Sept. 23, 1930. H. M. HOELSCHER 1,776,385

POP-UP VALVE

Filed Sept. 12, 1928

FIG. 1.

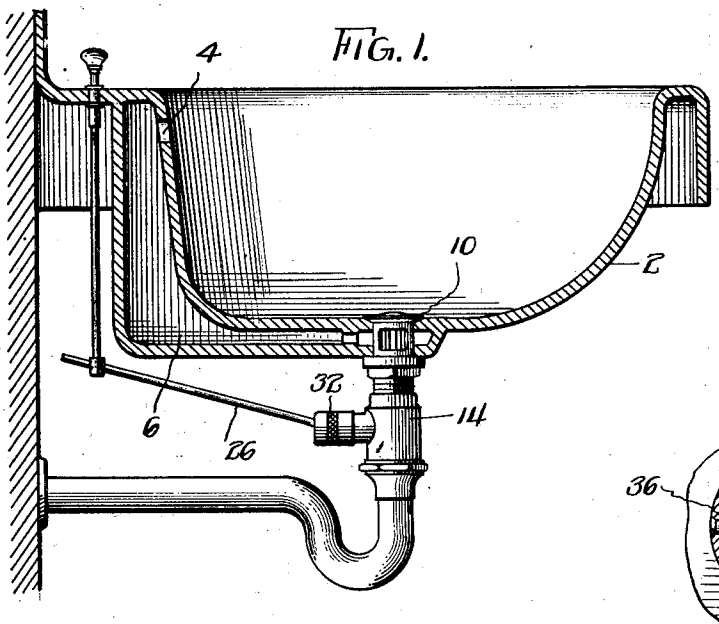


FIG. 3.

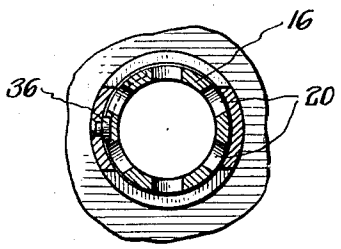


FIG. 2.

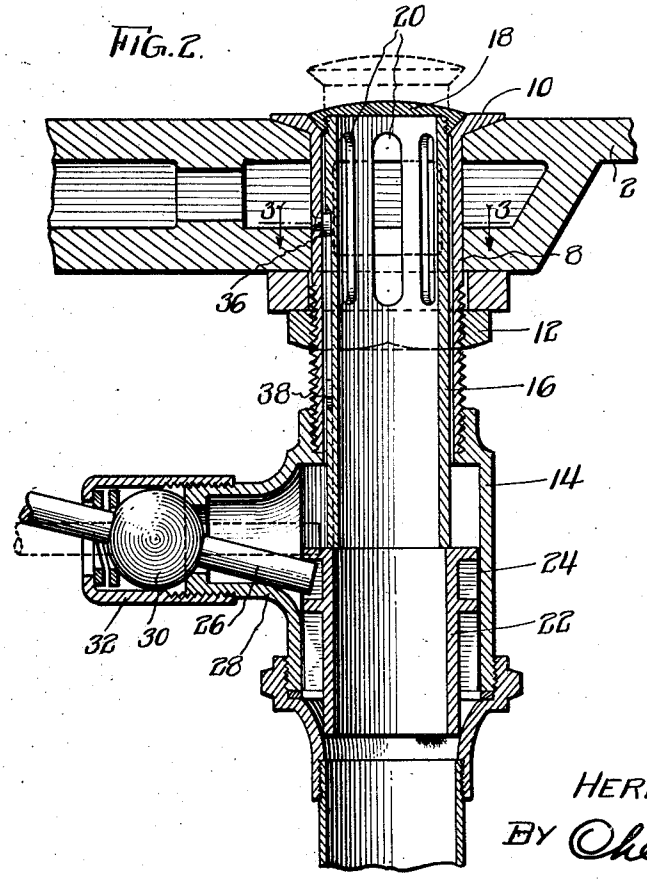
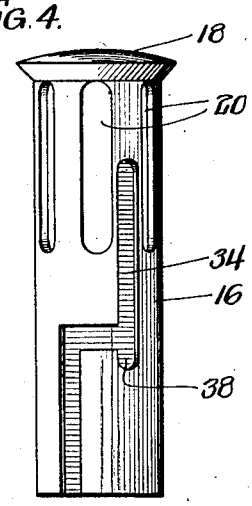


FIG. 4.



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UNITED STATES PATENT OFFICE

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POP-UP VALVE

Application filed September 12, 1928. Serial No. 305,454.

My invention relates to pop-up valves for waste pipes of bowls, tubs and containers of the like nature and more particularly to pop-up valves of the type which are adapted to be operated by means positioned externally of the liquid container.

My invention contemplates the provision of a pop-up valve comprising a sleeve which is readily removable from the drain pipe with which it is associated and which presents unobstructed drainage therethrough.

Another object of my invention is to provide a pop-up valve having a sleeve for permitting free and unobstructed drainage therethrough, said sleeve being readily removable from the drain pipe with which it is associated and adapted to be actuated through the agency of an independent annular member positioned within the drain pipe.

A further object of my invention is to preclude, as far as possible, the removal through theft or inadvertence, of drainage valve parts by providing a pop-up valve comprising a drainage sleeve which may be readily inserted within a drain pipe and which is provided with a way formed in the outer periphery thereof for co-operating with a locking pin so as to necessitate partial rotation of the sleeve in order to completely insert or remove the sleeve.

A still further object of my invention is to provide a pop-up valve, as above set forth, having a sleeve which will permit the free drainage of waste matter therethrough and which may be readily inserted or removed by a person familiar with a locking combination associated with the sleeve, said locking combination being such that the installation thereof does not necessitate the perforation of any portion of the detachable sleeve.

These and other objects will be more apparent from the following detailed description when considered in connection with the accompanying drawings, wherein—

Figure 1 is a vertical sectional view of a conventional basin or bowl which is equipped with a pop-up valve embodying features of my invention;

Figure 2 is an enlarged vertical sectional view of the pop-up valve disclosed in Figure 1;

Figure 3 is a horizontal sectional view taken transversely of the valve along the line 3—3 of Figure 2; and

Figure 4 is a detailed elevational view of the detachable sleeve, said view being shown primarily to disclose the nature of the way or locking groove formed in the periphery of said sleeve.

Referring now to the drawing wherein like numerals have been employed to designate similar parts throughout the various figures, it will be observed that I have disclosed, for the purpose of illustrating a practical application of my improved pop-up valve, a conventional basin or bowl 2. Over-flow water from the basin 2 may pass through an opening 4 in said basin into a chamber 6 which will direct such over-flow water to the central portion of the basin at which position my valve is installed.

By referring to Figure 2, it will be seen that I provide a fixed sleeve member 8 which is provided with a usual valve seating flange 10 at the upper end thereof. The lower half of the fixed sleeve member 8 is threaded to receive a clamping ring 12 which serves to secure the sleeve to the basin 2. Threaded to the lowermost extremity of the sleeve 8 is a suitable drain coupling 14 and vertically slidable within the fixed sleeve member 8 is another sleeve 16. This sleeve 16 is provided at its upper end with a cap 18 which is adapted to seat against the flange 10 when said sleeve is completely lowered within the fixed sleeve member 8. Drain openings 20 are formed within the sleeve 16 to permit the flow of waste matter through the sleeve from the basin 2 when said sleeve occupies the elevated position shown by the dotted lines in Figure 2. It will be observed that the sleeve 16 is imperforate and presents a smooth unobstructed surface below the drain openings 20 so as to permit the free drainage of material therethrough and that the space between the outer surface of said sleeve and the inner surface of companion fixed sleeve 8 is very small so as to prevent the accumulation of foreign matter such as soap and the like.

The lower extremity of the sleeve 16 terminates within the coupling 14 adjacent the upper portion of an annular sleeve lifting means 22. This lifting means 22 is vertically slidable within the coupling 14 and is provided with an annular groove 24 which accommodates the inner extremity of a lever 26. This lever 26 passes through a laterally extending portion 28 of the coupling 14 and is provided with a ball-like portion 30 which is housed within a closing cap 32, the usual packing gland being employed to provide a water-tight fit to prevent the escape of water through the laterally extending portion 28 of the coupling 14. In response to the movement of the lever 26, the lifting means 22 will be shifted vertically within the coupling 14 and thereby effect the elevation of the removable sleeve 16. It will be noted that the opening within the annular lifting member 22 is greater in diameter than the opening within the sleeve 16, thereby insuring the free and unobstructed flow of waste material from the sleeve 16 through the lifting member.

It is very desirable to have the sleeve 16 constructed so as to be readily detachable from and insertable within the fixed sleeve 8, but it is equally desirable to provide means whereby the removal of the sleeve through theft or inadvertence, will be avoided. To this end I provide, as clearly disclosed in Figure 4, a jogged way or groove 34 in the outer surface of the sleeve 16. It will be seen that this groove does not perforate the walls of the sleeve and, therefore, does not present any obstruction to the free drainage of materials through the sleeve. The lower end of this groove 34 is open to permit the association of said groove with a locking or guide pin 36, Figures 2 and 3, secured to the inner wall of the fixed sleeve member 8. Thus, it will be apparent that in order to properly insert the sleeve 16 within the sleeve 8, the lower vertical portion of the groove 34 must first be brought into registration with the locking pin or member 36. The sleeve may then be lowered until the horizontal portion of the groove 34 is reached, at which time the sleeve must be partially rotated in a clockwise direction, as viewed in Figure 3, until the upper vertical portion of the groove registers with the locking pin. The sleeve 16 may then be completely lowered within the companion sleeve 8 so as to occupy the position disclosed in Figure 2. In removing the sleeve 16 it is only necessary to reverse the movements just described in connection with the insertion thereof. In this connection it is to be noted that I provide a lower extended portion to the upper vertical section of the groove 34 which I have designated by the numeral 38, Figure 4, and obviously if the sleeve 16 is withdrawn vertically by a person not familiar with the jogged or bayonet-shaped construction of the groove 34, the horizontal portion of the groove will be moved past the pin 36 with the result that the extended portion 38 of the groove will be moved into association with said pin. In other words, the sleeve 16 can only be completely withdrawn by elevating said sleeve until the horizontal portion of the groove 34 is carried into registration with the pin 36 at which point the sleeve must be partially rotated in order to permit the continued upward movement thereof. Obviously, ways or grooves of varied forms may be used without departing from the spirit and scope of my invention. The bayonet-shaped groove which I have disclosed in the drawing, however, illustrates one type of groove which necessitates vertical and angular displacement of the sleeve in order to completely remove the same and thereby presents a very practical means for avoiding the inadvertent removal of such parts.

By providing means such as the annular elevating means 22 operable independently of the sleeve, I have avoided the necessity of directly connecting the sleeve with the lever 26 and this presents a very economical and practical construction. By employing this construction the sleeve 16 is very simple in construction and may be readily removed for purposes of repair or replacement with little difficulty. Also, my invention provides a very economically constructed and efficiently operable pop-up valve which may be readily, although not inadvertently, removed from the operative association with a drain pipe. As hereinbefore suggested, my invention is not limited to any specific form of locking the groove or way, but contemplates the use of variously shaped grooves which will function similarly to the bayonet or Z-shaped way disclosed in Figure 4 of the drawing. It will also be apparent that by employing the independently operable sleeve lifting means of the vertically slidable type disclosed in Figure 2, a continuous unobstructed drain conduit for waste material is presented and the possibility of accumulating foreign matter is thereby reduced to a minimum.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A pop-up valve including a sleeve having a closing valve at its upper end and a plurality of drain openings beneath said upper end, said sleeve being otherwise imperforate, an independently slidable lifting means including an annular member for engaging the lower extremity of the sleeve, and means for actuating the slidable lifting means.

2. In combination with a liquid container, a pop-up valve including a fixed outer sleeve, an inner sleeve slidable therein having a clos-

ing valve at its upper end and a plurality of drain openings beneath said upper end, said sleeve being otherwise imperforate, a way formed within the inner sleeve, and a fixed locking member for co-operation with the way, said way being formed to necessitate a rotary movement of the inner sleeve to effect the complete dislodgment thereof, said way serving to prevent complete rotation of the sleeve in its various positions of vertical adjustment, the smooth, cylindrical inner surface of the slidable sleeve being unbroken so as to permit the free unobstructed passage of drain water therethrough.

3. In combination with a liquid container, a pop-up valve of the class described including a fixed outer sleeve, an inner sleeve slidable therein having a closing valve at its upper end and a plurality of drain openings beneath said upper end, said sleeve being otherwise imperforate, a jogged groove formed within the inner sleeve extending circumferentially and longitudinally thereof, an abutment provided at each extremity of the circumferential groove for limiting rotation of the inner sleeve, and a fixed locking means designed for co-operation with the groove to secure the inner sleeve against inadvertent dislodgment, said jogged groove being formed upon the inner sleeve without impairing the smooth, cylindrical inner surface of the sleeve.

4. In a pop-up valve of the class described, an outer fixed sleeve, an inner sleeve slidable therein having a closing valve at its upper end and a plurality of drain openings beneath said upper end, said sleeve being otherwise imperforate, a groove formed within the peripheral surface of the inner sleeve, said groove comprising two sections extending longitudinally of the sleeve and a connecting section extending circumferentially of the sleeve, one of said longitudinal sections forming a T-connection with the connecting section, and means for actuating the slidable sleeve.

5. In a pop-up valve of the class described, an outer fixed sleeve, an inner sleeve slidable therein having a closing valve at its upper end and a plurality of drain openings beneath its upper end, said sleeve being otherwise imperforate, a groove formed within the inner sleeve, said groove comprising two sections extending longitudinally of the sleeve and a section extending between said longitudinal sections, the upper longitudinal section extending below said connecting section, and locking means extending into said groove.

In witness whereof, I have hereunto subscribed my name.

HERMAN M. HOELSCHER.