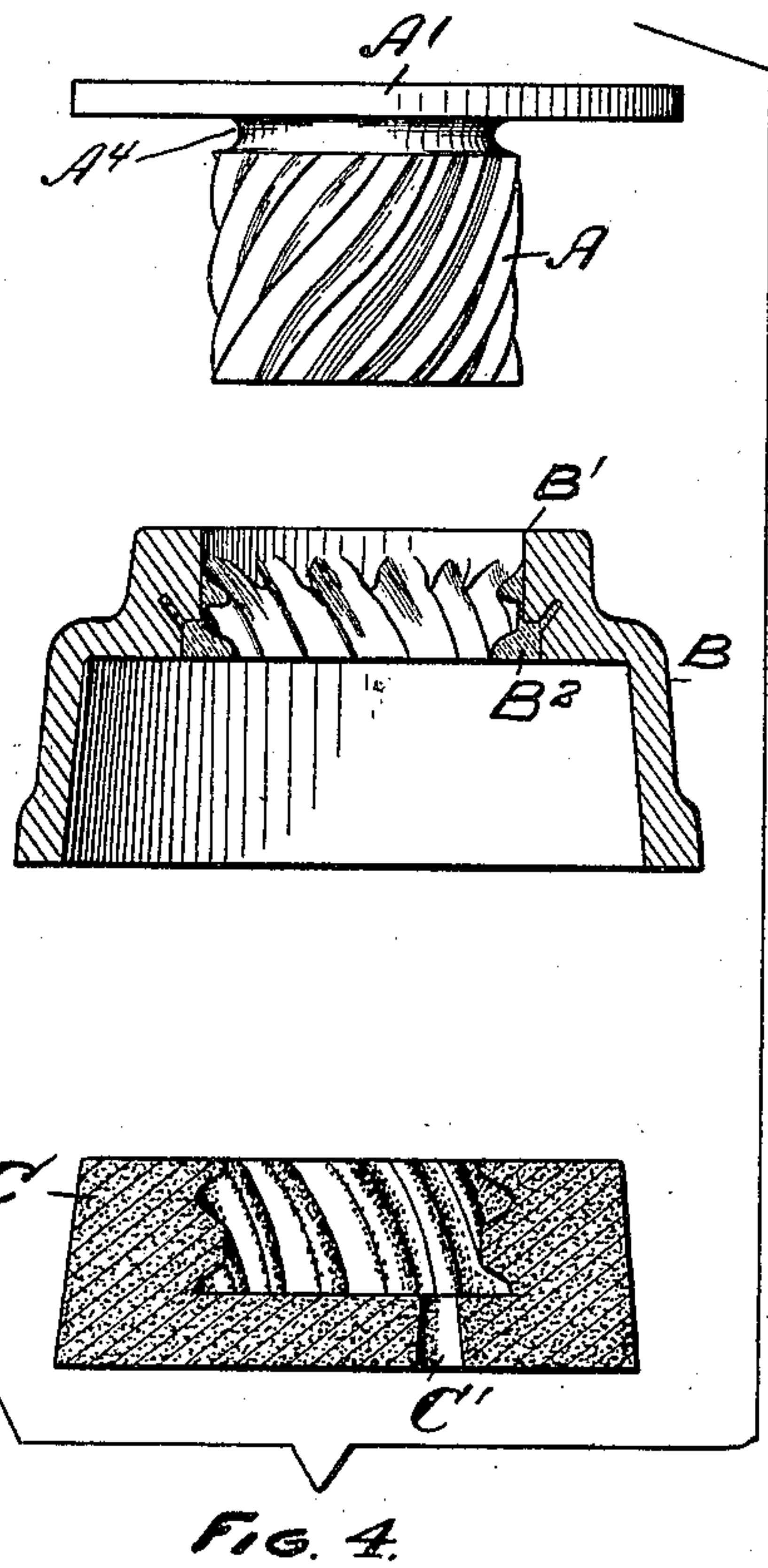
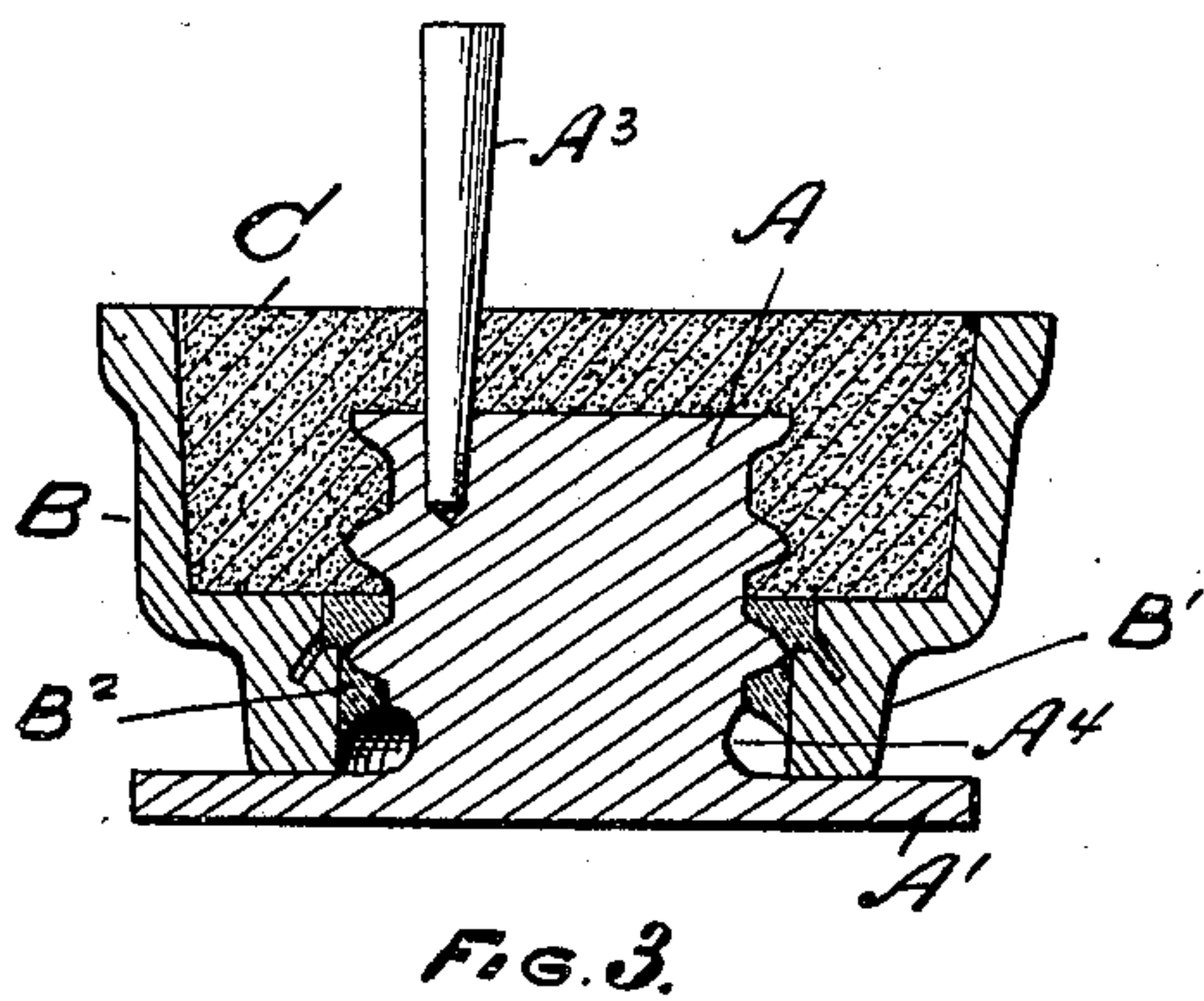
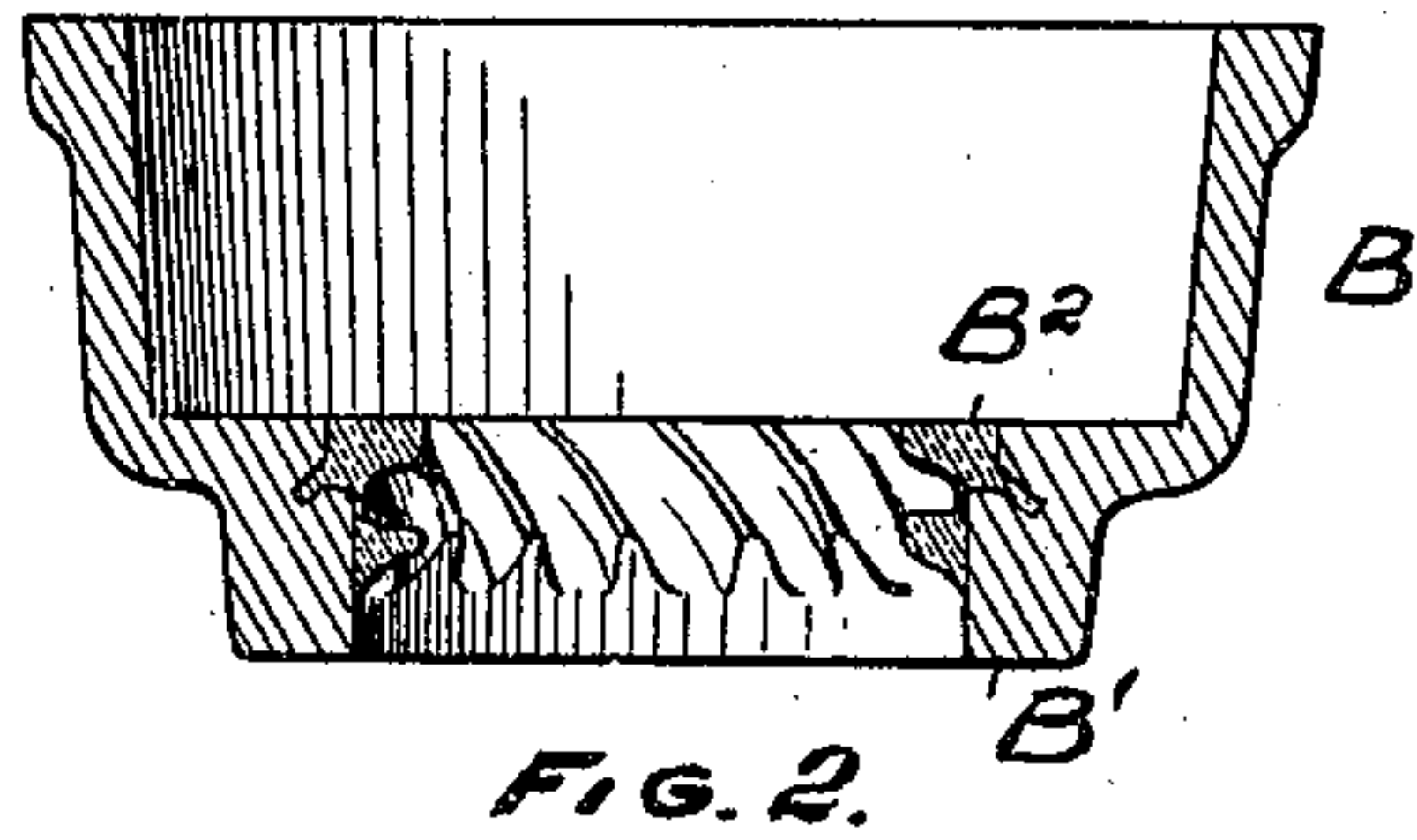
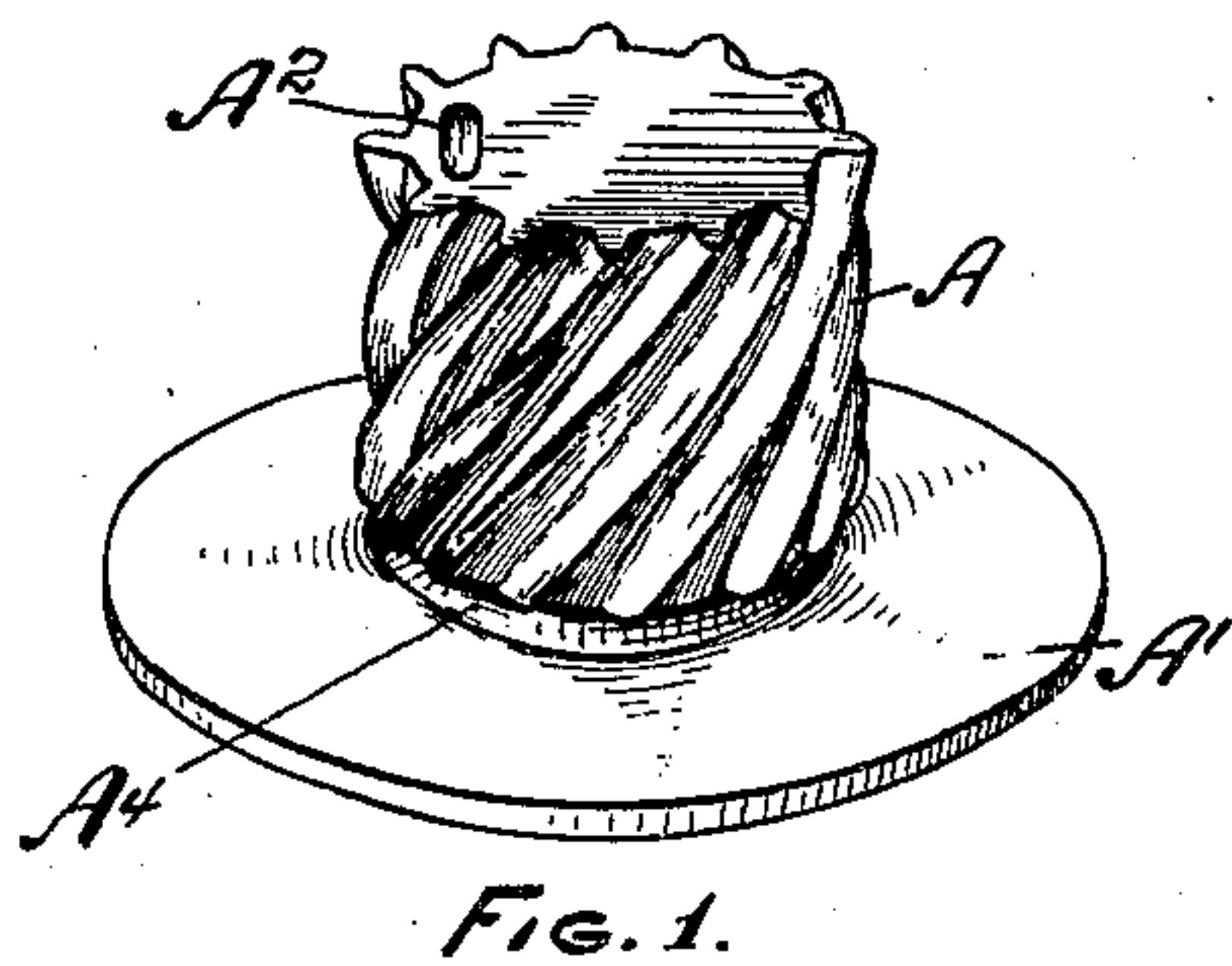


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MEANS FOR CASTING GEARS.  
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Patented Mar. 9, 1909.  
2 SHEETS—SHEET 1.



Witnesses

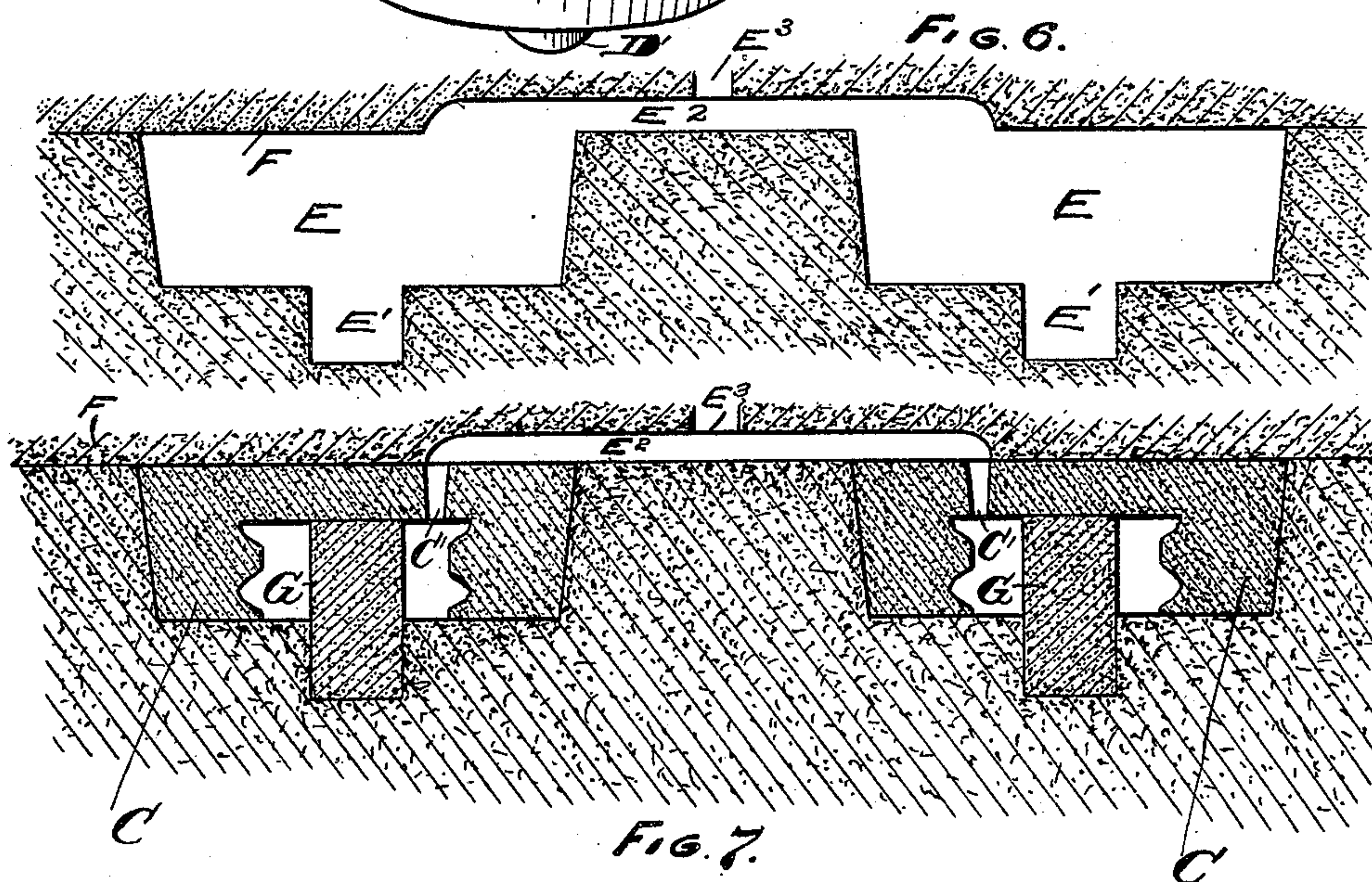
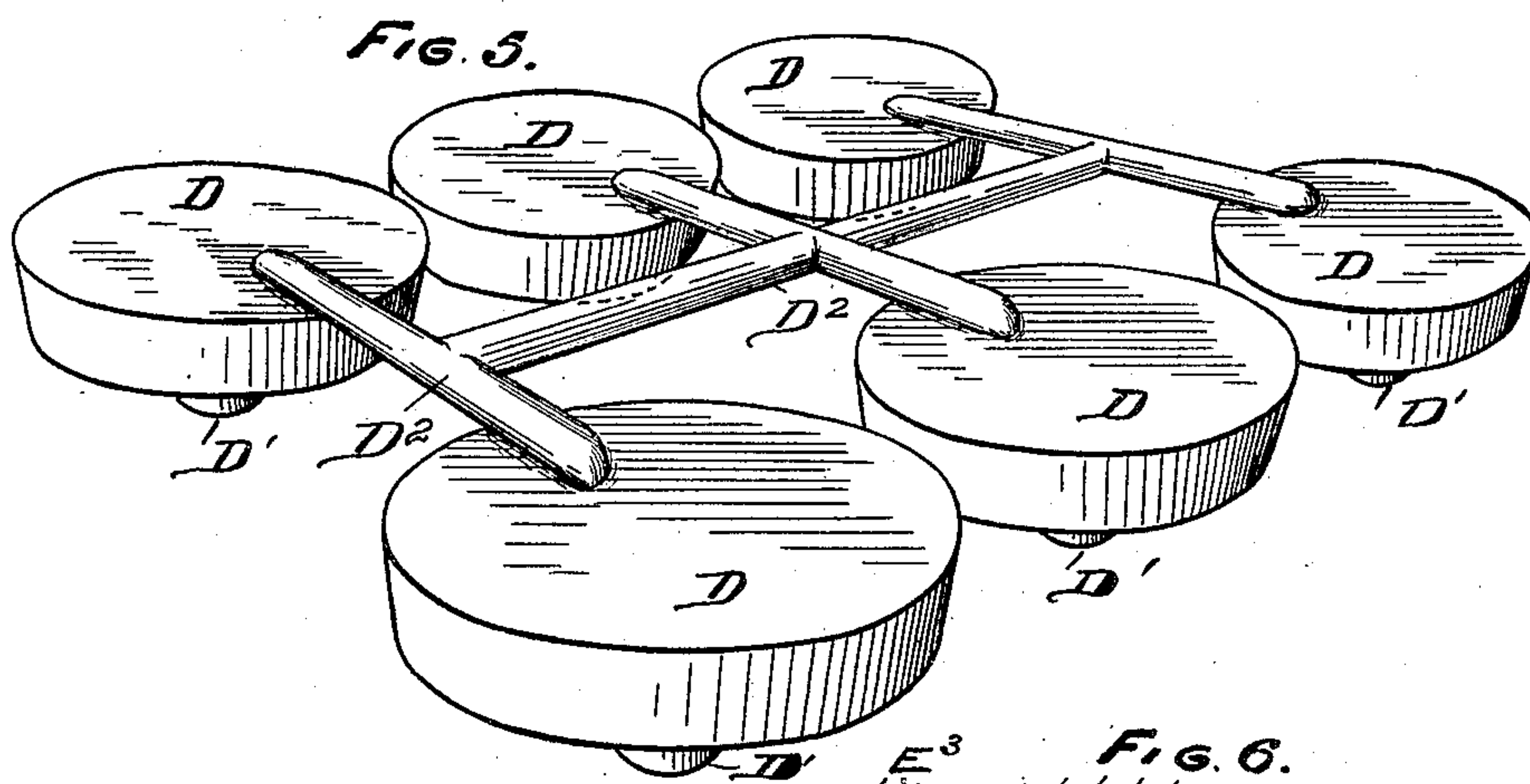
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# UNITED STATES PATENT OFFICE.

JOHN S. BARNES, OF DETROIT, MICHIGAN.

## MEANS FOR CASTING GEARS.

No. 914,474.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed November 18, 1907. Serial No. 402,607.

*To all whom it may concern:*

Be it known that I, JOHN S. BARNES, citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Means for Casting Gears, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improvement in the means for casting gears.

The object of this invention is the production of worm or spiral gears by a process of casting:—the means employed being such that gears of this type can be cheaply and accurately formed either singly or gated as may be desired.

In the drawings accompanying this application: Figure 1 is a perspective view of a metallic pattern of a spiral or worm gear. Fig. 2 is a cross-sectional view of a mold box having an internal spiral gear to receive and center the pattern shown in Fig. 1. Fig. 3 is a cross-sectional view through the mold box and pattern in assembled relation, showing the sand mold in place and the runner-stick in position. Fig. 4 shows the pattern, mold box and sand mold inverted and separated, the mold box being in the position shown when it is desired to discharge the sand mold. Fig. 5 is a perspective view of a series of sand mold patterns and their core prints, gated together. Fig. 6 is a fragmentary sectional view through the drag and cope of a mold formed by the employment of the gated sand mold pattern and core prints shown in Fig. 5. Fig. 7 is a fragmentary sectional view of the mold shown in Fig. 6, with the sand mold shown in Fig. 4, and with cores supported by the core-prints in position.

Referring now to the letters of reference shown on the drawings: A indicates a pattern of a spiral gear, having at one end a projecting flange A' for convenience in handling the pattern. A<sup>2</sup> is a socket formed in the other end of the pattern and is designed to support a runner-stick A<sup>3</sup>,—a pattern for providing an opening through the mold through which the metal is admitted.

A<sup>4</sup> is a groove or channel in the pattern A formed by cutting away the end of the

teeth adjacent to the flange A', the purpose of which will be hereafter explained.

B is a mold-box having an annular flange or collar B', within which is centered the pattern A supported in position by the Babbitt metal bushing B<sup>2</sup> surrounding same.

C is a sand mold provided with a sprue-hole or gate C' formed by the use of patterns A and A<sup>3</sup> in conjunction with the mold-box B.

D is a series of mold patterns provided with core prints D', and gated together at D<sup>2</sup> to form channel runners.

E is a sand mold formed by the employment of the mold prints D.

E' is a core print and E<sup>2</sup> indicates horizontal channel runners in the cope F leading from gate E<sup>3</sup> to the sprue-hole C' of the sand mold C.

G is a core supported in the print E'.

Having indicated by reference letters the several parts of my improved means for casting spiral gears, I will now explain the method of operation. The pattern A is first centered in the mold-box B, the parts being in the position indicated in Fig. 3. Babbitt metal B<sup>2</sup> is run in the space between the collar B' of the mold and the pattern A insuring it against lateral play. The runner-stick A<sup>3</sup> is then inserted in the socket provided in the pattern for its reception and the mold packed with sand as indicated in the figure before referred to. The mold is then inverted as shown in Fig. 4 and the pattern removed, which is accomplished by the operator unscrewing it from the mold by means of the flange A'. The side walls of the mold-box being slightly tapering the sand mold may now be readily removed from the box. It may then be baked to insure it against accidental injury after which it is ready for use and may be gated with others as I will now explain. A flask is now prepared by embedding the sand mold patterns shown in Fig. 5 in the usual way. The cope is then lifted and the sand mold, as shown in Fig. 4, placed in position in the drag as indicated in Fig. 7, the cores G being first inserted in their respective prints. The cope is then replaced upon which it is ready for casting.

It will be observed that the rotary motion given to the pattern upon withdrawing it from the sand serves to "slick" the mold thereby insuring a smooth uniform casting—



while the bearing in which the spiral pattern is supported is of sufficient breadth to overcome any tendency for lateral play, thus protecting the mold against accidental injury  
5 due to the withdrawal of the pattern.

The groove A<sup>4</sup> provided in the pattern adjacent to the flange is to furnish an outlet for the sand that might otherwise pack between the teeth of the gear near the flange  
10 which would make it difficult to brush out thoroughly upon making a new mold.

Having thus described my invention, what I claim is:

1. In means for casting gears, a sand mold  
15 box, and a gear pattern supported in the box, the pattern terminating at its outer end in a flange for operating it and adapted to engage the mold box when the gear pattern is in operative position.

20 2. In means for casting gears, a sand mold box, and a gear pattern operable into and out of the box, the pattern terminating at its outer end in a radial flange to operate it and adapted to engage the mold box when the  
25 gear pattern is in operative position.

3. In means for casting gears, a sand mold box, a gear pattern supported in the box, the pattern terminating at one end in a radial flange for operating it and also having a  
30 socket in its opposite end, and a runner stick for engagement in the socket the flange of the gear pattern being adapted for engagement with the mold box when the gear pattern is in operative position.

35 4. In means for casting spiral gears, a sand mold box provided with an internal spiral gear to receive, guide and support the pattern gear, and the pattern gear having at one end a flange for manually operating it, said  
40 gear also provided with an encircling groove or channel communicating with the space between the teeth.

5. In means for casting gears, a sand mold box provided with an internal gear, the gear  
45 pattern supported by and in mesh with said internal gear, and a sand mold print pattern adapted to form a mold to receive and support a gear mold formed in the gear mold box.

50 6. In means for casting gears, a sand mold box provided with a collar, a pattern gear projecting into the box through said collar, a

bushing supported in said collar and having an internal gear to support the gear pattern, and a plurality of sand mold print patterns  
55 gated together to form molds for the reception and support of gear molds formed in said mold box.

7. In means for casting gears, a sand mold box provided with an internal gear, a gear  
60 pattern supported by the internal gear of the box, and a plurality of sand mold print patterns gated together to form a number of communicating molds to receive and support the gear molds formed in the gear mold  
65 box.

8. In means for casting gears, a sand mold box provided with an internal gear, a gear pattern supported by the internal gear of the box, a plurality of sand mold print patterns  
70 gated together to form a number of communicating molds to receive and support the gear molds formed in the gear mold box.

9. In means for casting gears, a sand mold box having one end portion reduced in di-  
75 ameter and provided with an internal gear, the inner walls of the box proper tapering slightly, and a gear pattern supported by said internal gear of the box.

10. In means for casting gears, a sand  
80 mold box having one end portion reduced in diameter and provided with an internal gear, the inner walls of the box proper tapering slightly, and a gear pattern supported by said internal gear of the box, the pattern  
85 having a flange at one end to operate it and also having a groove in its body adjacent said flange to provide a sand outlet.

11. In means for casting gears, a sand mold box, and a gear pattern supported in  
90 the box, the gear pattern having a flange at one end to operate it and also having a groove in its body adjacent said flange to provide a sand outlet.

12. In means for casting gears, a sand  
95 mold box, and a gear pattern supported in the box, the gear pattern having a groove in its body to provide a sand outlet.

In testimony whereof, I, sign this specification in the presence of two witnesses.

JOHN S. BARNES.

Witnesses:

SAMUEL E. THOMAS,  
GRACE E. WYNKOOP.