A. BEARDSLEE.

ROTARY PUMP.

APPLICATION FILED JAN. 4, 1921.

1,437,706. Patented Dec. 5, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

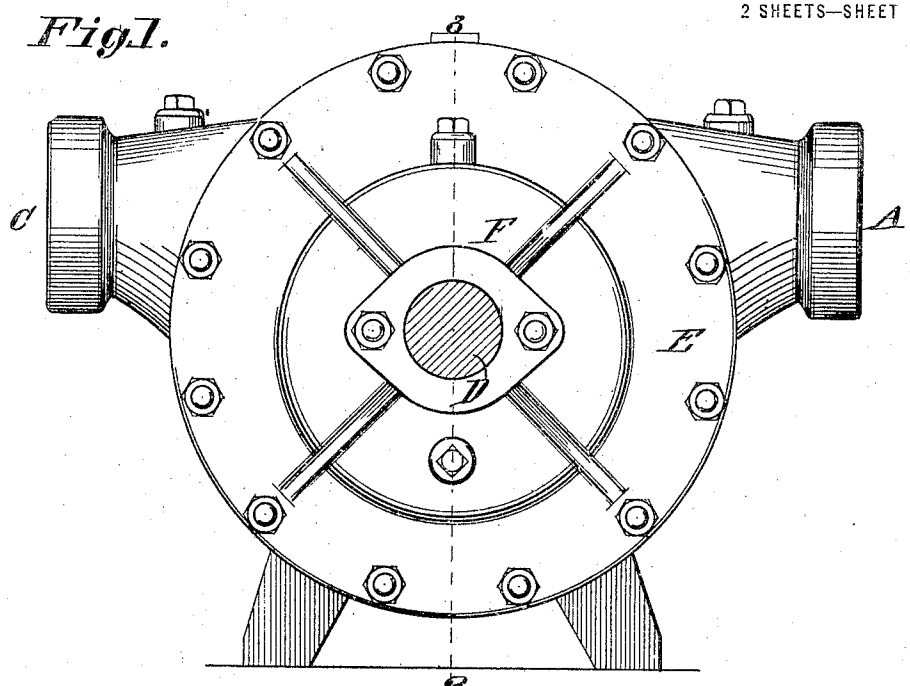
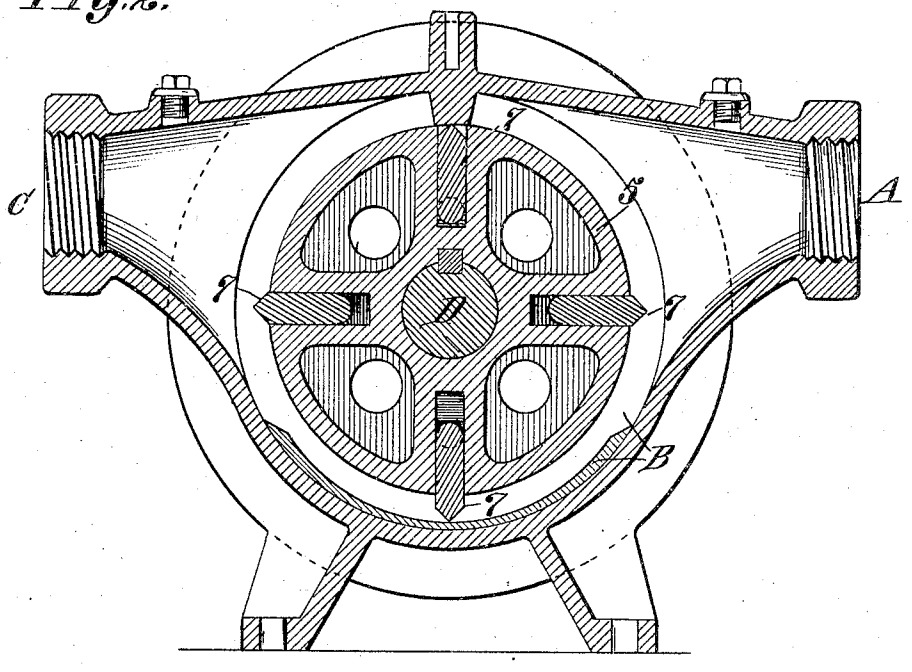


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

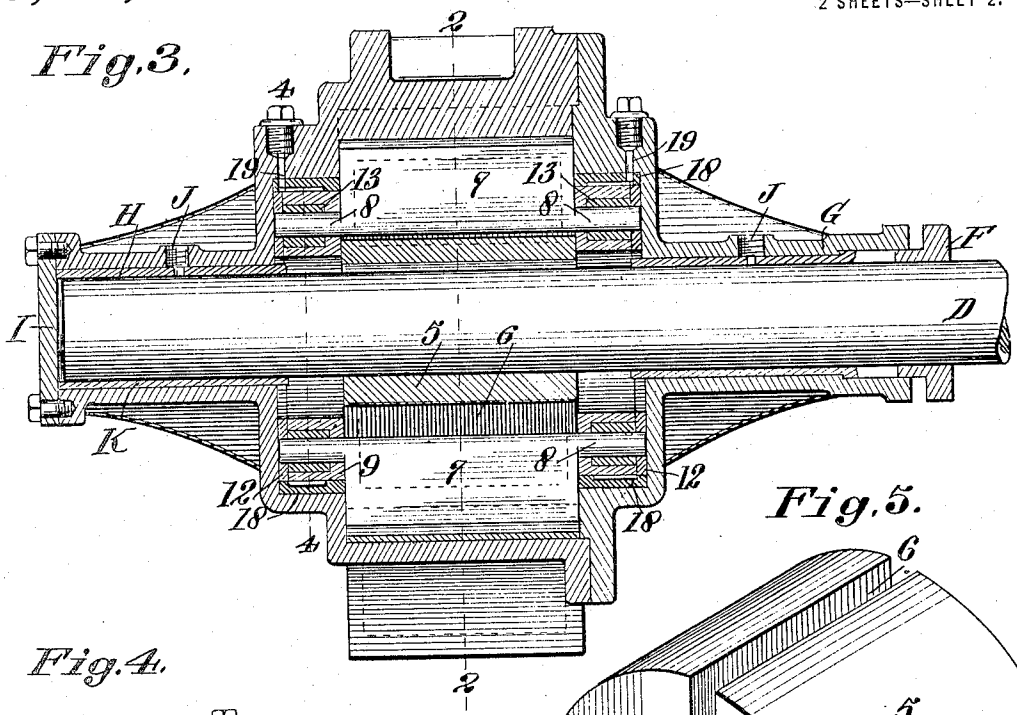


Fig. 5.

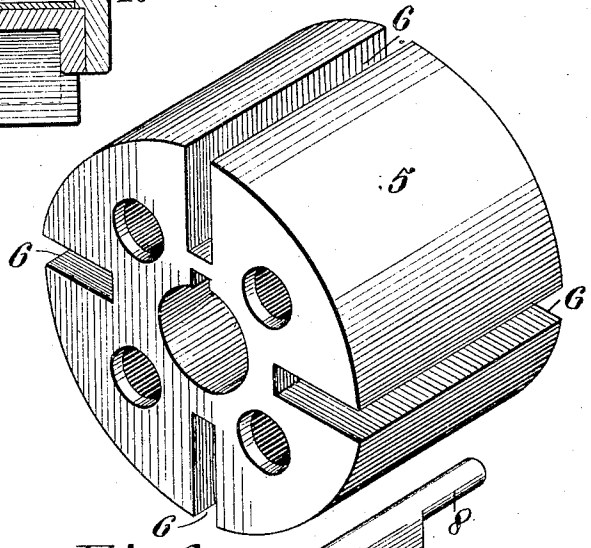


Fig. 4.

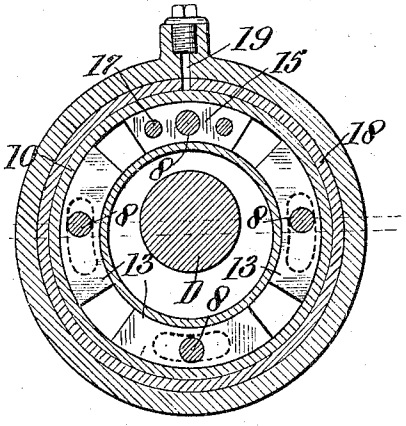


Fig. 6.

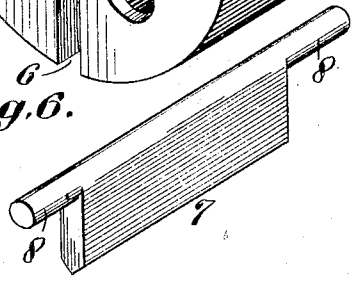


Fig. 7.

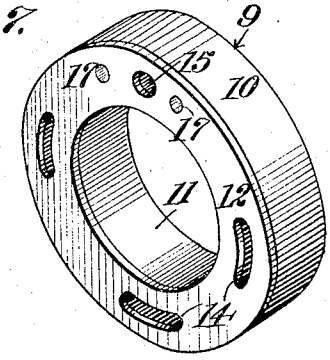
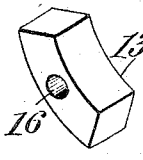


Fig. 8.



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UNITED STATES PATENT OFFICE.

ARBY BEARDSLEE, OF LIMA, MONTANA.

ROTARY PUMP.

Application filed January 4, 1921. Serial No. 434,915.

To all whom it may concern:

Be it known that I, ARBY BEARDSLEE, a citizen of the United States, and a resident of Lima, county of Beaverhead, and State of Montana, have invented a new and useful Improvement in Rotary Pumps, of which the following is a specification.

The present invention relates in general to pumps and has reference more particularly to a rotary pump of the centrifugal type for pumping liquids; especially water and oil.

The primary object of the invention is to provide a compact, simple and efficient construction in pumps and particularly one in which the friction parts may be lubricated to reduce friction to a minimum and prolong the life of the pump.

The invention possesses other features which will be referred to in the following detailed description, with the novelty pointed out in the subjoined claims.

In the accompanying drawings,

Figure 1 is an end view in elevation of one type of centrifugal pump with which the invention may be used;

Figure 2 is a cross-section on the line 2—2, Figure 3;

Figure 3 is a sectional view on the line 3—3, Figure 1;

Figure 4 is a sectional view on the line 4—4, Figure 3;

Figure 5 is a detail perspective view of the cylinder block for the blades;

Figure 6 is a detail perspective view of one of the blades;

Figure 7 is a detail perspective view of one of the ring bearings for the blade pintles, and

Figure 8 is a detail perspective view of one of the arcuate-shaped blocks which cooperate with the ring bearings.

Referring now to the drawings in detail, the pump may include a more or less conventional construction in so far as concerns the intake A, the stator B, the outlet C, the shaft D and the end plates E.

The stator may be made from a casting with the intake and outlet communicating therewith from opposite sides and with suitable supporting feet, as shown.

The shaft D extends through the casting transversely of the intake and outlet, with stuffing glands F appropriately arranged at the open ends of the bearings G and H for the shaft. In some instances the shaft need not extend through the casting, for as shown in Figure 3 the same terminates in the relatively long bearing H, with a closure plate I closing the open end of the bearing. In lieu of this plate, the shaft may project past the bearing, with a stuffing gland such as F employed.

Oil openings J may be arranged in the bearings G and H, with bushings K having small openings where oil may be introduced around the shaft.

Keyed to the shaft intermediate its ends, and housed within the casting is a cylinder block (5) the axis of which being arranged transversely to the intake A and outlet C. Interior portions of this cylinder block may be hollowed out as best shown in Figure 2 to reduce its weight, the solid portions of the same, however, being provided with radial slots (6) which, according to the present showing, are four in number, each of which is adapted to receive a blade (7) which is preferably of a length of that of the slots and including outwardly extending pintles (8). The blades are presented within their respective slots with the pintles (8) positioned inwardly or adjacent the axis of the block, and the same project outwardly on opposite sides parallel to the axis of the shaft.

As best shown in Figure 3, the opposite ends of the stator casing are reduced in transverse dimension to accommodate ring bearings (9) at opposite ends of the block (5). Each of the ring bearings includes an outer and inner annular member (10) and (11) respectively, the sides of which are enclosed by annular ring plates (12). The ring members will be disposed eccentric of the axis of rotation of the shaft D as shown in Figure 4.

Housed within the ring bearings are a plurality of arcuate blocks (13), and the plates (12) are provided with three elongated slots (14) and a single opening (15). For each one of the blades will be provided an arcuate block such as (13) so that the pintles (8) of the blades may project through the slots (14) with the pintles of one blade passing through the opening (15) and seated in the opening such as (16) in the arcuate blocks; in other words, while the slots (14) are provided in the plates (12), the blocks (13) all have circular openings the diameter of which corresponding to the diameter of the pintles. The plates

(12) may be fastened to the outer ring (10) by rivets (17), and in this connection it is to be noted from Figure 4 that the rivets passing through the arcuate block (13) are arranged to receive the pintles presented through the openings (15).

From the above it will be noted that one of the blades is fixed to the ring bearings (9) to an extent that it rotates eccentrically with the ring bearings, whereas the slots (14) for the other pintles permit these blades to rotate concentrically of the shaft.

A wearing plate with which the pointed ends and blades have a wiping contact is provided in the bottom of the stator casing, as shown in Figure 2.

Instead of duplicating the plate (12) on each side of the ring bearing, the opposite face of the same may be cast as a part of the outer ring (10). This is shown in Figure 3.

The ring bearings are adapted to rotate in suitable bushings, as best shown at (18) in Figures 3 and 4.

While the co-operative relationship of the parts operates to provide a most practical construction in pumps, it is really the provision of the ring bearings which represents the salient features of the principle involved, in that they may be so conveniently lubricated, which has heretofore been impossible with pumps of this general type. From Figure 3 it will be readily appreciated how oil may be introduced through the oil openings (19) through the bushings (18) and distributed over the surface of the outer rings (10) of the ring bearings. This is the location where friction will be the greatest and where wear will be the most severe.

I claim:

1. In a rotary pump, a shaft, a cylinder block keyed to the shaft, a plurality of radial slots in said block, a blade to work in each slot, each blade having pintles extending beyond opposite ends of the block, and a ring bearing eccentrically mounted at either end of the block co-operating with the pintles so as to be rotated by the same and to impart radial motion to the same, said bearing ring being provided with one perforation fitting snugly over one pintle and with a plurality of arcuate slots engaging the other pintles so as to allow of the simultaneous engagement of the pintles by two eccentric rings.

2. In a rotary pump, a shaft, a cylinder block keyed to the shaft, a plurality of radial slots in said block, a blade to work in each slot, each blade having pintles extending beyond opposite ends of the block, and a ring bearing ecentrically mounted at either end of the block co-operating with the pintles so as to be rotated by the same and to impart radial motion to the same, said bearing ring being provided with one perforation fitting snugly over one pintle and with a plurality of arcuate slots engaging the other pintles so as to allow of the simultaneous engagement of the pintles by two eccentric rings, and an individual arcuate bearing member for each pintle slidably supported in the ring so as to cover the slots.

ARBY BEARDSLEE.