R. PATRICK.

ROTARY PUMP AND ENGINE.

No. 170,448. Patented Nov. 30, 1875.

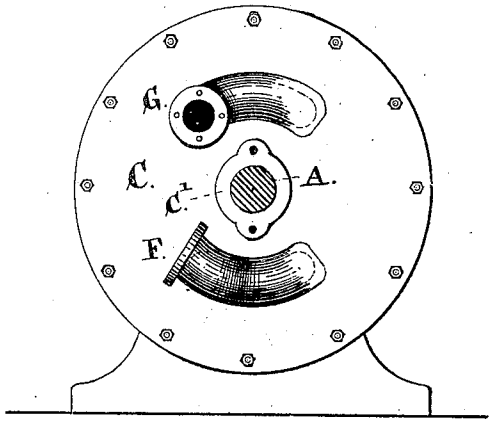

Fig. 1.

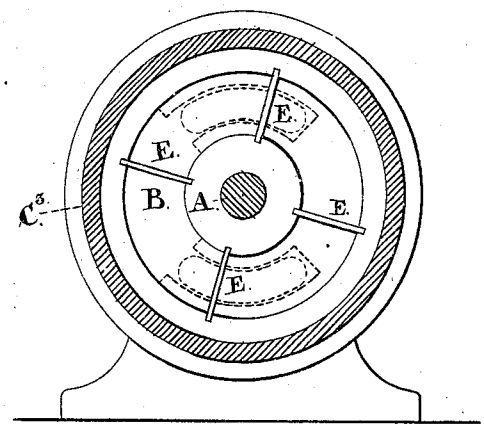

Fig. 2.

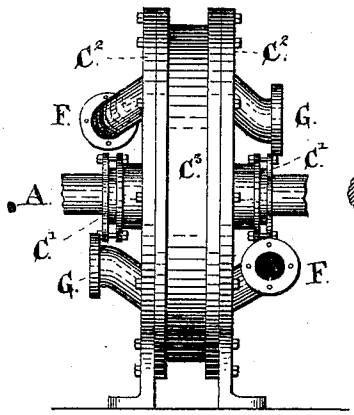

Fig. 3.

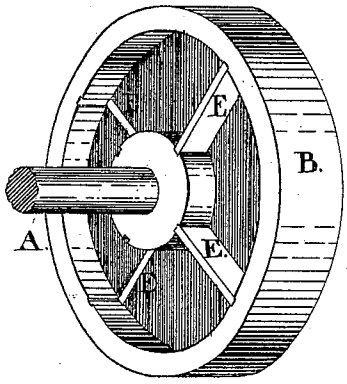

Fig. 4.

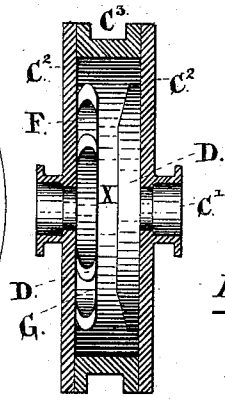

Fig. 5.

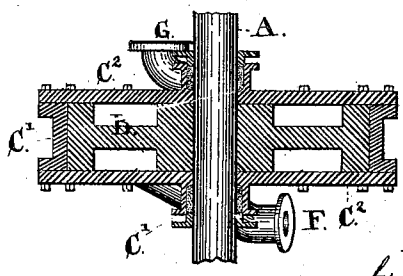

Fig. 6.

Witnesses.

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UNITED STATES PATENT OFFICE.

ROBERT PATRICK, OF BRANCHTON, CANADA.

IMPROVEMENT IN ROTARY PUMPS AND ENGINES.

Specification forming part of Letters Patent No. **170,448**, dated November 30, 1875; application filed August 17, 1875.

To all whom it may concern:

Be it known that I, ROBERT PATRICK, the younger, of the village of Branchton, Province of Ontario, Canada, have invented new and useful Improvements in Rotary Pumps and Engines, of which the following is a specification:

My invention has relation more particularly to improvements in that class of rotary pumps and engines in which a single cylinder or disk revolves within a cylindrical chamber; and it consists of a cylinder or disk of suitable dimensions mounted on a revolving shaft, and provided with a number of sliding blades placed parallel with its axis, which blades, acting in combination with certain peculiarly-placed cams projecting from the inner faces of the sides of the disk encasement, produce, as the disk revolves, a perfect or partial vacuum in the chambers or cells between the blades. Into these chambers the fluid or gas to be pumped is forced by a well-known law of nature through suitably-arranged passages, and, as the disk revolves, the fluid or gas is forced forward by the blades and discharged through other passages in a continuous stream with great force.

In the accompanying drawings, Figure 1 is a side view, Fig. 2 a cross-section, Fig. 3 an end view, Fig. 5 a longitudinal section, and Fig. 6 a sectional plan, of a pump or engine constructed according to my invention. Fig. 4 is a perspective view of the revolving disk, showing the blades.

A is the revolving shaft, driven in any suitable manner, to which is fastened the flanged disk or cylinder B. C is the hollow cylinder, within which the disk B revolves, the shaft A passing through the center being supported on flanged bearings C^1 provided with stuffing-boxes. The sides C^2 of the cylinder C are made detachable, and are connected together to form the chamber by a cylindrical cross-piece, C^3. An inwardly-projecting cam, D, is cast on the face of each of the side plates C^2 in such a manner and in such position with relation to each other that they form, when the sides are bolted together, an inflected passage, X, in the center of which the flanged disk B revolves. The disk is provided with four blades, E, placed radially and longitudinally with its axis, which blades are, in width, equal to the width of the inflected channel between the side plates C^2. The blades E slide freely in slots cut in the disk, and, as the shaft revolves, have communicated to them, in addition to their revolving motion, an alternating motion equal in stroke to the inflection of the before-mentioned passage. F F are ports, which admit the fluid or gas. G G are the discharge-ports. The outside mouth of both inlet and discharge ports are flanged, or otherwise arranged, to connect with the leading and discharge pipes. The cams D D decline from the center in both directions, feathering off to the face of the plates C^2 C^2, the inlet and discharge ports being placed at opposite ends of the cam, and alternately in relation to each other. The feather-edge of the cam on one side plate slightly overlaps the edge of the cam on the opposite plate, thus forming a continuous, easily-turned passage for the blades. An inlet and outlet port are provided on each of the side plates—that is, the pump has two inlet and two outlet ports—the inlet port on one plate being placed opposite the outlet port on the opposite side plate, and vice versa. Thus the pump is made double acting, as while a blade is taking its load on one side of the disk it is discharging on the other side.

The two discharge-ports may be connected together, or preserved distinct from each other, as desired.

The construction of the pump is such that it is reversible, working equally well in either direction.

Having now described the parts of my invention, its operation may be briefly described as follows: The shaft being set in motion, the fluid or gas is admitted by the ports F F, the quantity admitted being regulated by valve in the usual way. Each blade of the system as it passes the inlet-ports in its revolution takes with it a certain quantity of fluid (sufficient in theory to fill the chamber between it and the previous blade) and carries it forward until it reaches the discharge-port, where the direction of the passage X changes, causing the blade to recede and forcing the fluid out through the discharge-port with a velocity in proportion to the speed of the shaft. The substance to be pumped is fed into the pump

after each passage of a blade by that law of nature which forces matter (under the usual conditions) to fill up the vacuum thus caused.

Although the machine is peculiarly adapted for pumping fluids I do not wish it to be understood that I confine myself or limit my claim for this work only, as the pump will handle gases in the same manner as liquids. It is also adapted to be used as an air-blower for furnaces, &c., and it can further be used as a rotary steam-engine for furnishing motive power.

I claim as my invention—

The flanged disk or cylinder B, mounted on the revolving shaft A, and provided with the radially-placed sliding blades E, in combination with the side plates C^2, provided with the inwardly-projecting alternately-arranged cams D, inlet-ports F F, and discharge-ports G G, arranged and operating substantially as and in the manner set forth.

ROBERT PATRICK.

Witnesses:
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WM. YOUNG.