

No. 665,590.

Patented Jan. 8, 1901.

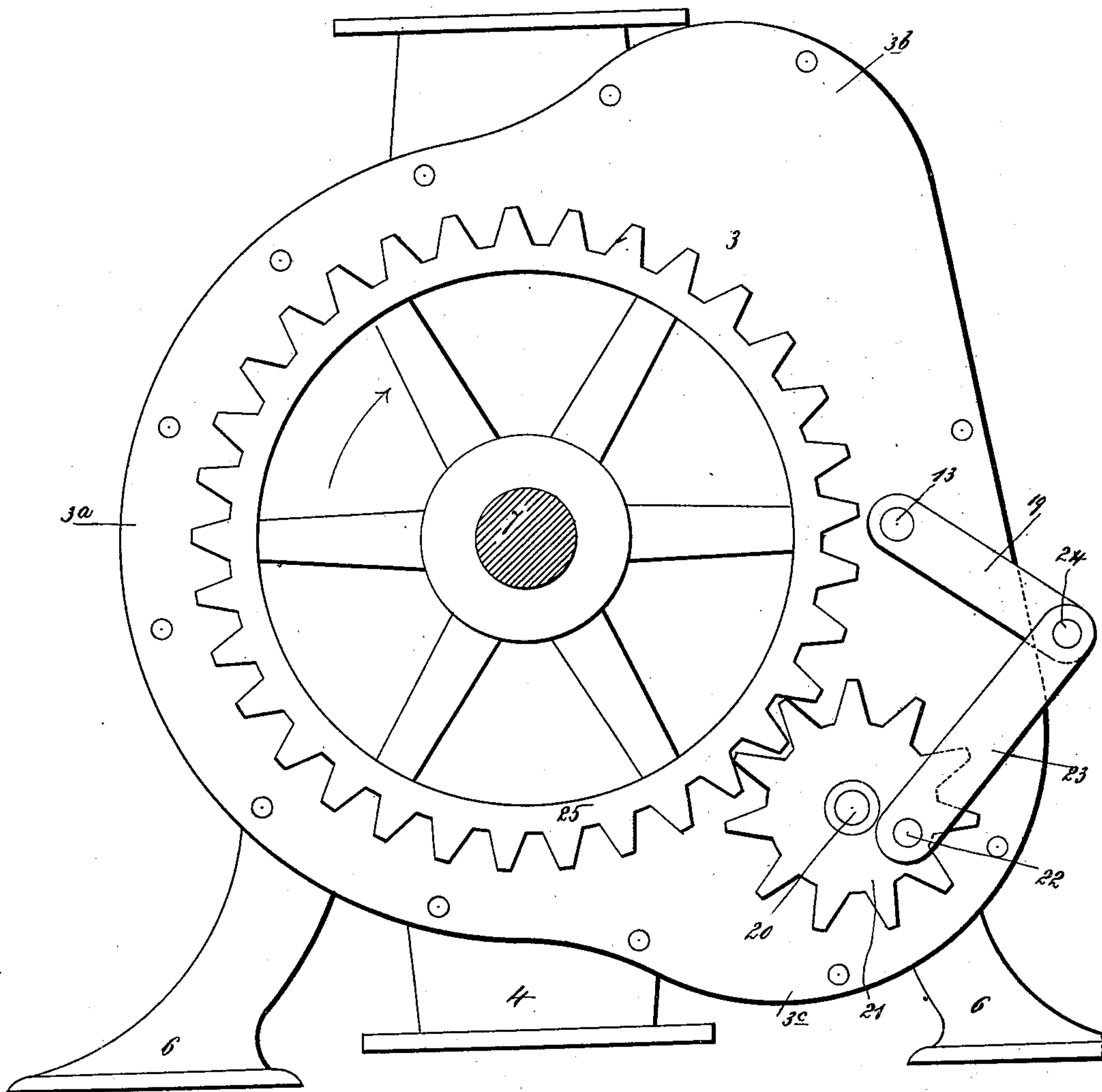
A. O. WYMAN.
ROTARY PUMP.

(Application filed Jan. 18, 1900.)

3 Sheets—Sheet 1.

(No Model.)

Fig. 1.



WITNESSES

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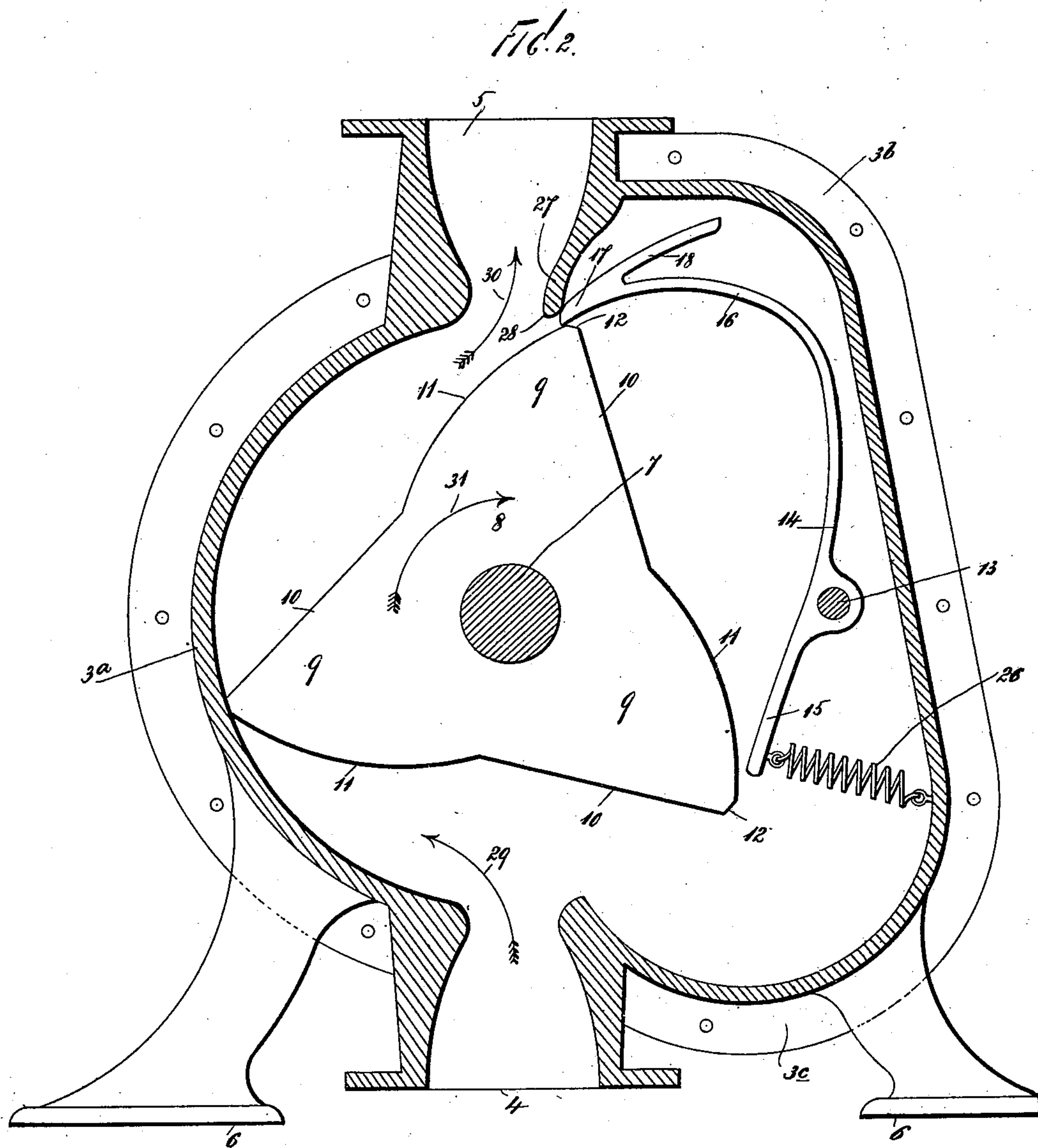
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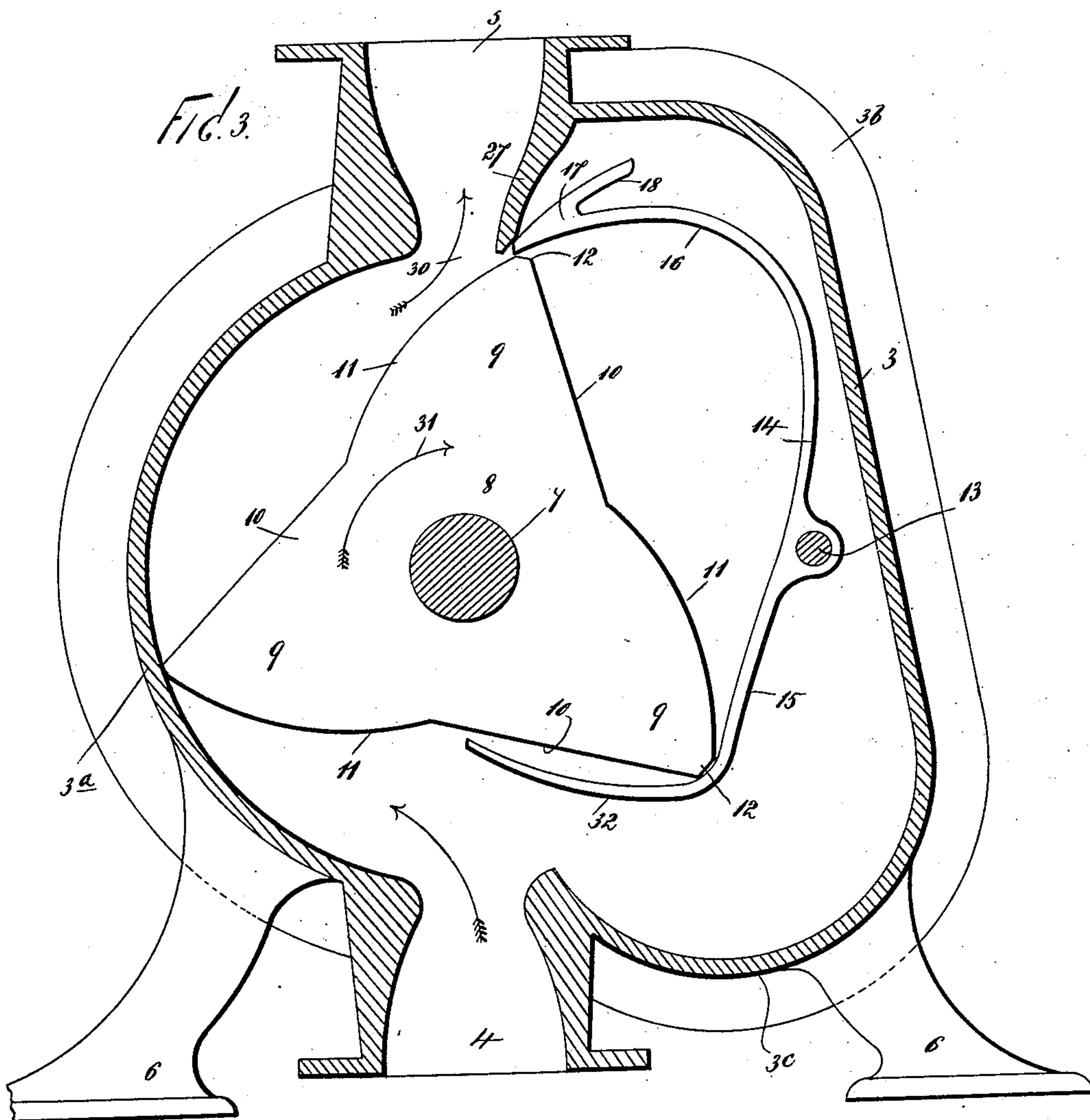
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UNITED STATES PATENT OFFICE.

ALBERT OREN WYMAN, OF TURNER'S FALLS, MASSACHUSETTS.

ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 665,590, dated January 8, 1901.

Application filed January 18, 1900. Serial No. 1,844. (No model.)

To all whom it may concern:

Be it known that I, ALBERT OREN WYMAN, a citizen of the United States, residing at Turner's Falls, in the county of Franklin and State of Massachusetts, have invented certain new and useful Improvements in Rotary Pumps, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to rotary pumps; and the object thereof is to provide a pump of this class whereby heavy stock may be raised, and which is therefore adapted for pumping paper-stock, water, sand, mud, gravel, and mixtures of the same.

The particular object of my invention is to provide a rotary-pump element whereby return flow of the stock in the pump-casing is obviated.

With the above and other objects in view, my invention consists in the construction and arrangement of parts hereinafter specified.

In the accompanying drawings, forming part of this specification, in which like reference characters denote corresponding parts in the several views, Figure 1 is a side elevation of a rotary pump constructed according to my invention. Fig. 2 is a sectional side elevation thereof; and Fig. 3, a view similar to Fig. 2, showing a modified form of construction.

In the practice of my invention I provide a pump-casing 3, provided with an ingress-port 4 in the bottom thereof and an egress-port 5 at the top thereof and having suitable supports 6. The casing 3 is preferably segmental at one side, as at 3^a, and is provided at the opposite side and at the top and bottom, respectively, with lobes 3^b and 3^c, of predetermined contour. A drive-shaft 7 passes transversely through the casing 3 and is provided within said casing with a pump-wheel 8, provided with three pistons 9, provided with convergent sides, respectively, 10 and 11, of which the sides 10 are preferably plain and the sides 11 curved, as shown in Fig. 2 of the drawings. The interior contour of the side 3^a of the casing 3 and the radial dimension of each of the pistons 9 are such that upon rotation of the shaft 7 the outer end portions 12 of said pistons are but slightly

spaced from said side 3^a in the phase of their revolution adjacent said side; and said outer ends 12 are preferably cut off or shouldered, as clearly shown in Fig. 2. The ends 12 pass in their rotation a considerable distance from the walls of the lobes 3^b and 3^c of the casing 3 and the part of said casing which connects said lobes, and intermediate of said lobes a valve-shaft 13 is passed through the casing 3 and provided with a cut-off valve, (denoted by the general index character 14,) which is fixed thereto and the lower end 15 of which extends downwardly into the lobe 3^c of the casing 3 and is preferably straight in form. The upper end 16 of the cut-off valve 14 is curved laterally, as shown in Fig 2, and provided with a bluntly-pointed head 17, from which projects a laterally-directed horn 18, which diverges at a slight angle from the curved portion 16 of the valve 14. This horn is in form the segment of a circle, with the center of the valve-shaft 13 as a radius center.

The valve-shaft 13 is provided exteriorly of the casing 3 with a fixed crank 19, and journaled upon a stub-shaft 20, fixed exteriorly of the casing 3, is a pinion 21, connected eccentrically with which by a crank-pin 22 is a connecting-rod 23, one end of which is operatively connected at 24 with the outer end of the crank 19. The drive-shaft 7 is provided exteriorly of the casing 3 with a gear-wheel 25, which meshes with the pinion 21, and the drive-shaft 7 receives its motion from any desired power-transmission element. A coiled spring 26 is connected at one end with the casing 3, within the lobe 3^c thereof, and at the other end with the end portion 15 of the valve 14, as shown in Fig. 2, and the portion of the casing 3 in which is formed the egress-port 5 is provided at one side with a depending flange 27, the lower extremity of which 28 is formed to fit the upper surface of the horn 18, and the head 17 operates in connection with said lower curved end 28 as does also the horn 18 of said head 17. As the drive-shaft 7 is rotated the pump-wheel 8 and pistons 9 are also rotated, and the stock passing into the casing 3 at the ingress-port 4 is raised by the pistons 9 through a path in the direction denoted by the arrows 29 and 30 in Fig. 2. The direction of rotation of the pump-wheel 8 is denoted by the arrow 31, connected

therewith in Fig. 2, and the sides 10 of the pistons 9 are the operative or lifting surfaces of said pistons. The head 17 operates upon rotation of the pump-wheel 8 in connection with the curved sides 10 and 11 of the pistons 9, the valve 14 being oscillated by the sides 10 and 11 of the pistons 9 as well as by the interoperation of the gear-wheel 25 and pinion 21 and the transmission of power therefrom to the shaft 13 by the crank 19 and connecting-rod 23. The spring 26 serves to impart a delicacy or responsiveness of motion to the valve 14, causing the head 17 of the said valve to at all times follow closely the contour of the sides 10 and 11 of the pistons 9, and the upper surfaces of the head 17 and the horn 18 operate in connection with the curved lower portion of the flange 27, thus continuously closing the space existent between the pistons 9 as they are successively brought into registration with said flange 27 and said flange, which space constantly varies, as will be clearly seen.

By means of the construction and arrangement of parts above described the return passage of the stock lifted by the piston 9 and discharged through the egress-port 5 into the lobes 3^b and 3^c of the casing 3 or "behind" the pump-wheel 8 is entirely prevented and said lobes of the casing remain free and open and the ingress-port 4 also remains unblocked and unclogged, which is not customarily the case where the passage of stock into the casing behind the pump-wheel is not prevented. The head 17, horn 18, and curved portion 16 of the valve 14, due to their relative arrangement and construction and due to their actuation by means of the surfaces of the pistons and by the gear 25, pinion 21, and connection 13 thereof with the valve-shaft 13, advance and retire into the space between the successively-presented pistons and the flange 27, according to the dimensions of said space, as will be clearly seen from the drawings, and as the said head 17 of the valve 14 passes down or in engagement with the curved sides 11 of the pistons 9 it remains in close engagement therewith and does not serve to retard the upward passage of the stock into and from the egress-port 5, and the extremity of the horn 18 is never passed beyond the flange 27, so as to interfere with the said upward passage of the stock.

By means of the construction and the relative arrangement of parts above described it will be seen that I provide a pump-casing and a pump-wheel operatively mounted therein and means whereby one side of the pump-casing is at all times maintained open and free from any portion of the upwardly-carried stock, which is consequently forced through the egress-port, and the height to which this may be carried is only limited by the strength of the pump and the power applied.

In Fig. 3 is shown a modified form of construction in which the pump-casing 3, the pump-wheel 8, and the valve 14 are all ar-

ranged and constructed as in the previous views, with the exception of the valve 14, the end portion 15 of which is extended to form an inwardly-curved finger 32, which operates in connection with the end portions 12 of the pistons 9 to actuate the valve 14 in combination with the head 17 of said valve, which operates in connection with the sides 10 and 11 of said pistons. In this form of construction the spring 26 is omitted as well as the pinion 21, arm 19, and connecting-rod 23, (shown in Fig. 1,) and the valve 14 is automatically operated by the head 12 and the finger 32, which operates as described.

I do not limit myself to the specific construction and arrangement of parts as herein described, but reserve the right to vary the same within the scope of my invention.

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

1. A pump of the class described, comprising a casing provided at the bottom with an ingress-port and at the top with an egress-port, a pump-wheel operatively mounted therein and provided with radially-directed pistons, each of which is formed with a curved and a plane side, which sides respectively converge outwardly, a cut-off valve pivotally mounted in said casing and provided with a curved end terminating in a curved head, which end and head operate in connection with the sides of said pistons, and in connection with a depending flange formed on said casing at one side of said egress-port, said head of said cut-off valve being also provided with a laterally-directed horn which also operates in connection with said depending flange, said pump-wheel being provided with a drive-shaft, and said cut-off valve being mounted upon a shaft, which shafts are operatively connected exteriorly of said casing, substantially as shown and described.

2. A pump of the class described, comprising a casing provided at the bottom with an ingress-port, and at the top with an egress-port, a pump-wheel operatively mounted therein and provided with radially-directed pistons, each of which is formed with a curved and a plane side, a cut-off valve pivotally mounted in said casing and provided with a curved end terminating in a curved head, which end and head operate in connection with the sides of said piston, and in connection with a depending flange formed on said casing at one side of said egress-port, said head of said cut-off valve being also provided with a laterally-directed horn which also operates in connection with said depending flange, said cut-off valve being provided with another end portion carrying a curved finger which operates in connection with the plane sides of said pistons, and means for operating said pump-wheel, whereby said valve will be operated by said curved and plane sides of said pistons, substantially as shown and described.

3. A pump of the class described, compris-

ing a casing provided with an ingress-port and
with an egress-port, a pump-wheel operatively
mounted therein and provided with radially-
directed pistons, each of which is formed with
5 a curved and with a plane side, a cut-off valve
pivotally mounted in said casing and pro-
vided with a curved end which operates in
connection with the sides of said piston and
in connection with said casing, said cut-off
10 valve being provided with another end por-
tion carrying a curved finger which operates
in connection with the plane sides of said

pistons, and means for operating said pump-
wheel, whereby said valve will be operated
by said curved and plane sides of said piston, 15
substantially as shown and described.

In testimony that I claim the foregoing as
my invention I have signed my name, in pres-
ence of the subscribing witnesses, this 10th
day of January, A. D. 1900.

ALBERT OREN WYMAN.

Witnesses:

JAS. A. GUNN,

ARTHUR E. WYMAN.