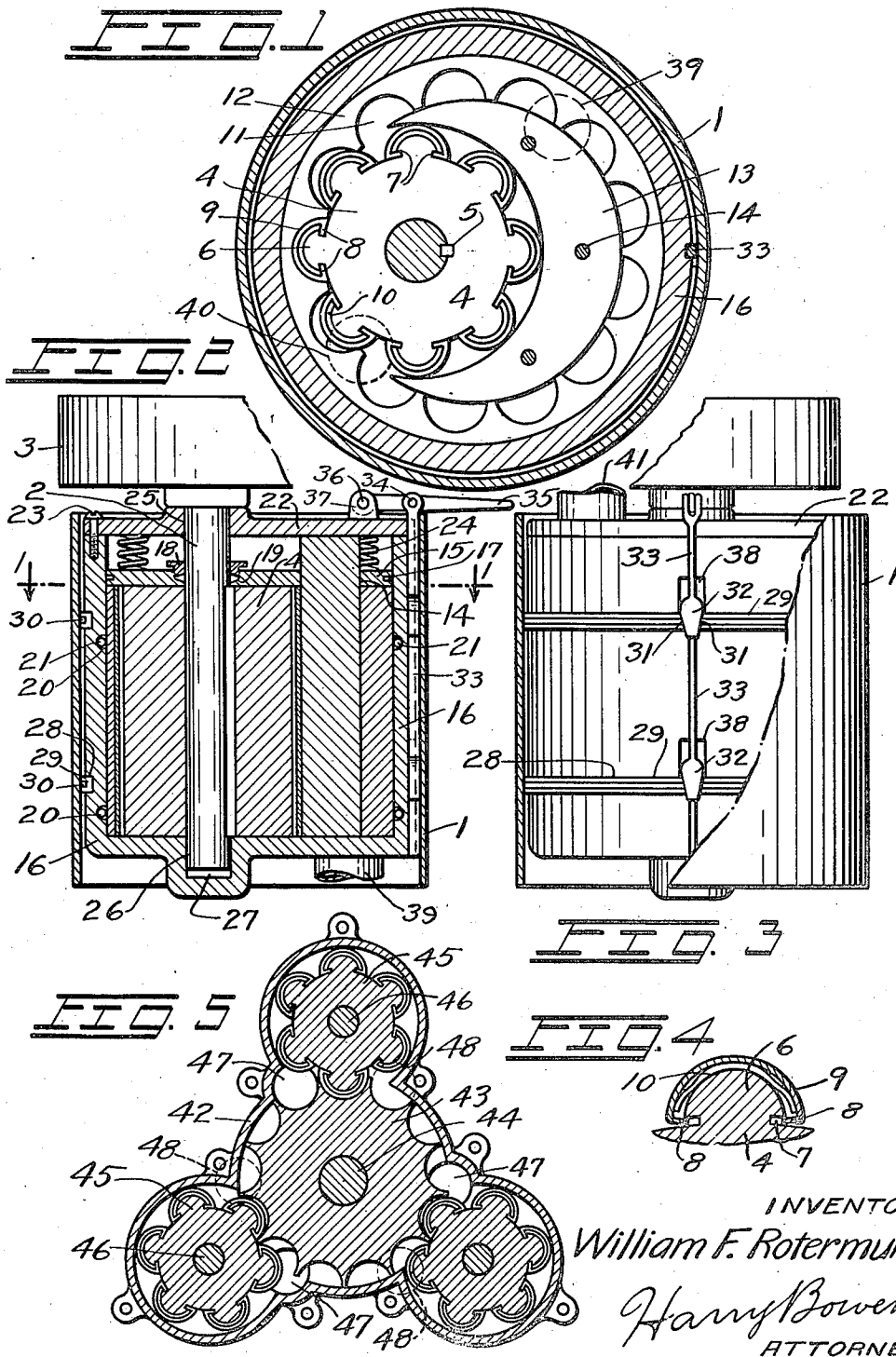


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ROTARY PUMP.
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ROTARY PUMP.

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To all whom it may concern:

Be it known that I, WILLIAM F. ROTERMUND, a citizen of the United States, residing at Seattle, county of King, and State of Washington, have invented a new and useful Rotary Pump; and I do hereby declare that the following is a full, clear, and exact specification, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention is a device for pumping water thru a pipe, especially designed to feed water into a boiler or for raising water in a well, or may be used as a circulating oil pump.

The object of the invention is to construct a pump which will raise a liquid to a very high head by the use of very little power.

With these ends in view the invention embodies a cylinder with notches on its inner surface, a rotor inside of the cylinder and of a smaller diameter, with lugs on its outer surface to fit into the notches on the inner surface of the cylinder, a crescent shaped segment between the rotor and the cylinder, a shaft through the center of the rotor for driving the same, a receptacle for holding the cylinder in which it may rotate, a flange on top of the rotor and cylinder, another flange on top of the receptacle and rings and keys for locking the receptacle in a tube.

Other features and advantages of the invention will appear from the following description taken in connection with the drawings, wherein:—

Figure 1 is a sectional plan looking on top of the rotor and cylinder.

Figure 2 is a cross section on the center line of the pump.

Figure 3 is a side elevation with part broken away.

Figure 4 is an exaggerated section showing how the wearing plates on the lugs of the motor are held outward by springs inside of them.

Figure 5 is an alternate arrangement showing the cylinder with the notches on the outside with three rotors on the outside instead of one on the inside.

In the drawings I have shown my pump installed in a tube 1 mounted upon a shaft 2 which may be driven by a pulley 3. On this shaft is fixedly mounted a rotor 4 in which is a key 5 and on the outside of which

are lugs 6. These lugs are shaped as shown in Figure 1 with notches 7 in them into which the heels 8 of the wearing plates 9 slide. Between the wearing plates 9 and the lugs 6 may be placed springs 10 which tend to spring the heels 8 of the wearing plates 9 outward as shown in Figure 4 so that as they wear they will be held outward in order to entirely fill the notches 11 of the cylinder 12 into which they work. Between the outside of the rotor 4 and the inside of the cylinder 12 is a crescent shaped segment 13 which is held in a notch 14 in the flange 15. The flange 15 fits directly on top of the rotor 4, and the cylinder 12, and inside of the receptacle 16 which houses the pump. In the edge of the flange 15 is a packing ring 17 and at the point where the shaft 2 passes thru it there is a stuffing box formed by the gland 18 screwing into the recess 19. In the receptacle 16 are grooves 20 in which are balls 21 which constitute ball-bearings between its inner surface and the outer surface of the cylinder 12. The flange 22 is held on the upper end of the receptacle 16 by the screws 23 and between this flange and the flange 15 are springs 24 which tend to force the pump members downward so that as they wear against the bottom of the receptacle 16 the pump members will move downward and take up this wear. The shaft 2 rotates in a bearing 25 in the flange 22 and a bearing 26 in the bottom of the receptacle 16. A space 27 is allowed below the end of the shaft in the bearing 26 to permit its moving downward as the pump members wear. Around the outside of the receptacle 16 are grooves 28 in which are rings 29 and in these are packing rings 30. The ends 31 of the rings 29 are bevelled as shown in Figure 3 and between them keys 32 are placed which are forced downward, by the rod 33, whose upper end is connected to the pin 34 thru the lever 35, by pushing downward on the end of the lever 35. The lever 35 is pivoted thru the pins 36 and the ears 37 to the flange 22. In the outer wall of the receptacles 16 are also slots 38 into which the keys 32 slide when the lever 35 is raised.

The water is admitted to the pump thru an opening 39 in the bottom of the receptacle 16, the location of which is shown in Figure 1 and an opening 40 shown in dash lines in Figure 1 is made in the flange 15 to allow

water from the pump to pass into the open space between the flange 15 and the flange 22. From this space it may be taken out thru a pipe 41 which may be located any where in the flange 22.

I have shown an alternate arrangement in Figure 5 so as to show that it is not necessary to make this an internal pump and also to show that it may be made with more than one rotor, in which case only one of them may be driven as one will drive the entire pump thru the cylinder in the center. In this arrangement I have shown my pump mounted in a casing 42 in which the central cylinder 43 is mounted upon a shaft 44 and the small rotors 45 mounted upon shafts 46. The water is admitted thru openings 47 in the bottom of the housing and discharged thru openings 48 indicated by dotted lines in the top of the housing.

It will be understood that other changes in the construction can be made without departing from the spirit of the invention. One of which changes may be in the use of more or less lugs or recesses in the rotor or cylinder that are shown, or in the proportion of the size of the rotor to the size of the cylinder, or in the omission of the wearing plates and springs on the lugs of the rotor, or in a different method of locking the pump in its cylinder.

The construction will be readily understood from the foregoing description. To use the device the pump may be installed in a tube as shown and the tube let down until the pump is immersed in water and then as the power is applied and the rotor rotates it will cause the cylinder 12 to rotate also; then as the water enters the pump thru the opening 39 it fills the recesses 11 and as the lugs 6 enter these recesses they force the water out. As the bottom of this pump is absolutely closed at this point and the only means of escape for the water is thru the opening 40

in the flange 15 at the top, the liquid will pass upward.

Having thus fully described the invention, what I claim as new and desire to secure by Letters Patent is:—

1. A device of the class described comprising a shaft, a rotor mounted upon the shaft, lugs around the circumference of the rotor, wearing plates on the lugs, springs under the wearing plates, a cylinder held concentrically about the shaft, recesses on the interior surface of the cylinder, a crescent shaped segment between the rotor and the cylinder, a housing surrounding the cylinder with its bottom closed, a flange on top of the housing, another flange on top of the rotor, a stuffing box in the flange on top of the rotor, springs between the flange on top of the rotor and the flange of the housing, rings around the outside of the housing, keys for forcing these rings outward and locking the housing in a tube, a lever for operating the keys, an inlet in the bottom of the housing, and an outlet thru both of the flanges on top of the housing.

2. A device of the class described comprising a shaft, a rotor mounted upon the shaft, lugs on the exterior surface of the rotor, wearing plates on the lugs, springs under the wearing plates, a cylinder held concentrically around the shaft, recesses on the interior surfaces of the cylinder, a crescent shaped segment between the rotor and the cylinder, a housing surrounding the cylinder, a flange on top of the rotor, means for pressing downward on this flange, means for locking the housing in a tube, an opening in the bottom of the housing, an opening in the flange on top of the rotor at a point where the lugs on the rotor enter the recesses of the cylinder, and an opening in the top of the housing thru which the liquid may be discharged.

WILLIAM F. ROTERMUND.