May 5, 1942. E. A. POPE 2,282,212

DRAIN ASSEMBLY

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Fig. 1.

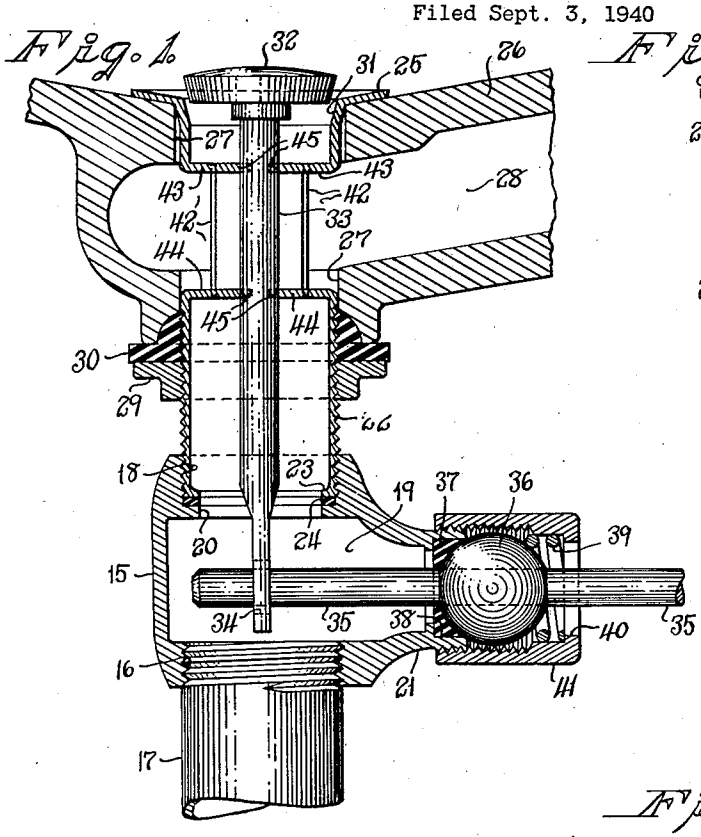


Fig. 2.

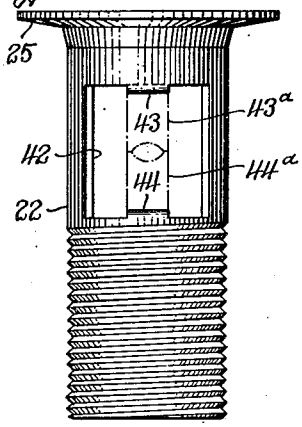


Fig. 4.

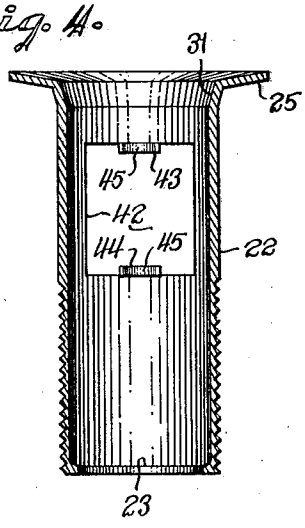


Fig. 3.

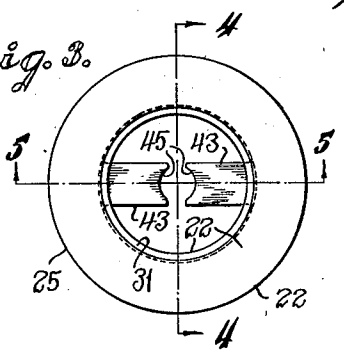


Fig. 5.

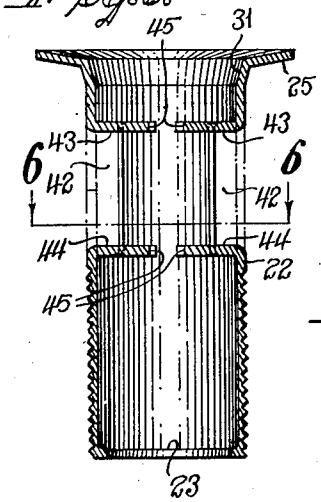
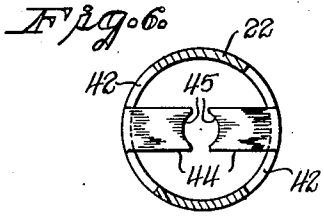


Fig. 6.



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DRAIN ASSEMBLY

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Fig. 1.

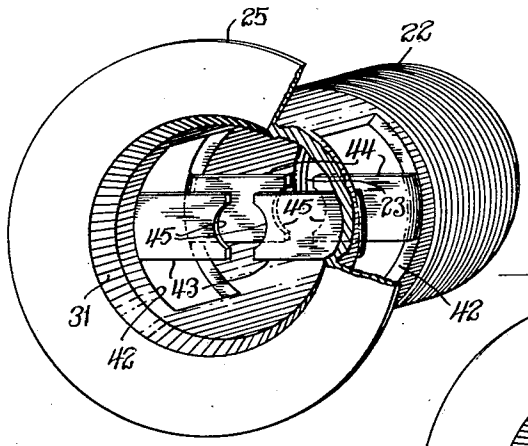


Fig. 9.

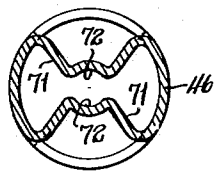


Fig. 10.

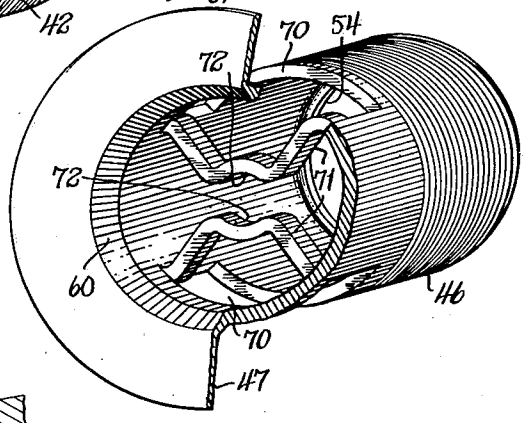


Fig. 8.

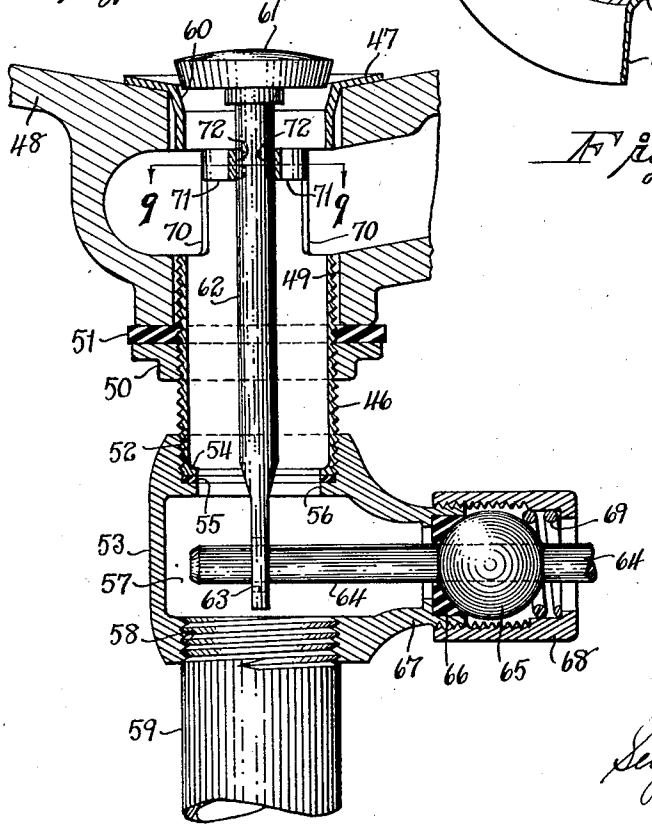
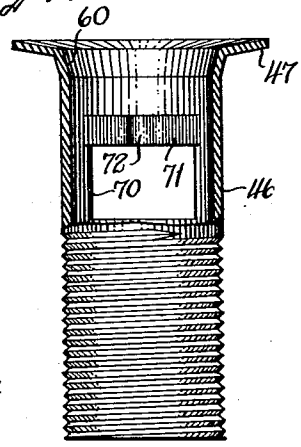


Fig. 11.



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UNITED STATES PATENT OFFICE

2,282,212

DRAIN ASSEMBLY

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Application September 3, 1940, Serial No. 355,108

4 Claims. (Cl. 4—194)

The present invention relates to improvements in drain-assemblies for lavatories, sinks, wash-trays, etc., and relates more particularly to improvements in drain-assemblies which are provided with a mechanically-operated stopper forming a permanent normal part of the assembly.

One of the objects of the present invention is to provide a superior drain-assembly of the character referred to which may be produced at a low cost for manufacture and which may be relied upon to discharge its functions over long periods of use and without derangement of its relatively-movable parts.

Another object of the present invention is to provide a drain-assembly having a mechanically-operable plug or stopper and characterized by superior means for guiding the said stopper in its movements into and out of its drain-closing position.

A further object of the present invention is to provide a drain-assembly of the character referred to and which is characterized by a superior construction and arrangement of parts whereby the stopper or plug may be properly guided in its movements without unduly restricting the flow of waste through the drain passage of the assembly.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention includes all features in the said disclosure which are novel over the prior art and which are not claimed in any separate application.

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

Fig. 1 is a broken view in vertical central-longitudinal section of a drain-assembly embodying the present invention and shown as installed in a lavatory-bowl and connected to a waste pipe;

Fig. 2 is a view in side elevation of the drain-head detached;

Fig. 3 is a top or plan view thereof;

Fig. 4 is a view in vertical central-longitudinal section taken on the line 4—4 of Fig. 3;

Fig. 5 is a similar view but taken on the line 5—5 of Fig. 3;

Fig. 6 is a transverse sectional view taken on the line 6—6 of Fig. 5;

Fig. 7 is a perspective view of the tubular drain-head with portions thereof broken away and shown in section;

Fig. 8 is a vertical central-longitudinal view corresponding to Fig. 1 but showing another form which the present invention may assume;

Fig. 9 is a transverse sectional view through the drain-head taken on the line 9—9 of Fig. 8 and omitting the other elements;

Fig. 10 is a perspective view of the drain-head of Figs. 8, 9 and 11 with portions thereof broken away and shown in section; and

Fig. 11 is a view of the tubular drain-head of Figs. 8, 9 and 10 shown partly in side elevation and partly in vertical central-longitudinal section but viewing the said drain-head from a right angle to the position in which it is shown in Fig. 8.

The structure of Figs. 1 to 7, inclusive

The drain-assembly shown in the figures now under consideration includes a body 15 having a threaded aperture 16 in its lower wall for the threaded reception of a waste-pipe 17 which may lead to any suitable waste-receiving system. Formed in the upper wall of the body 15 in axial alignment with the threaded aperture 16 is a threaded aperture 18 communicating with the chamber 19 within the said body 15 and having at its lower end an inwardly-projecting annular stop-flange 20. The body 15 of the drain-assembly is also provided with a horizontally-offsetting neck 21 communicating with the chamber 19 in the said body as is clearly shown in Fig. 1 and for purposes as will hereinafter appear.

Threaded into the upper aperture 18 in the body 15 is the externally-threaded lower portion of a tubular drain-head 22 having its lower end provided with an integral inwardly-projecting annular flange 23. The under face of the annular flange 23 just referred to, seats against a compressible ring-like gasket 24 having its under face, in turn, seated against the upper face of the stop-flange 20 of the body 15.

The upper end of the tubular drain-head 22 is formed with an integral outwardly-extending flared flange 25 having its under face seated against the upper face of the bottom wall of a lavatory-bowl 26 immediately around a vertical drain-passage 27 formed in the lavatory-bowl 26. The vertical drain-passage 27 just above referred to, is intersected about midway of its length by a laterally-extending overflow-passage 28 forming a usual feature of lavatory-bowls.

The flange 25 at the upper end of the tubular drain-head 22 is held seated against the adjacent portion of the lavatory-bowl 26 by means

of a clamping-nut 29 threaded onto the exteriorly-threaded lower portion of the said drain-head and thrusting upwardly against a packing-ring 30 which in turn presses against the under portion of the lavatory-bowl 26 around the lower terminus of the vertical drain-passage 27 therein.

In its upper portion the tubular drain-head 22 is formed with a conically-contoured stopper-seat 31 adapted to be engaged by the conically-contoured periphery of a disc-like stopper-head or plug 32 having a rigid depending stem 33 extending downwardly from the said stopper-head centrally through the interior of the drain-head 22 and into the chamber 19 in the body 15. The lower end of the stem 33 is flattened as shown in Fig. 1 and is provided with a transverse aperture 34 freely receiving the inner end of a horizontal rod-like operating-lever 35. The said operating-lever 35 extends outwardly from the chamber 19 in the body 15 through the neck 21 thereof and thence outwardly beyond the said neck for connection to any suitable manual operating means for effecting the raising and lowering of the stopper-head 32 with respect to the stopper-seat 31.

Intermediate its ends the operating-lever 35 is provided with a spherically-contoured ball-like trunnion 36 having its inner portion seated against a resilient seat-member 37 formed of rubber or other suitable resilient sealing material. The said seat-member 37 is mounted in an outwardly-opening counter-bore 38 formed in the outer portion of the neck 21 of the body 15. The ball-like trunnion 36 of the operating-lever 35 is held in watertight seated engagement with the resilient seat-member 37 by means of a helical spring 39 pressing at its inner end against the outer portion of the said trunnion. The outer portion of the said helical spring 39 presses in turn against an annular inwardly-propecting flange 40 formed at the outer end of a substantially-tubular retaining-cap 41 provided with internal threads for threaded engagement with external threads upon the outer end of the neck 21 of the body 15, all as shown in Fig. 1.

Registering with the overflow-passage 28 in the lavatory-bowl 26 are two arcuate overflow-receiving openings 42—42 respectively formed at diametrically-opposite points in the cylindrically-contoured side wall of the tubular drain-head 22.

For the purpose of providing guiding means for guiding the vertical reciprocation of the stem 33 of the stopper 32, the tubular drain-head 22 is formed with two upper radially-extending guide-fingers 43—43 respectively formed integral with and inwardly-projecting from the upper edges of the respective overflow-receiving openings 42—42 in the said drain-head. Also for purposes of guiding the stem 33 the said drain-head is formed with two lower guide-fingers 44—44 each formed integral at its outer ends with the material constituting the lower edge of the adjacent one of the said overflow-receiving openings 42—42 in the drain-head and projecting inwardly toward each other as shown in the drawings.

The guide-fingers 43—43 and 44—44 may be conveniently formed of material displaced in the process of forming the waste-receiving openings 42—42 in the drain-head 22 as is indicated by the broken lines 43*a* and 44*a* in Fig. 2.

Each of the guide-fingers 43—43 and 44—44 is formed in its inner edge with an arcuate notch 45 shaped to substantially conform to the transverse curvature of the stem 33 of the stopper-head 32 and providing, together with the similar notch of the horizontally-aligned opposed guide-finger, a guide-way which substantially encircles the said stem 33.

The fit between the periphery of the stem 33 of the stopper-head 32 and the surfaces of the notches 45 in the guide-fingers 43—43 and 44—44, is a free sliding fit just sufficiently close to ensure that the said stopper 32 will be guided into approximate registration with the stopper-seat 31.

By forming the guide-fingers 43—43 and 44—44 or their equivalent, integral with the drain-head a degree of rigidity is secured which is otherwise unattainable except by the employment of cumbersome and costly inserts, which latter, in addition to adding to the cost of the structure, are very apt to obstruct a greater portion of the cross-sectional area of the tubular passage through the drain-head than is the case with the integral guide-means referred to.

The structure of Figs. 8 to 11, inclusive

In the figures now under consideration there is shown a tubular drain-head 46 substantially conforming to the drain-head 22 before referred to, and like the same, provided at its upper end with a flange 47 resting upon the upper face of the bottom wall of a lavatory-bowl 48. The said drain-head 46 extends downwardly through a vertical drain-passage 49 in the lavatory-bowl 48 and has applied to its exteriorly-threaded lower portion a clamping-nut 50 pressing upwardly against a packing-ring 51 surrounding the said drain-head as is shown in Fig. 8. The clamping-nut 50 serves to seat the upper portion of the packing-ring 51 against the adjacent under portion of the lavatory-bowl 48 and thus firmly seat the flange 47 at the upper end of the drain-head 46 against the upper surface of the said lavatory-bowl.

Like the drain-head 22 before referred to, the lower portion of the drain-head 46 is threaded into a threaded aperture 52 formed in the upper portion of a body 53 corresponding generally to the body 15 of the structure of Figs. 1 to 7, inclusive. The lower end of the tubular drain-head 46 is provided with an inwardly-turned annular flange 54 seating against the upper surface of a ring-like gasket 55 supported upon an inwardly-projecting annular flange 56 at the inner end of the upper aperture 52 in the body 53. At its lower end the upper aperture 52 communicates with a chamber 57 in the interior of the body 53 and therefore is in communication with an aperture 58 formed in the lower portion of the said body and internally threaded for the reception of a waste-pipe 59.

Adjacent its upper end the drain-head 46 is formed with a conically-contoured stopper-seat 60 adapted to receive the similarly-contoured peripheral portion of a disc-like stopper-head 61 provided centrally with a depending stem 62 extending downwardly centrally through the interior of the drain-head 46 and ultimately into the chamber 57 of the body 53. The lower end of the stem 62 just referred to is provided with a transverse aperture 63 freely receiving the inner end of a horizontal operating-lever 64.

The operating-lever 64, like the operating-lever 35 before referred to, is provided intermediate its ends with a ball-like trunnion 65 seated at its inner end against a resilient seat-

member 66 mounted in the laterally-offsetting neck 67 of the body 53. The outer portion of the said neck 67 is externally threaded for the reception of the internally-threaded inner portion of a substantially-tubular retaining-cap 68 which houses the major portion of the trunnion 65. The retaining-cap 68 also accommodates in its outer portion a helical spring 69 which serves to press the inner portion of the spherically-contoured trunnion 65 into watertight seated engagement with the resilient seat-member 66, in a manner similar to that described in connection with the trunnion 36 of the structure of Figs. 1 to 7, inclusive.

At diametrically-opposite points adjacent its upper end the drain-head 46 is formed respectively with two overflow-receiving openings 70—70 of arcuate form in a horizontal direction as is shown especially well in Fig. 9. Bent inwardly from the upper portions of each of the side edges of each of the overflow-receiving openings 70—70 is one of two complemental guiding-webs 71—71. At each of its respective opposite ends the given one of the guiding-webs 71—71 is integrally united with the edges of the adjacent one of the two openings 70—70 and has in its center portion a concave guiding-face 72 substantially conforming in curvature to the curvature of the stem 62 of the stopper-head 61. As thus arranged the central portion of each of the guiding-webs 71—71 has its concave guiding-face 72 arranged in opposition to the similar face of the other guiding-web, as is especially well shown in Figs. 9 and 10. The distance between the respective concave guiding-faces 72—72 of the guiding-webs 71—71 is such as to afford a free sliding fit for the stem 62 in its vertical movement under movements imparted to it by the operating-lever 64.

The complemental guiding-webs 71—71 not only provide accurate guiding means for the stem 62 of the stopper 61 but present but a negligible amount of obstruction to the flow of waste water downwardly through the drain-head 45 past the stopper-seat 60 therein.

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. A drain-assembly including in combination: a stopper-unit comprising a stopper-head and a vertical stem depending from the said stopper-head; and a vertical tubular wrought-metal drain-head centrally receiving in its interior the stem of the said stopper-unit and having a cylindrical side-wall, the said drain-head being provided adjacent its upper end with a stopper-seat toward and away from which the stopper-head of the said stopper-unit is vertically movable, the said drain-head also having two openings in its side-wall from a margin of each of which openings an integral portion of the said side-wall is bent inwardly toward and into guiding relationship to the stem of the said stopper-unit to guide the vertical movement of the said stopper-unit and ensure the registration of the stopper-head thereof with the stopper-seat in the upper portion of the said drain-head.

2. A drain-assembly including in combination: a stopper-unit comprising a stopper-head and a vertical stem depending from the said stopper-head; and a vertical tubular wrought-metal drain-head centrally receiving in its interior the stem of the said stopper-unit and having a cylindrical side-wall, the said drain-head being provided adjacent its upper end with a stopper-seat toward and away from which the stopper-head of the said stopper-unit is vertically movable, the said drain-head also having two oppositely-located openings in its side-wall from a marginal edge of each of which openings an integral portion of the said side-wall is bent inwardly in opposition to the other said portion and toward and into guiding relationship to the stem of the said stopper-unit to guide the vertical movement of the said stopper-unit and ensure the registration of the stopper-head thereof with the stopper-seat in the upper portion of the said drain-head.

3. A drain-assembly including in combination: a stopper-unit comprising a stopper-head and a vertical stem depending from the said stopper-head; and a vertical tubular wrought-metal drain-head centrally receiving in its interior the stem of the said stopper-unit and having a cylindrical side-wall, the said drain-head being provided adjacent its upper end with a stopper-seat toward and away from which the stopper-head of the said stopper-unit is vertically movable, the said drain-head also having two openings in its side-wall from a margin of each of which openings an integral portion of the said side-wall is bent inwardly toward and into guiding relationship to the stem of the said stopper-unit, the said integral inwardly-bent portions of the said side-wall being provided with an inwardly-facing concave guiding-surface engageable with the stem of the said stopper-unit to stabilize the said stem againts lateral movement in a plurality of directions.

4. A drain-assembly including in combination: a stopper-unit comprising a stopper-head and a vertical stem depending from the said stopper-head; and a vertical tubular wrought-metal drain-head centrally receiving in its interior the stem of the said stopper-unit and having a cylindrical side-wall, the said drain-head being provided adjacent its upper end with a stopper-seat toward and away from which the stopper-head of the said stopper-unit is vertically movable, the said drain-head also having two oppositely-located openings in its side-wall from a marginal edge of each of which openings an integral portion of the said side-wall is bent inwardly in opposition to the other side portion and toward the stem of the said stopper-unit, each of the inner portions of the said inwardly-deflected integral portions being formed with an inwardly-facing concave guiding-surface engageable by the stem of the said stopper-unit for stabilizing the latter against lateral movement in a plurality of directions relative to the drain-head.

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