D. DREIER.

ROTARY PUMP.

APPLICATION FILED APR. 6, 1911.

1,019,613.

Patented Mar. 5, 1912.

Fig. 1.

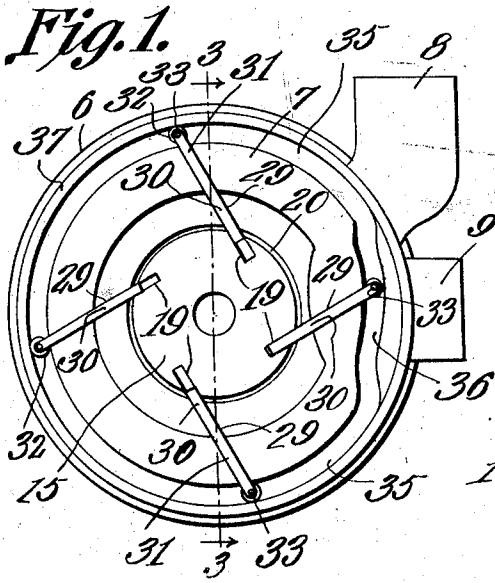
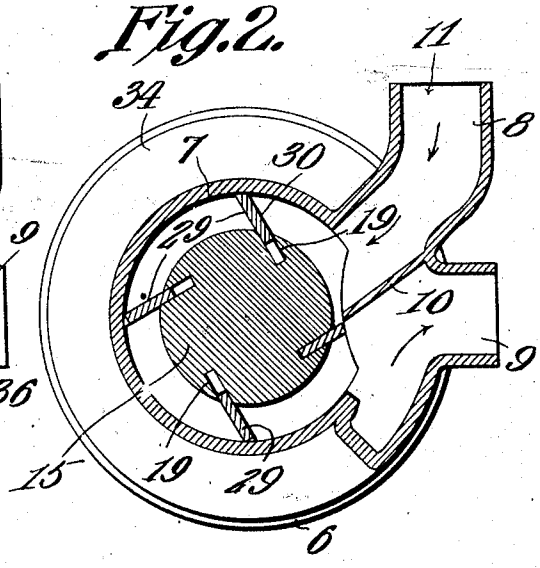


Fig. 2.



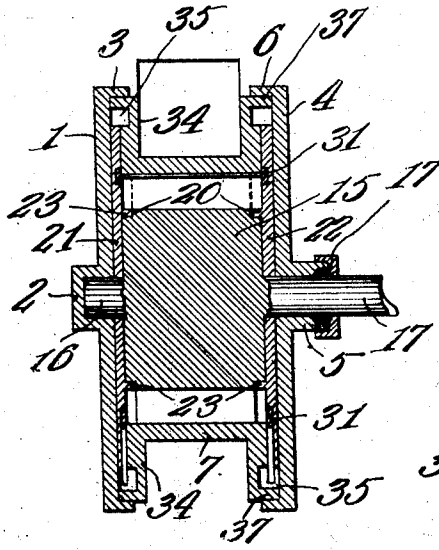


Fig. 3.

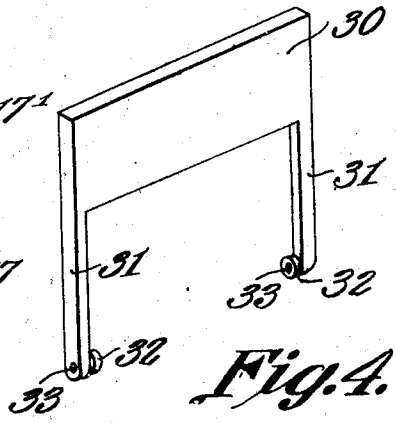


Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

DOMINICK DREIER, OF SPRINGDALE, MONTANA.

ROTARY PUMP.

1,019,613. Specification of Letters Patent. Patented Mar. 5, 1912.

Application filed April 6, 1911. Serial No. 619,418.

To all whom it may concern:

Be it known that I, DOMINICK DREIER, a citizen of the United States, residing at Springdale, in the county of Park and State of Montana, have invented a new and useful Rotary Pump, of which the following is a specification.

This invention relates to pumps, and more especially to those of that type which rotate; and the objects of the same are to simplify the construction of a pump of this character, reduce the number of its parts, avoid the necessity for the use of a spring, and at the same time do away with friction as far as possible. These objects are accomplished by the construction hereinafter more fully described and claimed, and as shown in the accompanying drawings, wherein—

Figure 1 is a side elevation of this pump with the face plate near the reader removed. Fig. 2 is a central vertical section therethrough. Fig. 3 is a central vertical section on a right angle to the section of Fig. 2, taken on the line 3—3 of Fig. 1. Fig. 4 is a perspective detail of one of the wings.

In the drawings the numeral 1 designates the rear face plate having a socket bearing 2 at its center and a flange 3 around its periphery, and the numeral 4 designates the front face plate having a tubular bearing 5 at its center and a flange 6 around its periphery. The said flanges are turned toward each other as seen in Fig. 3, and between them is embraced the rim 7 which complements the face plates and makes up the casing, this rim having through it an inlet opening 8 and adjacent thereto (or elsewhere if preferred) an outlet opening 9 with a partition 10 between these openings if they do stand adjacent, as seen in Fig. 2. This view shows the pump disposed in an upright position although it would operate successfully if disposed in a horizontal position. I prefer to employ it under water, and if so a strainer 11 may be placed over the inlet 8 to prevent sand and other extraneous matter from getting into the pump, and of course a pipe (not shown) will lead from the outlet to the point where it is desired to deliver the water. The entire device is preferably of metal, and the dimensions of its various parts are immaterial to the successful operation of the whole.

The numeral 15 designates a hub having a stub shaft 16 at one extremity of its axis and which is mounted for rotation in the socket bearing 2, and having a shaft 17 projecting from the other extremity of its axis and to which power is applied in a manner that will be clearly understood and needs no further description or illustration. The shaft 17 preferably passes through a stuffing box 18 in the tubular bearing 5, so as to prevent leakage, whereas it will be impossible for any leakage to occur through the socket bearing 2 and no stuffing box will be needed at that side of the casing. The hub 15 is truly cylindrical in shape except for slots 19 to be described below and annular notches 20 around the outer corners of its two ends; and against said ends are disposed end plates 21 and 22 which have annular ribs 23 fitting in said notches 20 and which are held against the extremities of the hub by the face plates of the casing. In this condition the hub and its end plates make up a spool-shaped rotary member mounted within the casing and capable of rotation therein on its shafts 16 and 17 which of course turn in their respective bearings.

In the inner faces of the end plates 21 and 22 are cut slots 29 standing in alinement with and therefore forming continuations of the slots 19 which are cut into the hub from its periphery and extend throughout its length. It will be observed from Fig. 2 that there are four of these combined slots 19—29 disposed equi-distant around the axis and each standing in a plane somewhat between a true radius of the hub and a true tangential line from its periphery, although they all would stand on tangents to a circle which touches the inner ends of the slots 19, and all these composite slots are disposed each respectively at right angles to those next adjacent it. Mounted in each slot is a wing (best seen in Fig. 4) which comprises a flat blade 30 disposed in the slots 19 in the hub, arms 31 projecting outward from the ends of this blade, and anti-friction rollers 32 at the outer ends of these arms and mounted on pivots 33 which extend toward each other. As best seen at the bottom of Fig. 3, the rim 7 is of channel metal, its walls 34 being spaced a little from the inner faces of the face plates, and in these spaces travel the arms 31 of the wings. The outer faces of said walls are provided with cam grooves 35 (best seen in Fig. 1) in which the rollers 32 travel, and these grooves have a depression 36 at the proper point to cause the wings to move inward just as their blades

30 reach and must pass the inner edge of the partition 10. Fig. 2 shows one blade as just passing said partition. The outer edges or peripheries of the walls 34 have outwardly projecting flanges 37 which engage the flanges 3 and 6 of the end plates so that the space between the walls 34 of the rim and the inner faces of the end plates is maintained for the uninterrupted passage of the arms 31 of the wings.

When power is applied to the shaft 17 and the hub rotated, it carries with it the several wings which are caused to have their proper movements in the combined slots 19—29 by reason of the shape of the cam grooves 35—36 which engage the rollers 32, and hence I avoid the necessity for any springs as the outward and inward movements of the wings are entirely positive, and no lubrication is necessary other than the water because the arms 31 are not truly radial to the hub. It will be clear that the water taken in at the inlet 8 is delivered through the outlet 9, whence it can be conveyed to any point that it is desired to use it, through a system of piping not necessary to illustrate. If the device is used beneath the surface of the water the latter will enter by reason of its own pressure, but otherwise it may be directed into the inlet in any suitable manner or the pump may be permitted to suck it in. When the rotation is slow the cam groove alone will cause the movements of the wings in and out, but it is obvious that when the rotation is more rapid these wings will have a certain centrifugal tendency so that practically the only function remaining to the cam groove is where its depression 36 pushes each wing inward as the latter passes the partition 10.

What is claimed as new is:—

1. In a rotary pump, the combination with a casing consisting of face plates, a rim between said plates and having a cam groove in one of the outer faces of its walls, the said face being separated from the corresponding face plate, the said rim having an inlet and an outlet therein, and a partition between the inlet and outlet, of a hub rotatably mounted in the casing, the hub being provided with a slot in its body, a wing slidably mounted in said slot, an arm projecting outwardly from the wing into the space between the wall of the rim and the adjacent face plate, and a member on the said arm engaging the said cam groove.

2. In a rotary pump, the combination with a casing consisting of face plates whereof one has a socket bearing and the other a tubular bearing, a rim of channeled metal between said plates and having cam grooves in the outer faces of its walls, an inlet and an outlet disposed adjacent each other through said rim, a partition between them, and engaging flanges on the rim walls and on the face plates and holding these elements separated; of a hub having a stub shaft mounted in said socket bearing and a power shaft mounted through said tubular bearing, the hub being provided with slots in its body, a series of wings slidably mounted in said slots, an arm projecting outward from each end of each wing into the space between that wall of the rim and the adjacent face plate, and an anti-friction roller on each arm engaging one of said cam grooves.

3. In a rotary pump, the combination with a casing having an adjacent inlet and outlet through its periphery and a partition between them, and having annular cam grooves with a depression opposite said partition; of a hub mounted for rotation within said casing and having annular notches around its corners, two end plates for said hub having annular ribs fitting said notches, the hub and the plates being provided with a series of slots registering with each other and each disposed on a line between a radius of and a tangent to said hub, and a series of wings mounted slidably in said slots and each comprising a blade, arms projecting outward from the extremities of said blade, and anti-friction rollers at the outer ends of said arms traveling in the cam grooves.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

DOMINICK DREIER.

Witnesses:
E. M. NILES,
S. F. SWAN.