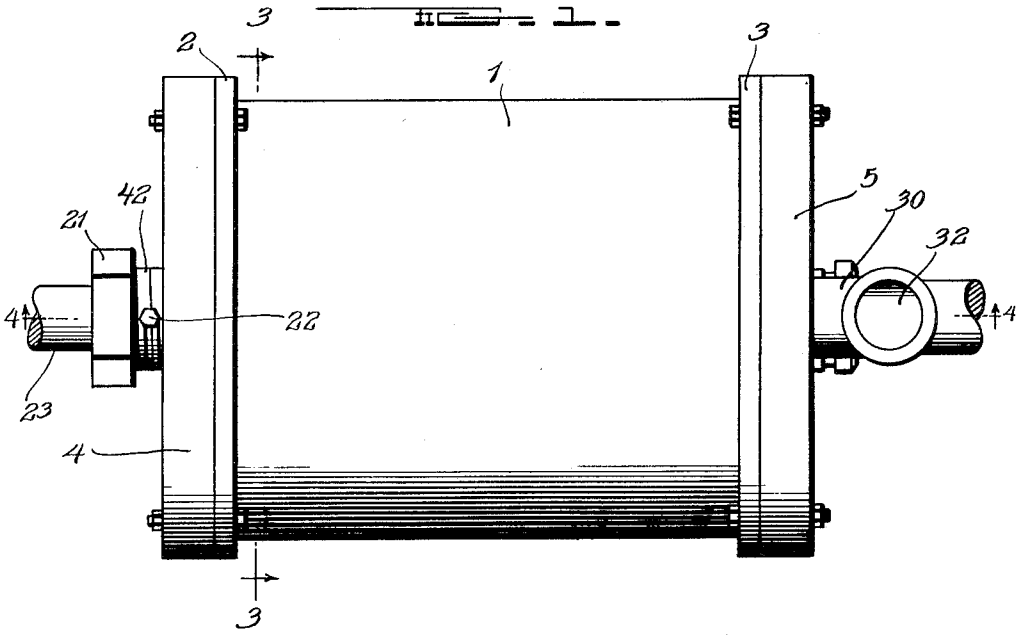
R. H. JOHNSON.

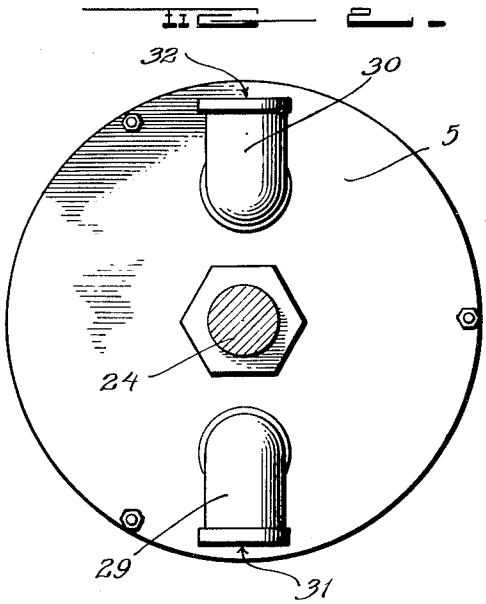
PUMP.

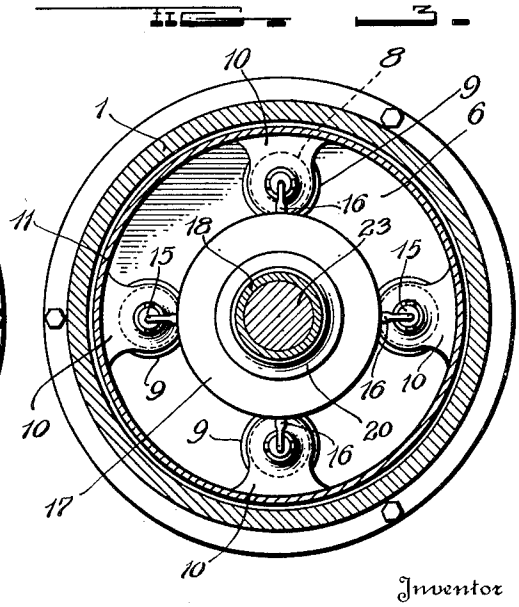
APPLICATION FILED NOV. 1, 1921.

1,427,740. Patented Aug. 29, 1922.

2 SHEETS—SHEET 1.







Inventor

R. H. Johnson

By Wilkinson & Giusta,

Attorneys.

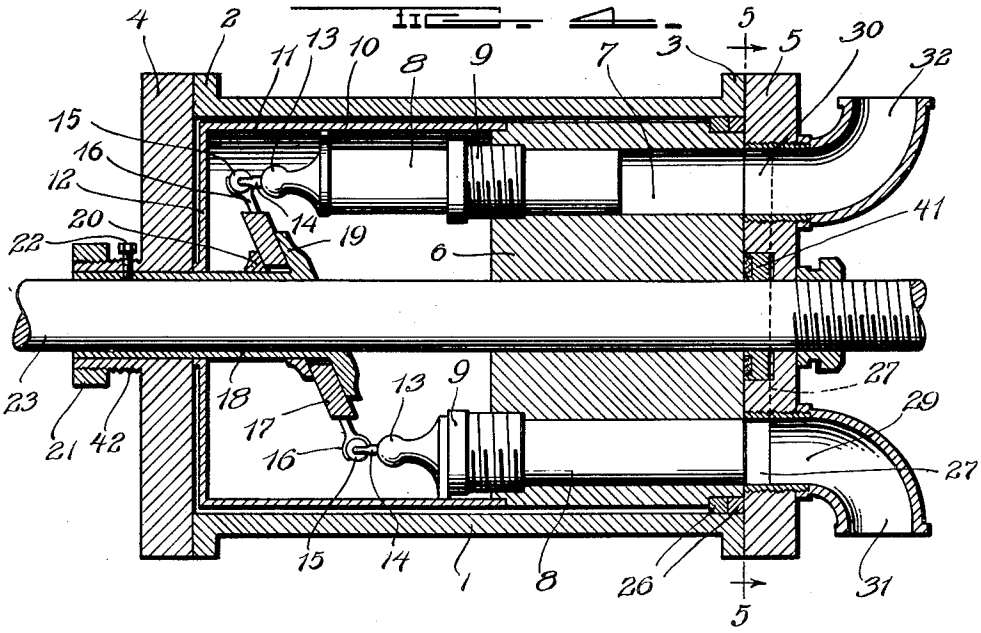
R. H. JOHNSON.

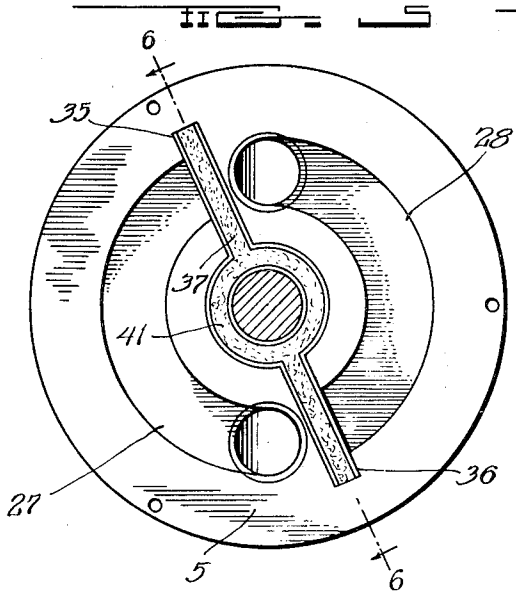
PUMP.

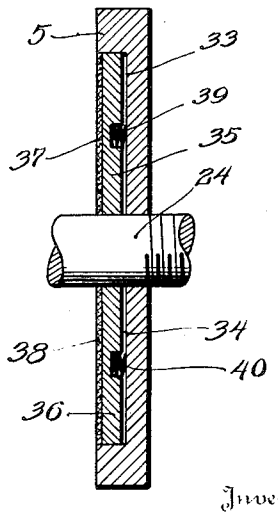
APPLICATION FILED NOV. 1, 1921.

1,427,740. **Patented Aug. 29, 1922.**

2 SHEETS—SHEET 2.







Inventor

R. H. Johnson

By Wilkinson & Giusta,

Attorneys.

UNITED STATES PATENT OFFICE.

ROBERT H. JOHNSON, OF WASHINGTON, DISTRICT OF COLUMBIA.

PUMP.

1,427,740. Specification of Letters Patent. Patented Aug. 29, 1922.

Application filed November 1, 1921. Serial No. 512,145.

To all whom it may concern:

Be it known that I, ROBERT H. JOHNSON, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in pumps in which a rotary drum, provided with cylinders, carries reciprocating pistons in the cylinders with improved mechanism for causing the reciprocation of the pistons upon rotation of the drum, the invention further contemplating the provision of an improved casing structure for enclosing the drum and the plunger actuating mechanism in which the inlet and exhaust of fluid is secured without leakage and without the use of valves.

It is an object of the invention to provide a compact pump having a large capacity for the material and with few parts of simple construction permitting of adjustment of the plunger actuating mechanism to secure the desirable throw of the plungers and a consequent alteration in the capacity of the pump.

Other objects of the invention are to reduce the expense of manufacture and maintenance of pumps generally, to provide a pump capable of diverse uses, of small compass, in which the plungers are guided in a novel manner to preserve their alignment and wherein the pump may be operated with a relatively small output of power.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Fig. 1 is a side elevation of an improved pump construction according to the present invention;

Fig. 2 is an end view thereof with the shaft shown in section;

Fig. 3 is a transverse section taken on the line 3—3 in Fig. 1;

Fig. 4 is a longitudinal section taken on the line 4—4 also in Fig. 1;

Fig. 5 is a cross section taken on the line 5—5 in Fig. 4; and,

Fig. 6 is a section on the line 6—6 in Fig. 5.

Referring more particularly to the drawings, 1 designates a casing of a cylindrical form having flanges 2 and 3 at its ends turned outwardly and adapted to receive the end heads 4 and 5 which close the ends of the casing. The casing is preferably cylindrical to receive and form a proper support for a rotary drum 6 having one end bearing against the inner face of the head 5 and provided with a number of cylinders 7 cylindrically arranged and opening through the ends of the drum.

In the cylinders are fitted pistons 8, adapted to rotate with the drum and to reciprocate in the cylinders. Stuffing boxes 9 are provided upon the inner end of the drum 6 in conjunction with each cylinder and its plunger. The plungers 8 project into the space in the remaining half portion of the casing 1 not occupied by the drum 6, and are each provided with flanges 10 of arcuate form adapted to rest at their outer sides against a shell 11 mounted within the casing 1 and having one end affixed to the drum 6.

The shell 11 is provided with a head 12 which closes the end adjacent the casing head 4. The plungers 8 are formed beyond the plungers 10 with ball heads 13 from which extend axial pins 14 carrying universal balls 15 which lie within complemental sockets 16 carried upon a cam ring 17 confined in an inclined position within the casing and shell 11 and mounted coaxially with the drum 6, being caused to rotate with the drum and with the plungers 8. The ring 17 fits with suitable clearance in a cam or inclined track mounted within the casing and carried upon a sleeve 18 mounted for both angular and longitudinal adjustment through the casing head 4.

The inner end of the sleeve 18 is provided with a flange 19 which cooperates with a companion flange 20 which is braced or otherwise secured to the sleeve 18 in spaced relation to the flange 19. The space between the two flanges is of a width to receive the ring 17 and to permit of the free rotation of the ring therein. The outer portion of the sleeve 18 is passed through an opening in the casing head 4 and through a flange 42 which is threaded to receive the stuffing box 21 and a set screw 22 which secures the sleeve 18 against rotation with the shaft 23.

The set screw 22 provides for securing the sleeve 18 after it has been adjusted, the set screw being withdrawn for the purpose of longitudinally and angularly adjusting said sleeve. The shaft 23 extends entirely through the casing and is secured to drive the drum 6, the shaft being rotated by any suitable source of external power.

The inner space of the casing head 5 is provided with intake and exhaust channels 27 and 28 respectively which are constituted by depressions made in the face of the plate and extending approximately semicircularly, the two channels being of course spaced apart at adjacent ends and being placed in communication with intake and exhaust ports 29 and 30. Suitable elbows or other connections 31 and 32 may be provided in conjunction with the intake and exhaust ports for the purpose of attaching pipes or other conduits.

The open ends of the cylinders 7 are adapted to register with the channels 27 and 28 and to be put in communication thereby with the intake and exhaust ports 29 and 30. The casing head 5 is provided with recesses 33 and 34 extending in diametric alignment at opposite sides of the shaft 24 for receiving partitions 35 and 36 having suitable facings 37 and 38 to bear against the adjacent end of the drum 6. Coil springs 39 and 40 seated in sockets in the partitions and bearing against the bases of the recesses 33 and 34, act to urge the partitions outwardly and against the drum. As shown in Fig. 5, the partitions extend beyond the inlet and exhaust channels 27 and 28, and have a ring 41 connecting them.

In use, the drum 6 is rotated through the shaft 23 and carries about with it the plungers 8 and the ring 17. Due to the inclined position in which the ring is held, it will impose in its rotation a reciprocating movement upon the plungers 8. It will thus take approximately one-half revolution of the drum to draw each plunger out, and the second half of the revolution to force it finally back into its cylinder.

During these one-half revolutions, the cylinders are placed in communication with the channels 27 and 28 so that an inlet of fluid may be taken into the cylinders by suction of the pistons during drawing out of the latter; while the cylinders are in communication for the second half movement of the drum with the exhaust channel 28 to permit of expelling the fluid from the cylinders to the desired destination. The partitions 35 and 36 separate the inlet and exhaust channels and positively prevent any interchange of fluid or any leakage which would impair the capacity of the pump.

The sleeve 18 may be adjusted by first loosening the set screw 22 and either revolving the sleeve to change the relative positions of the plungers as respects the intake and exhaust channels, or the sleeve 18 may be moved back and forth in an axial direction upon the shaft 23 to shift the longitudinal position of the plungers.

It will be appreciated from the foregoing that the apparatus is exceedingly compact, being contained within a small casing 1 within which all of the parts are confined against tampering, and dust and foreign matter, while the adjustments may be carried on from the exterior. The pump may be given a high rate of rotation and may thus be obliged to pump great quantities of fluid in a short space of time.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:

1. A pump comprising a casing, a drum rotatably mounted therein and having a number of concentric cylinders, pistons mounted to reciprocate in said cylinders, means to cause movement of the pistons upon rotation of the drum, an end wall for the casing abutting against the drum and having separated channels therein communicating alternately with the adjacent end of the cylinders, said end wall also having inlet and outlet ports in communication respectively with the separated channels, and a movable partition associated with the end wall and yieldably pressed against the drum, substantially as described.

2. A pump comprising a fixed casing, a rotary drum mounted within one portion of the casing and having means to rotate the same, said drum having cylinders formed therein lying parallel with the axis of rotation of the drum and opening through the ends thereof, plungers reciprocating in the cylinders, means to reciprocate the plungers upon rotation of the drum, an end wall for the casing abutting against the drum and having substantially semi-circular channels in the inner face thereof adapted to communicate with the open adjacent ends of the cylinders, said end wall also having inlet and exhaust ports connecting separately with the channels, and spring pressed partitions mounted in said end wall between the channels and bearing yieldably against the end of the drum, substantially as described.

3. A pump comprising a casing, a rotary drum mounted on one portion of the casing and having cylinders therein, a head for the casing providing intake and exhaust spaces for the cylinders with means to separate such spaces, plungers in the cylinders, a cam ring connected to the plungers and rotatably

mounted within the casing, a shell extending about said plungers and ring, a sleeve projecting through the casing and being detachable from the exterior thereof, said sleeve having an inclined track for the ring, substantially as described.

4. A pump comprising a casing having end heads detachably mounted thereon, one said head having intake and exhaust ports, and separate channels on its inner face communicating individually with said ports, yieldably pressed partition means carried by the head for separating said channels, a drum mounted for rotation within the casing and bearing against said head having the channels, said drum having a number of concentrically mounted cylinders, means for rotating the drum, plungers in the cylinders rotating with the drum and reciprocating at the same time, a ring for inclined rotary movement within the casing and rotated by the plungers and in turn reciprocating said plungers, an inclined track for the ring and means to adjust the track toward and from the drum from the exterior of the ends, substantially as described.

ROBERT H. JOHNSON.