J. ROBERTSON.

ROTARY PUMP OR BLOWER.

APPLICATION FILED APR. 24, 1914.

1,211,879.

Patented Jan. 9, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

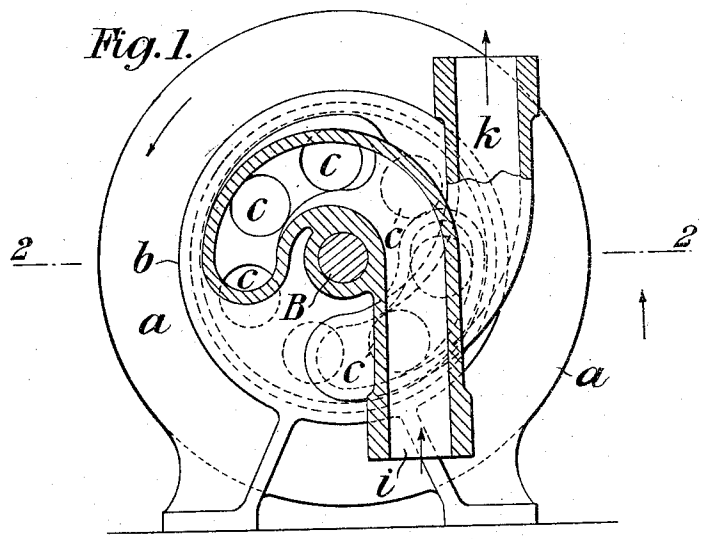
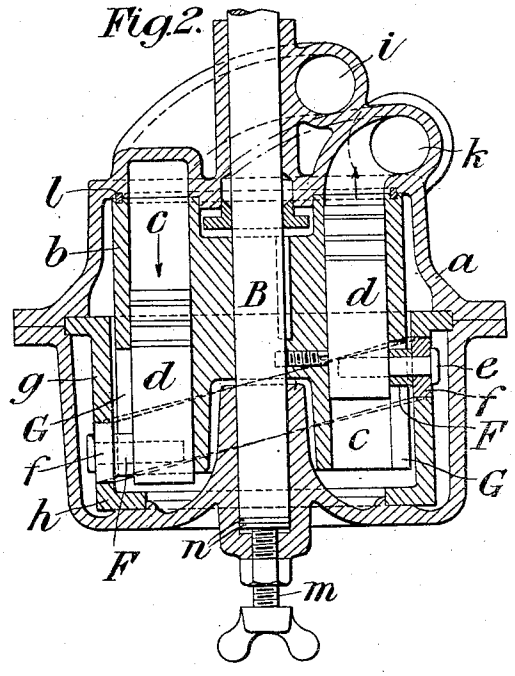


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

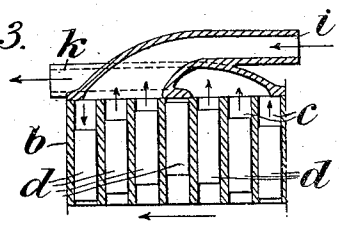


Fig. 4.

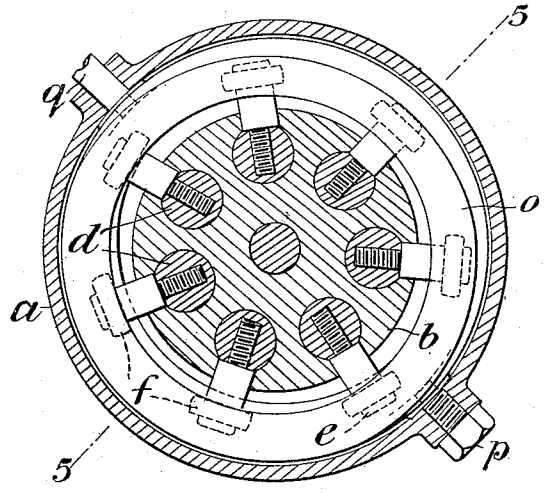
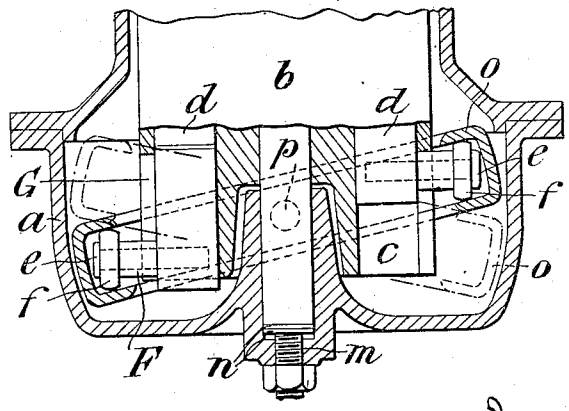


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES ROBERTSON, OF LEYTONSTONE, ENGLAND.

ROTARY PUMP OR BLOWER.

1,211,879. Specification of Letters Patent. Patented Jan. 9, 1917.

Application filed April 24, 1914. Serial No. 834,154.

To all whom it may concern:

Be it known that I, JAMES ROBERTSON, a subject of the King of Great Britain, residing at 28 Preston road, Leytonstone, Essex, England, have invented new and useful Improvements in Rotary Pumps or Blowers, of which the following is a specification.

My invention relates to improvements in rotary pumps or blowers of the kind comprising a casing in which revolves a rotor mounted upon a shaft extending through the casing and having a number of parallel cylinders in which pistons are caused to reciprocate as the rotor revolves, the cylinders being brought into coincidence with inlet and discharge passages alternately so that the water or other fluid being pumped is drawn into the said cylinders and discharged therefrom by the reciprocating pistons.

According to my invention I so dispose the suction and discharge passages that the fluid enters tangentially in to a curved passage which preferably constitutes a part of a circle, thence is drawn into the rotor cylinders and is discharged into a second passage of a similar shape to, and concentric or approximately concentric with, the inlet passage, the fluid then issuing through an outlet tangential to the second passage.

In a suitable arrangement for carrying out the invention I construct a pump or blower as follows, that is to say, I mount a rotor in the usual manner upon a shaft within a casing, one end of the rotor bearing against that end of the casing which carries the tangential and circular inlet or suction and discharge passages which are disposed and arranged in the manner above described. The pistons are reciprocated in the cylinders provided in the rotor in any convenient way, preferably by means of blocks or rollers which slide in slots or guides formed in an extension at the rear of the rotor, the said blocks having guide rollers which run in an inclined or cam groove provided on the inside of the casing.

To enable my invention to be fully understood, I will describe the same by reference to the accompanying drawings, in which:—

Figure 1 is a sectional end view of a pump or blower constructed according to my invention. Fig. 2 is a section on the line 2—2, Fig. 1, looking in the direction of the arrow. Fig. 3 is a diagrammatic view illustrating the operation of the pump plungers. Fig. 4 is a sectional end view illustrating a modification, and Fig. 5 is a section on the line 5—5, Fig. 4.

a indicates the pump casing and *b* the rotor mounted on a central shaft B and formed with a number of pump cylinders *c*, in which the pump plungers *d*, reciprocate, the said plungers being each provided with a lateral stud *e* upon which rollers F, *f* are mounted, the rollers F sliding in slots G in the rotor and the rollers *f*, running in a cam groove in an internal barrel formed in two parts *g*, *h*, the said parts being arranged in such relation to one another that there is a space between them which constitutes the said cam groove for the rollers *f*.

i, *k* are respectively the suction and discharge passages of the pump, the said passages being formed integral with one end of the casing *a*. These passages are arranged as follows, that is to say, the outer end of the inlet passage is tangential to a circle having its center at the axis of the rotor, while the inner portion of the passage is semicircular or curved to approximately correspond with the arc of a circle concentric with the axis of the rotor. The outlet passage is constructed in a substantially similar manner, the inner end being concentric with the rotor while the outer or discharge end is tangential thereto. The inner ends of these passages are arranged in such relation to the pump cylinders that in the case of a rotor having, say, seven cylinders as shown, three of the cylinders will be in communication with the inlet and three with the exhaust, while the intermediate cylinder will pass a plain portion of the cover so as to cut off direct communication between the inlet and exhaust. This arrangement will be clearly understood by reference to Fig. 3 which is a diagrammatic development of the pump cylinders *c* and the inlet and exhaust passages *i*, *k*.

With the construction hereinbefore described it will be understood that the water or the like which is being pumped practically whirls through a circular path in the pump which it enters tangentially and leaves tangentially so that the momentum of the fluid during the whole of its passage through the pump is always operative in the most efficient direction.

Any suitable means may be provided for making a joint between the end of the rotor and the casing against which it bears. As

shown in the drawings the opposing faces of the rotor and casing are recessed and a floating ring *l* is located within the annular groove thus provided. It is necessary to hold the rotor with the necessary pressure against the casing and ring *l*, and this is advantageously accomplished by means of a set-screw *m* passed through a screw-threaded hole in the outer end of the casing and bearing against the end of the shaft B upon which the rotor is keyed, one or more loose washers *n* being advantageously provided between the said screw and the adjacent end of the shaft B to minimize friction.

Instead of constructing the groove in which the rollers *f* run between the separate parts *g*, *h* of a fixed internal barrel, the said groove may be formed in a channel shaped ring *o*, as shown in Figs. 4 and 5. In these figures the ring *o* is mounted upon pivots *p*, *q* which allow of the said ring being oscillated from the position shown in full lines in Fig. 5 to that indicated by the dotted lines in the said figure, this arrangement permitting of the direction of flow of fluid through the pump being reversed, that is to say, of the inlet *i* being used as the discharge and the discharge *k* as the inlet. In order to permit of altering the position of the ring, the pivot *q* is extended through the casing so that a lever or other adjusting device may be applied to it.

Claims:

1. In a pump or blower of the kind described, the combination of a rotary drum provided with a plurality of longitudinal cylinders having open ends for the inlet and outlet of fluid and also having longitudinal slots, reciprocating pistons in each of said cylinders provided with radially extending studs, small rollers mounted on said studs and movable in said slots, a stationary casing within which the said drum is rotatably mounted and with one end of which the drum forms a fluid-tight working joint, curved passages provided in one end of the casing and communicating directly with the open ends of the cylinders, inlet and outlet branches tangential to and communicating with said passages, a channel shaped ring pivotally mounted in said casing, and large rollers provided upon the ends of said studs and traveling in said ring.

2. In a pump or blower of the kind described, the combination of a rotary drum provided with a plurality of longitudinal cylinders having open ends for the inlet and outlet of fluid, reciprocating pistons in each of said cylinders provided with radially extending studs, rollers mounted on said studs, a stationary casing within which the said drum is rotatably mounted and with one end of which the drum forms a fluid-tight working joint, curved passages provided in one end of the casing and communicating directly with the open ends of the cylinders, inlet and outlet branches tangential to and communicating with said passages, a channel shaped ring pivotally mounted in said casing in which the rollers travel, and means for rocking said ring.

JAMES ROBERTSON.

Witnesses:
C. G. REDPIN,
A. ALBUTT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."