

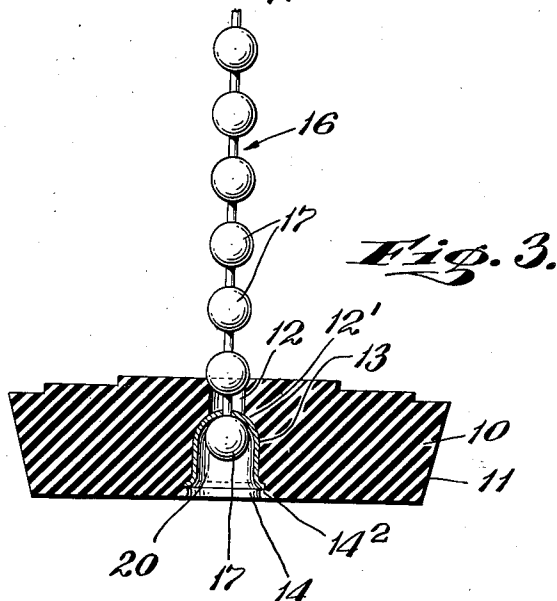
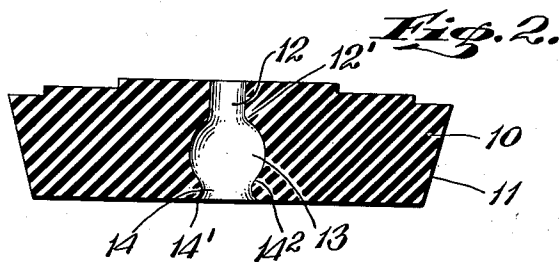
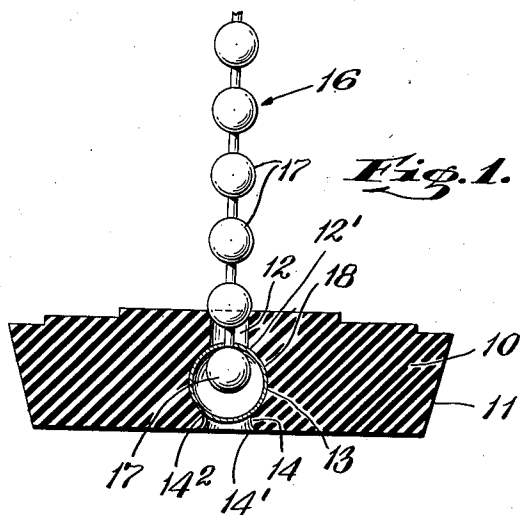
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DRAIN STOPPER

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DRAIN STOPPER

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The present invention relates to stoppers for sink, bathtub and lavatory drains or the like.

Stoppers for this purpose are usually provided with an elongated member such as a chain or cord which in turn is attached to the sink, tub or lavatory to anchor the same thereto and to facilitate removal of the stopper from the drain.

It is an object of the present invention to provide such stopper construction as will permit simple, quick and effective connection therewith of a suitable chain or cord without requiring the use of tools.

Another object is to provide such stopper construction as will permit the attachment of a suitable chain or cord directly to the stopper in a substantially leak-proof manner and without requiring additional connecting parts.

Still another object is to provide a stopper which can be readily manufactured with minimum costs.

To the accomplishment of the foregoing and such other objects as may hereinafter appear, this invention consists in the construction and arrangement of parts hereinafter described and then sought to be defined in the appended claims, reference being had to the accompanying drawing forming a part hereof and which shows, merely for the purpose of illustrative disclosure, preferred embodiments of the invention, it being expressly understood, however, that various changes may be made in practice within the scope of the claims without digressing from the inventive idea.

In the drawing, in which similar reference characters denote corresponding parts,

Figure 1 represents a vertical sectional elevation of a stopper constructed according to my invention to which a ball or bead chain of conventional form is attached in one manner by the use of an enlarged ball or bead;

Fig. 2 represents a vertical section of a stopper embodying my invention and illustrating in detail the internal stopper structure; and

Fig. 3 represents a vertical sectional elevation of a stopper constructed according to my invention to which a ball or bead chain of conventional form is attached in a modified manner by the use of a bell pendant or cup.

Referring now to the drawing and first to Figs. 1 and 2, 10 denotes generally a stopper made of rubber or other suitable resilient material. This stopper has a tapering side wall 11 adapted to engage the drain (not shown) snugly in well-known manner. A vertical bore 12 at the center

of the stopper extends downwardly from the top face thereof into the body of the stopper and communicates with a cavity 13 of substantially larger diameter in the body of the stopper. In the embodiment shown, this cavity is spherical and also communicates with the cavity 13. The diameter of this bore 14 is somewhat less than that of the cavity 13 and somewhat larger than that of bore 12. Bore 14 may be flared at its lower end 14'.

This stopper 10 is adapted to have a conventional bead or ball chain 16 attached thereto. In the embodiment shown in Fig. 1, this chain 16 has uniformly sized interconnected beads or balls 17 throughout its length. A single ball or bead 18 of enlarged diameter is attached to or over the lowermost ball 17 of the chain. The diameter of the balls or beads 17 is slightly in excess of the diameter of the bore 12 in the stopper so that they must be forced through said bore against the action of the resilient material of the stopper. The diameter of the large bead or ball 18 is somewhat larger in diameter than that of the cavity 13 and bore 14 of the stopper, so that the ball or bead 18 must be forced into the cavity 13 against the action of the resilient material which then presses snugly against the ball in the cavity.

This chain is attached to the stopper by inserting the uppermost small bead 17 through the bore 14 and cavity 13 from the bottom of the stopper and forcing it through the bore 12 to the upper face of the stopper and then pulling this bead and those below it through the bore 12 until the large bead 18 is pulled through the bore 14 and into the cavity 13 in the stopper. Being somewhat larger in diameter than the cavity, it must be forced into the latter, whose resilient walls give to receive it and snugly retain it in place, pressing against it to produce a substantially watertight seal. The wall of bore 14, of course, is deformed during passage of the ball 18 therethrough, but returns to initial shape and size as soon as the ball 18 is in the cavity 13 so that in effect the said ball is snugly nested in the said cavity and prevented from dislodgment by the overhanging edges 12' and 14' of the two smaller-sized bores 12 and 14. This snug nesting insures substantially permanent connection of the chain and stopper and is sufficiently watertight as practically to prevent leakage

through the drain to which the stopper is applied.

In the embodiment shown in Fig. 3, the enlarged ball or bead 18 is replaced by a bell pendant or cup 20 of enlarged diameter fitted to or
5 attached over the lowermost ball or bead 17. This cup or bell pendant 20 has a maximum diameter slightly in excess of the diameter of cavity 13 and in excess of the diameter of both bores 12 and 14.

10 A bead or ball chain 16 bearing this pendant or cup 20 is inserted into the stopper in the same manner as that bearing a large ball 13, and drawn through bore 12 until the bell pendant or cup 20 is nested in the cavity 13 between the
15 two bores 12 and 14 whose overhanging edges 12' and 14' then prevent dislodgement of said bell or cup.

In either embodiment, the chain 16 is secured to the sink, tub or lavatory in any desired manner.
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In practical embodiments of the invention, utilizing a bead chain of $\frac{1}{8}$ inch outside diameter and a large bead or bell pendant or cup of $\frac{1}{8}$ inch outside diameter, the diameter of the bore 12 is
25 approximately $\frac{3}{16}$ inch, that of cavity 13 is $\frac{1}{4}$ inch, and that of bore 14 is $\frac{1}{4}$ inch. Other sizes of bead chains will naturally require differently diametered bores and cavities, the requisites being that the diameter of bore 12 be less than that of the cavity 13 and also less than that
30 of the outside diameter of the smallest balls or beads of the chain, so that the balls of the chain must be forced therethrough but will not slip through of themselves. The diameter of the bore
35 14 also should be less than that of the cavity and of the outside diameter of the large bead or bell pendant or so that the latter will not slip through of themselves. The cavity 13 itself should have a diameter just slightly under the
40 outside diameter of the large ball 18 or bell pendant or cup 20 so that the resilient material of the stopper will give sufficiently to receive the ball or bell pendant or cup in the said cavity and press snugly against the same when in the cavity
45 to form a practical fluid seal between said stopper and said large ball or bell pendant or cup.

It is to be understood, of course, that departures in structural details are contemplated within the scope of the appended claims.

50 I claim:

1. In combination, a stopper of the class described, an attaching chain, and an enlarged member attached to one end of said chain, said stopper being of resilient material having a cavity therein of somewhat smaller diameter than the over-all diameter of said enlarged member and whose walls are adapted to give for receiving said enlarged member and snugly retaining the same in said cavity by intimate engagement with
55 a large portion of the surface area of the wall of said enlarged member, and said stopper having bores of smaller diameters than that of said cavity communicating therewith from opposite faces of said stopper for permitting the attachment of said chain to said stopper by passing said chain through said bores and cavity from the bottom face of said stopper, the said enlarged member being engaged and snugly retained in said cavity with the said chain extending from said
60 stopper through the bore between said cavity and said top face, said last named bore being of smaller diameter than the outside diameter of said chain for preventing free movement of said chain therethrough, and the bore from the bottom face
65 of said stopper being of smaller diameter than

said enlarged member for preventing dislodgment thereof from said cavity through the bottom of said stopper.

2. In combination, a stopper of the class described, a pull chain of the bead type and an enlarged member attached to one end of said chain, said stopper being of resilient material having a cavity therein of somewhat smaller diameter than the over-all diameter of said enlarged member and whose walls are adapted to give for receiving said enlarged member and snugly retaining the same in said cavity by intimate engagement with a large portion of the surface area of the wall of said enlarged member, and said stopper having bores of smaller
10 diameters than that of said cavity communicating therewith from opposite faces of said stopper for permitting the attachment of said chain to said stopper by passing said chain through said bores and cavity from the bottom face of said stopper, the said enlarged bead member being engaged and snugly retained in said cavity with the said chain extending from said stopper through the bore between said cavity and said top face, said last-named bore being of smaller diameter than the outside diameter of said chain for preventing free movement of said chain therethrough, and the bore from the bottom face of said stopper being of smaller diameter than said enlarged member for preventing dislodgment thereof from said cavity through the bottom of said stopper.
15 20 25 30

3. A stopper for use with a pull chain having an enlarged end, said stopper comprising a substantially solid body of resilient material having a cavity of somewhat smaller dimensions than said end, and whose cavity wall is adapted to give and retain said end snugly, and having bores of smaller size than said cavity communicating with the latter from opposite sides for permitting attachment of said chain to said stopper by the insertion of said end in said cavity with said chain projecting through one of said bores after said attachment, said one of said bores being of smaller diameter than that of said chain to prevent free movement of the latter therethrough.
35 40 45

4. In combination, a stopper of the class described, a pull chain of the bead type and an enlarged bell pendant attached to one end of said chain, said stopper being of resilient material having a cavity therein of somewhat smaller dimensions than the overall dimensions of said bell pendant and whose walls are adapted to give for receiving said bell pendant and snugly retain the same in said cavity by intimate engagement with a large portion of the surface area of the wall of said bell pendant, and said stopper having bores of smaller diameter than the maximum diameter of said cavity and communicating therewith from opposite faces of said stopper for permitting the attachment of said chain to said stopper by passing said chain through said bores and cavity from the bottom face of said stopper, the said bell pendant being engaged and snugly retained in said cavity with the said chain extending from said stopper through the bore between said cavity and said top face, said last named bore being of smaller diameter than the outside diameter of said chain for preventing free movement of said chain therethrough, and for aiding in preventing dislodgment of said bell pendant from said cavity through the bottom of said stopper.
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