Nov. 19, 1929. B. E. PARKS 1,736,666

ROTARY PUMP

Filed Sept. 20, 1926 3 Sheets-Sheet 1

Fig. 2.

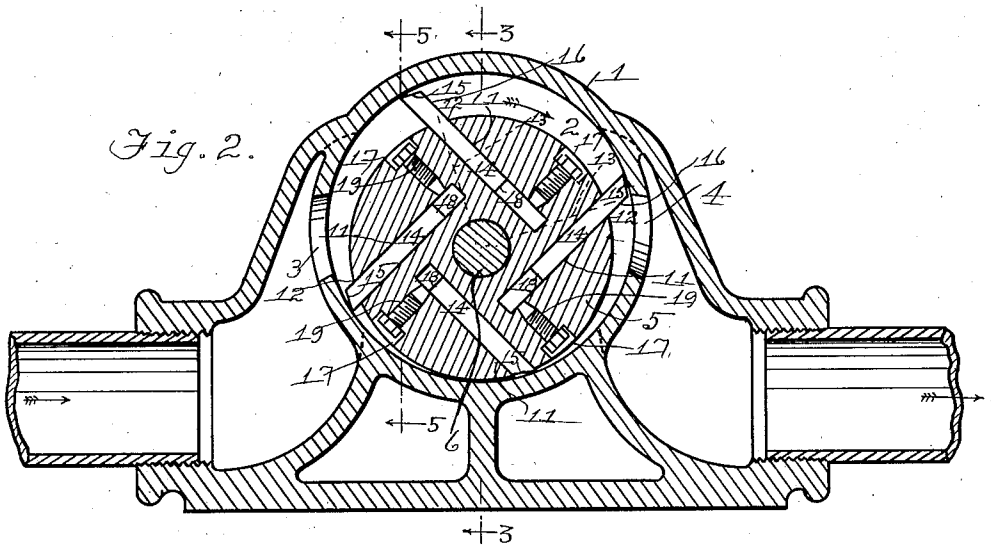
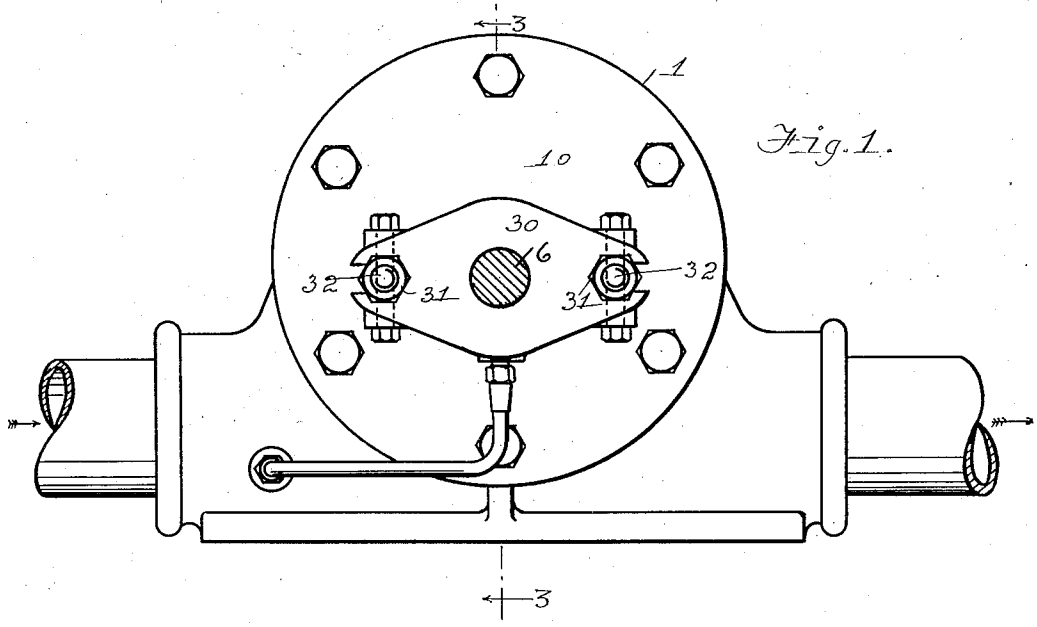


Fig. 1.



Witness:
Geo. L. Chapel

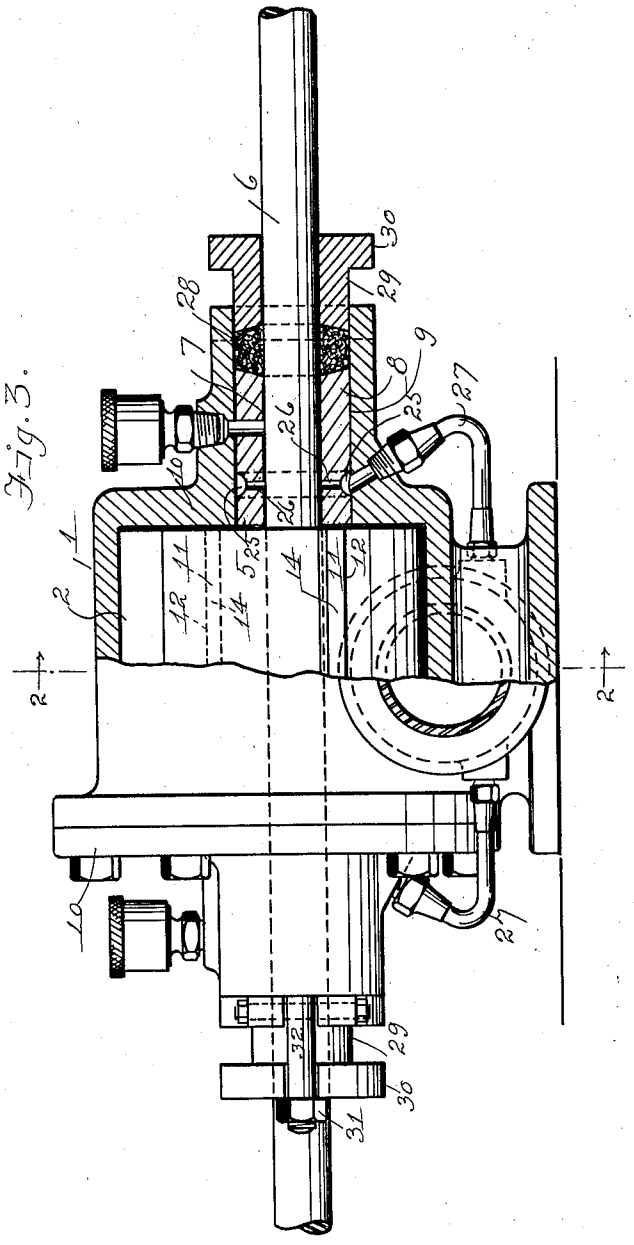
INVENTOR.
Byron E. Parks
BY
Cyrus W. Rice
ATTORNEYS.

Nov. 19, 1929. B. E. PARKS 1,736,666

ROTARY PUMP

Filed Sept. 20, 1926 3 Sheets-Sheet 2

Fig. 3.



Witness
Geo. L. Chapel

INVENTOR.
Byron E. Parks
BY Cyrus W. Rice
ATTORNEYS.

Nov. 19, 1929. B. E. PARKS 1,736,666

ROTARY PUMP

Filed Sept. 20, 1926 3 Sheets-Sheet 3

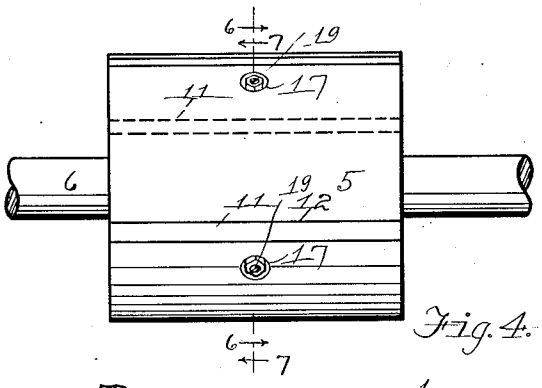


Fig. 4.

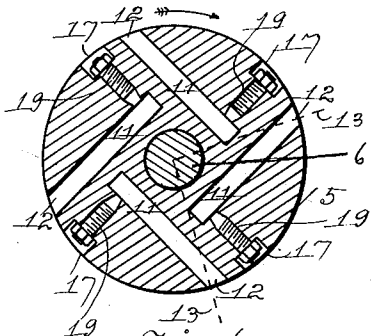


Fig. 6.

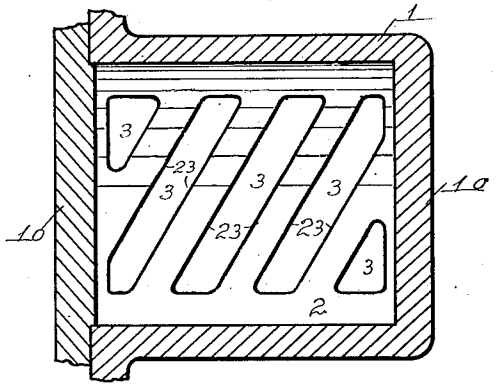


Fig. 5.

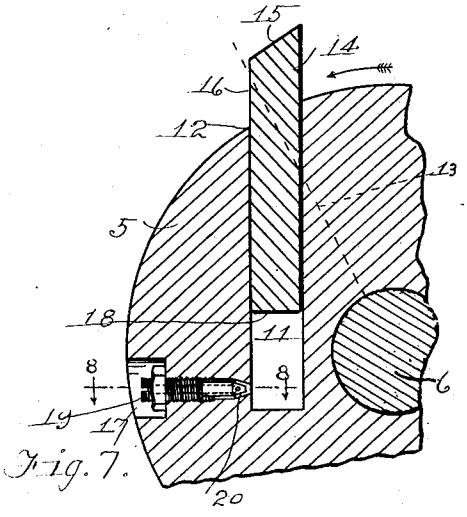


Fig. 7.

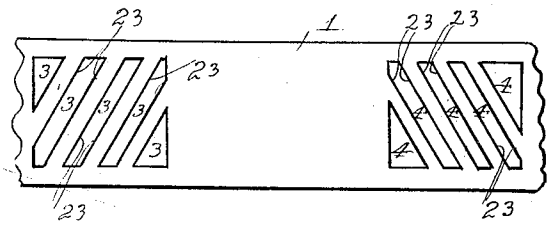


Fig. 9.

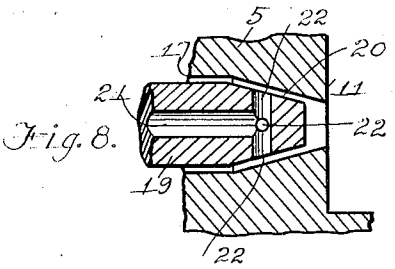


Fig. 8.

Witness:
Geo. L. Chapes.

INVENTOR.
Byron E. Parks
BY Cyrus W. Rice
ATTORNEYS.

Patented Nov. 19, 1929 1,736,666

UNITED STATES PATENT OFFICE

BYRON E. PARKS, OF WALKER TOWNSHIP, KENT COUNTY, MICHIGAN

ROTARY PUMP

Application filed September 20, 1926. Serial No. 136,424.

The present invention relates to rotary pumps; and its object is, generally, to provide such a pump improved in certain respects hereinafter appearing; and more particularly, to provide in such a pump fluid-propelling vanes moved into operative position by the centrifugal force created by the revolving piston, and in such manner as to minimize their frictional contact with the pump casing; and further, to provide means for thus moving such vanes by fluid pressure in the pump; and further, to provide in such a pump means for returning to its operative field any fluid which may pass into the piston's rotative bearings; and further, to provide means for preventing the vanes from engaging in the ports of the pump; and further, to provide means for preventing the piston's axial movement or end-thrust.

These and any other objects hereinafter appearing are attained by, and the invention finds preferable embodiment in, the pump structure hereinafter particularly described in the body of this specification and illustrated by the accompanying drawings, in which:—

Figure 1 is a side view of a rotary pump;

Figure 2 is a transaxial sectional view thereof taken on line 2—2 of Figure 3;

Figure 3 is a side view of the same, partially sectioned axially on line 3—3 of Figures 1 and 2;

Figure 4 is a side view of the pump's rotative piston;

Figure 5 is a sectional view of the body or casing of the pump, taken on line 5—5 of Figure 2;

Figure 6 is a transaxial sectional view of the piston, taken on line 6—6 of Figure 4;

Figure 7 is a like sectional view (enlarged) of a portion of the same and of one of the vanes, taken on a plane corresponding to line 7—7 of Figure 4;

Figure 8 is a sectional view (much enlarged) of certain parts, taken on line 8—8 of Figure 7; and

Figure 9 is a development of the concave inner surface of the casing of the pump, illustrating the position of the ports thereof.

In the accompanying drawings, a rotary pump is illustrated comprising a body or casing 1 having a cross-sectionally circular chamber 2 with oppositely disposed inlet ports 3 and outlet ports 4 through its concave side, and a cross-sectionally circular piston 5 having a shaft 6 journalled in bearings 7 in the bushings 8 carried in the openings 9 through the ends 10 of the chamber, the piston being rotated by means (not shown) applied to its shaft, and the bearings 7 being axially offset below and parallelly with the longitudinal axis of said chamber as shown. The piston has recesses 11 extending toward their mouths 12 in a direction inclined rearwardly from the radius 13 of the piston which intersects the mouth of the recess in the piston's periphery; that is, the recesses are inclined thus rearwardly in relation to the piston's direction of rotation. These recesses form bearings in which the vanes 14 freely move slidably.

It will be seen that, as the piston rotates, centrifugal force moves these vanes outwardly; but that the centrifugal component of the force acting on the vanes is less than if the vanes were mounted to move radially of the piston instead of in the inclined direction described; and that inasmuch as this centrifugal component is less, the friction between the vanes' outer edge portions 15 and the inner surface of the casing is less. It will also be seen that the inclined front sides 16 of these vanes pressing on the fluid being pumped tends to slide the vanes inwardly in their recess bearings 11, so that a portion of the fluid may leak rearwardly over said edge portions thereby relieving the pump from undue strain in case the piston is rotating too rapidly. This effect is increased by forming the outer edge portions 15 of the vanes somewhat inclined forwardly-inwardly from the chamber's concave surface, as shown.

It is evident that the pumps may be constructed in different sizes, or their parts interrelatively proportioned, and the degree of inclination of the recesses 11 so formed, as to accommodate the pumps to different requirements or uses.

The piston has fluid passages 17 extending from its curved side into the bottom of the

recesses 11 behind the inner edges 18 of the vanes therein, so that the pumped fluid in the chamber 2 may pass through said passages and press the vanes outwardly. These passages are shown provided with valves comprising a screw 19 threaded in the passage and having a conical inner end 20 and a fluid opening 21 venting at 22 through the side of said conical end. By turning this screw the passage may be opened or closed to the desired degree. In order that the outer end portions 15 of the vanes may not engage in the ports 3, 4 in passing thereover, the opposite walls 23 of these ports extend in a helical direction about the axis of the chamber 2; and to balance the piston against axial movement or end thrusts, the walls of some of the ports extend helically oppositely to the walls of others of said ports; the walls of the inlet ports 3 thus extending or winding in a helical direction opposite to that of the walls of the outlet ports 4, as shown in the development Figure 9.

Fluid passages extend from the bearings 7 downwardly and through the concave side of the chamber 2, venting into the chamber, to return to the field of the pump's operation any fluid which may pass into the rotative bearings 7, said fluid passages, as seen in Figure 3, comprising annular grooves 25 in the bushings 8, radial openings 26 therein, and a pipe 27. These bushings are held in place, with packing 28 at their inner ends, by collars 29 whose flanges 30 are engaged by nuts 31 on the bolts 32.

I claim:

In a device of the character described, a body having a circular chamber provided with inlet and outlet ports, a piston rotatable in said chamber having tangential recesses therein, vanes slidable in said recesses, said piston having partially threaded ports therein communicating with said recesses behind said vanes and with said chamber, a valve for controlling the flow of the pumped fluid through said ports to the recesses including a hollow member provided with a threaded portion cooperating with the threaded port, and a reduced portion terminating in a conical end and having a duct therethrough, the said ports having inclined walls at the inner ends thereof cooperating with the conical end of the valve to control the flow of fluid to the recesses, means for adjusting said valve to regulate said flow, and means for locking the same in adjusted position.

In testimony whereof I have hereunto set my hand at Grand Rapids, Michigan, this 10th day of September, 1926.

BYRON E. PARKS.