

Sept. 20, 1960

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2,952,852

FACE MASK LENS ATTACHING MEANS

Filed May 7, 1956

2 Sheets-Sheet 1

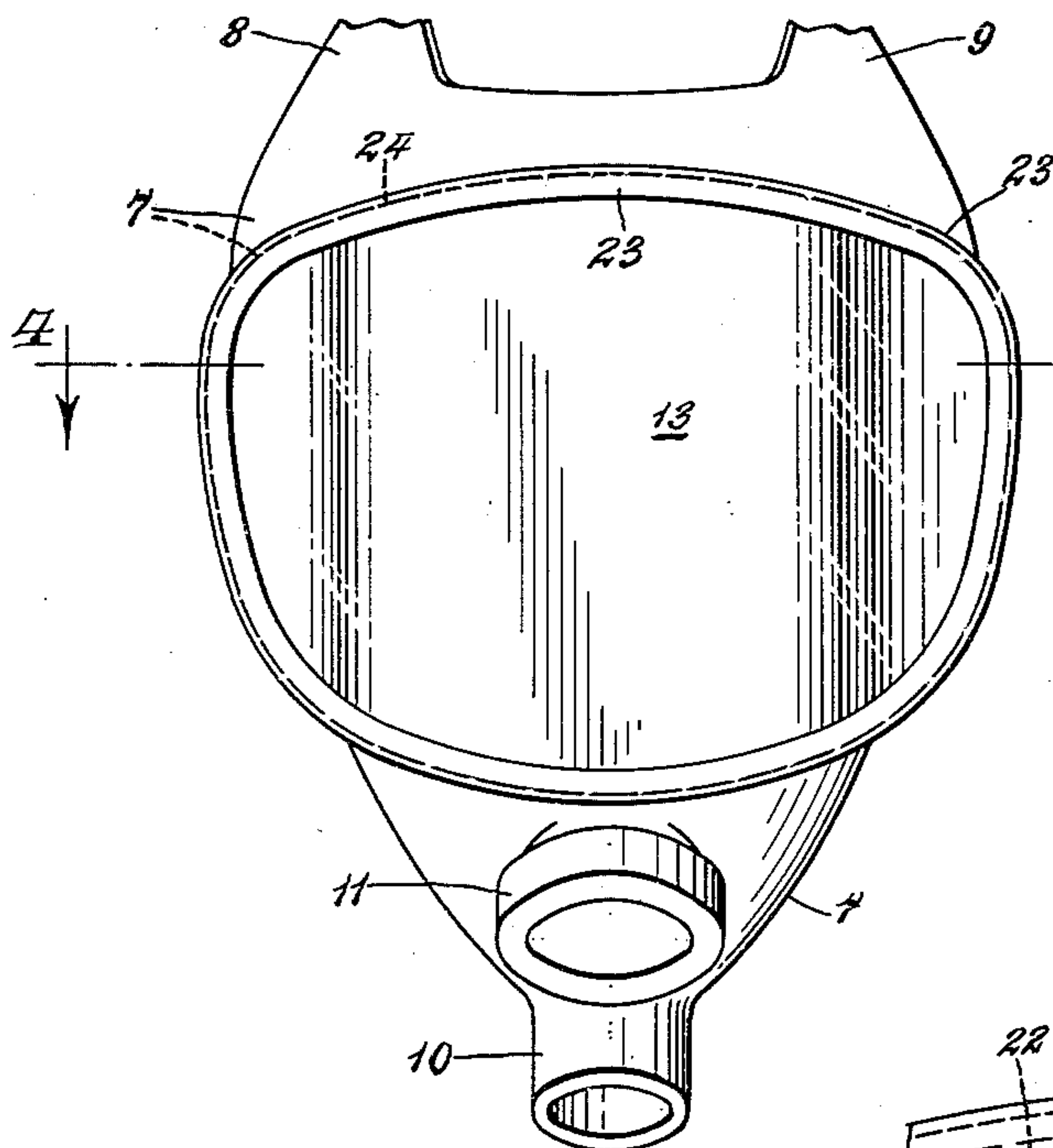


Fig. 1.

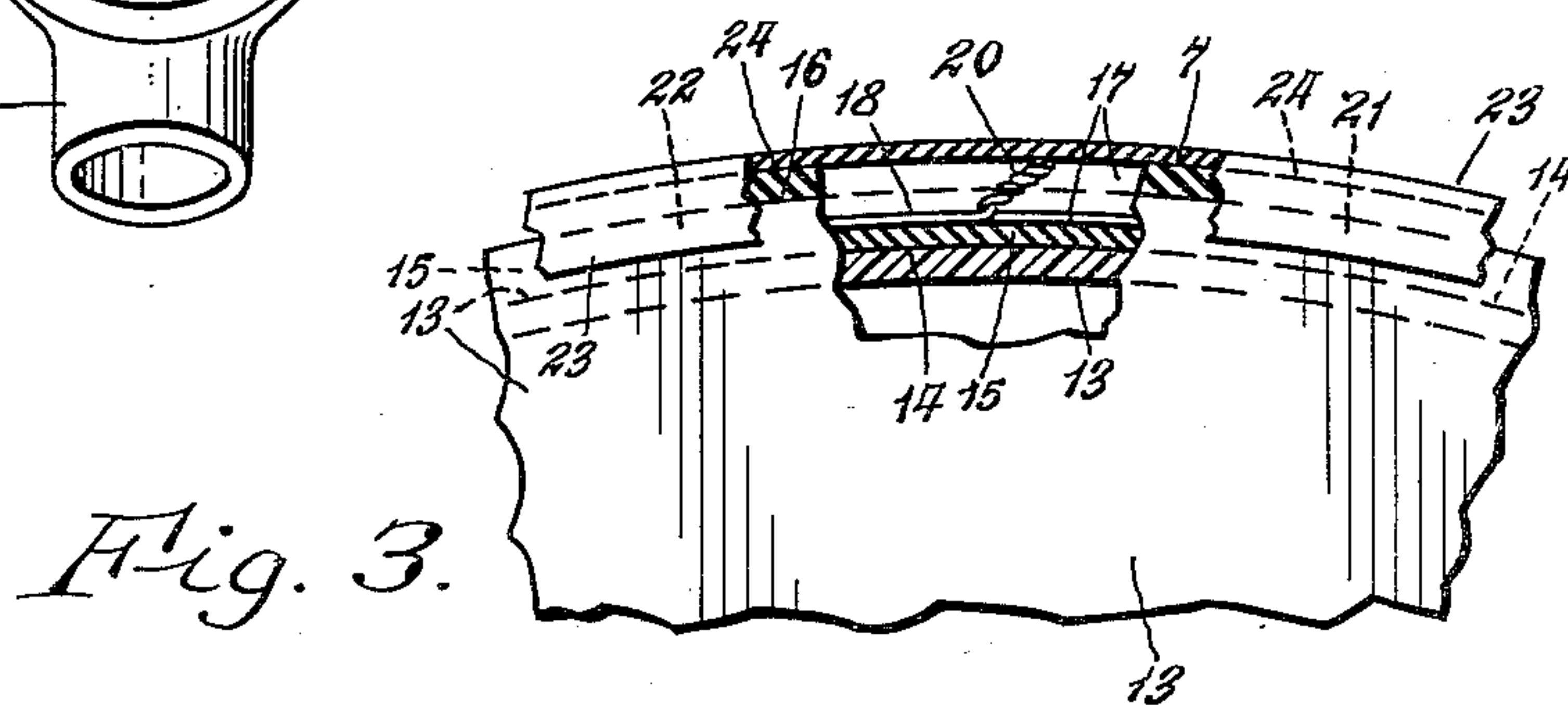


Fig. 3.

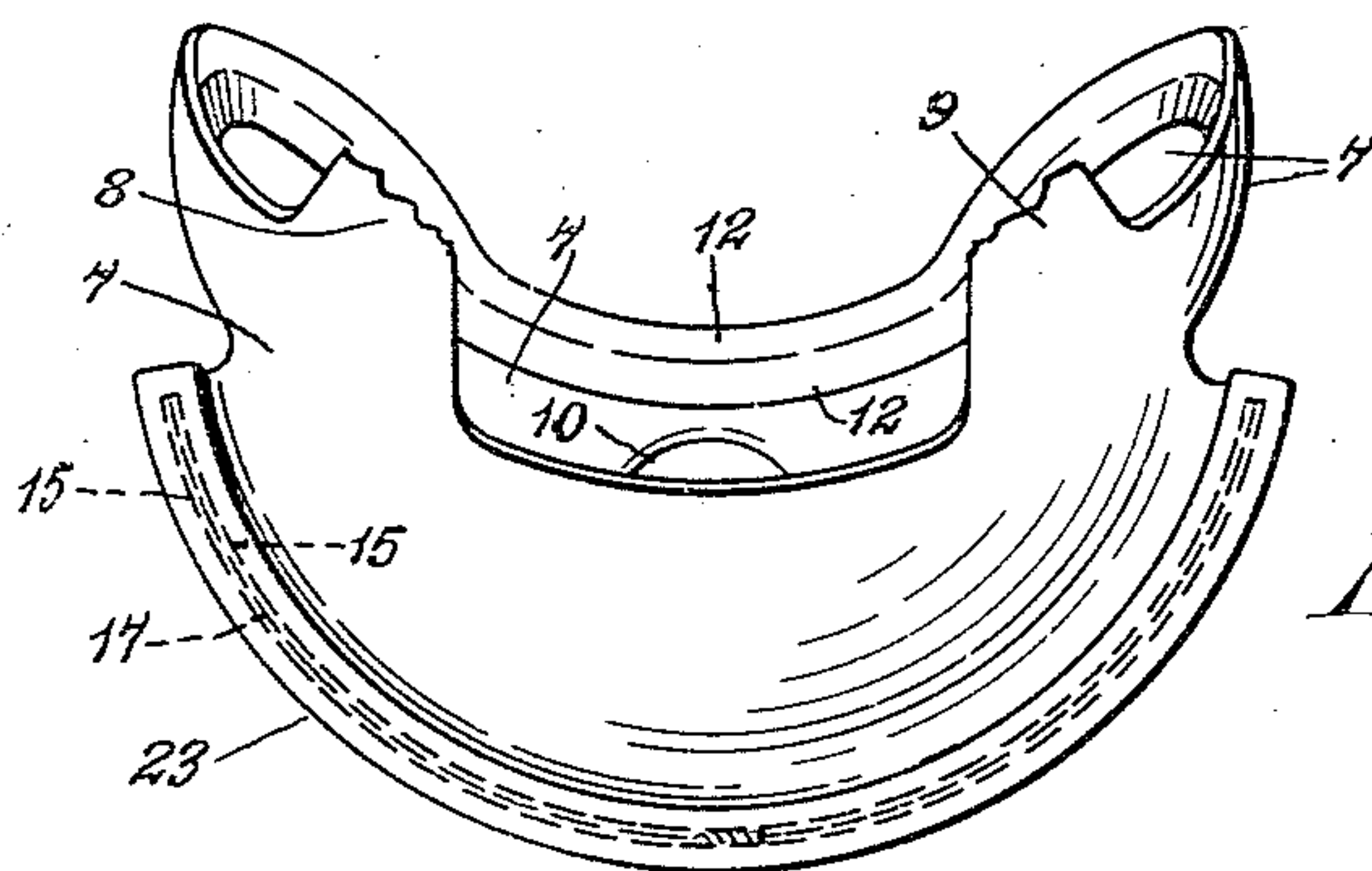


Fig. 2.

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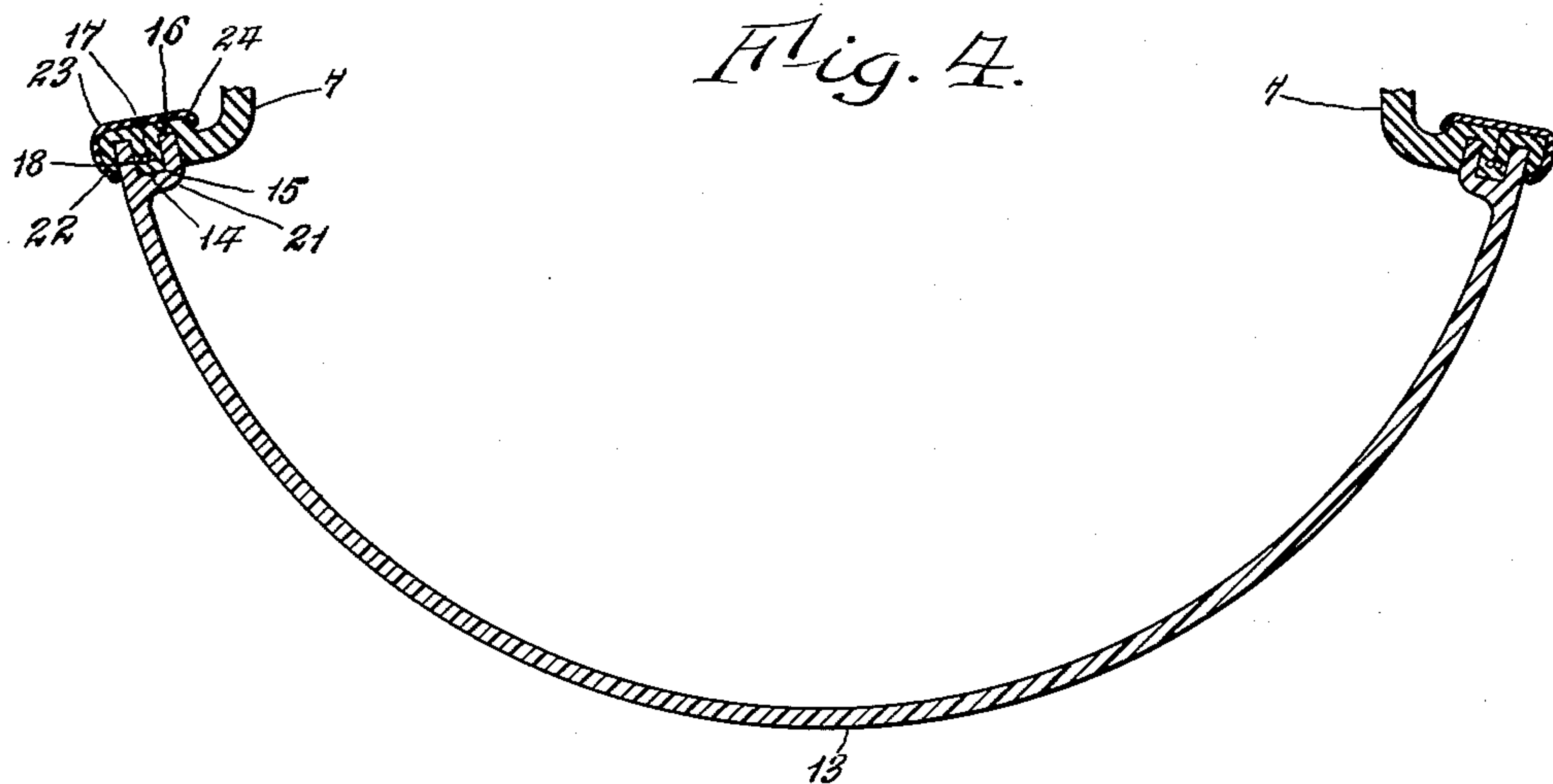


Fig. 5.

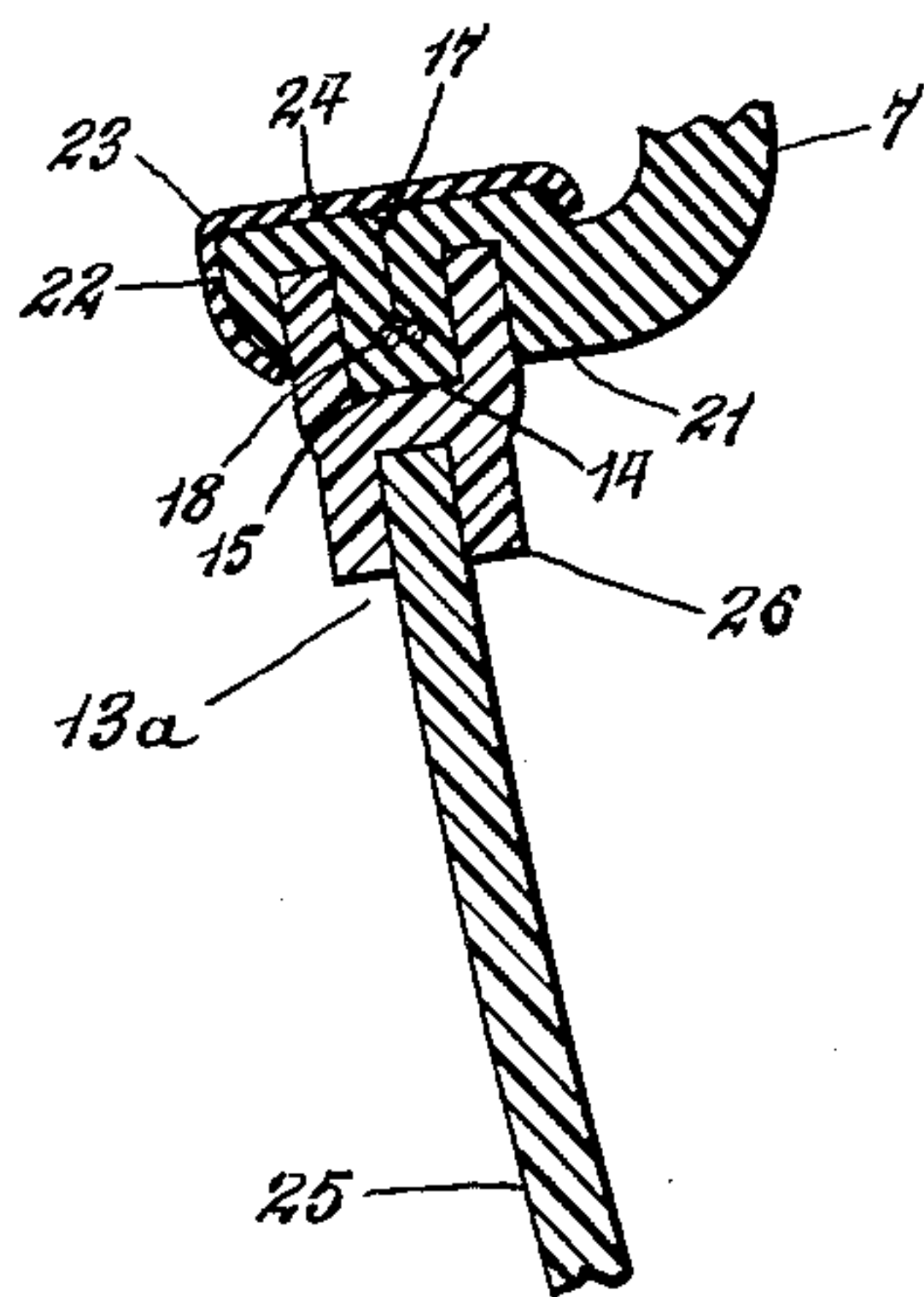
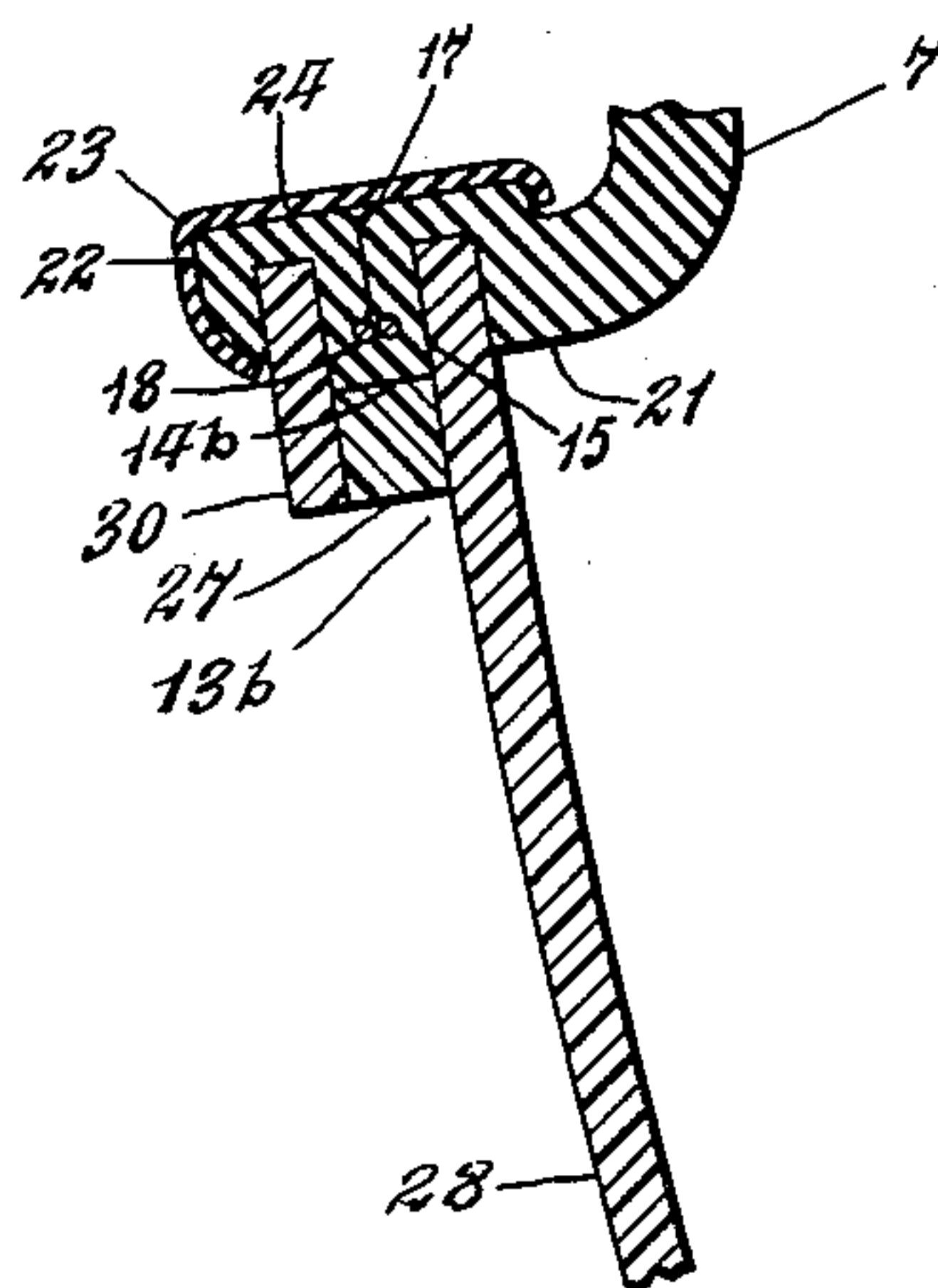


Fig. 6.



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FACE MASK LENS ATTACHING MEANS

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3 Claims. (Cl. 2—14)

This invention relates to a face mask for covering either just the eyes of the wearer, or for covering the eyes and also the nose of the wearer, or for covering the entire face of the wearer. In particular, this invention relates to a novel means for detachably attaching a transparent lens to a mask.

The main object of the invention is to provide a simple, inexpensive but rugged and fluid-tight means of so securing a transparent lens to a face mask, that said lens may be readily replaced when it becomes broken or unduly scratched. Other collateral objects of the invention and practical solutions thereof are described in the following description and illustrated in the appended drawings, wherein:

Fig. 1 is a diminutive, front elevation of a mask (with parts broken away) to which a lens 13 has been detachably secured by my novel lens securing means.

Fig. 2 is a diminutive, top plan thereof.

Fig. 3 is an enlarged, fragmentary section (with parts broken away) thru the upper part of said lens 13, and the adjacent members of the mask assembly.

Fig. 4 is a fragmentary, horizontal section thru the mask assembly taken on line 4—4 Fig. 1.

Fig. 5 is an enlarged, fragmentary, vertical section thru the upper part of a modified lens 13a, and the adjacent parts of the mask assembly.

Fig. 6 is an enlarged, fragmentary, vertical section thru the upper part of another modified lens 13b and the adjacent parts of the mask assembly.

For convenience, the present invention will be described precisely as it is illustrated, but it is to be understood that the scope of the invention is to be measured solely by the breadth of the appended claims and by the intrinsic novelty of the invention.

The mask 7 shown is of the full face type and is provided with the usual head straps 8 and 9, inlet tube 10 and exhalation fitting 11, all of which are molded in one integral piece of somewhat stiff but nevertheless flexible rubber. In the usual and well known manner, this mask snugly fits the face of the wearer so as to render it fluid-tight to the ambient fluid or gaseous medium in which the wearer is immersed, the inside of the mask being capable of withstanding a positive or above-ambient pressure by the provision of the usual, annular, inwardly and forwardly projecting, thin, integral flange 12, shown in Fig. 2.

Arranged in the front, upper part of the mask 7 is the transparent, plastic lens 13, and this lens is not flat but is of semi-cylindrical shape, and it is this curvilinear shape which prevents the use of conventional lens-securing means.

This lens 13 has integrally formed in its curvilinear periphery an outwardly-opening groove 14, and the latter is adapted to receive an annular rubber flange 15, which projects inwardly from what may be defined as a lens opening 16 of the mask 7. This flange 15 is flexible and is molded integrally with the rest of the rubber mask 7 and while being assembled is adapted to be snapped into aforesaid groove 14 of the lens 13.

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This flange 15 is mechanically held firmly in the lens groove 14, and is rendered fluid-tight with respect to the lens 13 as follows:

Formed annularly in the outer, medial part of said flange 15 is an annular slot or slit 17 which extends inwardly from the outer face of the mask 7 but terminates short of the inner face of said flange 15. In putting together the components of the mask assembly (or in replacing the lens 13 when the mask is in service) a flexible metal wire or draw cord 18 is passed inwardly into the slit 17 while being tightly pulled circumferentially and wound one or two or more times around the periphery of the lens 13. The ends of this draw cord 18 are then fastened or twisted together (see Fig. 3) and the excess portions of said draw-cord are then snipped off, the tied together or twisted ends 20 being tucked into the slit 17 so as to be out of sight and yet recoverable, if at some later time said twisted ends 20 are to be drawn out and then untwisted, and the draw-cord 18 removed, so as to enable the lens 13 to be replaced.

It is to be noted, however, that, while this whole construction is very efficient, this flange 15 and the slit 17 are not strictly necessary, and, instead, the draw-cord 18 may be employed to force the adjacent parts of the mask 7 directly into the groove 14 to form what is in effect a flange. Theoretically, this groove 14 of the lens 13 might also be eliminated, but such a construction is not deemed to properly withstand the physical stresses to which many masks in service are necessarily subjected.

For additional strength and also to absolutely ensure fluid tightness, the mask 7 is also provided with both a rear supplemental "flange" 21 and a front supplemental flange 22, both of said supplemental flanges projecting inwardly from the lens opening 16 and being adapted to bear firmly against the rear and front peripheral margins, respectively, of the lens 13.

Strictly speaking, the rear flange 21 is a shoulder or abutment in the form shown in the drawings, but it is deemed more convenient to speak of it as a flange so as to be in the same nomenclatural category as the front flange 22, and also because, obviously, the construction could be such that it would undisputedly be a definite flange.

For the sake of appearance and also to prevent dirt from getting into the slit 17, a flexible covering band 23 is provided, said band being of annular shape (like an ordinary rubber band) and being of sufficient width to lap over the front and rear sides of the annular protuberance 24, which projects outwardly from the mask adjacent its lens opening 16. This lapping over of said covering band 23 over the front side of said annular protuberance 24 permits the mask assembly to be attractive in appearance and the "frame" of the lens 13 to be symmetrical even tho the mask 7 itself is pulled somewhat out of shape by the tension of the draw-cord 18. The rear side of the covering band 23 laps over the rear side of said annular protuberance 24 so as to balance the forces exerted by said covering band 23 and thus prevent its "crawling" outwardly over the front face of the lens 13.

Fig. 5 shows a modified form of lens 13a, which is constructed of two components, a plastic lens proper 25 and an auxiliary, peripheral plastic component 26 which is substantially H shaped in cross section and which is cemented or otherwise secured to said lens proper 25. This construction has the advantage that the lens proper 25 does not have to be molded (as in Figs. 1—4) and can be constructed by either bending and cutting a sheet of plastic or a sheet of glass, or, if desired, said lens proper 25 may be constructed of ground and polished glass which is of special importance when a prescription is to be ground into the lens.

Fig. 6 shows another modified form of plastic lens

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13b which can be constructed entirely of components each of which is stamped out of sheet material. This is effected by cementing an annular ring 27 to the lens proper 28, and then cementing to said ring 27 a larger ring 30 so as to form a groove 14b. Here again the lens proper 28 may be constructed of bent sheet glass or bent sheet plastic or of ground and polished glass.

I claim:

1. A face mask assembly comprising: a face mask having a lens opening; a stiff lens arranged in said opening and having a peripheral, outwardly-facing groove, said mask being provided with a supplemental, annular, rear flange arranged adjacent the opening of said mask and adapted to bear against the rear, peripheral margin of said lens; and means for annularly drawing tightly inwardly upon said mask around its opening so as to press the adjacent portion of said mask into said groove of said lens.

2. A face mask assembly comprising: a face mask having a lens opening; a stiff lens arranged in said opening and having a peripheral, outwardly-facing groove, said mask being provided with a supplemental, annular, front flange arranged adjacent the opening of said mask and adapted to bear against the front, peripheral margin of said lens; and means for annularly drawing tightly inwardly upon said mask around its opening so as to press

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the adjacent portion of said mask into said groove of said lens.

3. A face mask assembly comprising: a face mask having a lens opening; a stiff lens arranged in said opening and having a peripheral, outwardly-facing groove, said mask being provided with a supplemental, annular, rear and front flanges arranged adjacent the opening of said mask and adapted to bear against the rear and front, peripheral margins, respectively of said lens; and means for annularly drawing tightly inwardly upon said mask around its opening so as to press the adjacent portion of said mask into said groove of said lens.

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