

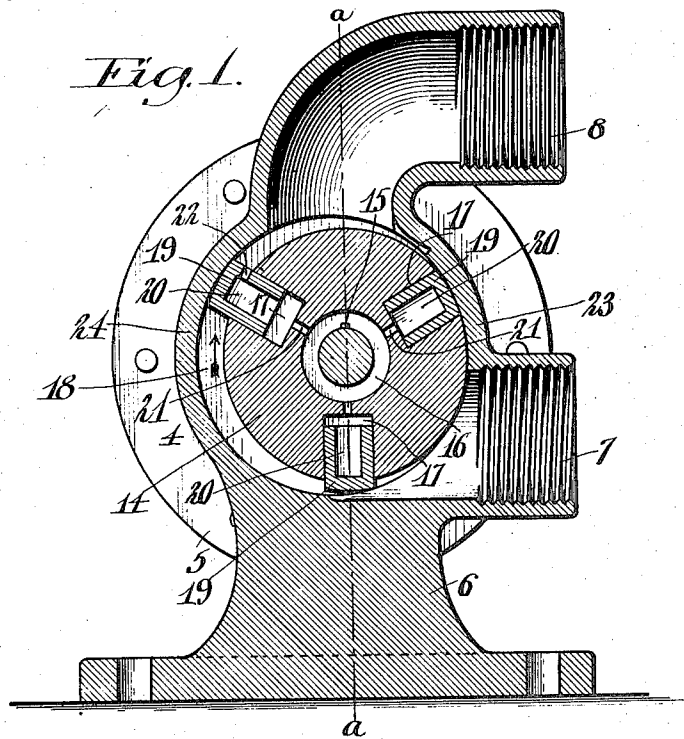
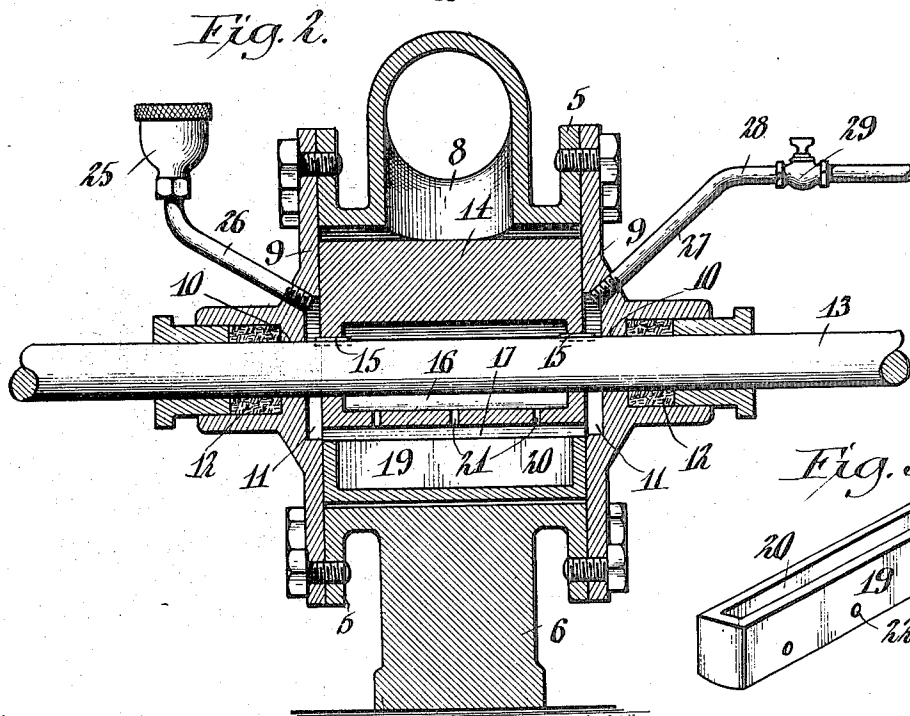
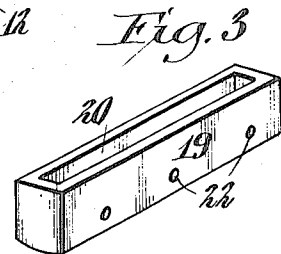
J. H. MYERS.

ROTARY PUMP.

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1,093,005.

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ROTARY PUMP.

1,093,005.

Specification of Letters Patent.

Patented Apr. 14, 1914.

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To all whom it may concern:

Be it known that I, JOHN H. MYERS, a citizen of the United States, residing at Kenmore, in the county of Erie and State of New York, have invented certain new and useful Improvements in Rotary Pumps, of which the following is a specification.

My invention relates to that type of rotary pumps in which a drum is rotatably and eccentrically mounted within a cylinder and provided with one or more pistons or wings movable toward and from the inner surface of the wall of the cylinder.

The primary object of my invention is the provision of a pump of this character in which new and improved means are employed for forcing the pistons or wings outwardly by liquid pressure with a view of simplifying the construction, reducing the cost of production and also avoiding noise and undue wear.

By resorting to the use of liquid pressure for moving the pistons or wings outwardly against the wall of the cylinder, the springs or equivalent means commonly employed are dispensed with; and other objects of my invention are the utilization of this principle in such a manner as to attain quick and positive action of the working pistons or wings; to improve the construction of the drum with which said pistons or wings are associated; to equip the pump for high service use; to so construct the pistons or wings that they are quickly moved outwardly aided by centrifugal force and so that the direction of rotation of the drum will assist in delivering the liquid behind the pistons or wings and cause their outward movement; and to otherwise improve on pumps of this type.

With these and other objects in view, my invention consists in the provision of a rotatable member or drum having radially or otherwise movable pistons or wings adapted to travel in contact with the inner surface of the pump cylinder or casing, distributing passages arranged in said rotatable member or drum, a central chamber common to said distributing passages, and a pressure port or ports leading from one or more of the pistons or wings and adapted to be in communication with said central chamber, thus causing the liquid pressure agent to act against the pistons or wings without possibility of the liquid which is being forced through the pump cylinder or casing acting as a re-

tarder to the action of that part of the liquid used as a pressure agent.

My invention further consists in providing pistons or wings with deep inwardly opening pockets so as to render them heavier at their outer ends, and under the centrifugal force created by the rotation of the drum cause said pistons or wings to move outwardly more rapidly, similar to an arrow.

It also consists in providing at least one of said pistons or wings with a pressure port to enable the liquid pressure agent to enter chambers in rear of said pistons or wings, and it further consists in the novel construction and arrangement of parts to be hereinafter described and particularly pointed out in the subjoined claims.

Certain features of the pump illustrated in my copending application filed March 20, 1912, Serial No. 615,453 are also herein shown, such features or similar parts, broadly considered, being the distributing ports communicating with the guideways in which the pistons or wings are movable and the depressions in the heads of the cylinder. In the drawings,—Figure 1 is a central transverse section of a pump constructed according to my invention. Fig. 2 is a vertical longitudinal section of the same taken on a plane indicated by line *a-a*, Fig. 1. Fig. 3 is a detached perspective view of one of the pistons or wings.

Similar numerals of reference designate similar parts in the several figures.

The rotary pump comprises a casing which is preferably cylindrical and horizontally-disposed, and has at opposite ends outstanding flanges 5 and at one side an integral enlargement 6 which serves as a base for the complete pump. The casing is provided at different parts of its periphery with a liquid inlet 7, a liquid outlet 8, and heads 9, 9, to close opposite ends of the cylinder, said heads being provided with alined bearings 10 and depressions 11, preferably circular, on their inner surfaces. These heads are also provided with stuffing boxes 12. Rotatably mounted in said heads and passing through said stuffing boxes is a shaft 13 on which is keyed a rotatable drum or member 14, as at 15, 15, said drum or member having a central chamber 16 extending from a point near one end thereof to a point near the other end. With the shaft 13 extending through said central chamber, an

liquid space is provided around said shaft. The rotatable drum or member 14 is mounted eccentrically to the axis of the cylinder and is provided with a plurality of radial guideways 17 which open at the periphery of the drum or member, three of said chambers being preferably employed and arranged equi-distant, as shown in the drawings. By arranging the rotatable drum or member 14 eccentrically within the cylinder, a crescent-shaped liquid space 18 is provided between the wall of the cylinder and said drum or member.

In each of the guideways a radially movable piston or wing 19 is provided, the outer edge or face of which engages with the inner surface of the cylinder or casing. These pistons or wings are hollowed out to provide a comparatively deep pocket 20 in each, and by reason of such arrangement the wings are more readily forced outward by the centrifugal force created when rotating said drum or member, this being due to the outer ends of the pistons or wings being heavier than the inner ends and acting similar to an arrow. Connecting the central or annular chamber 16 with each of the guideways 17 are one or more distributing passages 21 and that by means of these passages and said central or annular chamber said guideways are in intercommunication.

The rotatable drum or member 14 travels in the direction of the arrow shown in Fig. 1, and in the advancing side of one or more of the pistons or wings one or more inlet or pressure ports 22 are formed, said inlet or pressure ports entering the pockets 20 of the wing or wings in which they are formed. Thus the crescent-shaped chamber 18 is in communication with all of the guideways by reason of the fact that the several guideways are inter-connected. Each piston or wing reciprocates in its guideway as it sweeps successively in contact with the parts of the wall of the cylinder which are near and far from the periphery of the rotatable drum or member. Each piston or wing passes over the near side 23 of the cylinder between the liquid outlet and inlet, when in its fully retracted position, but as it passes the inlet it begins to move outwardly in its guideway and reaches its point of greatest projection at the far side 24 of the cylinder. Thereafter the piston during its continued forward rotary movement is gradually moved inwardly as it approaches the liquid outlet and is in almost fully retracted position by the time it passes the farther side of said liquid outlet. By this means the water is drawn from the inlet into the cylinder or casing and forced through the outlet in a manner well known in this type of pump. The inward movement of each piston or wing is produced by engagement of the outer edge of the same with the

wall of the cylinder, which is eccentric relatively to the periphery of the rotatable drum or member in which said pistons or wings are arranged.

The pistons or wings are moved automatically outward and move in contact with the wall of the cylinder by pressure of the liquid which is being pumped. This is effected by the liquid passing through the inlet or pressure ports 21 to the pockets 20 in the pistons or wings and filling the distributing passages 21 and annular chamber 16 between said pockets. As the liquid in the rear of the several pistons or wings is subjected to pressure, it exerts pressure against said pistons or wings and holds them positively against the wall of the cylinder whether retracted, partly projected, or in their outermost position. By this means the use of springs and equivalent forces are dispensed with and all the advantages of the latter obtained with additional advantages such as result in simplicity of construction, cost of production and wearing qualities.

By reason of the inlet or pressure ports 22 being on the advancing side of one or more of the pistons or wings, constant pressure is assured against the inner ends of the latter due to the tendency of the liquid to flow through said ports and, moreover, this pressure is increased and constant due to such position of the inlet or pressure ports. In this manner assurance is had that the pistons or wings will at all times be held in contact with the wall of the cylinder regardless of their position in the rotation of the drum. It is to be noted that the guideways in the rotatable drum or member are of sufficient depth to have their inner ends register with the depressions 11 in the heads of the casing so that communication is also established between said depressions, the said pockets in the pistons or wings, the distributing passages, and the central or annular chamber between said distributing passages.

When using the pump it is easily primed by means of a feed cup 25 and pipe 26, said pipe leading to the depression of one of said heads of the casing, and as this depression is in direct communication with the guideways and the latter in communication with the distributing passages and the central or annular chamber connecting the latter, the pump may be easily filled with water to force the pistons or wings into contact with the wall of the cylinder preparatory to starting the pump into action.

When using the pump for high service purposes a bleeder 27 is employed which comprises an outlet pipe 28 having a suitable regulating valve 29 therein so that the desired quantity of liquid may be allowed to flow through said pipe.

In the drawings I have shown only one of the pistons or wings provided with the inlet

or pressure ports although I deem it fully within the spirit of my invention to employ such an opening or openings in additional pistons or wings. However, when only one 5 piston or wing is provided with inlet openings or ports the piston or wing thus provided is not projected sufficiently far when passing the inlet or outlet to open said openings, which is a very desirable feature, owing to the fact that at such times it is of 10 advantage to prevent any pressure against the water within the pockets of the valves or blades and the spaces communicating therewith.

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

1. A rotary pump comprising a casing having an inlet and an outlet spaced apart, a rotatable member therein having a plurality of guideways and means for connecting 20 the inner ends of said guideways, a piston or wing movable inwardly or outwardly in each of said guideways, and a pressure port in one of said pistons or wings leading behind the latter.

2. A rotary pump comprising a casing having an inlet and an outlet spaced apart, a rotatable member therein having a guideway, a piston or wing movable inwardly and outwardly in said guideway, and a pressure port opening into said piston or wing at the advancing side thereof.

3. A rotary pump comprising a cylinder having an inlet and an outlet spaced apart, 35 a rotatable member eccentrically arranged within said cylinder and having a plurality of guideways and passages interconnecting said guideways, a piston or wing provided with an inwardly-opening pocket fitting into each of said guideways, and a pressure port 40 extending from the side face of one of said pistons or wings to said pocket.

4. A rotary pump comprising a casing having heads provided with depressions on their inner faces, a rotatable member eccentrically mounted in said casing and having 45 a plurality of guideways extending inwardly from its periphery and being in communication with the depressions in said

heads, a feed-pipe opening into one of said 50 depressions, and a piston or wing movable inwardly and outwardly in each of said guideways, one of said pistons having an inlet or pressure port leading to its cooperating guideway.

5. A rotary pump comprising a casing 55 having an inlet and an outlet spaced apart, a rotatable member eccentrically mounted within said casing and having a central chamber, a plurality of guideways extending 60 inwardly from its periphery and distributing means connecting said central chamber with said guideways, a piston or wing in each of said guideways constructed with its outer end heavier than its inner, and a pressure 65 port or ports in one of said pistons or wings in communication with said distributing means.

6. A rotary pump comprising a cylinder having heads, a shaft journaled in said 70 heads, a drum secured to said shaft and having a hollow central chamber through which said shaft extends to provide an annular space around the latter, said drum having 75 also guideways extending inwardly from its periphery and distributing passages connecting said annular space with said guideways, a piston or wing in each of said guideways, one of said pistons or wings having a pressure port extending inwardly from 80 the advancing side thereof and being in communication with said distributing passages and annular space.

7. A rotary pump comprising a casing, a drum rotatable in said casing and having 85 guideways and means of intercommunication between said guideways, and a piston in each of said guideways, one of said pistons having a pressure port extending inwardly from its advancing side and being in communication with said guideways. 90

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

JOHN H. MYERS.

Witnesses:

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