

No. 704,463.

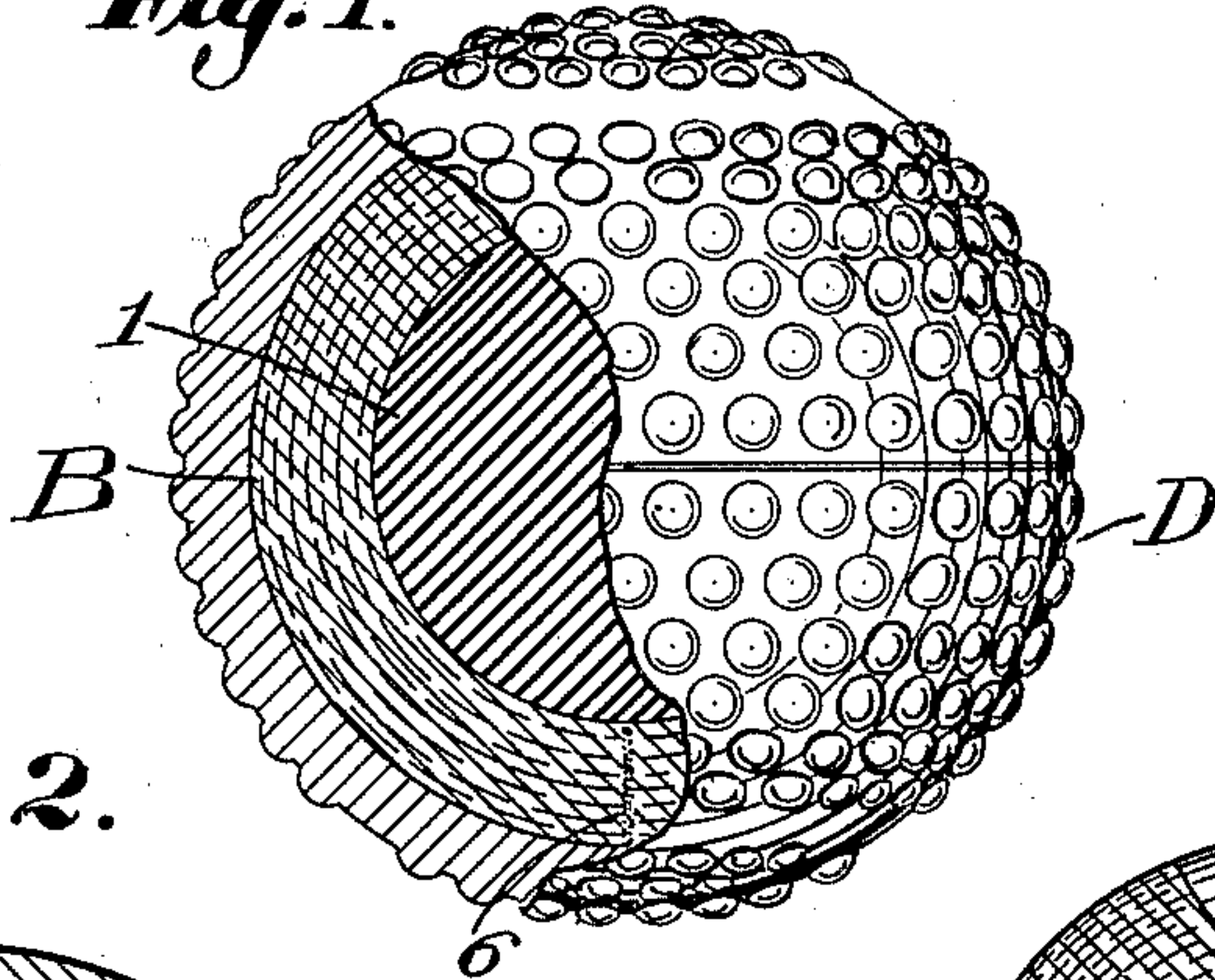
Patented July 8, 1902.

**E. KEMPSHALL.**  
**PROCESS OF MAKING PLAYING BALLS.**

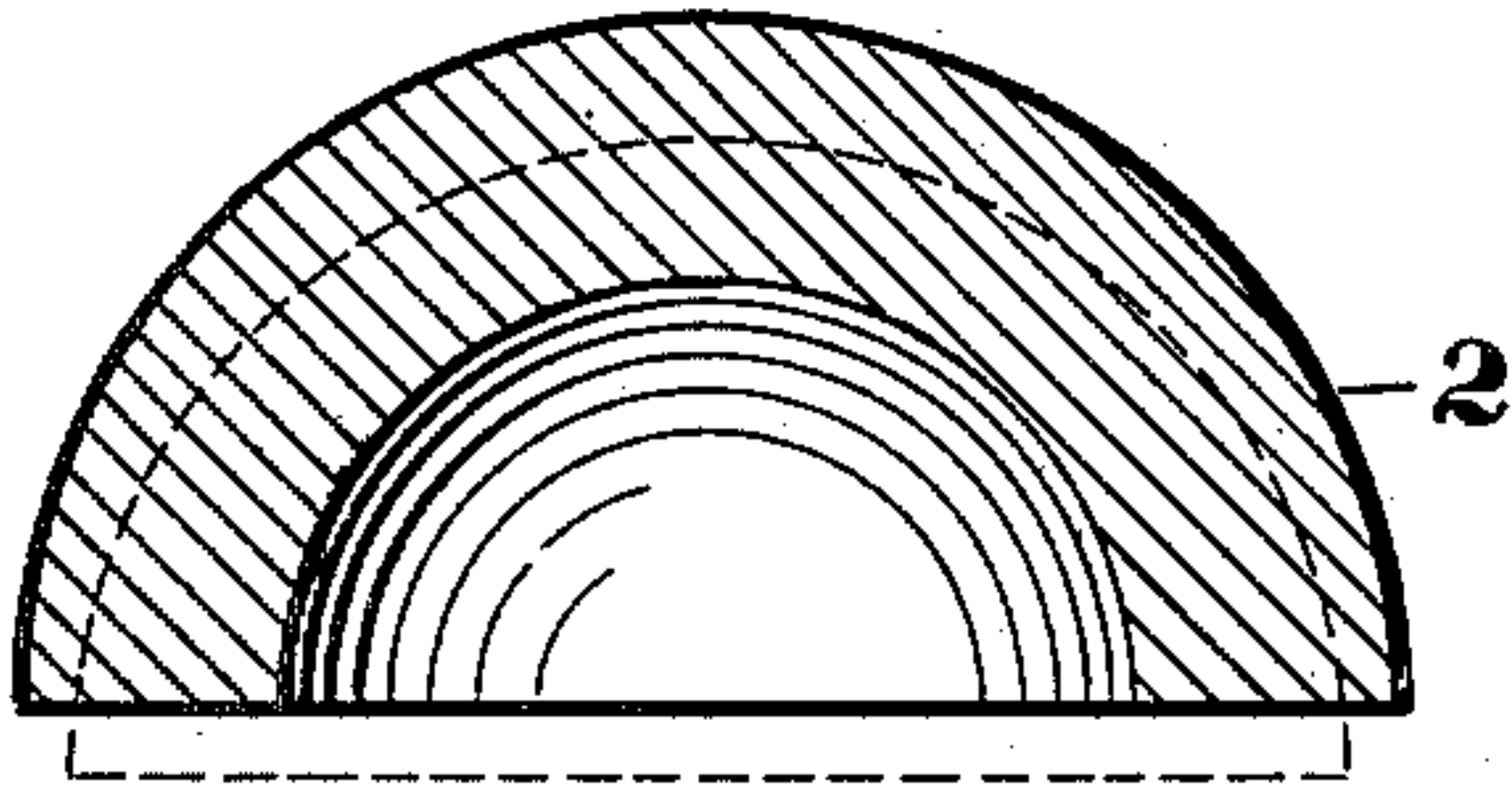
(Application filed Apr. 5, 1902.)

(No Model.)

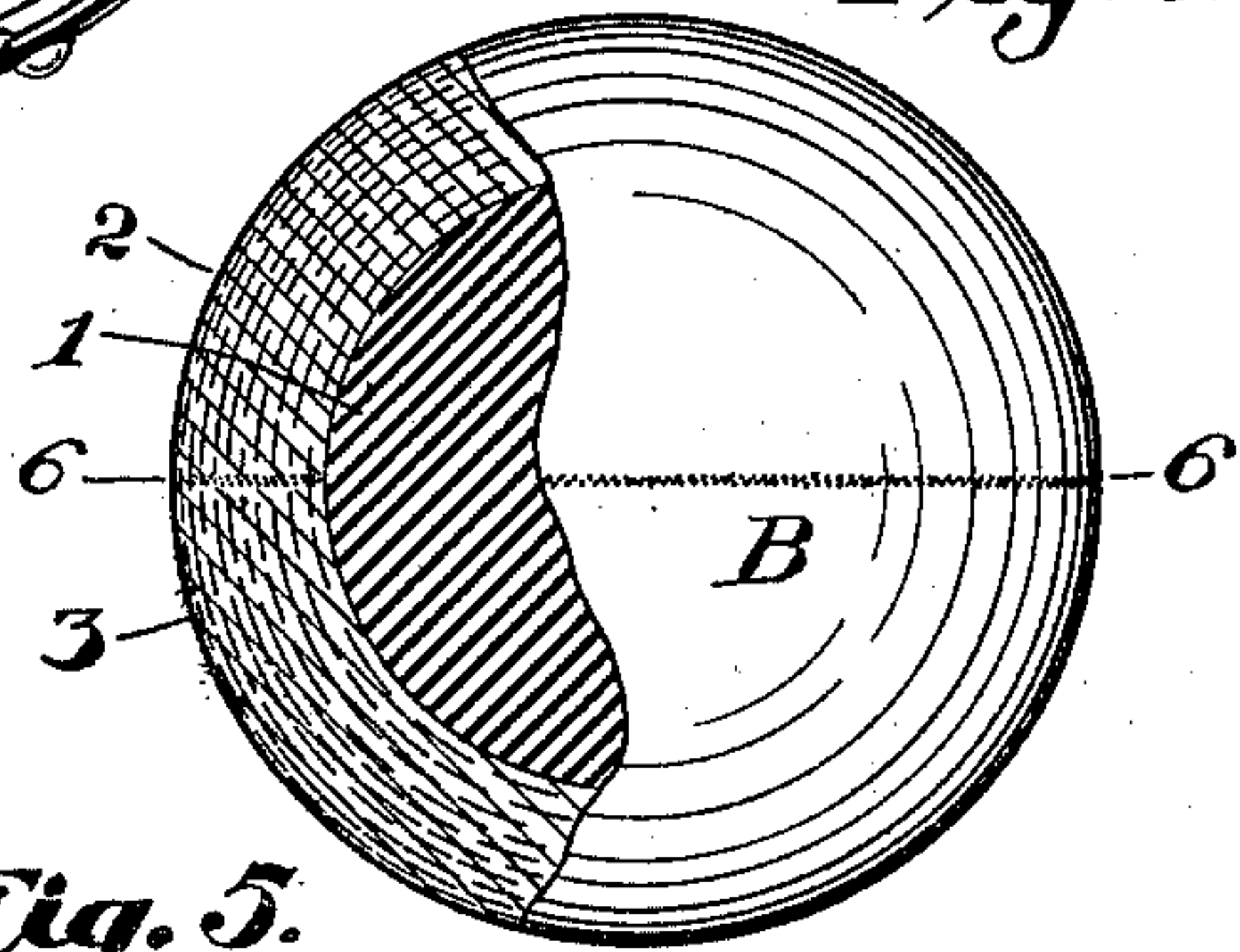
**Fig. 1.**



**Fig. 2.**

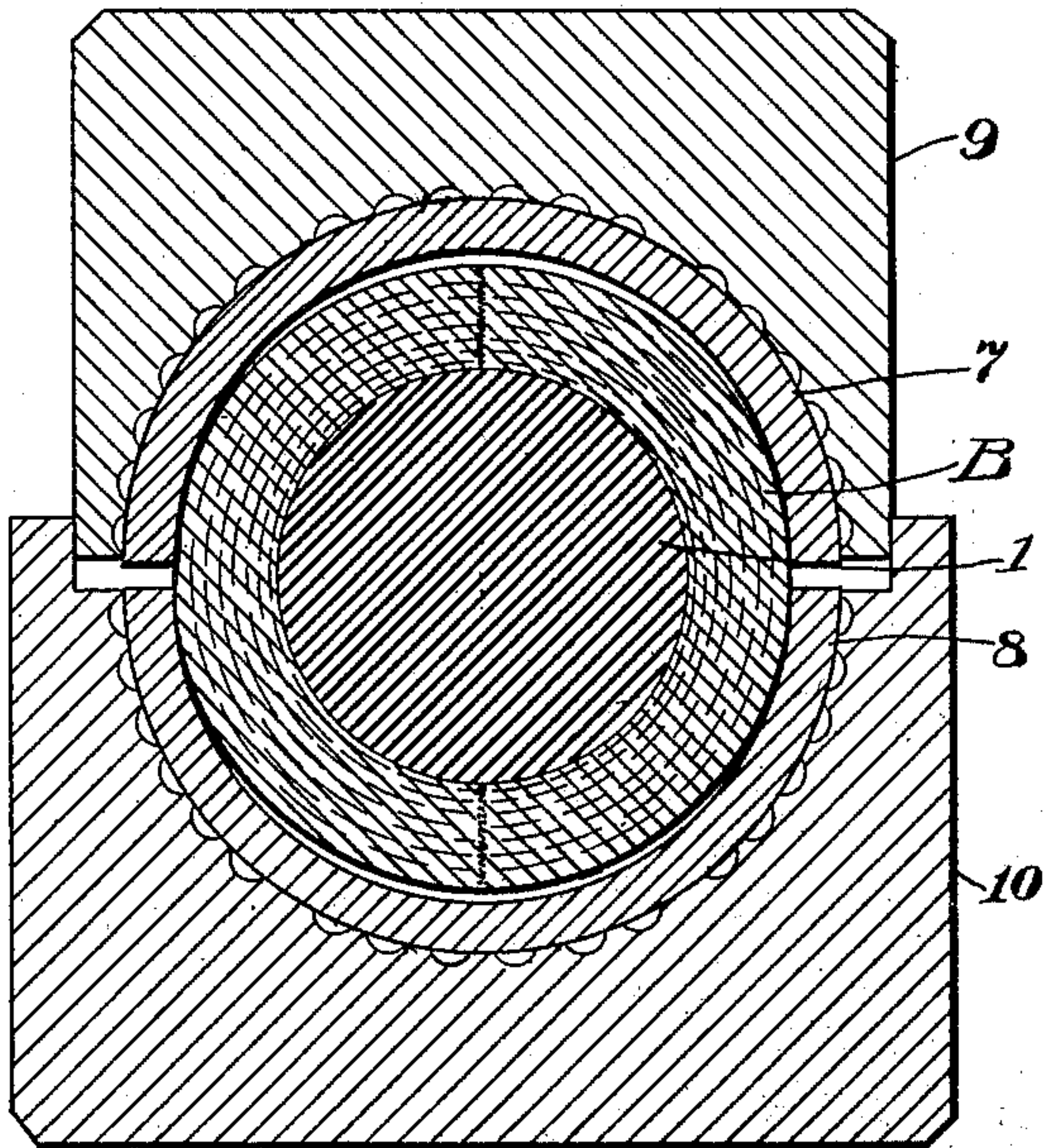
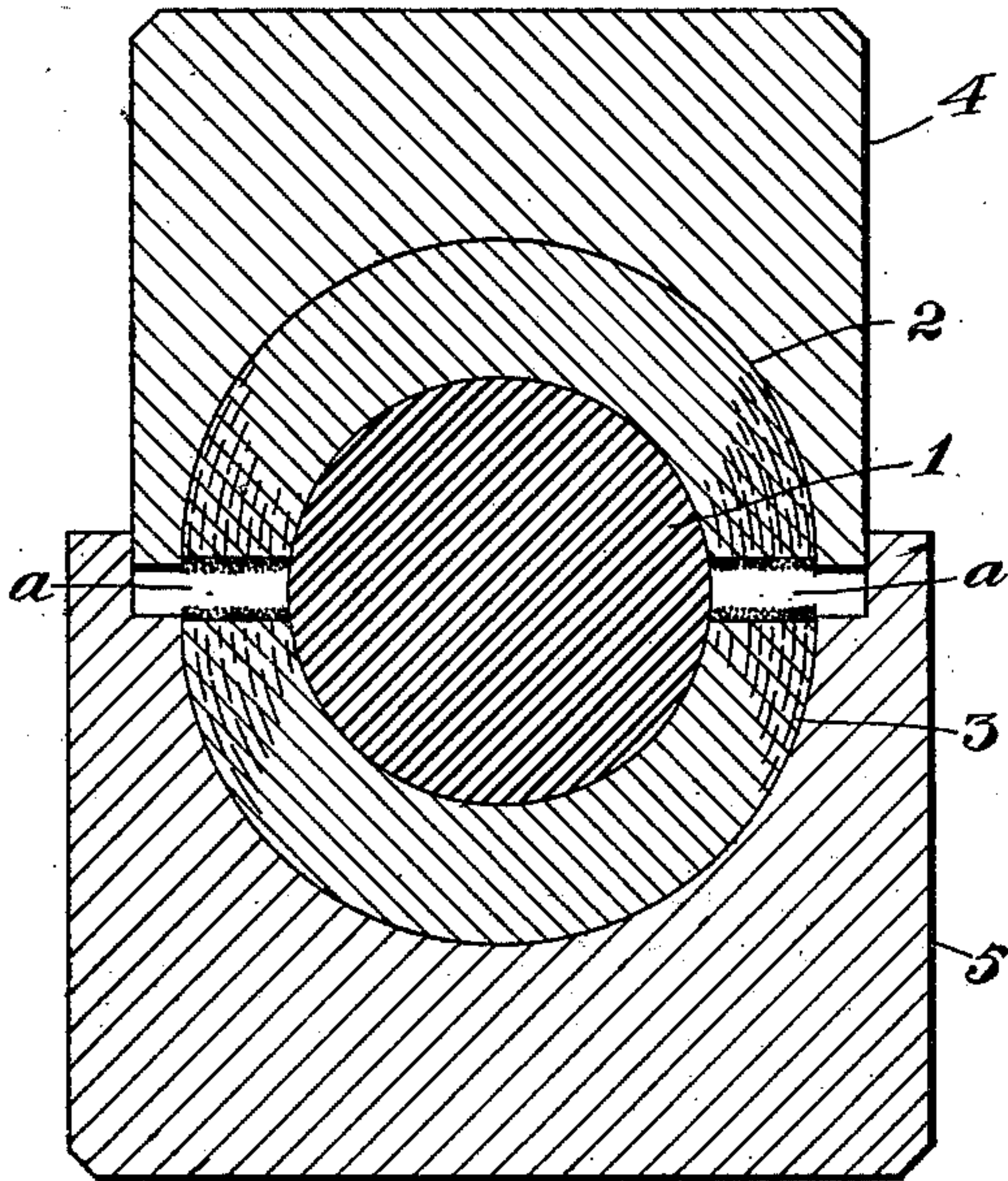


**Fig. 4.**



**Fig. 3.**

**Fig. 5.**



**Witnesses:**

*Herbert J. Smith.*

*Robert Head*

**Inventor:**

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*By his Attorney,*

*F. H. Richards.*



# UNITED STATES PATENT OFFICE.

ELEAZER KEMPSHALL, OF BOSTON, MASSACHUSETTS.

## PROCESS OF MAKING PLAYING-BALLS.

SPECIFICATION forming part of Letters Patent No. 704,463, dated July 8, 1902.

Application filed April 5, 1902. Serial No. 101,462. (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 Processes of Making Playing-Balls, of which the following is a specification.

This invention relates to processes for the manufacture of spherical bodies; and it consists substantially in the improvements hereinafter more particularly described.

The invention has reference to processes for making spherical bodies generally, but more especially small-sized spherical bodies, such as playing-balls employed in golf and similar games, in which the ball is propelled or driven by impact of a stick or other implement in the hand of the operator or player.

The principal object of the invention is to provide a process or means whereby may be manufactured at small cost a ball having superior flying powers under a powerful blow, but which will remain comparatively "dead" under a light blow, thereby meeting the essential requirements of the said game of golf, substantially as will hereinafter more fully appear when taken in connection with the accompanying drawings, in which—

Figure 1 is a part sectional view of a playing-ball resulting from my improved process of manufacture thereof, and Fig. 2 is a sectional view of an undersized half-shell or hemisphere made of soft rubber or similar material. Fig. 3 is a section view representing one means which may be employed in applying the undersized half-shells or hemispheres upon a hard core or filler. Fig. 4 is a part sectional view of the structure produced by the operation of the means disclosed in Fig. 3; and Fig. 5 is a sectional view representing one means which may be employed in the final step of the process in applying an outer shell or casing upon the Fig. 4 structure, so as to produce a completed ball, such as is indicated in Fig. 1.

Without entering into a general description of my present improved process for the manufacture of playing-balls it may be stated that I provide a spherical core 1, preferably of gutta-percha, but which may be of any other suitable hard material, and I place upon

said spherical core suitable cups 2 and 3, of highly-vulcanized soft rubber, each of said cups approaching or approximating the form of a hemisphere, but being slightly undersized or insufficient to completely inclose or envelop the said spherical core 1. I cement the said cups 2 and 3 upon the said core 1 and place the structure thus formed between drawing-dies 4 and 5, (see Fig. 3,) from which figure it will be seen that an intermediate space *a* is formed between the adjacent edges of the cups prior to the action of the dies to which the structure is subjected. The dies are operated to be brought together with sufficient force to draw the said rubber shells together by stretching or distending the same in such manner as that the adjacent edges thereof are brought together in the formation of a complete rubber envelop B upon the core 1, as indicated at Fig. 4, it being stated at this point that the said adjacent edges of the cups are cemented at 6, so as to effect a complete joinder or union of the cups when brought together in the manner described. It will also be understood that the dies 4 and 5 are held together long enough for the cement to harden between the edges of the half-spheres 2 and 3, so as to permanently unite the same. I thus produce a playing-ball having a hard core and a solid-rubber envelop tensioned thereon, which ball or structure may be used without further treatment or covering, if desired, the same possessing many valuable qualities arising largely from the tense condition of the rubber envelop. In forming a golf-ball, however, I preferably inclose the structure thus formed between hemispherical segments 7 and 8 of plastic material, such as gutta-percha or celluloid, preferably the latter, and I then inclose the whole structure in heating and compressing dies 9 and 10, Fig. 5, the celluloid being rendered plastic by the heating of the dies and the dies being brought together with sufficient force to place the spherical envelop B under considerable compression, the complete celluloid inclosing shell being indicated at D, Fig. 1. The dies 9 and 10 are preferably formed throughout their operative surfaces with suitable pits, so as to give to the outer surface of the completed ball a brambled structure, also as indicated in Fig. 1.



Thus it will be seen that by means of my present improved process for the manufacture of spherical bodies I am enabled to produce in an inexpensive manner a golf-ball  
5 having the quality of resilience under a heavy blow and one also which is comparatively dead under a light blow, the rubber being under a longitudinal tension and also being compressed between the hard inclosing shell  
10 and the hard core or filler, whereby an especially efficient ball is produced. An important feature of my present invention resides in the accurate centering of the core 1 within the completed golf-ball, it being ap-  
15 parent that said core must be exactly central in the rubber envelop and also that the latter must be exactly central with or concentric to the inclosing shell D, thus enabling the ball to fly accurately through the air, as well  
20 as to move accurately in "putting," which is highly essential in the golf game. While I prefer to use undersized hemispheres 2 and 3, of rubber, it will be understood that other material than rubber may be used and be  
25 within the scope of my present improvements.  
Having described my invention, I claim—  
1. A process in producing a playing-ball,

consisting in applying undersized soft-rubber segments to a spherical core, drawing said segments together upon said core so as to stretch the rubber and also to cause the edges of the segments to meet, and applying means for holding said segments together so as to form a tensioned sphere upon the core.

2. A process in producing a playing-ball consisting in applying undersized soft-rubber segments to a spherical core, drawing said segments together upon said core so as to stretch the rubber and also to cause the edges of the segments to meet, and cementing said edges together.

3. A process in producing a playing-ball consisting in applying undersized soft-rubber segments to a spherical core, drawing said segments together upon said core so as to stretch the rubber and also to cause the edges of the segments to meet, cementing said edges together, and compressing a hard cover upon the soft-rubber sphere.

ELEAZER KEMPSHALL.

Witnesses:

B. C. STICKNEY,  
JOHN O. SEIFERT.