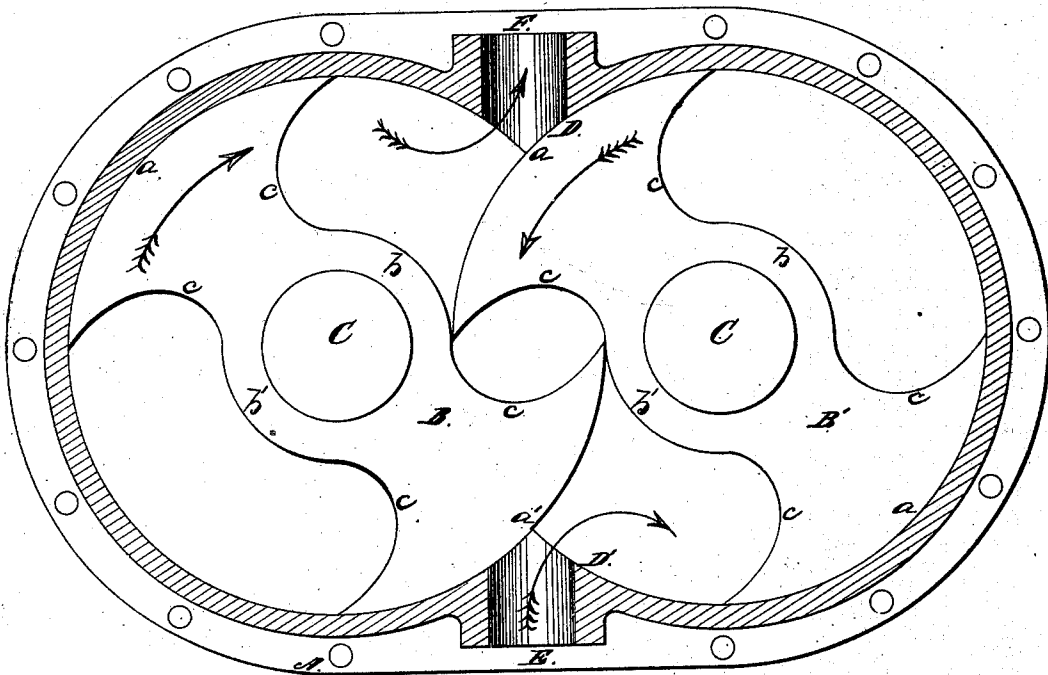


D. D. Hardy,
Rotary Pump.

N^o 60,365.

Patented Dec. 11, 1866.



Witnesses

W. D. Dalton
J. M. Wilson

Inventor

Dexter D. Hardy

United States Patent Office.

IMPROVEMENT IN ROTARY PUMPS AND ENGINES.

DEXTER D. HARDY, OF CINCINNATI, OHIO, ASSIGNOR TO THOMAS H. FOULDS, OF SAME PLACE.

Letters Patent No. 60,365, dated December 11, 1866.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, DEXTER D. HARDY, of Cincinnati, Hamilton county, in the State of Ohio, have invented a certain new and useful Improvement in Rotary Pumps and Engines; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, making part of this specification.

My improvement is adapted specially for the rotary pump and engine for which Letters Patent were granted to myself and John J. Morris, bearing date March 5, 1861, and consists in so constructing each revolving piston, that its exterior or rubbing surface shall form opposing quarter circles of large and small diameter, the large and small circles being connected by concave faces.

In the accompanying drawing, A is the case or cylinder, B B' the working pistons, and C the shafts, the latter being connected by the ordinary gearing, D D' are the inner tongues or projections whose office is fully explained in the patent above referred to, granted to myself and J. J. Morris, March 5, 1861.

E is the induction, and F the eduction port for water or steam. I have discovered by practical experience that the semi-cylindrical pistons, as covered by the above-mentioned patent, tend, by reason of their unbalanced character, to shake the pump or engine violently when running at high speeds, and cause the journals and other working parts to wear out quickly. To effectually remedy this defect, I construct the pistons, B B', of the form fully shown in the accompany drawing, *a a'*, being opposing and balancing quarter circles, and *b b'* opposing quarter circles of smaller diameter. To enable the pistons to work together, the circles *a a'* and *b b'*, are connected by concave sides, *c*, whose concavity must be sufficient to enable the points of the pistons to pass freely, and allow access for the water carried round in the concave sides, when in operation.

The form herein described is the one preferred by me to effect the balancing of weight of the pistons, and prevent shaking when in operation, but other inferior modifications may be employed, as for instance, three one-sixth circles, or four one-eighth circles, &c.

I claim herein as new and of my invention.

The rotary pistons B B', whose peripheries are formed by quarter circles *a a'* and *b b'*, of different diameters, connected by suitable sides *c*, in the described combination with the two central inner tongues D D', of the case A, as and for the purpose specified.

In testimony of which invention, I hereunto set my hand.

DEXTER D. HARDY.

Witnesses:

FRANK MILLWARD,
JAMES H. LAYMAN.