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G. ANDERSON & R. LUNDIN.  
ROTARY PUMP.

APPLICATION FILED AUG. 21, 1907.

2 SHEETS—SHEET 1

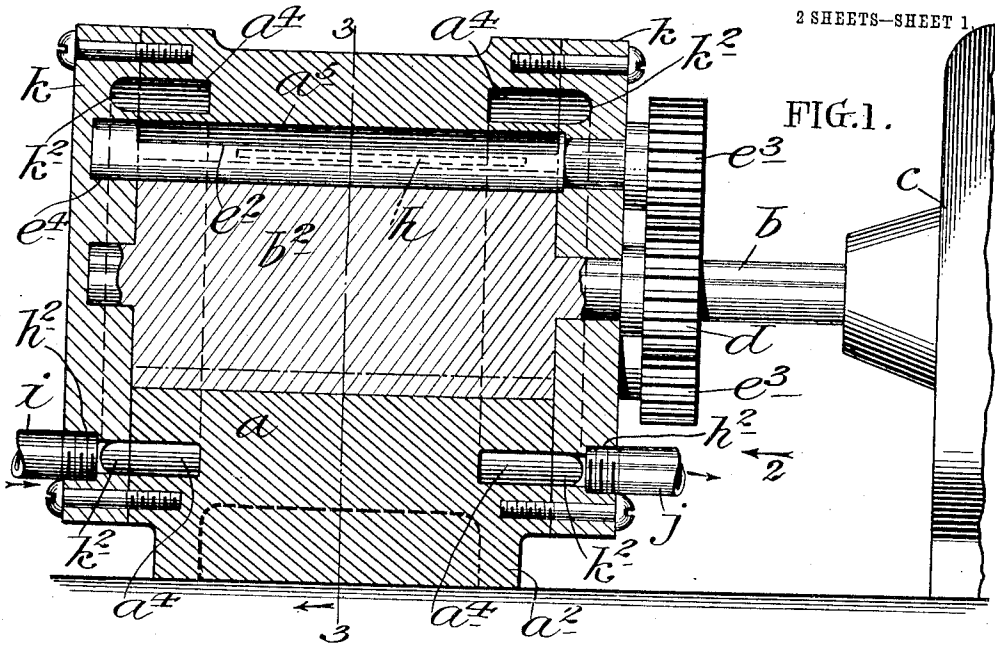
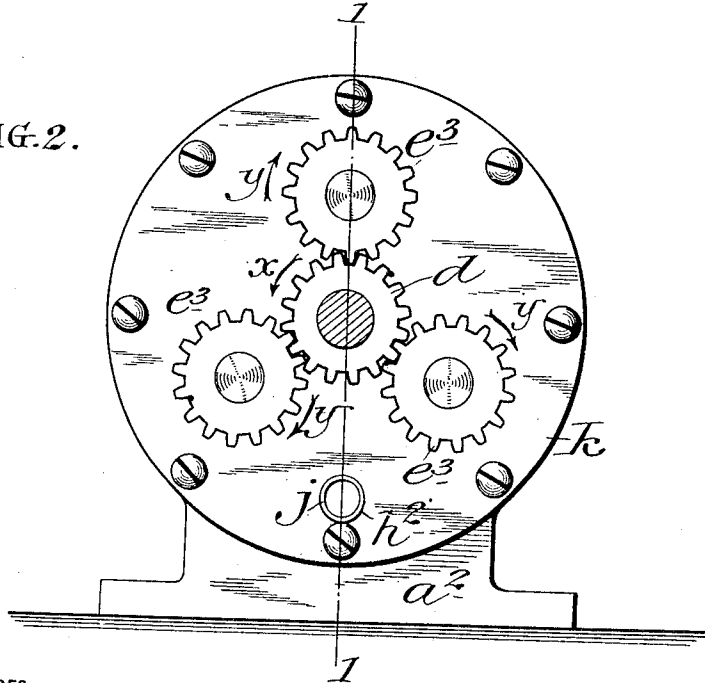


FIG. 2.



WITNESSES  
*A. Appleman*  
*W. E. Mulheany*

INVENTORS,  
*Gunnar Anderson*  
*and Richard Lundin,*  
BY *Edgar Tate & Co.* ATTORNEYS.

FIG. 3

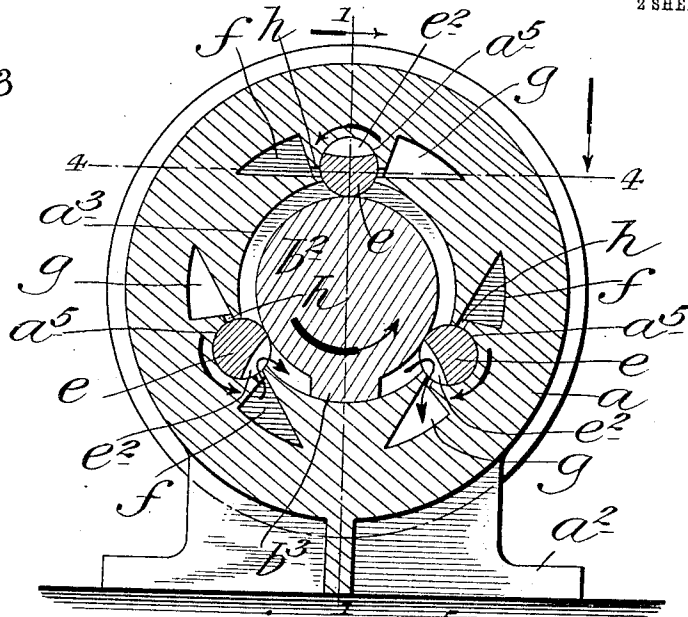
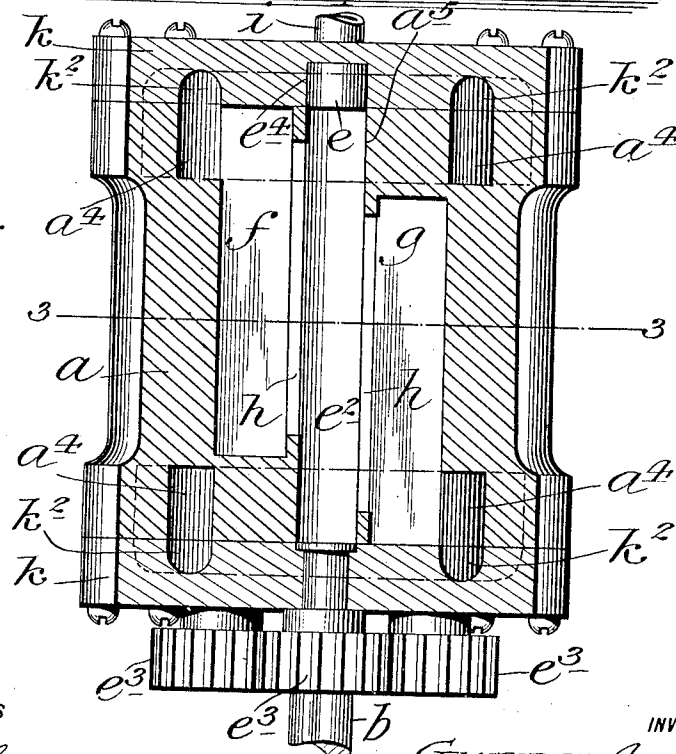


FIG. 4.



WITNESSES

*A. R. Appleman*  
*C. E. Mulreany*

INVENTORS

*Gunnar Anderson*  
 BY *And Richard Lundin,*  
*Edgar Tate & Co.* ATTORNEYS.

# UNITED STATES PATENT OFFICE.

GUNNAR ANDERSON AND RICHARD LUNDIN, OF NEW YORK, N. Y.

## ROTARY PUMP.

No. 872,040.

Specification of Letters Patent.

Patented Nov. 26, 1907.

Application filed August 21, 1907. Serial No. 389,443.

*To all whom it may concern:*

Be it known that we, GUNNAR ANDERSON and RICHARD LUNDIN, citizens of the United States, and residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Rotary Pumps, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to rotary pumps, and the object thereof is to provide an improved device of this class, which is simple in construction and operation and comparatively inexpensive, and by means of which water may be elevated to a considerable height or forced through long mains at a minimum of cost.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of our improvement are designated by suitable reference characters in each of the views, and in which:—

Figure 1 a central vertical section of our improved pump on the line 1—1 of Fig. 2; Fig. 2 an end view looking in the direction of the arrow 2 of Fig. 1; Fig. 3 a transverse vertical section on the line 3—3 of Fig. 1, and Fig. 4 a horizontal section on the line 4—4 of Fig. 3.

In the practice of our invention, we provide a cylindrical casing having a base portion  $a^2$  by which it may be secured to any suitable support, and passing into one end of said casing is a drive shaft  $b$  which is provided within the casing  $a$  with a drum or cylinder  $b^2$  which is rotatable in a corresponding chamber  $a^3$  within the casing  $a$ , and one side of the drum or cylinder  $b^2$  is provided with a longitudinal piston member  $b^3$  adapted to closely fit the outer wall of the chamber  $a^3$ .

Within each end of the casing  $a$  is an annular chamber  $a^4$ , and each end of the casing is provided with a head plate  $k$  in each of which is an annular chamber  $k^2$ , the annular chambers  $k^2$  corresponds with and registers with the annular chambers  $a^4$ .

The shaft  $b$  is adapted to be operated by any suitable motor  $c$ , and said shaft is provided with a gear wheel  $d$  and the casing  $a$  is provided at different points, preferably three in number with longitudinal cylindrical valve chambers  $a^5$  in which are mounted rotary cylindrical valves  $e$  which closely fit the valve chambers  $a^5$  except at one side where they

are cut out longitudinally to form longitudinal recesses  $e^2$  and the valves  $e$  extend at one end through the corresponding head plate  $k$  and are provided with gears  $e^3$  and at the other end said valves have bearings in the corresponding head plate  $b$  as shown at  $e^4$  in Fig. 1. The casing  $a$  is also provided with longitudinal chambers  $f$  and  $g$  arranged in pairs as shown in Fig. 3, one pair being employed in connection with each of the valve chambers  $a^5$  and said chambers  $f$  and  $g$  are preferably triangular in cross section, and each pair of said chambers  $f$  and  $g$  communicate with the corresponding valve chambers  $a^5$  through longitudinally arranged ports or passages  $h$  shown in cross section in Fig. 3, and one of which is shown in dotted lines in Fig. 1, and two of which are shown in full lines in Fig. 4.

In the construction shown the chambers  $f$ , of each pair of the chambers  $f$  and  $g$ , communicate with the annular chamber  $a^4$  in one end of the casing  $a$ , and the chamber  $g$  of each pair of the chambers  $f$  and  $g$ , communicate with the annular chamber  $a^4$ , in the other end of the chamber  $a$  as clearly shown in Fig. 4, and the said chambers  $f$  and  $g$  of each set are staggered longitudinally as shown in Fig. 4. Each of the head plates  $k$  of the casing  $a$  is also provided at the bottom thereof, as shown in the drawing, with a port or passage  $h$  and these ports or passages communicate with the annular chambers  $a^4$ , and connected with and communicating with said ports or passages are pipes  $i$  and  $j$  one of which serves as a water supply pipe or as a pipe through which water is supplied to the pump and the other as a water discharge pipe.

The operation will be readily understood from the foregoing description when taken in connection with the following statement thereof. Suppose the shaft  $b$  to be turned in the direction of the arrow  $x$  of Fig. 2. In this case the valves  $e$  will be turned in the direction of the arrow  $y$ . Water will flow in through the pipe  $i$ , and into the corresponding chambers  $k^2$  and  $a^4$ , and from the latter chamber  $a^4$  it will flow into the chambers  $f$  of the separate pairs of chambers  $f$  and  $g$ . From the chambers  $f$  it will be drawn into the annular chamber  $a^3$  from which it will be forced by the piston member  $b^3$ , out through the chambers  $g$  of the separate pairs of chambers  $f$  and  $g$ , from which it will flow into the opposite annular chamber  $a^4$  and then into the

corresponding annular chamber  $k^2$  from which it will flow through the pipe  $j$ . It will be seen that the valve  $e$  fill the space between the outer wall of the chamber  $a^3$  and the drum or cylinder  $b^2$  and the recesses  $e^2$  in the valve  $e$  permit the piston member  $b^3$  of the drum or cylinder  $b^2$  to pass said valves and the recess  $e^2$ , also permit the water to flow from the chambers  $f$  in the annular chamber  $a^3$ , and from said annular chamber  $a^3$  into the chamber  $g$ . It will also be observed that only two of the chambers  $f$  and  $g$  of the separate pairs of chambers  $f$  and  $g$  are in operation at the same time as is shown in Fig. 3, but the operation of the drum or cylinder  $b$  and the valves  $e$  is synchronous and a continual flow of water from the pump is produced. It will be observed that the chambers  $f$  and  $g$  of each pair of said chambers are arranged at the opposite sides of the valve chambers  $a^4$  and are placed in communication therewith, and it will also be observed that the pipe  $j$  may be made the inlet pipe and the pipe  $i$  the outlet pipe, and my improved pump will work with the shaft  $b$  and drum or cylinder  $b^2$  rotating in either direction.

Our invention is not limited to the exact construction shown and described and various changes therein and modifications thereof, within the scope of the appended claims, may be made without departing from the spirit of my invention or sacrificing its advantages.

Having fully described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. A pump comprising a cylindrical casing having head plates secured to the opposite ends thereof, said casing being provided in its opposite ends with annular chambers and said head plates with corresponding annular chambers in communication therewith, said casing being also provided with a central longitudinal cylindrical chamber, a drum or cylinder mounted in said chamber and of less diameter than said chamber and provided at one side with a longitudinal piston member adapted to closely fit the walls of said chamber, said drum or cylinder being also provided with a shaft by which it is rotated, a plurality of longitudinally arranged cylindrical valves located in said casing and geared in connection with said shaft, said valves being positioned so as to fill the space

between the outer walls of said chamber and the drum or cylinder mounted therein, said valves being also provided with longitudinal recesses, and a plurality of longitudinal chambers in said casing, said chambers being arranged in pairs at the opposite sides of said valves and being provided with ports or passages which communicate with the chambers in which said valves are placed, one of the heads of the casing being provided with an inlet pipe in communication with the annular chamber formed therein and the other head of the casing being provided with an outlet pipe which communicates with the annular chamber formed therein, substantially as shown and described.

2. A pump comprising a cylindrical casing having a central cylindrical chamber and provided at both ends with a head plate, said casing and said plates being provided with corresponding annular chambers which are in communication, a drum or cylinder placed in the central chamber of the casing and of less diameter than said chamber and provided with a shaft which passes through one of the head plates, a plurality of longitudinally arranged valve chambers formed in said casing and in communication with the central chamber in which the drum or cylinder is mounted, cylindrical valves placed in said valve chambers and geared in connection with said shaft, said valves being provided in one side with longitudinal recesses and said drum or cylinder being provided at one side with a longitudinally arranged piston member, longitudinal chambers formed in said casing, said chambers being arranged in pairs at the opposite sides of said valves, and in communication with the valve chambers, one chamber of each pair being in communication with one of the oppositely arranged annular chambers in the ends of the casing, and the heads of the casing being provided with inlet and outlet pipes which communicate with the annular chambers formed therein.

In testimony that we claim the foregoing as our invention we have signed our names in presence of the subscribing witnesses this 19th day of August 1907.

GUNNAR ANDERSON.  
RICHARD LUNDIN.

Witnesses:

C. E. MULREANY,  
A. R. APPLEMAN.