

No. 863,832

PATENTED AUG. 20, 1907.

F. P. BOLAND.
POSITIVE PRESSURE BLOWER.

APPLICATION FILED FEB. 18, 1907.

FIG. 1.

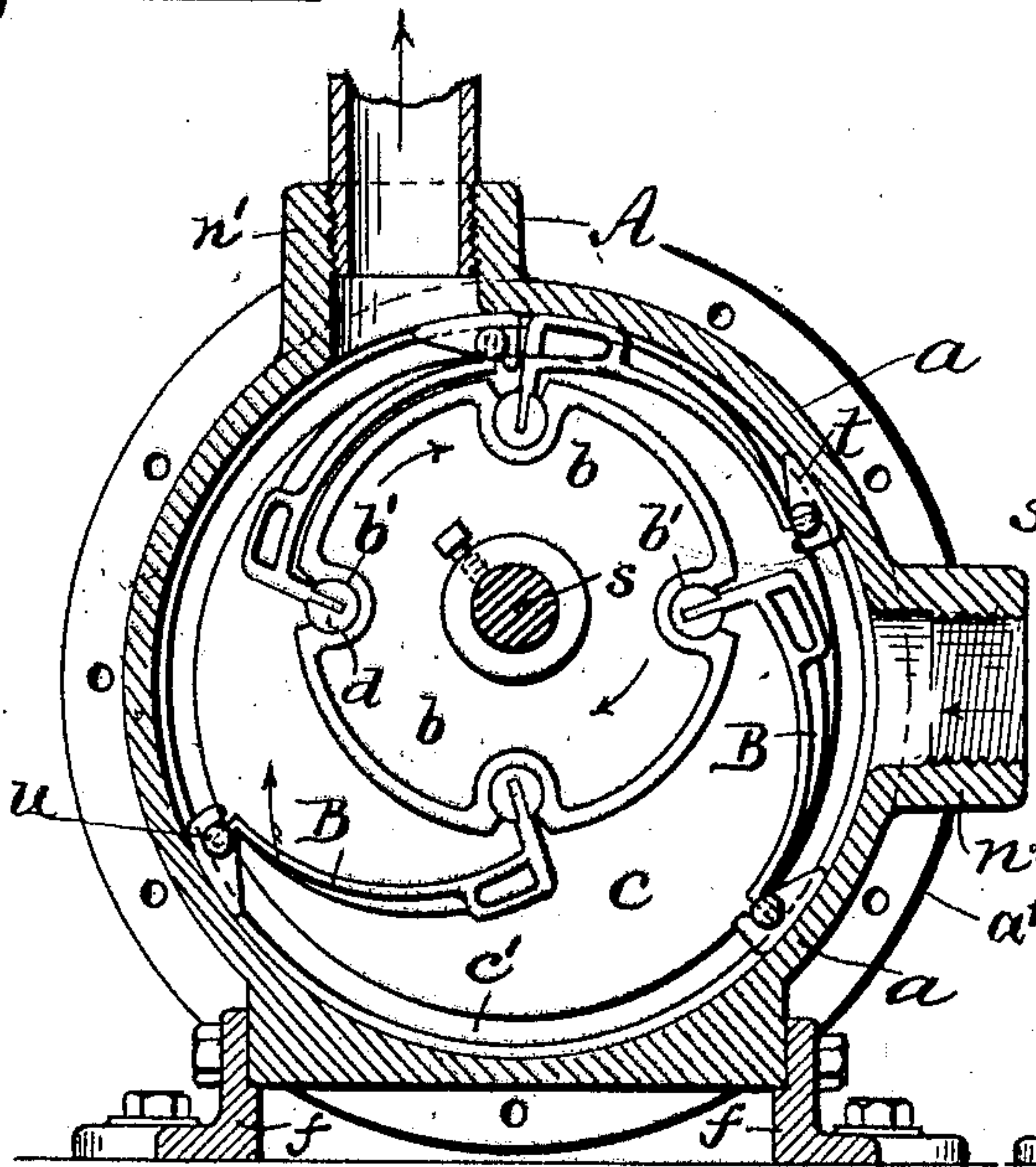


FIG. 2.

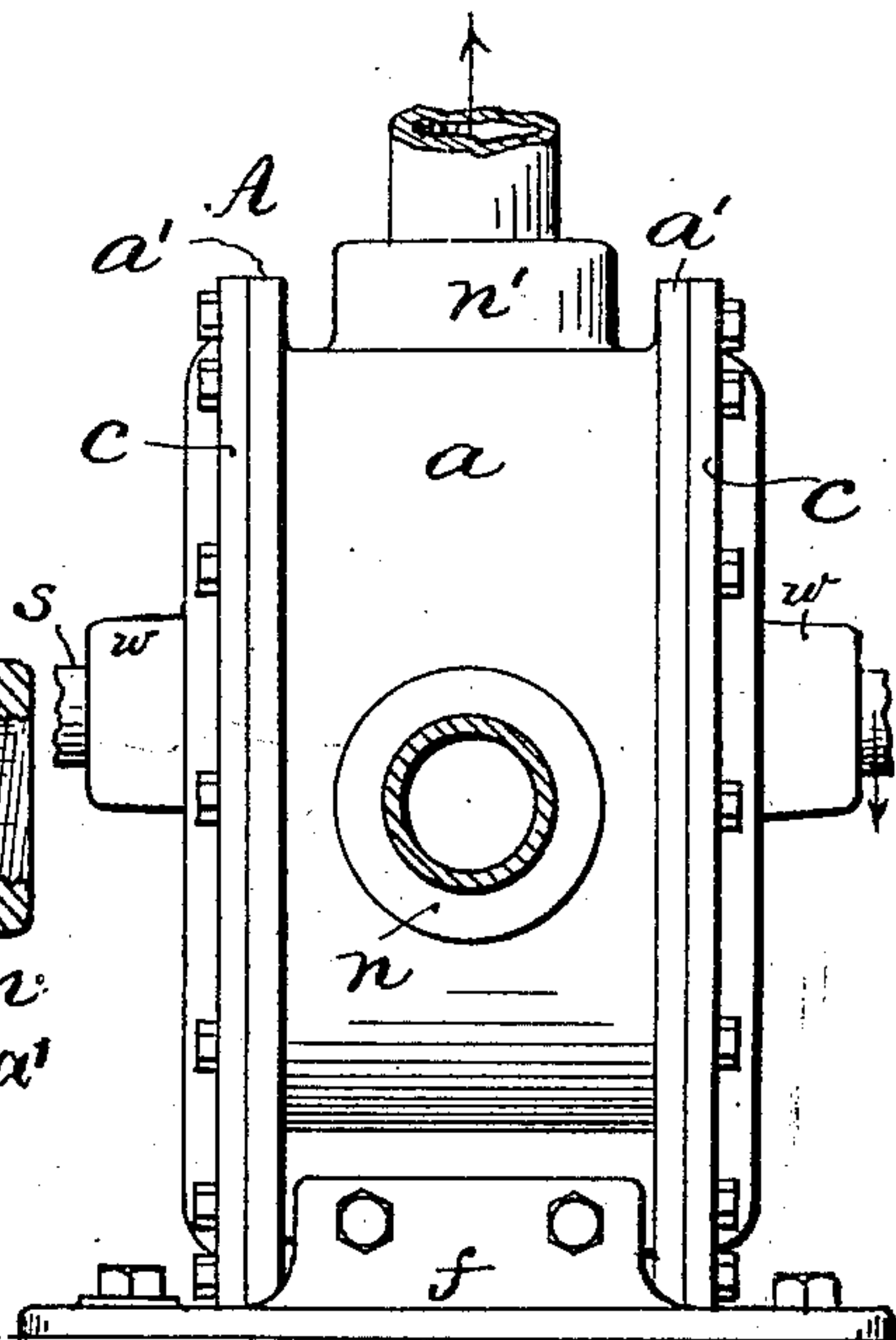


FIG. 3.

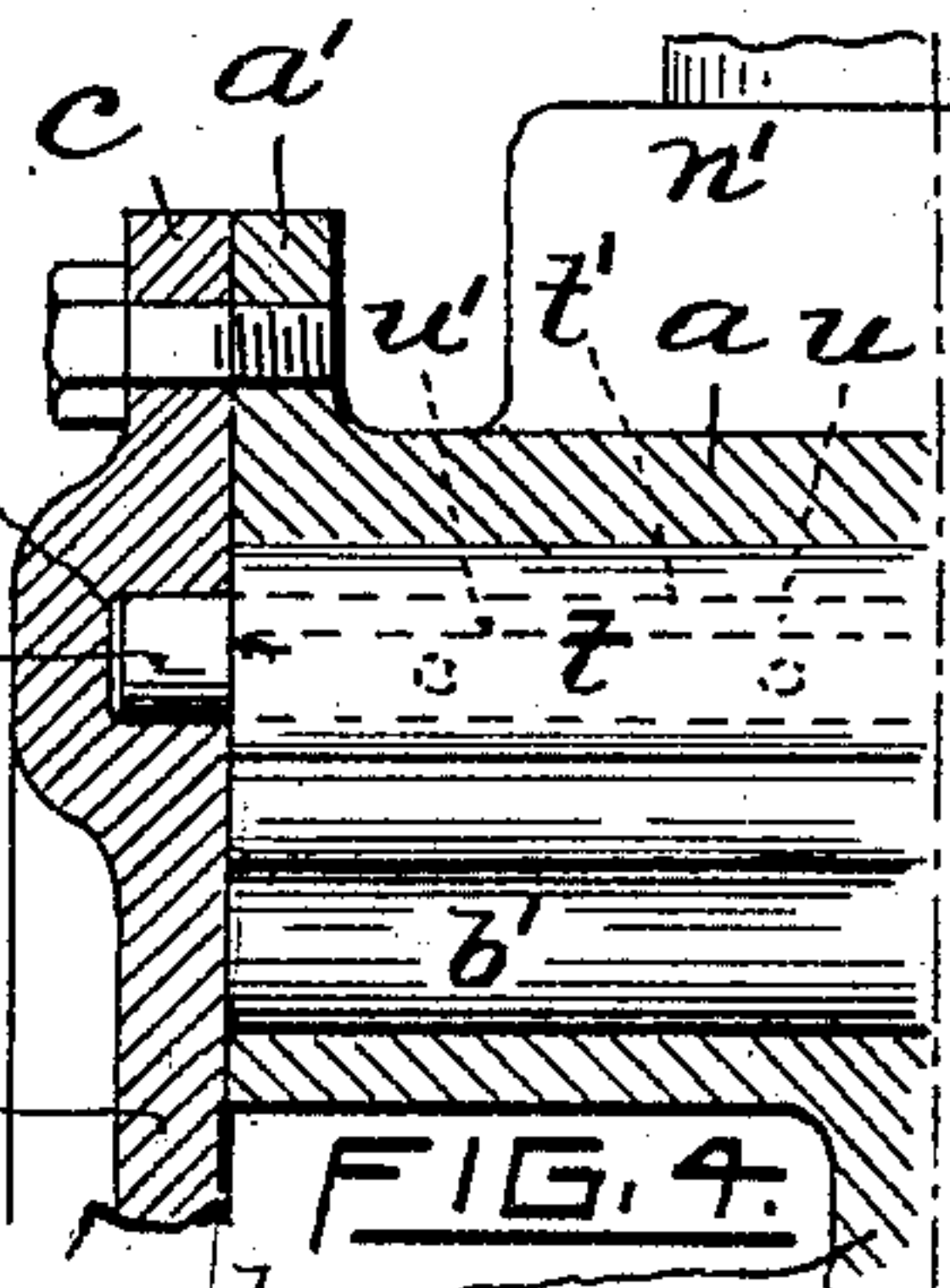
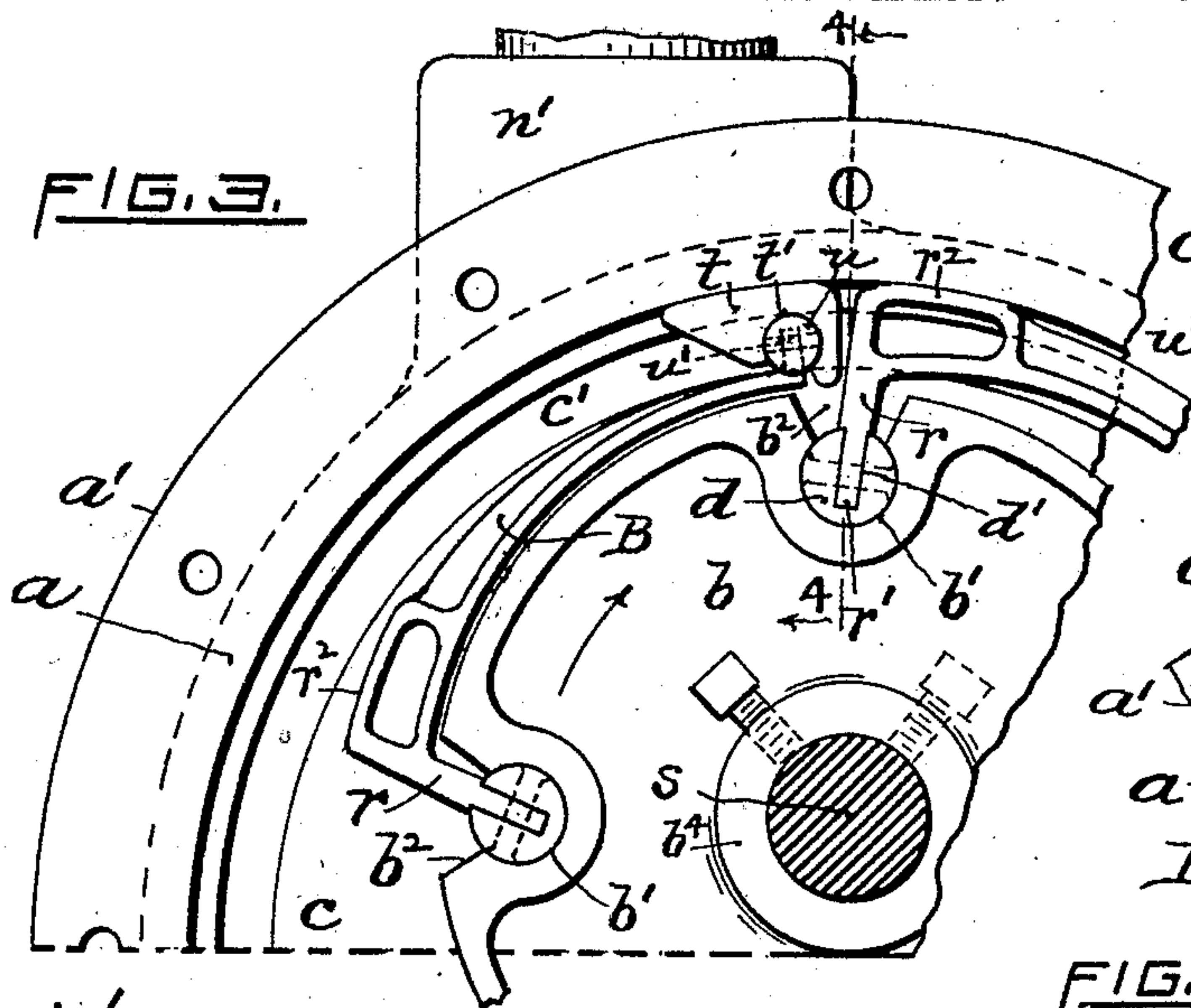
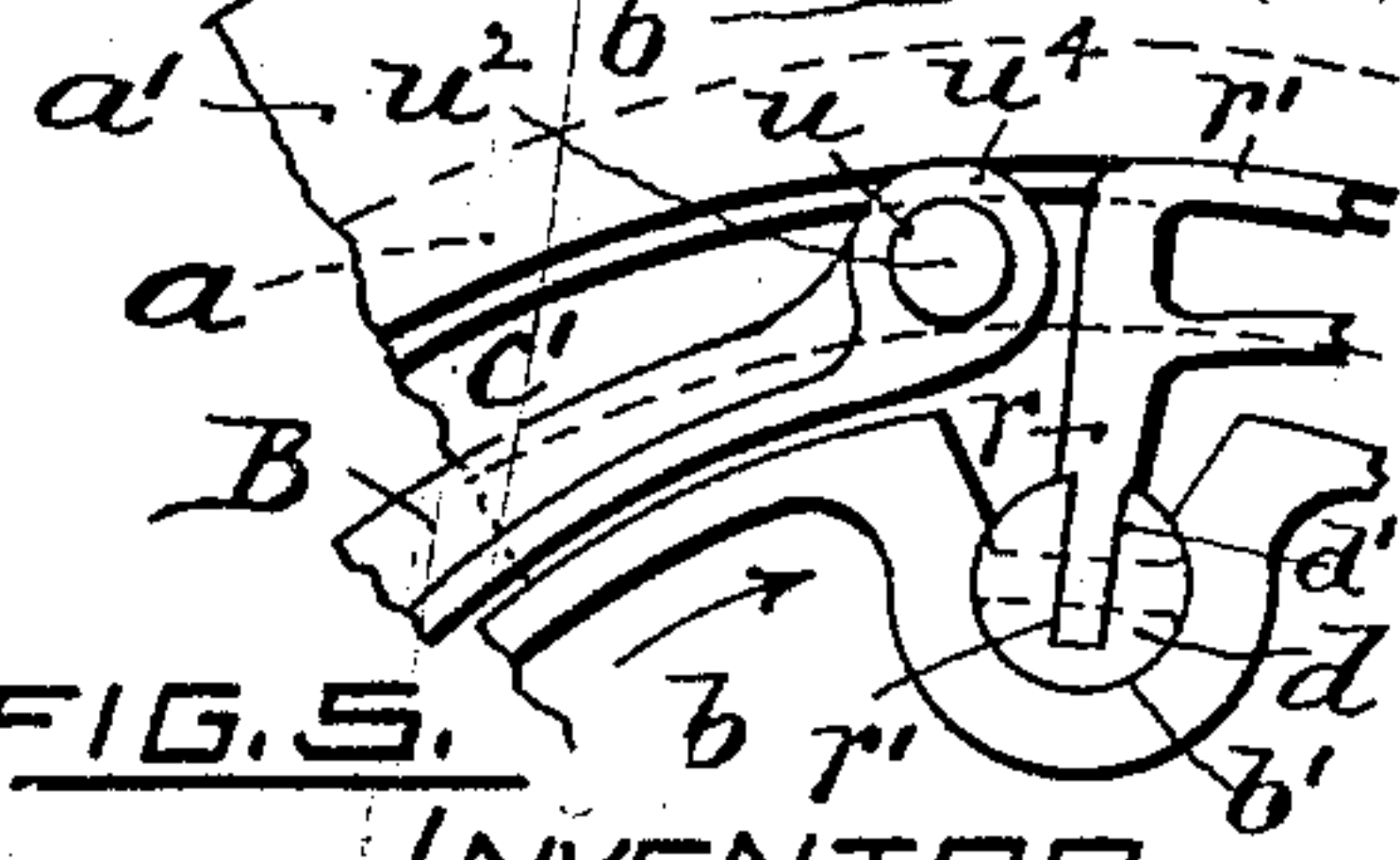


FIG. 5.



WITNESSES:

C. J. Hannigan.
Calvin H. Brown

INVENTOR.

Francis P. Boland
By Geo. W. Remington.
ATTY.

UNITED STATES PATENT OFFICE.

FRANCIS P. BOLAND, OF PROVIDENCE, RHODE ISLAND.

POSITIVE-PRESSURE BLOWER.

No. 863,832.

Specification of Letters Patent.

Patented Aug. 20, 1907.

Application filed February 18, 1907. Serial No. 357,837.

To all whom it may concern:

Be it known that I, FRANCIS P. BOLAND, a citizen of the United States of America, and a resident of 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 invention herewith relates to certain novel improvements in positive-pressure blowers, so-called, that is blowers of the class having suitably incased revolvable disks or cylinder members carrying independently movable blades or wings capable of being automatically opened and closed in a radial direction during each revolution of the blower.

The object I have in view is to produce a blowing machine of the general type referred to in which a greater degree of efficiency may be attained, the device being simple in construction, easily operated and not liable to get out of order.

To these ends the invention consists, essentially, of a bored annular casing having suitably disposed air-inlet and discharge passages, front and rear head or cover members secured to the casing having eccentrically arranged alining bearings, a revolvable shaft mounted in said bearings, a disk or cylinder secured to the shaft and extending the length of said casing, and a plurality of positively swinging blades or wings mounted in the periphery of and extending longitudinally of the cylinder, each blade having its free or outer end portion supported in concentric grooves formed in the said casing's heads and arranged so as to form a continuous and practically air-tight joint with the bore of the casing, all as will be more fully hereinafter set forth and claimed.

In the accompanying sheet of drawings, Figure 1 represents a front elevation of the interior construction and arrangement of my improved positive-pressure blower, the outer casing and driving shaft being shown in transverse section. Fig. 2 represents a side elevation of the blower. Fig. 3 shows, in enlarged scale, a partial end elevation, corresponding with Fig. 1, the front cover being omitted. Fig. 4 is a partial longitudinal central sectional view, taken substantially on line 4 4 of Fig. 3, some of the parts being omitted, and Fig. 5 is a partial end elevation showing a slight modification of the construction.

In my improved positive-pressure blower A the outer or main annular casing u is provided with end flanges, a^1 a^1 , and suitably located air-inlet and air-outlet passages, n , n^1 , respectively. The base portion of the casing may have supporting feet f removably secured thereto, as clearly shown. The casing member is bored out and the outer face of the flanges faced off true in a well-known manner.

To each end of the casing is suitably secured a head or cover c , the latter being faced so as to register with

the respective flanges a^1 . At a distance from the center of the covers and integral therewith are formed suitable bearings w , the two being in alinement with each other longitudinally of the blower and adapted to support a revolvable shaft s therein, substantially as usual. At a point adjacent the bore of the casing and concentric therewith the face of each member c is provided with a groove c^1 . See also Fig. 4.

A turned and faced cylinder or piston member b , having a hub b^4 , is rigidly secured to said shaft, its length being equal to the longitudinal distance between the adjacent faces of the members c , less a slight play. The diameter of the revolvable cylinder, being non-concentric with the casing as before stated, is such that a space say of about one inch is formed between its upper side and the bore at a point contiguous to the discharge-outlet. As drawn, the rim portion of the cylinder is provided with four equally spaced longitudinally arranged parallel circular seats b^1 , each being in open communication with its flaring mouth b^2 . In each of said openings b^1 is inserted a pintle or rock-shaft d provided with a deep longitudinal central groove d^1 .

The wings or blades B are mounted in, carried by and are normally concentric with and extend the length of the cylinder b . Each blade member is provided with a short shank r , the latter being reduced in thickness at r^1 and fitted into the said groove of the respective pintle, and secured therein by rivets, see Fig. 3; thereby adapting the blade and pintle to vibrate or swing in the corresponding seat b^1 of the cylinder while the latter is in action. The length of each blade circumferentially of the cylinder is nearly one-fourth of its periphery. The outer or free end w^1 of the blade is bent upwardly and inserted in a longitudinal groove formed centrally in the small guide-rod or pintle u and secured therein by rivets in substantially the same way as just described with respect to the pintles d . The end portions u^2 (Fig. 4) of each rod u extend into and travel in the respective annular grooves c^1 of the heads c , all as clearly indicated in the drawings.

In order to increase the bearing surface and to insure a more perfect joint between the bore of the casing and the blades each of the pintles u is inserted in a longitudinal circular groove t^1 formed in the underside of a shoe member t ; the mouth of the groove being enlarged so as to permit the shoe to rock or swing on the rod, thereby adapting the former to automatically adapt itself to the bore of the casing while being carried around by the cylinder, the blade itself at the same time swinging in its bearing b^1 . The heel part of each blade is extended radially to form a projection, r^2 ; these are adapted to successively prevent the escape of air under pressure past the cylinder and blades into the inlet-opening. See Figs. 1 and 3.

In my improved positive-pressure blower A atmospheric air enters, via the suitably connected air-inlet passage n , the several air-tight pockets produced in the main chamber between the bore of the casing and the outer periphery of the rapidly revoluble cylinder or piston member b ; the action of the latter advancing the wings B circumferentially and in unison, while at the same time the coaction of the rods or pintles u extending into the annular concentric grooves c^1 of the heads c operate to automatically swing the wings on the respective pivots, thereby opening and closing the pockets. The volume of air confined in each pocket is compressed to the desired pressure by the closing movement of the wings and successively discharged into the outlet-passage n^1 .

It will be observed that the shoes t pivoted on the rods u automatically adapt or adjust themselves to the varying positions of the wings during each revolution of the piston, thereby maintaining air-tight joints between the shoes and the bore of the casing and preventing the escape of air from the pockets until the advancing shoes uncover the discharge-opening.

It may be added that the presence of the guide-grooves c^1 and the coöperation therewith of the swinging wings prevent the latter from dropping by gravity onto the surface of the piston. In blowers unprovided with the grooves considerable noise is produced by the striking of the wings upon the revolving piston while they are passing the upper center at a rate of speed less than that required to overcome the inertia. The coaction of the forward part of the wing and the

raised lug r^2 of the heel part serve to practically close the air space above the piston while the wing is moving between the air-outlet and inlet, thereby preventing the escape of air under pressure into the air-intake passage.

In lieu of pivoting the shoe or joint members on the pintles u (which I deem the preferable arrangement) each wing may be made integral, its outer or swinging end being substantially cylindrical, as represented at u^4 in Fig. 5, and constructed to enter the grooves c^1 of the heads c .

What I claim as new and desire to secure by United States Letters Patent, is—

In a positive-pressure blower having a bored casing provided with air-inlet and air-outlet passages, head members secured to the casing having formed in each a continuous inner guide-groove c^1 located contiguous to and concentric with the casing's bore, and a revoluble piston having its axis parallel with but laterally separated from the axis of the casing, in combination with a plurality of swinging peripheral wings B pivoted to and carried by said piston, each wing having its advance or free end in normal contact with the cylinder and also movably mounted in said guide-grooves c^1 and having the opposite or heel end of the wing provided with a transversely disposed raised lug arranged in coöperation with said advance end for practically closing the air space above the piston while the wing is travelling between the said air-outlet and inlet passages, substantially as shown and described.

Signed at Providence, R. I., this 15th day of February, 1907.

FRANCIS P. BOLAND.

Witnesses:

GEO. H. REMINGTON,
CALVIN H. BROWN.