Doyle & Martin,

Rotary Punch.

No. 109,117. Patented Nov. 8. 1870.

Fig. 1.

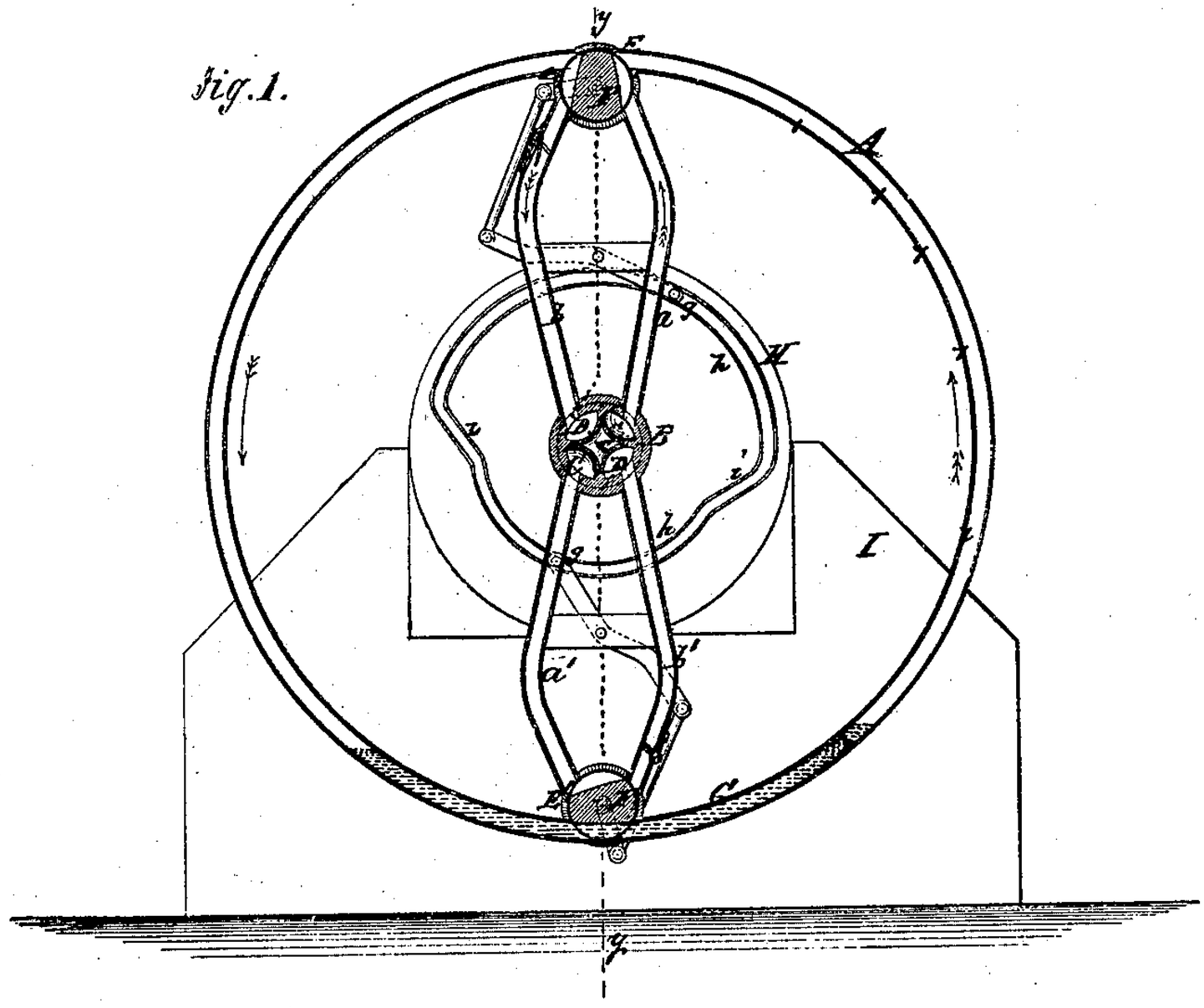
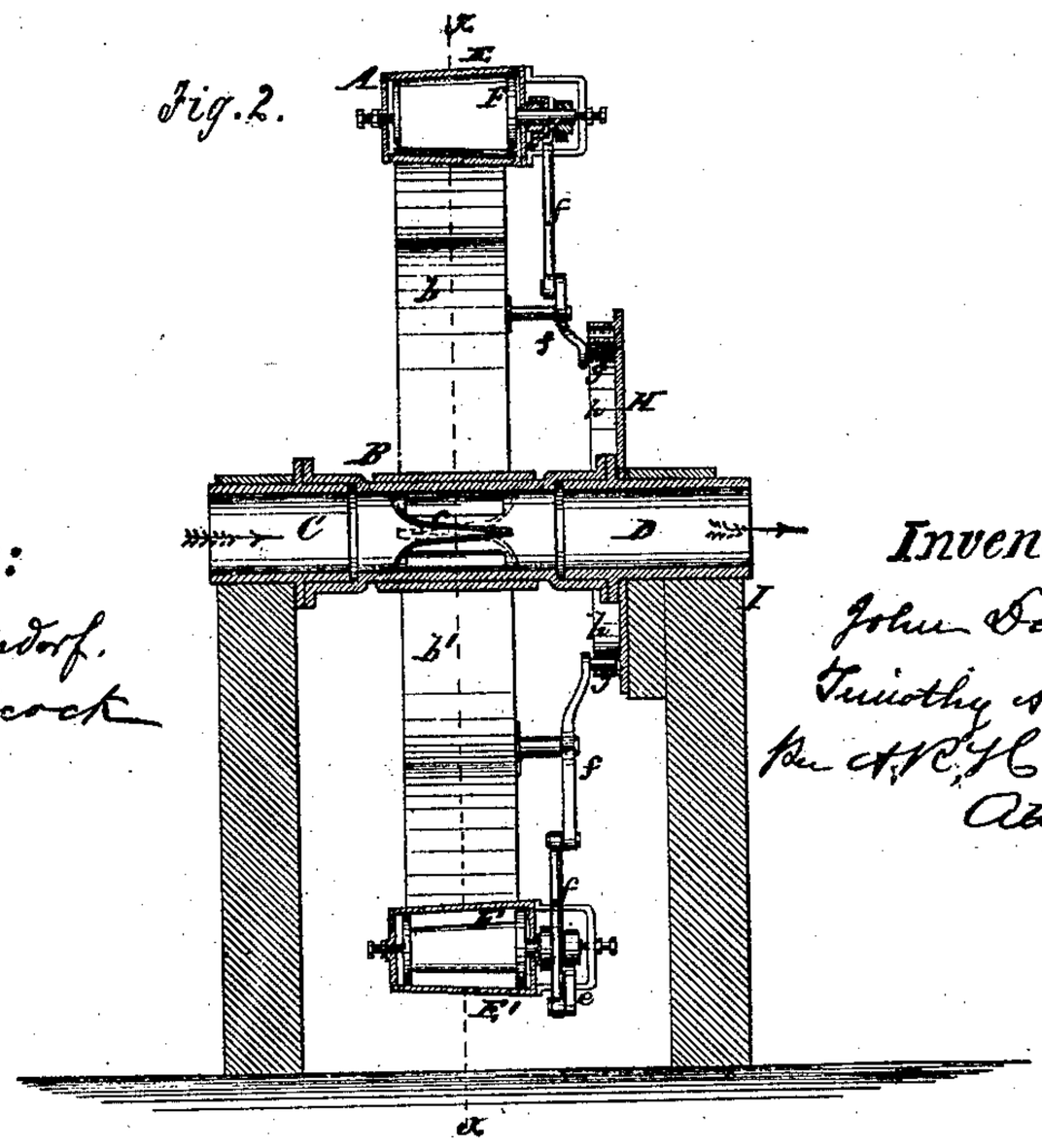


Fig. 2.



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JOHN DOYLE, OF HOBOKEN, NEW JERSEY, AND TIMOTHY AUGUSTINE MARTIN, OF NEW YORK, N. Y.

Letters Patent No. 109,117, dated November 8, 1870.

IMPROVEMENT IN ROTARY PUMPS.

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

To all whom it may concern:

Be it known that we, JOHN DOYLE, of Hoboken, in the county of Hudson and State of New Jersey, and TIMOTHY AUGUSTINE MARTIN, of the city, county, and State of New York, have invented a new and improved Rotary Pump; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon making a part of this specification.

This invention has for its object the obtaining of a rotary pump, which will operate efficiently with a comparatively small expenditure of power, and which will be simple in construction and not liable to get out of repair.

In the accompanying drawing—

Figure 1 is a side sectional view of our invention, taken in the line *x x*, fig. 2.

Figure 2, a vertical section of the same, taken in the line *y y*, fig. 1.

Similar letters of reference indicate corresponding parts.

A represents an annular tube, which is connected by four tubular arms, *a a' b b'*, with a tubular axis, B, the latter being divided by a wedge-shaped partition, *c*, into two parts, C D, the former, C, being the suction, and the latter, D, the discharge end of the axis.

The arms *a a'* communicate with the suction part C of the axis B, and the arms *b b'* communicate with the discharge-port of the same.

The annular tube A is provided with two valve-chambers E E', placed in the rim or tube at opposite points, and these chambers are provided with valves F, of slightly conical form, and so arranged that, by a partial rotation, the arms *a a' b b'* will communicate with and be cut off from the annular tube A, (see fig. 1.)

The annular tube A is provided with a certain quantity of mercury, G, or other suitable fluid or semi-fluid. Mercury, however, will probably be preferable.

This mercury, owing to its gravity, will remain at the lower part of the annular tube, while the latter rotates, as shown in fig. 1.

The valve-chambers E E' extend entirely across the annular tube A, and the valves F, when open, do not form any obstruction within said tube.

These valves may be described as being cones, having sections removed at two opposite sides, to form plane surfaces, either of which, when turned or adjusted in line with the annular tube, leave the latter open its entire width.

This will be fully understood by referring to fig. 1, in which one valve is shown open and the other closed.

The mercury G performs the function of a stationary piston, it being understood that the tube A revolves.

The valves F are opened and closed by means of a stationary cam, H, which is attached to the framing I, in which the axis B is hung, the valves being each provided at one end with an arm, *e*, to which arms rods *f* are connected, the outer ends of the latter being provided with friction-rollers *g*, which work in the cam H, (see both figures.)

This cam H may be described as being composed of two circular portions *h h*, or rather semicircular portions, concentric with each other, and connected at their ends by short oblique portions *i i*, as shown in fig. 1.

The operation, which is extremely simple, is as follows:

Suppose the annular tube A to be rotating in the direction indicated by the arrows, fig. 1, the mercury, as before stated, being stationary, a suction will be formed in the tube A, between the end of the mercury and the upper valve, as indicated by 1 1 1, and water or other fluid being acted upon will be drawn up into the suction part C of the axis B, up through the arm *a*, and into the portion of the annular tube 1 1 1, as indicated by the arrows; at the same time the water in the other portion of the tube, which was previously raised, is forced down the arm *b*, into and out of the discharge part D of the axis B, the lower valve closing the arms *a' b'*.

The valves are operated, opened, and closed by the passing of the friction-rollers of the rods *f* of the valves, through the oblique portions *i*, into the portions *h h'* of the cam; said oblique portions causing a gradual opening and closing of the valves, and being so disposed or placed as to cause one valve to open slightly in advance of the other closing, to insure a continuous operation of the pump.

It will be understood that when the valves F close the arms *a b* and *a' b'*, the annular tube A is unobstructed, (see the lower valve in fig. 1,) and when said arms are open, as shown by the upper valve in same figure, the tube A is obstructed, the valves forming a partition across the tube.

Having thus described our invention,

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

The annular rotating tube A, provided with valves F, in combination with mercury G or any suitable fluid or semi-fluid placed within the annular tube, and all arranged to operate in the manner substantially as and for the purpose set forth.

JOHN DOYLE.
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Witnesses:
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