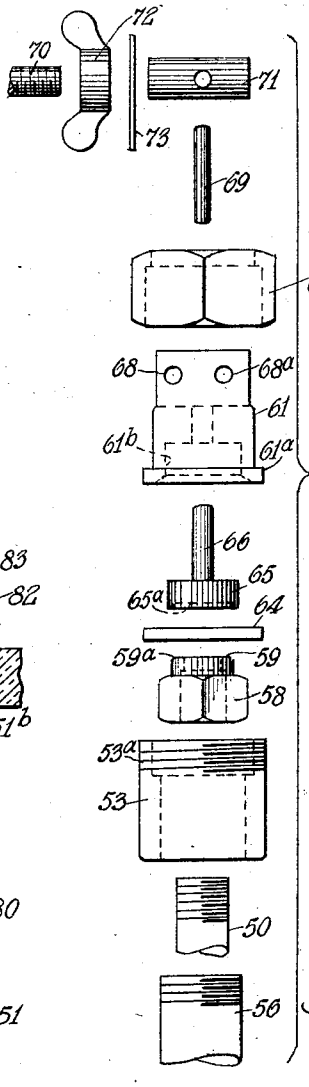


Fig. 3.

Fig. 4.

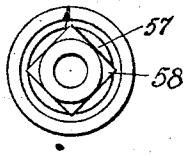


Fig. 5.

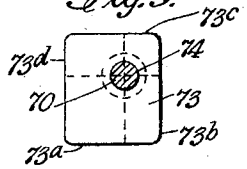


Fig. 6.

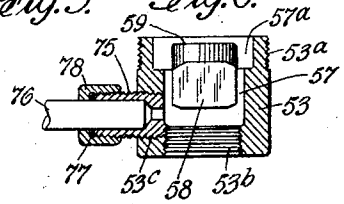
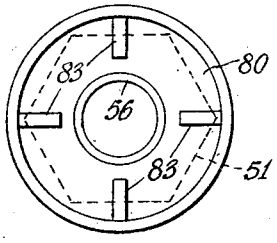


Fig. 7.



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UNITED STATES PATENT OFFICE.

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INLET-VALVE MECHANISM.

Application filed November 16, 1926. Serial No. 148,639.

My invention consists in the novel features hereinafter described, reference being had to the accompanying drawing which illustrates one embodiment of the invention selected by me for purposes of illustration, and the said invention is fully disclosed in the following description and claims.

The object of my invention is to provide an inlet valve mechanism for flushing tanks adapted to be controlled by a float and float lever, in which the maximum efficiency combined with extreme simplicity and cheapness of manufacture is obtained, the portions of the device subject to wear and replacement being readily accessible to the ordinary householder, so that all necessary repairs and replacements may be made by an unskilled person without the delay and expense incident to the employment of skilled labor, the said valve mechanism being so constructed that it may be readily installed in any of the ordinary flush tanks now in use, where desired, for the purpose of repairing or refitting the same.

Referring to the drawing,

Fig. 1 is a front view of a flush tank partly broken away, and showing my improved inlet valve mechanism installed therein in connection with the usual float and float lever.

Fig. 2 is an enlarged sectional view of the inlet valve and adjacent parts, including the inlet and discharge pipes connected therewith.

Fig. 3 is a detail view showing the several parts of the valve mechanism in separated relation.

Fig. 4 is a top plan view of the lower portion of the valve body showing the seat member pressed into the same.

Fig. 5 represents a section on line 5—5 of Fig. 2, showing an adjustable stop plate for limiting the downward movement of the float.

Fig. 6 represents a sectional view of the lower portion of the valve body showing the manner of connecting an after-fill pipe therewith, when desired.

Fig. 7 is a bottom plan view of a muffling collar with which the discharge pipe from the valve mechanism is provided, as shown in Fig. 2.

In the accompanying drawing, 1 represents a flush tank which may be of any usual or preferred construction. These tanks are usually made of porcelain, and provided with a removable cover, as indicated at 2, but my invention is applicable to tanks generally, regardless of the material of which they are made. The tank is shown provided with a discharge or flushing pipe, 3, controlled by any usual or preferred type of flushing valve mechanism, which is not herein shown or described, as it forms no part of my present invention. I have, however, shown the tank provided with the usual overflow pipe indicated at 4. In the form of my invention herein shown, 50 represents a vertically disposed inlet pipe within the tank which screws into a fitting, 51, having a threaded sleeve portion, 51^a, extending through an aperture in the bottom of the tank, and secured to the tank bottom by a nut, 51^b. The threaded sleeve, 51^a, is connected with a water supply pipe, 52, in any usual or desired way. The upper end of the inlet pipe, 50, preferably extends above the water level of the tank, as indicated in Fig. 1, and supports the inlet valve, the casing of which preferably comprises two parts united by a follower in a manner somewhat similar to a pipe union. The lower portion of the valve casing comprises a hollow sleeve, 53, which is preferably provided exteriorly at its upper end with threads, 53^a, which may be rolled or cut therein, and the lower portion of the sleeve is provided with interior threads, 53^b. The interior of the sleeve is provided with a plain cylindrical bore, so that this part can be readily produced in quantity on an ordinary screw machine. Within the sleeve, 53, is a separate valve seat member comprising a polygonal body, preferably square, indicated at 58, of such diameter through the opposite corners thereof, that it may be forced by pressure into the bore of the sleeve, 53, so that the sharp corners of the block will seat themselves in the metal of the sleeve, and retain the valve seat member permanently in the sleeve until it is desired to drive it out. The block, 58, is internally threaded to receive the upper end of the water inlet pipe, 50, which is screwed therein, and the upper part of the block is turned down to provide an annular valve seat, 59, the outer edges of which are preferably slightly beveled or rounded, as indicated at 59^a. This part may also be economically produced in quantity from square or polygonal stock on a screw machine. It will be noted that when the

block, 58, is forced into position within the sleeve, 53, as indicated for example in Fig. 2 and Fig. 6, an annular space is provided within the sleeve, as indicated at 57[a], surrounding the valve seat, which communicates by means of the segmental shaped vertical passages, 57, with the lower portion of the sleeve into which the vertical discharge pipe, 56, surrounding the water inlet pipe, 50, is screwed. The discharge pipe, 56, does not extend to the bottom of the tank, and the annular passage is thus formed, indicated at 60, between the inlet pipe, 50, and the outlet pipe, 56, through which the water is delivered into the tank. In order to carry this water to the bottom of the tank and deliver it quietly, I prefer to provide the lower end of the discharge pipe, 56, with a muffler sleeve, 80, which is preferably made of porcelain or other non-corrodible material, having an aperture at its upper end indicated at 81, fitting or closely surrounding the discharge pipe, and having an aperture of greatly increased diameter at its lower end sufficient to surround the upper portion of the fitting, 51, and leave an annular space, 82, for the discharge of the water into the tank. This annular space, 82, will be of much greater capacity than the annular space, 60, between the inlet and discharge pipes. In order to hold the lower edge of the muffler sleeve sufficiently above the tank bottom to insure the free delivery of water thereunder, said sleeve is preferably provided with inwardly extending brackets indicated at 83, see Figs. 2 and 7, which rest upon the fitting, 51, and hold the lower edge of the muffler sleeve at the desired distance from the bottom of the tank. This construction is very simple, but is very efficient, in permitting the water to discharge into the tank without pressure, thus causing it to run in silently, regardless of the pressure of the water supply.

The upper part of the valve casing comprises a casing member, 61, which is of cylindrical form, and is provided at its lower end with an annular flange, 61[a], adapted to receive a follower, 62, provided with interiorly threaded portions to engage the exteriorly threaded portions, 53[a], of the casing member, 53. The valve itself is formed by a simple disc, 64, of rubber or leather, or other suitable material, having its edges clamped rigidly between the meeting faces of the casing members, 61 and 53, above the valve seat, 59, the said disc being adapted to be forced down into engagement with the seat by a mushroom plug or pin, 65, located in a recess, 61[b], in the upper casing member, and having a stem, 66, extending through a hole in the upper casing member into a transverse recess, 67, with which said member, 61, is provided. It will be noted that the clamping of the marginal portions of the valve disc, 64, between the members of the casing makes it unnecessary to provide any stuffing box for the projecting stem, 66, as no water can pass above the valve. The lower face of the mushroom plug, 65, is provided with a circular recess, 65[a], slightly larger than the valve seat, 59, so that when the mushroom plug is depressed as hereinafter described, the central portion of the disc valve will be clamped between the inner face of this recess and the valve seat, and deflected slightly out of the plane of the other portions of the disc, thus insuring the positive seating of the valve on the valve seat, and the closing of the water inlet aperture in the seat. The upper portion of the casing member, 61, is provided on opposite sides of the slot or recess, 67, with two pairs of aligned apertures, 68 and 68[a], located at different distances from the mushroom plug, and designed to receive a pivot pin, 69, on which the valve actuating lever or float lever, 70, is pivoted. The object of having two sets of apertures is to permit of changing the leverage of the float lever with respect to the mushroom plug, when this is necessary or desirable. In this instance I have shown the lever, 70, threaded at its inner end and provided with an internally threaded sleeve, 71, into which it screws, the said sleeve being drilled transversely to receive the pivot pin, 69, and after the parts are assembled with the pin in the proper pair of registering holes, the float lever, 70, is screwed up against the pin, as indicated in Fig. 2, and serves to lock the pin against accidental longitudinal movement. I also prefer to provide the threaded portion of the lever, 70, adjacent to the sleeve, 71, with a lock nut, 72, preferably in the form of a wing nut, which can be screwed up against the end of the sleeve, 71, so as to lock the parts into position, and prevent the lever from unscrewing and releasing the pivot pin, 69.

I also prefer to provide the float lever, 70, with an adjustable stop to limit its downward movement, so that when the water level falls during a flushing action, the float indicated in this instance at 75, cannot interfere with the operation of the flushing valve, (not shown). For this purpose I conveniently employ an adjustable stop plate indicated at 73, and shown in detail in Fig. 5. This plate is preferably rectangular or polygonal in shape, and is provided with an aperture indicated at 74, surrounding the lever, 70, and so located that each of the edges, 73[a], 73[b], 73[c] and 73[d] are situated at a different distance from the center of the hole, 74, as indicated by dotted straight lines in Fig. 5. The length of the sleeve, 71, from the pivot pin, 69, is so calculated that by inserting this stop plate, 73, between the end of the sleeve and the set nut, 72, its lowest edge will engage a part

of the inlet valve structure, as for example in this instance the upper face of the follower, 62, and serve as a stop to limit the downward movement of the float and float lever. By loosening the set nut, 72, the stop plate, 73, may be rotated to bring any one of its edges into the bottom position, thereby forming an adjustable stop for limiting the downward movement of the float and lever. It will be understood that when the tank is filled to the desired level, the float, 75, will be buoyed up by the water, exerting an upward pressure on the lever, 70, and causing the inner end of the sleeve, 71, to exert a downward pressure on the mushroom plug, thus holding the valve clamped upon the valve seat, and preventing any water from entering the tank. When the water is discharged from the tank during a flushing operation, the float and float lever will descend, releasing the pressure on the mushroom plug, 65, and the pressure of the water in the inlet pipe, 50, will raise the valve, 64, permitting the water to flow over the valve seat and down through the segmental passages, 57, between the seat block, 58, and the walls of the lower casing member, 53, and discharge through the annular passage, 60, between the inlet pipe, 50, and the discharge pipe, 56, into the muffler sleeve, and thence silently into the tank. As soon as the flushing valve is closed, the tank is refilled, and as the water level rises it lifts the float and float lever, depressing the mushroom plug and forcing the disc valve upon its seat, so as to stop further ingress of water. In pressing the disc valve upon its seat, the beveled edges, 59[a], of the seat, and the recess, 65[a], in the plug co-operate in seating the valve at the outer edge of the seat first, thus closing off the supply of water silently, and preventing the prolonged hissing which is frequently noticed in the closing of inlet valves.

In Fig. 2 of the drawing the float lever is shown pivoted in the aperture, 68, located at the greater distance from the axis of the mushroom plug. In a case where very high water pressure is encountered and it is desired to afford the float and float lever increased leverage in closing the inlet valve, the upper member, 61, of the valve casing may be rotated into the diametrically opposite position by loosening the follower, 62, and the float lever may be pivoted in the other pair of apertures, 68[a].

It will be seen that my improved inlet valve mechanism is of very simple construction, and that the parts may be readily manufactured and assembled. As the valve casing is located above the water level, it is readily accessible to effect a repair or replacement by simply removing the top or cover, 2, of the tank, when the follower can be unscrewed by the fingers, (or an ordinary wrench, if necessary), to separate the members of the valve casing. The part of an inlet valve mechanism which is most subject to injury and wear, is the valve itself, and as this is a mere disc of rubber or leather, it can be readily removed and replaced by another similar valve or disc, and if the householder does not happen to have such a disc furnished by the manufacturer, a disc can be improvised by cutting it from any suitable piece of rubber or leather, which may be conveniently at hand. Should the valve seat become injured by the action of grit in the water or corrosion from chemical constituents of the water, the lower casing member can be unscrewed, and the seat plug, 58, driven out from the bottom upwardly by means of a nail or hammer or otherwise, and a new valve seat block furnished by the manufacturer can be inserted, so that my improved valve mechanism can be repaired by any ordinary householder, without the aid of skilled labor. The adjustment of the stop plate, 73, will ordinarily be made when the device is installed and will probably not require further adjustment, but if such adjustment should be necessary it can be readily effected by simply loosening the said nut, 72, and turning the plate, 73, to bring the proper edge into lowest position.

Where it is desired to provide for an after-fill, the lower member, 53, of the valve casing is preferably provided with a lateral threaded aperture, as indicated at 53[c], in Fig. 6, in which is screwed a nipple, 75, provided with a bore at its outer end large enough to receive a piece of small copper tubing indicated at 76. This tubing, 76, is provided with a rubber washer or packing ring, 77, surrounding the same, and is engaged by a follower, 78, which screws on to the nipple, 75, so as to clamp the washer, 77, between it and the end of the nipple and around the tube, 76, thus forming what is in effect a slip joint, and obviating the necessity of threading the copper tube, which necessarily weakens such a tube and causes it to conveniently break in the threads. The outer end of the tube, 76, is carried above the overflow pipe, 4, as indicated in Fig. 1 for example, in a well known way, thus providing a small stream of water which will be discharge through the overflow pipe to the bowl after the closing of the flushing valve and until the inlet valve is closed, and providing for an after-fill of the bowl. Where the tank is provided with other means for effecting the after-fill, the lower member of the valve casing may be made without the lateral aperture, 53[c], as indicated for example in Fig. 2.

By making the valve seat block separate from the lower member of the valve casing,

as herein shown and described, this portion of the valve mechanism can be made of material substantially resistant to corrosion, as for example, nickle silver or nickle bronze, while the remaining portion of the valve casing can be made of brass, thus providing a valve seat, which will not be apt to be affected by corrosion without having to make the entire lower member of the valve casing of non-corrosive material, thus effecting a very considerable saving in the cost of manufacture. It will also be understood that when the parts are assembled, the marginal portions of the flexible disc valve will be clamped by the action of the follower between the annular clamping portions of the upper and lower casing members in the manner shown.

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

1. The combination with a flushing tank, of a vertically disposed inlet pipe therefor, an inlet valve casing secured to the upper end of said pipe, and provided with an inlet valve, a float operated lever for controlling said inlet valve, a discharge pipe surrounding the inlet pipe and extending from the inlet valve casing to a point adjacent to the bottom of the tank, and a muffler sleeve having a portion at its upper end fitting the lower end of the discharge pipe, and a portion at its lower end of larger diameter providing ultimate discharge passages of increased area adjacent to the bottom of the tank, to facilitate the discharge and distribution of water from the discharge pipe noiselessly regardless of the pressure in the inlet pipe.

2. The combination with a flushing tank, of a vertically disposed inlet pipe therefor, an inlet valve casing secured to the upper end of said pipe, and provided with an inlet valve, a float operated lever for controlling said inlet valve, a discharge pipe surrounding the inlet pipe and extending from the inlet valve casing to a point adjacent to the bottom of the tank, and a muffler sleeve having an aperture at its upper end closely surrounding the lower end of the discharge pipe, and an aperture of greater diameter at its lower end, and means for supporting said sleeve in position to provide an ultimate discharge passage between its lower edge and the bottom of the tank of greater area than the discharge passage between the inlet and discharge pipes, to facilitate the discharge of water into the tank without noise regardless of the pressure in the inlet pipe.

3. The combination with a flushing tank, of a vertically disposed inlet pipe therefor, an inlet valve casing secured to the upper end of said pipe, and provided with an inlet valve, a float operated lever for controlling said inlet valve, a discharge pipe surrounding the inlet pipe and extending from the inlet valve casing to a point adjacent to the bottom of the tank, and a muffler sleeve provided with an aperture at its upper end closely surrounding the lower end of the discharge pipe, and having an aperture of greater diameter at its lower end, said sleeve being provided with inwardly extending supporting flanges for supporting it at the desired distance from the bottom of the tank.

4. The combination with a flushing tank, of a vertically disposed inlet pipe therefor, an inlet valve casing secured to the upper end of said pipe, and provided with an inlet valve, a float operated lever for controlling said inlet valve, a discharge pipe surrounding the inlet pipe and extending from the inlet valve casing to a point adjacent to the bottom of the tank, and a muffler sleeve of porcelain having an aperture at its upper end surrounding and substantially fitting the lower end of the discharge pipe, and having an aperture of greater diameter at its lower end, said sleeve being provided with integral supporting flanges for holding it at the desired distance above the bottom of the tank.

5. Inlet valve mechanism for flushing tanks, including an inlet valve casing formed of two separable members, one of said members being provided with a cylindrical bore and having a discharge aperture at its lower end, and threaded portions for connecting a discharge pipe thereto, a separately formed block polygonal in horizontal cross-section, and provided at its upper end with a valve seat, said block being forced into said bore and frictionally retained therein, and providing vertical apertures laterally of said block communicating with the discharge aperture, said block having a longitudinal bore and being provided with threaded portions for attaching thereto an inlet pipe extending longitudinally of the discharge pipe, the other member of the valve casing being provided with a longitudinally movable valve engaging plug, having a stem extending through said member into position to be engaged by a float operated lever, and said members being provided with co-acting clamping portions, a flexible disc valve interposed between the clamping portions of said members and extending between the valve seat and said plug, and means for clamping said members together upon the marginal portions of said disc valve.

6. Inlet valve mechanism for flushing tanks, including an inlet valve casing formed of two separable members, one of said members being provided with a cylindrical bore and having a discharge aperture at its lower end, and threaded portions for connecting a discharge pipe thereto, a separately formed block polygonal in horizontal cross section,

and provided at its upper end with a valve seat, said block being forced into said bore and frictionally retained therein, and providing vertical apertures laterally of said block communicating with the discharge aperture, said block having a longitudinal bore and being provided with threaded portions for attaching thereto an inlet pipe extending longitudinally of the discharge pipe, the other member of the valve casing being provided with a longitudinally movable valve engaging plug, having a stem extending through said member into position to be engaged by a float operated lever, and said members being provided with co-acting clamping portions, a flexible disc valve interposed between the clamping portions of said members and extending between the valve seat and said plug, and means for clamping said members together upon the marginal portions of said disc valve, said plug having its valve engaging face provided with a recess of slightly greater diameter than the valve seat.

7. Inlet valve mechanism for flushing tanks comprising among its members a valve casing formed of two separable members, one of said members being provided with a longitudinal bore, annular clamping portions at its upper end, and internally threaded portions at its lower end to receive a discharge pipe, a separately formed block square in horizontal cross-section, having its angular portions engaging the cylindrical bore of said member to frictionally retain said block therein, and form lateral passages around the block communicating with the discharge pipe, said block being provided at its upper end with a valve seat of smaller diameter than said bore, said block having a longitudinal bore and being provided with threaded portions at its lower end to receive a water inlet pipe, the other member of said valve casing being provided on its lower face with annular clamping portions, and at its upper end with a transverse recess to receive a float operated lever, and means for pivotally supporting said lever in said recess, said member being also provided with a vertically movable plug, having a stem extending longitudinally through said member, into said recess in position to be engaged by the float actuated lever, a disc valve extending between said plug and valve seat and having its marginal portions located between the clamping portions of said casing members, one of said casing members being provided with an annular flange and the other with exterior threaded portions, and a follower for engaging said flange and threaded portions of said members respectively, and clamping them together upon valve.

8. Inlet valve mechanism for flushing tanks, including an inlet valve casing formed of two separable members, one of said members being provided with a cylindrical bore and having a discharge aperture at its lower end, and threaded portions for connecting a discharge pipe thereto, a separately formed block polygonal in horizontal cross-section, and provided at its upper end with a valve seat, said block being forced into said bore and frictionally retained therein, and providing vertical apertures laterally of said block communicating with the discharge aperture, said block having a longitudinal bore and being provided with threaded portions for attaching thereto an inlet pipe extending longitudinally of the discharge pipe, the other member of the valve casing being provided with a longitudinally movable valve engaging plug, having a stem extending through said member into position to be engaged by a float operated lever, and said members being provided with co-acting clamping portions, a flexible disc valve interposed between the clamping portions of said members and extending between the valve seat and said plug, and means for clamping said members together upon the marginal portions of said disc valve, the first mentioned member of said valve casing being provided with a lateral aperture communicating with the vertical passages around the seat block therein, and means for connecting an after-fill pipe with said lateral aperture.

9. Inlet valve mechanism for flushing tanks, including an inlet valve casing formed of two separable members, one of said members being provided with a cylindrical bore and having a discharge aperture at its lower end, and threaded portions for connecting a discharge pipe thereto, a separately formed block polygonal in horizontal cross-section, and provided at its upper end with a valve seat, said block being forced into said bore and frictionally retained therein, and providing vertical apertures laterally of said block communicating with the discharge aperture, said block having a longitudinal bore and being provided with threaded portions for attaching thereto an inlet pipe extending longitudinally of the discharge pipe, the other member of the valve casing being provided with a longitudinally movable valve engaging plug, having a stem extending through said member into position to be engaged by a float operated lever, and said members being provided with co-acting clamping portions, a flexible disc valve interposed between the clamping portions of said members and extending between the valve seat and said plug, and means for clamping said members together upon the marginal portions of said disc valve, the first mentioned casing member being provided with a lateral aperture communicating with the vertical passages around the seat block there-

in, said lateral aperture having an enlarged portion for receiving an unthreaded after-fill pipe, and a follower and packing ring for attaching the after-fill pipe to said casing member without the use of threads.

10. Inlet valve mechanism for flushing tanks, comprising among its members a vertically disposed inlet pipe provided with means for securing it to said tank, an inlet valve comprising a lower member supported by said inlet pipe, and provided with a centrally located valve seat and vertical discharge passages disposed laterally thereof, and threaded portions at its lower end for receiving and supporting a discharge pipe surrounding the inlet pipe, an upper member detachably connected to the lower member, and provided at its upper end with means for pivotally supporting a float lever, and having a vertically movable plug provided with a stem, a disc valve extending between said plug and the valve seat of the other member, and having its marginal portions clamped between said members, a float lever pivotally connected with said second mentioned member in operative relation with said stem, a stop plate revolubly mounted on said lever and provided with edge portions at different distances from the lever for engaging a portion of said valve to limit the downward movement of said lever, and means for clamping said plate in its adjusted postion.

11. Inlet valve mechanism for flushing tanks comprising among its members a vertically disposed inlet pipe provided with means for securing it to said tank, an inlet valve comprising a lower member supported by said inlet pipe, and provided with a centrally located valve seat and vertical discharge passages disposed laterally thereof, and threaded portions at its lower end for receiving and supporting a discharge pipe surrounding the inlet pipe, an upper member detachably connected to the lower member, and provided at its upper end with means for pivotally supporting a float lever, and having a vertically movable plug provided with a stem, a disc valve extending between said plug and the valve seat of the other member, and having its marginal portions clamped between said members, a float lever pivotally connected with said second mentioned member in operative relation with said stem, a rectangular stop plate provided with an aperture therein to engage said lever, the axis of said aperture being located at different distances from the several edges of said plate, said edges being constructed to engage a portion of the valve casing to limit the downward movement of the float lever, and clamping means for holding said plate in its adjusted position with respect to said lever.

12. Inlet valve mechanism comprising among its members a vertically disposed inlet pipe, a valve casing comprising a lower member, having a valve seat and threaded portions adjacent thereto for engaging said inlet pipe, vertical passages exterior to and lateral of said valve seat, and a threaded aperture at its lower end for engaging a discharge pipe surrounding the inlet pipe, an upper member provided with a transverse recess and aligned pivot apertures on opposite sides thereof, and a vertically movable plug having a stem extending into said transverse recess, a flexible disc valve interposed between said plug and the valve seat, and having its marginal portions clamped between said members of the valve casing, and detachable means for connecting said casing members, a sleeve having an internally threaded recess and a transverse aperture communicating therewith, a pivot pin connecting said sleeve with the upper casing member and extending through the transverse aperture in the sleeve, and the aligned apertures of said casing member, a float lever having a threaded portion for engaging in the recess in said sleeve, and adapted to engage said pivot pin to hold it against longitudinal movement, and a set nut on the threaded portion of said lever, said sleeve forming an extension of said lever and having a part in operative engagement with the stem of said plug.

13. Inlet valve mechanism comprising among its members a vertically disposed inlet pipe, a valve casing comprising a lower member, having a valve seat and threaded portions adjacent thereto for engaging said inlet pipe, vertical passages exterior to and lateral of said valve seat, and a threaded aperture at its lower end for engaging a discharge pipe surrounding the inlet pipe, an upper member provided with a transverse recess and aligned pivot apertures on opposite sides thereof, and a vertically movable plug having a stem extending into said transverse recess, a flexible disc valve interposed between said plug and the valve seat, and having its marginal portions clamped between said members of the valve casing, and detachable means for connecting said casing members, a sleeve having an internally threaded recess and a transverse aperture communicating therewith, a pivot pin connecting said sleeve with the upper casing member and extending through the transverse aperture in the sleeve, and the aligned apertures of said casing member, a float lever having a threaded portion for engaging in the recess in said sleeve, and adapted to engage said pivot pin to hold it against longitudinal movement, and a set nut on the threaded portion of said lever, said sleeve forming an extension of said lever and having a part in operative engagement with the stem of said plug, a rectangular stop plate interposed between said set nut and said

sleeve, and provided with an aperture located at different distances from the edge portions of said plate, for engaging the threaded portion of said lever, the edges of said stop plate being adapted to engage a portion of the valve casing to variably limit the downward movement of the float lever, whereby said set nut locks the said lever against rotation in the sleeve, and in engagement with the pivoted pin, and also locks the stop plate against rotation with respect to the lever.

14. Inlet valve mechanism for flushing tanks comprising among its members a vertically disposed water inlet pipe, provided at its lower end with means for supporting it in the bottom of the tank, and having a threaded portion at its upper end, an inlet valve casing comprising separable lower and upper members, the lower member being provided with a cylindrical bore and threaded at its lower end to receive a discharge pipe surrounding the inlet pipe, a block polygonal in horizontal cross-section, having its angular portions frictionally engaging said cylindrical bore, and forming vertical passages between the polygonal faces of the block and said bore, said block having a longitudinal bore and a valve seat at its upper end, and said member being provided with exteriorly threaded portions, the upper casing member being provided with an outwardly projecting annular flange, an interior recess above said valve seat, a transverse recess in the upper portion, and a vertically movable plug having a stem extending into said recess, a flexible disc valve extending between the plug and said valve seat, and having its marginal portions clamped between said members of the casing, a follower detachably connecting said casing members, a float lever provided at one end with a sleeve threaded thereon and pivoted in said recess in operative relation with the stem of said plug, said lever being adjustable longitudinally in said sleeve into and out of engagement with the pivot, a set nut on the threaded portion of said lever for locking it with respect to the sleeve, and an adjustable stop plate interposed between said set nut and sleeve, and having edge portions at different distances from the lever for engaging said follower to limit the downward movement of the float lever.

15. Inlet valve mechanism for flushing tanks, including an inlet valve casing formed of two separable members, one of said members being provided with a cylindrical bore and having a discharge aperture at its lower end, and threaded portions for connecting a discharge pipe thereto, a separately formed block polygonal in horizontal cross-section, and provided at its upper end with a valve seat, said block being forced into said bore and frictionally retained therein, and providing vertical apertures laterally of said block communicating with the discharge aperture, said block having a longitudinal bore and being provided with threaded portions for attaching thereto an inlet pipe extending longitudinally of the discharge pipe, a valve in said valve casing for engaging said valve seat, and operative means for seating said valve including a stem provided with means for operatively engaging a float operated lever.

16. Inlet valve mechanism for flushing tanks including an inlet valve casing formed of two members, relatively rotatable with respect to each other and means for detachably clamping them together, one of said members being provided with a valve seat and vertical discharge passages disposed laterally of said seat, a valve for engaging said seat, valve seating means provided with a stem extending through the upper part of the other member of the casing, said upper part being provided with transverse horizontal apertures located at different distances from and on opposite sides of the axis of said stem, a float lever having a pivot to engage the apertures on one side of said axis, and having a portion for engaging said valve seating stem, whereby by loosening the clamping means and rotating the upper member of said valve casing the float lever pivot may be placed in engagement in the apertures on the other side of the axis of said stem to change the leverage of the float lever with respect thereto to adapt the device for use with different water pressures.

In testimony whereof I affix my signature.

PHILIP HAAS.