

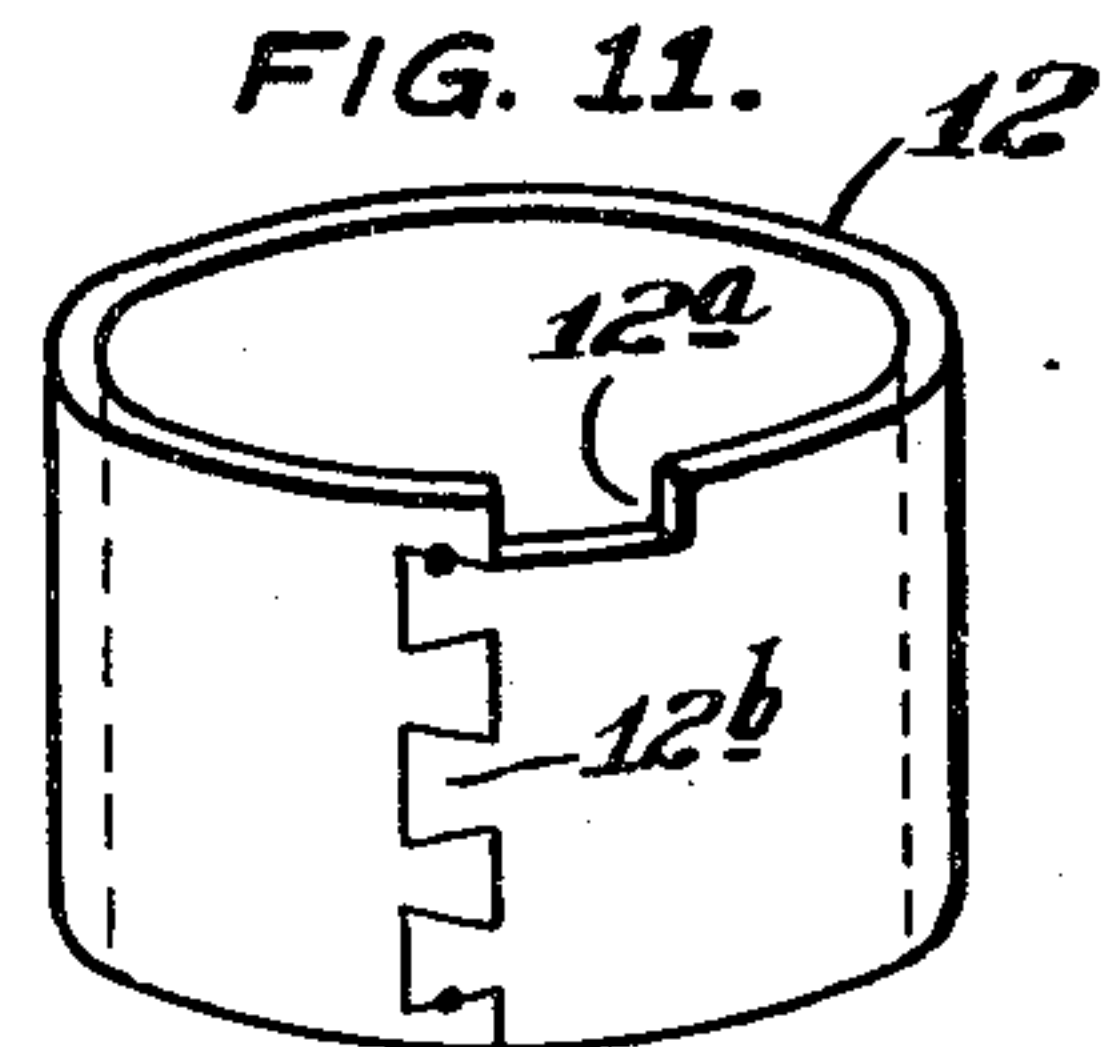
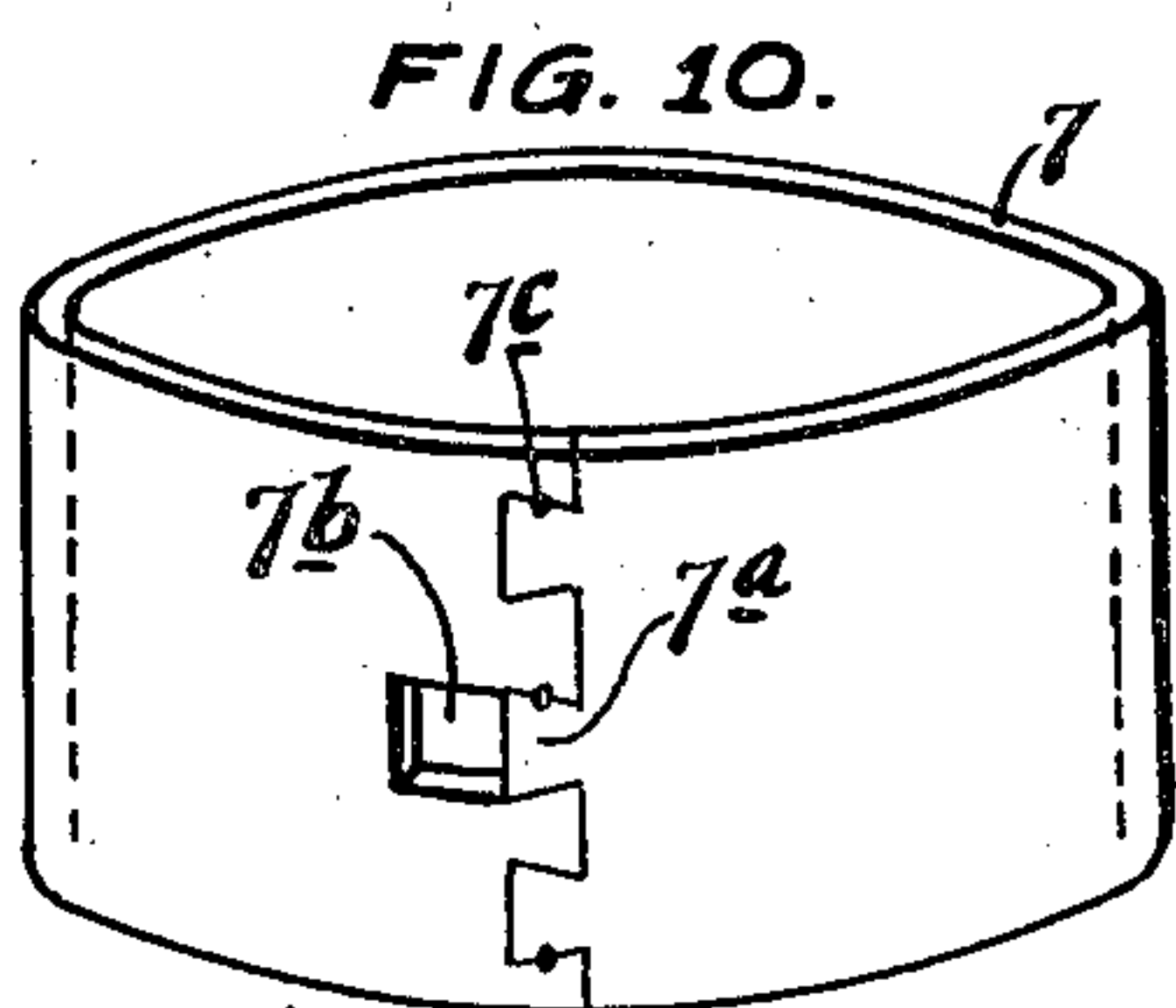
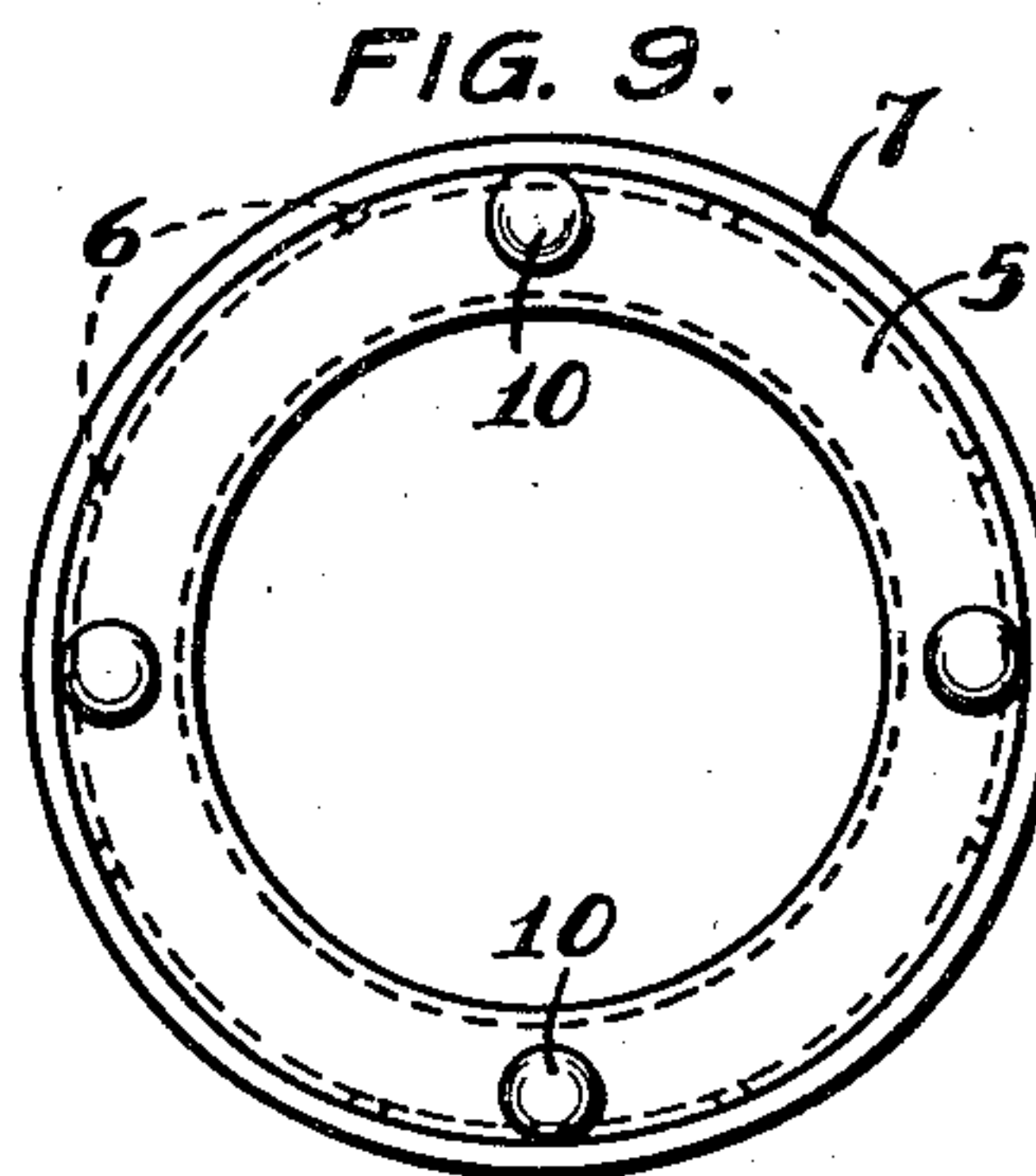
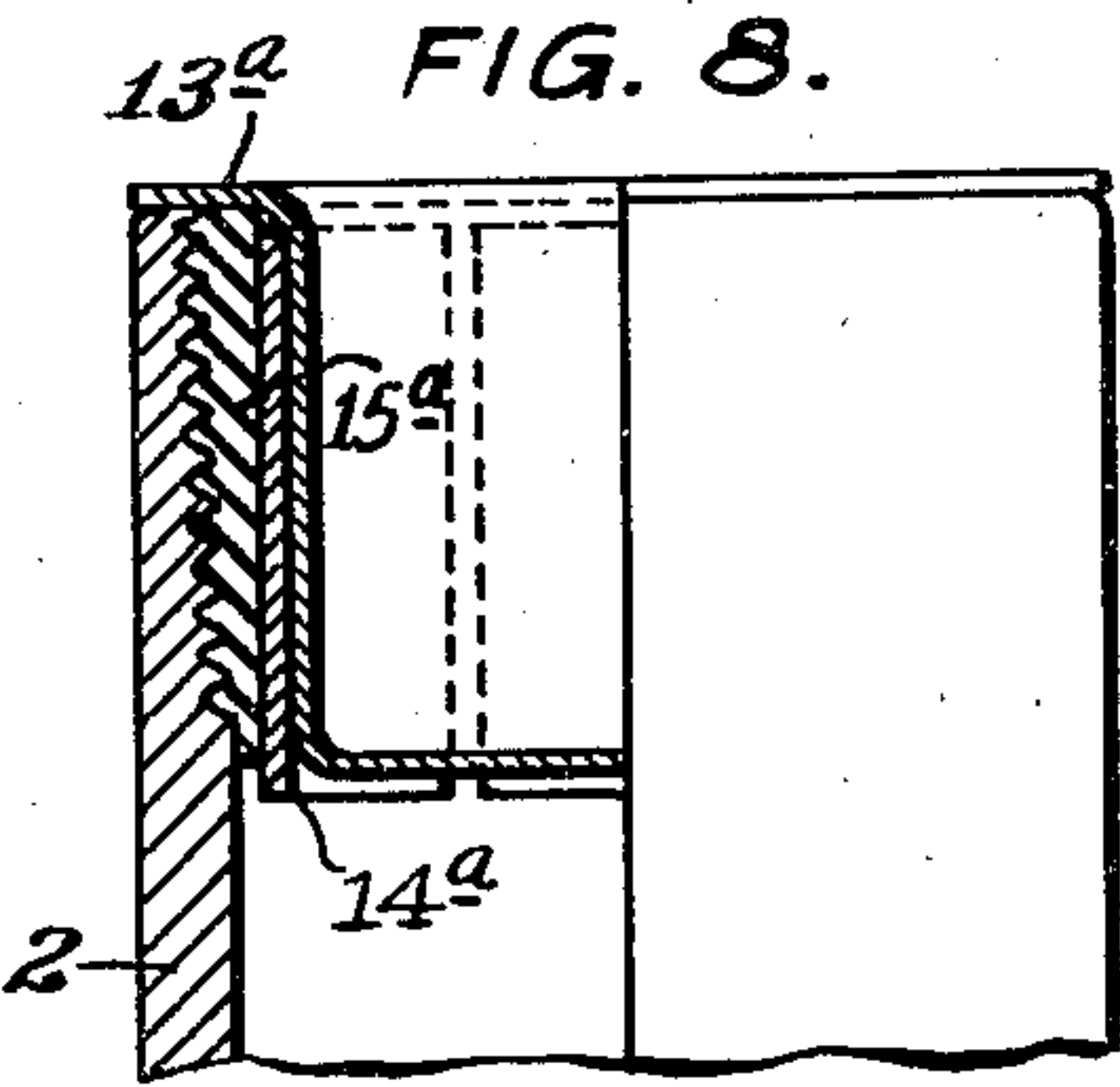
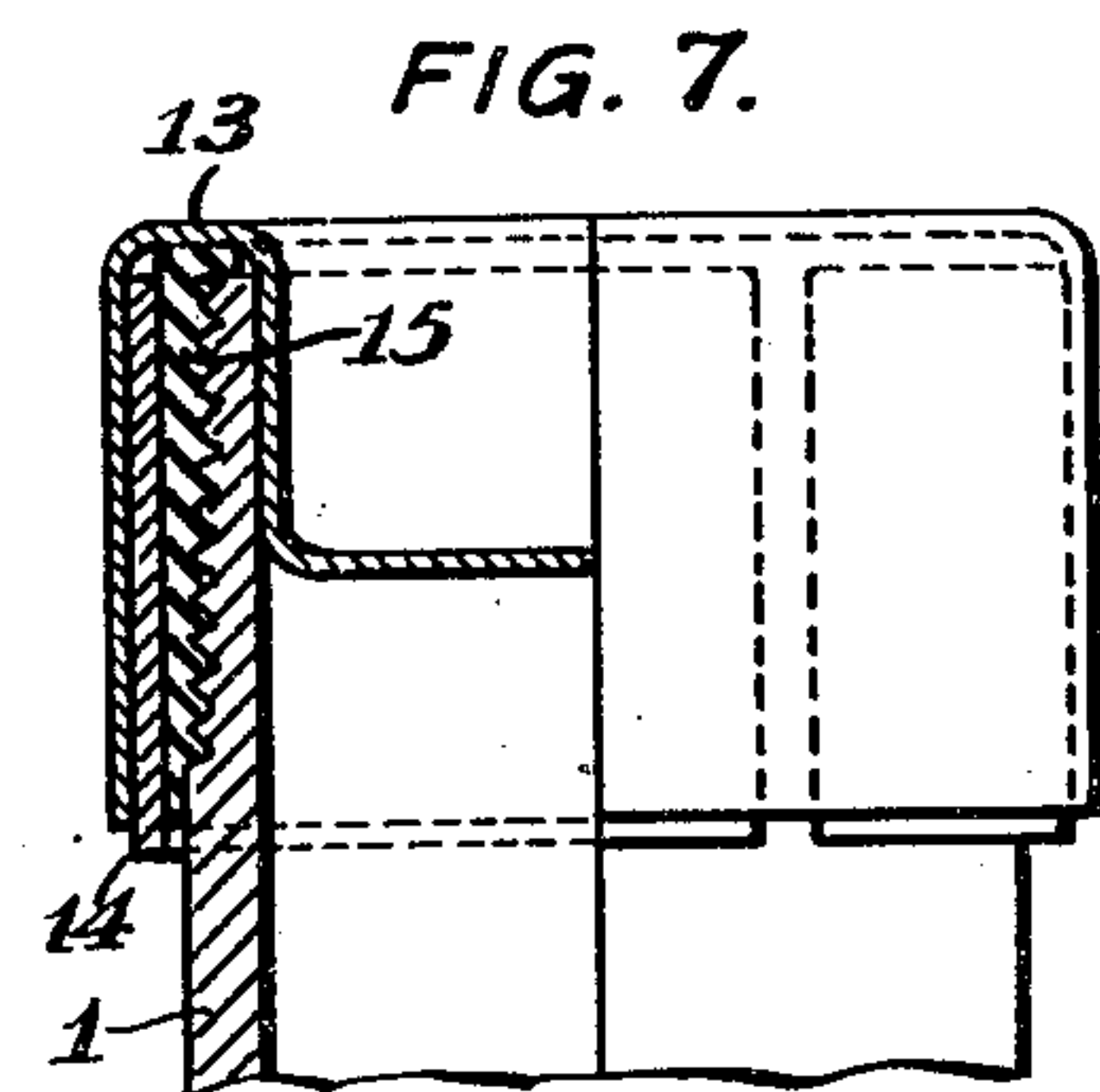
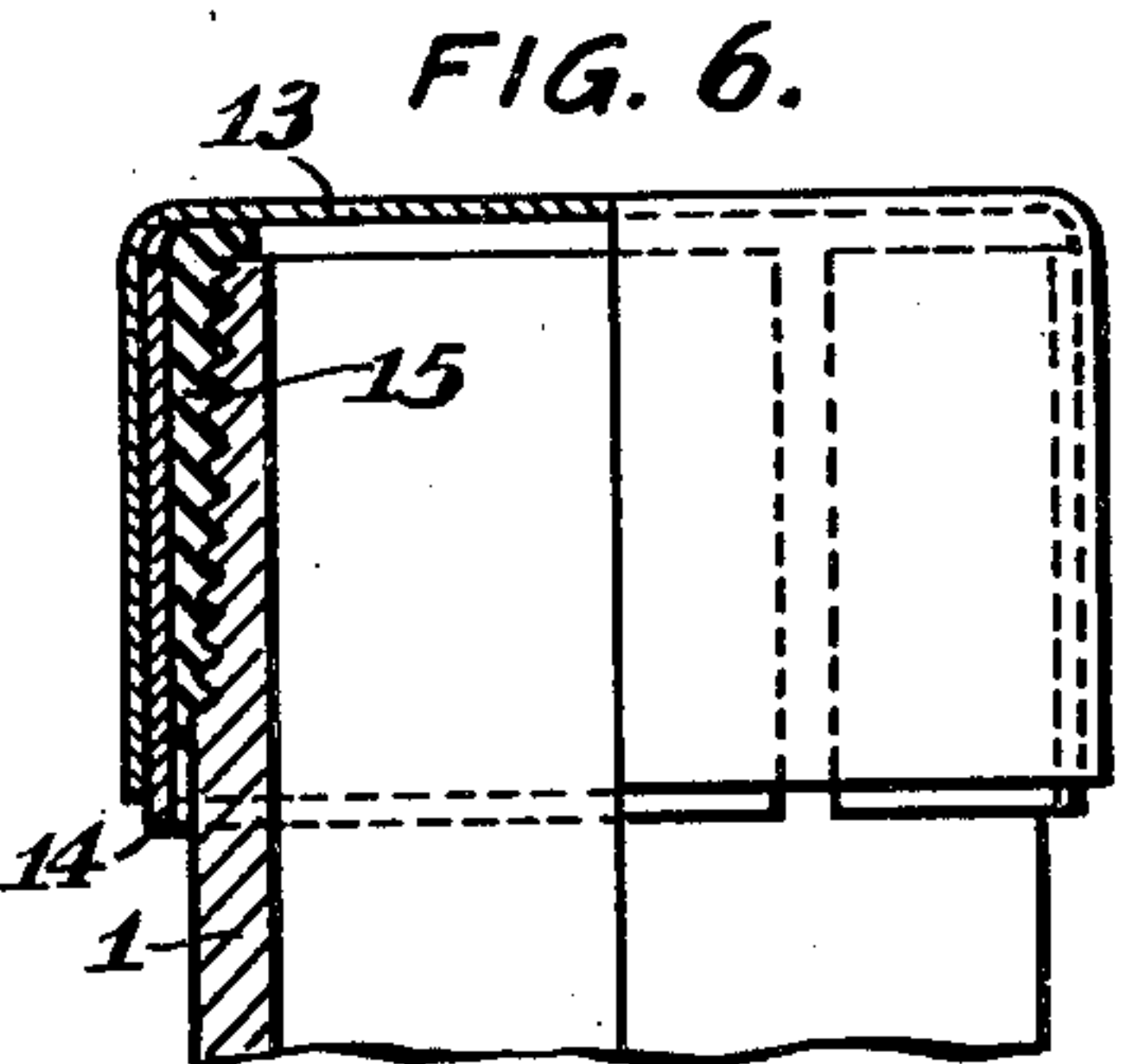
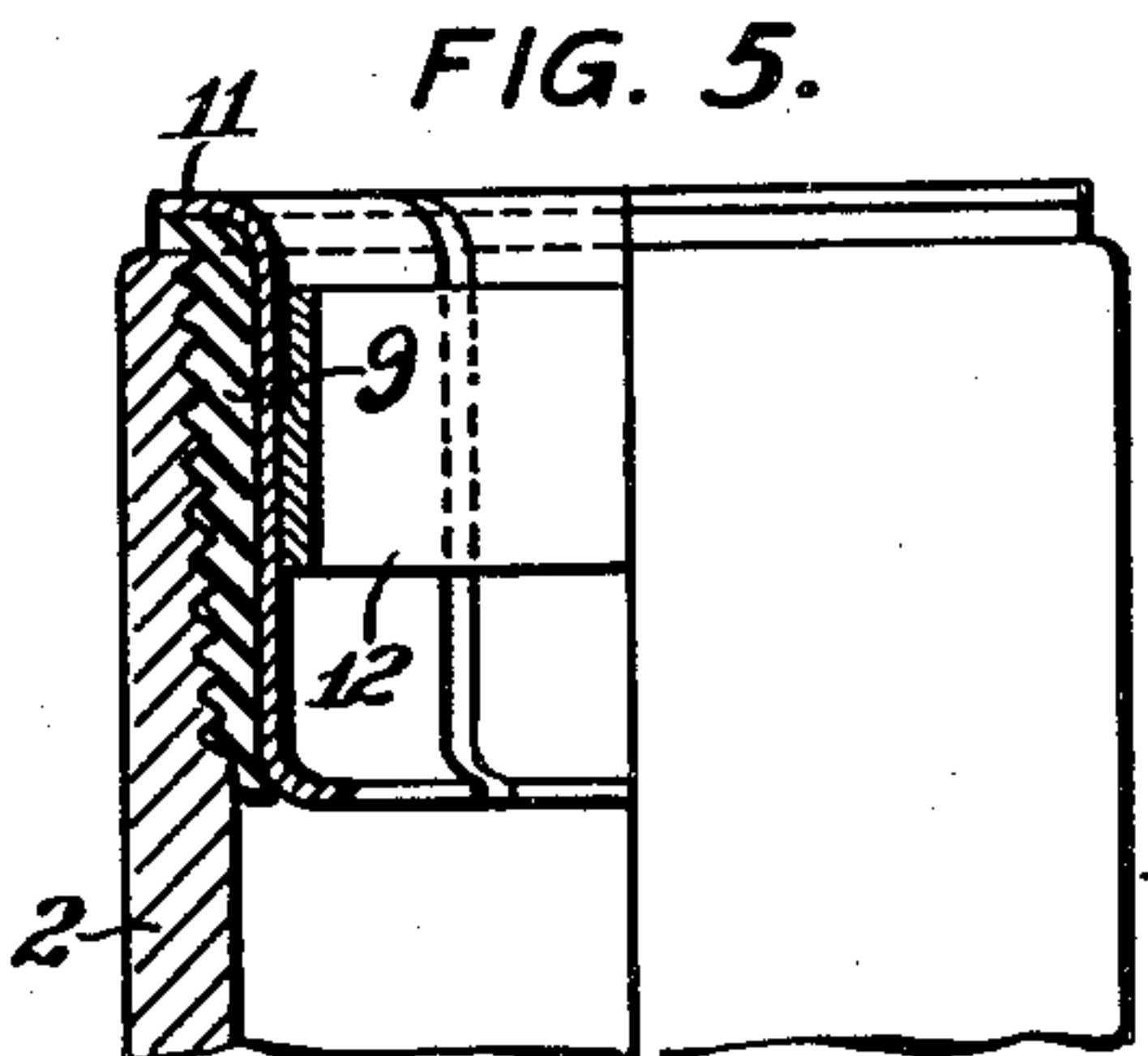
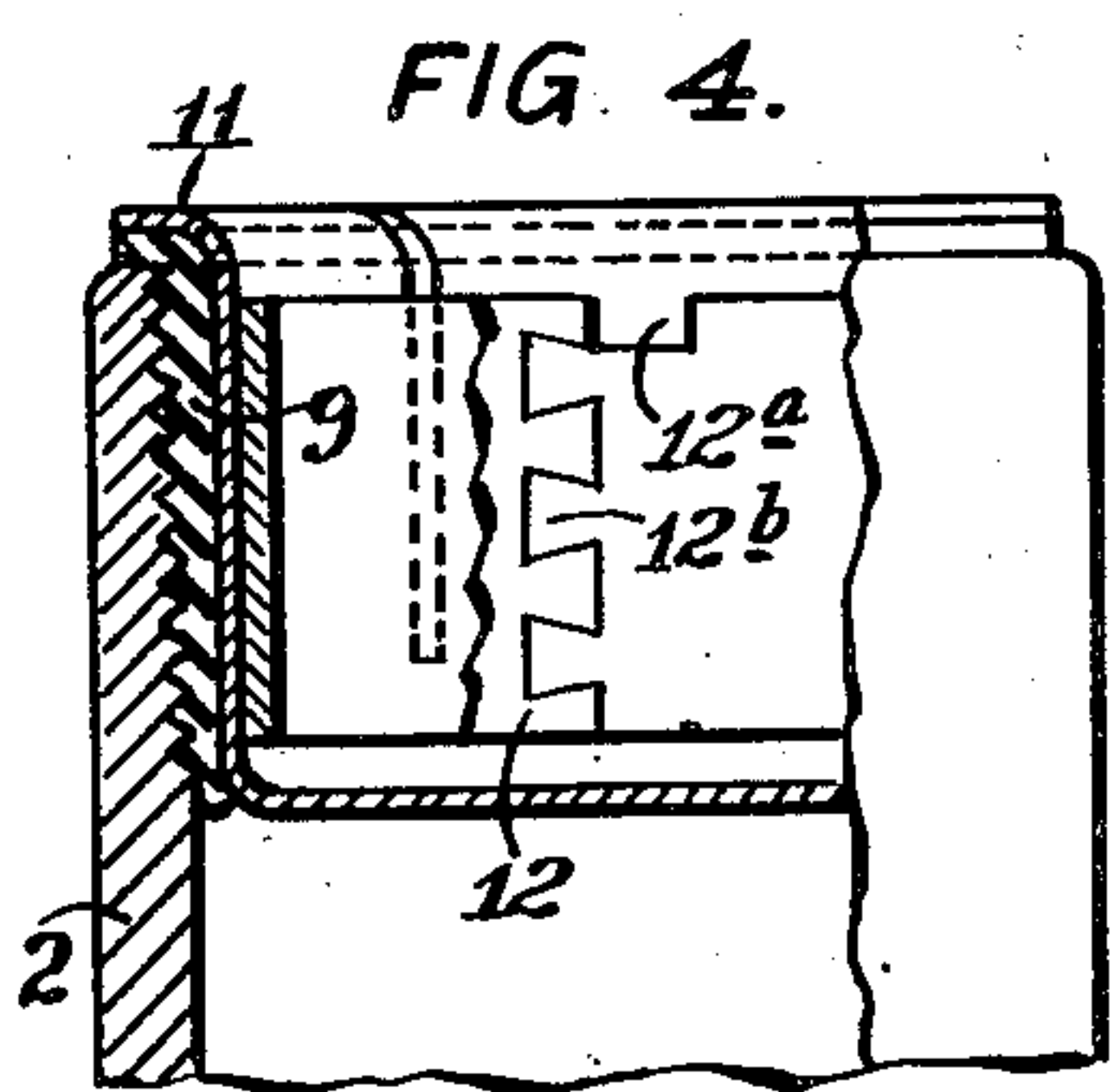
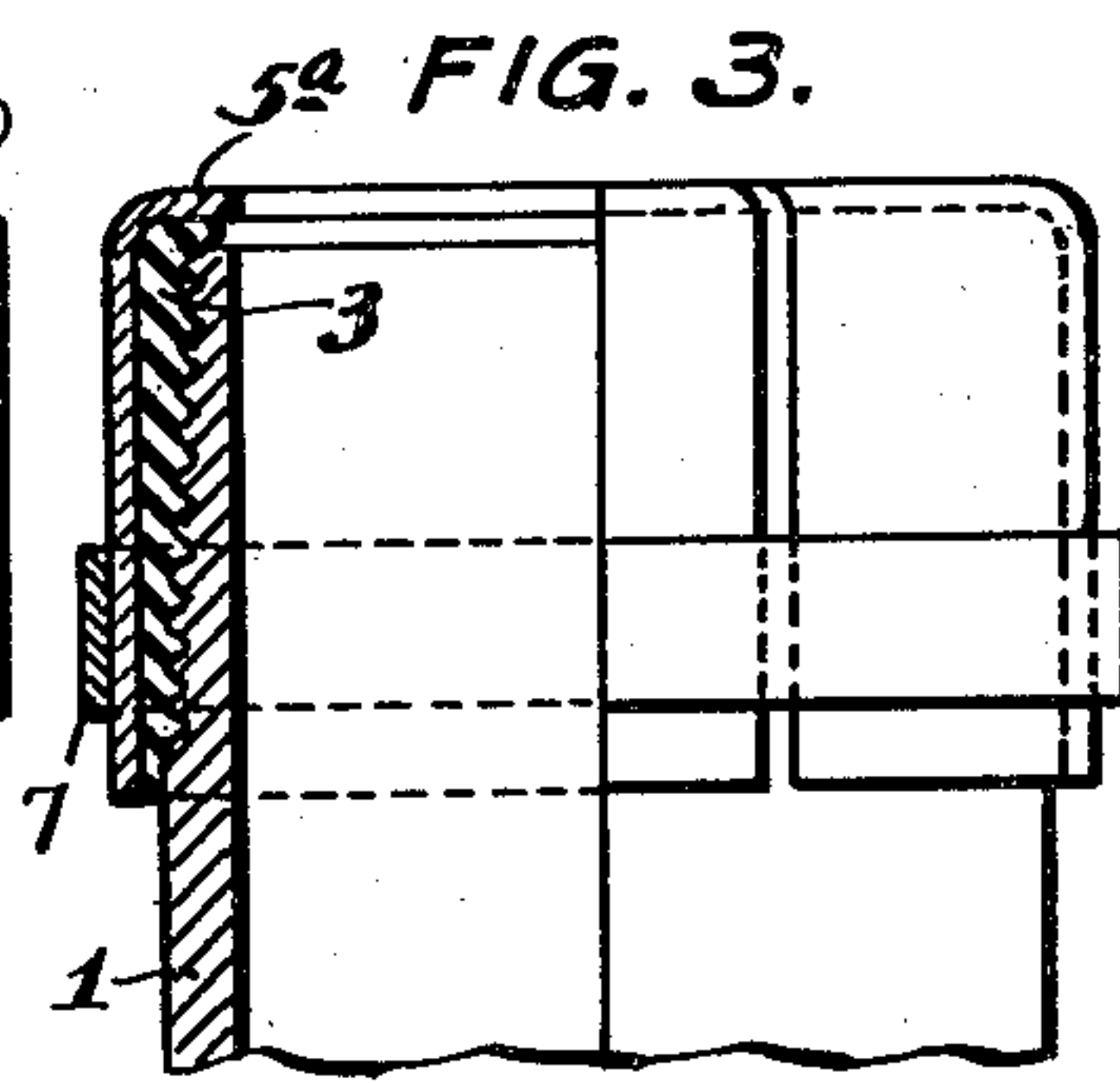
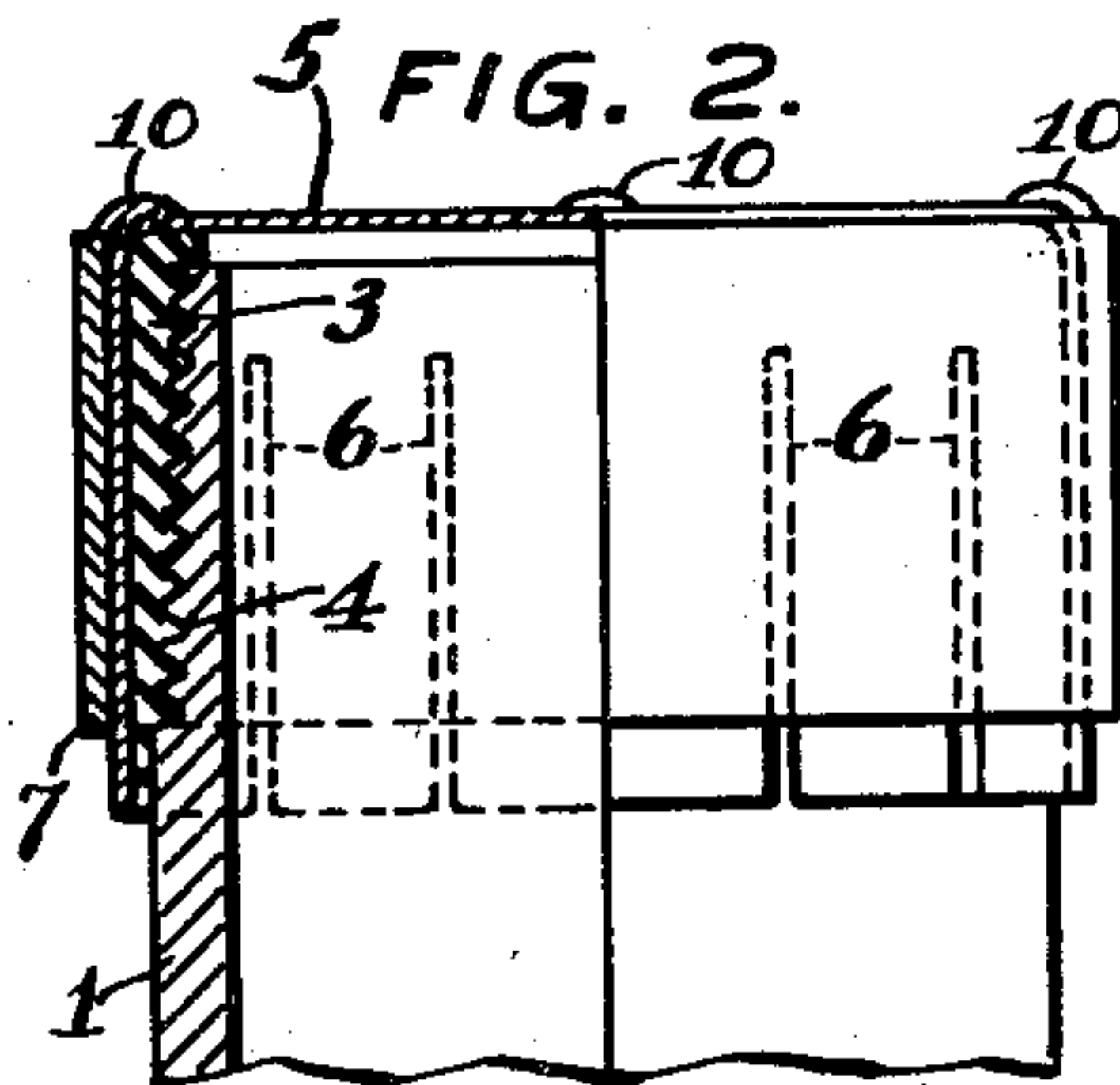
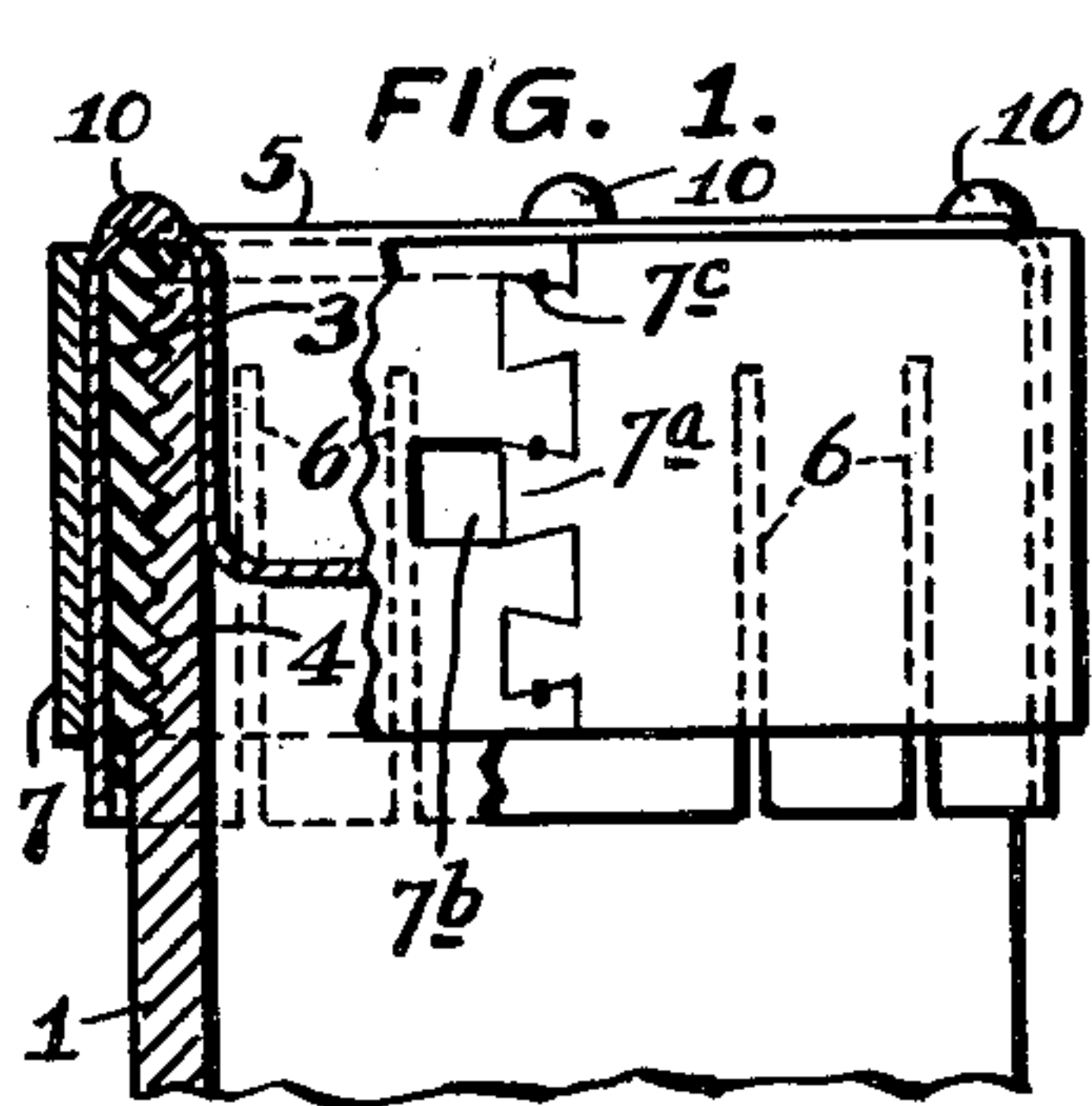
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B. ENGSTROM

2,022,189

PIPE THREAD PROTECTOR

Filed March 29, 1935



INVENTOR

WITNESSES

Attest
J. E. Dickinson

Birger Engstrom
by Brown, Cutchlow & Flick
his Attorneys

UNITED STATES PATENT OFFICE

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PIPE THREAD PROTECTOR

Birger Engstrom, Pittsburgh, Pa.

Application March 29, 1935, Serial No. 13,661

13 Claims. (Cl. 138—96)

This invention relates to an improvement in thread protectors of the type used to prevent the threads on the ends of tubes, shafts, rods and the like, from being damaged while they are being handled, coated or shipped from one place to another. While quite a great number of different kinds of protectors of this character have been developed and used, there is still considerable room for their improvement, and it is towards the reduction of their cost, their serviceability and the ease and convenience of their use that this invention is more particularly directed.

It is another of its objects to provide a protector which can be used on tubular articles without its interfering with the handling of the articles and which, at the same time, is adapted to seal the interior of the articles against the admission of any liquids or foreign matters, which is, for many purposes, highly desirable.

It is also one of its objects to provide a protector which does not depend upon positive engagement between it and the threads being protected for its installation, and which, while held in place when applied in a most effective and dependable manner, is adapted to be applied and removed by most simple and easy operations.

A further object is to provide a protector which may be utilized without alteration to protect the end of any pipe whether threaded or not.

These and various other objects, as well as the various other novel features and advantages of the invention, will be apparent when the following detailed description is read in conjunction with the accompanying drawing, of which Figs. 1, 2 and 3 are views partly in elevation and partly in section of three different modifications of one form of an outside thread protector embodying the invention; Figs. 4 and 5 similar views of two modifications of the same form of the invention designed to protect the threads on the inside of a pipe; Figs. 6 and 7 similar views of two modifications of another form of the invention designed for outside thread protection; Fig. 8 a similar view of an inside thread protector embodying the form of invention shown in Figs. 6 and 7; Fig. 9 an end view of the protector shown in Fig. 1; and Figs. 10 and 11 perspective views, respectively, of an outside and an inside clamping ring, such as are used in the forms of the invention illustrated in Figs. 1, 2, 3, 4 and 5.

Referring to the drawing, the numerals 1 and 2 designate a couple of interiorly and exteriorly threaded pipe ends, respectively, which are shown for the purpose of illustrating the application

of the invention and, while they represent the problem involved in its most common form, it is to be understood, as will be readily apparent, that the invention may be applied to any kind of end-threaded annular article.

In accordance with the invention as illustrated in Figs. 1, 2 and 3, an exterior thread protector is provided comprising a soft composition or fabric liner 3 which is placed around the article over the threads 4 to be protected. Outside of this liner there is mounted a relatively thin cup-shaped casing 5 which is either split along its side or provided with a plurality of slits 6 in its lower end which allow it to expand and hence permit its being easily and readily slid onto the end of the pipe without disturbing the liner 3 whether the liner is placed in the casing and the two applied together or the liner placed on the pipe before the casing. Outside of the casing 5 there is telescopically mounted a sturdy clamping ring 7 which is fitted tightly onto the casing and preferably extended over the entire length of the threads for their protection, although its width may be considerably varied, and where a narrow ring is used the casing 5 may be increased in weight where needed.

The soft liner 3, which is placed next to the thread, is made of some such material as felt, composition packing, rubber, or other suitable yielding material, and either wound about the thread or applied in the form of a split or a complete ring either before or with the encasing member 5. The casing 5, which encases this liner, is used principally merely for the purpose of making it possible to readily slide the clamping ring 7 in place, clamping the liner firmly against the threads without the latter damaging or disturbing the liner when it is moved into place.

As is common knowledge, the threads are usually cut on a progressively varying diameter or taper, and this is made use of in clamping the protector onto the threads. To take advantage of such condition the liner supporting casing 5 is preferably made with an inside diameter substantially equal to the outside diameter of the liner 3 at its outer end, and either split or slotted at its inner end as previously referred to, so that as it is slid onto the pipe over the liner it will readily expand and allow it to be easily moved into position. The clamping ring 7 in turn is made with an inside diameter which is only sufficiently greater than the outside diameter of the casing 5 to permit it to be readily moved over the outer end thereof but sufficiently close there-

to that as it is forced onto the end of the pipe a wedging action takes place which, due to the collapsibility of the casing 5 and the taper of the threads, causes the liner 3 to be firmly jammed into the threads 4 and the protector rigidly secured in operative position.

To adapt the protector to seal the end of the pipe, as well as to protect the threads so that no liquids or other foreign matters can get into it when the protector is applied, the casing 5 is provided with a totally enclosed outer end portion which may be either plain as shown in Fig. 2 or indented at its center as shown in Fig. 1 to permit the use of hooks, or other means, for handling the pipes as is commonly done, particularly in the handling of large pipes. Another advantage of such indentation of the end of the casing 5 is that it makes it possible to use an ordinary wrench for unscrewing the coupling as the wrench can then be simply applied to the end of the protector and the assembly removed as a whole.

When the protector is used with pipes which do not require the sealing feature, or in which it is desired to hold its cost as low as possible, the interlining casing 5a is made as shown in Fig. 3 in the form of a split collapsible ring having its outer end turned in to form a sufficient flange to engage the end of the pipe. Such an element, as will be apparent, will suffice to protect the liner 3 and is quite a little cheaper to make than the other forms shown.

While a welded or any other suitably manufactured solid clamping ring 7 may be employed as the outside clamping and thread-protecting element of the protector, a form which has been found to be particularly desirable for this purpose is that shown in Fig. 10. As shown in this figure, a split ring is provided which has its ends connected together by interlocking dovetail shaped lugs 7a which, for all purposes and effect, hold them together just as well as a weld.

Among the advantages of this form of ring, it is cheaper to manufacture and can be readily removed merely by disengaging the lugs, which simplifies the removal of the protector as it does away with the need of sliding it off the end of the pipe, and when removed it relieves the pressure on the casing and liner. To facilitate the dislodging of the interlocking lugs 7a, an opening 7b is provided in one end of the band forming the ring, and preferably in the center thereof adjacent one of the lugs 7a, and made sufficiently large to receive a screw-driver or similar tool which may be used for separating the lugs. As a safety feature to insure against any accidental dislodgment due to jarring of these lugs in service they may be spot welded at one or more points 7c. This will hold them quite firmly together and at the same time permit the band to be separated quite readily by a forcing tool.

To insure against any possibility of the clamping ring 7 being slid from the end of the protector while the pipe is being handled, beads or other equivalent means 10 (shown in their normal shape in Fig. 1) may be provided at the end of the casing 5 about its periphery and adapted to be hammered out after the protector is applied (as shown in Fig. 2) so that the metal is displaced in a manner to form lugs which engage the outer ends of the clamping ring 7 and thereby prevent its being slid outwardly. Such construction is particularly desirable where clamping rings of the type shown in Fig. 10 are used and which, as will be readily appreciated, do not have to

be slid from the end of the tube to remove the protector.

To adapt the invention for protecting threads on the inside of a pipe as illustrated in Figs. 4 and 5, the pliable thread-engaging liner 9 is made to fit on the inside of the pipe and the cup-shaped liner protecting casing 11 is made to fit inside of it as is the clamping ring 12 which is wedged in the casing 11 in the same fashion that the ring 7 is wedged on the outside thread protector previously described.

As in the outside protector, the interlining casing 11 is either slotted as shown in Fig. 4 to permit it to collapse, or is made in the form of an interrupted ring as shown in Fig. 5 for the same purpose. As also shown in Figs. 4 and 5, it may be made with either an enclosed inner end for sealing purposes or without an enclosed inner end to cheapen its cost. Also, the clamping ring 12 may be either made solid as shown in Fig. 5 or in the form of a split ring as shown in Figs. 4 and 11. When the latter form is used, it, like the ring 7, is preferably provided with an opening 12a adjacent its lugs 12b for receiving a tool for dislodging the lugs, and such opening is preferably disposed at the outer edge of the ring to facilitate the reception of the stripping tool.

Another way of practicing the invention is illustrated in Figs. 6, 7 and 8. As shown in the first two of these figures, which illustrate outside thread protectors, the clamping ring 13 instead of the interlining liner protecting casing 14 is adapted to provide the end-enclosing seal for the pipe, and like the casing 5 in the previously described coupling, is made in the shape of a cup and with either a plain or an indented end wall as may be desired. The soft liner 15 is the same as previously described, while the interlining casing 14 is made in the shape of a simple interrupted ring or band which allows it to be readily applied and removed.

To protect the interior threads of a pipe in accordance with the latter form of the invention as shown in Fig. 8, the assembly shown in Figs. 6 and 7 is merely inverted to fit on the inside instead of on the outside of the pipe.

As will be readily appreciated by those skilled in the art, this invention provides a protector which is simple and relatively inexpensive to manufacture and use, and which may be reused if desired, although its cheapness makes the economy of reuse somewhat questionable. As is also obvious from the foregoing, the soft liner is either placed in the casing and the two applied to the threads at the same time or the liner is first placed over the threads to be protected and then the sealing and liner-protecting casing placed in position by a simple operation requiring insufficient pressure to necessitate the use of tools. With this in place the clamping ring is next driven into place until the protector is rigidly secured to the threaded member. Where the beads 10 are provided on the protector for locking the clamping ring in place, they are flattened as soon as the ring is in position. To remove the protector the entire assembly may be unscrewed altogether due to the engagement of the threads in the soft liner, or the clamping ring or clamping member may be removed separately as pointed out and the casing and soft liner then either stripped or turned from the threaded portion of the article.

According to the provisions of the patent statutes, I have explained the principle and construction of my invention, and have illustrated and

described what I now consider to represent its best embodiments. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A thread protector comprising a liner of soft material disposed to cover the threads to be protected, an expansibly yieldable casing disposed to extend over and protect the surface of said liner opposite the threads and entirely out of contact with said threads, and a clamping ring telescopically press fitted over said casing in a manner to embed the threads in said liner and firmly hold the assembly in place.

2. A thread protector comprising a liner of soft material disposed to cover the threads to be protected, an expansibly yieldable casing having a closed outer end disposed to fit over and protect the surface of said liner when the protector is being assembled and entirely out of contact with the threads, and a rigid protecting sleeve which is telescopically press fitted over said casing in such a way as to embed the threads in the liner and tightly clamp the assembly onto the threaded surface.

3. A thread protector comprising a liner of soft material which lies adjacent to and extends over the threaded surface, a cup-shaped metallic casing having expansion slits in its side wall mounted over and encasing said liner, and a clamping ring engaging said casing in such a manner as to force the soft liner into the threads and firmly hold the assembly in place.

4. A device for protecting exterior threads on the end of a hollow article comprising a soft liner which is adapted to lie adjacent to and extend over the threaded surface, a cup-shaped expansible casing having an inset center which is mounted over and encases said liner, and a clamping ring which fits over said casing and forcibly secures the assembly to the article being protected.

5. A protector according to claim 1 in which the clamping member is made in the shape of a cup.

6. A protector according to claim 1 in which the expansible casing consists of a split ring provided at one end with a turned edge for limiting its movement into the article being protected.

7. A protector according to claim 1, in which a clamping element is employed which comprises a split ring the ends of which are releasably connected together by an interlocking lug arrangement.

8. A protector according to claim 1, in which a clamping element is employed which comprises a split ring the ends of which are releasably connected together by an interlocking lug arrangement and in one end of which an opening is provided to receive a disengaging tool.

9. A protector according to claim 1, in which means is provided on the outer end of the interlining casing member for locking the clamping element in place when the protector is assembled.

10. A protector according to claim 1, in which a clamping element is employed which comprises a split ring the ends of which are releasably held together.

11. A device for protecting threads on the inside of a hollow article at the end thereof comprising a soft liner disposed to lie adjacent to and cover the threads to be protected, an expansibly yieldable surface protecting casing arranged adjacent the inner surface of said liner, and a clamping member fitted inside of said casing to bear thereagainst and force said liner into the threads and hold the assembly in place.

12. A protector according to claim 11, in which the liner protecting casing is made in the shape of a cup provided with expansion slots in its side wall.

13. A protector according to claim 11, in which the liner encasing casing is made in the shape of a split ring and the clamping member in the shape of a cup.

BIRGER ENGSTROM.