

Sept. 4, 1928.

1,683,272

M. TUCKER

DUSTPROOF HINGE

Filed May 9, 1927

2 Sheets-Sheet 1

FIG. 3

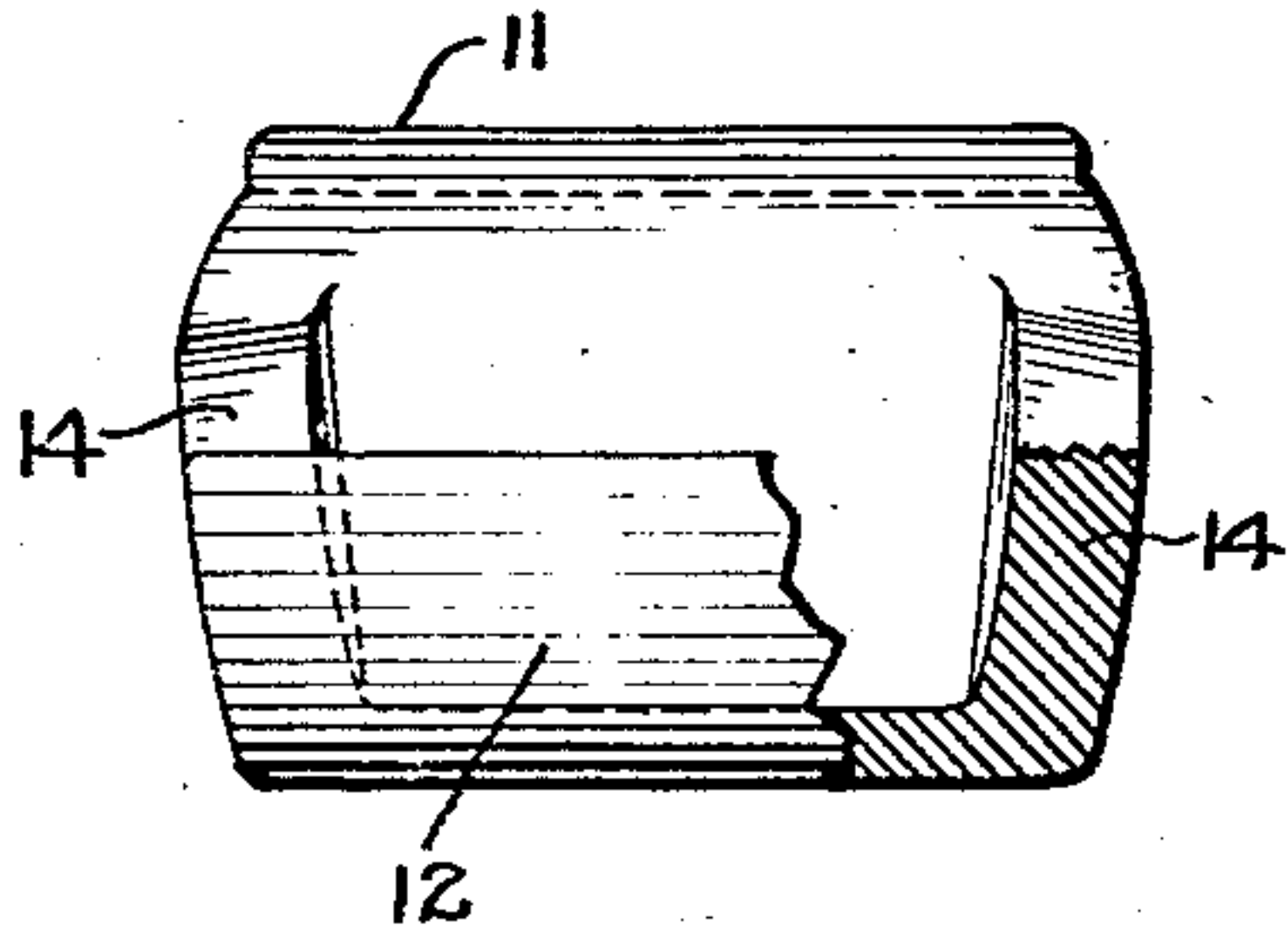


FIG. 1

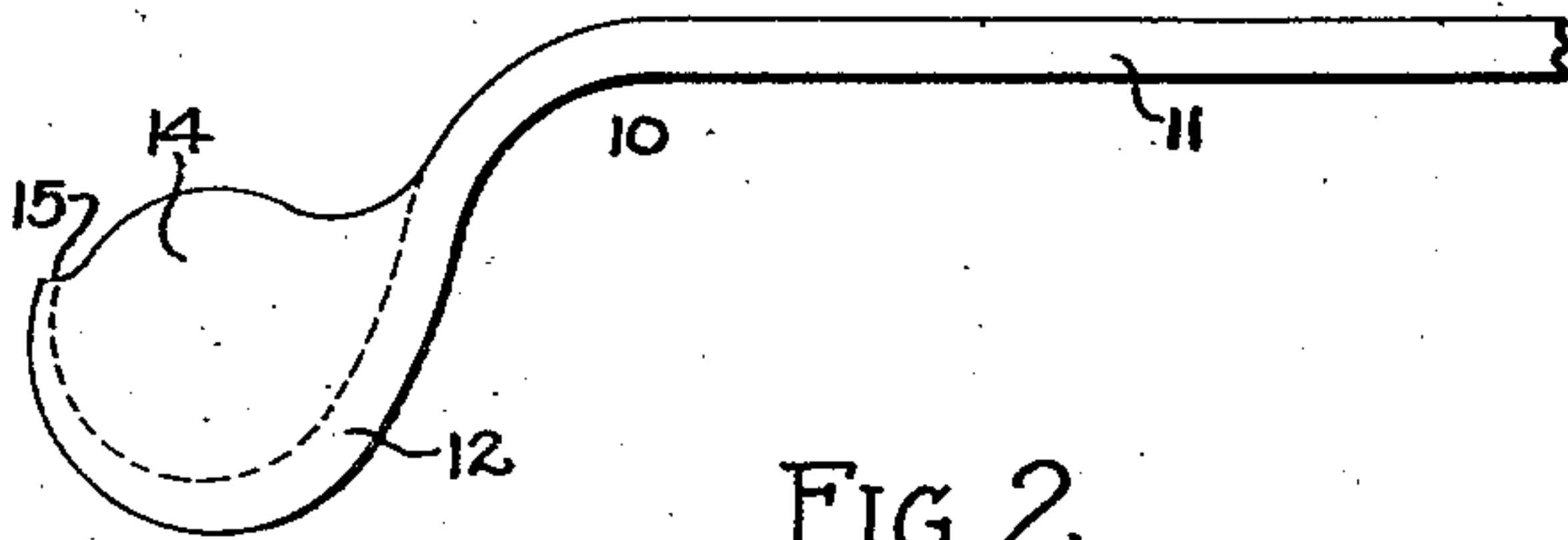


FIG. 2

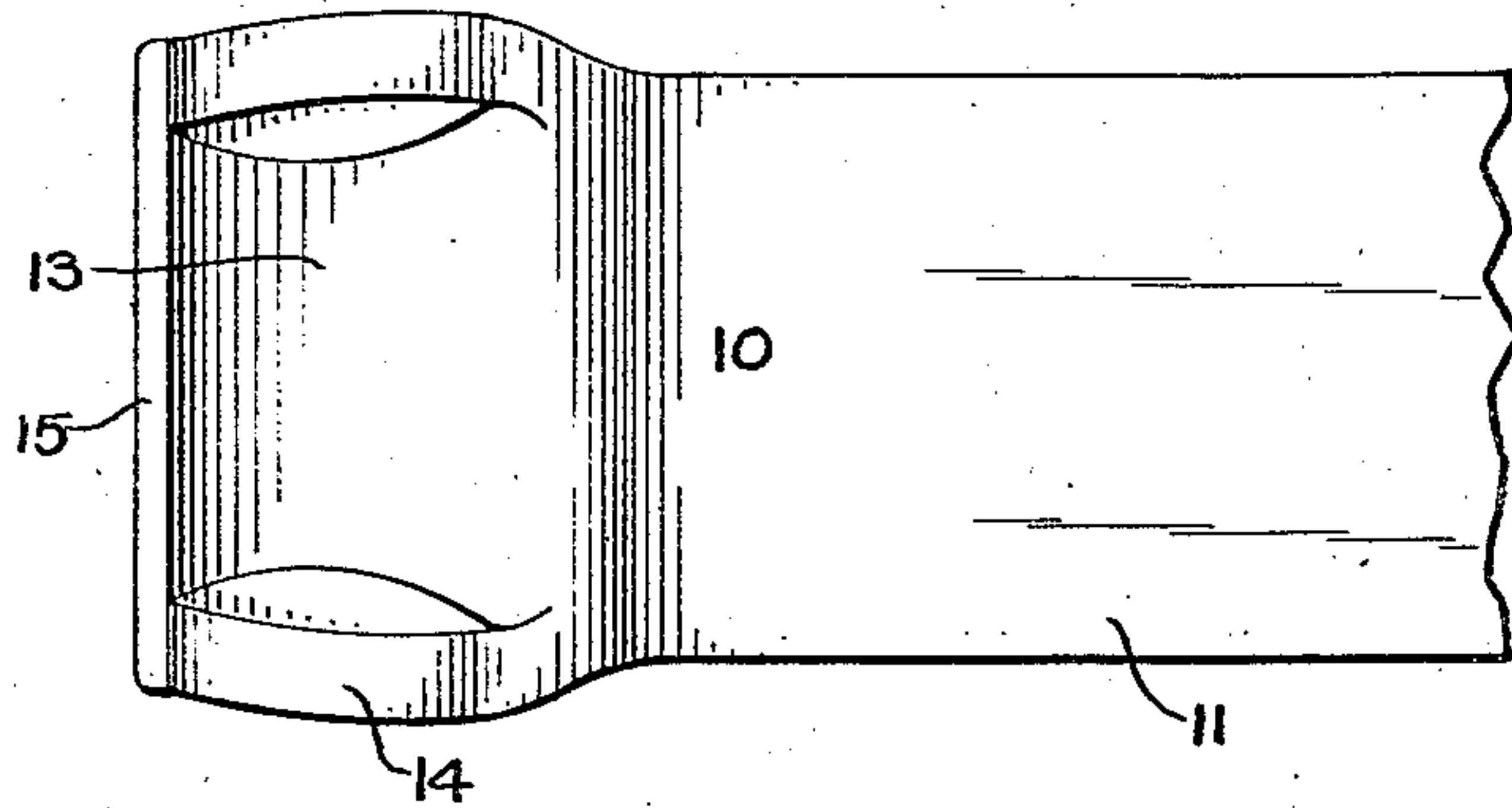


FIG. 6

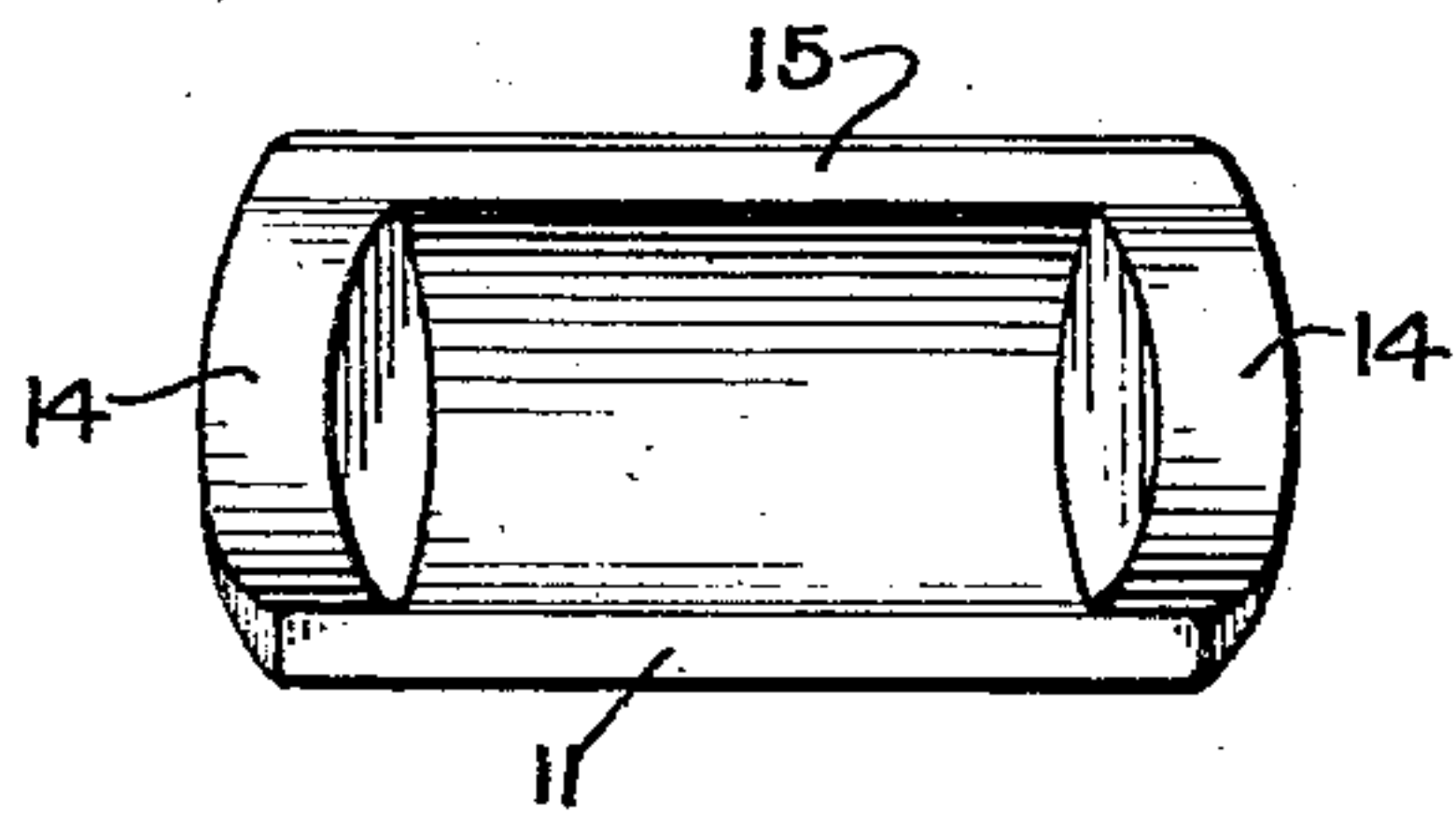


FIG. 4

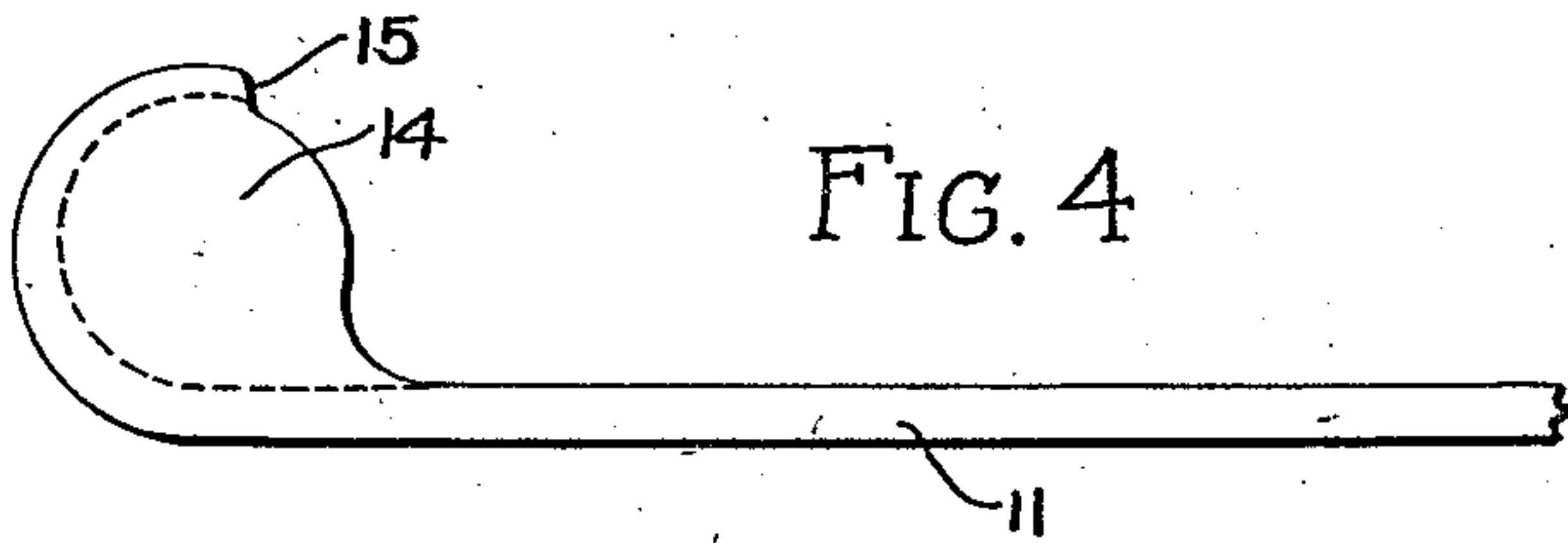
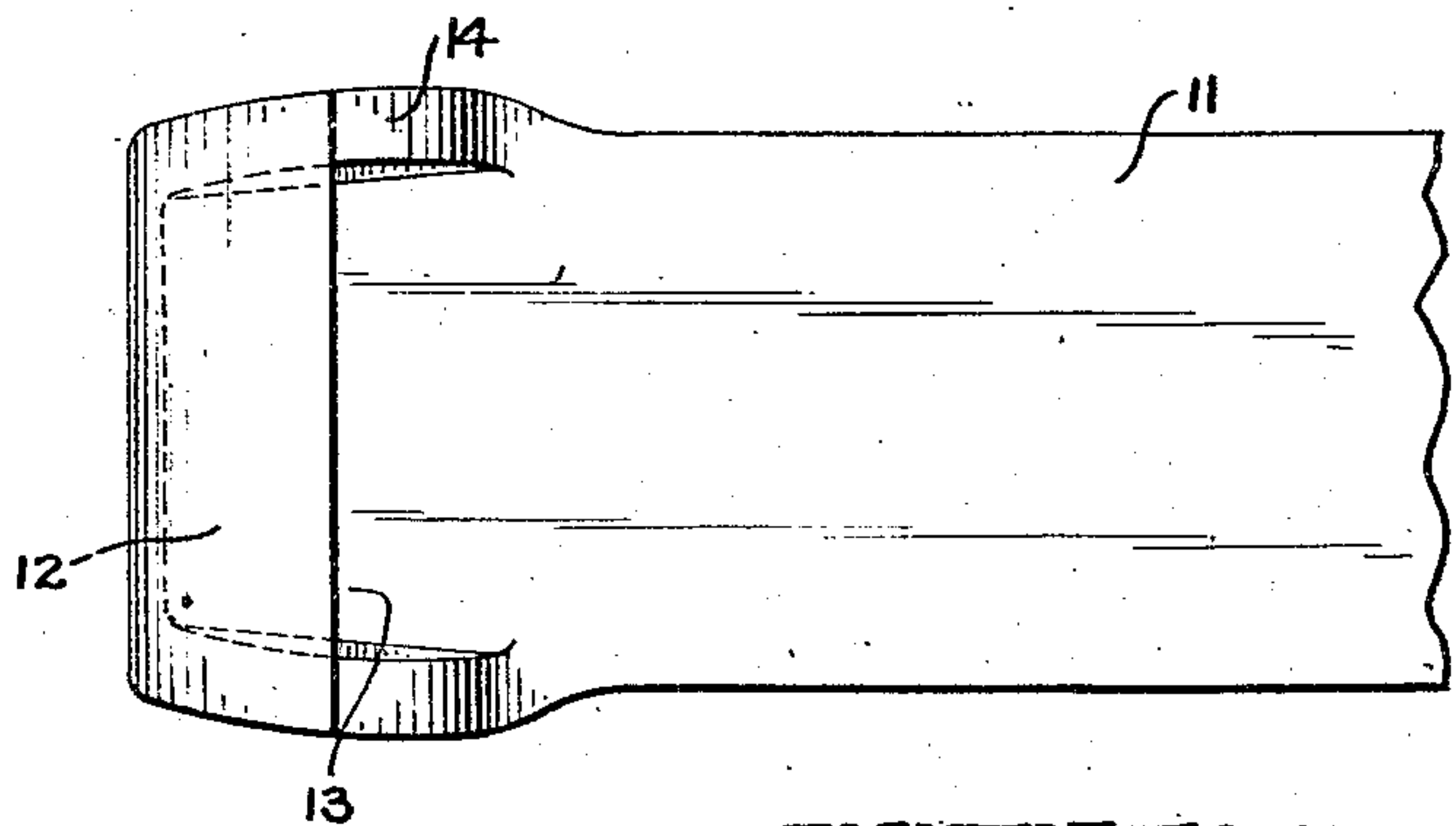


FIG. 5



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2 Sheets-Sheet 2

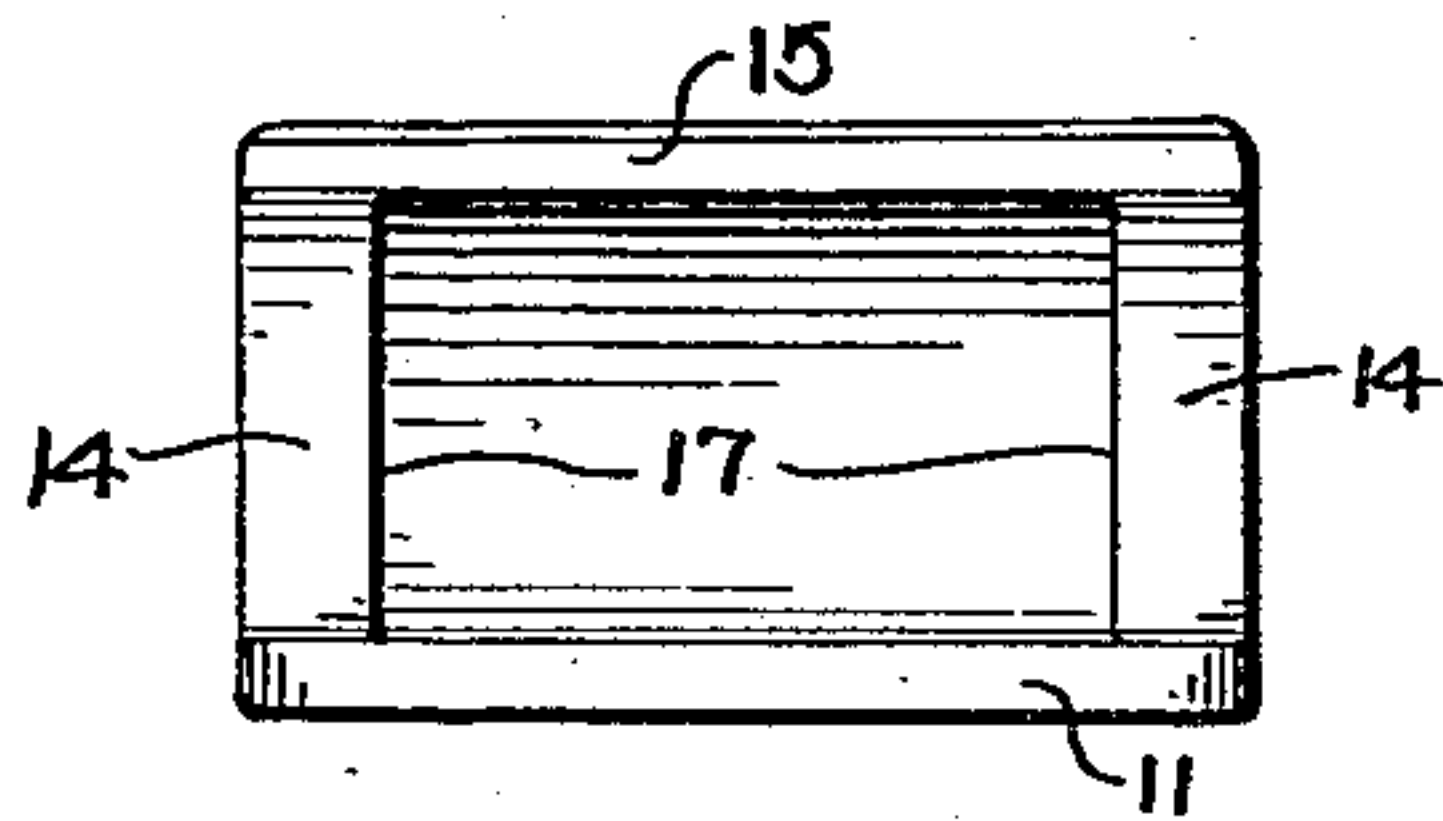


FIG. 9

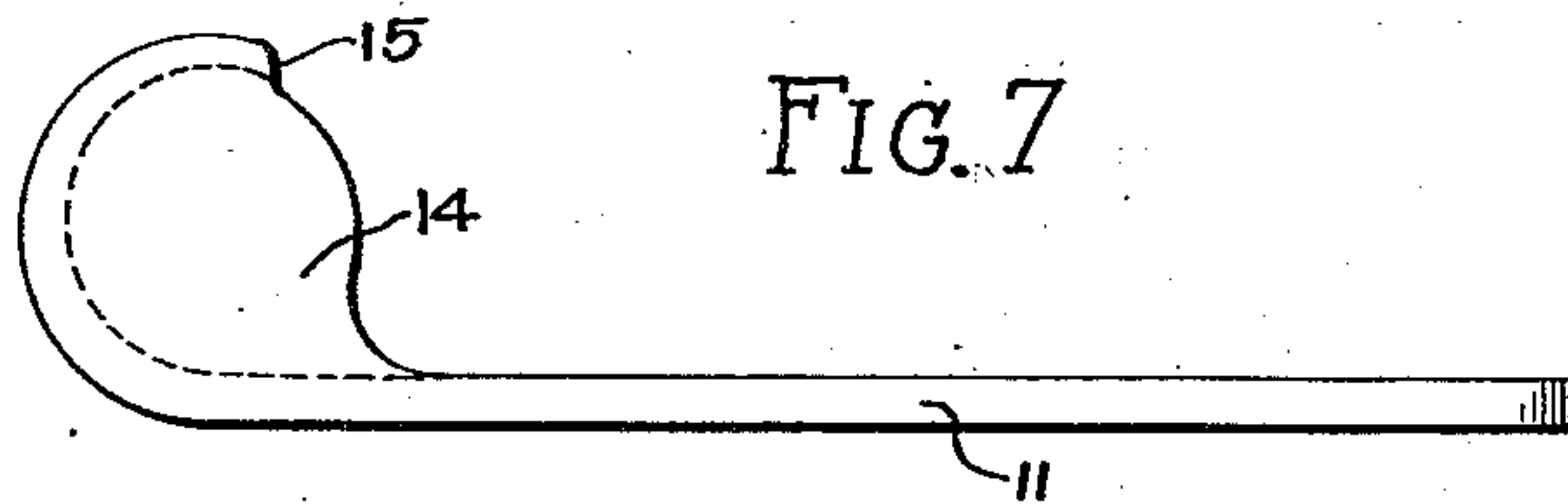


FIG. 7

FIG. 8

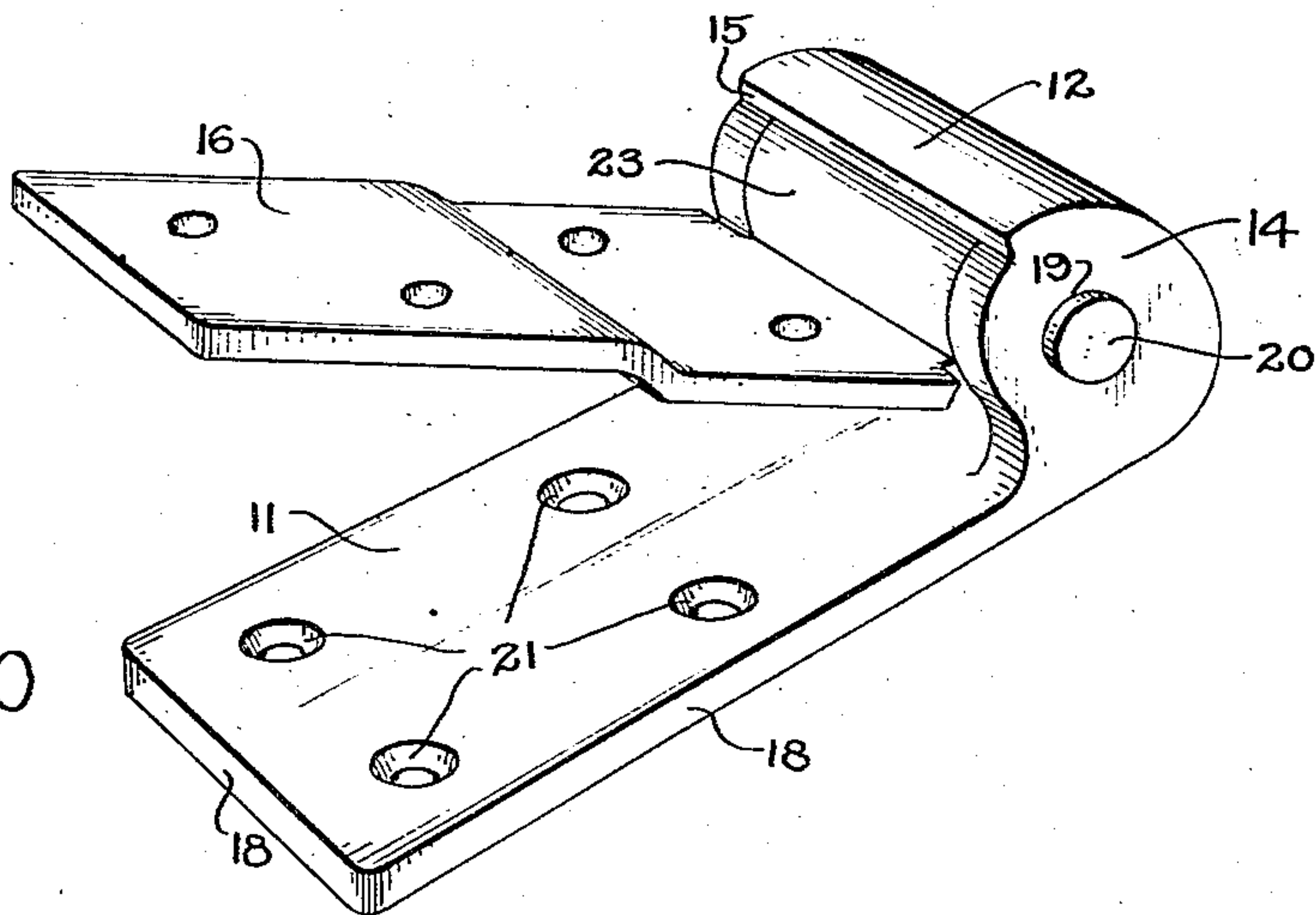
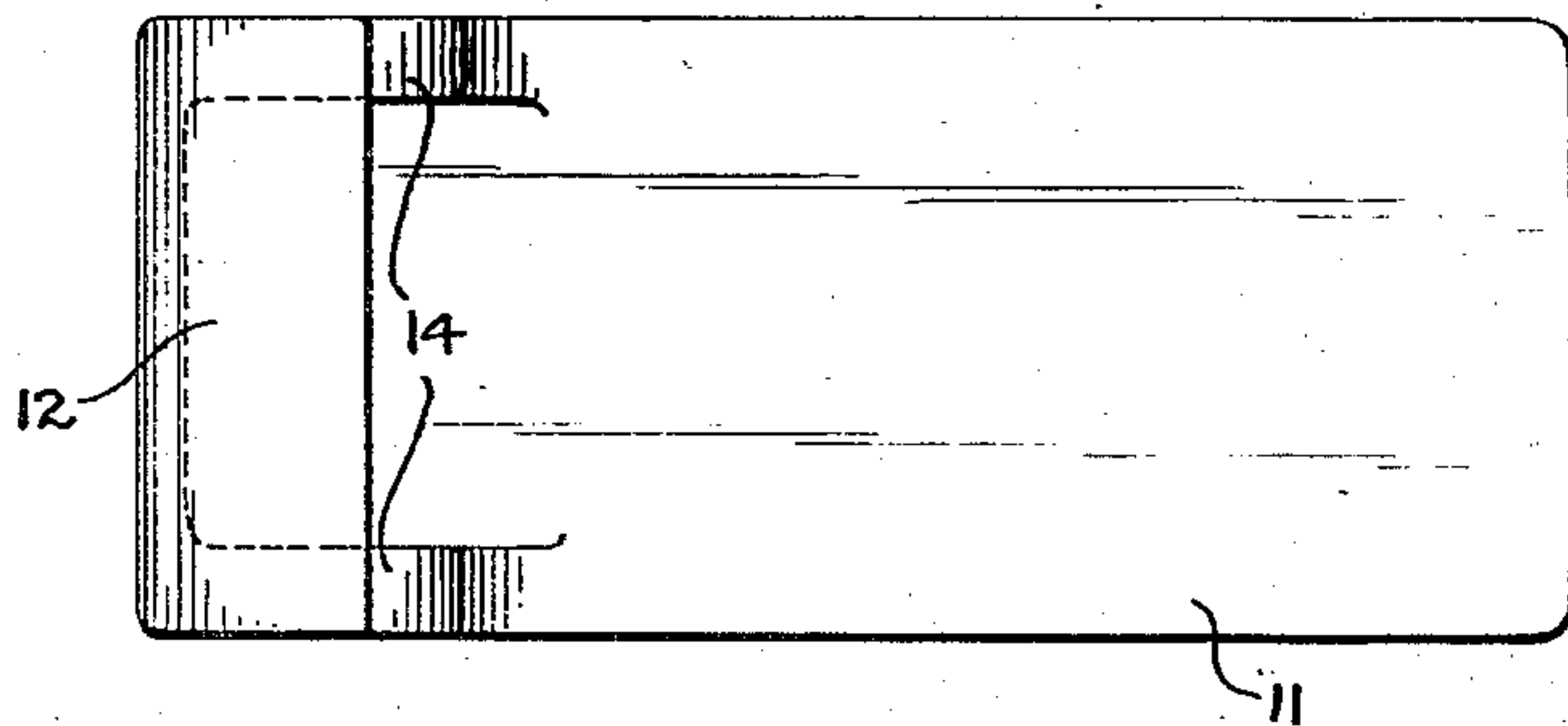


FIG. 10

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DUSTPROOF HINGE.

Application filed May 9, 1927. Serial No. 189,945.

This invention relates to hinge butts and more particularly to the method or process employed in the formation or manufacture of female hinge butts of the type shown and described in my copending application, Serial No. 151,385, filed November 29, 1926.

Heretofore and prior to this invention it has been the common practice to form these female hinge members either of pressed metal stampings or of castings. Where these members were formed of pressed metal stampings they had the disadvantage of not being of sufficient strength and rigidity to withstand the more or less severe strains and stresses to which they were subjected when in use, and to overcome this serious disadvantage resort has been had to various forms and arrangements of reinforcing and bracing expedients, these latter being often in the nature of elements separately secured to the sheet metal stampings. Where the hinge butts were made of cast metal it was exceedingly difficult, if not altogether impossible, to cast a female butt of the type disclosed and claimed in said copending application above referred to without leaving the bearing portion of the butt open to such extent that dust and other foreign material readily found its way into the hinge joint. Obviously where it was necessary to resort to a multiplicity of parts in a single hinge member in order to secure the requisite strength and rigidity for withstanding the strains and stresses to which the member was subjected when in use the cost of manufacture was considerably increased and the time consumed in assembling these parts was excessive. On the other hand, where the butt member was made in the form of a casting, it was necessary to finish the inner surfaces of the bearing portion of the member, this being a relatively expensive and time-consuming operation at the same time that it was practically impossible to provide an adequate integrally formed covering for the hinge pin arranged to effectually preclude any possibility of dirt or grit entering into the joint and so causing premature wear between the parts thereof.

It is accordingly among the objects of this invention to obviate the aforementioned objections and difficulties by the provision of a method for forming the female hinge butt of a dust-proof hinge which consists in initially drop-forging a blank and finally pressing this drop-forged blank into final shape.

A further object of the invention is the method of producing a dust-proof hinge butt by first drop-forging a blank having a hook-shaped extension at one end thereof provided with integrally formed inclined side walls, then forming this drop-forging such that the hook-shaped extension forms a covering hood for the hinge pin, and finally coining the side walls of the hood so that their inner surfaces will be spaced apart the exact required distance to constitute bearings for the hinge pin upon which is mounted the other butt member of the hinge.

A still further object of the invention is the method of producing a female hinge butt which is strong, rigid and durable and which is provided with a curved hood at one end thereof for protecting the joint against the entry of grit, dust or other foreign material thereinto.

Other objects, and objects relating to details of economy and construction will appear more fully hereinafter.

The invention consists substantially in constructing, combining, locating and relatively arranging the parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally pointed out in the appended claims.

In the accompanying drawings:—

Figure 1 is a side view of the initially drop-forged blank;

Figure 2 is a plan view thereof;

Figure 3 is an end view thereof looking in the direction of the arrows 3—3 of Figure 1, a portion of the blank being shown in section;

Figure 4 is a side elevation of the blank after it has been straightened into normal shape;

Figure 5 is a plan view of the straightened blank;

Figure 6 is an end view looking in the direction of the arrows 6—6 of Figure 4;

Figure 7 is a side view of the completed hinge butt;

Figure 8 is a plan view thereof;

Figure 9 is an end view looking in the direction of the arrows 9—9 of Figure 7; and

Figure 10 is a perspective view of the complete hinge.

Referring to the drawings and more particularly to Figures 1, 2 and 3, it will be seen that the first step in the method of producing female hinge butts is to drop-forge a blank

10 into the shape shown in these figures, the blank so formed consisting of a leaf 11 having a hook-shaped extension 12 at one end thereof. This hook-shaped extension extends substantially across the entire width of the blank 10 and when initially formed is arranged with its mouth 13 presenting upwardly and at right angles to the plane of the leaf 11. At opposite sides of this curved extension 12 are integrally formed side walls 14, these latter being inclined outwardly and upwardly with respect to one another to provide the necessary clearance or draft for the drop-forging die or hammer. As is most clearly shown in Figure 2 the curved portion 12 lies wholly below the plane of the leaf portion 11, and it will further be seen that the side walls 14, which are of substantially circular formation, have the greater portions of their peripheries joined integrally to the curved extension 12. The side walls 12 are preferably of greater thickness than is the leaf 11, and the curved extension 12 gradually decreases in thickness from its line of connection with the leaf 11 to its outer free edge 15.

After the blank 10 has been so formed, it is subjected to the next operation wherein the hook-shaped extension 12 is bent upwardly in such manner that its mouth 13 presents forwardly and in a direction substantially paralleling the plane of the leaf 11, the resultant product being shown most clearly in Figures 4, 5, and 6. It will be seen that as a result of this last operation the hook-shaped extension 12 will have been shifted from a position below the plane of the leaf 11 to a position above said plane.

The partially completed butt shown in Figures 4-6 is then subjected to an operation for coining the side walls 14 so that their inner surfaces will be spaced apart the exact required distance. This coining operation is carried out by placing the butt in a suitable coining press having an anvil or gauge of a length equal to the desired distance between the inner surfaces of the walls 14, these latter being positioned one either side of the anvil. The coining dies are then operated to force the walls 14 inwardly and toward the sides of the anvil until the walls are straight and in substantial parallelism with respect to each other. This coining or straightening of the side walls 14 accurately spaces them to snugly accommodate the companion or male hinge butt 16 (see Fig. 10) therebetween, the necessity for finishing the inner surfaces 17 of the side walls 14 being entirely eliminated with the result that considerable time, labor and expense are saved in the manufacture of these female butt members. In fact, as has already been pointed out, it is almost impossible to properly and conveniently finish the interior surfaces of the hook-shaped extension 12, especially when the latter is of the form shown in Figures 4 and 7 having its free edge

15 lying well to one side of the vertical plane of the hinge pin axis.

After the side walls 14 have been coined to proper position, the outer surfaces thereof together with the edges 18 of the leaf 11 may be finished in any suitable manner, as for instance, by grinding. The holes 19 may then be drilled or otherwise formed in the side walls, these holes being in axial alignment and of a diameter sufficient to snugly accommodate therein the opposite ends of the hinge pin 20. The holes 21 in the leaf 11 may also be drilled and countersunk if necessary.

The male butt member 16, which forms no part of the present invention, is provided with a transversely bored head 23 arranged to be received within the curved extension 12 of the female butt member 10 so that the hinge pin 20 may be projected therethrough. The integrally formed side walls 14 overlie and conceal the ends of the head 23, while the curved hood portion of the extension 12 overlies and conceals approximately three-fourths of the cylindrical surface of said head as well as the joints between the ends of the head and the inner surfaces of the side walls 14. The free edge 15 of this hood or cover portion acts as a stop to limit the opening movement of the hinge.

It will be apparent to those skilled in the art that by the method just described it is possible to provide a female hinge butt member which is not only exceedingly strong, thereby reducing the possibility of its being thrown out of alignment or otherwise damaged, but which also may be constructed inexpensively and in one piece, even though the member be of the fully enclosed type.

It is to be understood of course that various changes and modifications may be had from time to time without departing from the real spirit of this invention and it is accordingly intended that the appended claims cover the invention broadly, as well as specifically.

What is claimed as new and useful is:

1. The herein described process of manufacturing the female butt of a dust proof hinge, which consists in producing in one operation a drop-forged blank including a curved portion at one end thereof having diverging side enclosures, and then straightening said enclosures into substantial parallelism.

2. The herein described process of manufacturing a hinge butt, which consists in initially and in one operation shaping a blank such that its longitudinal section is in the form of a hook, the opposite sides of the curved portion of the hook being provided in said initial operation with diverging walls, and then pressing said walls out of divergence and into substantial parallelism.

3. The herein described method of manufacturing a hinge butt, which consists in ini-

tially and in one direction drop-forging a blank in the form of a leaf having a curved extension at one end thereof, said extension lying below the plane of said leaf and being provided in said operation with diverging side walls, then bending said extension such that it lies above said plane, and then coining said side walls to remove the divergence therebetween and bring them to proper gauge.

4. The herein described method of manufacturing hinge butts which consists in initially and in one operation shaping a blank in the form of a leaf having a substantially hook-shaped end portion with outwardly diverging side enclosing walls, said end portion lying to one side of the plane of said leaf, bending said end portion at the line of junction between said end portion and said leaf so as to position the former to the other side of the plane of the latter, and pressing said walls inwardly and into substantial parallelism with respect to each other.

5. The herein described method of manufacturing a dust proof hinge butt, which consists in initially and simultaneously drop-forging a blank to form a curved extension at one end thereof having diverging side enclosing walls and subsequently coining said inclined side walls to the exact gauge desired.

6. The herein described method of manufacturing a female hinge butt, which consists in forming in one operation, a blank having a hook-shaped extension at one end thereof provided with diverging side enclosing walls, and then, in a subsequent operation, coining said walls into parallelism.

7. The herein described method of manufacturing the female butt of a dust proof hinge, which consists in drop-forging a blank to produce in one operation, a leaf including at one end thereof a transverse depression provided with diverging side enclosing walls, and then coining said walls to remove the divergence to bring them to proper gauge.

8. The herein described method of manufacturing a hinge butt, which consists in initially and in one operation drop-forging a blank in the form of a leaf having a hook-shaped extension at one end thereof, said extension being provided in said operation with side-enclosing walls and being further presented upwardly and at right angles to the

plane of said leaf, and subsequently bending said extension such that it presents toward the free end of said leaf and in substantial parallelism with said plane.

9. The herein described method of manufacturing a hinge butt, which consists in initially and in one operation forming a blank having a leaf and a curved portion extending transversely across one end thereof, said curved portion being initially presented upwardly and at right angles to said leaf and being provided in said initial operation with diverging side-enclosing walls, then straightening said blank such that said curved portion presents itself in a direction paralleling said leaf, and finally coining said side walls to the exact gauge required.

10. The herein described method of manufacturing a hinge butt, which consists in initially and in one operation drop-forging a blank to form a leaf having a transverse depression at one end thereof presenting upwardly and at right angles to said leaf, said depression being initially provided in said operation with oppositely inclined side walls, then straightening said blank such that the depression presents in a direction paralleling said leaf, then removing the divergence between the side walls, and finally forming apertures in said walls for accommodating the ends of a hinge pin.

11. The herein described method of manufacturing a female hinge butt which consists in initially and in one operation producing a drop-forged blank comprising a leaf and a transversely extending curved portion including diverging side-enclosing walls, said curved portion being of gradually decreasing thickness toward its outer free end and said free end being spaced from that part of the curved portion which is of greatest thickness whereby to form a mouth presenting upwardly and at right angles to said leaf, then bending said leaf with respect to said curved portion until the mouth of the latter faces in a direction paralleling said leaf, and then coining said side-enclosing walls to remove their divergence and establish them in substantial parallelism.

In testimony whereof, I have hereunto affixed my signature.

MORTON TUCKER.