

I. J. JOHNSON.
 ROTARY PUMP.
 APPLICATION FILED AUG. 16, 1915.

1,187,628.

Patented June 20, 1916.

Fig. 2.

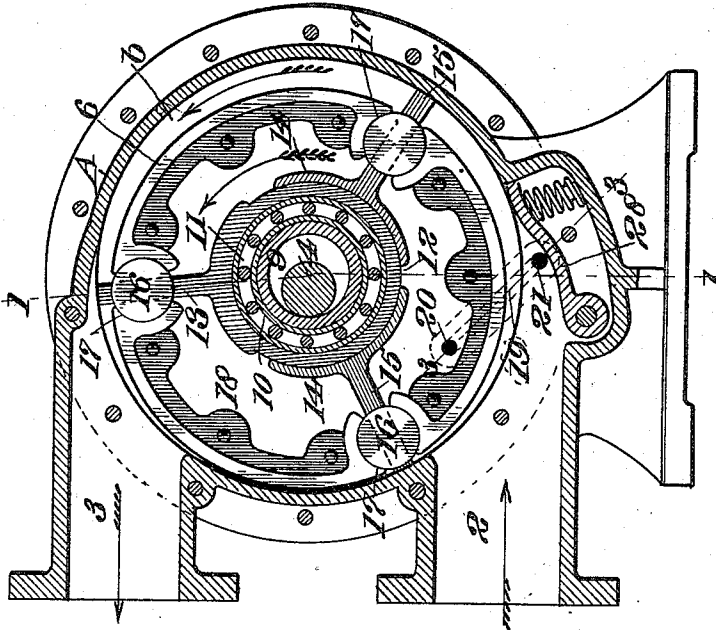
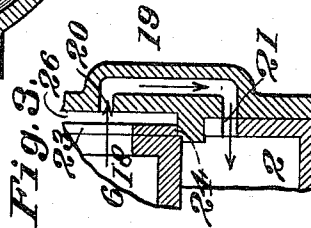
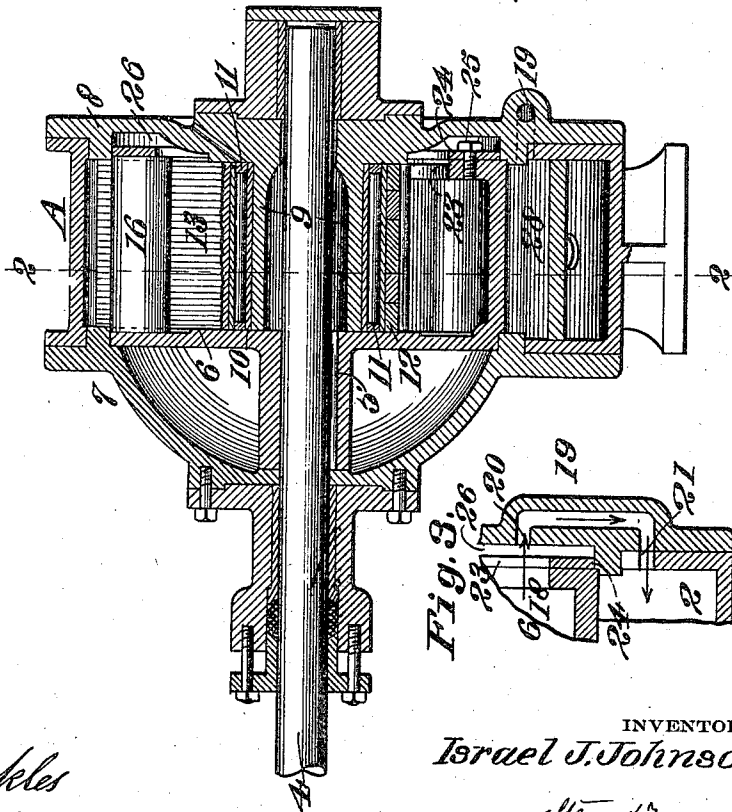


Fig. 1.



WITNESSES:

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ROTARY PUMP.

1,187,628.

Specification of Letters Patent. Patented June 20, 1916.

Application filed August 16, 1915. Serial No. 45,669.

To all whom it may concern:

Be it known that I, ISRAEL J. JOHNSON, a citizen of the United States, residing at Redding, in the county of Shasta and State of California, have invented new and useful Improvements in Rotary Pumps, of which the following is a specification.

This invention relates to a rotary pump, and particularly to improvements on Patent #1,143,200, entitled "rotary pump," issued to Harry McClelland and myself June 15, 1915.

By actual practice and operation of the pump described in Patent #1,143,200, it was found that the efficiency of same was materially decreased by end thrust and unnecessary friction caused by leakage water passing by the vanes into the hollow chamber of the rotor.

The object of the present invention is to overcome this defect by providing a relief passage through which the leakage water entering the hollow rotor may escape and be conveyed back to the intake or suction side of the pump.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a longitudinal section on line 1—1 of Fig. 2. Fig. 2 is a cross section on line 2—2 of Fig. 1. Fig. 3 is a detail section on line 3—3 of Fig. 2.

Referring in detail to the drawings, A indicates a pump cylinder, provided with suction and discharge openings 2 and 3. Extending through the cylinder and mounted eccentrically therewith is a driving shaft 4, upon which is secured, as at 5, by means of a key, a hollow rotor 6, and secured at each end of the cylinder to form a closure therefor, and also for the purpose of providing bearings for the driving shaft, are heads 7 and 8. The head 8 of the pump is provided with a tubular concentric hub 9 surrounded by a bushing 10, upon which is mounted a roller bearing 11. Surrounding the roller bearing 11 is a sleeve-like member 12, and formed integrally with said member is a radially disposed vane or impeller blade 13, which will hereinafter be known as the "master impeller."

Loosely mounted exteriorly of the sleeve member 12 is a pair of foot extensions 14,

and formed integrally with each foot member 14 is a radially disposed impeller blade 15. The several impeller blades extend through roller journals, such as indicated at 16, which are mounted in apertures or bearing chambers 17 formed in the rotor proper, and these, together with the master impeller and foot extensions 14, permit the several impeller blades to rock and reciprocate with relation to the rotor as this revolves within the cylinder. Because of the eccentricity of shaft 4 and the journals formed in the heads 7 and 8 there will be a relative sliding and oscillating movement of the impeller blades with relation to the rotor; the blades also having a relative independent motion to each other, this being permitted by the inner mounting of the several impellers.

By actual experience, in the operation of the pump disclosed in the Patent #1,143,200, it was found that the efficiency of same was materially decreased by end thrust of the rotor against head 7, this being caused by leakage water passing by the blades and roller journals 16 into the space 18 formed within the rotor. This leakage water accumulating within the hollow rotor would naturally be under pressure equal to the head under which the pump was operating and where this pressure became fairly high the end thrust exerted against head 7 would be sufficiently great to cause excessive wear and a material decrease in efficiency.

The object of the present invention is to overcome this defect by providing a relief port, such as indicated at 19. This port is formed in head 8 and is so positioned as to communicate at one end, as at 20, with the space formed in the hollow rotor, while the opposite end communicates with the suction side 2 of the pump, as indicated at 21. Any leakage water entering the hollow rotor is in this manner permitted to escape into the suction side, thereby preventing any water under pressure from accumulating within the hollow rotor, in this manner eliminating the end thrust and excessive friction previously encountered.

One side of the rotor is entirely open, as indicated at 23, and the roller journals 16 are slipped in from this side and secured in position by an end plate 24 and screws 25. All leakage water which would otherwise accumulate in the hollow rotor escapes through the opening 23 and into an annular

chamber 26 formed in head 8 and then through the relief passage previously described.

In operation, when power is applied to the driving shaft 4 from any suitable source, the rotor 6 will revolve on its axis eccentrically within the pump or cylinder chamber so that the impeller blades 13 and 15 will be swept around successively through the crescent-shaped chamber 6, and having a tendency to create a vacuum in the suction side 2 of the chamber it will draw the water in behind the leading blade and then force it out by the succeeding blade. The present pump is also provided with a trap, such as indicated at 28, for the purpose of preventing the rotor, cylinder or impeller blades from becoming injured by small rocks or other solid substances which might enter with the incoming water. These solids impinging against the depressible trap member 28 will cause this to yield and thereby protect the revolving members from injury.

The materials and finish of the several parts of the rotary pump are such as the experience and judgment of the manufacturer may dictate.

I wish it understood that various changes in form, proportion, and minor details of construction may be resorted to within the scope of the appended claim and that I do

not wish to limit myself to the specific design and construction here shown.

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

In a rotary pump, a pump cylinder having suction and discharge openings therein, a hollow rotor in the cylinder opened at one end and closed at the other, a series of roller bearing chambers formed in the rotor and opening through the opened end of the latter, roller journals mounted in the chambers, impeller blades slidable through the roller journals, a retaining ring secured to the rotor across the opened end of the bearing chambers to hold the roller journals therein, and a head at each end of the cylinder having an annular flange for engaging the periphery of the rotor, the head opposing the opened end of the rotor being provided with a passage leading from within its annular flange to the suction opening of the cylinder.

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

ISRAEL J. JOHNSON.

Witnesses:

HENRY G. HILL,

R. F. GILES.