

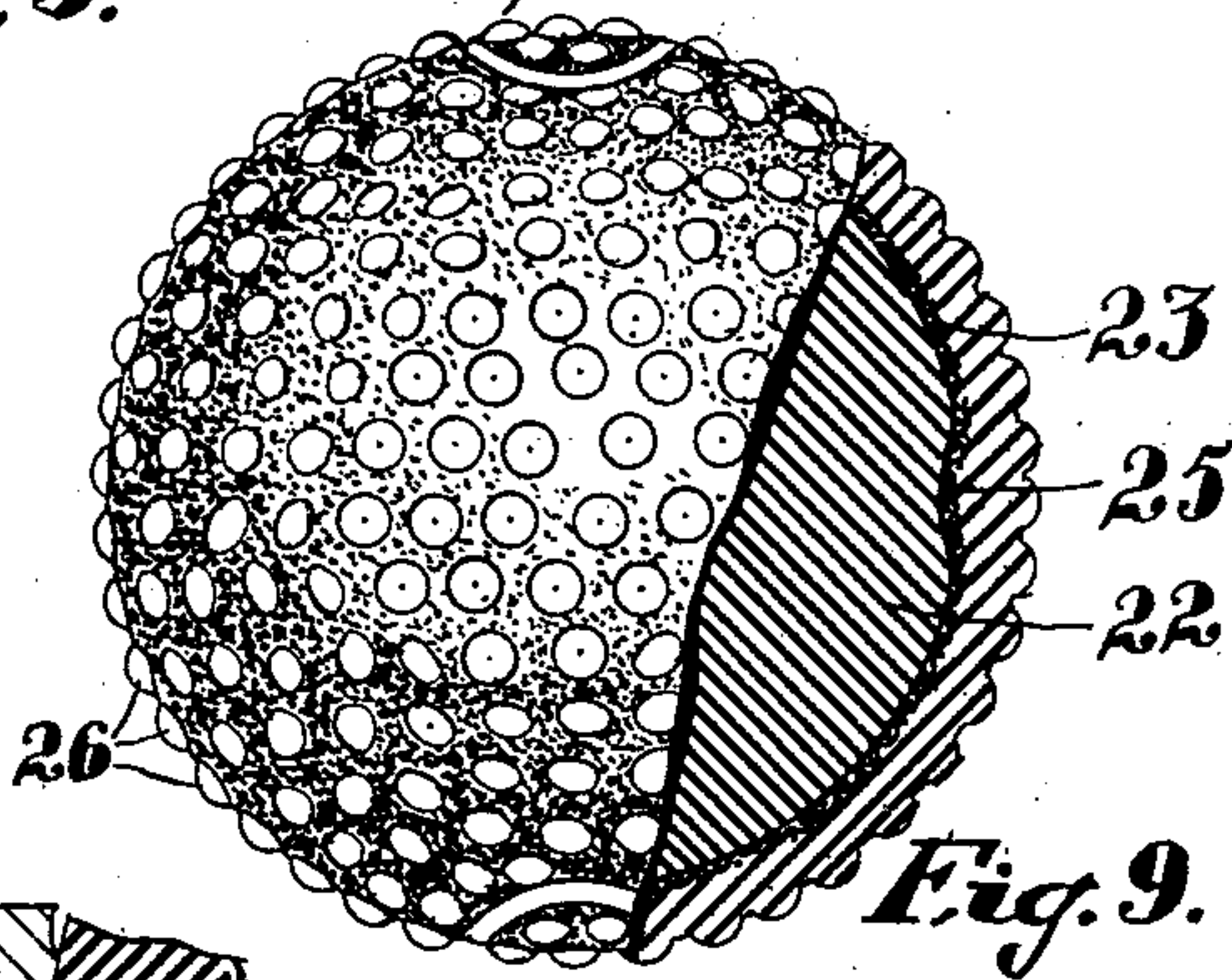
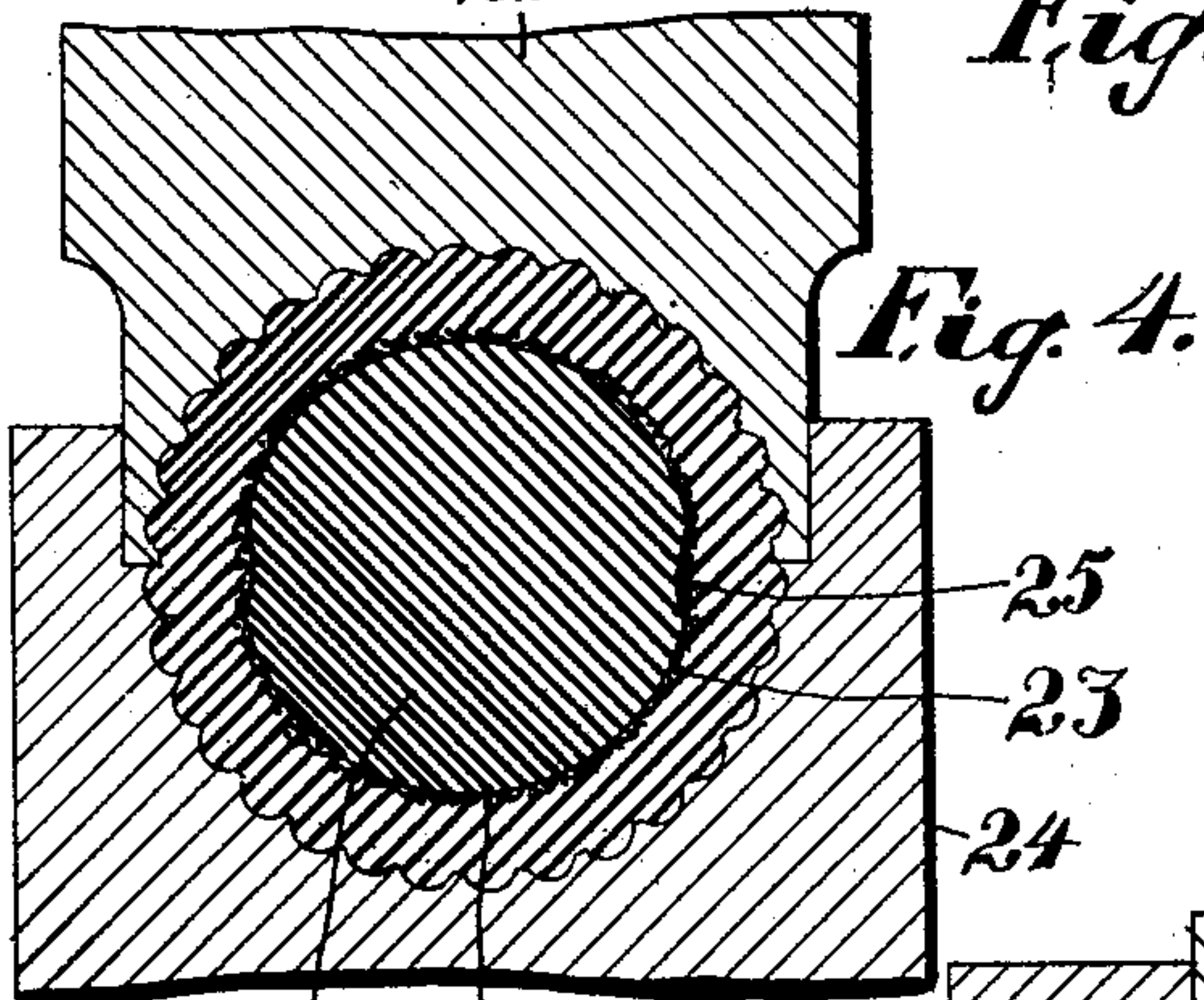
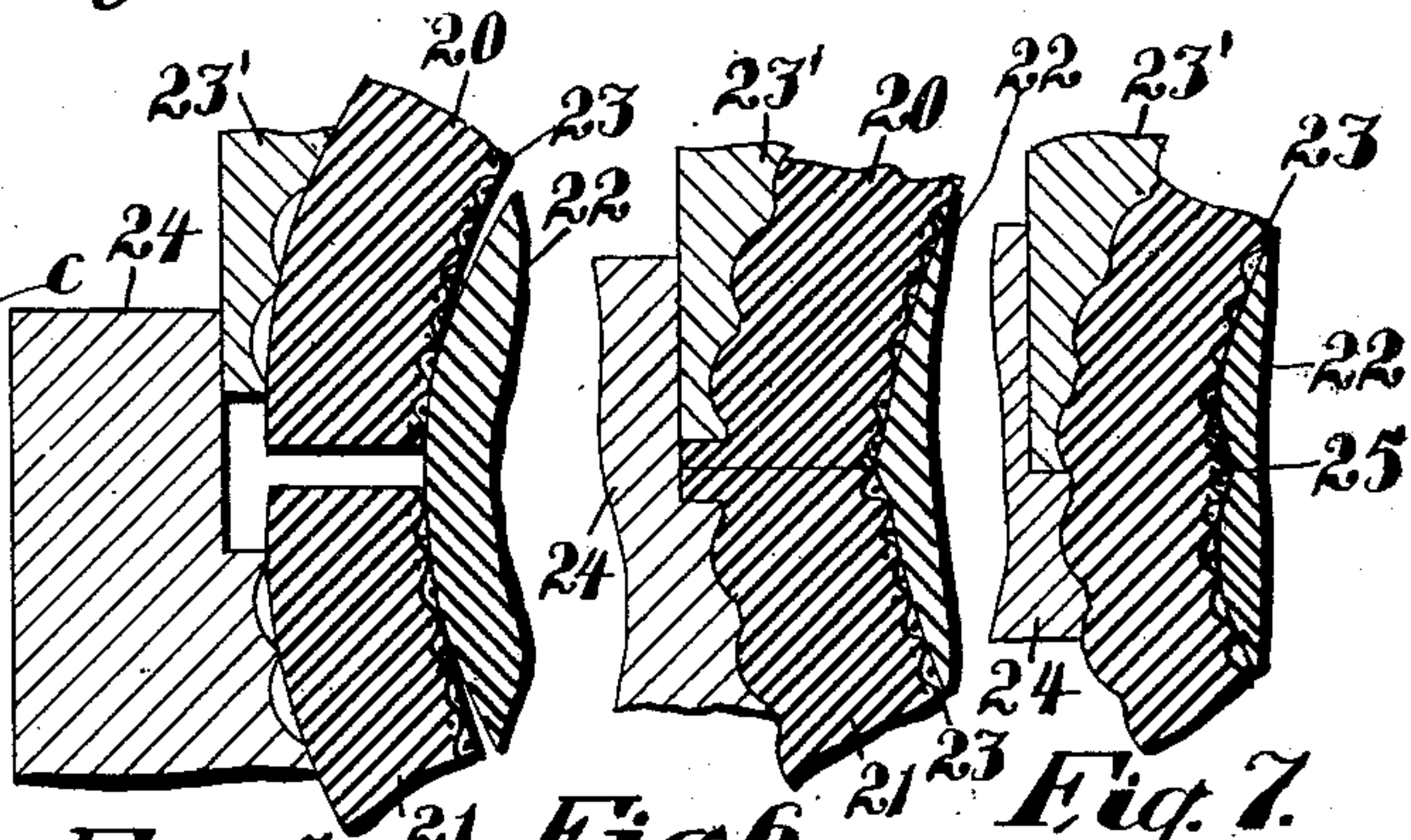
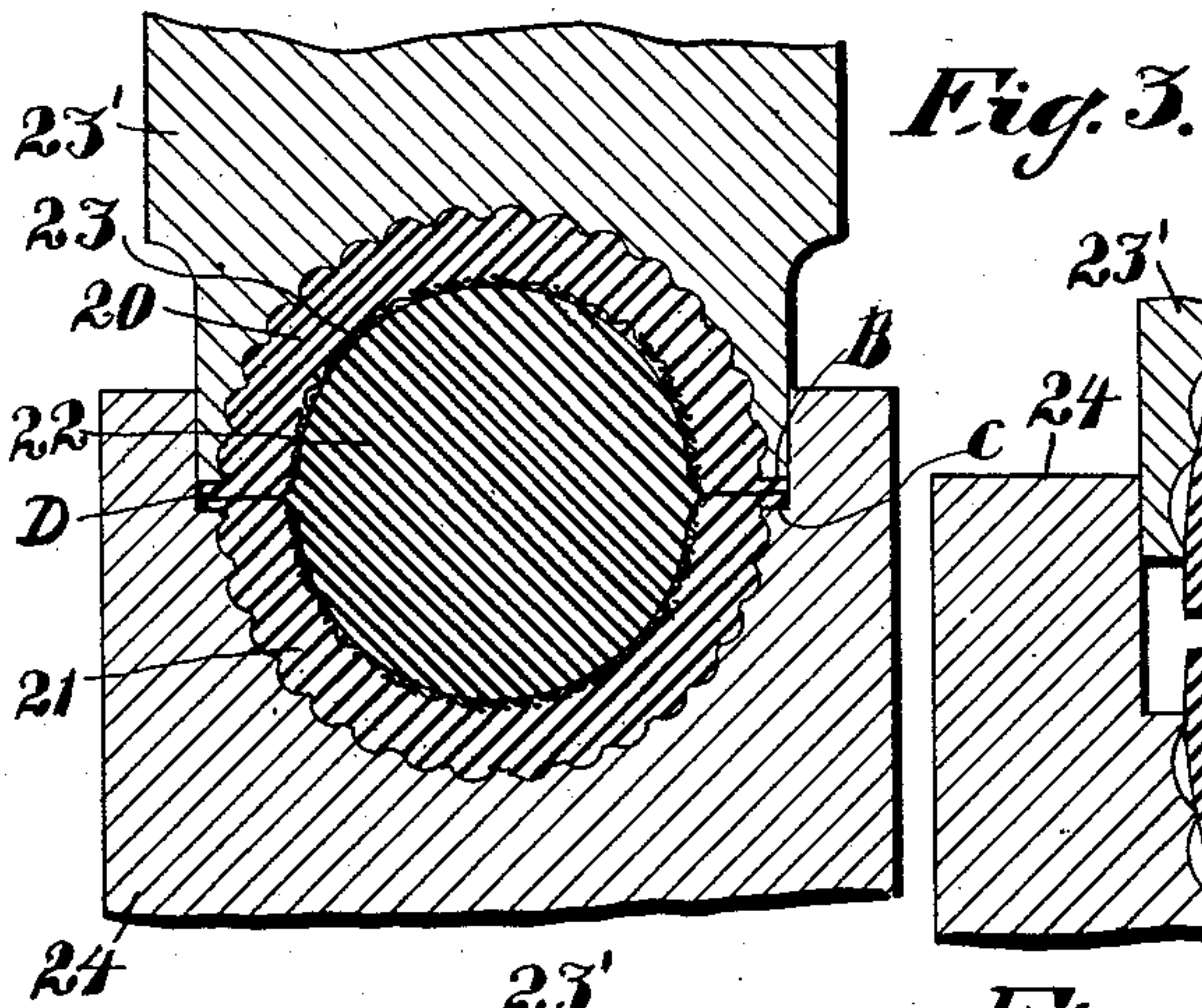
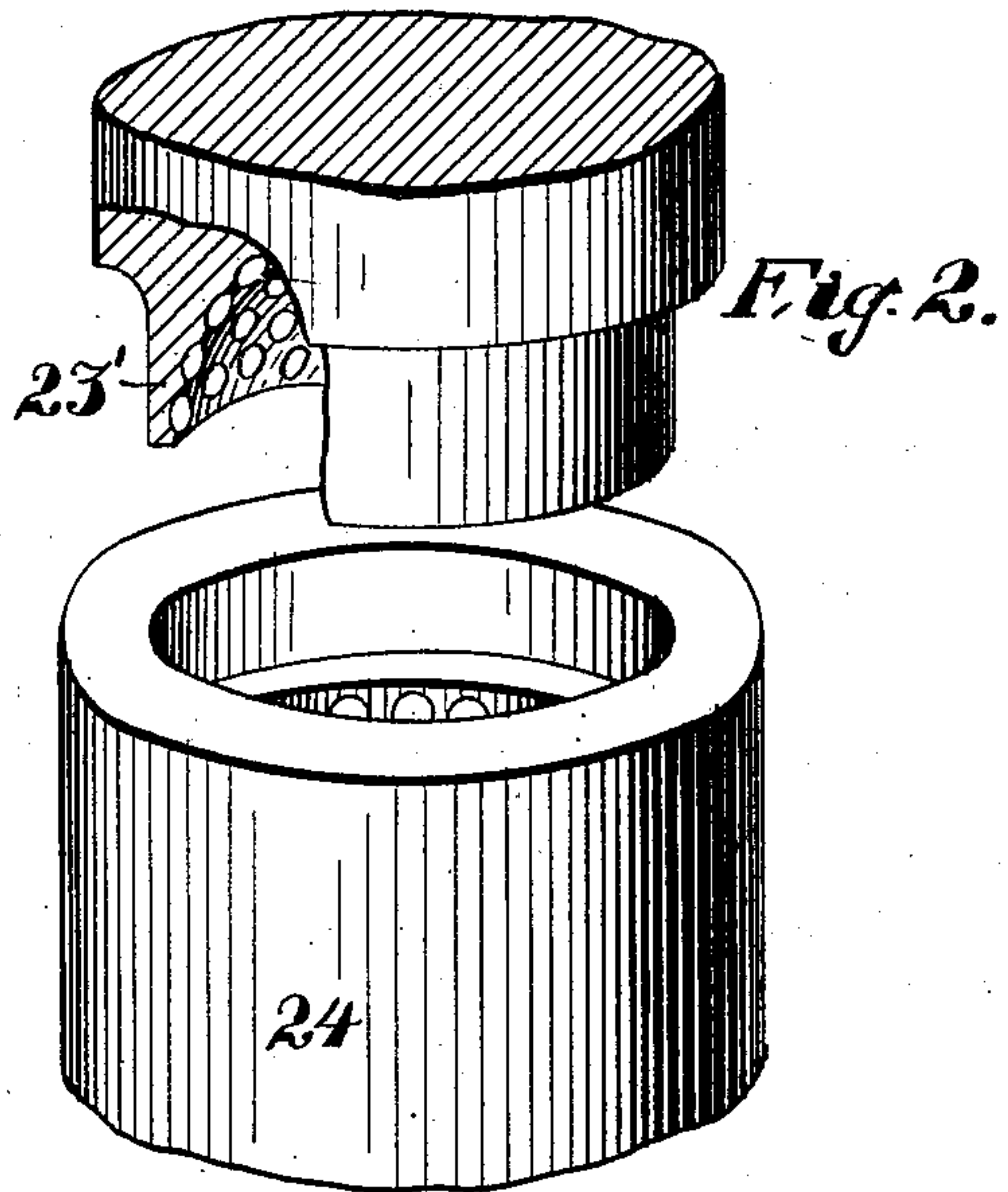
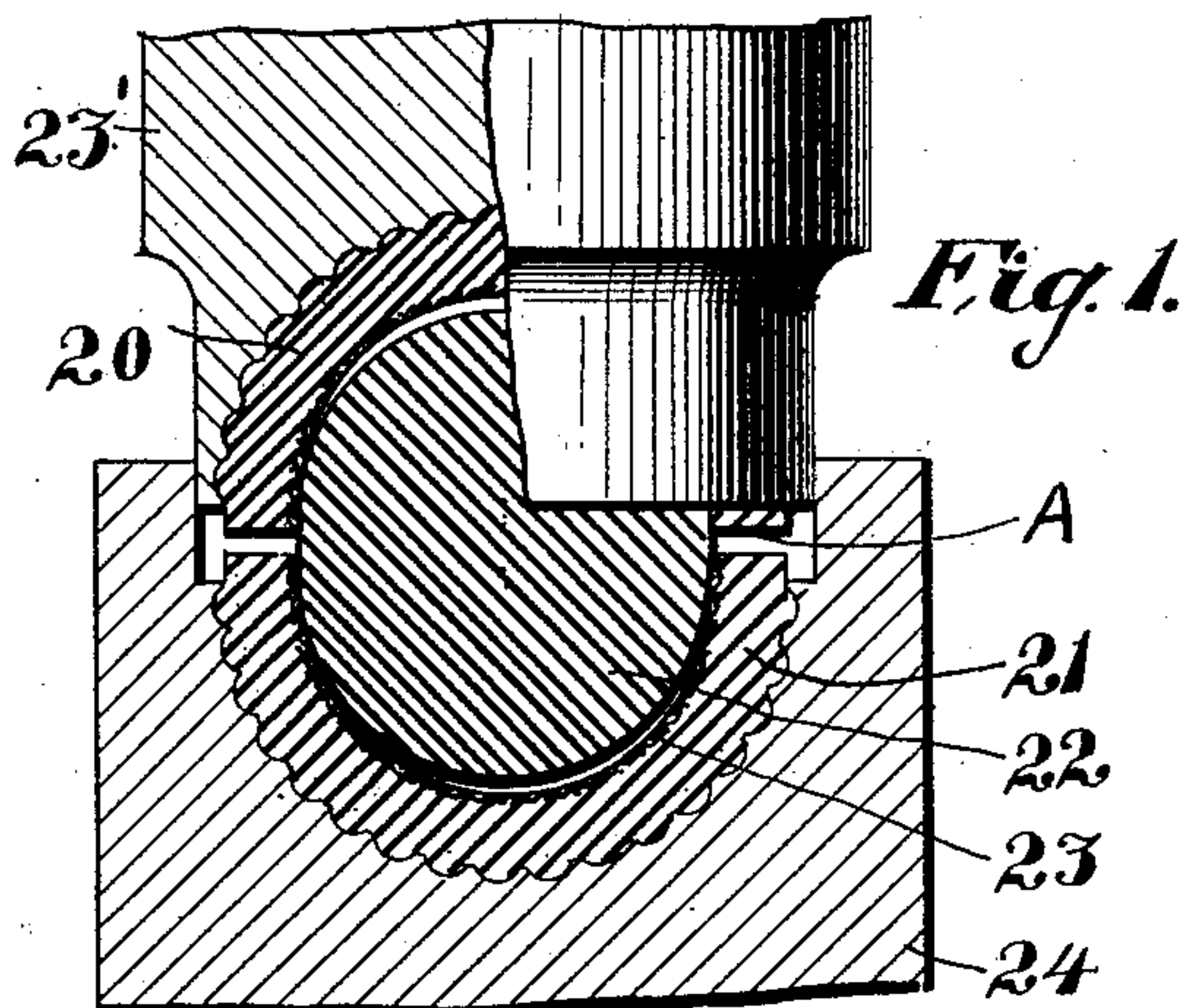
No. 699,089.

Patented Apr. 29, 1902.

E. KEMPSHALL.
PLAYING BALL.

(Application filed Mar. 25, 1902.)

(No Model.)



Witnesses: Fig. 8.
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UNITED STATES PATENT OFFICE.

ELEAZER KEMPSHALL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE KEMPSHALL MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

PLAYING-BALL.

SPECIFICATION forming part of Letters Patent No. 699,089, dated April 29, 1902.

Application filed March 25, 1902. Serial No. 99,930. (No model.)

To all whom it may concern:

Be it known that I, ELEAZER KEMPSHALL, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Playing-Balls, of which the following is a specification.

This invention relates to playing-balls; and it consists, substantially, in the improvements hereinafter more particularly described.

In the drawings forming part of this specification, Figure 1 shows the parts of a ball placed in a telescoping die. Fig. 2 is a perspective view representing the die members. Fig. 3 is a view similar to Fig. 1, but represents a later stage in the process of manufacturing the ball. Figs. 5, 6, and 7 are fragmentary sectional views drawn upon a larger scale to illustrate the action of the dies upon the shell and the core or filling and the blanket or envelop of fibrous material inclosing said core or filling. Fig. 8 illustrates a stage in the process between the Fig. 5 and the Fig. 6 operations, and Fig. 9 is a part-sectional view illustrating a completed ball constructed in accordance with my present invention.

In practicing the present invention I preferably employ hemispherical segments 20 and 21 to form an outer shell or cover for a core or filling 22 and an intermediate tightly-fitting blanket or envelop 23, of fibrous material, inclosing said core or filling. The part 23 forms a lining for each of the shell-segments, as illustrated at Fig. 1, and may consist of hemispherical cups of woven fabric, the celluloid and fabric being usually first compacted and then formed into cups, as illustrated in my pending application, Serial No. 98,976, filed March 19, 1902. The material of the shell, which in the present instance is formed preferably of celluloid, is generally harder than that of the filling and is also relatively stiff, while the filling is preferably, though not essentially, relatively soft and may possess elasticity. The material of the shell may be rendered plastic in any suitable way, as by means of heat, and such material may subsequently be converted to a hardened condition, as by means of cold, while the filling is of suitable material, preferably well-vulcanized soft rubber, which is not injuriously

affected or changed in condition by a degree of heat required to reduce the shell to a plastic condition. The core or filling 22 may first be formed of the required size and shape by means of suitable dies and presses and is too large or bulky for the capacity of the finished shell. The latter is also by preference previously formed in any suitable way, so that said shell and filling may be properly assembled between the upper and lower telescopic heating and compressing dies 23 and 24. (Indicated at Fig. 1.) The hemispherical segments 20 and 21 of fabric-lined celluloid may be treated or put in proper condition for the adherence of the edges thereof under pressure, and the dies to the action of which the said segments are subjected may be heated by steam or otherwise for bringing the celluloid into suitable condition and consistency for union in completing the shell of the ball. The inner surfaces of the celluloid shell-segments and the layers of fabric are interlocked, or, in other words, the fabric is embedded in the celluloid.

The abutting edges of the hemispherical segments 20 and 21 are made somewhat full at A, whereby when said edges meet the shell is oversize and the core or filling 22, combined with its inclosing envelop of fibrous material, may be large enough to wholly fill the interior of the shell when or just before said edges of the segments 20 and 21 are brought together, as illustrated diagrammatically in Fig. 8. Upon the closing action of the dies the core or filling 22, the envelop-segments of fibrous material, and the shell-segments of celluloid are all compressed together, and the material of the shell, which is rendered plastic, preferably by heating, is squeezed out between the approaching steps B and C of the dies, as at D, Fig. 3, completely filling said steps. It will be seen that said material is urged outwardly, not only by the forcing action of the dies directly upon the shell itself, but also by reason of the compression of the core or filling 22, which tends also to expand and force the material of the shell edges outwardly. Preferably the edges are brought together or into contact before much, if any, compression of the core is effected, so as to avoid undue squeezing of the rubber out-

wardly between said edges. The material of the inner member of the telescoping die at the edge portion thereof is thin, and the annular open space surrounding the ball-shell at Fig. 8 is preferably thinner than said shell, so as to prevent too much outflow of shell material. Upon further closing of the dies the shell material at D, being unable to escape between the closely-fitting die-sections, is forced or squeezed by the approaching steps back toward the interior of the ball, forming an annular welt upon the inner surface of the shell, as at 25. Since the material of the shell is preferably capable of welding, the process herein set forth produces a reinforced weld—that is, a weld of extra thickness—since the welt 25 is formed directly in line with the point at which the welding takes place. In other words, the abutting edges of the shell-segments are lipped or given an extra width, thus forming a stronger joint. Moreover, the kneading of the material of the shells from the stage indicated at Fig. 8 to that indicated at Fig. 4 has a beneficial effect upon the weld, causing the material of the segments to knit firmly. After the shells meet, as shown in Fig. 8, the edges thereof tend to break down and flow outwardly, until finally the space between the die edges B and C becomes filled with material which has been so dislodged or broken away, breaking up and destroying the continuity of the edges of the shell, causing an intermingling or mixing of the edge portions of the two half shells or hemispheres, with the result of producing an integrality of the entire shell of the ball. It will be observed that the process of breaking down the edges of the shell, whereby some of the material driven outward, is reversed by the further advance of the dies or molds toward each other, whereby the said outflowing material flows back into the shell itself, thus restoring to its approximately original position that portion of the substance of the shell first subjected to the outward flow. Thus by first forcing the material outward and then reversing the action and forcing the material inwardly the two half-shells become a complete perfectly-welded shell. By the movement of the dies the core or filling is reduced in bulk, and the welt 25, by its pinching or creasing action, serves to give extra compression to the filling, thus rendering the ball highly desirable for certain games. The welt also

serves to anchor the filling and its envelop to the shell, thus reducing the liability to disruption of the latter under impact of an implement.

In case heating-dies are used they may be allowed to cool before the ball is taken out, so that the shell may become sufficiently hardened. In practice the balls made by the present process are found to have a high degree of uniformity, and by reason of the dense and uniform character of the material in the different parts of the completed shell the ball is enabled to withstand the heavy blows to which it is subjected with substantial equality wherever it may be struck. The original half-shells may be made very dense or compact.

Variations may be resorted to within the scope of my invention, and portions of my present improvements may be used without others.

Having described my invention, I claim—

1. In a playing-ball, the combination of a shell consisting wholly of two layers, one of said layers consisting of fabric and the other thereof being relatively massive and consisting of celluloid in which said fabric is embedded, and a springy core filling said shell.

2. A playing-ball comprising a core of solid elastic material and a shell strongly gripping said core; said shell consisting wholly of two layers, of which one is woven fabric and the other is relatively massive and consists of celluloid, the fabric being embedded in the inner side of the celluloid layer.

3. A playing-ball comprising a sphere of soft rubber and a shell thereon consisting of welded segments; each of said segments consisting wholly of two layers, whereof one is fabric and the other is celluloid, the fabric being embedded in the inner side of the celluloid layer.

4. A playing-ball comprising a sphere of yielding material and a shell holding said sphere under compression, said shell consisting wholly of two layers, whereof the inner consists of woven fabric and the outer consists of a relatively massive layer of celluloid in which said fabric is embedded.

ELEAZER KEMPSHALL.

Witnesses:

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