2 Sheets—Sheet 1.

S. D. SIMMONS.

ROTARY PUMP AND ENGINE.

No. 191,258. Patented May 29, 1877.

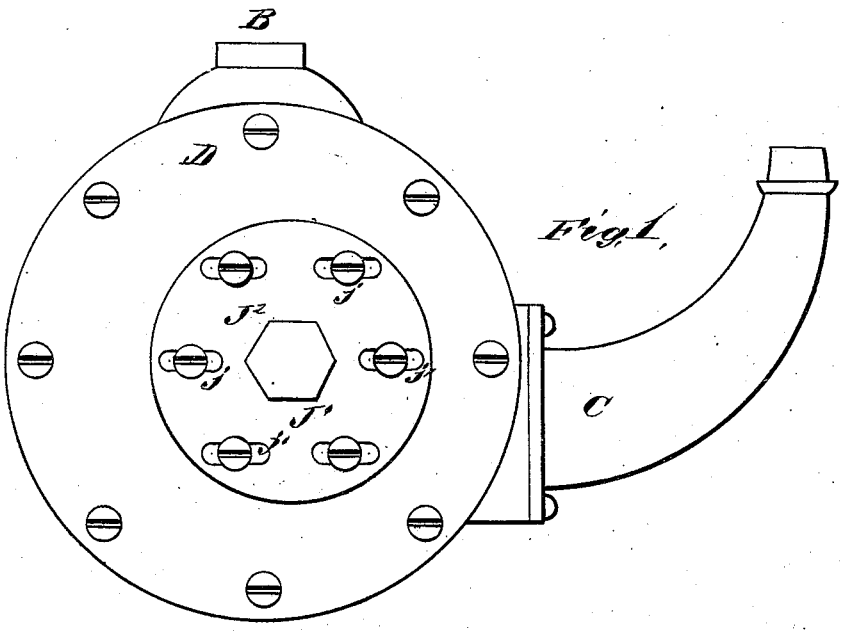

Fig. 1.

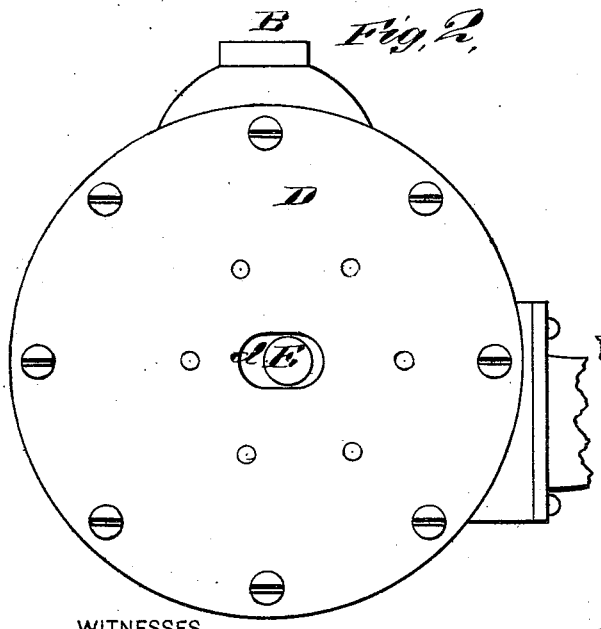

Fig. 2.

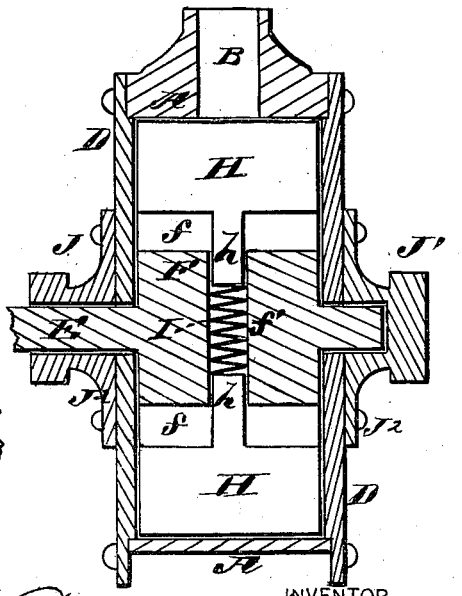

Fig. 3.

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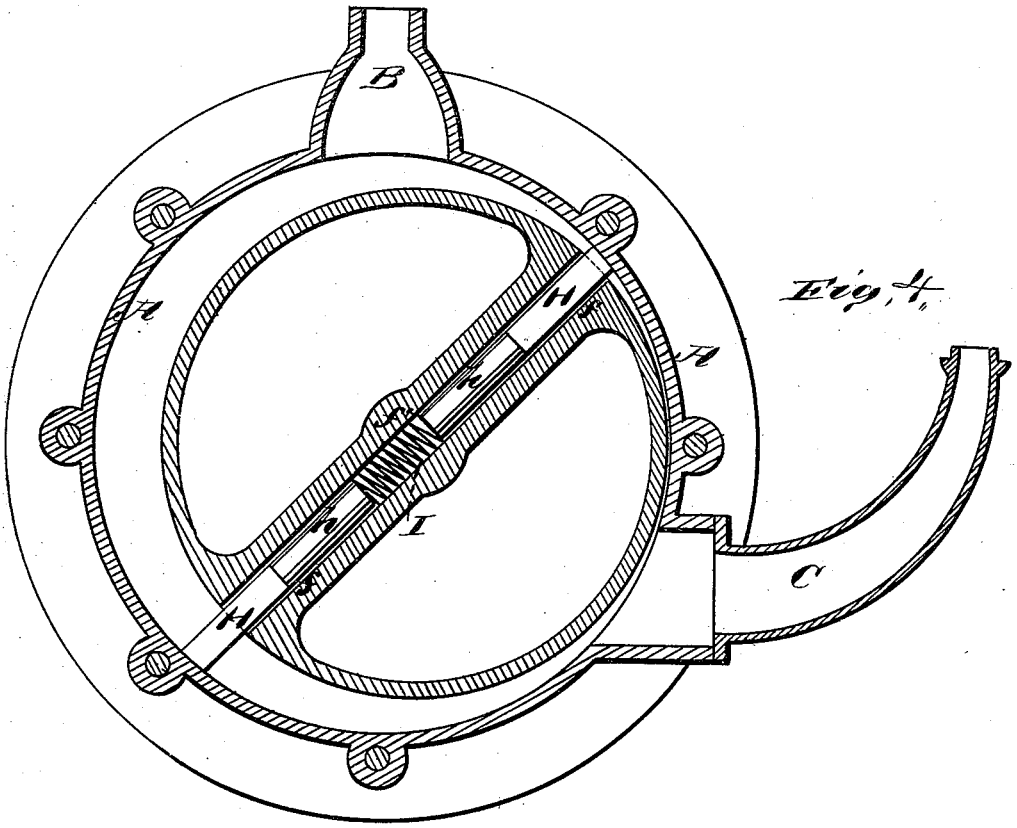
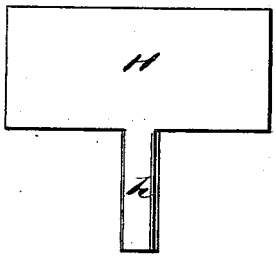


Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

SAMUEL D. SIMMONS, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO ALLEN L. WOOD, OF NEW YORK CITY.

IMPROVEMENT IN ROTARY PUMPS AND ENGINES.

Specification forming part of Letters Patent No. **191,258**, dated May 29, 1877; application filed September 30, 1876.

To all whom it may concern:

Be it known that I, SAMUEL D. SIMMONS, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and valuable Improvement in Rotary Pumps and Engines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a side elevation of my rotary pump and engine, and Fig. 2 is a side elevation of same with one of the bearings removed. Fig. 3 is a horizontal sectional view, and Fig. 4 is a longitudinal vertical sectional view thereof. Fig. 5 is a detail view.

This invention relates to rotary pumps and rotary engines. The nature of said invention consists in constructing the bearings of the rotating cylinder with oblique fastening-slots, in order that said rotating cylinder may be set up against the stationary cylindrical casing, so as to compensate for wear, this compensation being effected without opening said casing. It also consists in providing the heads of said cylindrical casing with elongated perforations or slots for the passage of the piston-cylinder shaft, so as to allow the compensating adjustment above stated. It also consists in perforating said cylinder and providing it with a central expanding-spring, which operates to force two pistons outward in opposite directions, as hereinafter set forth.

In the annexed drawings, A designates a stationary outer cylindrical casing, which is provided with induction-tube B and discharge-tube C, as well as with cylinder heads or disks D D. Said cylinder-heads are rigidly secured to said cylinders in any known manner, but are preferably detachable. Each one of said cylinder-heads is provided with an oblong eccentric aperture, *d*, near its center. Through said apertures passes shaft E, which carries a rotary piston-cylinder, F, that is arranged eccentrically within outer stationary cylindrical casing A. Said cylinder F is provided with two opposite recesses, *f f*, which are adapted to receive the rectangular heads of pistons H H. Said recesses are connected by a central transverse tubular passage, *f'*, which is adapted to receive cylindrical shanks or short rods *h h* secured to the inner side of said piston-heads, and forming parts of said pistons H H. Within said tubular passage *f'*, and between the inner ends of said short shanks *h h*, I place a helical spring, I, which operates to force said pistons H H outwardly in opposite directions toward said cylindrical casing A.

The operation of the above devices is as follows: When said piston-cylinder F rotates it touches said cylindrical casing so closely on one side that it makes an air-tight contact between said casing and said cylinder, forcing each one of pistons H inward into one of recesses *f f* and tubular connecting-passage *f'*, as said pistons successively reach or approach this part of their revolution. While one of said pistons is thus being forced inward, the other piston is thrust outward by the action of spring I. As said outwardly-thrust piston revolves it touches the inside of casing A and sweeps the water before it around from induction-pipe B to discharge-pipe C. It is then forced inwardly again, as before described, while the other piston carries the water round. The water is drawn from the induction-pipe by means of the vacuum produced by the rotation of said piston-cylinder and pistons.

After long use the circumference of said piston-cylinder becomes worn, and so does the inside of casing A at that part where said cylinder and said casing come into contact. In this way the said contact becomes less perfect, until air is admitted between said casing and said piston-cylinder to the upper end of induction-pipe B, thereby destroying the vacuum alluded to, and preventing the water from being sucked up by the pump. This defect is remedied by adjusting said piston-cylinder F closer to said casing A, on the side where the said contact takes place. My invention enables said adjustment to be made without opening said casing A. This result I accomplish by the use of the following devices:

J J^1 designate two similarly-constructed bearings for shaft E. Bearing J is perforated

to allow the passage of said shaft; and bearing J^1 is recessed but closed at the end, so as to receive the end of said shaft. Said bearings are secured to said casing-heads A A by means of fastening-screws *j j*, which pass through oblique slots *j' j'* in annular flanges J^2 J^2, one of which is rigidly connected to each one of said bearings or made in one piece therewith. Said slots *j' j'* incline toward that side of the casing where contact is made between the same and piston-cylinder F. By loosening said screws *j*, said bearings and shaft are left free, so that they can be adjusted toward the said side of the casing, so as to compensate for the said wear and make air-tight contact again. The oblique elongated slots *a a* in said heads A A also allow said compensating adjustment.

The devices above described are also applicable to rotary engines, so as to prevent the escape of the steam or other expansible motor.

What I claim as new, and desire to secure by Letters Patent, is—

1. Cylinder A, provided with heads or disks D D, having eccentric oblong apertures, substantially as set forth.

2. Bearings J J^1, having oblique slots *j' j'*, substantially as and for the purpose set forth.

3. Bearings J J^1, in combination with cylinder-heads D D, fastening-screws *j j*, and shaft C, substantially as set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

SAMUEL D. SIMMONS.

Witnesses:

HENRY JACOBSON,

CHARLES S. ENSIGN.