(No Model.)

J. MASON.

PUMP.

No. 473,940. Patented May 3, 1892.

Fig. 3.

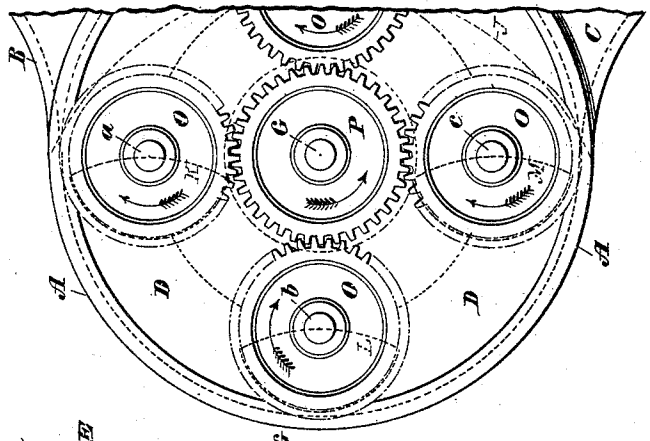


Fig. 2.

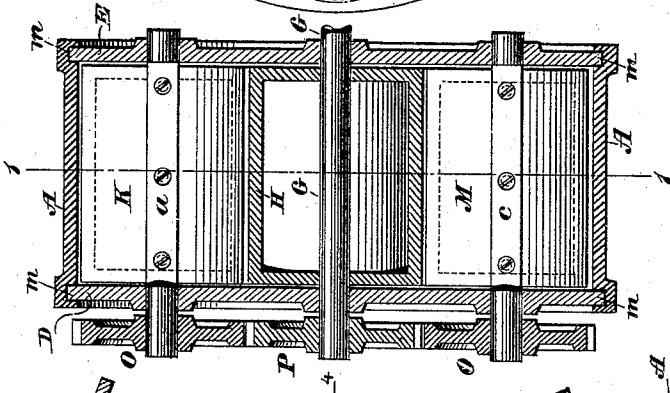


Fig. 4.

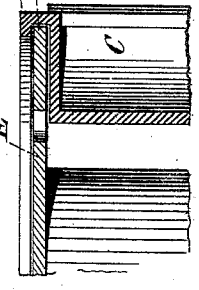
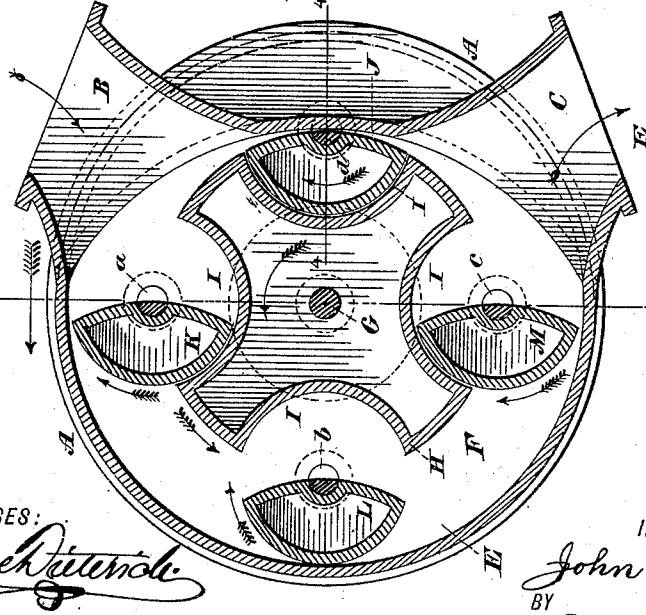


Fig. 1.



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SPECIFICATION forming part of Letters Patent No. 473,940, dated May 3, 1892.

Application filed August 1, 1891. Serial No. 401,382. (No model.)

To all whom it may concern:

Be it known that I, JOHN MASON, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

The invention relates to improvements in rotary pumps; and it consists in the novel features of construction hereinafter described and claimed.

Referring to the accompanying drawings, Figure 1 is a central vertical longitudinal section of a pump constructed in accordance with the invention, said section being on the dotted line 1 1 of Fig. 2, which is a central vertical transverse section of same on the dotted line 2 2 of Fig. 1. Fig. 3 is a side elevation, partly broken away, of the exterior of said pump, being presented particularly for the purpose of illustrating the gearing by which the interior mechanism is actuated; and Fig. 4 is a detached transverse section of a portion of the pump on the dotted line 4 4 of Fig. 1.

In the drawings, A designates the periphery of the pump casing or shell provided or cast with an inlet B and discharge-outlet C of appropriate outline for union with the customary pipe connections. The shell A is closed on opposite sides by the rotary plates D E, and within the casing is formed the chamber F, in which is eccentrically mounted the transverse driving-shaft G, carrying the hub H, which is hollow and has upon its surface the longitudinal semicircular concavities I at equal distances apart and extending from one side of the casing to the other side thereof. The shaft G is concentric with the exterior face-plates D E of the casing A; but at one edge the circle of the casing is departed from, and at said edge the portion lettered J, being on a larger circle, leaves the shaft G and hub H eccentrically mounted with respect to the chamber F, while they are concentric with the face-plates D E of the casing A. Within the chamber F are also mounted the transverse shafts *a b c d*, which are parallel with the driving-shaft G and are arranged in the line of a circle around said shaft. The longitudinal center of the shafts *a b c d* is about on a line with the circle of the hub H, and said shafts carry the blades K L M N, which are preferably of hollow segmental form and engage or bear against the concavities I and the face-plates.

The blades K L M N correspond with each other and are of the size and form of the concavities I in the hub H, and if said blades were fitted into the concavities I they would fill the same and leave said hub with a smooth unbroken periphery. There is no time during the operation of the pump, however, when said blades K L M N are all fitted within the concavities of the hub H; but during such operation one of said blades does enter one of said concavities I which is adjacent to the portion J of the pump-casing.

Within the chamber F the shafts *a b c d* are cut away on one side down to about their center, so that their outer faces will follow the line of the lesser convex side of the blades K L M N, while beyond the sides of the casing A the ends of said shafts are circular in cross-section and pass through the face-plates D E to the gear-wheels O, all the latter engaging the center gear-wheel P, mounted on the driving-shaft G, which is rigid with the face-plates D E, and may be set in motion by the customary power connections at present in use on rotary pumps. The motion from the shaft G is transmitted to the face-plates D E, gear-wheels P O, shafts *a b c d*, and blades K L M N, and hence said parts will have a simultaneous movement with the hub H.

The blades K L M N move with the face-plates D E and hub H; but said blades during this movement are constantly preserved in the upright position shown in Fig. 1, and this is accomplished by the engagement of the gear-wheels O with the gear-wheel P, the effect of said engagement being to permit the complete revolution of the face-plates D E and hub H and the carrying around of the blades K L M N with said face-plates without said blades losing the position with relation to the hub H illustrated in Fig. 1. The driving-shaft G, hub H, gear-wheel P, and face-plates D E are all rigid with each other and revolve together, while the shafts *a b c d* and blades K L M N are carried around by the face-plates D E; but they are not upset at such time, from the fact that the gear-wheels O are also carried by the face-plates D E, but revolve in a direction opposite to that of said

plates. While the face-plates D E make one revolution in one direction the gear-wheels O carried by them make one revolution in the opposite direction, and the result of the two movements in opposite directions is that the blades K L M N are never upset during their line of travel.

In the construction of the pump the shell or casing A will be provided with the annular grooves *m* to receive the edges of the face-plates D E and permit of said plates being rotated, and in the arrangement of the parts of the pump care should be taken that the blades K L M N are set with their lesser convex sides facing in the same direction in order that the greater convex sides of said blades may one after another enter the concavities I of the hub H as the same are brought in succession adjacent to the depressed portion J of the casing A, as shown in Fig. 1, thereby at said portion effectually closing the space between the hub and casing A and preventing a direct passage between the inlet B and outlet C at the right-hand side of the hub H.

In the operation of the pump, motion being imparted to the driving-shaft G, the hub H and blades K L M N will have a simultaneous action in the direction indicated by the arrows in Fig. 1, and the water will be drawn through the inlet B into the chamber F, whence it will pass around the left-hand side of the hub H, Fig. 1, and be discharged through the outlet C. The water is by means of the blades K L M N drawn into the chamber F and moved downward to and through the discharge-outlet C. It is to be observed that the blades K L M N move their greater convex faces into the concavities I, and that the blades are of such dimensions that when the pointed edge of one of them is in the concavity the other pointed edge thereof will extend to the wall of said chamber, which is the position of the blades K M in Fig. 1. The parts of the pump are particularly strong and durable and not liable to become clogged or broken by any foreign matter entering the chamber with the water. I do not confine the invention to the use of any special number of concavities I in the hub H; but the number of blades should correspond with that of said concavities.

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

1. The pump consisting of the casing having the inlet and discharge openings, combined with the hub mounted on the main driving-shaft and having the concavities I, the blades engaging said concavities, and the inner walls of said casing, and mechanism for simultaneously actuating said hub and blades, substantially as and for the purposes set forth.

2. The pump consisting of the casing having the inlet and discharge openings and provided with the revoluble face-plates, combined with the hub having the concavities I, the blades adapted to engage said concavities and move with said hub and plates, and the gear-wheels O P, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 10th day of July, A. D. 1891.

JOHN MASON.

Witnesses:
CHAS. C. GILL,
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