

B. LOBEE.
 ROTARY PUMP.
 APPLICATION FILED DEC. 19, 1908.

967,400.

Patented Aug. 16, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

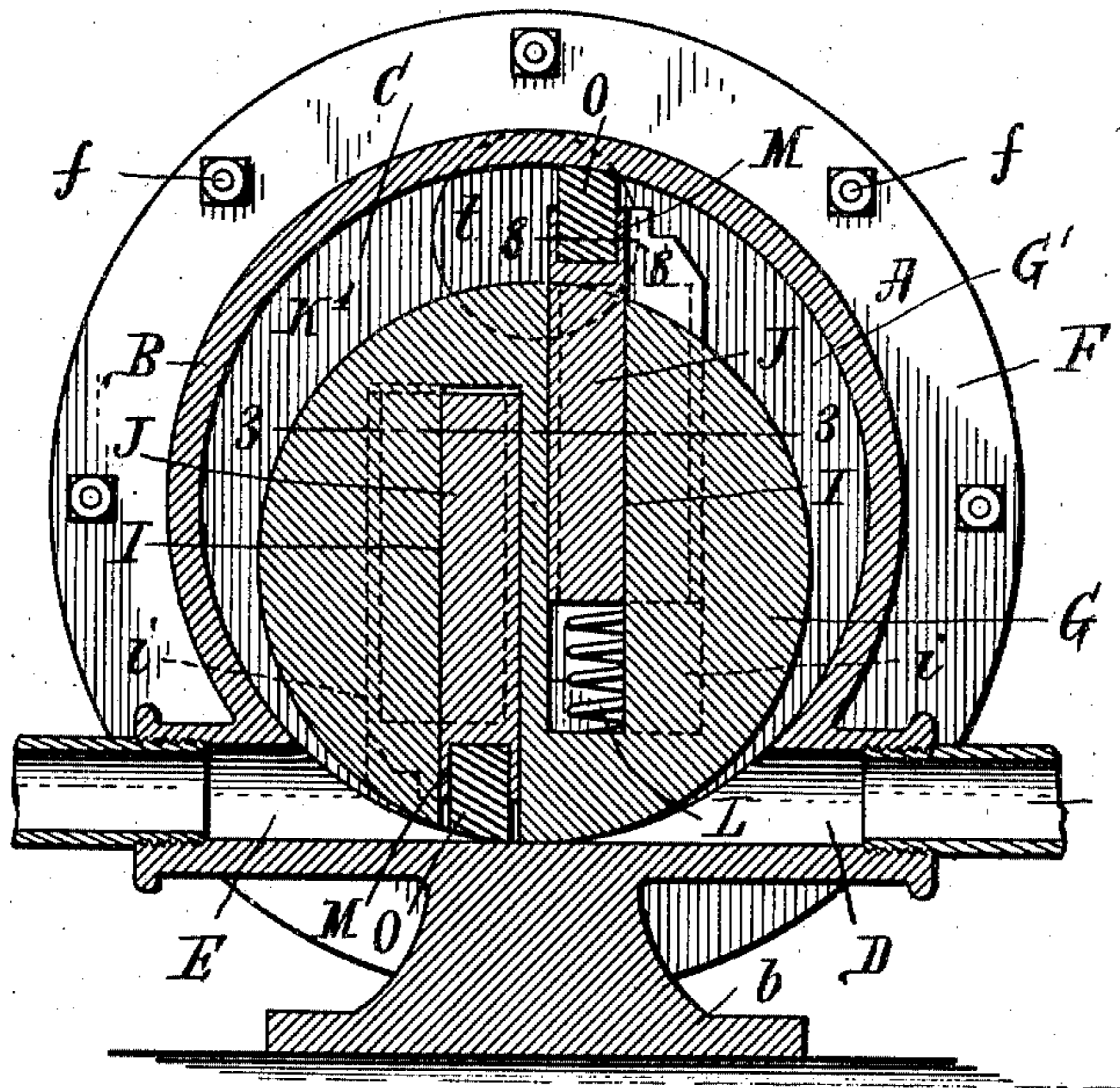
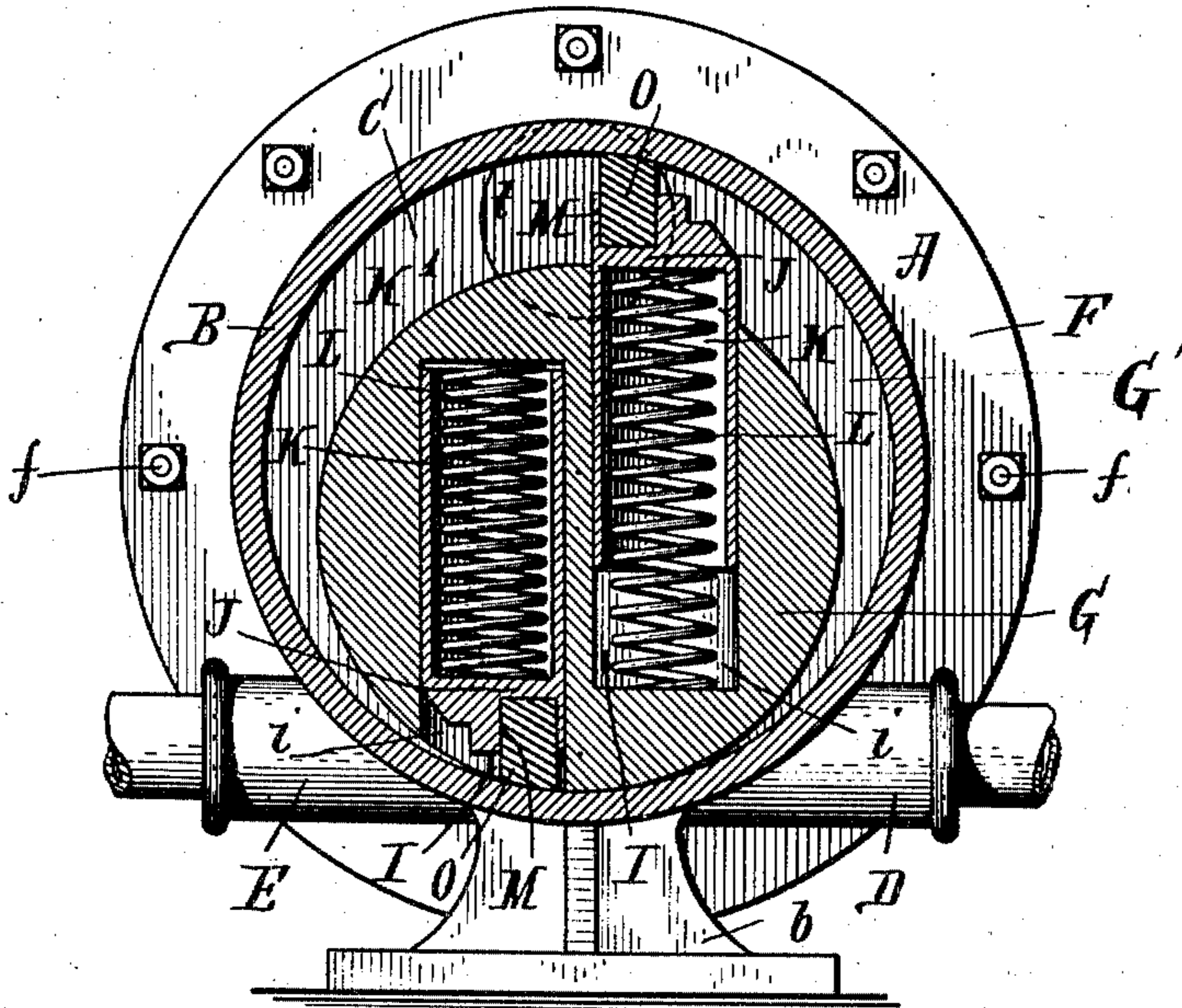


Fig. 2.



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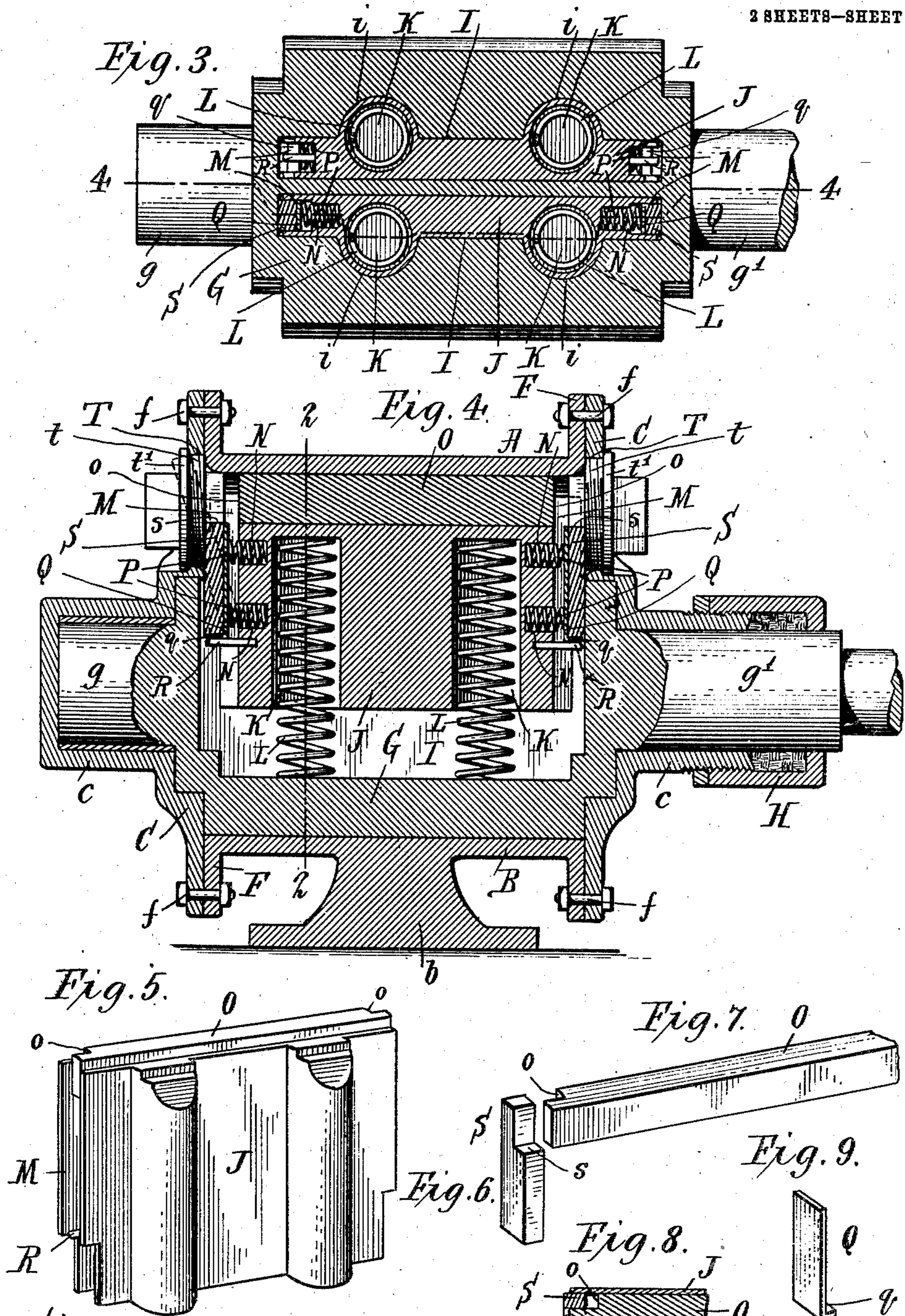
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UNITED STATES PATENT OFFICE.

BART LOBEE, OF BUFFALO, NEW YORK.

ROTARY PUMP.

967,400.

Specification of Letters Patent.

Patented Aug. 16, 1910.

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To all whom it may concern:

Be it known that I, BART LOBEE, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Rotary Pumps, of which the following is a specification.

My invention relates to an improved rotary-pump, and the primary object of my invention is the production of a simple and inexpensive pump which will serve admirably as a vacuum pump, yet retain its high efficiency in pumping all kinds of thin and thick liquids.

Another object is the provision of means whereby a long and comparatively large spring in diameter can be used to hold the piston-blades against the peripheral wall of the pump casing without increasing the thickness of said blades, except at points where said springs are located.

Further objects are, to provide the longitudinal and end edges of said blades with wear-pieces and the casing with openings through which said wear-pieces may be removed; and to otherwise improve the construction of the pump with a view of simplifying the same and increasing its effectiveness and durability.

To these ends the invention consists in the construction, arrangement and combination of parts to be hereinafter described and particularly pointed out in the subjoined claims.

Reference is to be had to the accompanying drawings, in which,—

Figure 1 is a central transverse vertical section of a pump constructed according to my invention. Fig. 2 is a transverse vertical section taken through the pump, on or about line 2—2, Fig. 4. Fig. 3 is a horizontal section of the complete piston taken on line 3—3, Fig. 1. Fig. 4 is a vertical longitudinal section taken on line 4—4, Fig. 3, with the piston within the casing. Fig. 5 is a detached perspective view of one of the piston-blades. Fig. 6 is a perspective view of the outer portion of one of the end wear-pieces of a piston blade. Fig. 7 is a perspective view of a portion of the longitudinal wear-piece of one of the piston-blades. Fig. 8 is a longitudinal section through one end of one of the piston-blades, taken on line 8—8, Fig. 1. Fig. 9 is a perspective view of one of the retaining-members for the springs in the ends of the blades.

Referring now to the drawings in detail, like letters of reference refer to like parts in the several figures.

The reference letter A designates the casing comprising a cylindrical body-portion B having a base *b*, and heads or end-walls C having bearings *c*. The cylindrical body-portion B has the usual inlet D and outlet E and at its ends it has outstanding annular flanges F through which and the heads C, bolts *f* are passed to fasten said heads to the body-portion. Within said casing a piston G is eccentrically arranged to provide a crescent-shaped pumping-chamber *G*¹ having the inlet D at one end thereof and the outlet E at its other end. The piston has an integral stud-shaft *g* at one end which enters the bearing in one of the heads C and at its other end it has an integral shaft *g*¹ which passes through the bearing in the opposite head and is adapted to have a pulley secured thereto whereby the piston is revolved. A stuffing-box H is provided to prevent leakage along the shaft. Said piston, in the particular embodiment herein shown, has two parallel overlapping blade slide-ways I divided by a narrow wall and they extend from end to end of the piston body and almost through the same transversely. Said slideways have in their distant walls and at certain points between their ends, lateral substantially semi-circular enlargements *i* which extend from the inner end of the slide-ways to the surface of the piston. Piston-blades J are slidably held in said slide-ways and each has a pair of substantially semi-circular lateral enlargements on its outer side fitting into the enlargements of said slide-ways. Said blades are bored out from their inner edges to within a short distance of their outer edges at the points where they are enlarged laterally to form pockets K and in these pockets and the enlarged portions of the slide-ways, coil-springs L are placed, one of their ends bearing against the inner ends of said pockets and their opposite ends bearing against the inner walls of said slide-ways. By enlarging the blades laterally and boring into them to form the pockets K, quite powerful springs can be used which will act effectively to hold the blades against the cylindrical wall of the casing and which will not so quickly lose their resiliency and effectiveness. This construction also permits the use of a comparatively powerful

spring without increasing the thickness of the blades except at the points where the springs are located, and as the blades are hollowed out at such points, there is practically no increase in the weight of the same. Furthermore, these advantages are obtained without enlarging the diameter of the piston, and without sacrificing any advantages common in ordinary pumps of this type.

The end edges and the outer longitudinal edge of each blade are grooved, as at M, and at the ends, there are pockets N which open into the end grooves. In the grooves M at the longitudinal edges of the blades, hard rubber or other wearing-pieces O of suitable material are held by frictional contact. Within the pockets N, coil springs P are held which project into the end grooves, and in the latter spring-retaining members Q are held against which the outer ends of said springs bear. Said retaining-members bear with their inner ends against stop-pins R which are driven into the blades and extend into the end grooves. Between said spring-retaining members and the end walls of the casing are wear-pieces S which also bear with their inner ends against the stop-pins R. Said stop-pins prevent endwise movement of the spring-retaining members and the wear pieces S in one direction and said wear-pieces are held against endwise movement in the other direction by the co-operating longitudinal wear-piece O. The adjacent ends of the wear-pieces O and S of each blade are reduced in width to form shoulders *o* and *s* on the respective pieces; the shoulders of the end wear-pieces acting as stops that bear against the longitudinal wear-pieces. Said end wear pieces are therefore free to move against the action of the springs P but not endwise. In order to prevent the retaining-members entering between the outer ends of the stop-pins R and the end walls of the casing when the wear-pieces S are removed, the lower ends of said retaining members are bent at a right-angle, as at *q*.

In the heads or end walls of the casing, two alined and threaded openings T are formed and screw-plugs *t* are threaded into said openings and have their inner faces flush with the inner faces of said end-walls so that the end wear-pieces have a smooth and unbroken surface to bear against. Said plugs have peripheral flanges *t*¹ which bear against the outer surface of the heads and thus prevent said plugs projecting beyond the inner surfaces of said heads. Through the openings T, the wear-pieces may be removed when worn; the end pieces being first removed, as shown in dotted lines at the left in Fig. 4, after which the longitudinal wear-pieces may be driven from their retaining grooves; it being, of course, understood that

the piston must be positioned to bring the wear pieces in line with the openings T. By means of this construction, the wear-pieces can be replaced at any time without removing the heads of the casing, which is a very desirable feature of my invention. When inserting the end wear-pieces, the spring-retaining members provide a smooth yielding wall against which the inner ends of said wear-pieces are placed and down which they slide until they strike the bent ends of the retaining-member Q. Without said spring retaining-members, the springs P projecting from the pockets would act as obstructions to the insertion of said wear-pieces.

By the use of the yielding wear-pieces at the ends of the blades, a very effective vacuum pump is obtained.

Having thus described my invention, what I claim is,—

1. In a rotary-pump, the combination with a casing comprising a cylindrical wall and end walls and having an opening in one of its end walls, of a piston having a piston-blade slidable therein, and a wear-piece removably held to the longitudinal edge of said blade and removable from the latter through said opening.
2. In a rotary-pump, the combination with a casing having openings in opposite end walls, of a piston having a piston blade slidable therein, and wear-pieces removable from the blade through said openings.
3. In a rotary-pump, the combination with a casing having alined openings in opposite end walls and means to close said openings, of a piston revoluble in said casing and having a piston blade slidable therein provided with a groove in its longitudinal edge, and a wear-piece held in said groove and adapted to be removed through either of said openings.
4. In a rotary-pump, the combination with a casing having an opening in one of its end walls and a screw-plug closing said opening; of a revoluble piston in said casing, a piston-blade slidable in said piston and having a removable wear-piece held to one edge thereof, said wear-piece being removable from said piston-blade through said opening.
5. In a rotary-pump, the combination with a casing having alined openings in its end walls and means to close said openings, of a piston revoluble in said casing, a piston-blade slidable in said piston and having its outer longitudinal edge and its end edges provided with grooves, wear-pieces in said grooves and removable from the casing through said openings, and springs behind the wear-pieces in the end grooves of said valve.
6. In a rotary-pump, the combination with a casing having alined threaded openings in its end walls and screw-plugs closing said openings, of a piston revoluble in said cas-

ing, a spring-projected piston-blade slidable
in said piston and having grooves in its outer
longitudinal edge and its end edges and hav-
ing also pockets opening into the grooves in
5 said end edges, coil springs in said pockets
and projecting therefrom, and wear-pieces
in the edge grooves of said blade having re-
duced overlapping ends and being remov-
able from said blade through said aligned
10 openings, the wear pieces in the grooves
formed in the end edges being held against
the ends of the casing by said springs.

7. In a rotary-pump, the combination with
a casing having openings in opposite ends
15 and means to close said openings, of a piston
revoluble in said casing and having blade
slide-ways, piston-blades in said slide-ways
provided at their ends with grooves and
pockets opening into said grooves, coil
20 springs in said pockets and projecting into
said grooves, a spring-retaining member in
each of said grooves against which the pro-
jecting ends of said springs bear, and wear-
pieces between said retaining members and

the ends of the casing, said wear-pieces being 25
removable from the casing through the open-
ings in the ends thereof.

8. In a rotary-pump, the combination with
a casing, of a piston revoluble in said casing
and having blade slide-ways, piston-blades 30
in said slide-ways provided at their ends
with grooves and pockets opening into said
grooves, coil springs in said pockets and pro-
jecting into said grooves, a spring retaining-
member in each of said grooves against 35
which the projecting ends of said springs
bear, stops in said grooves against which the
lower ends of said retaining-members bear,
and wear-pieces between said retaining-mem-
bers and the ends of the casing. 40

In testimony whereof, I have affixed my
signature in the presence of two subscribing
witnesses.

BART LOBEE.

Witnesses:

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EMIL NEUHART.