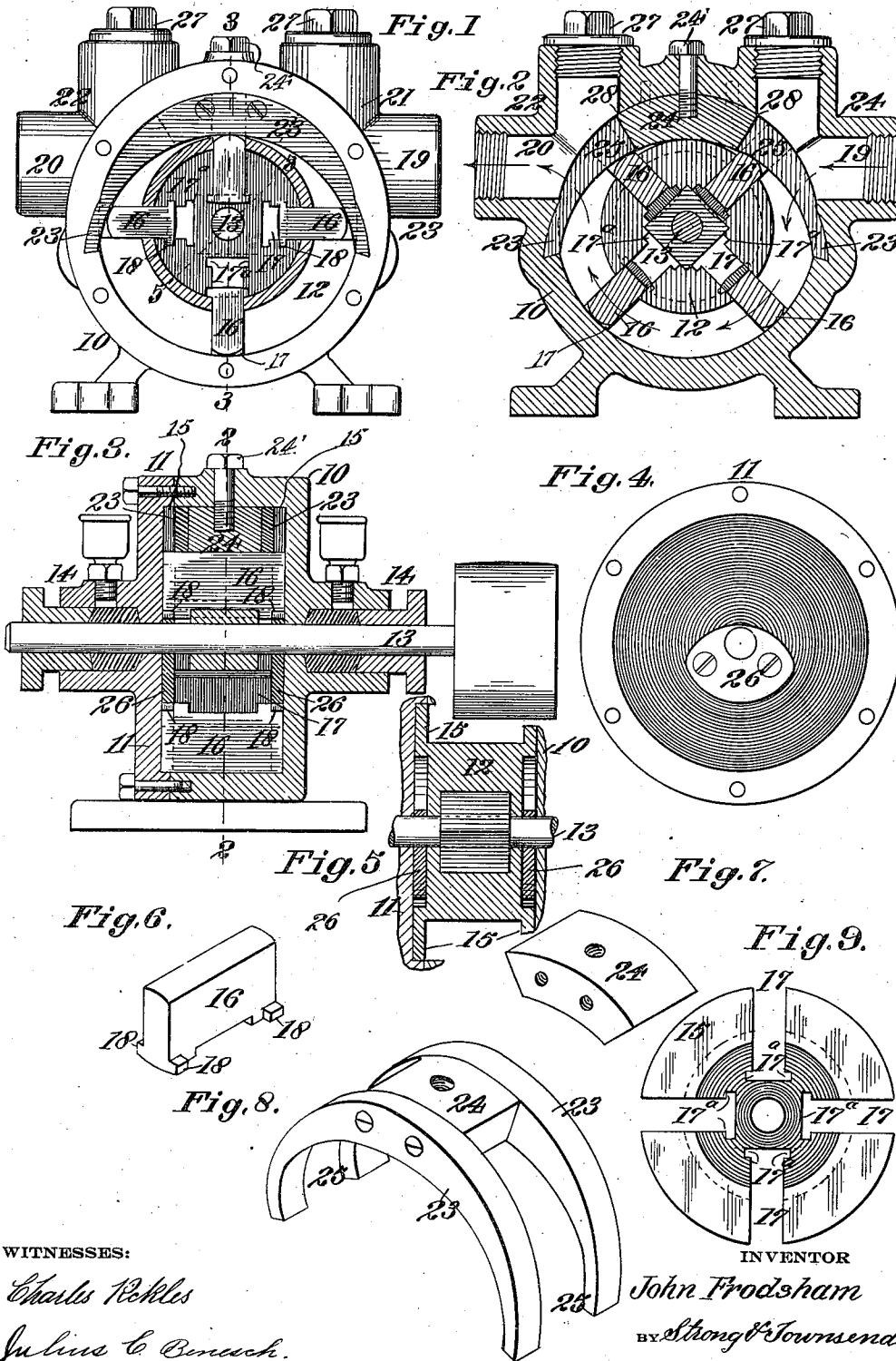


J. FRODSHAM.
 ROTARY PUMP.
 APPLICATION FILED MAY 31, 1917.

1,296,500.

Patented Mar. 4, 1919.



WITNESSES:

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JOHN FRODSHAM, OF FRODSHAM, CALIFORNIA.

ROTARY PUMP.

1,296,500.

Specification of Letters Patent.

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Application filed May 31, 1917. Serial No. 171,904.

To all whom it may concern:

Be it known that I, JOHN FRODSHAM, a citizen of the United States, residing at Frodsham, in the county of Sacramento and State of California, have invented new and useful Improvements in Rotary Pumps, of which the following is a specification.

This invention relates to rotary pumps or motors; and has for its object to simplify and improve the construction and operation of such devices.

One form which my invention may assume is exemplified in the following description and illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of a device embodying my invention, with the cover plate of the casing removed.

Fig. 2 shows a vertical, central, sectional view of the same.

Fig. 3 shows a transverse sectional view.

Fig. 4 shows a detached view of the interior of the cover plate.

Fig. 5 shows a detail view, in section, of the rotor.

Fig. 6 shows a detached view of one of the vanes.

Fig. 7 shows a detached view of a removable block or stop employed therein.

Fig. 8 shows a detached view, in perspective, of the removable curved plates employed in the casing to give the same the required shape or outline.

Fig. 9 shows a side elevation of the rotor detached.

Referring more in detail to the device shown, it comprises a cylindrical casing 10 with a removable head 11 and a rotor 12 within the casing carried on a shaft 13, journaled in bearings 14 on the heads of the cylinder concentric thereof, said rotor being in the shape of a drum provided with side flanges 15 projecting radially and contacting with the inner circumference of the casing at all points. The rotor carries radial vanes 16, slidable endwise in slots 17 and held in place by lugs or projections 18 on the sides near the inner end thereof, the said slots having enlargements 17^a at their inner ends to admit said lugs, whereby the vane may be inserted at the side of the rotor and whereby the vanes will be held in spaced relation to the end walls of the casing as well as the circumscribing walls. The casing is provided with ports 19 and 20 at points thereon separated by about 90°.

The present embodiment is shown in the form of a pump and communicating with said ports are L-shaped, screw-threaded spigots 21 and 22, respectively, forming intake and outlet connections.

The portion of the casing adjacent to the ports is fitted with detachable curved plates 23, spaced apart and so shaped and positioned as to give the interior of the casing an elliptical outline. A block 24 detachably secured to the casing between the ports spaces the plates apart and forms an anchor and support therefor. The plates lie between the flanges 15 of the rotor and in conjunction with the block 24 contact with the periphery of the body portion of the rotor, thereby closing the space between the rotor and the casing. It will be further observed that when the plates 23 and their block 24 are held in position by a screw 24', the rotor will be held against lateral movement and will require no further anchorage. The ends of the plates 23 being spaced apart form openings 25 which register with the ports 19 and 20. The heads of the casing, adjacent to the center, carry each a cam 26, against which the inner ends of the vanes abut, said cams being so shaped and positioned as to keep the vanes projected into operative relation with the inner walls of the elliptical chamber and determine their movement, it not being intended to rely upon the guiding action of the outer wall for movement as a water seal exists between adjacent edges of the vanes and the case. These cams are in a plane with the flanges 15 of the rotor, the core or central portion of the rotor being countersunk for this purpose.

In operation, the rotor may be driven in either direction and when operated as a pump the branch of the L not in use is closed by a screw plug 27. Water is drawn in through one of the ports 19—20 and passes through the openings 25, between the plates 23, and is carried around by the vanes to the opposite port. The annular space between the periphery of the drum and the inner wall of the casing is of uniform cross section from one port to the other so that the resistance offered to the passage of water therethrough is not varied. The spaced plates 23 and block 24 close the water channel with an abruptness, as shown at 28, by reason of which weeds and debris will not be wedged between the rotor and casing.

The described arrangement is simple and

economical to manufacture, since the casing is cylindrical in form and the rotor is centrally journaled within. The curved plates 23 are detachable and can be replaced without much expense, when worn. The vanes are adequately supported by the flanges 15 and are kept in place by the lugs 18. Due to the fact that the ends of the vanes extend through slots 17, it is desirable that they be held against lateral movement in relation to the rotor as is effected by these lugs. These lugs also abut against the inner periphery of the rotor in the outermost position of the vanes and are held thereagainst by the cams 26. In this manner the vanes will be rigidly held against the lever action of the water pressure against the ends of the vanes and thus aid in the action of the guide slots 17. The cam 26 acts to control the position of the vanes so that they will be held in operative relation with the inner walls of the casing at all times.

Various changes in the construction and arrangement of the parts herein shown and described may be made without departing from the spirit of my invention as disclosed in the appended claims.

Having thus described my invention what I claim and desire to secure by Letters Patent is—

1. A rotary pump comprising a cylindrical casing, a rotor journaled therein and concentric therewith, circular end flanges of enlarged diameter formed upon the rotor and in parallel spaced relation to each other, said flanges and the body of the rotor being formed with radial slots extending the entire width of the rotor, separate vanes reciprocally mounted within said slots for radial movement, and positively operating means for reciprocating said vanes throughout the movement of the rotor.

2. A rotary pump or motor, comprising a cylindrical casing, a cylindrical rotor therein having end flanges concentric with the casing and a cylindrical body portion of reduced diameter and concentric with said end

flanges, radial slots being formed through the cylindrical wall of the rotor and entirely through the end flanges, separate vanes independently mounted within the radial slots, means formed upon said vanes for limiting their outward movement, and means formed upon the end walls of the casing, whereby the outward movement of said vanes will be predetermined to cause their outer ends to describe an elliptical path of travel.

3. In a rotary pump having a cylindrical casing, a cylindrical rotor therein within which are formed radial slots, a vane consisting of a body portion having flat parallel sides and formed along one edge with an arcuate face, and perpendicularly extending lugs formed upon the opposite flat faces of the vane and at the corners formed by the ends and the inner edge thereof, whereby the outward movement of the vane will be limited when positioned within the rotor.

4. In a rotary pump, a cylindrical casing, a tubular cylindrical rotor positioned therein and having enlarged end flanges at its opposite ends, radial slots formed the entire width of the rotor and through the end flanges, said apertures in the end flanges having an enlarged T-shaped opening at their inner ends, circular recesses formed in the outer faces of said end flanges, separate vanes positioned for radial movement within the slots of the rotor, and oppositely extending lugs at the opposite ends of said vanes adapted to pass through the T-slots in the rotor flanges and to seat within the recesses of said flanges, whereby the vanes may be inserted from either side of the rotor and when moving radially will be locked against lateral movement.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN FRODSHAM.

Witnesses:

JOHN H. HERRING,
W. W. HEALEY.