Aug. 25, 1953 J. W. McGARRY 2,649,592

VALVE-PLUG UNIT FOR DRAIN ASSEMBLIES

Filed March 2, 1950

FIG. 1.

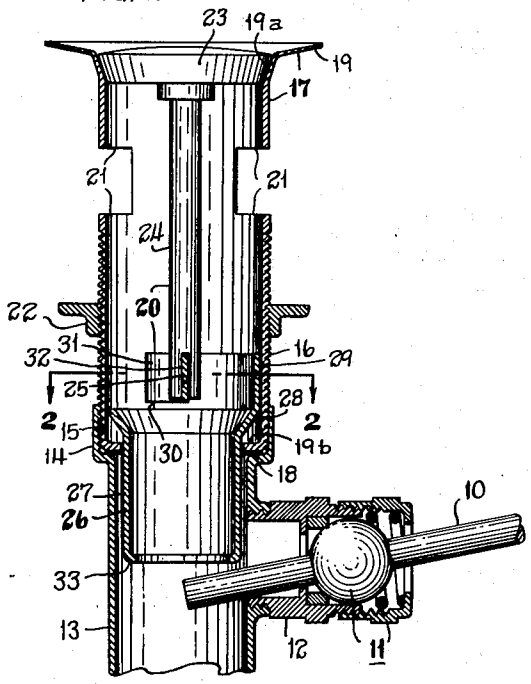


FIG. 2.

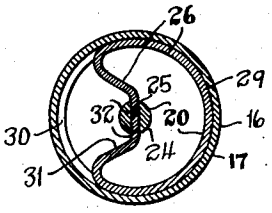


FIG. 5.

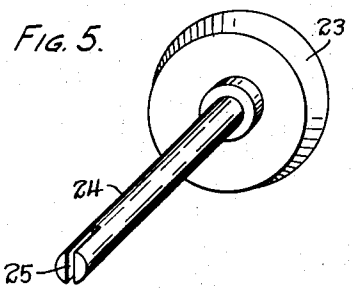


FIG. 6.

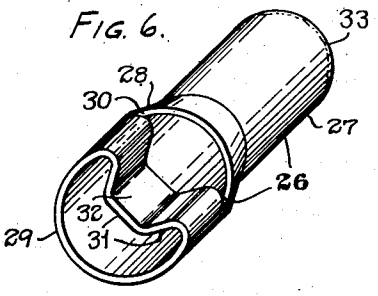


FIG. 3.

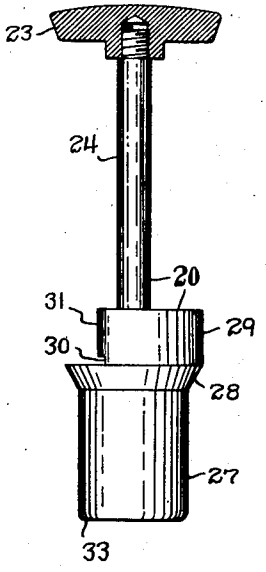
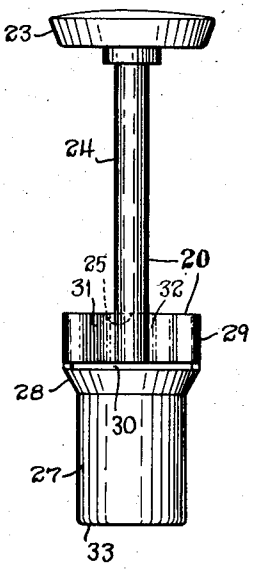


FIG. 4.



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VALVE-PLUG UNIT FOR DRAIN ASSEMBLIES

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3 Claims. (Cl. 4—203)

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This invention relates to drain-fittings for lavatories, sinks, washstands, and the like, and more particularly to an improved valve-plug unit of the mechanically-operated type.

An important object of the present invention is to provide an improved valve-plug unit and co-acting drain-head of novel design and construction.

Another object of the invention is to provide an improved mechanically-operable valve-plug unit with a view to effecting a substantial saving in cost of manufacture, while assuring a strong, rigid and simplified construction.

An additional object of the invention is the provision of a mechanically-operable valve-plug unit for drain-fittings, of comparatively simple and inexpensive construction, and adapted to provide self-guiding means within its drain-head while affording an unusually rugged wear-resistant construction, and a design assuring smooth efficient operation in use.

Other objects and advantages will appear to those skilled in the art from the following, considered in conjunction with the accompanying drawings.

In accordance with the present invention, the drain-head is of open construction in that there are no means in the interior for guiding the stem of the valve-plug unit, this function being provided for by arranging on the stem of the unit a novel self-guiding member that coacts with the drain-head to assure the correct alignment and smooth reciprocation of the unit in the drain-head.

Since these devices are manufactured on an extensive scale, it is important that the cost of their manufacture be reduced so far as practicable and consistent with an efficient design and construction. This is achieved by the present novel method of construction that affords an unusually strong and efficient operating-structure, easily removed from the drain-head when required, and that particularly lends itself to quantity production.

In the accompanying drawings, in which certain modes of carrying out the present invention are shown for illustrative purposes:

Fig. 1 is a central-longitudinal sectional view of one form which a drain-fitting may assume in accordance with the present invention;

Fig. 2 is a transverse sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a view mainly in side elevation and partly in section of the valve-plug unit, detached;

Fig. 4 is a view similar to Fig. 3, but viewing the valve-plug unit from a direction at a right angle to the direction in which it is viewed in Fig. 3;

Fig. 5 is a perspective view of the valve head and valve-stem unit detached from the guide-tube; and

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Fig. 6 is a perspective view of the guide-tube of the valve-plug unit, detached.

In the drawings wherein a preferred form of the invention is depicted, the numeral 10 designates an operating-lever connected to a lift-rod (not shown) and rockably supported by an associated ball-and-socket unit, generally designated at 11, secured to an offset-section of pipe 12 projecting exteriorly from a waste pipe 13. The inner end of the operating-lever 10 is protruded a predetermined distance into the waste pipe, for a purpose which will appear more fully hereinafter.

The waste pipe 13 has a flange 14 interiorly threaded as at 15 and accommodating the lower externally-threaded body-portion 16 of an open-type or guideless drain-head designated generally at 17. A gasket 18 at the bottom of the flange 14 affords a liquid-tight seal between the drain-head and the waste pipe.

The drain-head 17 has a tubular body-portion provided at its upper end with an outwardly-projecting integral annular flange 19 that is adapted to engage on its under surface an adjacent portion of a drain assembly, such as a lavatory bowl (not shown). The inner surface of the body-portion of the drain-head adjacent its junction with the flange 19, is flared and conically configured, as at 19*a*, to provide a sealing seat for the plug-head of the valve-plug unit, designated generally at 20 and described more fully in ensuing paragraphs. The bottom edge of the drain-head 17 is flanged inwardly, as at 19*b*.

The upper body-portion of the drain-head 17 further includes a pair of diametrically-opposed overflow-receiving arcuate cutout-portions or openings as at 21. A clamp nut 22 secures the drain-head operatively to the aforesaid lavatory bowl.

In accordance with the present invention, the valve-plug unit 20 comprises a plug-head 23 mentioned above and having a conical lateral periphery adapted to engage the similarly conically-configured seat-portion 19*a* of the flange 19, when the said plug-head is lowered to close the passageway of the drain-head. The under surface of the plug-head 23 has secured thereto in any suitable manner a rigid depending-stem 24 having its bottom edge centrally slotted as at 25, the said slot being positioned in a plane registering with the longitudinal axis of the stem.

In further conformity with and as an important feature of the present invention, a guide-member, generally designated at 26, is fastened to the lower end of the stem 24 and within the slot 25. The guide-member 26 has a lower tubular body-portion 27 of relatively-reduced diame-

ter open at its lower end, and flared or flanged, as at 28, and then extended vertically upward and integrally, as seen in Figs. 3 and 4, from the flare 28 to provide a relatively-enlarged or expanded portion 29 concentric with the body-portion 27.

The enlarged portion 29 is slotted or cut, as at 30, adjacent its junction with the flange 28 substantially to the depth of a radius or semicircle, and now provides an upper section that is pressure-formed, as by die-punching, to afford a reentrant and somewhat U-shaped integral convolution 31. The convolution 31 has a comparatively straight or rectilinear reach 32 in substantial alignment with the longitudinal axis of the stem 24 and, consequently, with that of the guide-member 26. The reach 32 is designed and adapted for reception in the slot 25 of the stem 24, and is fastened therein in any suitable manner as by soldering, brazing, etc.

The bottom edge of the lower body-portion 27 has an inwardly-directed annular flange as at 33, which is engageable by the adjacent end-portion of the operating-lever 10 (Fig. 1) in the waste pipe 13, so that when the said operating-lever is rocked, the valve-plug unit 20 will be raised or lowered and the plug-head 23 will similarly move with respect to its conical seat 19a in the drain-head 17, as described more fully hereinafter.

With the operating-lever 10 in its drain-closing position, the valve-plug unit 20, when introduced into the drain-head 17, will descend until the under surface of the plug-head 23 engages the conical seat 19a, thereby sealing the top of the passageway in the drain-head. The enlarged diameter portion 29 of the guide-member 26, it will be understood, is in free sliding contact with the inner periphery of the drain-head 17, while the relatively-reduced or lower body-portion 27 is slidable through the inwardly-directed annular flange 19b, mentioned above, on the lower end of the drain-head.

When the valve-plug unit 20 is in position to close the passageway of the drain-head, the stopper or plug-head 23 is seated on the conical seat 19a and the flange 33 on the bottom edge of the body-portion 27 is in position to be engaged by the inner protruded end of the operating-lever 10. If the outer end of the operating-lever 10 is now rocked downwardly, it will be understood that the inner end thereof will rise and engage the flange 33 of the body-portion 27 and consequently elevate the engaged stopper or plug-head 23 off the conical seat 19a, thereby opening the passageway of the drain-head and permitting the contents of the lavatory bowl to drain. When the operating-lever is moved to lower the inner end thereof, the valve-plug unit descends by gravity with the lower end thereof, engaging the operating-lever 10 until the plug-head 23 seats on the conical seat 19a. Continued downward movement of the inner end of the operating-lever will disengage the latter from the valve-plug unit ensuring the seating of the plug-head on the seat 19a.

The construction of the valve-plug unit, it will be noted, is at once simple and rugged. The tubular body-portion and the integral reach thereon, in its central position, permits a quick, yet accurate locating of the valve-stem so that correct seating of the plug-head unit on the drain-head is assured.

The unit itself, by virtue of its design and construction, is smoothly and easily guided in the drain-head so that during its lifting and lowering

movements, canting and, therefore, possible binding in the said drain-head is substantially eliminated. The device also is particularly adapted for quantity production, since it merely involves the provision of a valve-plug with its stem slotted, and then applying the latter to a reach on a preformed tube-section, as indicated above.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. In a drain-assembly; a substantially tubular drain-head having an inwardly turned annular flange at the lower end thereof, said flange forming an opening of smaller diameter than the diameter of said drain-head; a plug-head adapted to engage with the upper end of said drain-head; a stem element secured at one end to said plug-head; and a tubular guide member secured to the other end of said stem element, said guide member comprising an upper portion having a sliding fit with said drain-head and a lower portion of reduced diameter having a sliding fit with the opening formed by said flange.

2. A drain-assembly as defined in claim 1, wherein said stem element is formed with slot means in its guide member engaging end, and the upper portion of said guide member is formed with a diametral reach secured in said slot means.

3. In a drain assembly; a substantially tubular drain-head having an inwardly directed annular flange at the lower end thereof, said flange forming an opening of smaller diameter than the inner diameter of the body of said drain-head; a waste pipe secured to said drain-head and having an inner diameter substantially equal to the diameter of the opening formed by said flange; a plug operating element extending into said waste pipe; a plug-head adapted to operably engage with the upper end of said drain-head; a cylindrical stem secured at its upper end to said plug-head, said stem having a slot formed in its lower end; and a tubular guide member positioned in said drain-head and comprising an upper portion having a sliding fit in the body of said drain-head and a lower portion of reduced diameter having a sliding fit in the opening formed by said flange and in said waste pipe, said upper portion having an integral diametral reach secured in said slot, and said lower portion being formed at its lower end with an inwardly turned annular flange for engagement with said plug operating element.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
393,690	Cite	Nov. 27, 1888
568,261	Lewis	Sept. 22, 1896
1,049,795	Allingham	Jan. 7, 1913
1,485,669	Davis	Mar. 4, 1924
1,723,038	Hoelscher	Aug. 6, 1929
2,282,212	Pope	May 5, 1942