

D. H. HAYWOOD.  
BOLT ANCHOR.  
APPLICATION FILED MAR. 7, 1910.

983,442.

Patented Feb. 7, 1911.

3 SHEETS-SHEET 1.

Fig. 1,

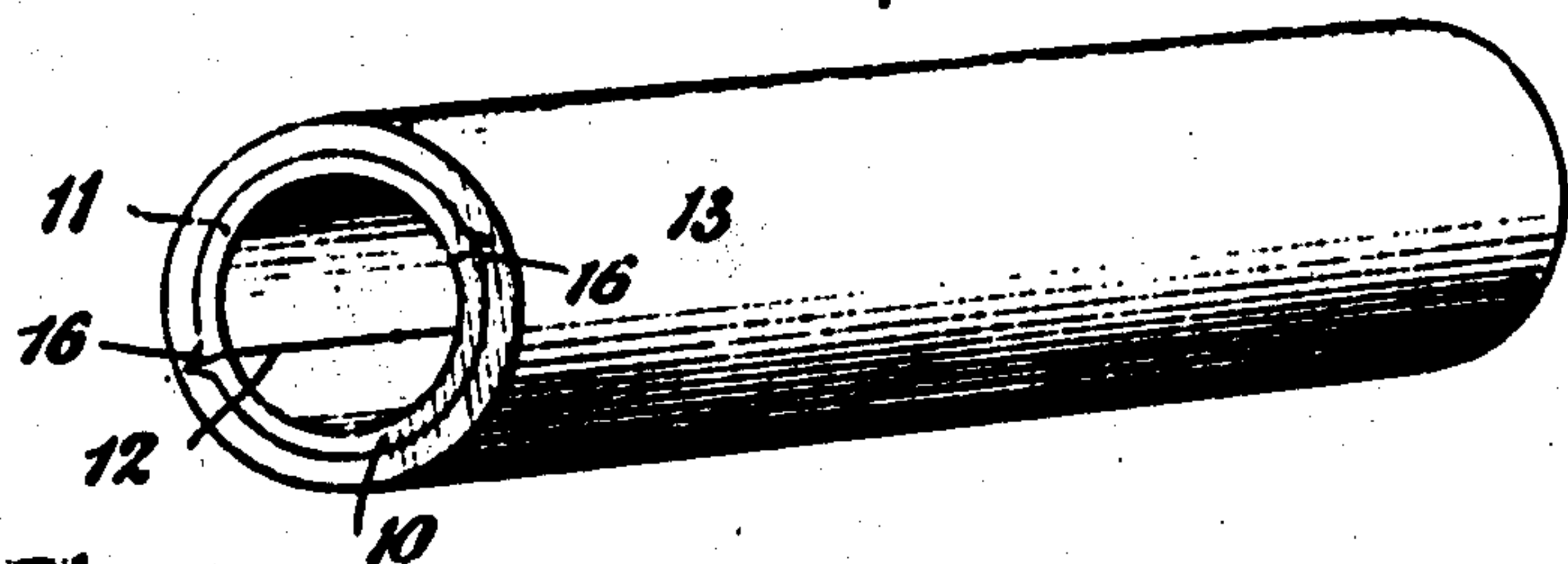


Fig. 2,

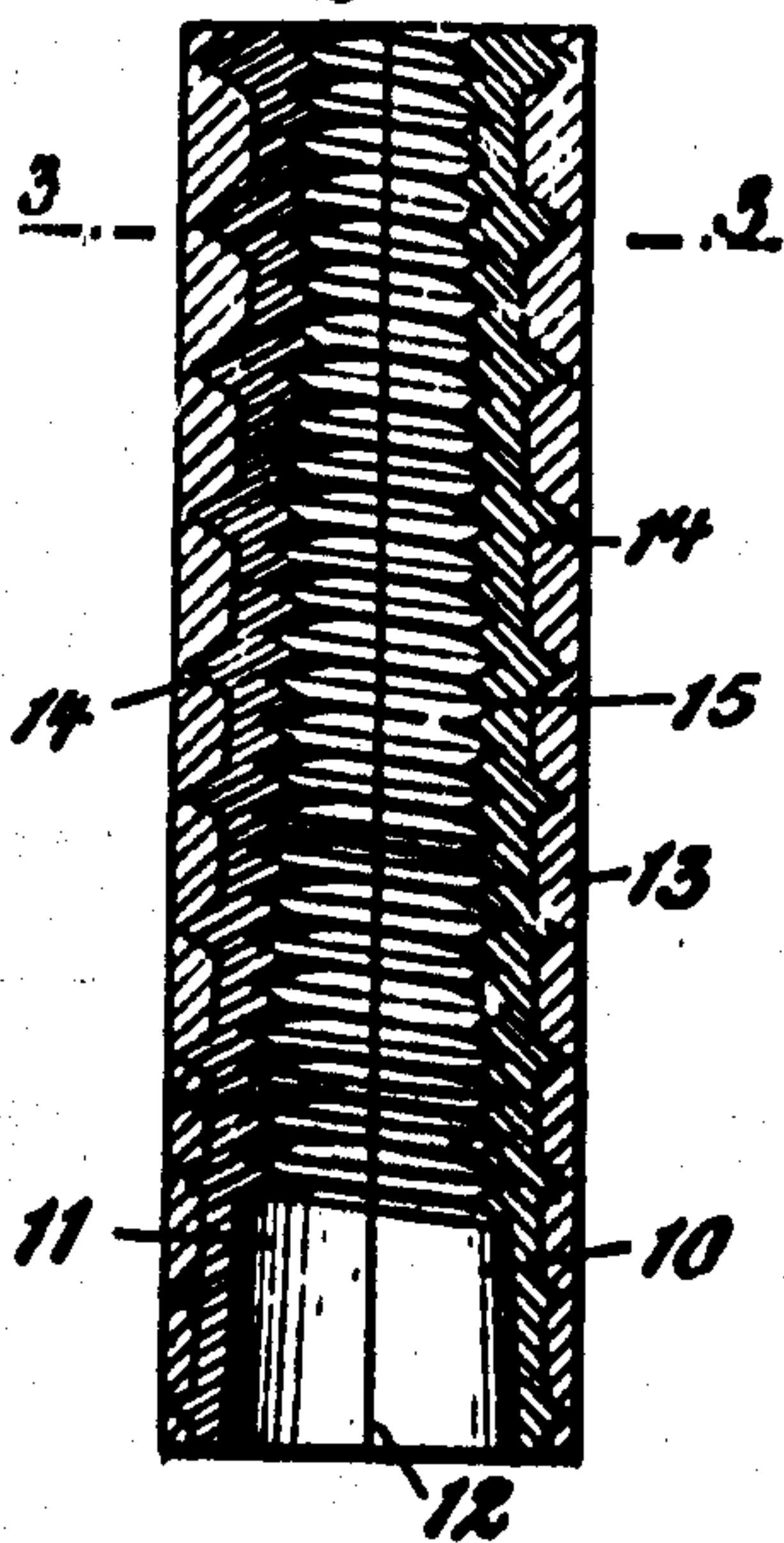


Fig. 3,

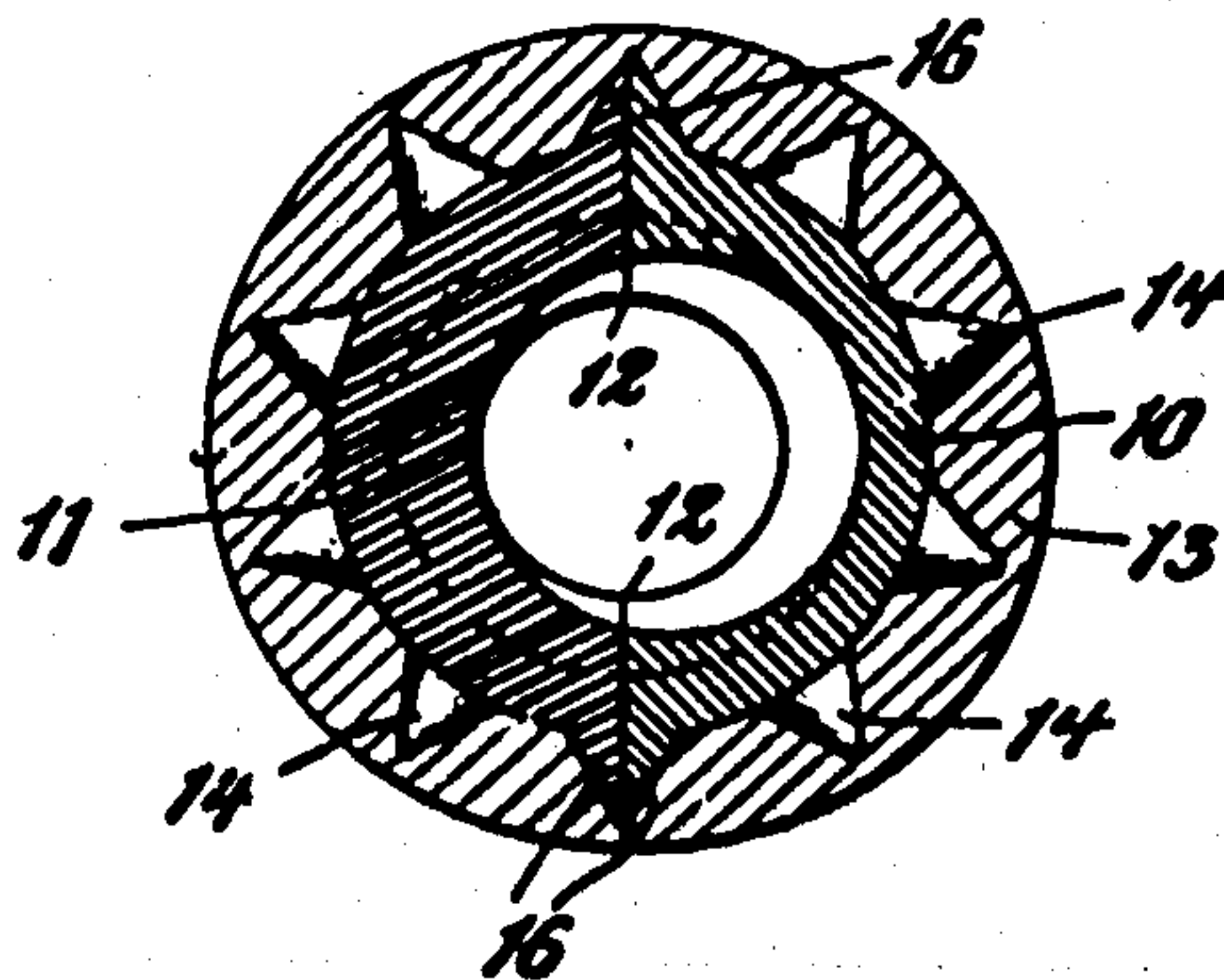
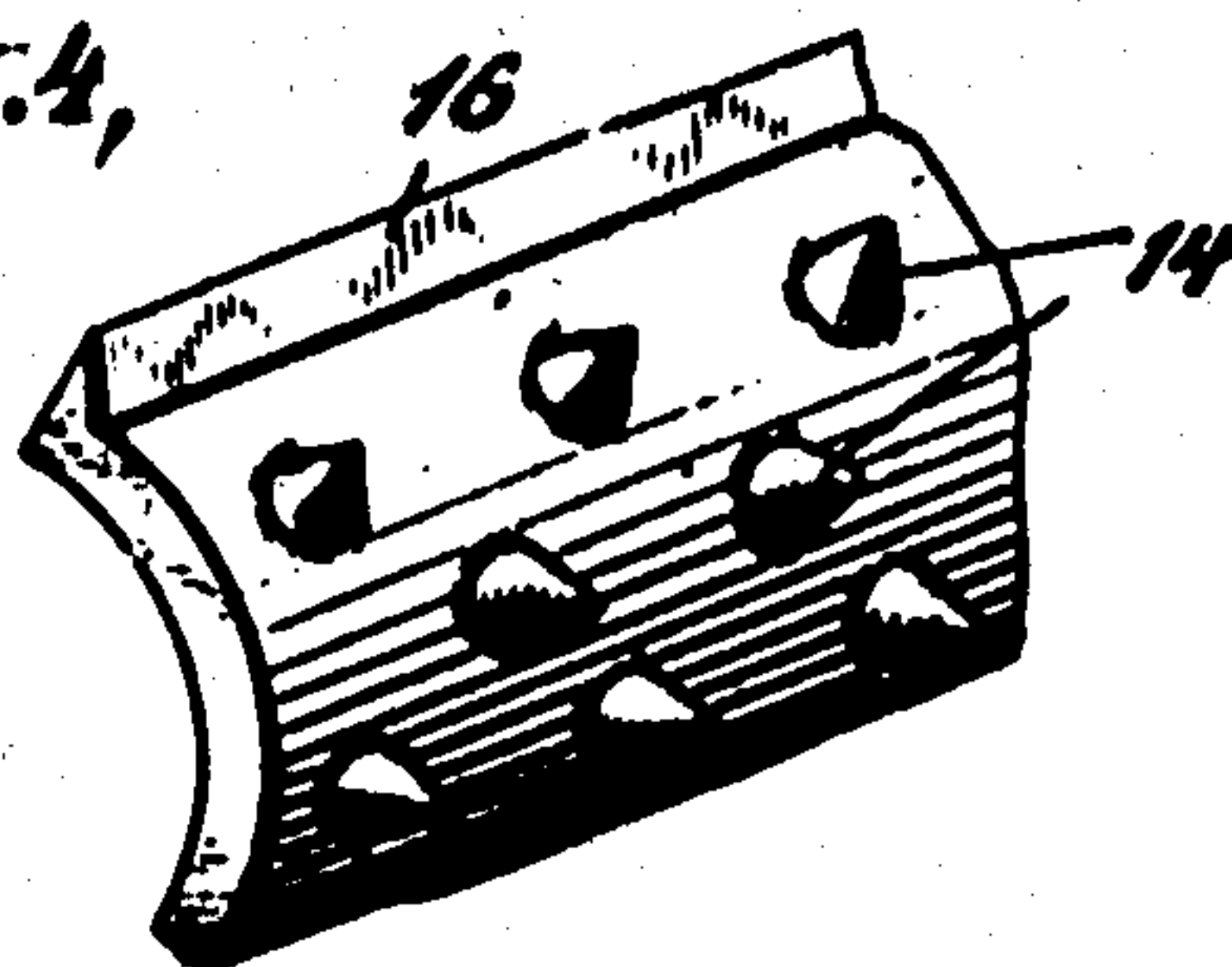


Fig. 4,



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2 SHEETS—SHEET 2.

Fig. 5,

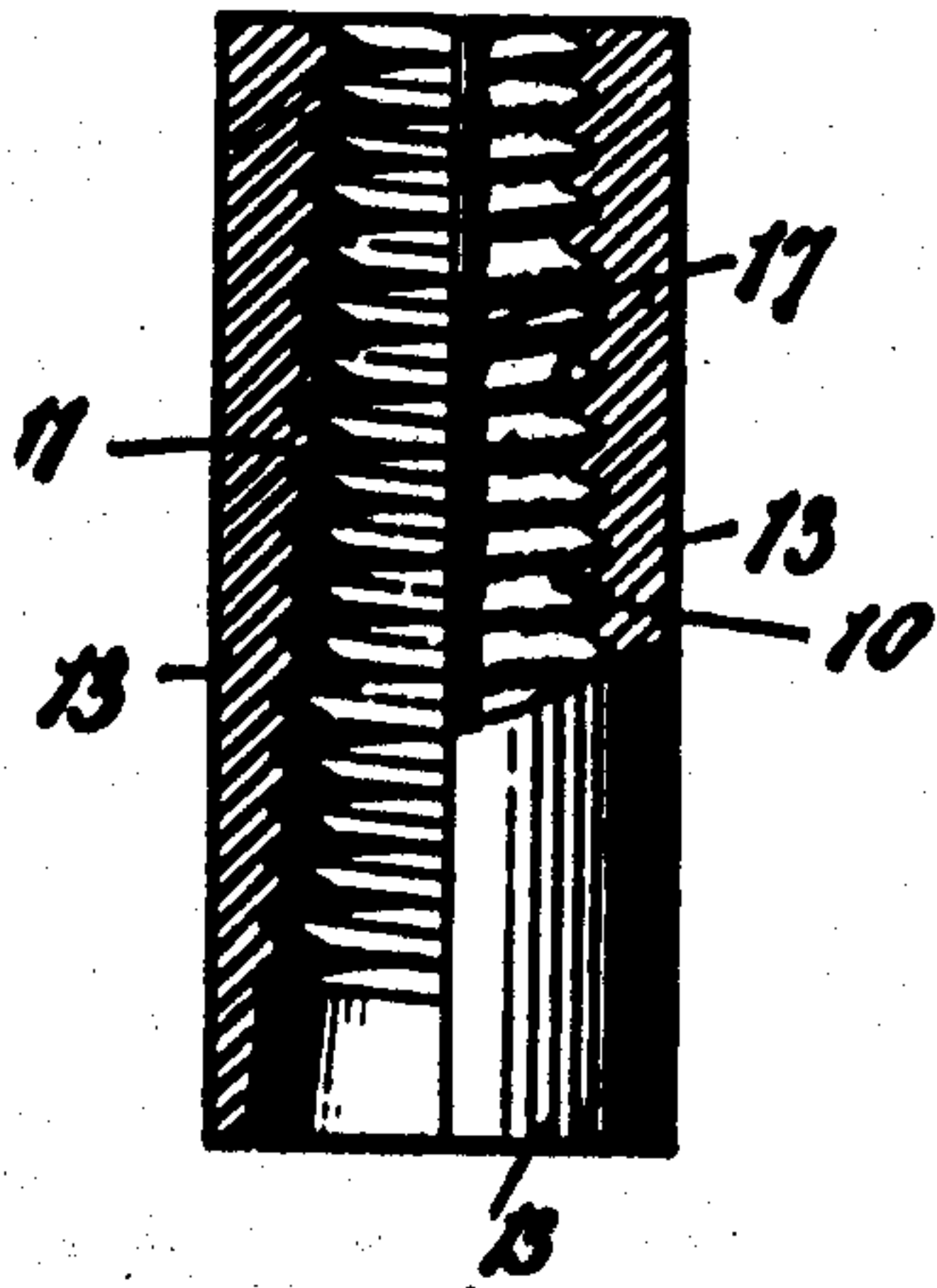


Fig. 6,

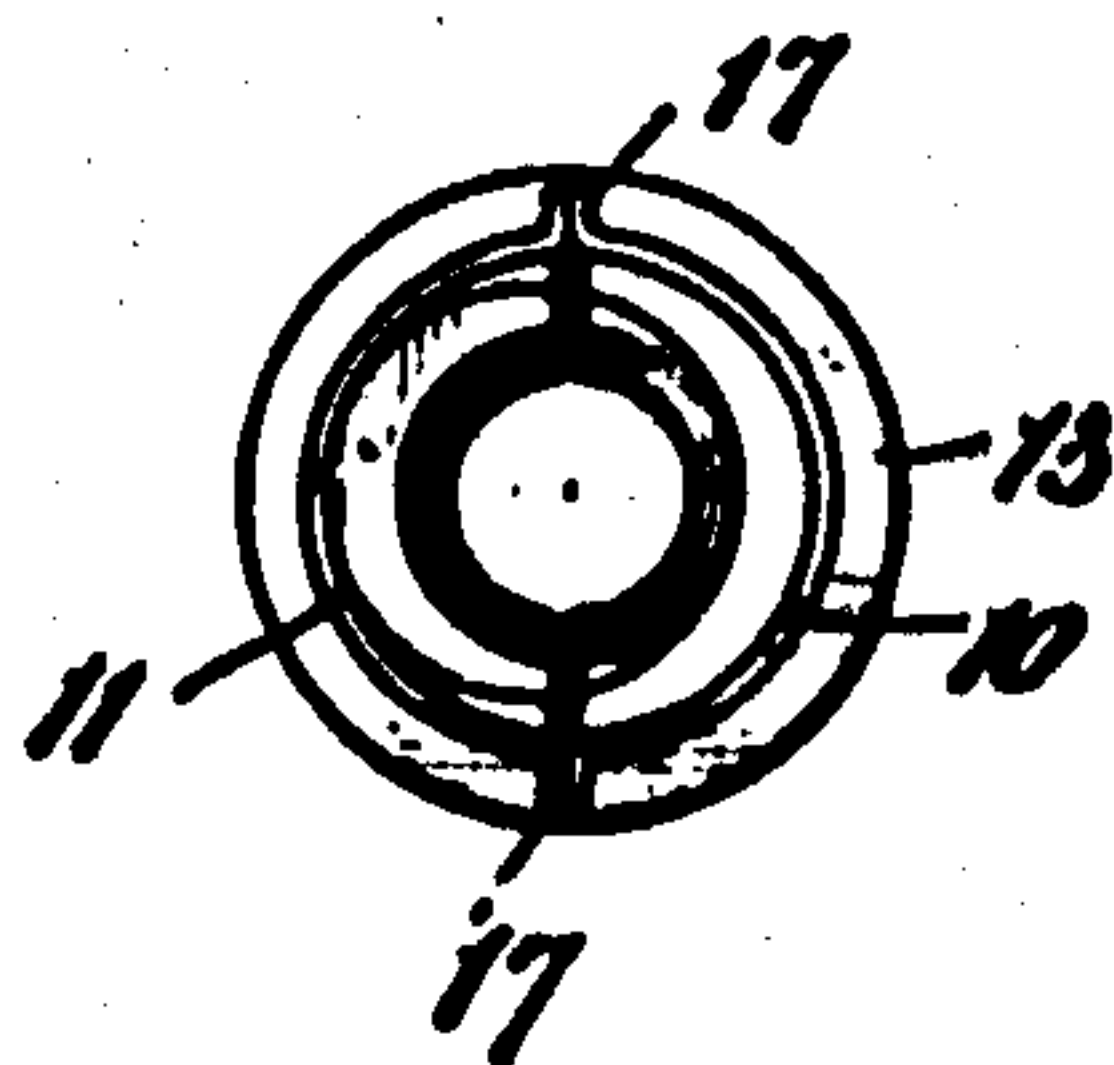


Fig. 10,

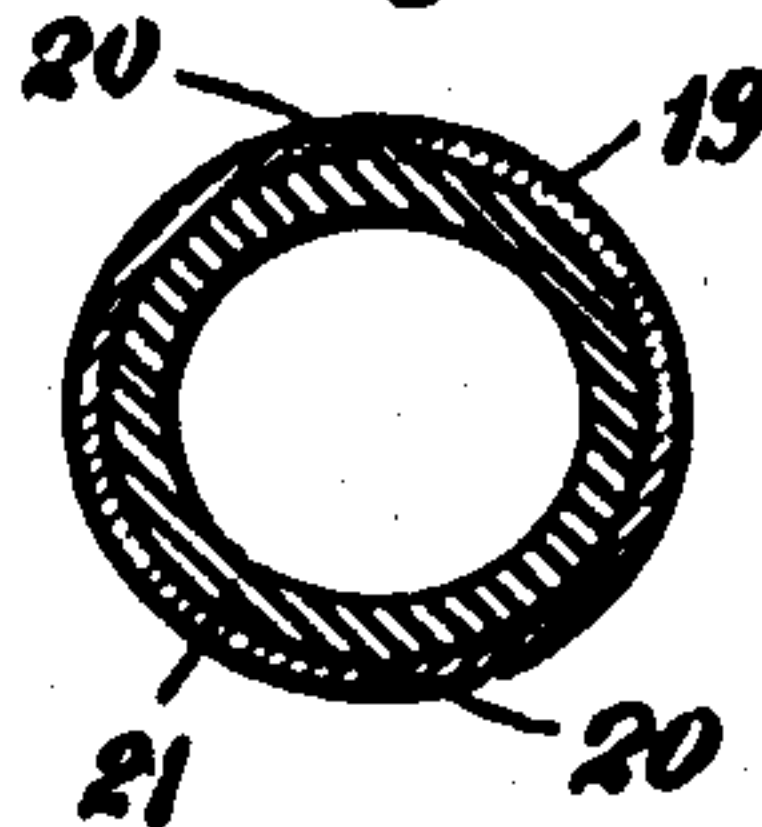


Fig. 7,

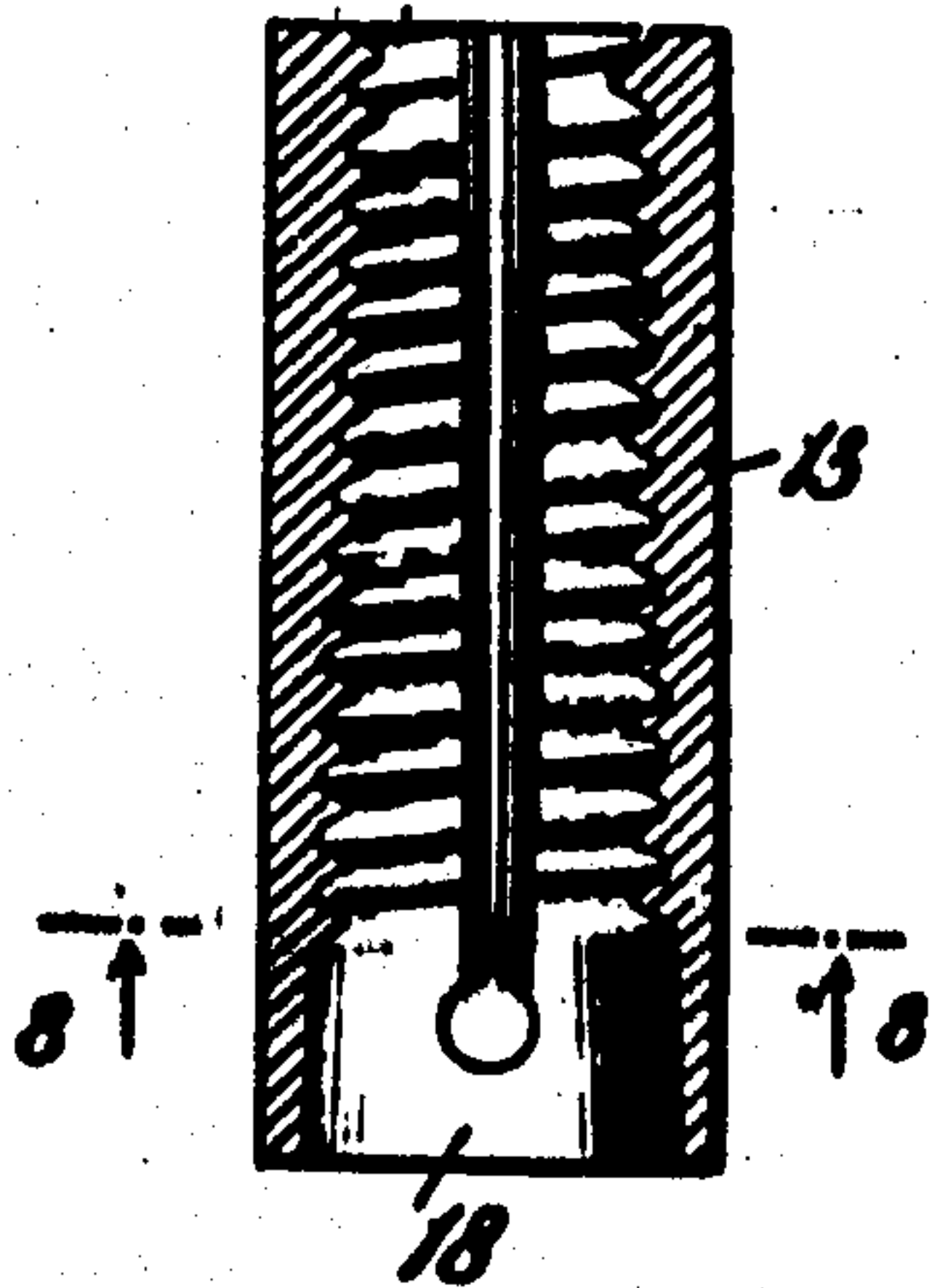


Fig. 8,

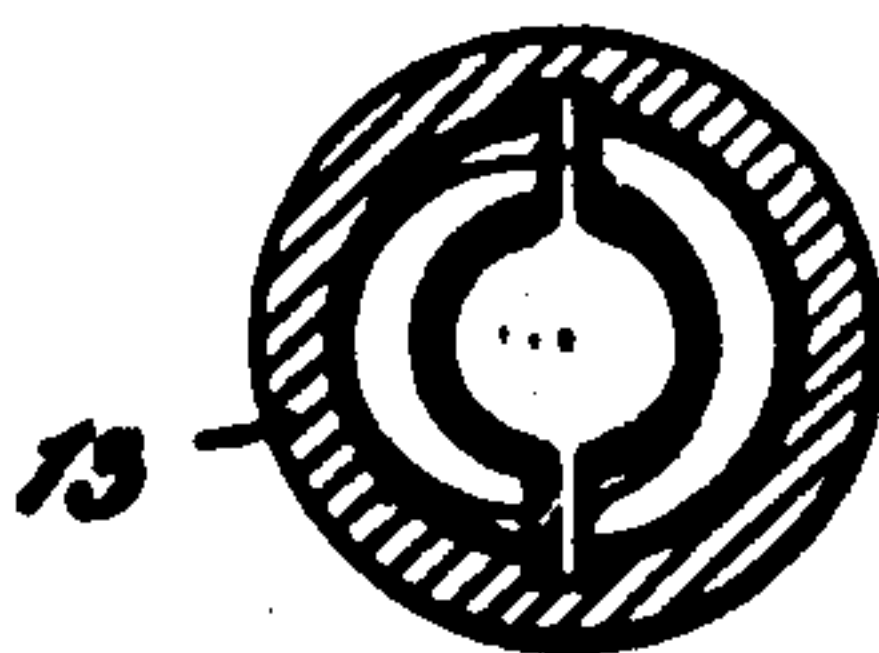
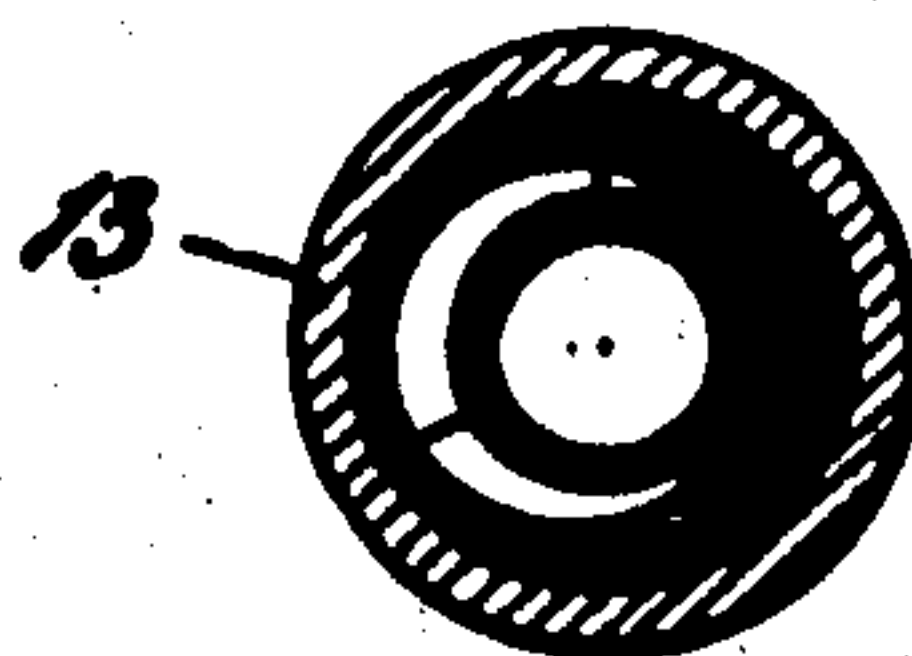


Fig. 9,



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# UNITED STATES PATENT OFFICE.

DANIEL HOWARD HAYWOOD, OF NEW YORK, N. Y.

BOLT-ANCHOR.

983,442.

Specification of Letters Patent.

Patented Feb. 7, 1911.

Application filed March 7, 1910. Serial No. 547,647.

*To all whom it may concern:*

Be it known that I, DANIEL HOWARD HAYWOOD, a citizen of the United States of America, and a resident of New York, county and State of New York, have invented certain new and useful improvements in Bolt-Anchors, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to improvements in bolt anchors of the type employed in combination with bolts for securing objects to brick or stone walls or the like, and specifically to that class of bolt anchor comprising an expansible shell having an inner tapering bore adapted to be expanded by the insertion of a bolt therein.

My invention consists broadly in a continuous tubular shell provided with one or more lines of weakness, whereby the shell is adapted to be disrupted by, and upon, the insertion of a bolt therein, either by direct or indirect engagement therewith. The shell may, if desired, be formed as a continuous integral structure throughout, but it preferably comprises a continuous tubular covering inclosing a plurality of longitudinally divided tubular segments, the said covering being of a softer metal than that employed for the interior segments. In use this covering is intended to yield or to be disrupted upon lines coincident with the adjacent edges of the inner tubular segments, and to permit this to occur readily I conveniently weaken the outer covering at these points. The advantages of such a construction are many,—first, it improves the appearance of the shells as a marketable commodity, the exterior having conveniently the form of a true and continuous cylinder; second it provides an efficient means for holding the segments together thus doing away with the objectionable clips, bands, and the like commonly used for this purpose; third, it is easy and inexpensive to manufacture; fourth, it lends itself well to the construction of the desirable form of bolt anchor comprising an inner and outer shell of relatively hard and soft metals disclosed and broadly claimed in an application filed by me on the 5th day of January, 1910, and serially numbered 536,434; and fifth, it enables the inner shell to be com-

posed of more than two segments without increasing the difficulty of normally holding them together, such as results where spring clips, retaining lugs, and the like, are employed.

My invention also consists in certain details of construction and combinations of parts such as will be fully pointed out hereinafter, and in order that my invention may be thoroughly understood, I will now proceed to describe an embodiment thereof, having reference to the accompanying drawings illustrating the same, and will then point out the novel features in claims.

In the drawings: Figure 1 is an elevational view in perspective of a bolt anchor constructed in accordance with my invention. Fig. 2 is a view in central longitudinal section therethrough. Fig. 3 is a view in transverse section therethrough. Fig. 4 is a detail fragmentary perspective view of a portion of one of the tubular segments before the outer covering has been applied thereto. Fig. 5 is a view in partial central longitudinal section and partial side elevation of another form of the bolt anchor. Fig. 6 is an end view thereof. Figs. 7 and 8 are respectively central longitudinal and transverse sections of a further modification. Fig. 9 is a transverse sectional view of a further modification. Fig. 10 is a transverse sectional view of a further modification.

Referring first to the structure shown in Figs. 1 to 4 inclusive the inner portion of the anchor comprises two tubular segments 10 and 11, each being substantially semi-cylindrical and arranged in abutting relation along lines 12, while the outer portion comprises a continuous exteriorly cylindrical covering 13. The segments 10 and 11 are preferably made of a relatively hard metal and are provided upon their exterior with projections 14; interiorly the said segments are longitudinally tapered and are provided with screw-threads 15. The exterior covering 13 is preferably of a relatively soft metal and in practice it may conveniently be cast directly upon the interior tubular segments.

In use the anchor is placed in a hole in a stone or brick wall or the like, and a bolt is inserted therein. As the bolt is gradually screwed into the shell the tubular segments will be forced apart, the covering being disrupted along the lines of union between the



segments. If the metal is sufficiently ductile it may flow along these lines to a considerable extent before it is finally disrupted, as will be well understood. As the shell is expanded the projections 14 will be forced into intimate engagement with the walls of the hole, being in many cases caused to actually embed themselves therein, while the softer metal of the portion 13 will be forced to flow to an extent sufficient to cause it to conform to the configuration of the walls of the hole, whereby the anchor will be held securely and steadily in place. I conveniently provide lines of weakness in the outer covering along lines thereof in the plane or planes 12 so that the outer shell will be readily disrupted in use, and this may be conveniently accomplished by providing the inner tubular segments 10, 11 with longitudinal ribs 16 adjacent their uniting faces, the said ribs projecting almost to the outer surface of the covering 13.

In Figs. 5 and 6 I have shown a construction similar to that of Figs. 1 to 4 except that the inner tubular segments are made as sheet metal stampings instead of castings. In such case the edges thereof may be turned outward as at 17 to form the longitudinal ribs. In Figs. 7 and 8 a still further form is shown in which the tubular segments are not completely divided but are united at the outer end of the shell as at 18. This is a common form of expansible anchor shell and is rendered practicable by reason of the fact that the inner end of the shell is expanded with relation to the outer end, the outer end being substantially non-expansible. It will of course be understood that in referring to the longitudinally divided tubular segments herein the expansion is intended to include such a construction as is shown in Fig. 5, for instance, wherein the segments are completely divided from end to end, as well as such a construction as is shown in Fig. 7 in which the segments while divided upon the longitudinal lines are not completely divided but are united at the outer end of the shell as has just been described.

In Fig. 9 I have shown a cross sectional view of a structure in which there are three tubular segments instead of two. It will, of course, be understood that either two or more segments may be employed as may be desired, and indeed my present invention renders the use of more than two segments more practicable than heretofore, because of the fact that it solves the problem of holding them normally together.

For some purposes the exterior covering might be of a relatively harder metal than the interior portion, in which case the exterior portion would, of course, be provided with one or more lines of weakness along which it would be readily disrupted, and in such case

the interior portion might either be continuously tubular or segmental, as might be desired, and in Fig. 10 I have shown such a structure in end view, the exterior relatively hard metal covering 19 being continuous but having internal depressions 20 therein which form lines of weakness which nearly but not quite sever the outer covering, the inner portion 21 of relatively soft metal being continuously tubular.

What I claim is:

1. A bolt anchor comprising an interior tubular segmental shell composed of a relatively hard metal, and a continuous tubular covering therefor, composed of a relatively soft metal.

2. A bolt anchor comprising an interior shell composed of a plurality of longitudinally divided tubular segments, and a continuous tubular expansible covering therefor.

3. A bolt anchor comprising an interior shell composed of a plurality of longitudinally divided, relatively hard metal tubular segments, and a continuous tubular relative soft metal covering therefor.

4. A bolt anchor comprising an interior shell composed of a plurality of longitudinally divided tubular segments, and a continuous tubular covering therefor, the said covering having lines of weakness coincident with the dividing lines of the segments.

5. A bolt anchor comprising an interior shell composed of a plurality of longitudinally divided relatively hard metal, tubular segments, and a continuous tubular relatively soft metal covering therefor, the said covering having lines of weakness coincident with the dividing lines of the segments.

6. A bolt anchor comprising an interior shell composed of a plurality of longitudinally divided tubular segments provided with exterior ribs at their adjoining edges, and a continuous tubular covering therefor.

7. A bolt anchor comprising an interior shell composed of a plurality of longitudinally divided tubular segments provided with exterior ribs at their adjoining edges and composed of a relatively hard metal, and a continuous tubular covering therefor composed of a relatively soft metal.

8. A bolt anchor comprising an interior tubular segmental shell composed of relatively hard metal, and provided with exterior projections, and a continuous tubular covering therefor, composed of relatively soft metal.

9. A bolt anchor comprising a tubular segmental shell composed of a relatively hard metal having a longitudinally tapered bore, and provided with a continuous tubular covering therefor composed of a relatively soft metal.

10. A bolt anchor comprising an interior expansible shell provided with exterior lon-

5 longitudinal ribs, and a continuous exterior shell fitted thereto provided with longitudinal depressions complementary to the said ribs, the said ribs being of a height almost equal to the thickness of the said exterior shell whereby the latter said shell is adapted to be longitudinally disrupted along the

lines of the said depressions upon the expansion of the said interior shell.

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Witnesses:

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