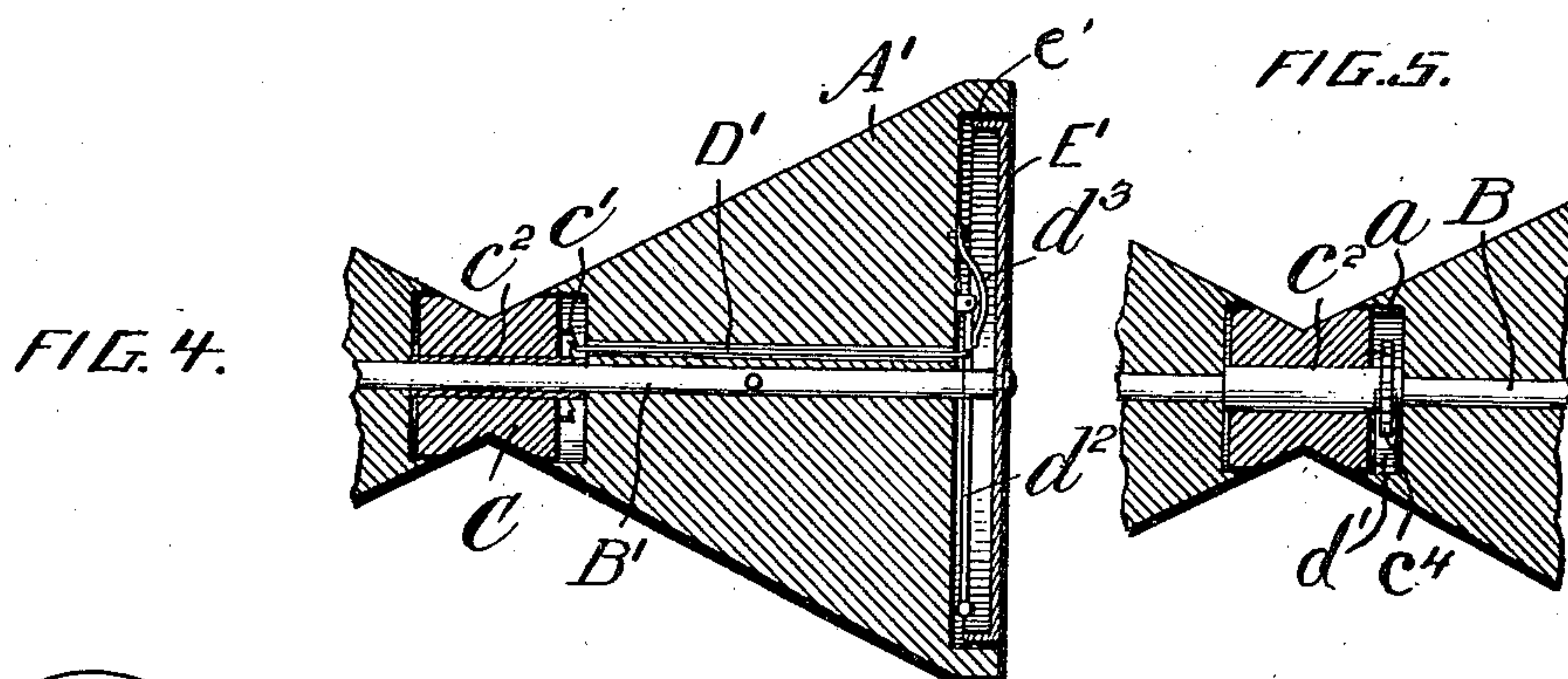
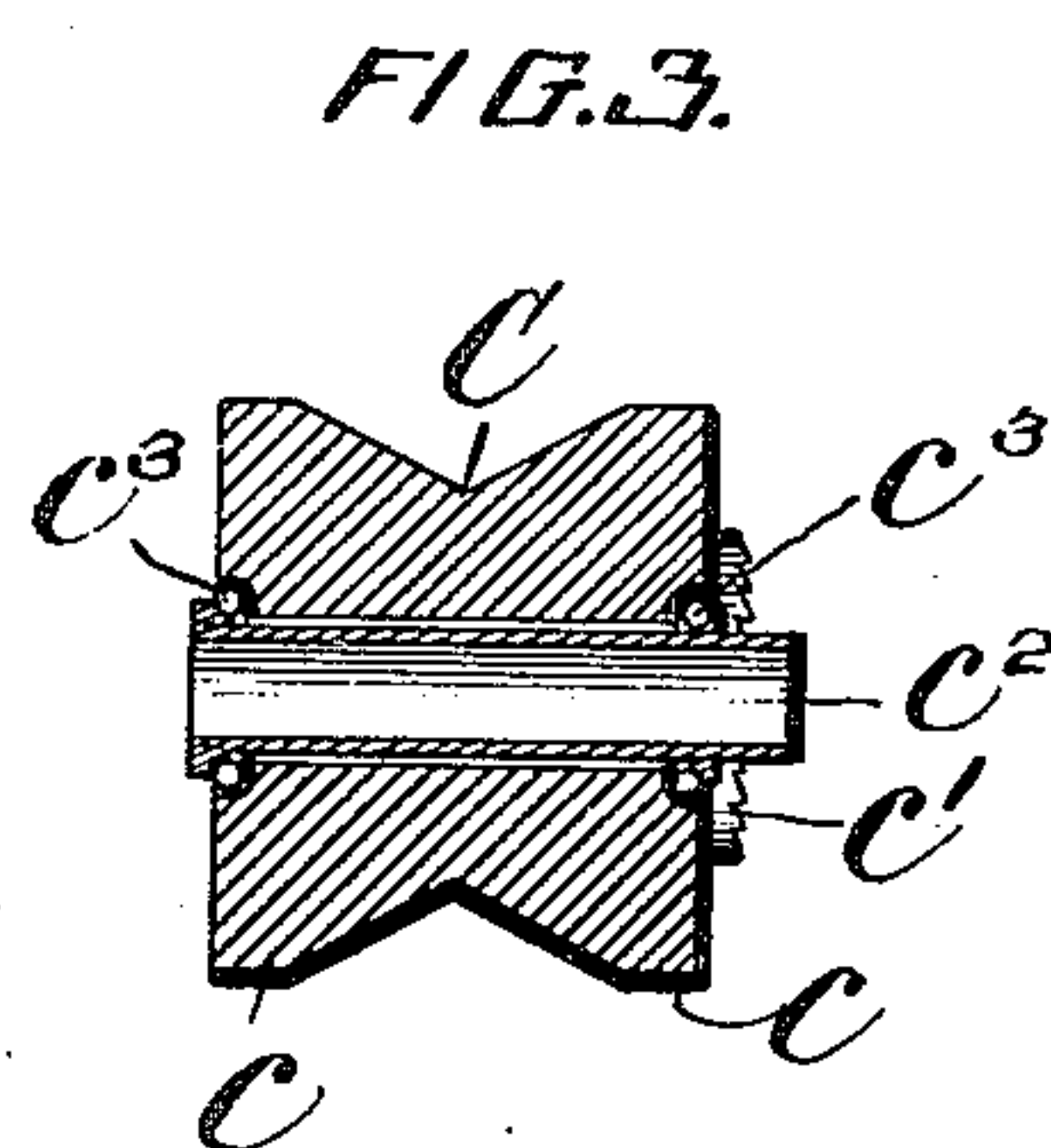
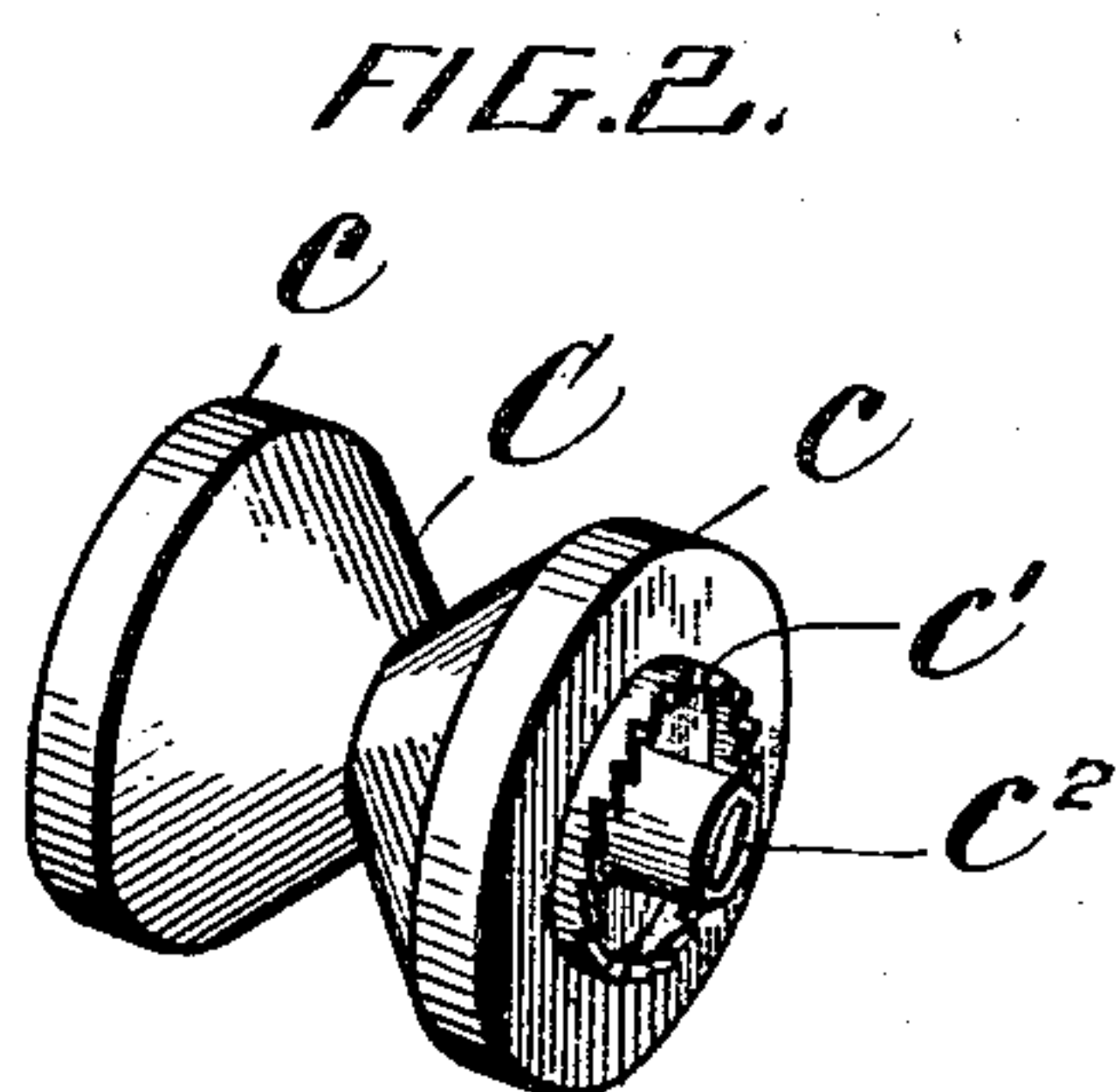
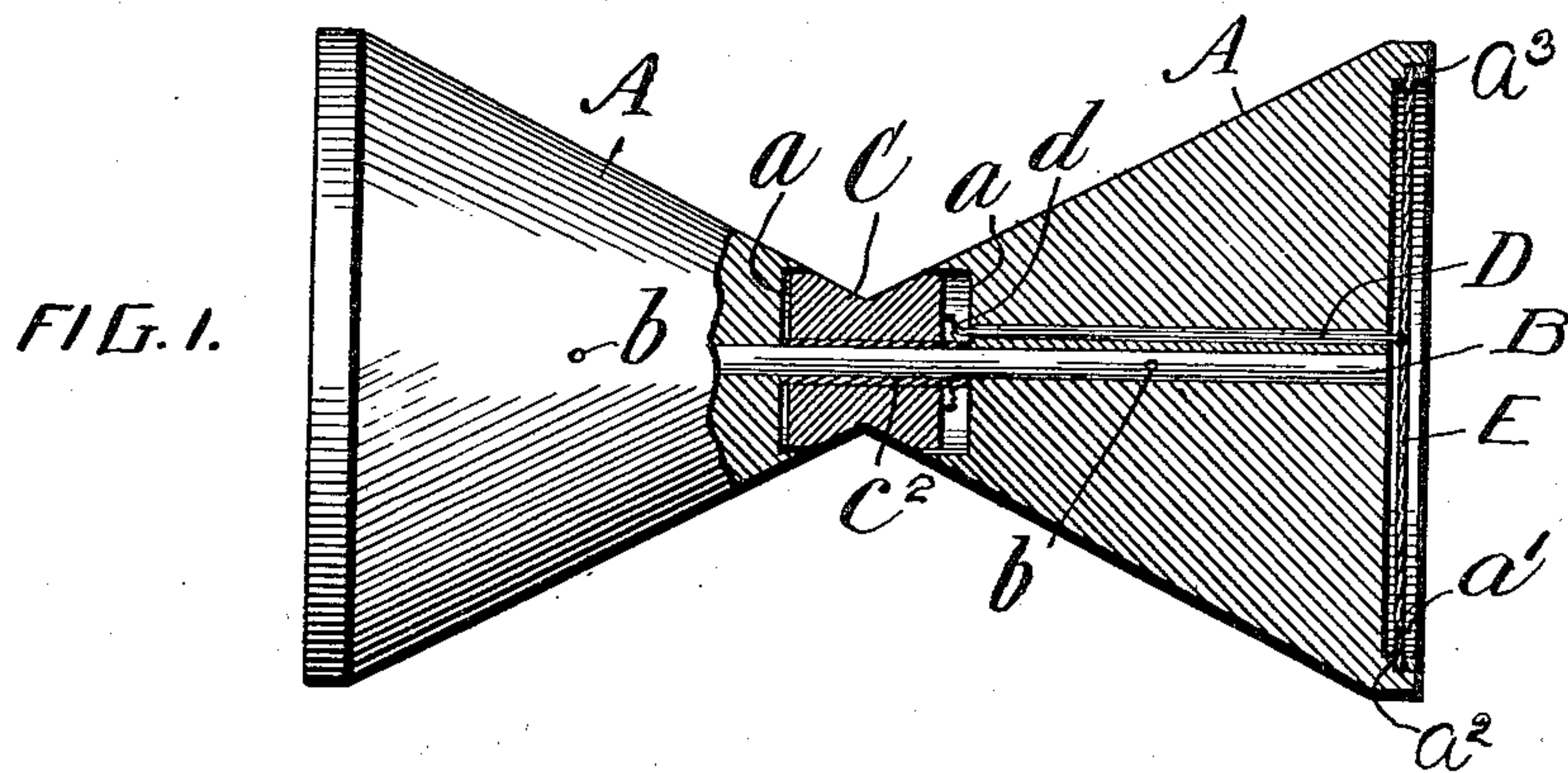


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 DOUBLE TOP OR DIABOLO.  
 APPLICATION FILED JUNE 17, 1908.

903,419.

Patented Nov. 10, 1908.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

CHARLES HARPER SKEER, OF WASHINGTON, DISTRICT OF COLUMBIA.

## DOUBLE TOP OR DIABOLO.

No. 903,419.

Specification of Letters Patent.

Patented Nov. 10, 1908.

Application filed June 17, 1908. Serial No. 439,076.

*To all whom it may concern:*

Be it known that I, CHARLES HARPER SKEER, citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Double Tops or "Diabolos;" and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists in the novel features hereinafter described reference being had to the accompanying drawings which illustrate one form in which I have contemplated embodying my invention and a slight modification thereof and said invention is fully disclosed in the following description and claims.

Referring to the said drawings, Figure 1 represents an elevation partly in section of my improved device. Fig. 2 is a detail perspective view of the independently rotatable central spool. Fig. 3 is a sectional view of a modification of the central spool. Fig. 4 is a partial sectional view of a modification of the device shown in Fig. 1. Fig. 5 is a detail of a further modification.

This invention consists in an improved double top or "diabolo" as it is sometimes called, which is spun by means of a cord connected to two handles, in a well known manner.

The object of my invention is first, to provide such device with a central section or spool which is rotatable independently of the end portions in one direction and is connected thereto by a pawl and ratchet construction, so that the central section can rotate backwardly or forwardly with the string while the end portions of the device will be rotated at all times in one direction.

My invention also contemplates the provision of noise producing mechanism operated by the differential movement of the central or driving spool and the end portions of the device whereby musical or other sounds may be produced when the said driving spool is reversely rotated.

In the drawings I have illustrated two simple embodiments of my invention. In

the first form shown in Figs. 1 and 2, A, A represent the end body portions of the top or device which are each given the shape of the frustum of a cone, and are arranged with their smaller ends opposite each other and connected, in this instance by a shaft B, which extends through both of said conical portions, and is secured thereto by pins as at b b. The conical portions A, A are shown as solid and may be formed of wood or other preferred material. They may also be formed hollow if desired. Between the end bodies A, A I insert an independently rotatable driving spool C, having the shape of substantially a double cone frustum, the conical portions being in line with the conical faces of the adjacent end bodies. In order to make neat joints I prefer to recess the end bodies as shown at a a and to provide the driving spool with cylindrical end portions c c to enter said recesses, thus preventing the cord or string from running into the narrow annular spaces between the parts.

The driving spool is connected to the end bodies by a ratchet and pawl connection which in this instance consists of a crown ratchet wheel c' secured to one end of the spool C and engaged by a pawl d, carried on one end of a longitudinally movable rod D, which extends through a guiding aperture in the adjacent end body, near the center and is connected in any desired way, with a diaphragm E supported in a recess a'. The diaphragm E, as shown, is composed of metal, and is supported on an annular shoulder a<sup>2</sup> and held in place by an annular retaining ring a<sup>3</sup> glued or otherwise secured to the end body, the rod D being secured to the diaphragm by solder. The teeth of the crown wheel are very low and the diaphragm is sufficiently elastic to serve as a spring to hold the pawl in engagement with the ratchet wheel, and to permit it to pass freely over the teeth when the driving spool is rotated in one direction (backward) while when the spool is rotated in the forward direction the end bodies will of necessity rotate therewith. During the backward rotation of the driving spool the teeth of the ratchet passing over the pawl will cause the diaphragm to vibrate



and produce sounds which will vary with the size, thickness and composition of the diaphragm.

The driving spool C is preferably provided with a bearing sleeve  $c^2$  which may be driven through its central aperture and held by friction therein or otherwise secured, and which projects at each end so as to engage the end bodies and hold the spool in proper relation therewith. This construction is simple and facilitates the assembling of the parts but the same result may be accomplished in other ways and I do not limit myself to the exact constructions herein shown.

In some cases I may provide the spool C with ball bearings  $c^3$  to engage the sleeve  $c'$  as shown in Fig. 3, to reduce the friction of the spool to a minimum, in which case the sleeve may engage the end bodies and need not be capable of rotation on the shaft, or the sleeve may be dispensed with and the ball bearings may directly engage the shaft if desired.

Instead of using a circumferentially confined diaphragm as shown in Fig. 1, I may employ a disk or bell supported centrally by the shaft, as shown in Fig. 4. In this figure  $E'$  represents a bell or disk secured to the shaft  $B'$  and having an annular flange  $e'$  (which however may be omitted) the disk  $E'$  being free at its periphery and giving a clear ringing sound. In this instance the pawl rod  $D'$  is pivotally connected to a striker arm  $d^2$  arranged in the recess in the end body  $A'$  and held in inoperative position by a spring  $d^3$  the other parts of the device being identical with those previously described.

In operation the device is spun by a cord or string in the customary manner, the end of the string being ordinarily connected to handles which are moved so as to cause a frictional engagement of the cord or string with the driving spool first in one direction and then in the other. The effect of this back and forth movement of the cord is to drive the end bodies always in one direction by means of the ratchet and pawl, the reverse movement of the driving spool causing the sound producing apparatus to be operated as before explained. I may in some cases omit the sound producing devices, and employ simply the pawl and ratchet if desired. Thus in Fig. 5 I have shown a modification in which I employ an ordinary ratchet wheel  $c^4$  and a spring pawl  $d'$  engaging the same, one end of which is secured to the adjacent end body  $A^2$ .

By providing the device with the central driving spool connected to the end bodies by pawl and ratchet mechanism, it is much easier to spin than a double top not having these features and a beginner can very readily learn to use the device.

What I claim and desire to secure by Letters Patent is:—

1. A double top or diabolo, comprising among its members, the end bodies, means for rigidly connecting said end bodies and holding them spaced apart, a central driving spool interposed between said end bodies, and capable of independent rotation with respect thereto, one of said end bodies and said central spool being provided the one with a single ratchet and the other with a spring actuated pawl engaging the ratchet, whereby said central spool and end bodies are held against rotary movement with respect to each other in one direction, substantially as described.

2. A double top or diabolo, comprising among its members, the end bodies, a spindle rigidly connected with both of said end bodies, a central driving spool, loosely mounted on said spindle between said end bodies, one of said end bodies and said central spool being provided the one with a single ratchet, and the other with a spring pawl engaging said ratchet, one of said parts being provided with a recess to accommodate the pawl and ratchet mechanism to permit the adjacent edges of the cord engaging portions of said spool and end bodies to approach each other closely and form practically continuous surfaces, substantially as described.

3. A double top or diabolo, comprising among its members the end bodies, a central driving spool connected thereto by means permitting the independent rotation of said spool in one direction and a sound producing mechanism operatively connected with said driving spool, substantially as described.

4. A double top or diabolo, comprising among its members, the end bodies, a sound producing mechanism carried by one of said end bodies, a central driving spool movable independently of the end bodies, pawl and ratchet mechanism connecting said driving spool with the end bodies, and a connection between said spool and said sound producing mechanism for operating the same when the spool is rotated independently of the end bodies, substantially as described.

5. A double top or diabolo comprising the conical end bodies provided with recessed portions, a central spool having portions extending into said recesses, and having its outer surface provided with portions in line with adjacent portions of the outer surfaces of the end bodies, and pawl and ratchet mechanism connecting said spool with said end bodies, substantially as described.

6. A double top or diabolo, comprising the conical end bodies, the central driving spool, a circular sound producing device carried by one of said end bodies, a ratchet wheel on



said spool, a pawl engaging said ratchet wheel and connections operated by said pawl for vibrating said sound producing device, substantially as described.

- 5 7. A double top or diablo comprising the conical end bodies, the central driving spool, a diaphragm carried by one of said end bodies, a ratchet wheel connected with said spool, a pawl engaging the ratchet wheel

and a connection from said pawl to said dia- 10  
phragm, adjacent to the center thereof, substantially as described.

In testimony whereof I affix my signature,  
in the presence of two witnesses.

CHARLES HARPER SKEER.

Witnesses:

L. P. WHITAKER,  
L. C. HARBISON.