Nov. 23, 1943. P. MOORE-MacMAHON 2,335,129

SELF-CLOSING PLUG AND DRAIN ASSEMBLY FOR WASH-BASINS, SINKS, AND THE LIKE

Filed Sept. 24, 1942 2 Sheets-Sheet 1

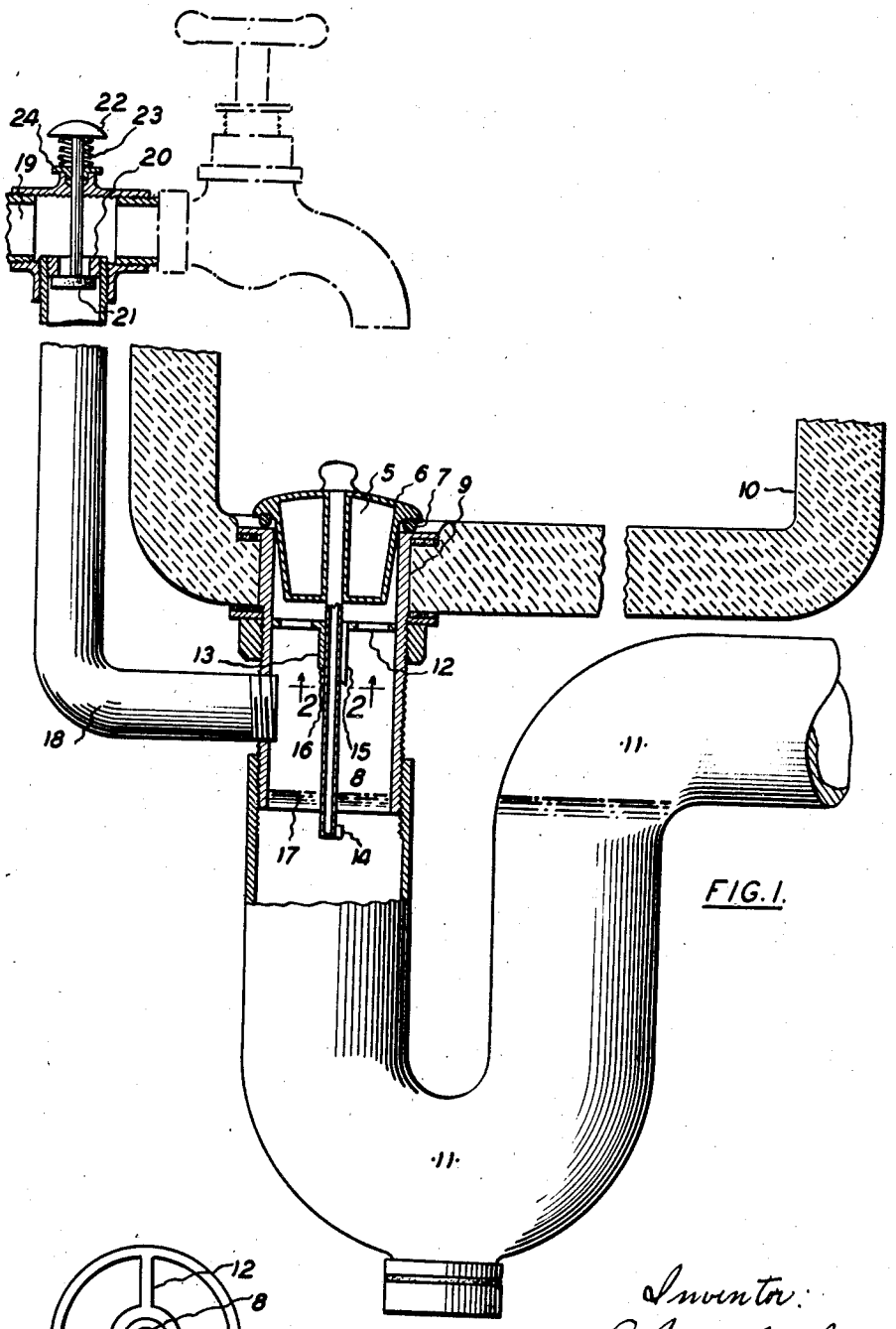


FIG. 1.

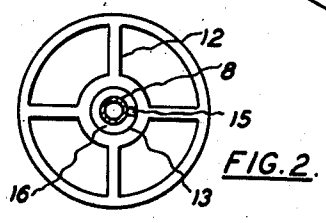


FIG. 2.

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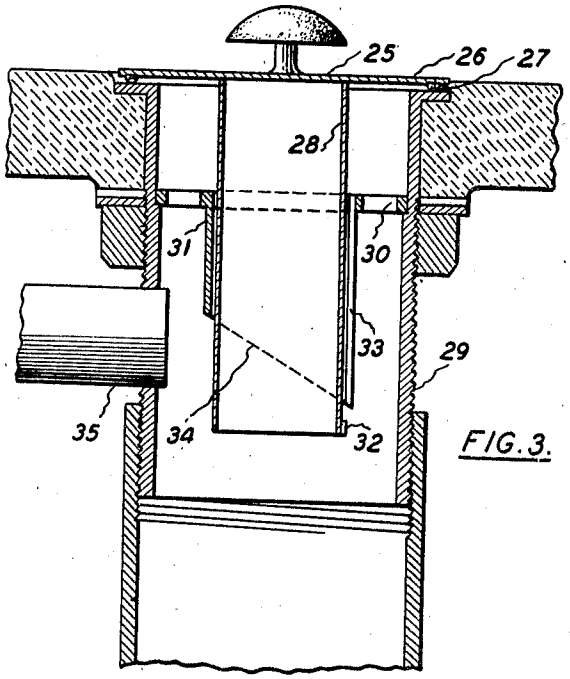


FIG. 3.

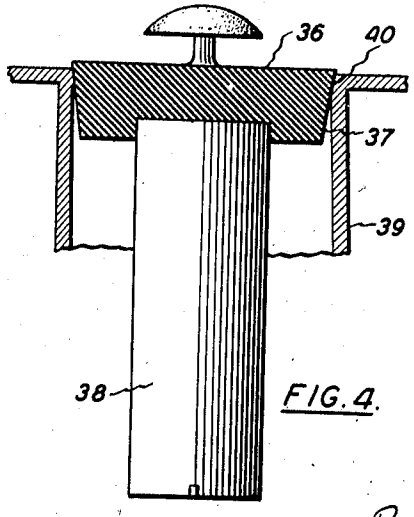


FIG. 4.

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SELF-CLOSING PLUG AND DRAIN ASSEMBLY FOR WASHBASINS, SINKS, AND THE LIKE

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Application September 24, 1942, Serial No. 459,572
In Australia November 18, 1941

7 Claims. (Cl. 4—295)

This invention relates to closure plugs and plug fitments for drain-vessels such as wash-basins, baths, sinks and the like; and it has been devised with the object of providing a plug and drain assembly which while of simple and inexpensive construction gives the plug self-closing ability when the contents of a vessel associated therewith have drained way. A further object of the invention is the provision of a self-closing plug and drain assembly in which the plug is adapted to be unseated from closed position, when required, without necessity for a user to handle the plug or wet his hands.

The present invention may be summarized as comprising a buoyant plug able to seat on the upper face or portion of a drain bush in a vessel, and guide means associated with the plug and with the bush, whereby the plug is directed into closed position during self-closing action, and whereby the plug is restrained against leaving the vicinity of the drain. Hand operated valve mechanism is preferably incorporated in the assembly to enable the pressure due to a flush of mains water to be directed against the underside of the plug so to unseat it when required.

In the accompanying drawings:

Fig. 1 is a partly sectioned side elevation of a preferred arrangement of the invention;

Fig. 2 is an incomplete sectional plan taken on line 2—2 in Fig. 1;

Fig. 3 is a sectional side elevation of a plug and drain assembly of slightly modified construction; and

Fig. 4 is a side elevation, partly in section, of an alternative plug construction.

Referring to Figs. 1 and 2, a buoyant plug consists of a head 5 (which is hollow, and to which buoyancy is due), a seating ring consisting of flange 6 and a ring gasket 7 of rubber or other sealing material which is applied to flange 6 by adhesive or other known means, and a guide stem 8 which is fixed to said head 5.

The drain-bush 9 is applied to vessel 10 in known manner, and is connected to a drain pipe or trap 11, also in conventional manner. The bush 9 includes a grating 12 having a central sleeve 13 within which the stem 8 is a sliding fit. The stem 8 has a key 14 integral therewith or fixed thereon in order to keep the plug in the vicinity of the bush. The sleeve may have a keyway 15 to enable the plug to be completely separated from the bush if required, and where such a keyway is provided it is preferable that the end-face 16 of the sleeve 13 be made oblique as shown in Fig. 1 so as to minimize likelihood of unwanted registrations of key 14 with keyway 15.

In order that the degree of necessary plug buoyancy may be kept as low as possible, the trap 11 is preferably positioned at a high level (as shown in Fig. 1) so that the water level (17) provides a relatively small air space below the plug. This air space may be only just sufficient to prevent floating of the plug in the trap water when the vessel is empty. This reduction of air space above the trap water level, to a minimum amount compatible with proper seating of the plug and practical placement of the trap below the vessel, ensures against the likelihood of the plug being suctionally seated in closed position before water emptying to waste has completely passed clear of the drain bush. This likelihood of suctional seating of the plug may also be avoided by providing a portion of reduced cross-sectional area in the drain pipe or trap, thus reducing the get-away speed of draining liquid.

The plug and drain means described above, by themselves, are useful, in that the plug possesses self-closing ability. For preference however, the installation includes means whereby the plug may be opened as required, without necessity for handling the plug or wetting the hands. These means comprise a pipe 18 which leads from a mains water pipe 19 and opens into the bush 9 between the plug head 5 and the trap water level 17. The mains end of pipe 19 has a seating 20 for a valve 21. Valve 21 has a hand knob 22 and is loaded by spring 23. The valve stem passes through stuffing box 24.

Fig. 1 illustrates the disposition of the several integers prior to use. In use, liquid in vessel 10 holds the plug in the closed position shown. When the vessel is to be drained, lifting of the plug initiates draining, and the buoyant property of the plug prevents reseating thereof until the vessel is empty. Lifting of the plug may be effected by grasping it, or by pressing on the hand-piece 22. In the latter case, the pressure rise due to the resulting flush of mains water into the space between head 5 and level 17 causes the plug to rise and thereby initiate draining as before.

Referring to Fig. 3, the plug consists of a head 25, a seating ring consisting of the marginal portion 26 of the head and a ring gasket 27, and a guide stem 28. In this construction, the guide stem is a hollow bell to which plug buoyancy is due. The drain bush 29 includes a grating 30 having a central sleeve 31 within which the stem 28 is a sliding fit. The stem 28 has a key 32, and the sleeve 31 may have a keyway 33. In

such case the end face 34 of the sleeve 31 is oblique as shown in Fig. 3 and has the keyway 33 opening to the lowest point of said oblique face. In this arrangement there is preferably included a flush-pipe 35 which is the same as that numbered 18 in Fig. 1, and is similarly equipped and employed.

Fig. 4 shows a plug consisting of a head 36, a seating ring consisting of the conical side surface 37 of said head, and a guide stem 38 the same as that numbered 28 in Fig. 3. The drain bush 39 is shaped at 40, to accommodate the seating ring 37.

What is claimed is:

1. A self-closing plug and drain assembly for drain-vessels, comprising a drain-bush having a plug seat-forming end thereon, a buoyant plug having a seating ring seatable on said seat-forming end, said plug being removable from said drain-bush by withdrawal thereof from the seat-forming end and without disassembly of any of the parts of the assembly, and means associated with said plug and with said drain-bush for guiding the movement of said plug to and from seating position on said seat-forming end and for restraining said plug against undesired dissociation from said drain-bush.

2. A self-closing plug and drain assembly for drain-vessels, comprising a drain-bush having a plug seat-forming end thereon, a buoyant plug having a seating ring seatable on said seat-forming end, said plug being removable from said drain-bush by withdrawal thereof from the seat-forming end and without disassembly of any of the parts of the assembly, means associated with said plug and with said drain-bush for guiding the movement of said plug to and from seating position on said seat-forming end and for restraining said plug against undesired dissociation from said drain-bush, and means for delivering a flow of water under pressure into said drain-bush.

3. A self-closing plug and drain assembly for drain-vessels, comprising a buoyant plug consisting of a head, a seating ring on said head, a guide stem fixed to said head, and a key on said guide stem, and a drain-bush which includes a grating and a sleeve on said grating in which said stem is slidable, said plug being seatable by its seating ring on said drain-bush and being removable from the latter by withdrawal thereof from the drain-bush without disassembly of any of the parts of the assembly, means registrable with said key being provided on said sleeve for the reception and passage of the key during withdrawal of said plug from the drain-bush.

4. A self-closing plug and drain assembly for drain-vessels, comprising a buoyant plug consisting of a head, a seating ring on said head, a guide stem fixed to said head, and a key on said guide stem, a drain-bush which includes a grating and a sleeve on said grating in which said stem is slidable, a flush-pipe which extends from a mains water pipe and opens into said drain-bush, and a spring loaded valve whereby water may be admitted into said flush-pipe from said mains water pipe, said plug being seatable by its seating ring on said drain-bush and being removable from the latter by withdrawal thereof from the drain-bush without disassembly of any of the parts of the assembly, means registrable with said key being provided on said sleeve for the reception and passage of the key during withdrawal of said plug from the drain-bush.

5. An assembly according to claim 2, wherein the sleeve in said drain-bush has an oblique lower end face, and said last-named means is a keyway slot extending along the entire length of said sleeve.

6. An assembly according to claim 1, wherein said plug comprises a closed hollow head, and said seating ring consists of a circumferential flange which extends laterally from said head.

7. An assembly according to claim 1, wherein said plug comprises a head and a guide stem in the form of a hollow bell fixed to said head.

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