(No Model.)

F. T. ADAMS.

ROTARY PUMP, MOTOR, BLOWER, OR EXHAUSTER.

No. 374,331. Patented Dec. 6, 1887.

Fig. 2.

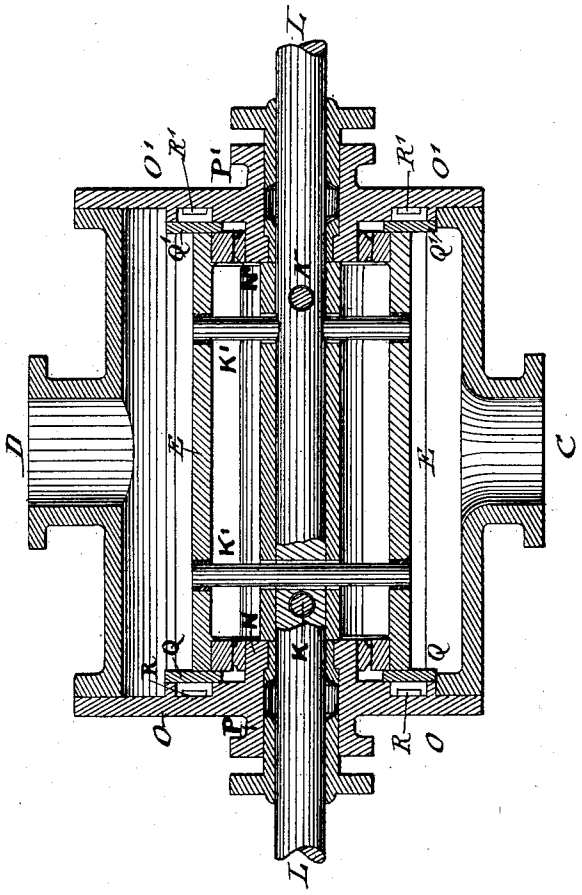


Fig. 1.

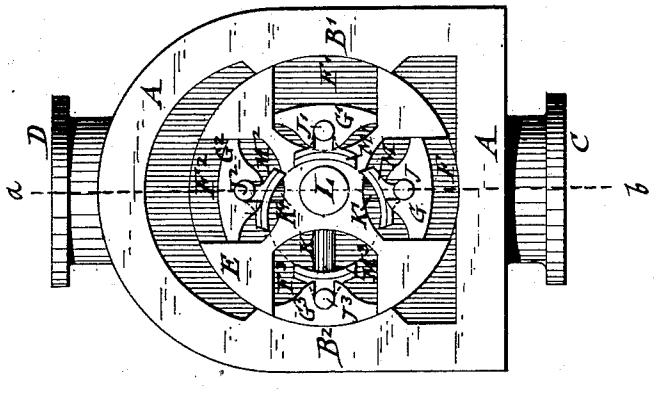


Fig. 3



Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FREDERICK T. ADAMS, OF DERBY, COUNTY OF DERBY, ENGLAND.

ROTARY PUMP, MOTOR, BLOWER, OR EXHAUSTER.

SPECIFICATION forming part of Letters Patent No. 374,331, dated December 6, 1887.

Application filed December 4, 1886. Serial No. 220,658. (No model.) Patented in England December 4, 1885, No. 14,890.

To all whom it may concern:

Be it known that I, FREDERICK THOMAS ADAMS, of 55 Alexandra Street, in the town and county of Derby, England, engineer, have invented certain new and useful Improvements in Rotary Pumps, Motors, Blowers, or Exhausters, (for which I have applied for Letters Patent in Great Britain on the 4th day of December, 1885, No. 14,890,) of which the following is a specification.

The invention relates to the construction of an apparatus applicable as a rotary pump, easily driven and capable of lifting considerable quantities of liquid, but which may be arranged also as a motor, blower, or exhauster; and the invention consists of a casing provided with inlet and outlet ports, fixed end covers on which are formed eccentrics or fixed cams, a rotating cylinder, drum, or roller carrying sliding pistons working in slots or grooves formed in the said cylinder, drum, or roller, oscillating guide blocks and pins connected with said sliding pistons, which carry a rib or ribs for elastic strips of packing to spring over such rib or ribs and so be held, connecting-rods for connecting each opposite pair of pistons, and end covers for closing the ends of the cylinder, drum, or roller, and so forming grooves for the travel of the pistons.

In the accompanying drawings, Figure 1 is an elevation of a pump constructed according to my invention, with one of the end covers and rings removed. Fig. 2 is a vertical longitudinal section on line *a b* of Fig. 1; Fig. 3, an elevation of packed piston; Fig. 4, an elevation of unpacked piston.

A is a casing truly bored at points B B′ B^2, and in this casing I form an inlet at C and an outlet at D. Inside the casing I place a cylinder, drum, or roller, E, having, as shown, four slots or grooves, F F′ F^2 F^3, cut or formed in its periphery, and in these I arrange sliding pistons G G′ G^2 G^3. These pistons are formed (see Figs. 3 and 4) with curved faces having a rib or ribs, H, thereon. Over this rib or these ribs I spring a slotted piece of rubber, leather, or other packing, H′, which bears on the points B B′ B^2 when the piston is at the end of its outstroke. I form a slot, I, in the pistons, which slots fit over pins or bosses J J′ J^2 J^3. On these pins or bosses J J′ J^2 J^3 curved blocks M M′ M^2 M^3 can oscillate, bearing on fixed eccentrics or cams N N′, formed on stationary covers O O′, closing the ends of the casing A and furnished with stuffing-boxes P P′, through which pass the ends of the shaft L.

The rods K K′ serve to connect the opposite pistons or blocks, and pass through the shaft L at right angles, and the holes in the main shaft through which they pass form also connections between opposite pairs of slots or grooves F F^2 F′ F^3, whereby air (or water leaking) behind the pistons can escape from one slot or groove to its opposite, to avoid back-pressure on the instroke; or I may form special ports for the purpose.

The cylinder, drum, or roller E has rings Q Q′ bolted on its ends on which the outer faces of the pistons G G′ G^2 G^3 work, and these rings Q Q′ run against leather or like packing-rings R R′ confined between the rings Q Q′ and the inner sides of the covers O O′. The rings Q Q′ further act as ties to strengthen the ends of the cylinder, drum, or roller E where they are slotted out to receive the pistons.

Water or liquid enters at C and as the cylinder, drum, or roller E rotates flows into the slot or groove F opposite to it, the piston G receding as the water or liquid flows in, by reason of the block or guide M bearing on the smaller diameter of the eccentrics or cams N N′, so allowing the piston opposite the inlet to gradually recede and allow the slot or groove F to become filled with liquid. As the cylinder, drum, or roller further rotates, the liquid is retained in the slot or groove F, (see the position of F′ and its piston or block now at the end of its instroke, Fig. 1,) and by the edge of the cylinder, drum, or roller bearing on the side B′ of the casing A as it passes the center the liquid is prevented from escaping from the slot or groove. As the cylinder, drum, or roller rotates toward the outlet D, the block M will commence its outstroke and begin to bear on the larger diameter of the eccentrics or cams N N′, (see the position of F^2,) and the piston G, being now forced outward thereby, will expel the liquid into the outlet D. The further rotation of the cylinder, drum, or roller will cause the block M to bear on the largest diameter of the eccentrics

or cams, (see the position of F^3,) and the piston or block G will bear on the portion B^2 of the casing A, and so prevent liquid running from the outlet to the inlet port of the casing. The drum, roller, or cylinder E may be made of any desired length, and the number of slots or grooves and pistons may be varied; but I find four a useful number.

Where corrosive liquids have to be pumped or corrosive gases forced or exhausted, the working parts must be constructed of or covered with protecting material, as will be understood.

The apparatus can be driven for a blower or exhauster for withdrawing air or gases, or be arranged as a motor to be driven by fluid-pressure.

I claim—

1. In a pump, motor, blower, or exhauster, the combination of casing A, provided with inlet and outlet ports and intermediate abutments, cylinder E, having slots F F′ F^2 F^3, convex piston-blocks G G′ G^2 G^3, moving entirely within said slots, piston-rods K K′, connecting said blocks in pairs, blocks or guides M M′ M^2 M^3, having concave inner faces and pivoted to oscillate independently of the piston-blocks, and fixed cams N N′, of smaller diameter than said slotted cylinder E and against which said oscillating concave blocks bear, substantially as described.

2. The combination of a casing, A, having inlet and outlet ports C D, and abutments B B′ B^2, fixed heads or covers O O′, having fixed eccentric-cams N N′, and interior packing-rings Q R and Q′ and R′, a rotary cylinder, drum, or roller, E, of larger diameter than said cams, having slots F F′ F^2 F^3, segmental piston-blocks G G′ G^2 G^3, movable entirely within said slots, diametrically-sliding piston-rods K K′, connecting said piston-blocks, and oscillating blocks or guides M M′ M^2 M^3, pivoted to oscillate independently of the piston-blocks in recesses thereof and moving along the circumference of said cams, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

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