June 8, 1926.

D. M. FORFAR

1,587,516

FLUSHING DEVICE

Filed June 29, 1925

2 Sheets-Sheet 1

Fig. 1

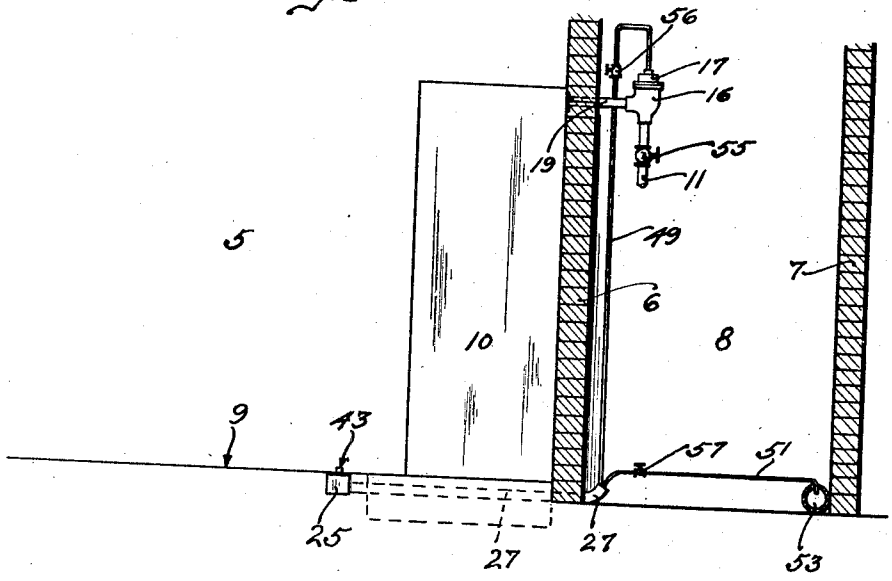
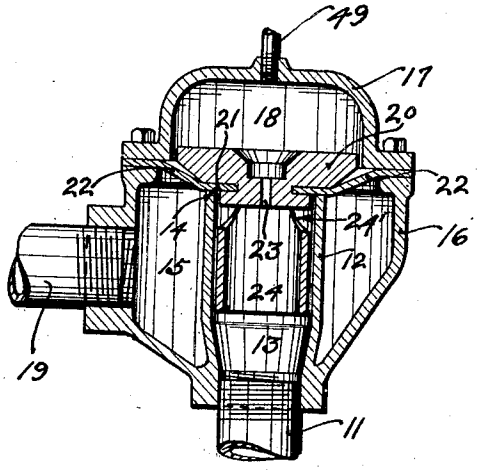


Fig. 2



Inventor
Donald M. Forfar
By his Attorneys
Merchant and

June 8, 1926.

D. M. FORFAR

1,587,516

FLUSHING DEVICE

Filed June 29, 1925

2 Sheets-Sheet 2

Fig. 3

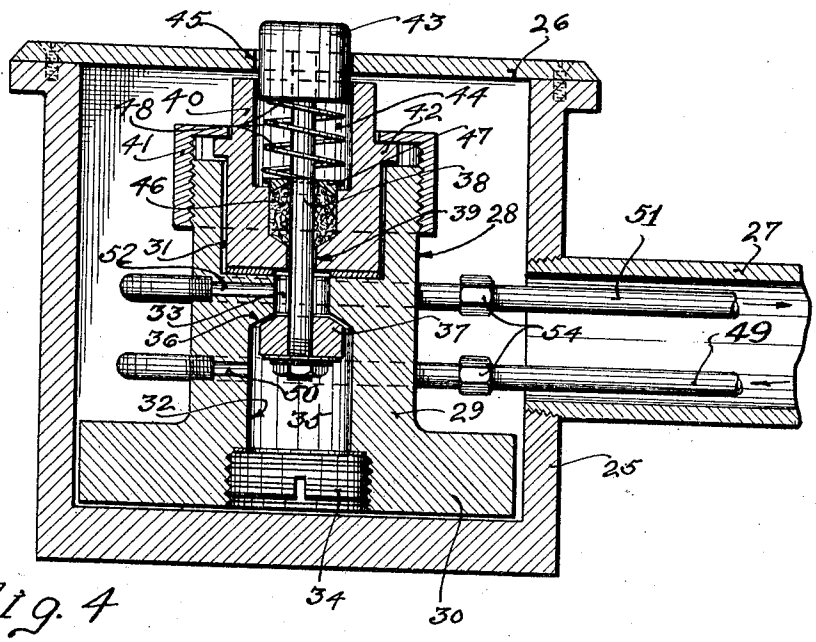
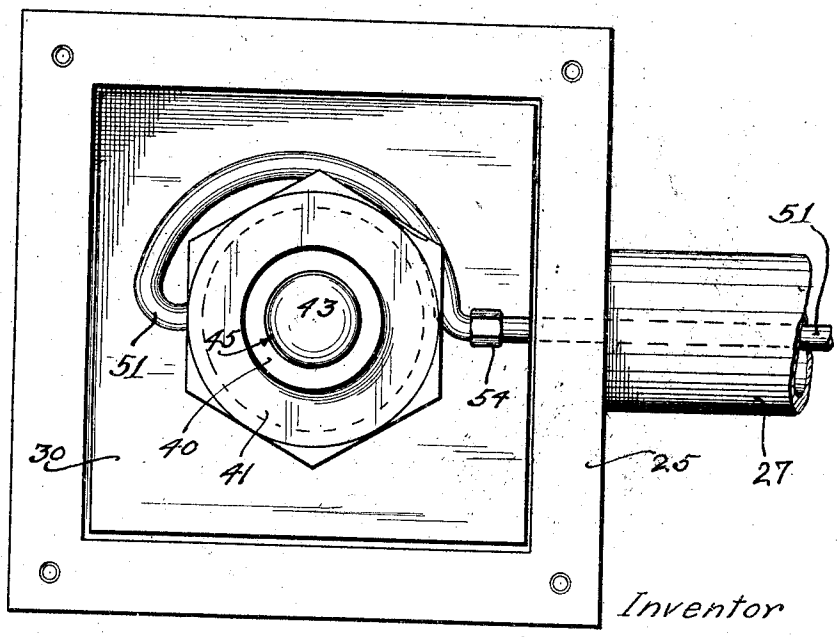


Fig. 4



Inventor
Donald M. Forfar
By his Attorneys
Merchant and Gibson

Patented June 8, 1926. 1,587,516

UNITED STATES PATENT OFFICE.

DONALD M. FORFAR, OF MINNEAPOLIS, MINNESOTA.

FLUSHING DEVICE.

Application filed June 29, 1925. Serial No. 40,380.

My present invention relates to a flushing device for plumbing fixtures and the like and more particularly to an auxiliary pilot valve for controlling a water-operated main or flushing valve, and to this end, generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a view partly in diagram and partly in section illustrating a toilet room having spaced inner and outer walls, and also illustrating in said room a urinal and the flushing device therefor;

Fig. 2 is a view, principally in section, of the flushing valve;

Fig. 3 is a view, principally in section, of the auxiliary pilot valve and floor box in which it is mounted with a conduit leading therefrom; and

Fig. 4 is a plan view of the parts shown in Fig. 3, with the cover of the floor box removed;

The numeral 5 indicates what may be assumed to be a toilet room having spaced inner and outer walls 6 and 7 which afford therebetween a pipe space 8, and the finished floor of said toilet room is indicated by the numeral 9. Within the toilet room 5 is a urinal 10 supported on the floor 9 against the inner wall 6. Extending into the pipe space 8 is a cold water supply pipe 11 leading from any suitable source of supply under pressure and tapped into the lower end of an upstanding cylindrical valve casing 12 for a water supply chamber 13. The casing 12 is open at its top, and its upper edge affords a valve seat 14. Surrounding the valve casing 12 is a water discharge chamber 15, the casing 16 of which, at its bottom, is integrally formed with the lower end of the valve casing 12, and the top of which is open and extends slightly above the valve seat 14. A dome-like cover 17 for the casing 16 is detachably bolted to the top thereof and the interior of said cover affords a water pressure chamber 18. A water discharge pipe 19 leads from the casing 16 through the inner wall 6 with its delivery end arranged to flush the urinal 10 in the customary manner.

The open top of the water supply chamber 13 is normally closed to the water discharge chamber 15 by a water-operated differential main or flushing valve 20, the small area of which is in said chamber 13 and the large area of which is in the pressure chamber 18. A pliable packing 21, secured in a peripheral groove in the valve 20, normally rests on the valve seat 14 and forms a water tight joint between the chambers 13 and 15. When the flushing valve 20 is open, water may flow through the open top of the water supply chamber 13 into the water discharge chamber 15. The flushing valve 20 is carried by a diaphragm 22 formed with the pliable packing 21 and secured in position by having its outer marginal edge portion clamped between the casing 16 and cover 17.

The diaphragm 22, pliable packing 21 and the small area of the valve 20 afford a partition which closes both chambers 13 and 15 to the water pressure chamber 18. A constantly open axial port 23 extends completely through the flushing valve 20 and connects the water-supply chamber 13 to the water pressure chamber 18. Integrally formed with the small area of the flushing valve 20 is a depending hollow stem 24 which extends loosely into the water supply chamber 13 and guides said valve during its opening and closing movements. Formed in the upper end of the stem 24 is a plurality of circumferentially spaced ports 24′ for the escape of water from the hollow stem 24 into the water discharge chamber 15 when the flushing valve 20 is open.

A rectangular metal box 25 is set into the floor 9 with its upper edge flush therewith and located outward of the urinal 10. This box 25 is provided with a displaceable cover 26 held in position by a plurality of screws. An iron conduit 27 is laid under the floor 9 and leads from the pipe space 8 to the floor box 25.

An auxiliary pilot valve assembly 28 is loosely and removably mounted in the floor box 25 and includes a casing 29 having a square base 30 which rests on the bottom of the box 25 and is of such size as to prevent horizontal shifting movement of said assembly in the box 25. Formed in the casing 29 are upper and lower recesses 31 and 32, respectively, connected by a restricted passageway 33, and which lower recess 32 is nor-

mally closed by a screw plug 34 and affords a water pressure chamber 35. The casing 29, at the top of the water pressure chamber 35, is beveled to afford a valve seat 36 for a valve 37 which normally closes the water pressure chamber 35 to the passageway 33.

The valve 37 is secured to the lower end of an upright valve stem 38 which is mounted for endwise movement in a seat 39 formed in the lower end of a head block 40 removably mounted in the upper recess 31. This head block 40 is held in the recess 31 by a clamping ring 41 having screw-threaded engagement with the valve casing 29 and engages an annular rib 42 on the head block 40 above the casing 29 and draws said head block onto a gasket on the bottom of said recess to form a water tight joint.

A push button 43 is secured to the upper end of the valve stem 38 and mounted in a recess 44 formed in the upper end of the head block 40 and works through an aperture 45 in the box cover 26 and normally projects thereabove. A packing gland 46 for the valve stem 38 is mounted in the head block 40, between the seat 39 and recess 44. This packing gland is held compressed around the valve stem 38 by a washer-like follower 47 on said valve stem. A coiled spring 48 is compressed between the follower 47 and push button 43 and yieldingly and normally holds said push button raised and the valve 37 on its seat 36.

The water pressure chamber 35 of the auxiliary pilot valve assembly 28 is connected to the water pressure chamber 18 by a flexible copper tube 49 and a port 50. One end of the tube 49 is tapped into the top of the cover 17 and its other end is tapped into the casing 29 on the opposite side thereof from the conduit 27 and port 50 formed in the casing 29. A flexible copper tube 51 and a port 52 afford a waste connection from the water pressure 35 to a sewer pipe 53 located in the pipe space 8. One end of the tube 51 is tapped into the casing 29 directly above the tube 49 and its other end is connected to the sewer pipe 53, and the port 52 is formed in the casing 29. Both tubes 49 and 51 extend from the box 25 through the conduit 27 to the pipe space 8, and have separable joints at a point where they enter said floor box from the conduit 27, and the sections of said tubes are connected by unions 54. The purpose of providing these separable joints is to permit the auxiliary pilot valve assembly to be detached from the tubes 49 and 51 and removed from the floor box 25 or inserted therein without disturbing said tubes in the conduit 27. The purpose of connecting the tubes 49 and 51 on the opposite side of the casing 29 to the conduit 27 and bending the same around said casing is to allow for expansion and contraction and for any variation made in their length due to cutting. By mounting the tubes 49 and 51 in a conduit 27, they can easily be removed for the purpose of repairs and then relaid or new ones substituted therefor without disturbing the floor or plumbing fixtures. A hand-controlled cut-off valve 55 is interposed in the cold water supply pipe 11, adjacent to the casing 16, a hand-controlled cut-off valve 56 is interposed in the water pressure tube 49 in the vicinity of said casing 16, and a hand-controlled cut-off valve 57 is interposed in the waste tube 51 at a point after it leaves the conduit 27.

Normally the cut-off valves 55, 56 and 57 are open and the valves 20 and 37 are closed, the latter of which is held closed by the spring 48 and the former of which is held closed by the water pressure in the chamber 18 on the side of said valve having the greatest area. To flush the urinal 10, it is only necessary to step on the push button 43 to open the valve 37 against the tension of the spring 40 and thereby release the water pressure in the chambers 18 and 35 and conduit 49 and permit the same to waste through the port 52 and conduit 51 to the sewer 53 or other receptacle. With the release of the water pressure on the side of the flushing valve 20 having the greatest area, the water pressure in the chamber 13 will then open said valve and permit water to flow from the chamber 13 and water pipe 19 and flush the urinal 10. This flushing action will continue as long as the push button 43 is held depressed.

When the push button 43 is released, the compressed spring 40 will close the valve 37 and thereby start the building up of a water pressure in the chamber 18 through the port 23 from the chamber 13. As soon as this chamber 18, water conduit 49 and chamber 35 are filled with water, the pressure thereof on the side of the flushing valve 20 in the chamber 18 and having the greatest area will close said valve against the water pressure in the chamber 13 and thereby prevent further flow of said water from said chamber 13 to the chamber 15 and stop the flushing action.

While the flushing device is shown in connection with a urinal, it is of course understood that the same is equally well adapted for use in connection with various different plumbing fixtures to be flushed. In some instance, it might be desirable to mount the auxiliary pilot valve in a wall box instead of a floor box.

What I claim is:

1. An embedded cover-equipped floor or wall box located at a distant point from a flushing valve, a concealed conduit between the box and flushing valve, a removable water pressure tube leading from the flushing valve and extending through the conduit to the box, an auxiliary pilot valve assembly

removably mounted in the box and having an actuating push button extending through an aperture in the cover of the box, and a separable coupling connecting said tube to the auxiliary pilot valve assembly outward thereof.

2. The structure defined in claim 1 in further combination with a waste water tube extending from the box through the conduit, and a separable coupling connecting the waste water tube to the auxiliary pilot valve assembly outward thereof.

In testimony whereof I affix my signature.

DONALD M. FORFAR.