

No. 640,343.

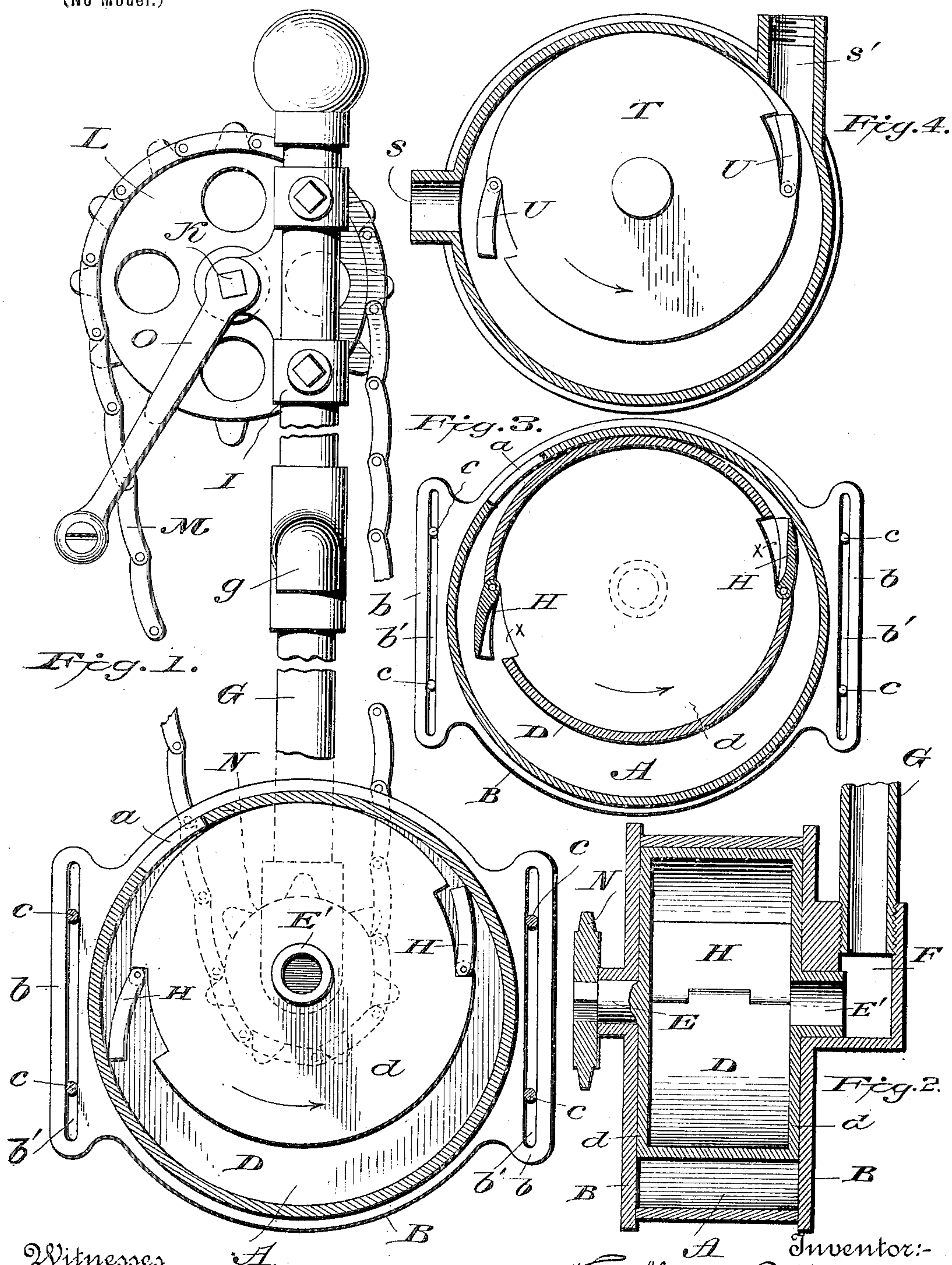
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H. D. B. WILLIAMS.

ROTARY PUMP.

(Application filed Dec. 17, 1898.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

HUBBARD D. B. WILLIAMS, OF MANSFIELD, OHIO.

ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 640,343, dated January 2, 1900.

Application filed December 17, 1898. Serial No. 699,540. (No model.)

To all whom it may concern:

Be it known that I, HUBBARD D. B. WILLIAMS, a citizen of the United States of America, residing at Mansfield, in the county of Richland and State of Ohio, have invented a new and useful Rotary Pump, of which the following is a specification.

This invention is an improvement in pumps, and relates more especially to submerged rotary pumps, the object of the invention being to provide a pump of this general character which shall be positive in its action and simple and cheap in its construction, affording a perfectly smooth operation and producing a continuous flow of water.

The following specification enters into a detail description of my improved rotary pump, to enable others skilled in the art to make and use the same, reference being had to the accompanying drawings and to letters thereon, which designate the different parts, and what I particularly claim as my invention and desire to protect by Letters Patent is more specifically set forth in the appended claims.

In the drawings forming part hereof, Figure 1 is a side elevation of a pump constructed in accordance with my invention, one side of the casing or pump-cylinder being removed to show the rotary piston and valve carried thereby. Fig. 2 is a vertical sectional view through the pump-cylinder and rotary piston mounted therein. Fig. 3 is a transverse sectional view through said pump-cylinder and piston. Fig. 4 is a sectional view illustrating a modification of the invention.

Referring more particularly to said drawings, A designates the pump-cylinder, which is closed at its ends by disks or heads B B, firmly clamped against the cylinder by bolts or threaded rods c, connecting the heads and located on the outer side of the cylinder to leave an unobstructed water-space within the latter. In order to adjust the heads with respect to the cylinder and independently for the purpose hereinafter mentioned, the said heads are provided at opposite sides with projecting flanges b, having slots b', through which the connecting rods or bolts c pass. In one side of the cylinder A is an opening a, through which water passes into the pump-cylinder, it being understood that in use said pump-cylinder is submerged.

Located within the pump-cylinder is a rotary piston D, made up of a circular casing or cylinder having end walls d d to form a hollow cylindrical piston. This piston is of smaller diameter than the pump-cylinder, and its axis is to one side of the center of said pump-cylinder, which so positions the piston therein that it will be in contact with one side of the pump-cylinder and leave a water-space that nearly surrounds the piston. The inlet-opening a in the pump-cylinder is located adjoining the point where the piston abuts against the pump-cylinder or at one of the contracted ends of the water-space just referred to.

The piston is journaled in the heads of the pump-cylinder, and to this end the said piston is provided with stub axles or spindles E and E', which project outward from the center of the end walls d d. Stub-axle E is solid, and where it passes through the head of the pump-cylinder said head is provided with a boss to form an increased bearing, and by way of this stub-axle motion is imparted to the piston through the intervention of the driving mechanism hereinafter described. The other stub-axle E' is hollow and passing through the other head of the pump-cylinder establishes communication between the hollow piston and a casing F, to which the discharge-pipe G is connected. The casing F may be cast integral with the head B, as illustrated in the drawings, or it may be an ordinary elbow-coupling.

The cylinder or ring of the hollow piston is provided with openings x, extending the full width of said ring and forming passages for the water from the pump-cylinder into the piston, and in order to force the water from the pump-cylinder into the piston a swinging valve H is hinged to the ring at one side of each opening therein. This valve has a free movement, so that it will extend across the water-space in the pump-cylinder and practically form a partition that will cause the water therein to flow into the hollow piston, the free end of the valve bearing against the inner side of the outer or pump cylinder. The inner side of the free end of the valve is preferably hollowed out, as shown, to prevent the formation of a shoulder that would be an obstruction to the free movement or flow of the water. The piston

turns in the direction indicated by the arrow, and it will be noted that the valves are closed when brought to the point where the piston contacts with the pump-cylinder and gradually open until they reach the opposite side of said pump-cylinder, again closing as they enter the other contracted portion of the water-space. In other words, the valves form partitions across the water-space in the pump-cylinder and open and close to accommodate themselves to varying size of said water-space. It will also be noted that the inlet-opening a of the pump-cylinder is so located that the water will enter one end of the space which the valves traverse, and the direction of rotation of the piston is such that said space is being filled in the rear of the valve as the latter proceeds, forcing the water in front of the same into the hollow piston and through the hollow stub-axle to the discharge-pipe. If desired, each valve may be provided with a spring to insure its opening outward at the proper time; but a spring is not necessary, as the valve readily opens by centrifugal force.

The piston being journaled in the heads of the pump-cylinder and said heads being independently adjustable with respect to the outer ring or cylinder, the piston can be readily adjusted to bring it into proper contact with said outer ring or cylinder, so there will be no leakage past this point. Any wear on the periphery of the piston can be quickly and effectively taken up by this adjustment. The discharge-pipe G is provided with a spout g and is extended above the spout to form a support for the operating mechanism of the pump. Any operating mechanism may be employed that will impart a rotary motion to the piston, though that shown and hereinafter described is found preferable, being what is known as "the sprocket chain and wheel gearing." To apply this driving mechanism, a bracket I is clamped upon the upper part of the discharge-pipe G and presents a bearing for a horizontal shaft K , to one end of which is keyed a large sprocket-wheel L , connected by chain M to a small sprocket-wheel N on the outer end of the stub-axle E of the rotary piston. The shaft K is turned by a crank-handle O .

The operation of the preferred form of construction will be apparent from the foregoing description when taken in connection with the drawings, for the rapid rotation of the hollow cylindrical piston, with its valves, will cause the water to be taken from the pump-cylinder and forced into the piston and out through the discharge-pipe in a continuous flow, the water-space in the pump-cylinder filling through the opening a .

In the modification of the invention shown in Fig. 4 of the drawings the pump-cylinder is provided with an inlet-opening s at one end of the water-space in which the valve travels and with an outlet-opening s' at the other end of said water-space. In this arrangement the

water is forced directly out of the pump-cylinder instead of by way of the hollow piston. Therefore in the modification the piston (designated by the letter T) may be solid and cut away at each side to receive the valves U . This construction, however, forms a contracted opening to the discharge-pipe, while the hollow piston presents an opening which varies to correspond with the size of the water-space.

A rotary pump constructed in accordance with my invention will operate smoothly and positively, the valves acting in a positive manner to force the water into the discharge-pipe.

It will be understood that instead of having two valves located at opposite sides of the piston but a single valve could be employed. It is obvious, however, that much better results are attained with two valves, as shown and described.

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

1. A submerged rotary pump, comprising a cylinder consisting of heads and interposed ring, rods clamping the heads upon the ring and passed through slots in said heads, the ring being adjustable with respect to the heads; a casing or water-chamber formed on one of the heads and providing a bearing, an opposite bearing in the other head, and a discharge-pipe connected to said casing or water-chamber; together with a hollow piston mounted eccentrically in the cylinder, said piston having a solid axle and a hollow axle, the latter entering the aforesaid chamber, and swinging valves on the periphery of the piston; the piston having openings under the valve and the cylinder an inlet-opening in its ring; and means for turning the piston, the parts being constructed and arranged as herein shown and described.

2. A submerged rotary pump, comprising a cylinder, a hollow cylindrical piston mounted therein with its axis to one side of the center of the cylinder and provided with an opening in its periphery, stub-axles on the piston extending through the heads of the cylinder, one of the stub-axles being hollow, a discharge-pipe communicating with the hollow stub-axle, and a valve hinged to the piston at one side of the opening therein, the cylinder having an opening at one end of the water-space beyond the piston; together with a sprocket-wheel on the solid stub-axle, a larger sprocket-wheel mounted on a shaft supported at the upper part of the pump, a chain connecting the sprocket-wheels, and means for turning the shaft, substantially as shown and for the purpose set forth.

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

HUBBARD D. B. WILLIAMS.

Witnesses:

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