R. J. MEYER.

ROTARY PUMP.

APPLICATION FILED JAN. 28, 1919.

1,324,260. Patented Dec. 9, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

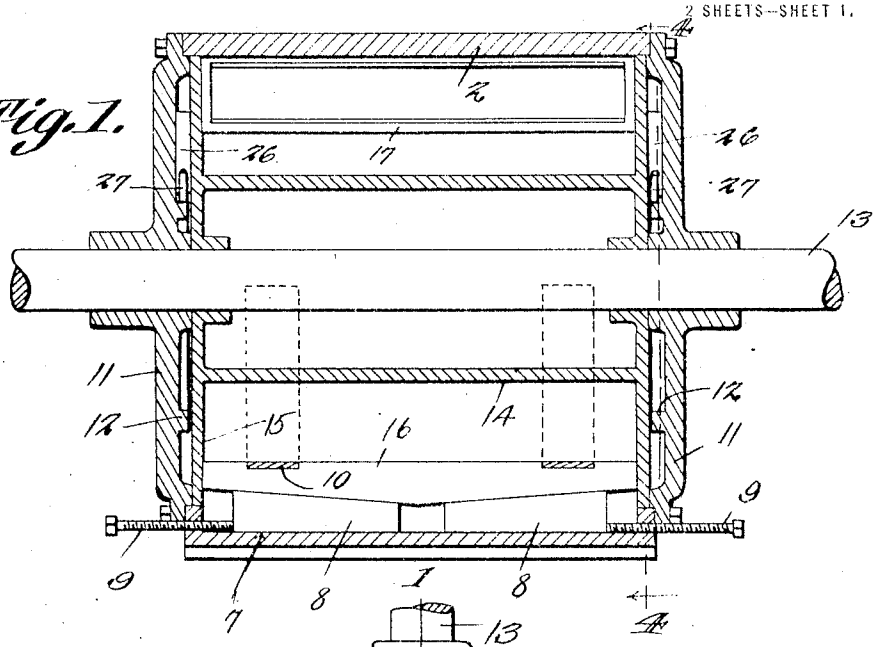
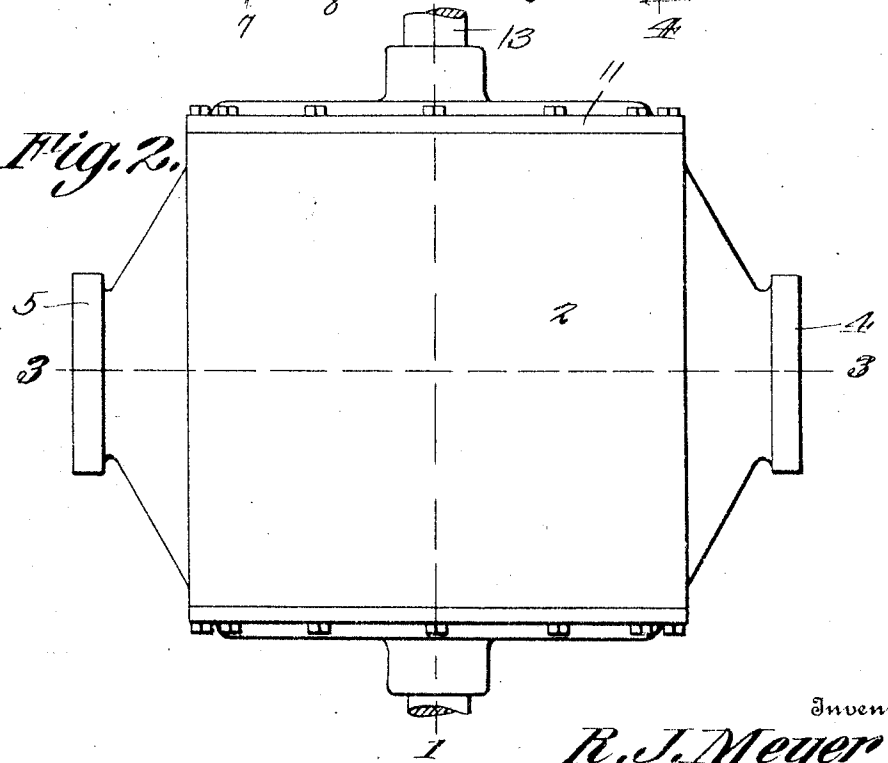


Fig. 2.



Witness

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2 SHEETS SHEET 2.

Fig. 3.

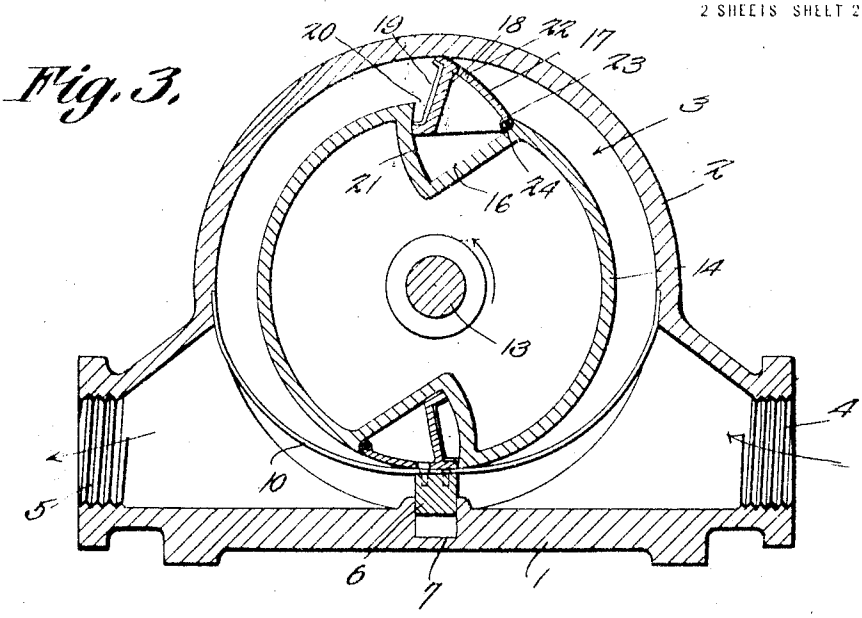
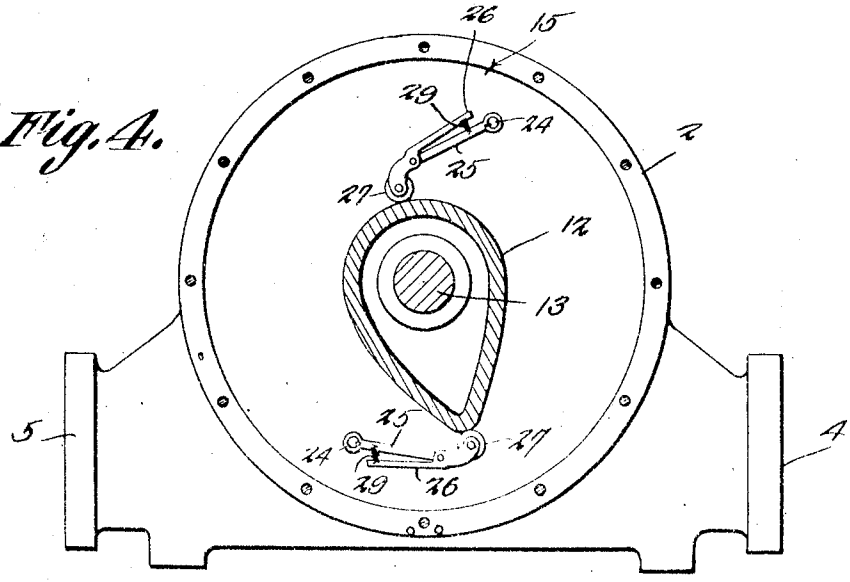


Fig. 4.



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UNITED STATES PATENT OFFICE.

RALPH J. MEYER, OF GRAND JUNCTION, COLORADO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO BULLDOG PUMP CO., A CORPORATION OF COLORADO.

ROTARY PUMP.

1,324,260. Specification of Letters Patent. Patented Dec. 9, 1919.

Application filed January 28, 1919. Serial No. 273,565.

To all whom it may concern:

Be it known that I, RALPH J. MEYER, a citizen of the United States, residing at Grand Junction, in the county of Mesa and State of Colorado, have invented a new and useful Rotary Pump, of which the following is a specification.

This invention relates to rotary pumps, one of its objects being to provide hingedly mounted pistons carried by the rotor and so arranged as to balance the pressure so that frictional contact between the pistons and the stator will not be excessive in the operation of the pump.

A further object is to provide means of simple and efficient construction for actuating the pistons positively relative to the rotor.

Another object is to provide a pump which is of simple construction and which can be readily opened for the purpose of repairing or cleaning the parts.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combination of parts which will be hereinafter more fully described and pointed out in the claims it being understood that various changes may be made in the construction and arrangement of the parts without departing from the spirit, or sacrificing any of the advantages of the invention as set forth in the appended claims.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:

Figure 1 is a central vertical section through the pump, said section being taken on the line 1—1, Fig. 2.

Fig. 2 is a plan view of the pump.

Fig. 3 is a section on line 3—3, Fig. 2.

Fig. 4 is a section on line 4—4, Fig. 1.

Referring to the figures by characters of reference 1 designates the base of a stator 2, there being a circular chamber 3 within the stator provided, at the base, with oppositely disposed inlet and outlet ports 4 and 5 respectively. An abutment bar 6 is mounted in the upper portion of a transverse groove 7 in the base 1 and under the center of the chamber 3 and has downwardly converging bottom faces resting on oppositely disposed wedge blocks 8 which are slidable within the groove 7. Adjusting screws 9 are extended through the end walls of the groove 7 and bear against the outer or large ends of the blocks 8. Thus by rotating these screws the blocks can be adjusted toward each other, thus to raise the abutment 6. Secured on the abutment are arcuate strips 10 constituting guides, these strips extending across the ports 4 and 5 and being secured to the wall of the stator with their inner faces flush with said wall as shown clearly in Fig. 3.

The stator is provided with removable heads 11 on the inner faces of which are formed cam rails 12.

A shaft 13 is journaled in the heads 11 and suitably secured to this shaft is a rotor 14 having end annular flanges 15 which work snugly upon the wall of the stator 2, a space being left between the ends of the rotor 14 and the heads 11 in which the rails 12 are located. The rotor is provided at one or more points in its periphery with segmental pockets 16 extending from end to end of the rotor. Extending into each of the pockets is a piston consisting of an arcuate plate 17 hinged along one edge to the rotor at the shallow end of the pocket 16 and extending from the other edge of the plate 17 is a head 18 which constantly projects into the pocket and has its front or advancing face recessed as shown at 19 and provided with a covering of soft material 20 formed of rubber, canvas or the like. This edge is adapted to fit snugly against and to slide upon the end arcuate wall 21 of the pocket 16. An opening 22 may be formed in the plate 17.

The hinge 23 of each plate includes a shaft 24 which extends longitudinally within the rotor 14 and beyond the ends thereof, there being an arm 25 secured to each projecting end of the shaft. Each arm has a lever 26 pivotally mounted thereon and carrying a roller 27 at one end adapted to travel along the adjacent cam rail 12. A spring 29, which is interposed between and secured to the arm 25 and the lever 26, serves to hold the roller 27 normally pressed yieldingly against the rail 12.

When the shaft 13 is rotated in the direction indicated by the arrow in Fig. 3, the rotor 14 will move therewith. The free longitudinal edges of the plate 17 will ride along the inner surface of the chamber wall toward the outlet port the water or other liquid trapped in the path thereof will be forced over the rotor and to the outlet 45,

the pressure of the water being balanced upon the hinge 23 because the recessed face 19 of the piston extends downwardly into the pocket 16, thus allowing the pressure to be distributed evenly at all times against the head 18. Thus frictional engagement of the piston with the wall of the stator is materially reduced. As the piston approaches and passes the outlet port 5 it will be gradually deflected inwardly by the strips 10 and by the action of the roller 27 on the cam rail 12. Any water or other liquid that may have been deposited in the pocket 16 will be free to escape through the openings 22 during this inward movement of the pistons. The pistons will pass successively over the abutment 6 and will then move gradually outwardly from their pockets so as to trap a new supply of liquid and force it from the inlet to the outlet. It has been found to be advantageous to provide the recess 19 with the soft covering 20 which will give a better grip upon the liquid being pumped. Particular importance is attached to the use of the recess piston head 20 whereby during the pumping or forcing operation, the pressure is distributed throughout the area of the head and thus balanced upon the hinge 23. The heads of the stator can be removed readily, thus allowing convenient removal of the rotor when it is desired to clean or repair the pump.

What is claimed is:

1. In a rotary pump the combination with a stator, having opposed inlet and outlet ports, of a rotor having a segmental pocket in its periphery, a shaft extending through the rotor at one end of the pocket, a plate secured to and movable with the shaft, a recessed head extending from the plate and into the pocket, said head and plate constituting a piston, the recess in the head constituting means for directing pressure of the pumped fluid against that portion of the head projecting into the pockets, a cam beyond one end of the rotor, and means upon the shaft for engaging the cam during the movement of the rotor to swing the piston positively into and out of the pocket.

2. In a rotary pump the combination with a stator, having an inlet port and an outlet port, of a rotor having a segmental recess in its periphery, a plate hingedly mounted in the recess and having a vent opening, a head extending from the plate and into the recess, said plate having a recess in its front or advancing face for distributing pressure of the pumped fluid to all portions of the head extending into the pocket or recess in the rotor, a detachable head on the stator, a cam rail thereon, a shaft connected to and movable with the piston plate and extending beyond one end of the rotor, an arm thereon, and a spring controlled lever mounted on the arm and engaging the cam rail.

3. In a rotary pump the combination with a stator having an inlet port and an outlet port, there being a groove in the stator between said ports, of an abutment bar movably mounted within the groove, opposed wedging blocks within the groove and constituting supports for bar, means for adjusting the blocks toward each other to shift the bar inwardly, arcuate guide strips extending from the bar across the ports, a rotor having a segmental pocket, and a piston hingedly mounted within the pocket and movable along the arcuate strips and across the abutment bar.

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

RALPH J. MEYER.

Witnesses:
JAMES R. MURPHY,
GEORGE W. GORDAN.