

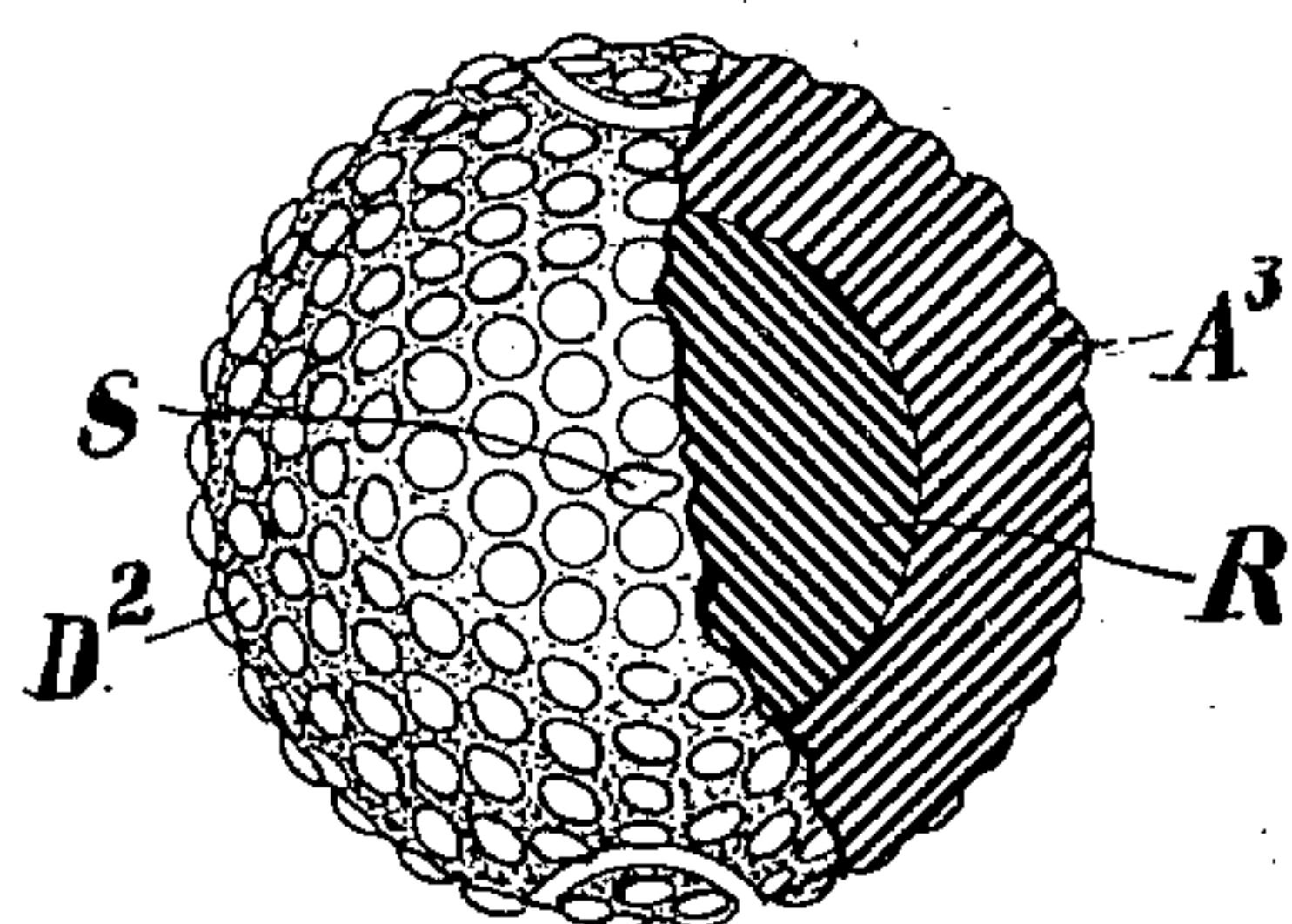
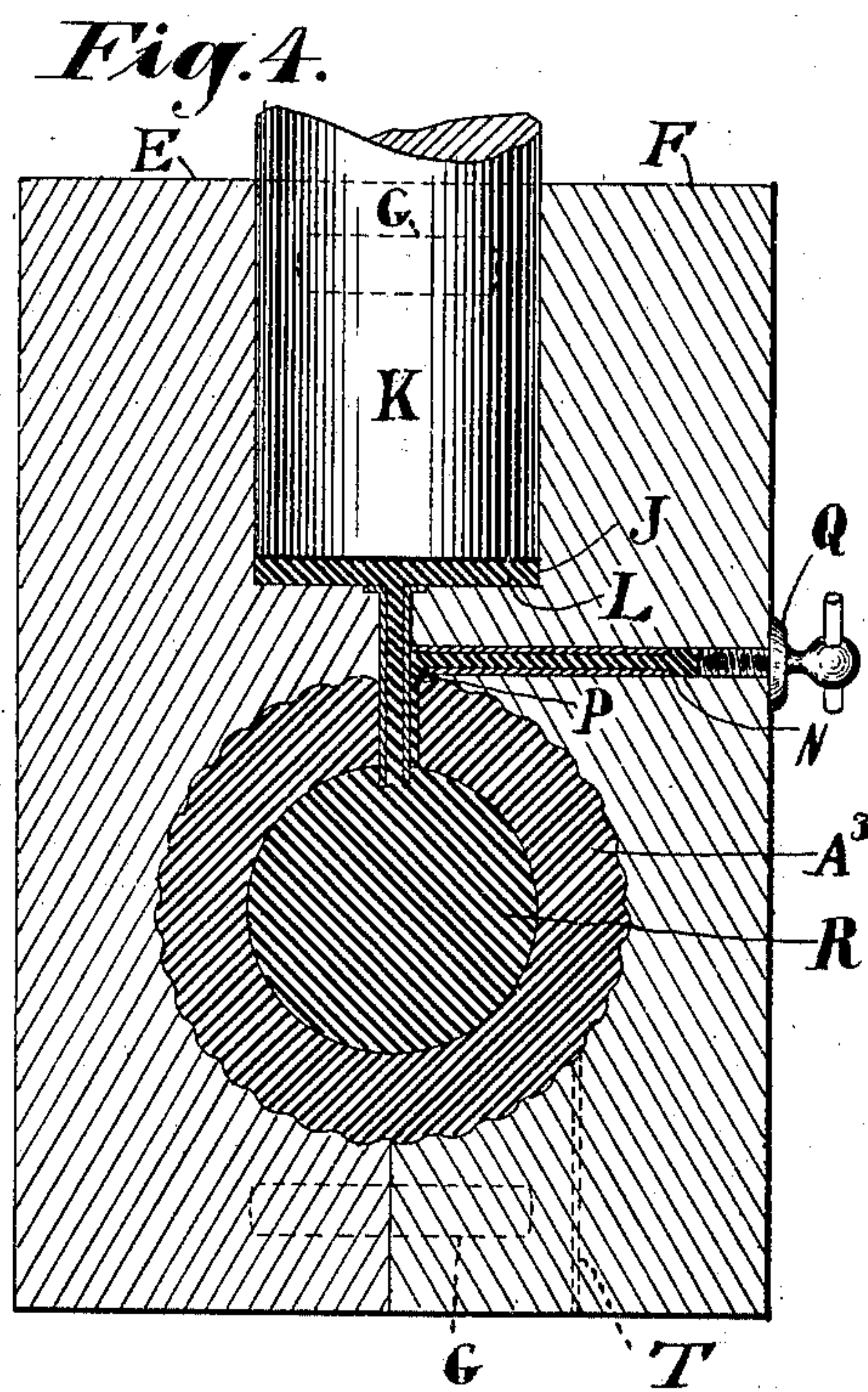
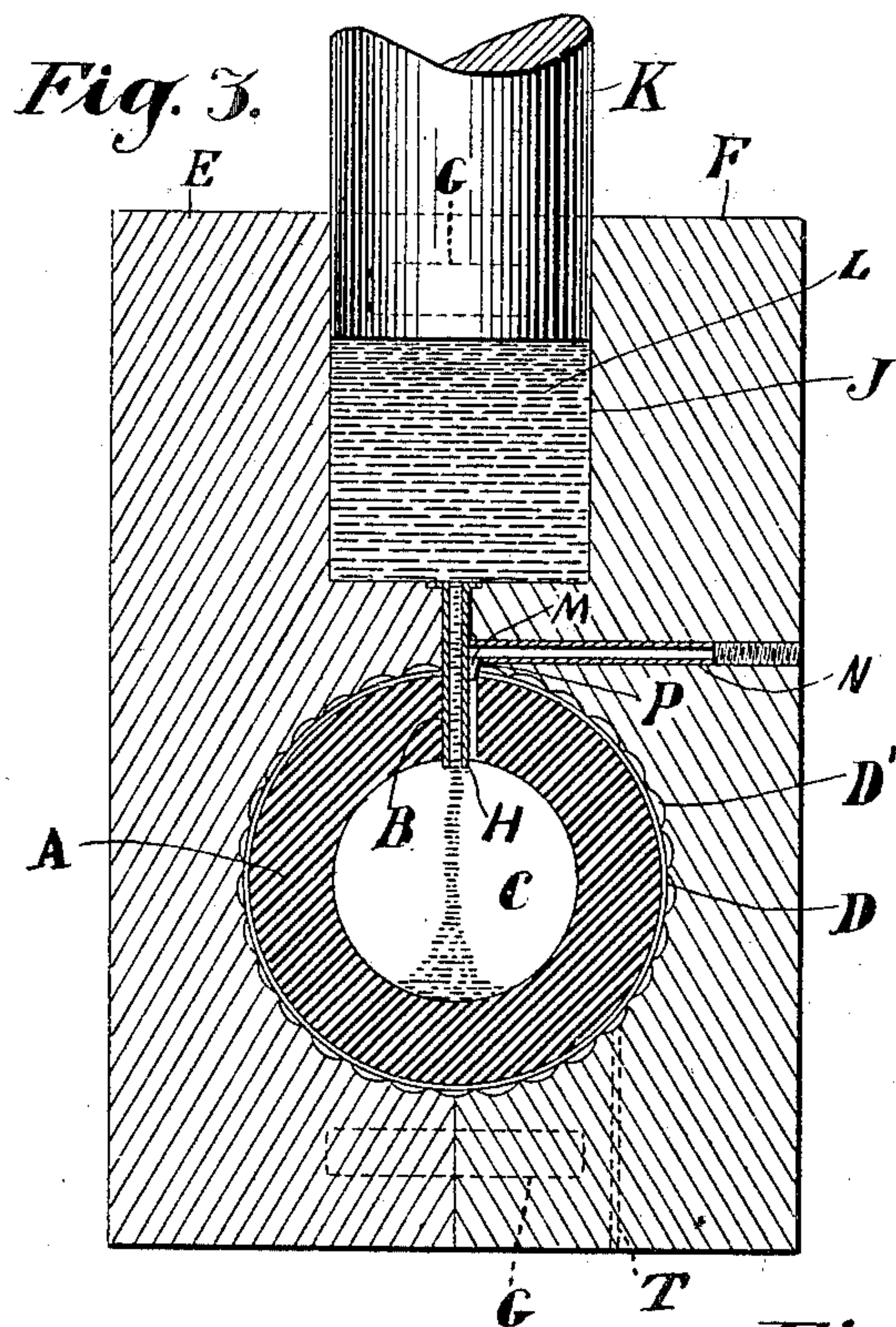
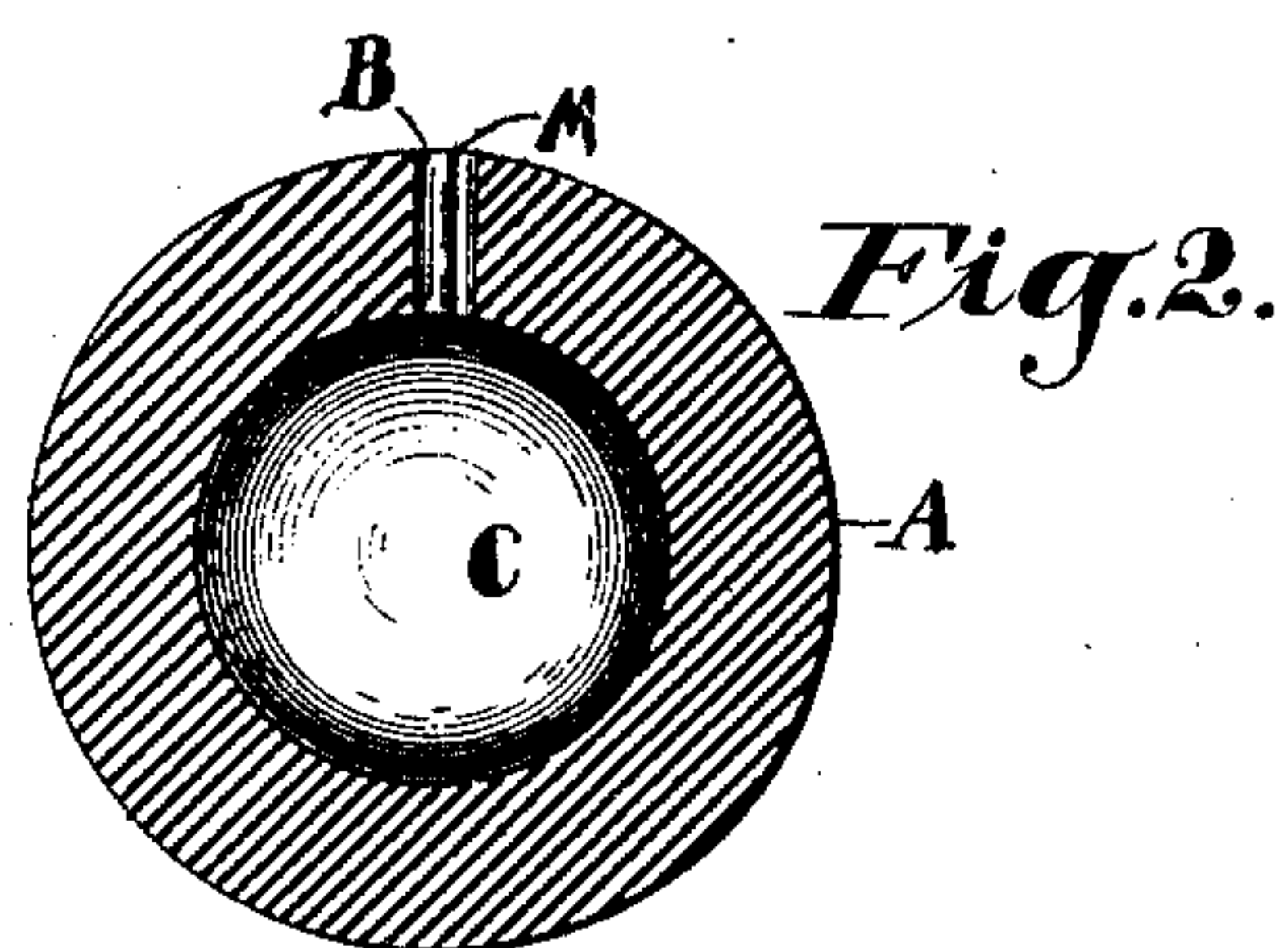
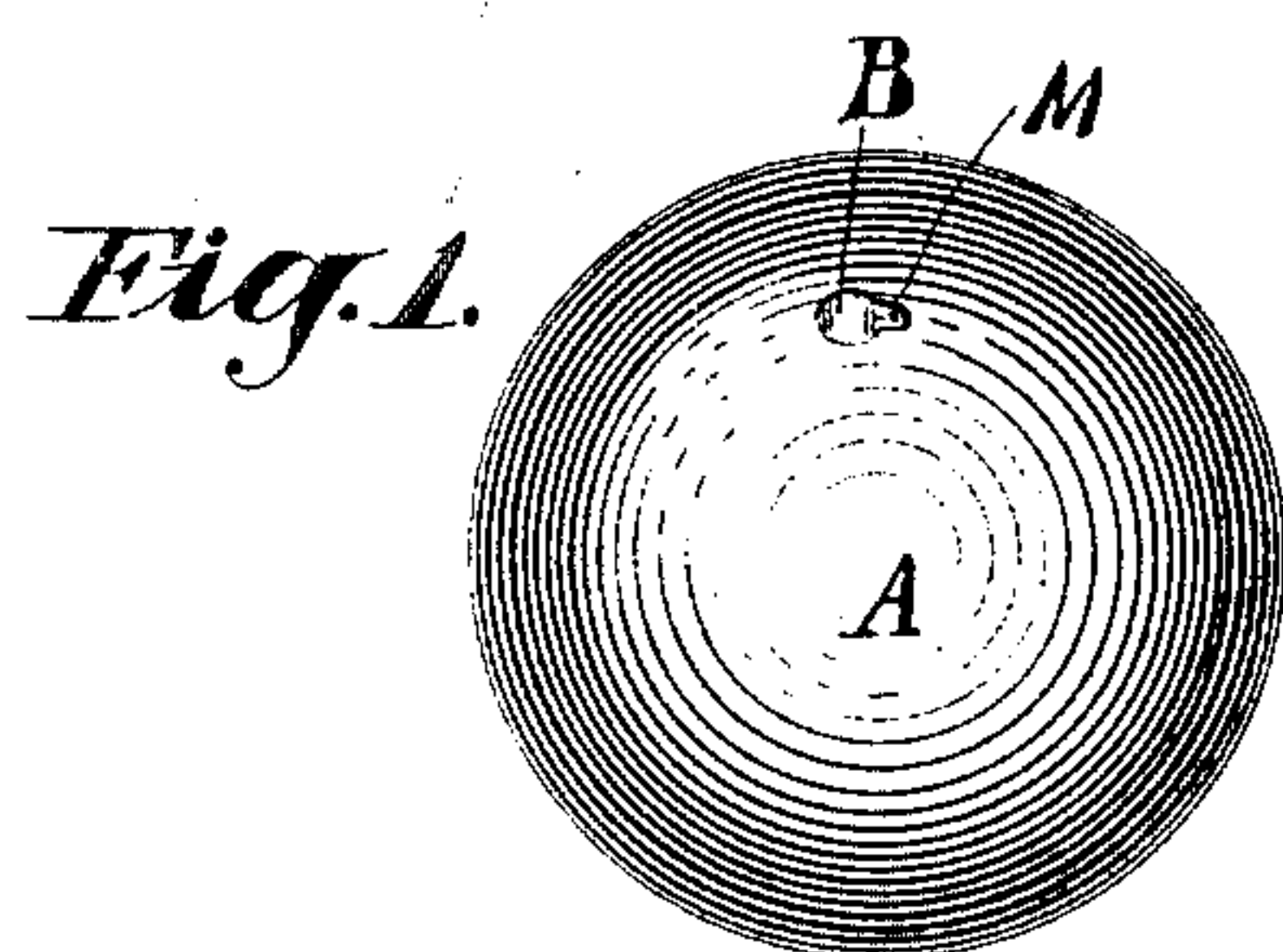
No. 697,920.

Patented Apr. 15, 1902.

E. KEMPSHALL.
GOLF BALL.

(Application filed Mar. 12, 1902.)

(No Model.)



Witnesses:-

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UNITED STATES PATENT OFFICE.

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

GOLF-BALL.

SPECIFICATION forming part of Letters Patent No. 697,920, dated April 15, 1902.

Application filed March 12, 1902. Serial No. 97,882. (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 Golf-Balls, of which the following is a specification.

This invention relates to playing-balls, and particularly to those of the class described in an application filed by me September 27, 1901, Serial No. 76,814, in which a celluloid shell is formed upon a springy core, the shell being made in sections and while plastic compressed upon the core, causing the segments to weld, the shell being hardened under pressure and holding the core under compression, so that the condition of the ball throughout is tense, thus augmenting its effectiveness.

One object of my present improvements is to produce at low cost an improved solid gutta-percha ball.

In the accompanying drawings, Figure 1 is a perspective and Fig. 2 a sectional view of one form of shell-blank. Fig. 3 illustrates a stage in the production of a ball. Fig. 4 is a view similar to Fig. 3, but illustrating a later stage. Fig. 5 is a finished ball made in accordance with my present improvements and partly broken away, so as to exhibit its construction.

In the several views similar parts are designated by similar characters of reference.

Preferably I employ a previously-formed thick shell or hollow sphere A, made wholly or principally of gutta-percha. This blank may be formed of compressed hemispherical or other segments suitably cemented or joined or, if desired, in one piece. Although it is illustrated as round, still in this stage the shell need not be a true sphere. I preferably form said shell-blank with an opening B, communicating with the hollow C thereof.

I place the sphere A in a spherical chamber D, formed in a mold consisting of opposing halves E and F, having registering-dowels G and clamped together by any suitable means. Each of said members E and F may have one-half of the chamber D, which may either have the same diameter or be somewhat larger than the blank sphere A. The chamber is suitably figured, in this instance

having bramble-pits D'. Into the opening B in the latter I insert the mouth of a funnel H, which is shown as penetrating into the hollow C, although this is not important in all cases. By means of said funnel the interior C of the ball is placed in communication with a vessel or receptacle J, formed or provided in the apparatus above the chamber D, said receptacle preferably being round and having a closely-fitting plunger K. The blank A may be formed without an opening B, and a pointed injector may be forced into said blank. I place in the receptacle J a quantity of plastic or other mobile material, preferably gutta-percha, which may by the action of heat be reduced to a fluent condition, as at L, Fig. 3. This material flows down the funnel H into the hollow of the sphere A and drives out the air through a vent M, which in this instance is illustrated as a groove formed in the side wall of the main opening B and lying without the funnel H. In the portion F of the mold there may be provided a vent N, communicating at P with the ball-vent M, so the air escaping from the ball may be conducted out of the apparatus. The fluid or plastic gutta-percha may therefore settle or be forced by the plunger K through the funnel H, so as to completely fill the interior of the ball A, whereupon the vent N in the mold may be closed by a screw-plug Q, Fig. 4, the overflow of the material into or through said vent indicating to the workman that the hollow C has been filled. By means of suitable appliances the plunger K may be pressed still farther down, so as to force more of the filling material into the interior of the ball, causing the walls thereof to yield and expanding the shell until it completely fills the large spherical chamber D in the mold, as at Fig. 4. The air may escape from the chamber between the mold-section or through a vent T. Preferably sufficient force is applied to highly compress the shell between the injected gutta-percha and the walls of the chamber. The gutta-percha or other filling material is allowed to pass from a liquid into a dry or hard condition while the plunger is still pressed down, so that the expanded condition of the shell A³ is made permanent, as indicated by R, Fig. 4. The mold may then be taken

apart and the ball removed, the funnel H being withdrawn and the hole left thereby in the ball being filled with a plug S, Fig. 5.

It will be understood that during the operation of forcing the gutta-percha into the ball the shell A, which may be rendered nearly or quite plastic either by the heat of the injected gutta-percha or by the heat of the dies, or both, is expanded in all directions and caused to conform to the surface of the chamber D and to fill the bramble-pits D' or other marks therein. The brambles or other figures D² are gradually formed upon the periphery of the ball, and since there is no movement of the dies there is no tendency to tear any of the brambles from the shell, nor is the material of the shell itself likely to be torn or unduly thinned at any point. On the contrary, the pressure of the fluent injected mass is uniform in all directions throughout the interior of the shell, and since great pressure may be produced by said plunger said shell may be thoroughly compacted, thereby conducing to its toughness, durability, and springy properties, which are of great value in golf-balls. By reason of the fluent mass of gutta-percha being maintained at high pressure while the portion thereof within the shell, as well as the shell itself, cools or hardens the quality of the ball is improved.

Preferably the gutta-percha in the receptacle J is kept hot as well as under great pressure during the hardening of all or the principal portion of the shell and also during the hardening of the major portion of the core, the latter cooling first at its exterior and then gradually hardening toward the center. By this means the core is not only solidified, but also put in a condition of permanent compression, in which condition it is held by the hardened shell. The process of hardening the ball from the exterior during the feeding of hot gutta-percha to the still fluent heart of the ball may be facilitated by cooling the dies in any suitable way. Not only is a ball thus produced extremely compact or solid, but it will also be understood that the material of the ball from center to periphery is in an abnormal condition, the core being held under compression by the shell, thereby increasing the efficiency of the ball, largely because the compressed core effectually maintains the shell in a true spherical form and immediately and powerfully resists distortion thereof by a blow and by reaction aids in speeding the ball when struck by an implement. It will be understood that my invention is not limited in all cases, however, to the use of a core consisting either wholly or partly of gutta-percha nor to a core having a springy nature, since other cores may

be employed within the scope of my invention to meet different requirements. One of the leading features in my present improvement consists in molding a solid or hard core within a gutta-percha shell, which at the molding operation is caused to conform to the surfaces of the die, and causing both shell and core to harden, so that each retains its form, and especially when the core material is excessive, so that the shell is expanded, and particularly where both shell and core are permitted to harden gradually while the feeding in of the core material is continued.

Other modifications and variations may be resorted to within the scope of my invention, which may be used in producing a variety of molded shells or articles having other than spherical form.

I do not claim herein any features which are claimed in pending applications, Nos. 84,529, 93,312, and 97,227.

Having described my invention, I claim—

1. A playing-ball comprising a highly-compacted substantial gutta-percha shell expanded by plastic material injected therinto and forming a core, the shell constantly tending to compress the core and the latter to expand the shell.

2. A playing-ball comprising a highly-compacted substantial gutta-percha shell distended by gutta-percha injected therinto.

3. A playing-ball comprising a gutta-percha shell consisting of joined segments, and distended by gutta-percha injected therinto.

4. A playing-ball consisting of a highly-compacted shell built up from compressed gutta-percha segments, said segments being cemented edge to edge, and said shell being expanded by gutta-percha forced therinto.

5. A playing-ball comprising a shell built up of highly solidified or compacted thick hemispherical sections of well-seasoned gutta-percha, said shell being expanded by mobile material injected therinto.

6. A playing-ball comprising a highly-compacted gutta-percha shell distended by gutta-percha injected therinto and forming a core; the diameter of said core being about one-half that of the complete ball.

7. A playing-ball comprising a shell formed at least partially from plastic material and distended by similar plastic material injected therinto.

8. A playing-ball comprising a highly-compacted, substantial gutta-percha shell, and a sphere of gutta-percha held under permanent compression by said shell.

ELEAZER KEMPSHALL.

Witnesses:

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