No. 883,271. PATENTED MAR. 31, 1908.

G. WILSON.

ROTARY PUMP.

APPLICATION FILED SEPT. 16, 1907.

2 SHEETS—SHEET 1.

FIG. 1.

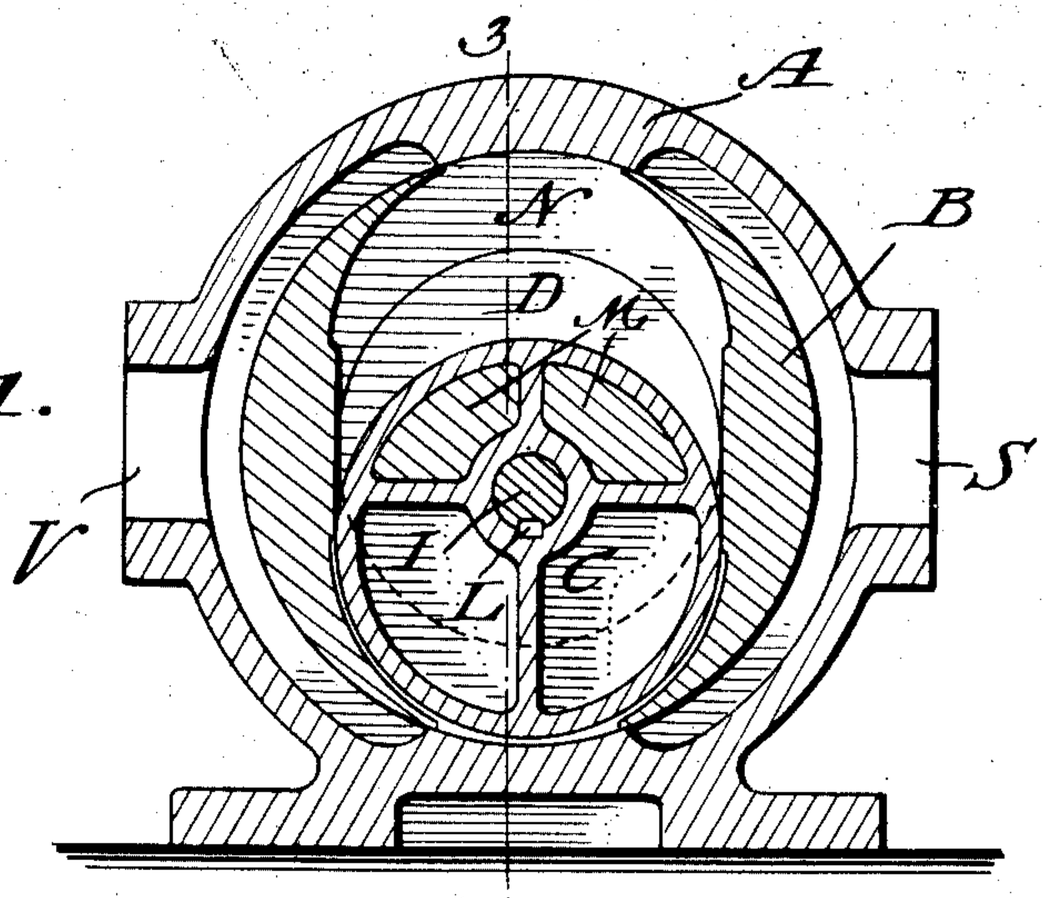


FIG. 2.

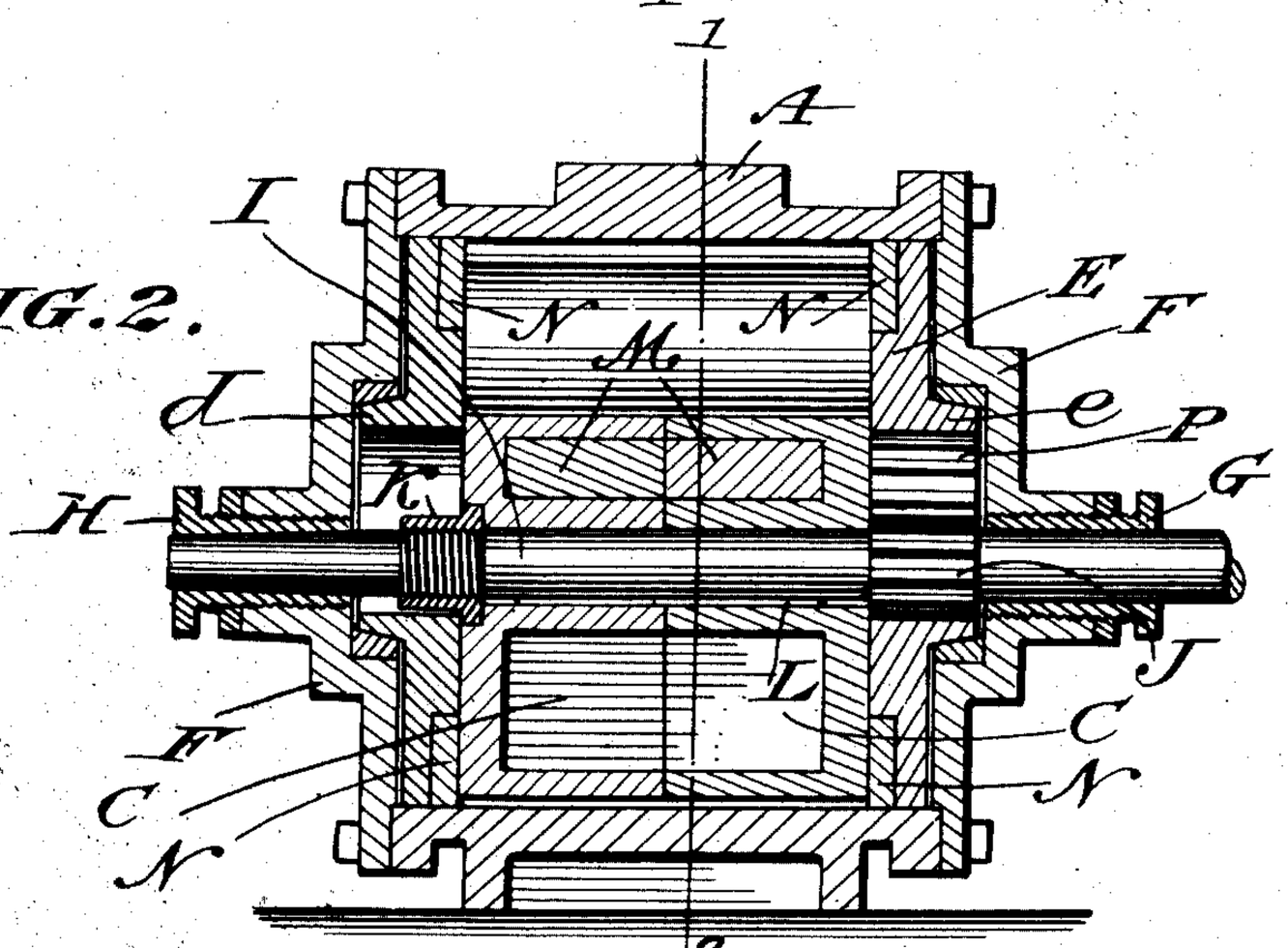
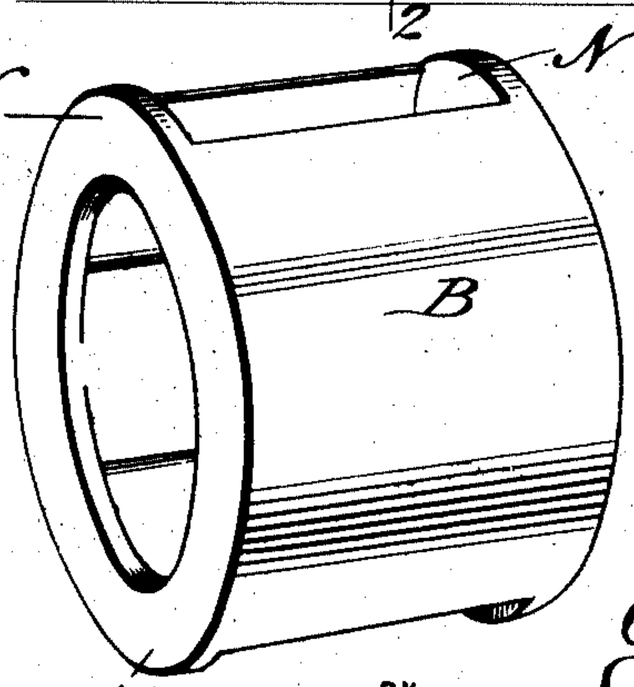


FIG. 5.



WITNESSES

A. R. Appleman

C. E. Mulreany

INVENTOR,

George Wilson,

BY

Edgar Tate & Co

ATTORNEYS

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2 SHEETS—SHEET 2.

FIG. 3.

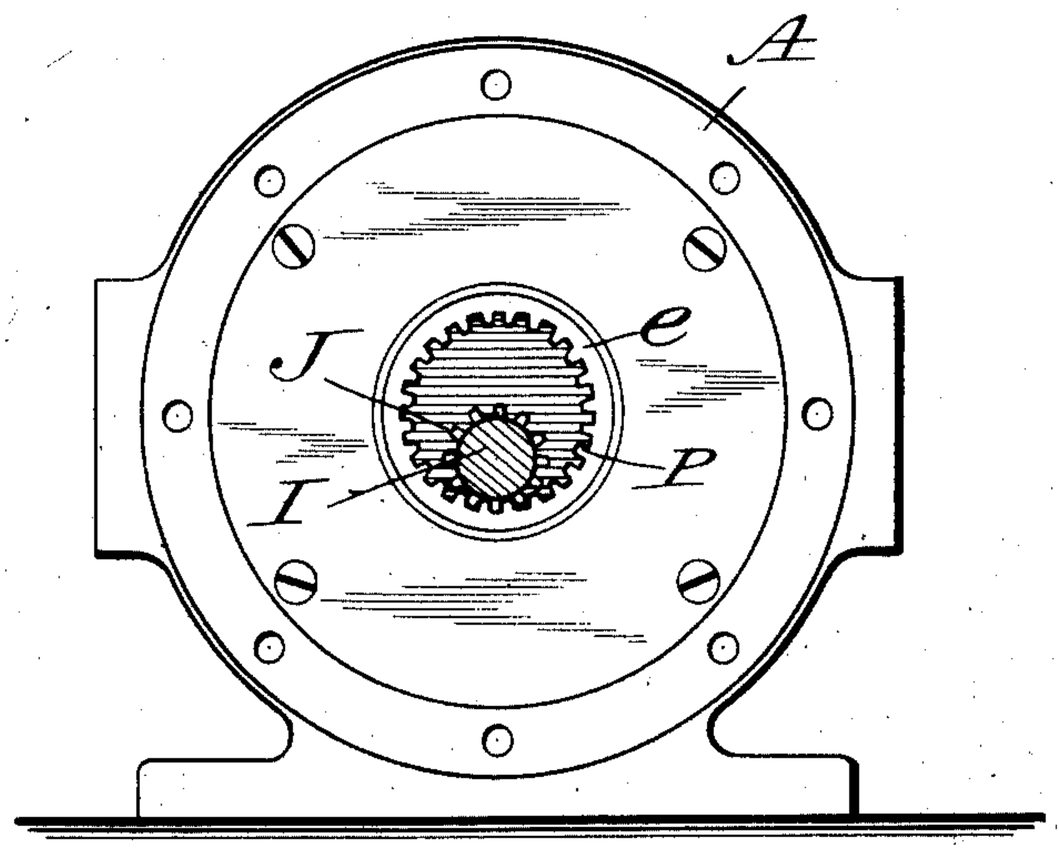
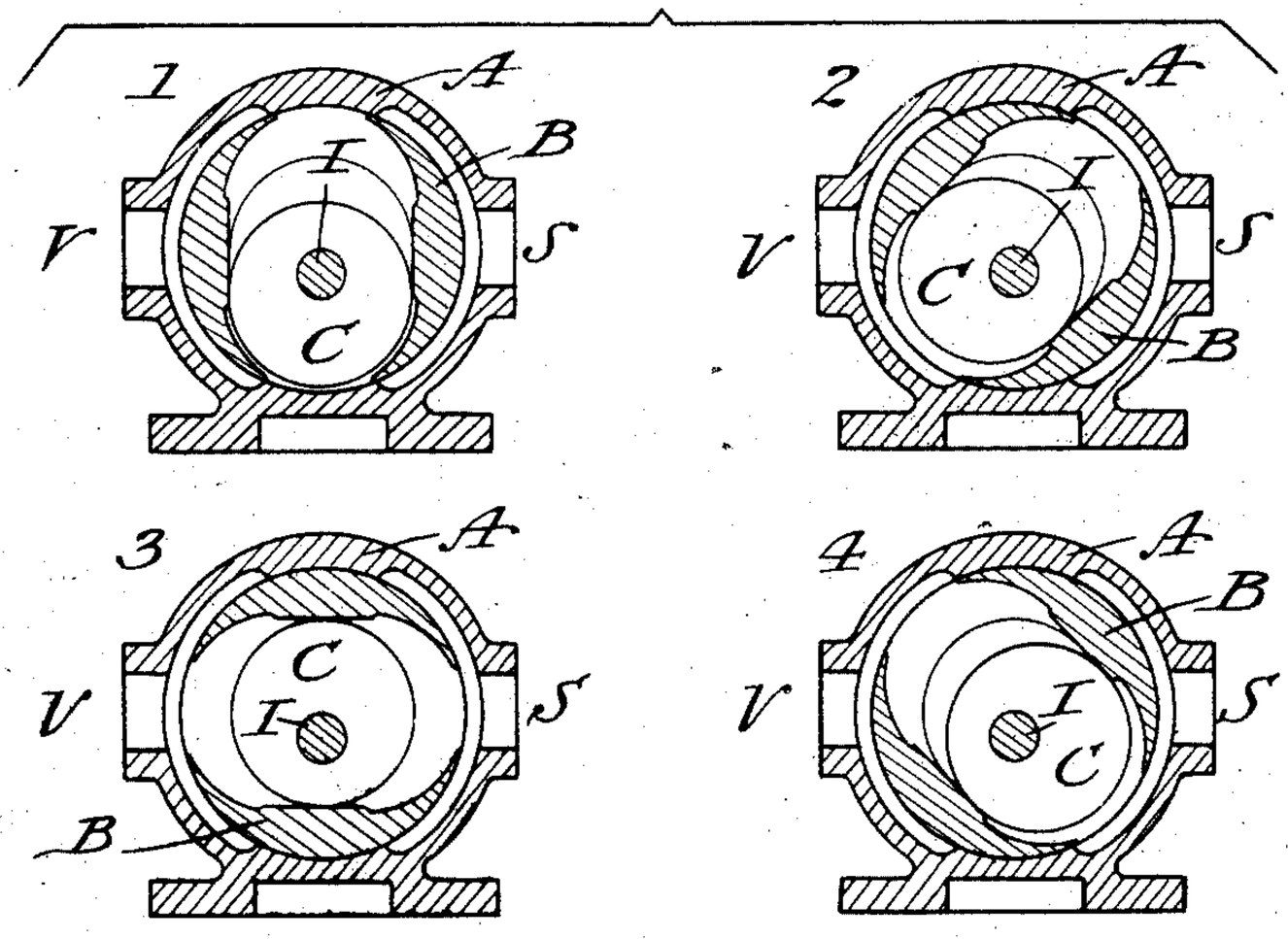


FIG. 4.



WITNESSES

A. R. Stoppleman

L. E. Mulreany

BY

INVENTOR,

George Wilson,

Edgar Tate & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE WILSON, OF SHARROW, SHEFFIELD, ENGLAND.

ROTARY PUMP.

No. 883,271. Specification of Letters Patent. Patented March 31, 1908.

Application filed September 16, 1907. Serial No. 393,000.

To all whom it may concern:

Be it known that I, GEORGE WILSON, a subject of the King of Great Britain, and residing at Sharrow, Sheffield, in the county of York, England, have invented certain new and useful Improvements in Rotary Pumps, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to rotary pumps, and the object thereof is to provide an improved device of this class which may be also used under certain conditions as a motor; and the invention consists in a novel construction of working parts enabling said parts to be easily, accurately and quickly machined; moreover the motion of each part being purely rotary is capable of being perfectly balanced so that when the pump is required to work on compressible fluids it may be driven at high speeds without risk or undue frictional resistances.

With my improved construction a pump may be used for either compressible or incompressible fluids or it can be used as a motor when subjected to fluids under adequate pressure.

That my invention may be better understood, I will now describe the same by reference to the drawings.

Figure 1 is a transverse section of a pump through the center as on line 1—2 of Fig. 2; Fig. 2 a longitudinal vertical section of the same through the axis of the casing as on line 3—4 of Fig. 1; Fig. 3 an end view of the pump with the end cover of the casing removed; and, Fig. 4 consists of a series of four diagrams showing the actual position of each working part at each quarter revolution of the driving shaft, and Fig. 5 a perspective view of the details of the construction.

In constructing a pump which embodies my improvements I provide a cylinder or casing A, having a suitable base for fixing and provided with inlet and outlet branches V and S; and close said cylinder ends by means of plates or covers F F one at each end respectively, and each end plate is provided eccentrically with a bearing wherein a toothed shaft or spindle I is carried, the eccentricity or distance from the center of the covers to the center of the shaft being equal to the eccentric radius of an eccentric drum C keyed upon the spindle I.

Fitting inside cylinder A and revolving within it I provide a cylindrical drum B, Fig. 1, diametrically across which I form a rectangular slot, the slot terminating at each end in openings or ports in the periphery of the drum, which, as the drum revolves come alternately in communication with suction and delivery ports V and S in the outer casing A. The said drum B is machined internally to form slides as shown, within which the eccentric drum C fits, revolves and reciprocates freely, the said drum being fixed by a key L upon the driving shaft I, supported in bearings G and H upon the outer covers or end plates F F, Fig. 2.

The width of the slot in the drum B measured in the direction of the axis of the drum is necessarily less than the length of the drum so that the end portions N N are left thereon. These end portions are bored out to a diameter which is equal to the transverse width of the slot; these holes may be finished with a milling cutter, the same cutter being used to finish the inner surfaces of the drum B between which the drum C revolves and slides.

The ends of the slotted drum B, are covered by circular plates E and D firmly and concentrically secured thereto, each plate being provided with a concentric boss *e* and *d* respectively which revolves in corresponding annular bushes fitted inside of the outer covers F F. The said end plate B is bored concentrically to clear the nut K while the center opening in the other end plate E is provided with internal spur teeth P forming an internal wheel which gears with the pinion J cut out of a solid collar upon the dividing shaft I, the number of teeth in the said pinion being in the proportion of one to two of the number of teeth in the internal wheel so that the shaft I shall make two revolutions for each revolution of the drum B, the end plate E and its internal wheel is so adjusted that when the drum C is in the center of the slot the eccentric radius of the drum C is at right angles of the center line of the slot.

The eccentric drum C is not only secured to the shaft I by the key L, but is further fixed by a flanged nut K which holds it against the end face of the pinion J. For the purpose of passing the drum C into the slot of the drum B, it is necessary to remove the end plate E, and when the pump is to be driven at high speeds, the drum C must be

carefully balanced on the shaft I. This can be readily accomplished by filling the spaces M M with the necessary amount of lead or other heavy metal and to facilitate this operation the drum C may be cast in two parts each part having one end closed, the two portions of the drum being then fixed on the shaft with the open ends together.

Fig. 3 shows clearly how the slotted drum B is geared to the shaft I by the internal wheel with teeth P and the pinion J there being twice the number of teeth in the wheel that there is in the pinion.

In Fig. 4 diagram 1 corresponds with Fig. 1 that is the eccentric drum C is shown at its greatest distance from the center of drum B.

The action of such a pump is as follows:— Assuming that the shaft I rotates in a clockwise direction, the slotted drum B will revolve in the same direction but with only one half the angular velocity of the said shaft, the eccentric drum C will revolve within the slot and reciprocate therein and its stroke within the slot will be four times the eccentric radius so that while one end of the slot is in communication with the inlet branch V in the casing A, the eccentric drum C will be receding from the said branch and thereby drawing into the slot while at the same time fluid will be ejected from the opposite end of the slot and so escape by the delivery branch S. When the slotted drum B has completed one half of a revolution, the eccentric drum C will have made one complete revolution, and during the next half of a revolution of drum B a similar cycle of operations will take place but with the ends of the slot reversed.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

In a rotary pump, a cylindrical casing provided at its opposite sides with inlet and outlet ports and having end plates provided in their inner faces with central circular recesses, a shaft passing eccentrically through said casing and said recesses, an eccentric drum keyed to said shaft, a second drum mounted on the eccentric drum within said casing and provided with a longitudinal and diametric slot which opens at the opposite sides thereof to form ports which correspond with the ports in the casing, said second drum being provided with end openings the diameter of which is equal to the width of the transverse slot therein, and said second drum being also provided with end plates having on their inner faces eccentric bosses which fit in the end openings in said drum and on their outer faces eccentric bosses which fit in the recesses in the inner faces of the end plates of the casing, said end plates of the second drum being also provided with central openings through which the shaft eccentrically passes, and one of said openings being provided with an internal gear, and said shaft being also provided with a pinion which meshes with said gear.

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this fifth day of September 1907.

GEORGE WILSON.

Witnesses:
ROBERT JOHN BROWN,
WILLIAM GLASIER TURNER.