J. L. SAUCHEREAU.

WATER PUMP.

APPLICATION FILED MAR. 31, 1913.

1,089,441.

Patented Mar. 10, 1914.

3 SHEETS—SHEET 1.

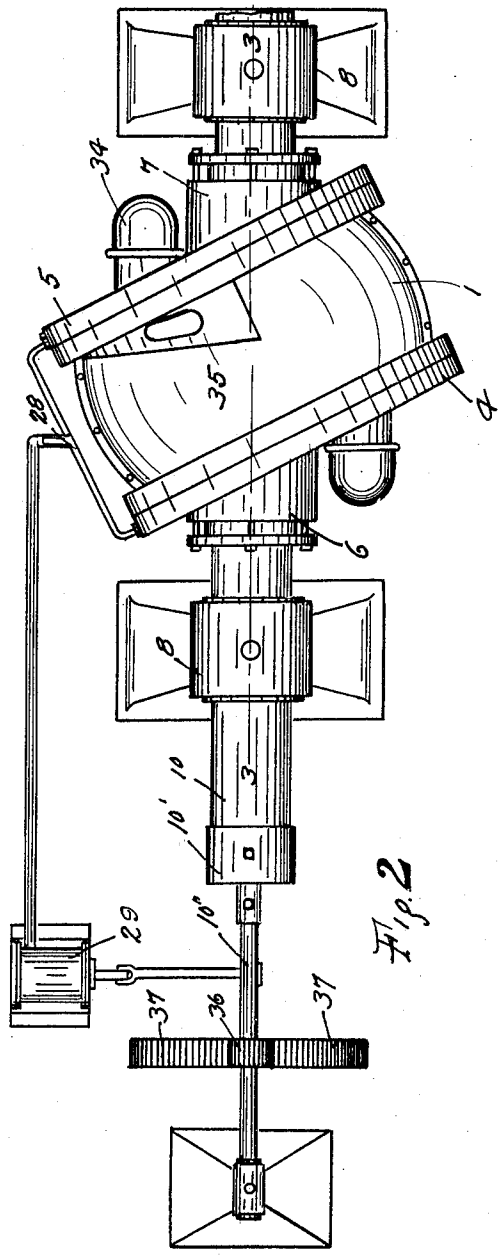


Fig. 2

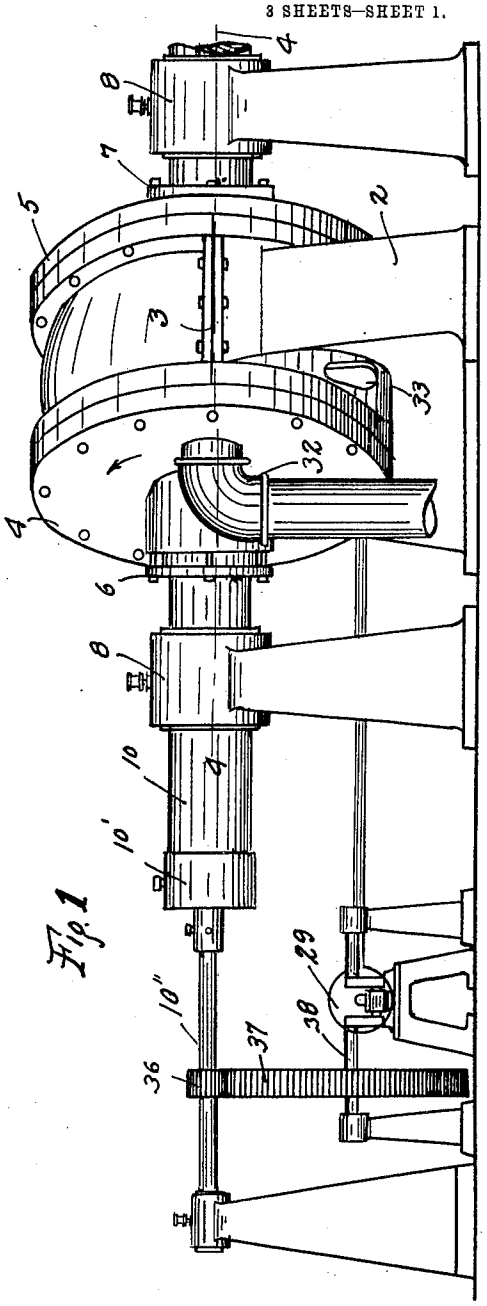


Fig. 1

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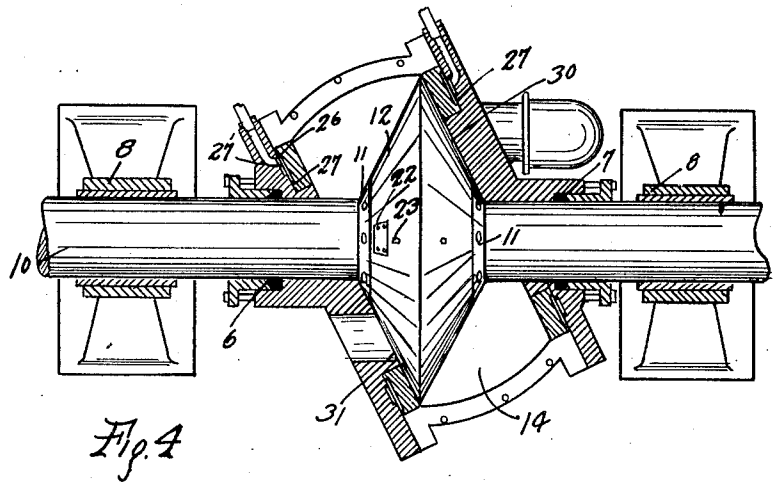


Fig. 4

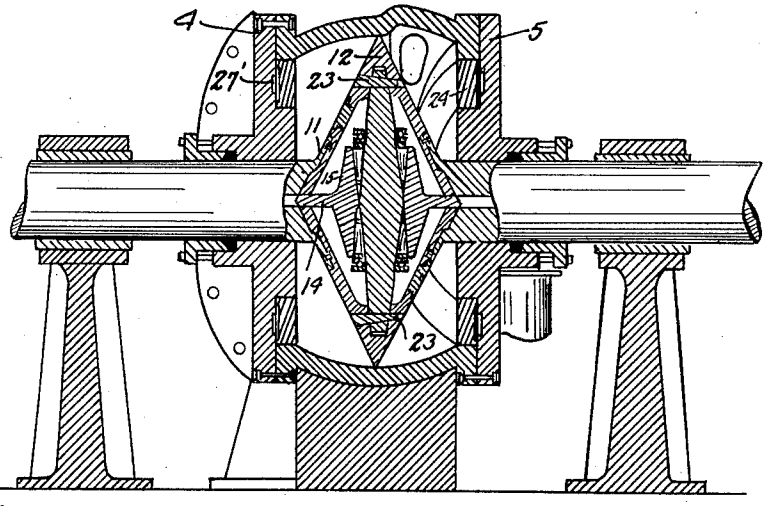


Fig. 3

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3 SHEETS—SHEET 3.

Fig. 7

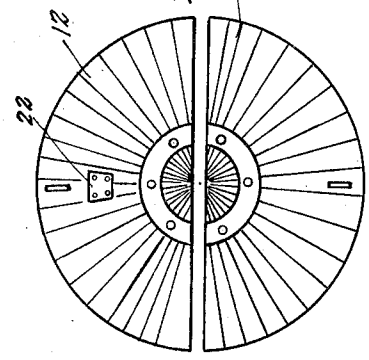


Fig. 8

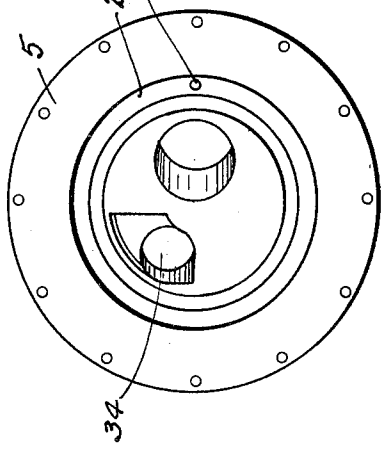


Fig. 5

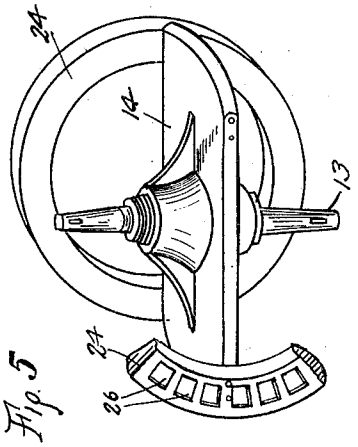
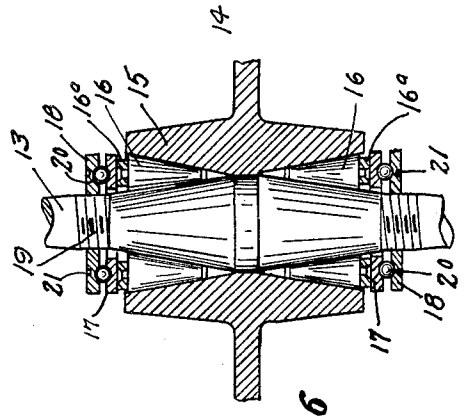


Fig. 6



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UNITED STATES PATENT OFFICE.

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WATER-PUMP.

1,089,441. Specification of Letters Patent. **Patented Mar. 10, 1914.**

Application filed March 31, 1913. Serial No. 757,734.

To all whom it may concern:

Be it known that I, JOHN L. SAUCHEREAU, a citizen of the United States, residing at Spokane, in the county of Spokane and State of Washington, have invented new and useful Improvements in Water-Pumps, of which the following is a specification.

My invention relates to an improved form of pump and has as its principal object the provision of a pump having a maximum efficiency.

A second object of my invention is to provide an improved form mounting for the piston of a pump of the revolving piston type.

A third object resides in the particular arrangement and combination of parts hereinafter described.

In the accompanying drawings:—Figure 1 is a side elevation of a pump embodying my improvements. Fig. 2 is a plan view of the pump shown in Fig. 1. Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2. Fig. 4 is a horizontal section on the line 4—4 of Fig. 1. Fig. 5 is a perspective view of the piston showing details of my improved mounting arrangement. Fig. 6 is a detailed view of a portion of the apparatus shown in Fig. 3 drawn on an enlarged scale. Fig. 7 is a detail view of a portion of the apparatus shown in Fig. 4. Fig. 8 is an interior view of one of the cylinder heads used in my pump.

Throughout the separate views the same part is designated by the same reference character.

Referring more particularly to the drawings, 1 indicates the cylinder of my pump which is mounted on suitable standards 2, the cylinder 1 being in two parts separable along a horizontal line as indicated at 3. 4 and 5 are the heads for the cylinder 1 and a shaft 10 is shown as passing through the cylinder and set at an angle to the axis thereof. Suitable stuffing boxes 6 and 7 are provided where the shaft 10 passes through the cylinder heads 4 and 5, respectively, these stuffing boxes being set at an inclination to the base of the cylinder heads so as to properly accommodate the shaft. Shaft 10 is shown as mounted in suitable bearings such as 8—8 which may be of any convenient type and at one end the shaft 10 is connected by means of a reducing coupling 10′ to the shaft extension 10″ which has rigid therewith a pinion 36 which meshes with a gear wheel 37 which drives in turn a shaft 38. The shaft 38 is provided with a crank and pitman connection with a small reciprocating pump 29, the purpose of which will hereinafter appear. The pump 29 may be of any convenient type, the details of this pump forming no part of my invention.

Referring more particularly to Figs. 3 and 4, it will be seen that the shaft 10 is divided into two sections, each of which is provided with a flaring flange such as 11. The flanges 11 make the same angle with the shaft 10 as does the inner face of the casing 1 so that the flanges run in contact with the inner face of the casing. The flanges 11 are bolted to the cone member 12 which is in the form of two cones set base to base and which is divided into two parts by the piston or blade 14. It will appear that the two outside surfaces of the members 12 also have the proper inclination so as to run in contact with the inner faces of the cylinder head. Within the member 12 is a pin 13 which is set at right angles to the shaft 10 and also at right angles to the blade or piston 14. The pin 13 is attached to the two parts of the member 12 by means of the tapered keys 23. Now it will be seen that the piston 14 is provided with a hub 15 which is bored to accommodate pin 13 and the bore of the hub 15 is tapered from both ends toward the middle to provide cone shaped interior surfaces. It will also be seen that the pin 13 tapers in the opposite direction. As best shown in Fig. 6, two tapered roller bearings 16 are mounted intermediate the hub 15 and the pin 13. The individual cones of the bearings 16 are attached to gage rings such as 16ª at their larger ends and rings such as 17 are placed outside of the gage rings. Outside of the rings 17 are collars 18 which have threaded connection with the pin 13 as shown at 19. The rings 18 are provided with holes 21 by which they may be adjusted on the pin 13 and both the rings 17 and 18 are provided with opposing grooves within which are mounted balls such as 20. The cone member 12 is provided with plates such as 22 and by removing these plates a spanner wrench may be inserted whereby the cone bearings 16 may be adjusted so as to run properly in the tapered bore of the hub 15, the wrench fitting the holes 21.

As shown in Fig. 5, the piston 14 is attached to rings 24 which are on opposite

sides of the piston and which run in grooves such as 27 which grooves are turned on the inner faces of the heads 4 and 5, the rings 24 being flushed with the inner face of the heads when in position. The outside faces of the rings 24 are provided with pockets such as 26, clearly shown in Fig. 5, for the purpose of retaining a lubricant such as water. Now the grooves 27 are connected to the discharge of the pump 29, previously mentioned, by the pipe 28, and the water forced into the grooves 27 by the pump 29 is caught by the pocket 26 and distributed around the grooves so as to lubricate the passage of the rings, and also serve to keep the piston in proper position. As clearly shown in Fig. 4, the bottoms of the grooves 27 are turned out as shown at 27′ so as to permit the liquid from the pump 29 to be evenly distributed around the entire circumference of the grooves even when the rings are in running position.

In the operation of my device it will be apparent that the cone 12 is in contact with the heads 4 and 5 at the points 30 and 31, respectively, and consequently forms a dam at these points even though moving, since it runs concentrically with the shaft 10. The blade 14 runs concentrically with the rings 24 which are at an angle to the axis of the shaft 10. From this it follows that when the shaft is revolved the blade 14 is swung from side to side on the pin 13 as an axis. I have provided head 4 with an intake through pipe 32 and a discharge through port 33, while the head 5 is provided with an intake through pipe 34 and a discharge through port 35. It will be understood that the inlet 32 is on an opposite side of the contact point 31 from the outlet 33 and that the inlet 34 is on an opposite side of the point 30 from the outlet 35. Consequently, when one half of the piston 14 passes by the inlet, the direction of rotation being as shown by the arrow in Fig. 1, water will be drawn in behind the piston and that before the first mentioned half of the piston reaches the outlet, the other half of the piston will have passed the inlet, thus inclosing a body of water within the pump, and when the first mentioned half of the piston passes the outlet this body of water is forced out under pressure owing to the continued reduction in space between the piston and the outlet. The operation just described is repeated and is the same for both sets of inlets and outlets. It will be understood that the pump 29 is adapted to pump against a higher head than the main pump so that the flow of water will be inward around the rings 24, thus insuring that they will be thoroughly lubricated. It will also be obvious that instead of turning out the groove 27 as at 27′ to provide passage for the water from pump 29 all around the groove 27, that I may lead the pipe 28 around the outside of the heads 4 and 5 and tap off from the pipe 28 into the groove 27 at various points.

It will be understood that while I have shown and described the preferred form of my invention, that various modifications thereof may be made without departing from the spirit thereof, and that parts of my invention may be utilized without using the whole.

Having thus described my invention, what I claim is:—

1. In a device of the class described in combination, a revoluble piston having a pair of rings attached thereto, grooved heads in which said rings revolve, a shaft set at an angle with said heads, and driving connections intermediate said shaft and said piston.

2. In a device of the class described in combination, a pump cylinder provided with a pair of grooved heads, a piston mounted in said cylinder, rings contacting with said piston on opposite sides thereof mounted in the grooves of said heads, means for revolving said piston, and means for forcing water into said grooves underneath said rings.

3. In a device of the class described comprising in combination, a cylinder, a revoluble piston mounted in said cylinder, and rings mounted in contact with said piston on each side thereof, said cylinder being provided with grooved heads into which said rings are inserted and said rings being provided with pockets on their faces next to said head for receiving lubricating material.

4. In a device of the class described in combination, a revoluble piston, driving means for said piston comprising a member provided with two exterior cone like surfaces, a pin within said member and on which said piston is revolubly mounted, tapered roller bearings mounted between said piston and said pin, and means whereby said bearings may be adjusted.

5. In a device of the class described in combination, a revoluble piston, and driving means for said piston comprising a member provided with two exterior cone like surfaces, a pin mounted within said member, said pin having rotating connection with said piston, tapered roller bearings interposed between said piston and said pins, said bearings having cage rings, plates having threaded engagement with said pin for adjusting said cage rings, and balls intermediate said plate and said rings, said member being provided with removable portions to afford access to said plates.

6. In a device of the class described in combination, a revoluble piston, and a driving head for said piston comprising two parts, one on each side of the piston, a pin within said head upon which said piston is revolubly mounted, and means for attaching said head to said pin at each end thereof

whereby the two parts of said head are fastened together.

7. In a device of the class described in combination, a driving shaft, a revoluble piston, and a member interposed between said shaft and said piston whereby said piston is driven, said member being provided with an exterior cone like surface and having recesses, flanges carried by said shaft and fitting into said recesses, and means whereby the said member is attached to said flanges.

8. The combination of a revolving piston pump, of a cylinder having detachable heads, each of said heads having an annular groove in the inner face thereof, a revolving piston mounted in said cylinder and carrying annular members adapted to run in said grooves, auxiliary means operated by said pump for lubricating the said annular members.

In testimony whereof I affix my signature in the presence of two witnesses.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."