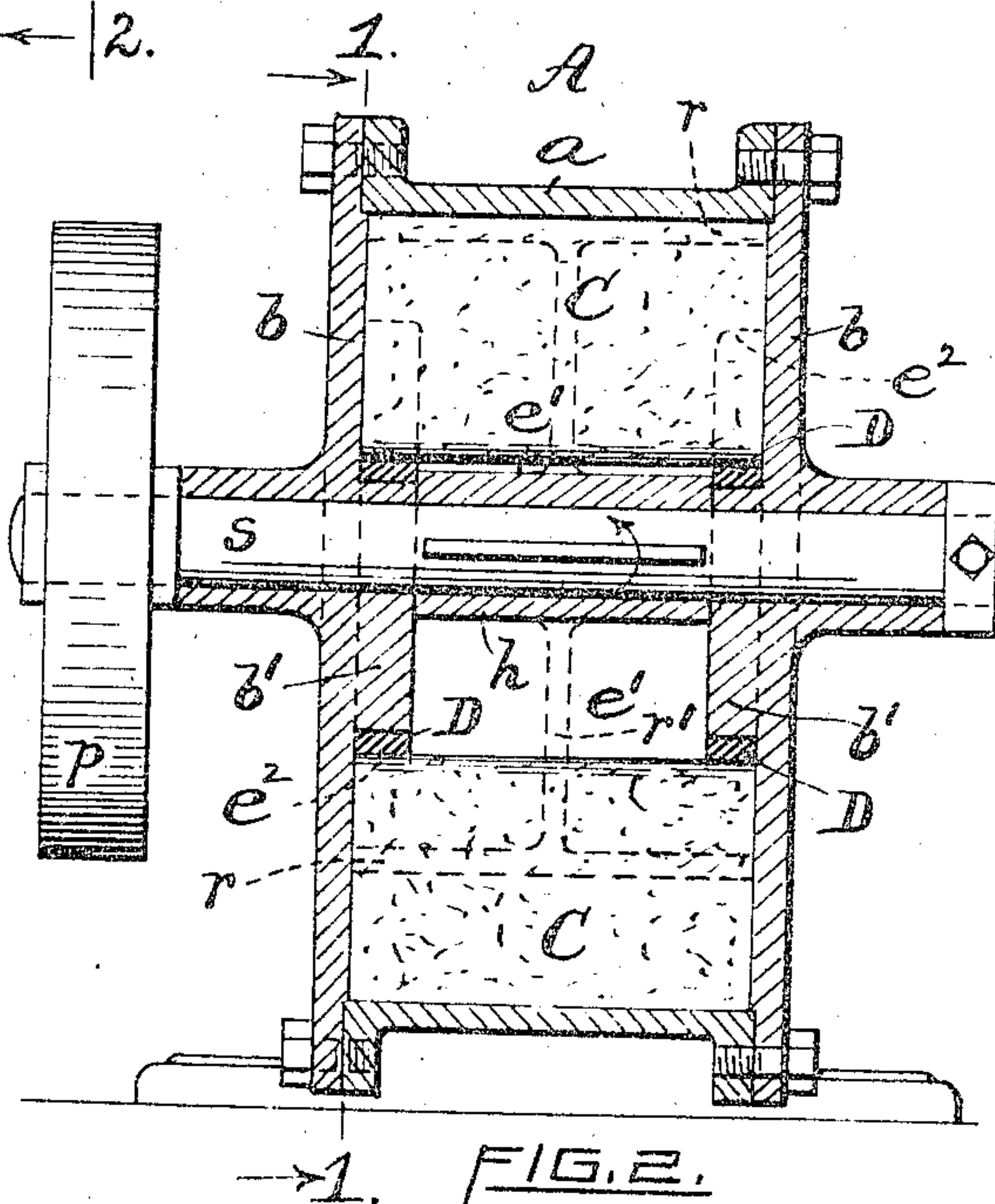
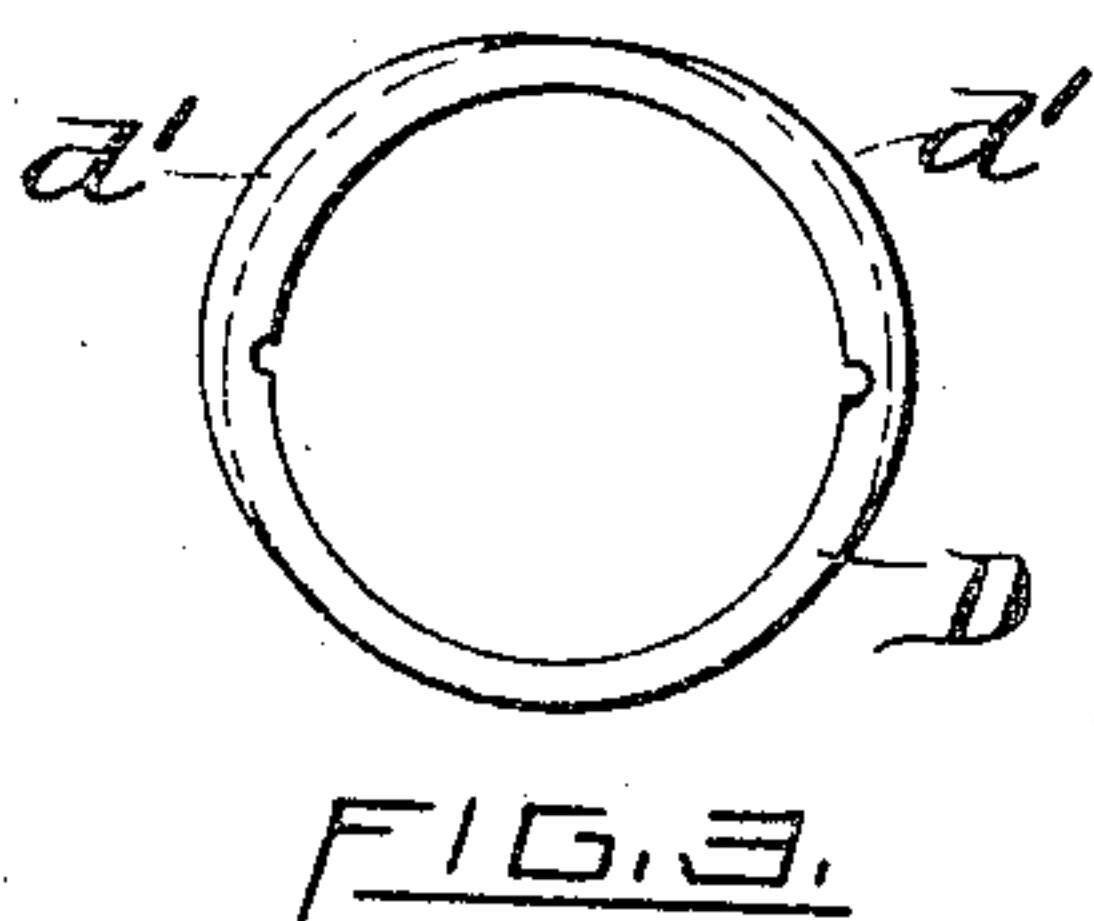
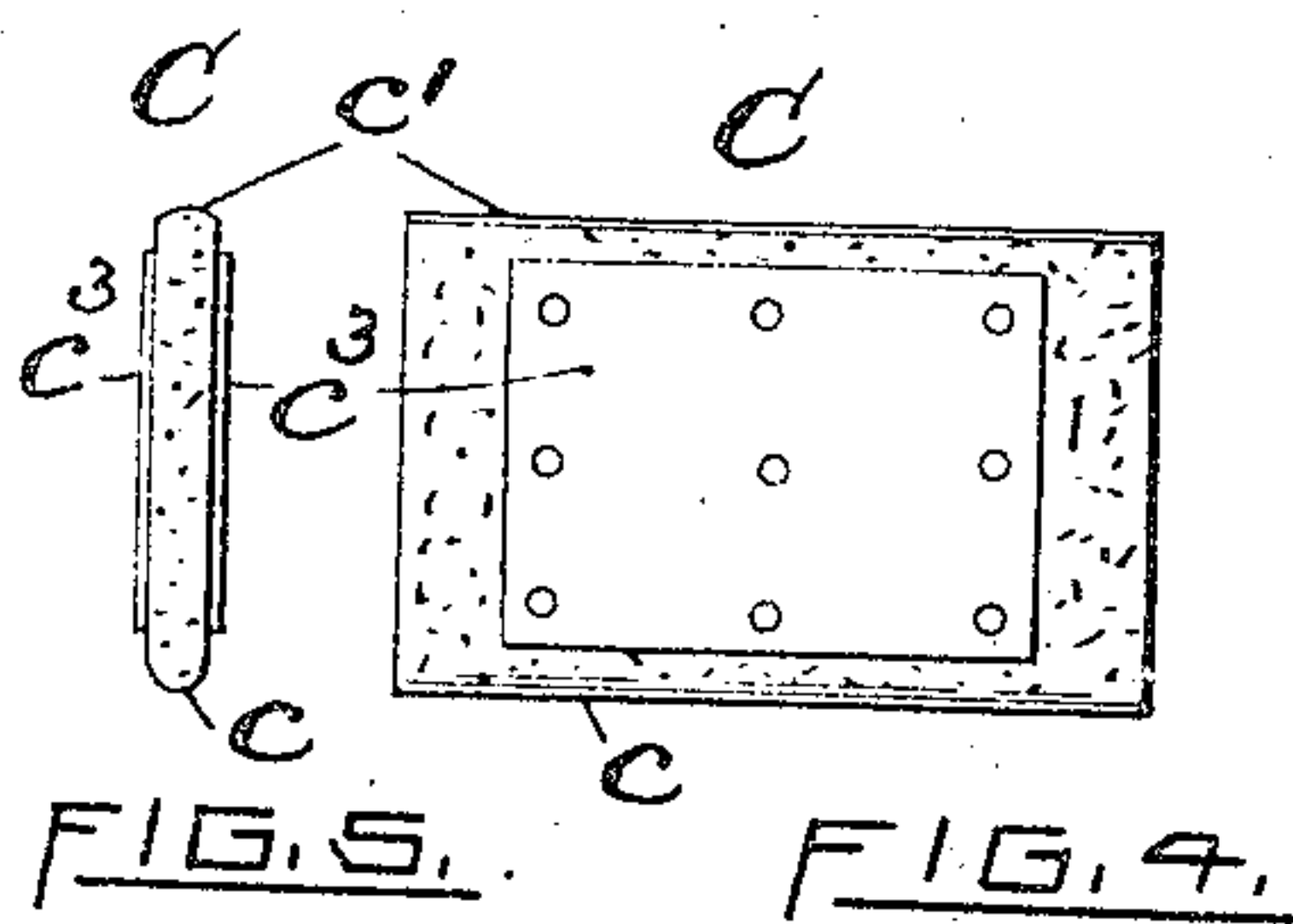
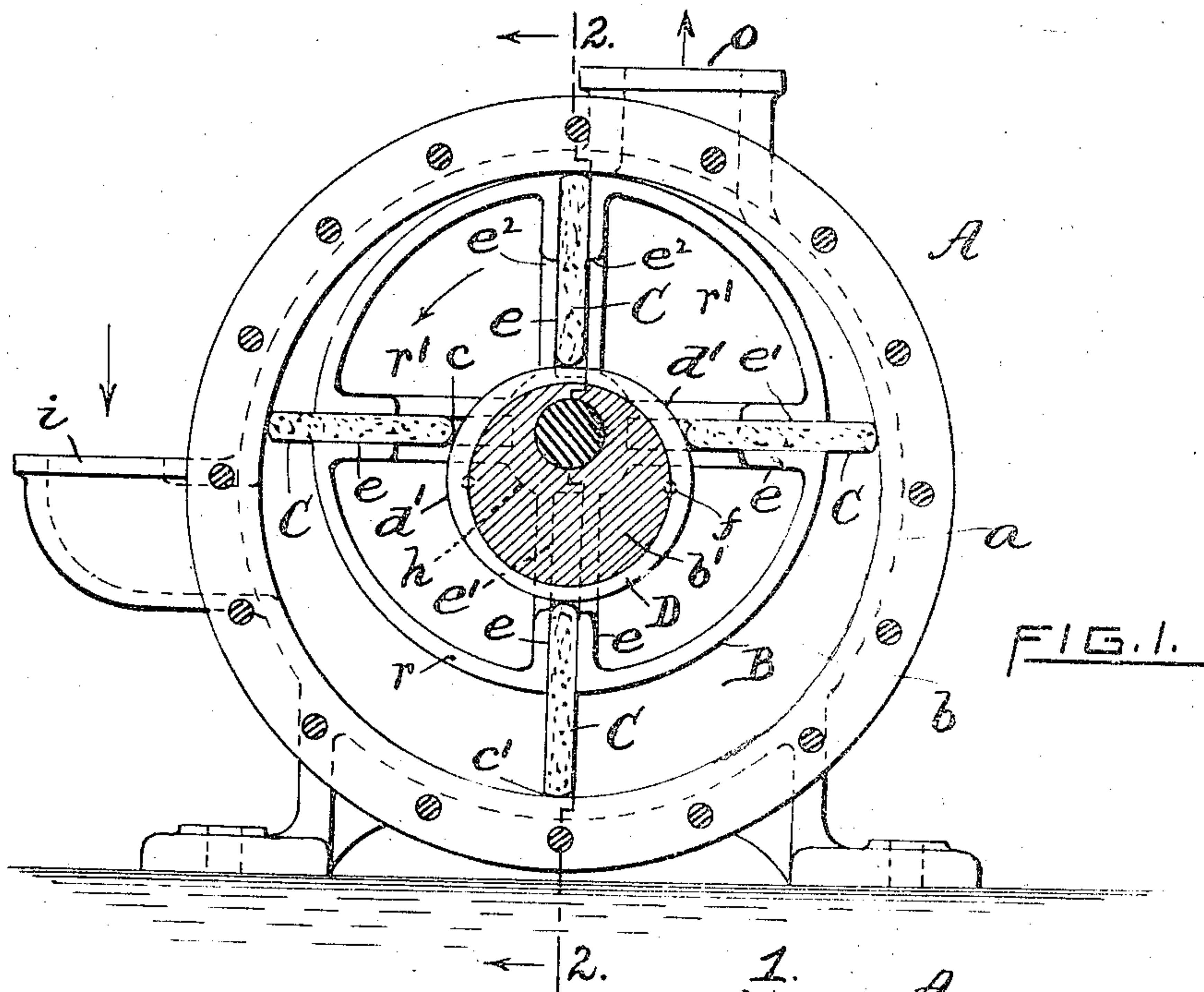


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POSITIVE PRESSURE BLOWER.  
APPLICATION FILED NOV. 8, 1909.

959,049.

Patented May 24, 1910.



WITNESSES:  
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Atty.



# UNITED STATES PATENT OFFICE.

FRANCIS P. BOLAND, OF PROVIDENCE, RHODE ISLAND.

## POSITIVE-PRESSURE BLOWER.

959,049.

Specification of Letters Patent.

Patented May 24, 1910.

Application filed November 8, 1909. Serial No. 526,771.

*To all whom it may concern:*

Be it known that I, FRANCIS P. BOLAND, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Positive-Pressure Blowers, of which the following is a specification.

My present invention relates to improvements in rotary pressure blowers, and it consists essentially in the novel construction of the blades or wings, and means for positively insuring continuous engagement of the blades with the bore of the cylinder; all as fully hereinafter described and claimed.

The objects sought to be attained are as follows: To produce a rotary pressure blower that is simple in construction, comparatively inexpensive to manufacture; having a minimum number of parts; reduced weight, practically frictionless and noiseless when in action; readily accessible for inspection or repair, and possessing increased efficiency.

In the drawings herewith, Figure 1 represents, in partial front elevation and section (the latter being taken on line 1 1 of Fig. 2), a rotary pressure blower embodying my invention. Fig. 2 is a longitudinal sectional view, taken on line 2 2 of Fig. 1. Fig. 3 represents an end view of one of the stationary rings or collars, detached; and Figs. 4 and 5 represent side and end elevations, respectively, of the blade itself, slightly modified.

Again referring to the drawings, A designates my improved rotary pressure blower, as a whole. The cylinder or casing *a* is bored true throughout its length, and provided with suitable intake and discharge nozzles, as *i* and *o*. A head, *b*, is removably secured to each end of the casing, the same as drawn, having outer and inner hubs forming alining bearings for the horizontal driving-shaft *s*. The inner part, *b*<sup>1</sup>, of the bearing portion is enlarged and also concentric with the center of the head, while the outer portion is disposed eccentrically to it, as clearly shown. As usual in blowers of this type, the bore of the said bearing is disposed eccentric to or noncentral with respect to the casing's axis; the amount of such eccentricity being equal to one-half the "throw" or radial movement of the blades carried by the revoluble piston.

The piston B is cylindrical and turned off

true, its length being practically equal to the distance between the adjacent faces of the heads *b*, and is provided with a central hub, *h*, keyed to the said shaft *s*. The hub portion is somewhat shorter than the rim, being in fact substantially the same as the distance between the inner faces of the said enlarged parts *b*<sup>1</sup>. The piston is provided with a plurality of slotted openings, *e*<sup>1</sup>, extending radially from the hub *h* to the piston's periphery. The inner faces of the side walls *e* of each opening are parallel and adapted to receive and support therebetween a movable blade C, soon to be described. The ends of said walls or arms adjacent the heads *b* are cut away or recessed at *e*<sup>2</sup>, and are also flush with the ends of the hub *h*, so as to freely pass the stationary parts *b*<sup>1</sup>. The piston is further provided with the thin outer rim sections *r* and also the central transverse web *r*<sup>1</sup>.

In blowers, as usually constructed, the radially movable blades mounted in the revoluble piston are made of metal, thus increasing the weight of the moving parts, while at the same time the correspondingly increased centrifugal force produces greater friction and wear, to overcome which relatively greater power must be expended.

In my improved blower I prefer to use non-metallic blades, C, made of compressed suitable fibrous material produced, say from wood, paper or rag pulp. The blades are light, plain rectangular-shaped members having their inner and outer edges, *e* and *e*<sup>1</sup>, suitably shaped and adapted to bear lightly against the adjacent stationary surfaces of the cylinder and its two center hubs; the ends of the blades at the same time being in substantial engagement with the inner faces of the heads *b*, all as clearly shown in Figs. 1 and 2.

In blowers of the type referred to, and as usually devised, wherein a true cylindrical piston is revolubly mounted eccentrically to and within the bore of the casing *a*, the relation of the one to the other is such that during certain portions of each revolution the inner or lower edges of the blades do not travel in a perfectly true circular path, that is, a path concentric with the bore of the casing, thereby producing irregular blade action, permitting a greater percentage of loss by leakage of the air or fluid being acted upon, and also producing increased wear.



Moreover, in case the blower is actuated at a comparatively slow speed rate, the blades are liable to, and in fact do, make a disagreeable noise by reason of the lost motion or play due to such construction. In some cases the working edges of the blades are provided with resilient or self-acting packing devices for overcoming the objections just referred to.

10 In order to simplify the construction and at the same time increase the efficiency of the blower, the peripheral face of said inner part  $v^1$  of the hub of each head  $b$  is turned off true and concentric with the casing's bore, and provided with a thin steel ring, D, 15 removably secured thereon. The ring is bored to snugly receive the said hub part, and secured in position by pins or screws  $f$ . The ring member is not wholly uniform in 20 thickness, or annular, but is slightly elliptical or oval, being provided with oppositely disposed, peripheral, cam-like projections,  $d^1$ , which merge gradually into and are integral with the other or more concentric portions of the ring. See Figs. 1 and 3. These 25 members,  $d^1$ , are devised and positioned so that a uniform distance is maintained laterally or radially between the bore of the casing and the perimeter of the ring D; the said distance being just equal to the depth or width of the blades C. Thus it will be obvious that the opposite edges,  $c^1$  and  $c$ , of the blades are in continuous frictional engagement, respectively, with the casing's 30 bore and the periphery of the ring D throughout the revolution of the piston.

If desired, the blades may be further stiffened or strengthened by means of thin

metal plates,  $c^2$ , secured thereto, as indicated in Figs. 4 and 5.

What I claim as my invention is:

1. In a positive-pressure blower, the combination with a bored casing provided with intake and discharge passages, and end heads secured to the casing, each having a short, inwardly extending, slightly oval-shaped hub, of a cylindrical-shaped piston disposed eccentrically to and revolubly mounted in the casing's chamber, and a plurality of blades, uniformly alike in width and length, movably mounted in and carried 45 50 bodily by the piston; the contour surface of the said hubs in connection with the bored surface of the casing forming a space therebetween such that, when in action, the inner and outer edges of the blades are adapted to be in substantial continuous frictional contact with said surfaces during each revolution of the piston. 55

2. In a blower of the character described, provided with a casing and a revolubly mounted blade-carrying piston, a pair of head members secured to the casing, each having an inner hub portion disposed concentrically therewith, and a thin, oval-shaped metal ring bored to receive said hub and being removably secured to and positioned upon it, for the purpose hereinbefore set forth. 60 65

In testimony whereof I have affixed my signature in presence of two witnesses. 70

FRANCIS P. BOLAND.

Witnesses:

GEO. H. REMINGTON,  
CALVIN H. BROWN.