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L. A. PAYNE

2,479,862

STOPPER

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Fig. 1

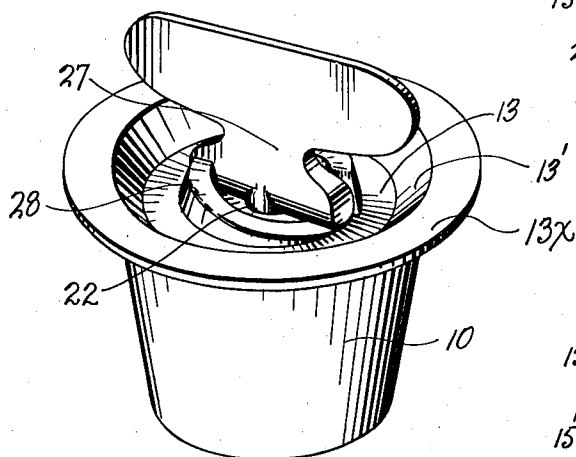


Fig. 2

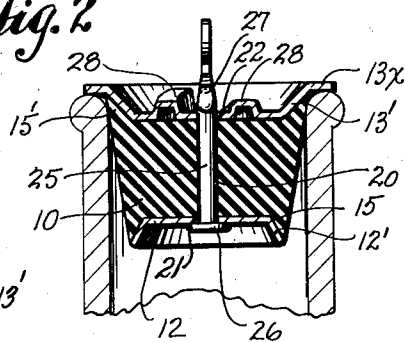


Fig. 3

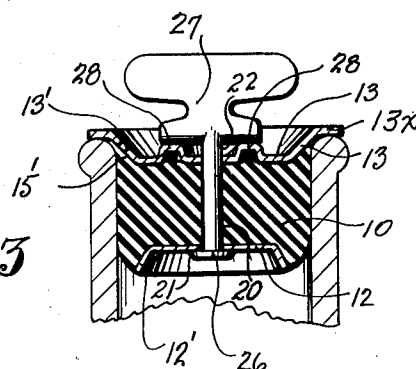


Fig. 5

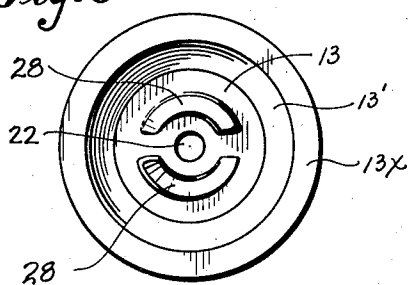


Fig. 4

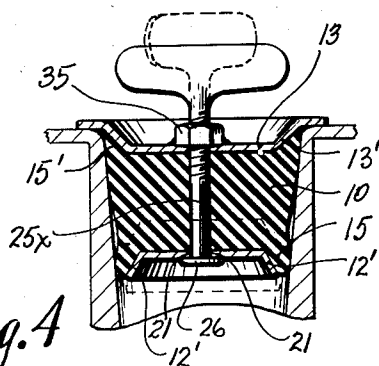
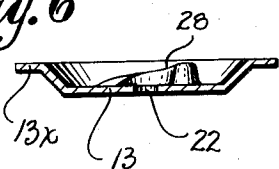


Fig. 6



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STOPPER

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1 Claim. (Cl. 215—53)

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This invention relates to stoppers and it has reference more particularly to improvements in stoppers in general, such, for example, as those designed to be applied to drains in sinks, basins and the like, or to jugs, bottles, pipes or tank openings, or to other devices where it is desirable to use a stopper that may be quickly and easily applied or removed.

It is the principal object of this invention to provide improvements in stoppers of the kind above mentioned that may be diametrically expanded after being applied to an opening, thus to insure tightness and security.

It is also an object of the invention to provide a stopper that will adapt itself to openings of various sizes within certain limits by reason of the expandability of the body portion.

Another object of the invention is to provide a stopper that will be diametrically expanded in encircling bands adjacent its opposite ends, as well as in a band encircling the medial portion, thus to insure better holding effect and effective sealing.

Still further objects of the invention reside in the details of construction of parts, in their combination and relationship, and mode of use, as will hereinafter be fully described.

In accomplishing these and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Fig. 1 is a perspective view of a stopper embodied by the present invention.

Fig. 2 is an axial cross-sectional view of the stopper as applied to an opening but before being expanded therein.

Fig. 3 is a similar view, showing the stopper expanded to tighten it in the opening.

Fig. 4 is an axial, cross sectional view of a stopper of an alternative form, and illustrating the expanded bands of the stopper.

Fig. 5 is a plan view of of the outer end disk for the stopper of Fig. 1.

Fig. 6 is a central, cross section of the same.

Referring more in detail to the drawings:

In its present preferred form, the stopper comprises a central or body portion 10 comprised of a tough, expandable and resilient material, such as rubber; said body being of plug-like form, and preferably but not necessarily slightly tapered from one end to the other for easy application.

Applied against opposite ends of the body, respectively, are metal disks 12 and 13. The disk 12, which is applied against that end of the plug

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that is to be referred to as the inner end, is of the same over-all diameter of that end, and seats flatly against a flat end surface of the body, and this disk has an angularly turned peripheral flange 12' over which an integral lip portion 15 at that end of the plug body extends, the lip terminating flush with the peripheral edge of the flange.

The disk 13, likewise, rests flatly against that end of the plug body of greater diameter, and referred to as the outer end, and this disk is formed with an angularly turned peripheral portion 13' over which an integral lip portion 15' at that end of the plug extends. The flange 13' terminates in a flat peripheral rim portion 13x that extends beyond the stopper body and serves as a stop or seat for limiting the extent to which the stopper may be inserted in an opening.

Formed axially through the rubber body 10 is an opening 20 and this is in alignment with center holes 21 and 22 in the disks 12 and 13. A shaft 25 is extended axially and rotatably through the body opening 20 and also through the plate openings 21 and 22. This shaft has a flat head 26 seated against the outside face of the lower end disk 13 and it has a winged turning head 27 fixed solidly on its upper end at the outside of the outer end disk. The base portions of this head, at opposite sides of the shaft, are adapted to ride on cam rises 28 and 28 that are struck upwardly on the disk at opposite sides of its center. These cams are so formed that by turning the head to ride upwardly thereon, the disks will be drawn toward each other, thereby diametrically expanding the stopper body.

The inclined peripheral rim portions of the two disks in this expanding operation, causes the overlying lip portions of the stopper body to be expanded, and thus if the stopper is applied to a closely fitting hole, the stopper will be tightened therein at both ends as well as in the medial portion. The tightening of the stopper may be to any extent within the limits provided for by the design and extent of the cams. When the head 27 is turned to a position disengaged from the rises of cams, the body 10 contracts to its minimum diameter and may then be easily removed from an opening.

The expanding of the stopper to greater extent in bands at opposite ends and at an intermediate position, is shown in Fig. 4, but this same action would take place in stoppers like that of Fig. 2.

In the device of Fig. 4, the principal parts; that is, body and end disks, are like those in the device of Fig. 2. However, I have here employed

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a tightening shaft 25x that is threaded through a nut 35 that is welded to the top disk. Thus, by rotation of the shaft in one direction, the disks are drawn toward each other, and the plug may be expanded up to a maximum diameter. When it is turned in the other direction, it permits the plug to lengthen and to contract accordingly.

Plugs of this kind may be made in various sizes, dimensions and of various materials. Their application for use is easy and convenient, and their uses apply to many and various articles.

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

A stopper of the character described comprising a resilient, expandable, conically tapered plug adapted to be applied within an opening and having counter-sunk inner and outer end surfaces, a metal disk applied flat against the inner end surface of the plug and having a downwardly and outwardly inclined peripheral flange and said plug having a lip portion overlying said flange, a flat metal disk applied against the counter-sunk outer end surface of the plug and having an upwardly and outwardly inclined peripheral flange adjacent the periphery of the plug, and a continuing flange extending outwardly beyond the periphery of the plug to limit its extent of insertion into an opening; a shaft applied axially

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through the plug and disks and rotatably anchored at its inner end in the inner end disk, a winged turning head on the outer end of the shaft, and upwardly inclined cam surfaces on the outer disk on which said head will ride when turned in a tightening direction to draw the disks toward each other, thus to expand the stopper body and to cause the inclined flanges of the disks to expand the surrounding portions of the plug into tight sealing contact with the walls of an opening in which the plug may be fitted.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
701,117	Wintherlich	May 27, 1902
1,428,306	McFadden	Aug. 15, 1922
1,939,569	Pfister	Dec. 12, 1933
2,292,149	Moeller	Aug. 4, 1942
2,347,835	Moeller	May 2, 1944

FOREIGN PATENTS

Number	Country	Date
29,774	Germany	Jan. 17, 1885
298,865	Great Britain	Oct. 18, 1928