

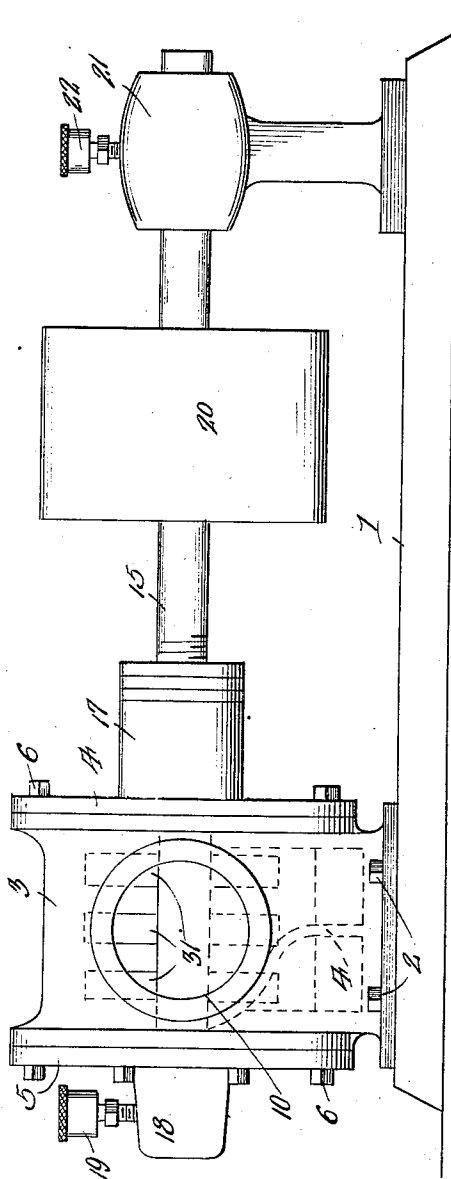
A. C. PITMAN.
PUMP OR MOTOR.
APPLICATION FILED SEPT. 4, 1912.

1,087,181.

Patented Feb. 17, 1914.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses

G. M. Spring
McQuay

Inventor

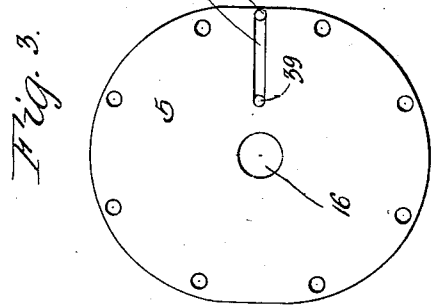
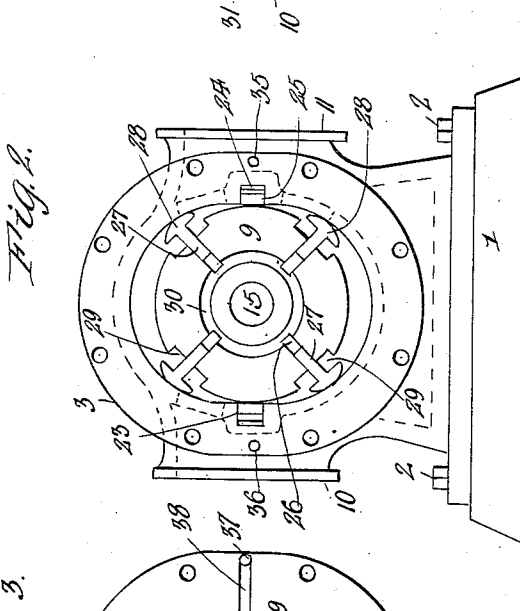
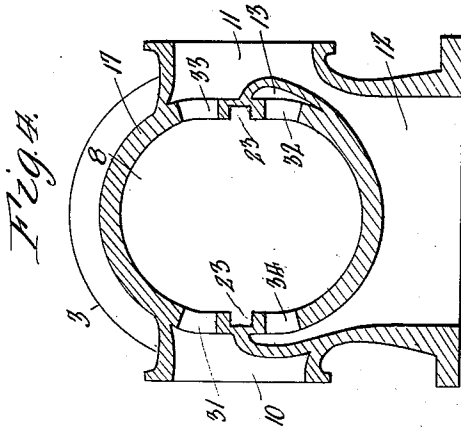
Andrew C. Pitman,
By Richard Brown
his Attorney

A. C. PITMAN.
PUMP OR MOTOR.
APPLICATION FILED SEPT. 4, 1912.

1,087,181.

Patented Feb. 17, 1914.

3 SHEETS—SHEET 2.



Witnesses

G. M. Spring

M. J. Spring

Inventor

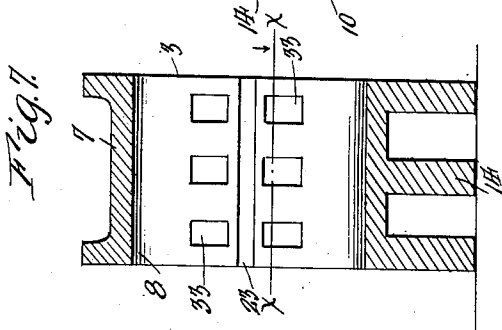
Andrew C. Pitman

Richard Brown
his Attorney

1,087,181.

Technical drawing of a mechanical assembly in cross-section. The drawing shows a central shaft (1) with a pin (2) and a nut (3) secured by a lock washer (4). The assembly is housed within a housing (5) with a flange (6). The housing is secured by a bolt (7) and a nut (8). The drawing is labeled with numbers 1 through 14.

Fig. 6.



1624

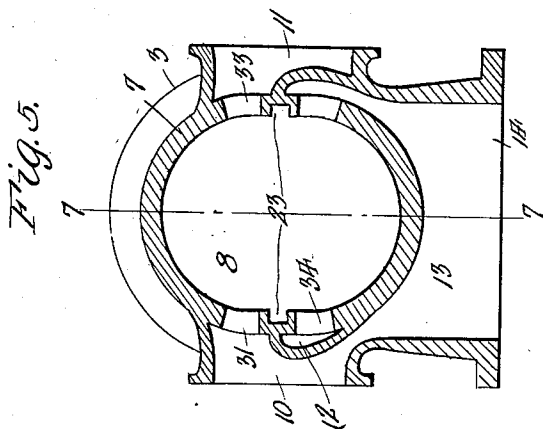


Fig. 5.

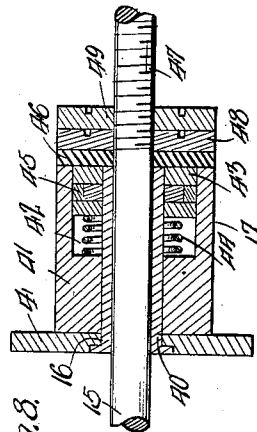


Fig. 8.

G.M. Spring
M.P. Gue Jr.

INVENTOR
Andrew C. Pitman,
Richard Brown
 His Attorney

UNITED STATES PATENT OFFICE.

ANDREW C. PITMAN, OF PHILIPPI, WEST VIRGINIA.

PUMP OR MOTOR.

1,087,181.

Specification of Letters Patent. - Patented Feb. 17, 1914.

Application filed September 4, 1912. Serial No. 718,591.

To all whom it may concern:

Be it known that I, ANDREW C. PITMAN, a citizen of the United States, residing at Philippi, in the county of Barbour and State of West Virginia, have invented new and useful Improvements in Pumps or Motors, of which the following is a specification.

My invention relates to a pump or motor.

One object of my invention is to provide a plurality of separate chambers in which the pump cylinder operates, and means to supply fluid to each of said chambers to act upon the cylinder so as to give the same a duplex or double action.

Another object of the invention is to so construct the device that the fluid will be supplied and act on opposite sides of the cylinder.

Another object of my invention is to provide a chamber for the cylinder of larger size than the diameter of the cylinder and non-circular, together with pistons movable radially from the cylinder to act against the interior wall of the chamber.

A further object of the invention is to so construct the pump that the pistons mentioned will be moved from the cylinder shaft by centrifugal force so as to act upon the wall of the chamber, and to supply fluid to assist in the moving or actuation of the pistons.

A further object of the invention is to provide an end plate for the pump casing having a groove to supply the liquid to act against the pistons, and so constructed as to be removable and reversible, so that by adjustment thereof the motion of the pump or motor may be reversed.

Other objects of the invention will hereinafter appear, wherein the device is specifically described in connection with the accompanying drawings.

In the accompanying drawings Figure 1 is a side elevation. Fig. 2 is an end view with an end plate removed. Fig. 3 is an elevation showing the interior face of the removed end plate. Fig. 4 is a vertical sectional view through the pump casing, illustrating one of the inlet and discharge openings. Fig. 5 is a similar view showing the other inlet and discharge openings. Fig. 6 is a horizontal sectional view through the pump casing. Fig. 7 is a sectional view on

the line 7—7 of Fig. 5, and, Fig. 8 is a sectional view illustrating the packing device for the pump shaft.

Referring to the drawings, 1 designates a base plate or bed, to which is bolted or otherwise secured as at 2, a casing 3 which is open at its sides and provided with removable side wall plates 4 and 5 at opposite ends, respectively, and secured to the casing as by means of bolts at 6. The casing is provided with a substantially elliptical shaped wall 7 so as to provide a similarly shaped chamber 8 in which a pump cylinder 9 operates. The casing is provided with inlet or outlet openings or ports at its opposite ends designated 10 and 11. The opening 11 communicates with a passageway 12 which extends to the opposite side of the casing, and the opening 10 communicates with a passageway 13 which also extends to the opposite side of the casing. The passageways 12 and 13 are divided and closed against inter-communication by a fan-like partition such as 14.

The cylinder 9 is mounted on a shaft 15 so as to turn therewith, and which shaft is supported or journaled in openings 16 in the side plates 4 and 5, in any suitable manner, and beyond the side plate 4, a suitable packing device as at 17, which will be hereinafter referred to, is provided. The shaft beyond the side plate 5 enters a bearing such as 18, and to which lubricant can be supplied from a cup or the like designated 19. Beyond the packing device 17 the shaft 15 has mounted thereon a pulley 20, and beyond the pulley 20 the shaft is mounted in a bearing 21 having a cup 22 thereon, adapted to supply lubricant to the shaft interior of the bearing.

At the narrowest width of the chamber 8, which is preferably the same width as the diameter of the cylinder, are provided on opposite sides of the wall 7 and in alignment, grooves designated 23, in which grooves are provided suitable leaf springs 24 and gibs or plates 25. The springs 24 bear against the gibs 25, pressing the same outwardly and maintaining close contact with the periphery of the cylinder, and thereby dividing the chamber 8 into separate non-communicating upper and lower chambers. In openings or slots 26 provided

in the cylinder 9 are slidably and radially mounted a plurality of pistons of suitable shape and as shown each having a stem or shank 27 and a head 28. The cylinder is suitably recessed at 29 so that the pistons may move inwardly and their heads 28 be within the periphery of the cylinder. The slots 26 communicate with an annular groove 30 provided in one end of the cylinder 9.

The port 10 has communication with the chamber 8 through one or more ports 31 provided in the wall 7, and the chamber or passageway 13 has communication with the chamber 8 through a port or ports 32 provided in the wall 7 on the opposite side to the ports 31. Likewise the port 11 has communication with the chamber 8 through a port or ports 33 provided in the wall 7, and the passageway 12 has communication with the chamber 8 through a port or ports 34 provided in the wall 7 on the opposite side to the ports 33. An intermediate opening or port 35 is provided in the casing and communicates with the port 11, and a port or opening 36 similar to the port 35 is provided in the casing at the opposite end and communicates with the port 10. The side plate 5 is provided with an inlet opening or port 37. Said side plate 5 may be secured in position with the port 37 registering with the port 35 or port 36 as desired. The port 37 leads to a groove or channel 38 having an outlet port or opening 39 adapted to communicate with the annular groove 30, whether secured so that the ports 35 and 37 are in registry or the ports 36 or 37 are in registry.

Referring now to the packing device 17 on the shaft 15, the shaft is directly journaled in a bushing 40 extending from the side plate 4. A collar 41 provided with a recess or chamber 42 is mounted on the bushing 40 and bears at one end against the plate 4. A gland 43 is slidably mounted upon the bushing 40 and in the chamber 42 and a spiral spring 44 surrounds the bushing and is interposed between the gland 43 and base wall of the chamber 42, tending to force the gland away from said wall and out of the chamber 42. Said gland is provided with an expansion ring 45 secured in a suitable groove on the periphery or edge thereof.

Numerical 46 designates a friction washer, such as one made of fiber, which washer is slipped over the shaft 15 and is adapted to bear against the end of the collar, the gland, and the end of the bushing. Said shaft 15 is screw threaded as at 47 and on said threads rides a nut 48 adapted to clamp the fiber washer against the several parts mentioned. On said threads 47 also rides a nut 49 which serves as a lock for the nut 48.

My device may either serve as a pump or as a motor. When serving as a pump, the shaft 15 is driven in any suitable manner as by means of the engagement of a belt, driven from a suitable source of power, with the pulley 20. It is clear of course, that the device is adapted for the pumping of fluids, principally water. When used as a motor, the shaft 15 is driven by water or other fluid which is supplied through the parts and which drives the shaft 15. The power generated may be imparted or supplied to any device it is desired to operate.

In operation, say for example that the water enters through the port or inlet 10, a portion thereof passes through the ports 31 into the upper chamber divided from the chamber 8 by means of the gibs 25, and operates against the pistons 28 and is discharged through the ports 33 and port or outlet 11. Simultaneously with the passage of a portion of the water into the upper chamber, another portion thereof passes through the passageway 13 and ports 32 and into the lower chamber to act upon the pistons and below the axis of the cylinder, the water discharging from said lower chamber through the ports 34, passageway 12, and outlet or port 11. The pistons upon the rotation of the cylinder, are forced outwardly against the wall of the upper and lower chambers by centrifugal force, and to assist in the actuation or outward movement of said pistons, a portion of the water entering the inlet 10, passes through the opening 36, port 37, groove 38, port 39, annular groove 30, and into the slot 26 where the same acts against the ends of the pistons. The supply of the water to act against the pistons is thus effected simultaneously with the supply to the upper and lower chambers. When the device acts as a pump, the pistons in their extended position force the water out of the chambers through the respective openings, and when the device acts as a motor the water impinges or flows against the extended pistons and the force thereof moving said pistons and thus driving the shaft 15. The cylinder 9 being of a diameter substantially equal to the narrowest width of the chamber permits the gibs 25 at all times, to bear against the periphery of the cylinder and thus provide the separate upper and lower, non-communicating chambers. The recess 29 and elongated slots 26 also permit the pistons to move inwardly and interior of the periphery of the cylinder 9 as the pistons pass the gibs 25.

When the motion of the device is reversed the port 11 serves as the inlet and the port 10 serves as the outlet, and the water passes through the respective ports and passage-

ways in a manner just the opposite to that just described. Preparatory to such reversal however, the plate 5 must be secured so that the port 37 will be in registry with the port 35 so as to communicate with the water supplied to the inlet or port 11, and convey a portion of the same to act against the pistons, as described.

It will be seen that the cylinder 9 operates simultaneously in separate chambers, to each of which chambers water is supplied to act in connection with the pistons, thus giving a duplex action to the pump. It will also be seen that the water acts simultaneously upon the pistons on opposite sides of the axis thereof.

The device shown herein is my preferred form, and it is to be understood that the same may be varied within the spirit and scope of the appended claims.

Referring to the packing device illustrated, a portion of the water may escape from the chamber of the pump and pass along the shaft 15 between the same and the bushing 40, said water will then pass around the ends of the bushing and into the chamber 42 between the exterior of the bushing 40 and the interior of the gland 43; where it will assist the spring 44 in forcing the gland 43 against the washer 46, which is preferably of friction material such as fiber, as stated, and the water is prevented from escaping by the engagement or close contact of the expansive ring or the like 45 peripherally of the wall of the chamber 42.

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

1. In a device of the class described, a casing, a cylinder therein, said casing provided with inlet and outlet ports arranged on opposite sides thereof and leading directly to the cylinder chamber and with side walls, a wall of said casing extending intermediate the side walls from one port to the other port providing passageways on opposite sides thereof between the same and said side walls, one passageway from each port leading to the cylinder chamber on the side of the chamber opposite to the port to which the passageway leads.

2. In a device of the class described, a casing, a cylinder therein, said casing provided with inlet and outlet ports arranged on opposite sides thereof, first and second ports communicating with the cylinder chamber opposite said inlet and outlet ports, said casing having side walls and a wall extending intermediate the side walls and partly across said inlet and outlet ports and distanced from and over said second ports, said first ports communicating directly with said inlet and outlet ports and cylinder

chamber, said wall providing passageways on opposite sides thereof between the same and said side walls and from said inlet and outlet ports, one passageway from each of said latter ports leading to the cylinder chamber on the side of the chamber opposite to the port from which the passageway leads.

3. In a device of the class described, a casing, a rotary cylinder therein provided with a plurality of radially slidable pistons, the configuration of the chamber wall differing from the configuration of the periphery of the cylinder, said casing provided with inlet and outlet ports arranged on opposite sides thereof and leading directly to the cylinder chamber, said casing having side walls and a wall extending intermediate said walls and from one port to the other port providing passageways on opposite sides thereof between the same and said side walls, one passageway from each port leading to the cylinder chamber on the side of the chamber opposite to the port to which the passageway leads.

4. A device of the class described having a casing provided with a chamber, a cylinder in said chamber, separate ports at opposite ends for a fluid, said casing provided with an opening communicating with each port, a removable plate having a groove to communicate with either of said ports, and supply fluid to act against the piston means.

5. A device of the class described having a casing provided with a chamber, a cylinder in said chamber, said cylinder provided with a continuous groove and with second grooves leading therefrom, pistons slidable in said latter grooves, said casing provided with separate fluid ports at opposite ends and with an opening communicating with each port, an adjustable plate provided with a groove to communicate with either of said latter ports, and with said continuous groove.

6. In a device of the class described, a casing, a cylinder therein, said cylinder provided with a continuous groove and with second grooves leading therefrom, pistons slidably mounted in said second grooves provided with heads, said cylinder provided with recesses to receive said heads, the cylinder chamber being of different configuration than the configuration of the periphery of the cylinder, said casing provided with inlet and outlet ports arranged on opposite sides thereof, first and second ports communicating with the cylinder chamber opposite said ports, a wall of said casing extending partly across said ports and distanced from and over said second ports, said first ports communicating directly with said second ports and cylinder chamber, said wall pro-

viding passageway from each of said inlet and outlet ports to said second ports, one passageway from each second port leading to the cylinder chamber on the side of the
5 chamber opposite to the port from which the passageway leads, a removable side plate on said casing, said casing provided with ports communicating with said ports, and
said plate provided with a groove to communicate with said continuous groove of the
cylinder and with either of said latter ports. 10

ANDREW C. PITMAN.

Witnesses:

W. T. ICE, Jr.,
J. HOR WOODS.