Feb. 9, 1937. A. E. OSBORN 2,070,296

MEANS FOR ATTACHING MEMBERS TO THE INTERIOR OF HOLLOW ARTICLES

Filed Aug. 23, 1934

Fig. 1,

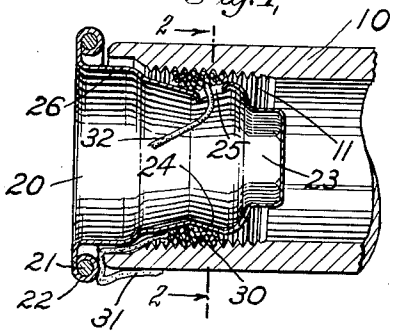


Fig. 2,

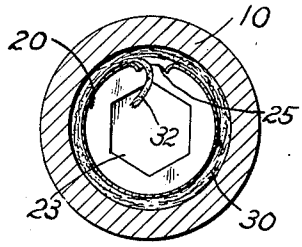


Fig. 3,

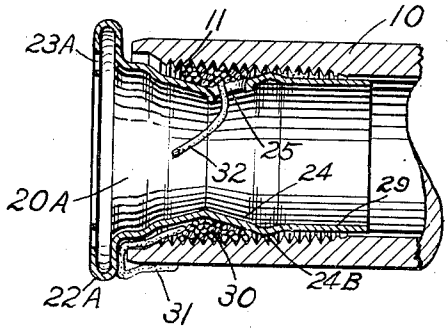


Fig. 4,

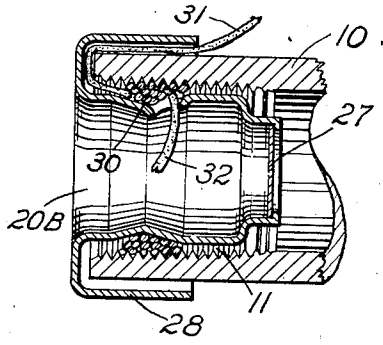
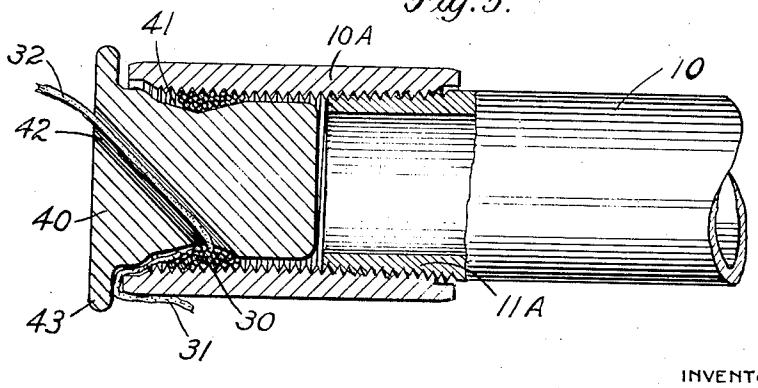


Fig. 5.



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MEANS FOR ATTACHING MEMBERS TO THE INTERIOR OF HOLLOW ARTICLES

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8 Claims. (Cl. 138—96)

This invention relates to improvements in means for attaching members to the interior of hollow articles. Broadly it relates to securing a member to the interior of threaded or other articles, and more specifically to providing a simple and effective device for preventing damage to the article which may be inserted in the end of the article and secured thereto by rotation. More specifically, it relates to such a device combined with a flexible element which may be interposed between a surface of the device and an adjacent surface of the article to which it is applied for the double purpose of more perfectly protecting the article and of affixing the device to it.

These and other objects will appear in the following specification in which I will describe the invention, the novel features of which will be set forth in appended claims.

In my Patent No. 1,949,431 I have described and claimed a somewhat similar arrangement for attaching devices to the outside of articles and this application discloses devices chiefly applicable to the inside of open ended or hollow articles and the means described herein for attaching such devices to such articles by engagement with an inner surface of such articles.

Referring to the drawing,

Fig. 1 is a sectional side elevation of a part of an internally threaded pipe with a device which embodies my invention applied to it;

Fig. 2 is a sectional end view of the parts shown in Fig. 1, the section being taken on the line 2—2 of the latter figure;

Fig. 3 is a sectional side elevation of a similar part of a pipe with a device of modified construction applied to it;

Fig. 4 is a view similar to Figs. 1 and 3 illustrating a further modification; and

Fig. 5 is a sectional side elevation showing an end portion of an externally threaded pipe with a coupling on it, with a device of still further form applied to the coupling.

In the drawing, 10 designates a pipe or tube of ordinary form having threads 11 cut in its inner surface.

In Figs. 1 and 2, 20 designates a hollow plug of metal of sufficient rigidity for its intended purpose. In this case its outer edge is rolled over a stiffening ring 21, as shown at 22, to form a flange of a size suited to protect the end of the pipe. The inner end of the device is closed and constructed to form a hexagonal socket 23. Intermediate the flange and the socket its wall is constructed to form an annular groove or channel. A part 24 of the wall is oblique to the adjacent surface of the pipe for a purpose which will be described. 25 is a lateral opening from the channel to the inside of the device. In this particular device the part 26 of the wall which is adjacent the outer flange is cylindrical.

A flexible element, such as a cord, wire or cane is shown at 30, wound in the channel and against the pipe threads 11. One of its ends 31 projects through a clearance left for that purpose, between the inside and end of the pipe and the cylindrical wall 26 and flange 22 of the device. Its other end 32 is led through the opening 25 from the inside of the device. If the flexible element is of porous material it may be permeated with grease or other matter to preserve the pipe.

Before specifically describing the structures shown in the other figures I will describe how this device is applied and used. The flexible element is passed through the opening 25 and to the outside of the pipe where its end may be held from rotation relative to the pipe. Now a relative rotation between the device and the pipe will cause the end 32 of the flexible element to be drawn through the opening 25 wound around the channel formed by the wall of the device and between it and the screw threads 11. Continued rotation will cause enough of the flexible element to be drawn into the space between the device and the pipe to create a lateral pressure which will securely lock the device to the pipe. A suitable wrench may be inserted in the socket 23 to facilitate this rotation. A feature of considerable importance, which is shown in all of the figures, is that the wall 24 is given a considerable slope relative to the axis of the pipe so that when the flexible element 30 is wound into locking engagement with the parts a longitudinal pressure component is created which tends to move the device into the pipe. When thus positioned and locked it may be seen that the threads of the pipe are adequately protected and that the outer flange of the device will protect the end of the pipe over and beyond which it extends.

The device 20A shown in Fig. 3 differs in that its inner end is open and that its outer end is constructed to form a hollow flange 22A which is extended inwardly to an extent to be constructed with spaced openings 23A for the reception of a spanner wrench. The end 24B of this wall is of slightly larger diameter than the cylindrical continuation thereof, shown at 29.

Referring to Fig. 4, 20B is another form of device which embodies this invention. In this case the inner end is closed by a disk 27 and instead

of a flange at the outer end, the wall is bent backwardly, as shown at 28, to cover the end and a part of the outside of the pipe 10. In this form of the device the disk 20 serves to prevent dirt entering the inside of the pipe while it is in transit, but it may be easily fractured for the insertion of a rod for lifting or moving the pipe and such a rod may be used safely without injuring the threads on the end of the pipe.

The device 40 in Fig. 5 is a solid block which also embodies this invention. It is constructed to form a channel 41 for the reception of the flexible element which is led to this channel through an opening 42. The outer end of the block is constructed with a flange 43 for protecting the end of the pipe. In this case the device is shown inserted in the end of a coupling 10A which is screwed onto external threads 11A on the end of a pipe 10.

The device may be as long as desired. It will be securely attached to the article in the manner described whether the latter is threaded or not. Several modifications have been described to show that the invention is not limited to any specific form or construction. The drawing and description are limited to specific applications of the invention as applied to protectors, but I intend no limitations other than those imposed by the following claims.

What I claim is:

1. A rigid member closed at its inner end and open at its outer end adapted to be inserted in an open ended article, said member having an annular groove with a surface oblique to the adjacent inner surface of the article, said groove being constructed to form a space between the member and said adjacent surface of the article to which it is applied, a flexible element adapted to be wound into said space by relative rotation between the member and article whereby the member is advanced longitudinally into the article and affixed thereto, and a lateral opening through the member through which said flexible element is drawn into the space by such rotation.

2. A rigid hollow member adapted to be inserted in an open ended article, said member having a body forming an annular groove constructed to form a space between the member and the adjacent inner surface of the article to which it is applied, a sleeve surrounding but spaced from the outer surface of the body, a flexible element adapted to be wound into the space formed by the groove by relative rotation between the member and article, and a lateral opening through the member through which said flexible element is drawn into the space by such rotation.

3. A rigid member adapted to be inserted in an open ended article, said member having an annular groove constructed to form a space between the member and the adjacent surface of the article to which it is applied and a flexible element adapted to be wound into said space by relative rotation between the member and article, a lateral opening through the member through which said flexible element is drawn by such rotation, said member having a relatively close fit within said article at the side of the groove farthest into said article and being provided with clearance for said element between it and the article at the side of the groove toward the open end of the article.

4. A flanged rigid member adapted to form an annular space between an article and an adjacent surface of said member, with its flange adjacent to the end of said article and extending over said end, a lateral opening through the member, and a flexible element extending through said opening into said space, adapted to be wound into said space between the member and article, an end of said element passing between the flange and the end of said article and being bent around the end of the article, whereby said element is restrained from movement in relation to the article.

5. A rigid member adapted to be inserted in an open ended article and to form an annular space between an inner surface of the article and an adjacent external surface of the member, a flexible element adapted to be wound into said space between the member and the article by relative rotation between said member and article when a part of said retaining element within said space is held from movement in relation to the article, and means whereby the winding of said element into said space exerts a pressure in a longitudinal direction on the rigid member tending to draw said member into said article.

6. A rigid member having an open outer end adapted to be inserted in an open ended article and to form an annular space between an inner surface of the article and an adjacent external surface of the member, said member being constructed with a passage leading from said space to the open end of the member, and a flexible element adapted to be drawn into said space through the open end of the member and said passage in the member by relative rotation between the member and the article.

7. A rigid member having an open outer end adapted to be inserted in an open ended article and to form an annular space between an inner surface of the article and an adjacent external surface of the member, said member being constructed with a passage leading from said space to the open end of the member, said member having a closing wall between said passage and the interior of the article beyond said member, and a flexible element entering into said passage and adapted to be drawn into said space by relative rotation between the member and the article.

8. A rigid member adapted to be inserted in an open ended article and to form an annular space between an inner surface of the article and an adjacent external surface of the member, said member being constructed with a passage leading inwardly from said space, and a flexible element adapted to be drawn into said space through said passage in the member by relative rotation between the member and article, with said element anchored in relation to the article and being of such cross sectional area in relation to said space that it becomes forcibly pressed against the inner surface of the article before the number of its turns, coiled about said member, prevents rotation of said member within the coils of said element.

ALDEN E. OSBORN.