(No Model.)

M. W. KIDDER.

ROTARY PUMP AND MOTOR.

No. 258,535. Patented May 23, 1882.

Fig. 1.

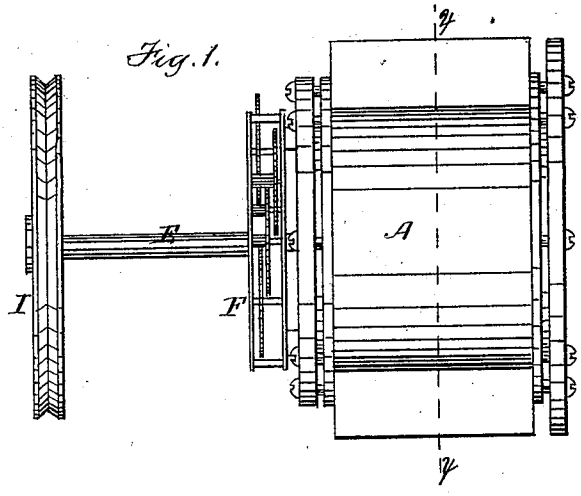


Fig. 2.

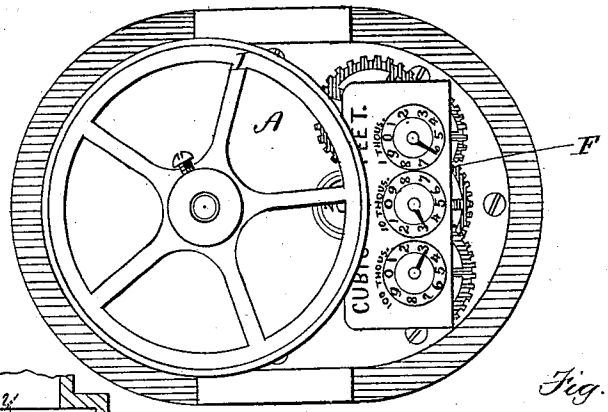


Fig. 3.

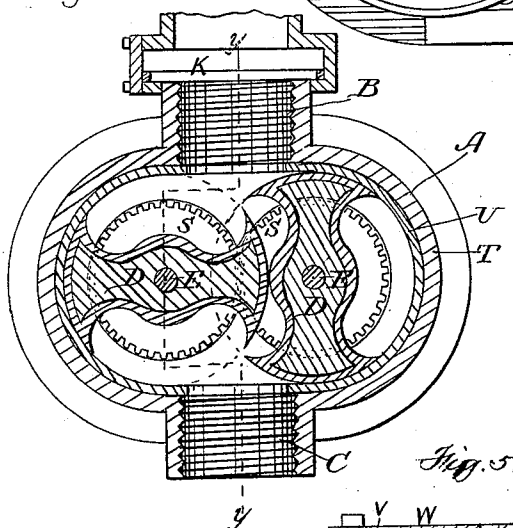


Fig. 4.

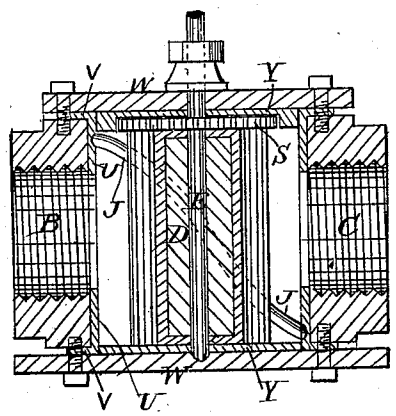
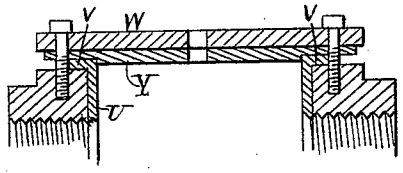


Fig. 5.



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UNITED STATES PATENT OFFICE.

MOSES W. KIDDER, OF BOSTON, ASSIGNOR TO PERSON NOYES, OF LOWELL, MASSACHUSETTS.

ROTARY PUMP AND MOTOR.

SPECIFICATION forming part of Letters Patent No. 258,535, dated May 23, 1882.

Application filed October 15, 1881. (No model.)

To all whom it may concern:

Be it known that I, MOSES W. KIDDER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Rotary Pumps and Meters or Motors, of which the following is a specification.

My invention relates to the construction of rotary pumps, meters, and motors; and it consists in certain novel improvements, which I will describe and claim hereinafter.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of a meter or motor embodying my invention. Fig. 2 represents an end elevation of the same. Fig. 3 represents a section on line *x x* of Fig. 1. Fig. 4 represents a section on line *y y* of Fig. 3. Fig. 5 represents a a section showing a different form of end plate.

The same letters of reference indicate the same parts in all the figures.

In carrying out my invention I provide a rotary engine composed of a casing, A, having an induction-port, B, an eduction-port, C, and two rotary coacting pistons, D, rigidly attached to shafts E E, which are journaled in the heads of the casing. The casing A and the rotary pistons D D have the same general characteristics of form and operation as in rotary pumps and blowers in which two rotary pistons are employed, so formed as to be always in contact with each other at a point that changes or moves with the rotary movements of the pistons. The casing has concave inner surfaces separated by plane surfaces, and the pistons have convex surfaces fitting closely in the concave surfaces of the casing. The pistons are adapted to be rotated by a fluid passing through the casing, the construction being such that no fluid passes through the casing without exerting pressure on the pistons. The pistons being rigidly attached to their shafts, the latter are of course rotated by the pistons, said shafts being connected by gears S S within the casing. One or both of the shafts E E project through one end of the casing, and when the machine is to be used as a motor the projecting shaft is provided with a suitable pulley or wheel, I, for transmitting power by a belt or otherwise.

When it is desired to use the machine as a registering-motor or power-meter, a registering mechanism, F—for instance, like that ordinarily employed on a gas-meter—is applied to the casing A, one of the pinions of said mechanism meshing with a pinion on one of the shafts E. The wheel I and the registering mechanism may be actuated by the same or different shafts.

It will be seen that by the described construction and combination the rotary coacting pistons, which have heretofore been driven by power applied to their shafts for forcing air and water through their casing, are adapted to receive motion from the fluid passing through the casing and transmit power derived from such fluid, and to register or indicate the value of said power when the device is used as a motor and the value of the passing fluid when the device is used as a meter.

In the construction of the casing I take a rough shell, T, of cast-iron or other hard metal, and cast upon the interior and ends thereof a lining, U, and flanges V V, of Babbitt or other equivalent metal capable of being cast with a smooth surface. In doing this I use a suitable mold, so that the lining will be given the exact internal shape that it is to possess with little or no finishing or dressing, and the flanges will have perfectly true plane outer surfaces. The flanges form the seats for the end plates, W W, of hard metal, which are clamped firmly against said flanges by screws or bolts, the soft metal of the flanges enabling water-tight joints to be formed by the pressure against them of the hard plates W W. Y Y represent end plates, of Babbitt or equivalent soft metal, interposed between the hard external plates and the ends of the rotary pistons, and forming the ends of the case inclosing said pistons. Said plates are also cast or molded with smooth surfaces, so that they require little or no planing or dressing. The surfaces of the hard external plates W W can therefore be left in a rough condition without planing. It will be seen that the labor and cost of making the casing are thus greatly reduced when compared with the labor and cost of making it entirely of hard metal. As the soft metal employed is not affected by water, corrosion and rusting are avoided. One of the end plates Y

is recessed to receive the gears S S, as shown in Fig. 4. Said gears are arranged within the casing, so that when water-pressure is used to rotate the pistons, as will usually be the case, the gears will be kept lubricated, as it were, by the water and prevented from wearing away rapidly as if left dry.

When the device is used as a motor I provide the concave interior surfaces of the casing with diagonal grooves J J, extending from the space in the upper part of the casing, communicating with the induction-port to the space in the lower portion of the casing communicating with the eduction-port. These grooves receive any sand and dirt which may find its way between the pistons and the concave ends of the casing and conduct such matters to the eduction-port, so that they will not materially wear the surfaces of the pistons and casing.

When the device is used to register the quantity of water used to raise an elevator, the registering mechanism should be arranged to be made inoperative when the elevator is descending. I prefer to provide the pipe leading to the eduction-port with a strainer, K, to arrest foreign matter in the water. This strainer is removable from the pipe, so that it can be cleansed; and it may be composed of woven wire, cloth, or any suitable material.

If desired, the end plates of the casing may be made large enough to bear on the flanges V, as shown in Fig. 5. By this means a tighter joint will be formed than by the construction shown in Fig. 4, the soft-metal end plates being pressed by the external plates, W, against the soft-metal flanges.

I claim as my invention—

The combination of the casing having the induction and eduction ports with the rotating pistons and the grooves or passages, adapted to receive sand, &c., from the induction-passage and to discharge it into the eduction-passage, thereby preventing the wear of pistons and casing, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 29th day of September, A. D. 1881.

MOSES W. KIDDER.

Witnesses:
H. G. WADLIN,
C. F. BROWN.