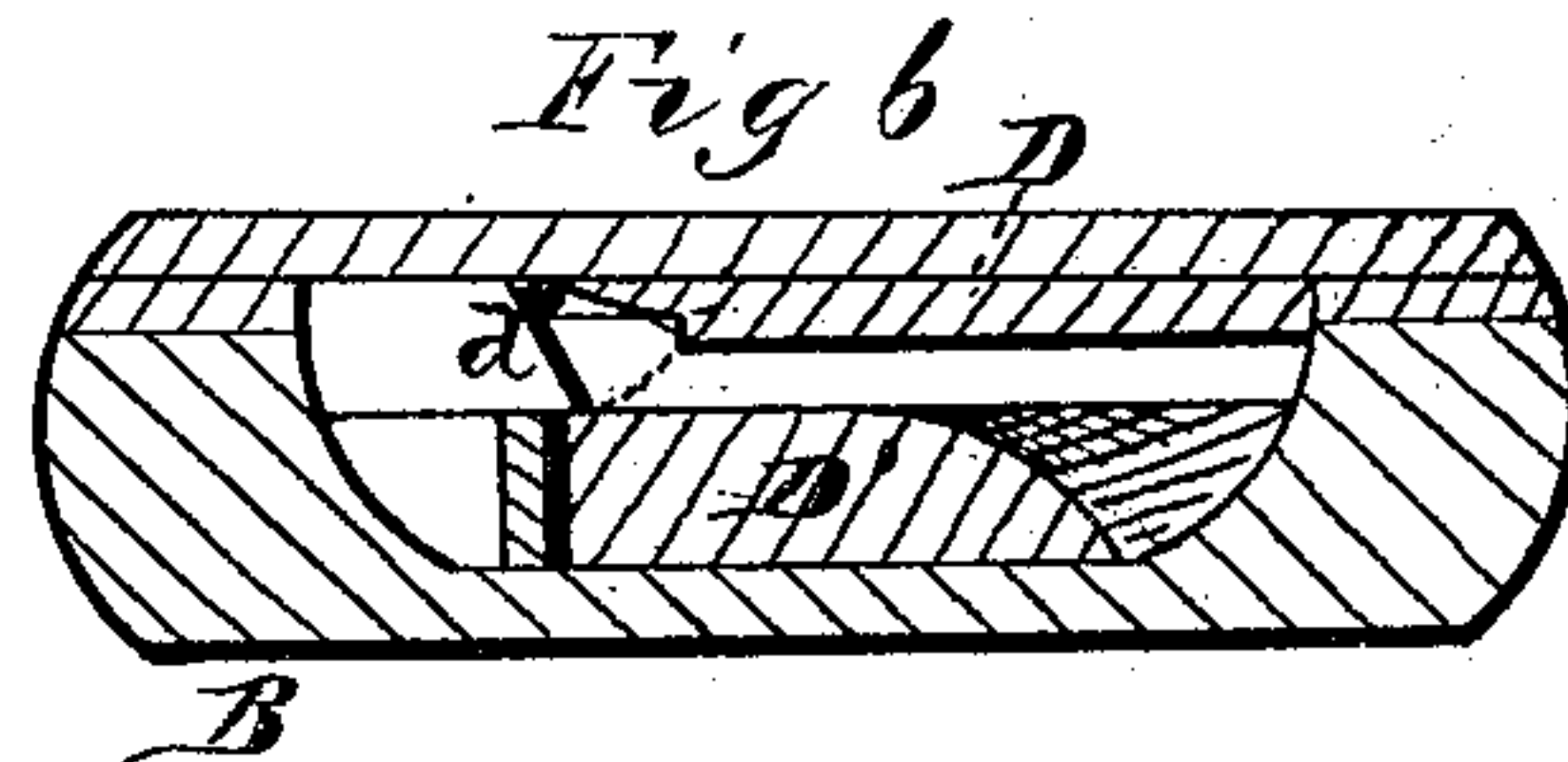
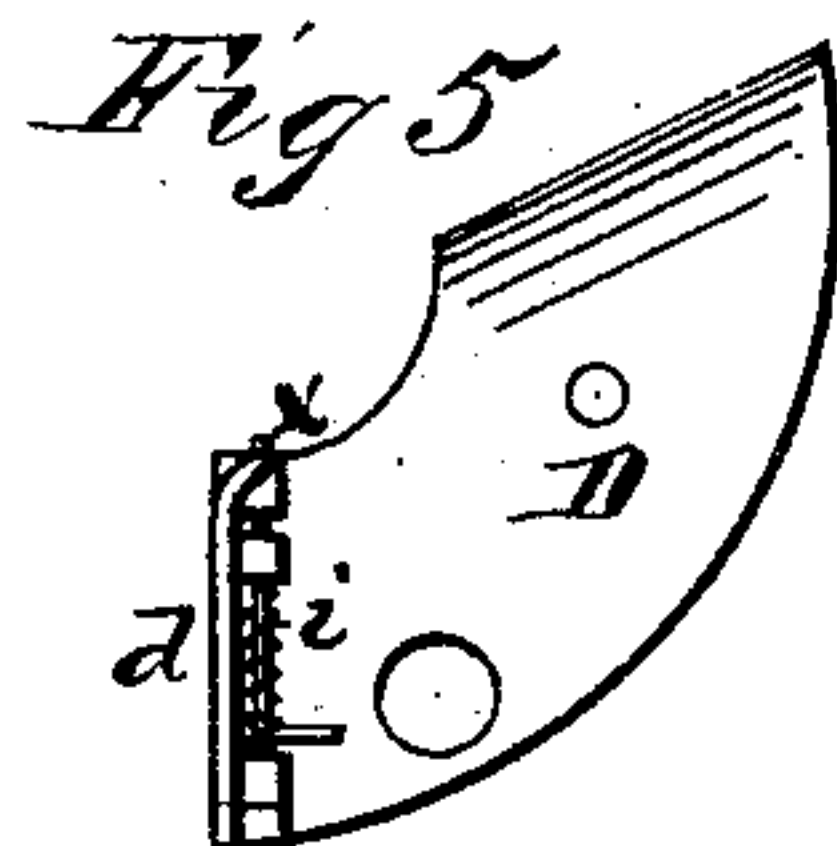
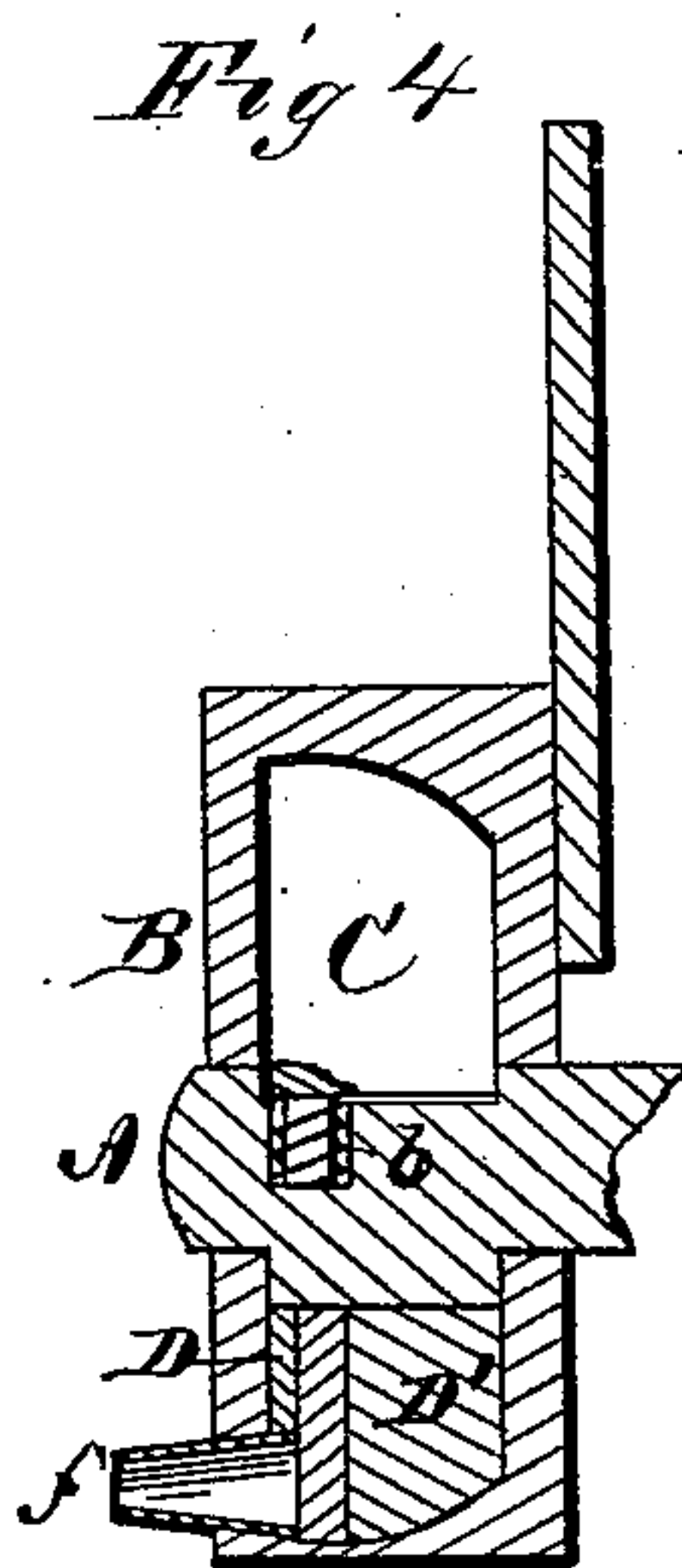
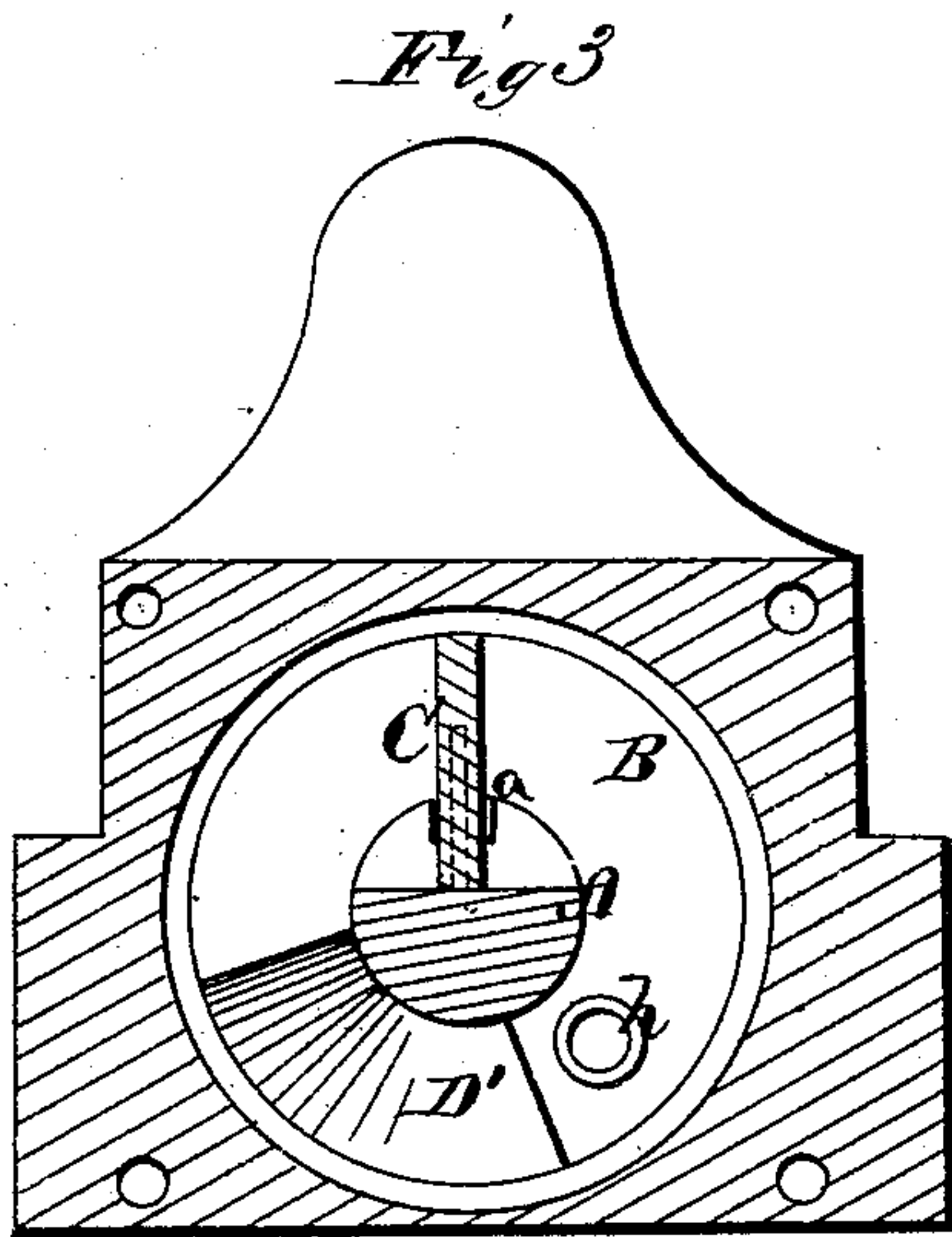
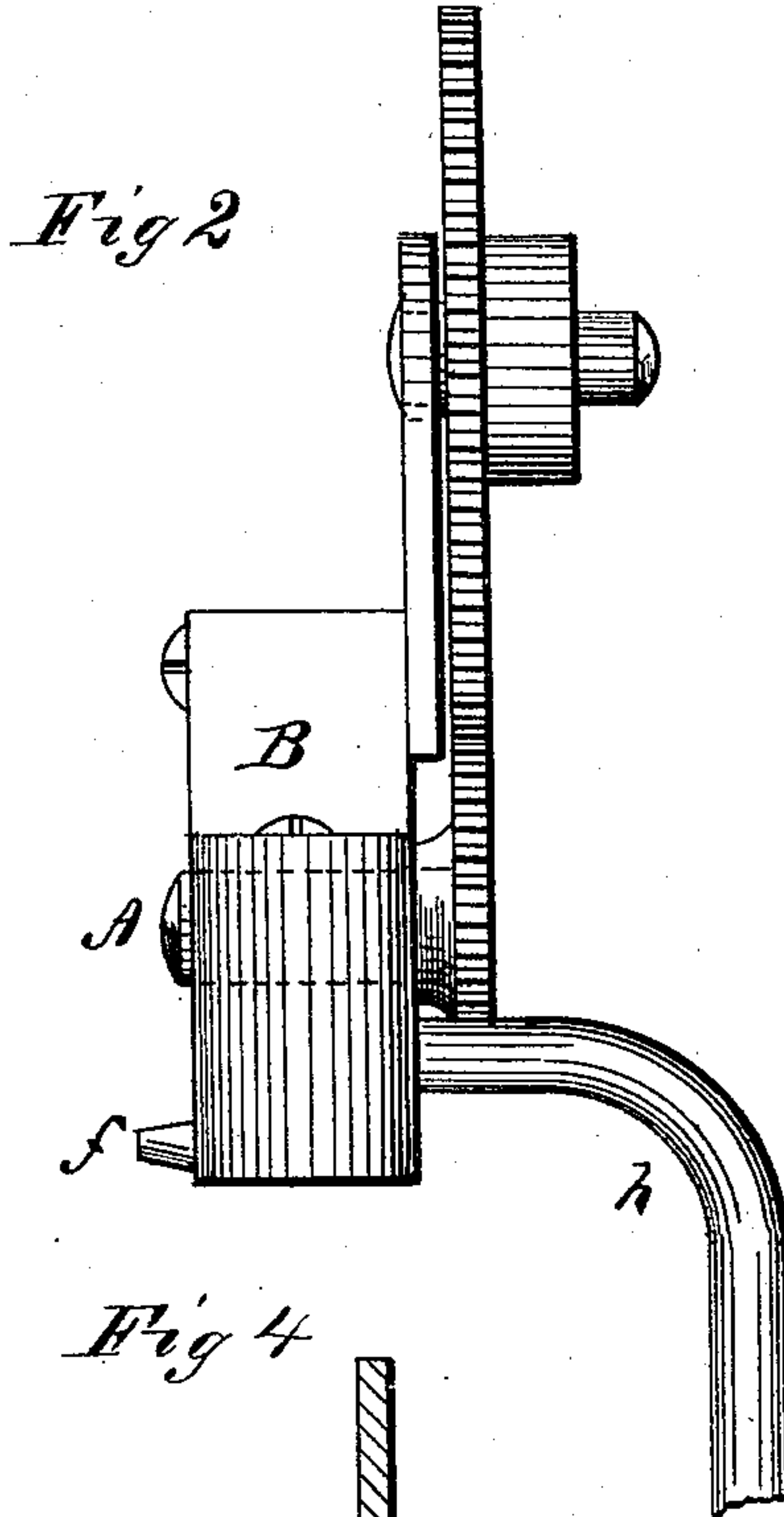
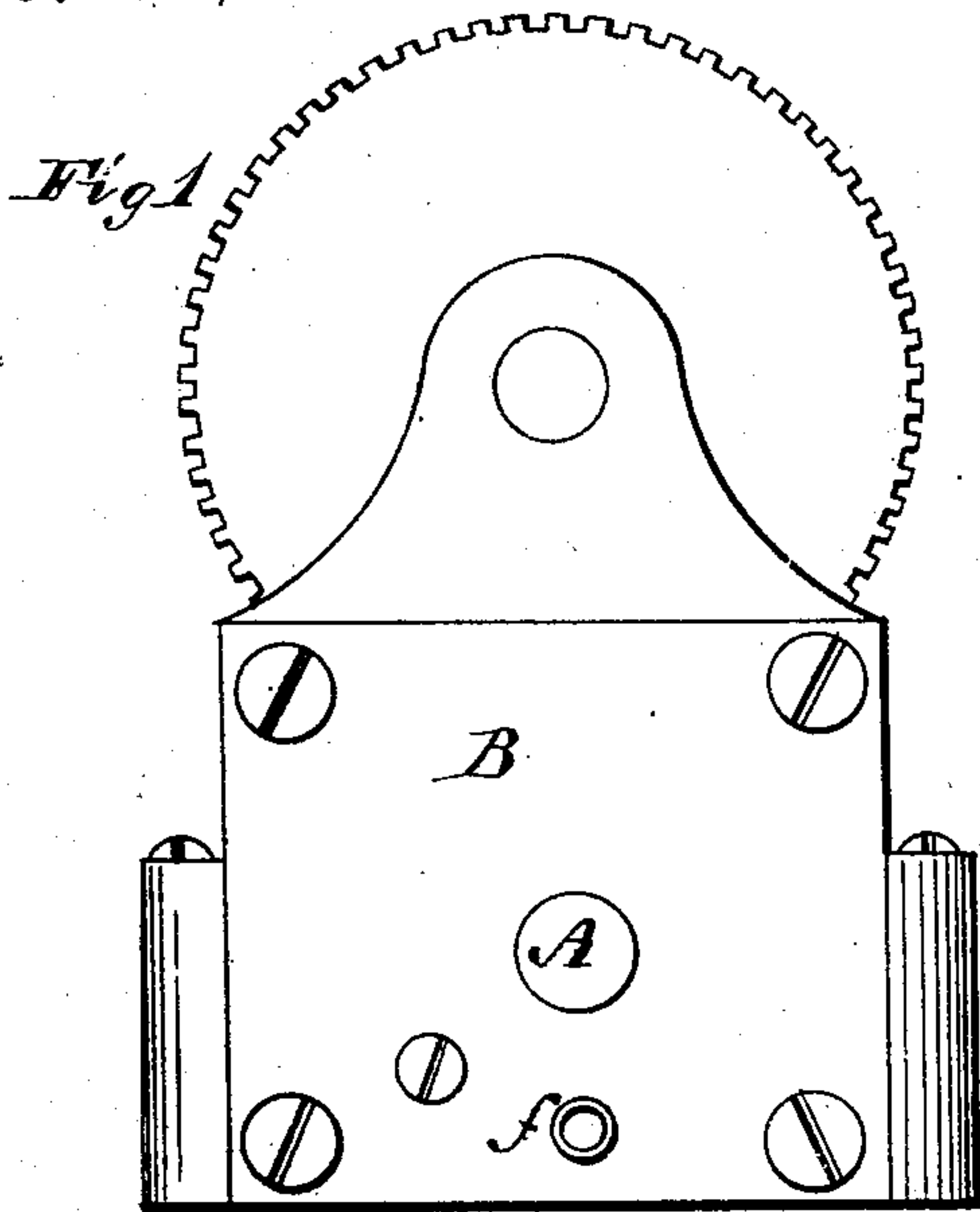


W. H. BEAL.
Rotary-Pumps.

No. 149,182.

Patented March 31, 1874.



WITNESSES.
A. L. Ourand
C. L. Evert.

By

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UNITED STATES PATENT OFFICE.

WILLIAM H. BEAL, OF JACKSON, TENNESSEE.

IMPROVEMENT IN ROTARY PUMPS.

Specification forming part of Letters Patent No. **149,182**, dated March 31, 1874; application filed February 19, 1874.

To all whom it may concern:

Be it known that I, WILLIAM HENRY BEAL, of Jackson, in the county of Madison and State of Tennessee, have invented certain new and useful Improvements in Rotary Pumps; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

The nature of my invention consists in a piston pivoted near one side radially to a central shaft, and provided with a spring around its pivot, so that in its natural position it may occupy the whole width of the cylinder inside from the shaft to the inner circumference of the cylinder, in order to force all water before it, and create a suction by a vacuum behind it.

The object of pivoting the piston is to allow a cam inside the cylinder to turn the piston at right angles to its natural position, in order that it may pass between two cams projecting from the inside of the cylinder, after which a spring affixed to the piston restores it to its natural position; and it also consists in fitting a hinge or other suitable kind of valve to the orifice between the cams, in such a position that when the piston is turned by the cam, it will open the valve to allow a passage for it, and when the piston is past the valve will close over the orifice, and make it air-tight; the object of said valve being to make an air-tight division between the inlet and outlet of the cylinder to give the piston force and suction; also, in the combination of parts as hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a front elevation of a machine or pump, embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a front section of the same, piston in natural position. Fig. 4 is a cross-section of the same, showing the piston in its natural position, the valve closed between the cams, and showing the shape of the cylinder. Fig. 5 represents one

of the cams with the valve hinged thereto, and Fig. 6 is a section through the cams and valve.

A represents a central shaft revolving within a cylindrical case, B. C is the piston pivoted radially to the shaft. A is a recess thereon, and fitted so that when in its natural position it forms an air-tight partition, and is of such a shape as to fit equally well on its outer edge in any position. This is accomplished by making the inner circumference of the cylinder B crosswise on a curve, with the same radius as that of the cylinder, the center being on a line with the axis of the piston. The piston C is then shaped to correspond with this curvature of the cylinder crosswise. It is pivoted out of its center, sidewise, in order to prevent the pressure in front from turning it the wrong way. Its long side is supported by a shoulder, *a*, on the shaft A, and it is held in place by means of a spring, *b*. D D' represent two cams so placed that the small cam D abuts, from the inside of the cylinder B, against the piston C when it arrives at a certain point, and is of sufficient thickness to turn it to an angle of forty-five degrees from its natural position. The large cam D' is placed directly opposite the small cam, and is graded so as to fit the piston C, until it has ejected all the water before it. *d* represents a valve hinged to the end of the small cam D, at the end where the piston emerges from between the two cams, and is fitted to open and shut between the cams, and which, when shut, forms, together with the cams, an air-tight partition, and when open it discloses an orifice of sufficient size for the piston C to pass through. The valve *d* is provided with a projection, *x*, at the point the piston first approaches, which is placed in such a position that the motion of the piston C will thereby force it open. *h* is the inlet, and *f* the outlet, situated one on each side of the valve *d*.

The mode of operation is as follows: When the shaft A is in motion, the piston C being air-tight carries all water before it through the outlet *f*, and causes a vacuum behind it. The water then rushes in behind the piston through the inlet *h* to supply the vacuum. On the ar-

rival of the piston C at the cams, the cam D turns it at right angles to its former position. The piston C, by its sidewise motion then opens the valve *d*, and passes through to the back side thereof, when the valve *d* closes again by a spring, *i*, and the spring *b* restores the piston C to its former position, when it again resumes its pressure on the water contained in the cylinder, and draws in a fresh supply behind.

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

1. The piston C, pivoted on one side of its center to the central shaft A within the cylinder B, and provided with a spring, *b*, around the pivot, substantially as and for the purposes herein set forth.

2. The combination of the shaft A, having stop *a*, the pivoted piston C and spring *b*, substantially as and for the purposes herein set forth.

3. The valve *d*, with projection *x* and spring *i*, for closing the space between the cams D D', substantially as herein set forth.

4. The combination of the cylinder B, central shaft A, pivoted piston C, cams D D', and valve *d*, all constructed substantially as and for the purposes herein set forth.

WILLIAM HENRY BEAL.

Witnesses:

GEORGE SIDDONS,
RADCLIFFE STOTT.