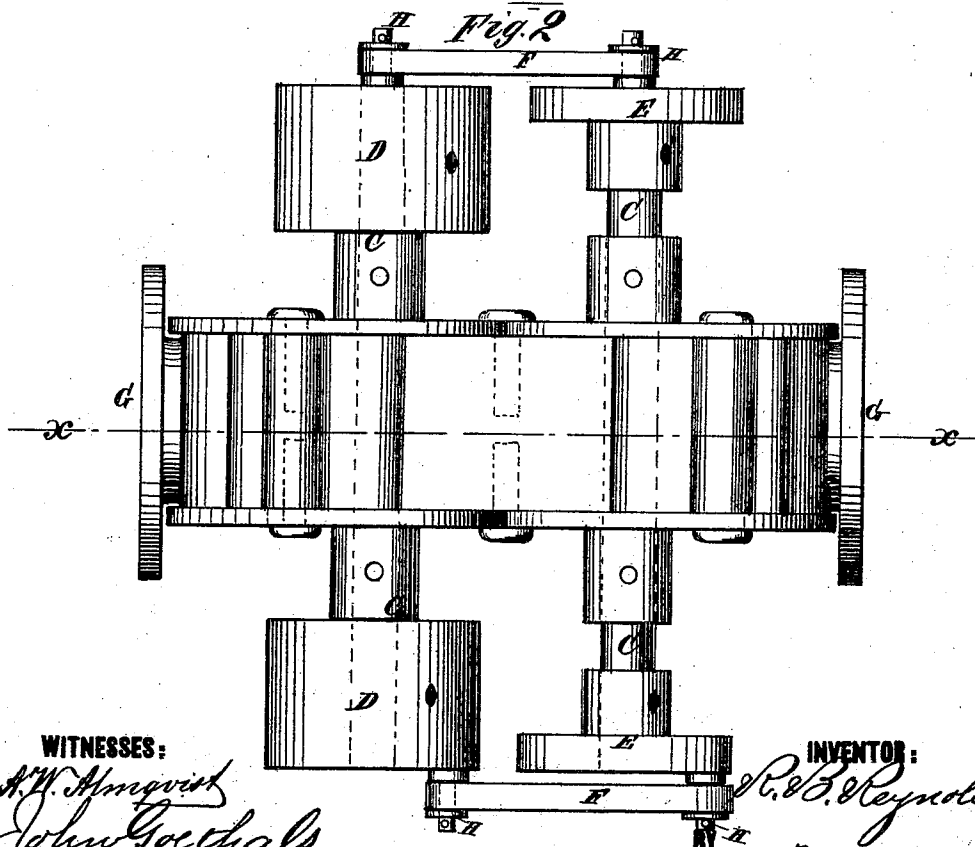
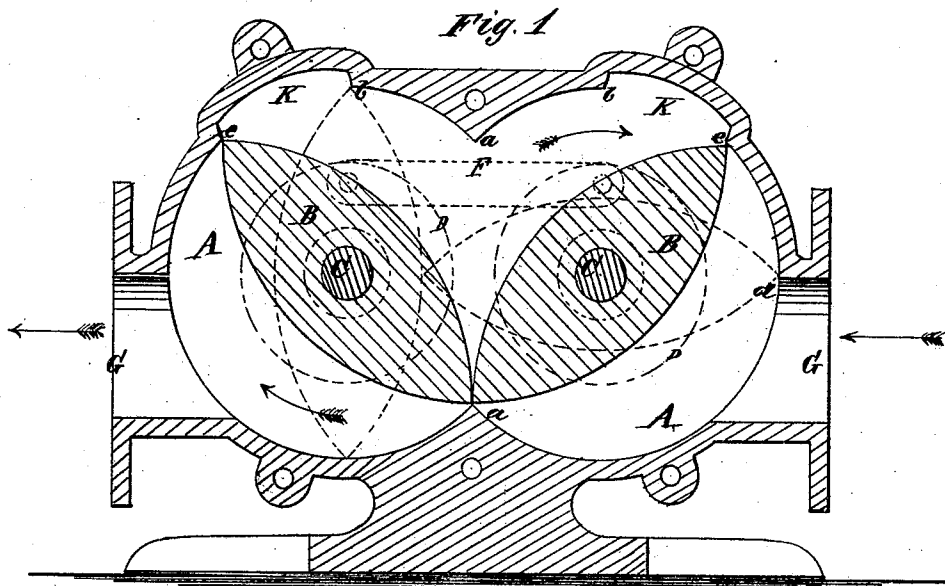


R. B. REYNOLDS.

ROTARY-PUMP.

No. 178,672.

Patented June 13, 1876.



WITNESSES:

A. W. Amqvist
John Goethals

INVENTOR:

R. B. Reynolds
Munroe
ATTORNEYS.

UNITED STATES PATENT OFFICE.

ROBERT BURNS REYNOLDS, OF STOCKPORT, NEW YORK.

IMPROVEMENT IN ROTARY PUMPS.

Specification forming part of Letters Patent No. **178,672**, dated June 13, 1876; application filed May 22, 1876.

To all whom it may concern:

Be it known that I, R. BURNS REYNOLDS, of Stockport, Columbia county, and State of New York, have invented a new and Improved Rotary Pump, of which the following is a specification:

My invention consists of two rotary pistons on parallel axes, both turning in the same direction, so that they have a wiping action on each other instead of the rolling development of one on the other, as has always been the case in pumps of this character.

Some of the advantages of the arrangement are, first, it allows of the sides of the pistons being true arcs of circles, which can be fitted up in the simplest manner; second, it allows of coupling the shafts by cranks and connecting-rods, which run smoother and stiller, and with less wear than gears; third, it allows of locating the inlet and outlet at will in different positions; and, fourth, it produces an alternate suction and discharge on each side of the pistons, enabling two independent suctions and discharges to be used, which is desirable in some cases.

In the accompanying drawing, Figure 1 is a sectional elevation of my-improved pump, taken on the line X X of Fig. 2; and Fig. 2 is a top view.

A represents two circular chambers in the case, running into each other at one side in such a manner that lines drawn from the points *a*, where the circles cut each other, form right angles at said points, a proportion necessary to allow the sides of the pistons B to be formed on arcs of true circles, as above stated. G represents the inlet and outlet pipes, through which the water will pass either way, according as the pistons are turned one way or the other. D represents driving-pulleys on one of the shafts for applying the power, and F represents rods connecting the two shafts by crank-pins H, which are on one side at right angles to those on the other side, for passing the centers properly. K represents cavities in the upper part of the case for clearance or easement of the space above the pistons, which contract during part of the revolution of the pistons. The relative positions and length of these recesses are indicated by the positions of the pistons in black lines, and

the indicated positions in dotted lines. The distance of the shafts apart and the curve of piston-faces, are dependent upon each other; and, when fitted with careful reference to this dependence or relation, the pistons maintain a regular and uniform fit all the way round—*i. e.*, throughout their revolutions, whether in contact with the cylinder-case or with each other. The radius of the curve of face of piston is the side of the square inscribed in a circle whose diameter is the same as the longest diameter of the piston—in other words, the radius is the chord of one-quarter of the circle forming each bore of the pump-case. The circles forming the interior of the cylinder-case intersect each other in such a manner as to cut out one-quarter of the circumference of each. To find the distance of the two centers of the piston-shafts apart, I square the radius of bore of pump-case, double this result, and extract the square root; this root is the distance required. If the shafts are placed farther apart, the curve of piston-face becomes a full ellipse; if near together, the curve becomes so short as to reduce the diameter of the piston, and make it too small for case. The cavities in the rim of the case are different in position and size for different varieties of the pump.

The positions of the suction and discharge openings are determined by placing the piston on the side next to the opening to be located horizontally, when the point of the piston next the case will mark the position of the upper side of suction or discharge pipe. (See *d*.) Now, turn the same piston till the opposite point of piston to that last observed stands exactly at the upper intersection of the circles forming the case. The lower end of the piston will then mark the lower side of the suction or discharge pipe. The positions of the cavities in upper side of case are determined by placing the piston vertical. Mark where the upper end strikes case, (see *b*.) then turn same piston till lower point comes to lower intersection of the circles of case, and mark again at *e*. These points limit the cavity.

The chamber above and the chamber below are each independently and alternately suction and discharge; but, by means of the cavities in the cylinder-case above each piston,

the suction and discharge of the upper chamber are caused to be made through the same orifices as those of the lower chamber. By omitting the cavities an independent suction and discharge may be connected with each chamber. The suction and discharge may be located above the centers of the pistons, in the same relative arrangement as they are represented below, and they may be located vertically at the centers of the case, one above, and one below.

Packing may be applied to the points of the pistons in any approved way, if desired.

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

1. The combination, in a case, A, of two pistons, B, whose sides are true arcs of circles,

and which are arranged on parallel axes, and geared to run in the same direction.

2. The pistons B, having sides constructed on true arcs or circles, and being mounted on parallel axes, which are coupled by cranks and rods, substantially as herein shown and described.

3. The combination of the pistons B, constructed in the form described, and arranged to run in the same direction with a case, A, having cavities K in the upper chamber, or the one opposite to that having the inlet and discharge passages, substantially as herein shown and described.

ROBERT BURNS REYNOLDS.

Witnesses:

J. H. DEVOE,

J. T. VAN BUREN.