(No Model.)

2 Sheets—Sheet 1.

S. MARCUS.

ROTARY ENGINE AND PUMP.

No. 282,340. Patented July 31, 1883.

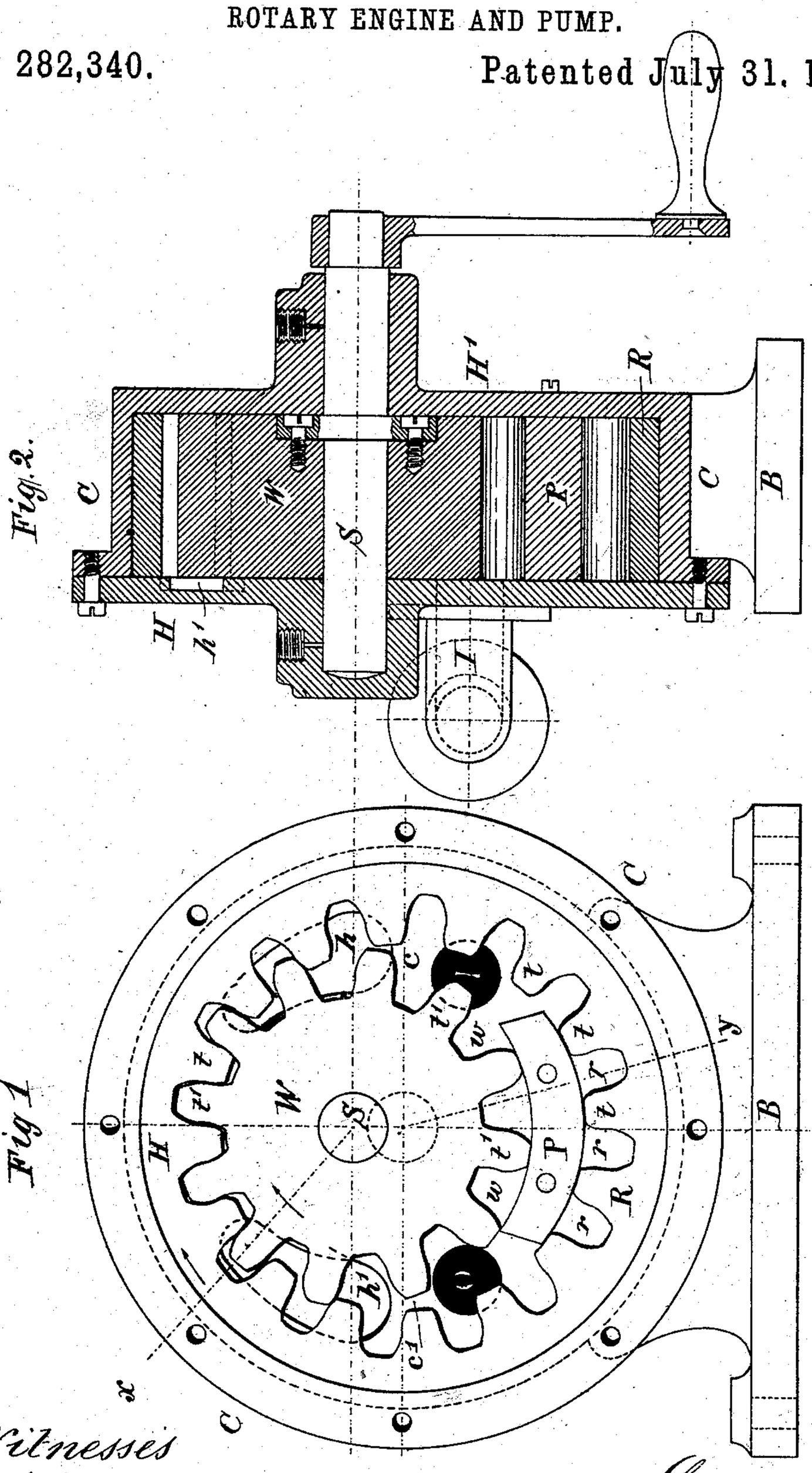

Fig. 2.

Fig 1

Witnesses
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

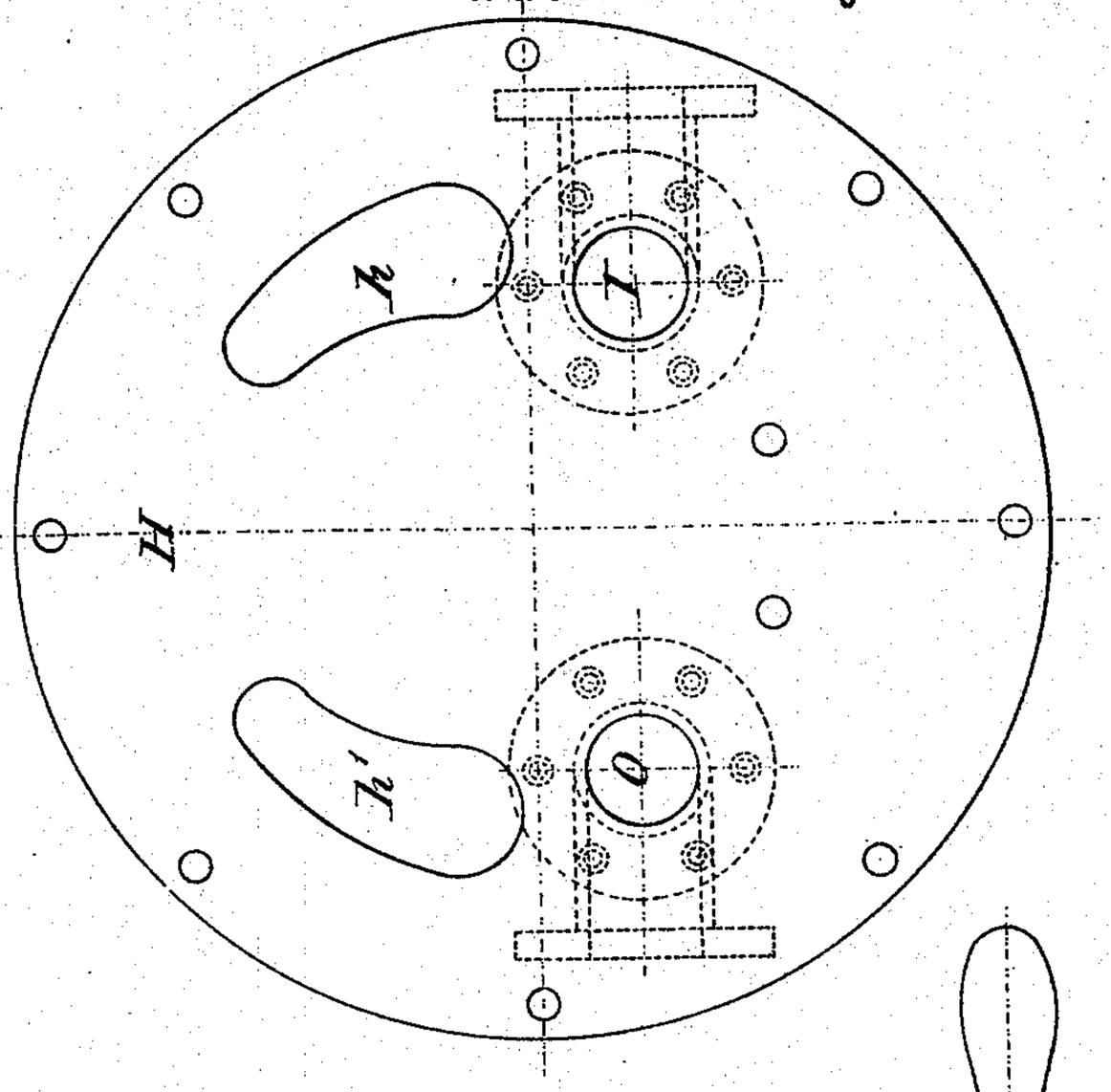
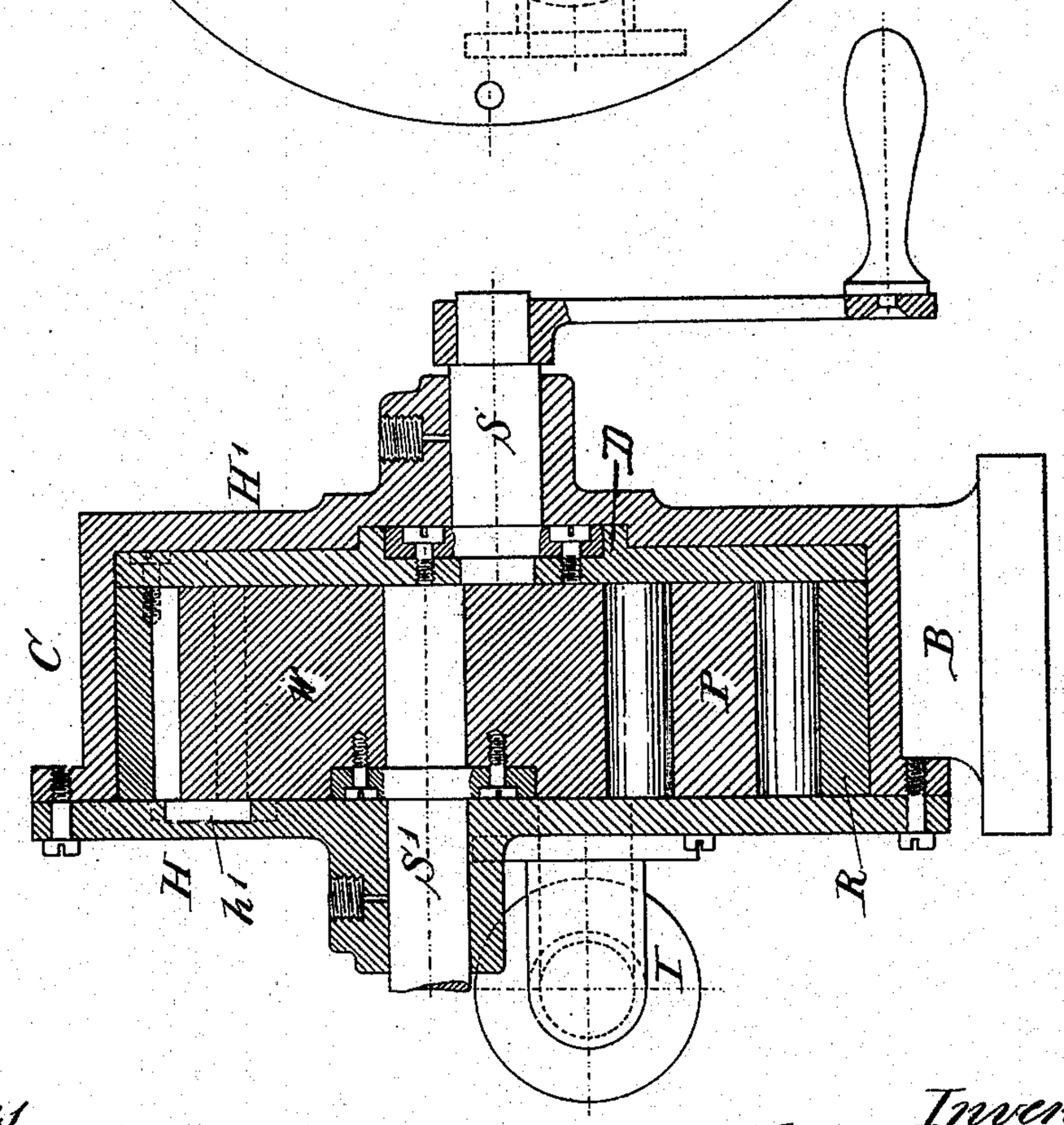


Fig. 3.



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UNITED STATES PATENT OFFICE.

SIEGFRIED MARCUS, OF VIENNA, AUSTRIA-HUNGARY.

ROTARY ENGINE AND PUMP.

SPECIFICATION forming part of Letters Patent No. 282,340, dated July 31, 1883.

Application filed August 9, 1882. (No model.) Patented in Belgium July 17, 1882, No. 58,503; in France July 20, 1882, No. 150,213; in Germany July 22, 1882, No. 21,413, and in England July 25, 1882, No. 3,526.

To all whom it may concern:

Be it known that I, SIEGFRIED MARCUS, a subject of the Emperor of Austria, residing at the city of Vienna, in the Austro-Hungarian Empire, have invented certain new and use ful Improvements in Rotary Engines and Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in rotary pumps adapted for use as a motor; and it consists in the construction and arrangement of parts, substantially as hereinafter more fully described, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation showing the internal construction of my improved pump, one cylinder-head being removed to that effect. Fig. 2 is a vertital transverse section thereof, taken on line *x y* of Fig. 1. Fig. 3 is a like view, showing a modified arrangement for operating the pump; and Fig. 4 is an inside face view of one of the cylinder-heads.

In the above figures of drawings like letters of reference indicate like parts.

C is the pump-cylinder, and H H′ the heads thereof, supported upon any suitable base, B. The head H has inlet and outlet passages I O, respectively, and recesses *h h′*, for purposes hereinafter described. Within the cylinder is located a ring, R, toothed upon its interior periphery, with the teeth of which meshes a toothed wheel, W, of less diameter than the toothed ring. Both the wheel and ring extend from one cylinder-head to the other, as shown in Figs. 2 and 3. The cylinder is divided into two chambers, *c c′*, by the wheel W and by a segmental partition, P, in the space between said wheel and the ring R. The outer periphery of the partition P is a segment of the circle described by the crest of the teeth *t* of the ring R, and the inner periphery a segment of the circle described by the crest of the teeth *t′* of the wheel W, said partition P being attached to the heads of the cylinder C. The wheel W is mounted upon and rotated by a shaft, S, either by hand or from any desired prime motor, and communicates its movement to the ring R, which rotates within the cylinder. The inlet-orifice I and the recess *h* of the cylinder-head H communicate with the chamber *c* of the cylinder, and the outlet-orifice O and recessed passage *h′* of said head communicate with the chamber *c′*. If motion is imparted to the wheel W in the direction of the arrows, Fig. 1, the ring will rotate in the same direction, and they will carry the water in the interdental spaces *w w* of the wheel W and the corresponding spaces, *r r*, of the ring R from the suction-chamber *c* to the delivery-chamber *c′* on opposite sides of the partition P, each of said spaces inclosing a certain volume of water. In this manner the water entering at I is transferred to chamber *c′*, and, as will be observed, the chamber *c* increases in area in the direction of rotation of the wheel and ring, or from the point of engagement of the two to the partition P, while that of the chamber *c′* decreases in area in the said direction of rotation, whereby a partial vacuum is created in chamber *c* and fluid drawn in, while the fluid carried over to chamber *c′* is compressed and forced out through the outlet-orifice. All fluid between the interdental spaces on the side of the suction-chamber is forced through the recess *h* into said chamber.

It is evident that when the movement of the pump is reversed the inlet and outlet orifices and the chambers *c c′* have their functions correspondingly reversed, and the recess *h′* then serves to conduct the water from the interdental spaces to the left of the point of engagement of the wheel and ring to the chamber *c′*, which is now the suction-chamber.

It is also evident that the recesses *h h′* may be formed in the body of the cylinder or in the opposite head, and that instead of imparting motion to the wheel W motion may be imparted to the ring R. This latter may be effected in a very simple manner, as shown by Fig. 3, in which a disk, D, mounted upon the driving-shaft S, is connected with the ring R,

or formed with such ring, and the wheel W is mounted upon a counter-shaft, S', rotating with the wheel in its bearings.

If the inlet-passage is connected to a supply-main and a liquid supplied to chamber *c* under pressure, the pump may be used as a motor, as will be readily understood.

Having now described my invention, what I claim is—

1. In a rotary pump, a pump-cylinder having the suction and delivery ports formed in one of the heads thereof, an internally-toothed ring arranged to rotate in contact with the interior periphery of such cylinder, in combination with a pinion meshing with said ring, and a diaphragm or partition interposed between the pinion and ring, dividing said cylinder into a suction and discharge chamber, substantially as and for the purposes specified.

2. In a rotary pump, a pump-cylinder having recesses *h h'*, and inlet and outlet ports formed in one of the heads thereof, in combination with an internally-toothed ring arranged to rotate in contact with the interior periphery of such cylinder, a pinion meshing with said ring, and a diaphragm or partition interposed between the two and dividing said cylinder into a suction and discharge chamber, substantially as and for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

SIEGFRIED MARCUS.

Witnesses:
WILLIAM HÜNING,
JAMES RILEY WEAVER.