(No Model.)

2 Sheets—Sheet 1.

# H. SAXTON.

## ROTARY ENGINE.

No. 549,615. Patented Nov. 12, 1895.

Fig. 1.

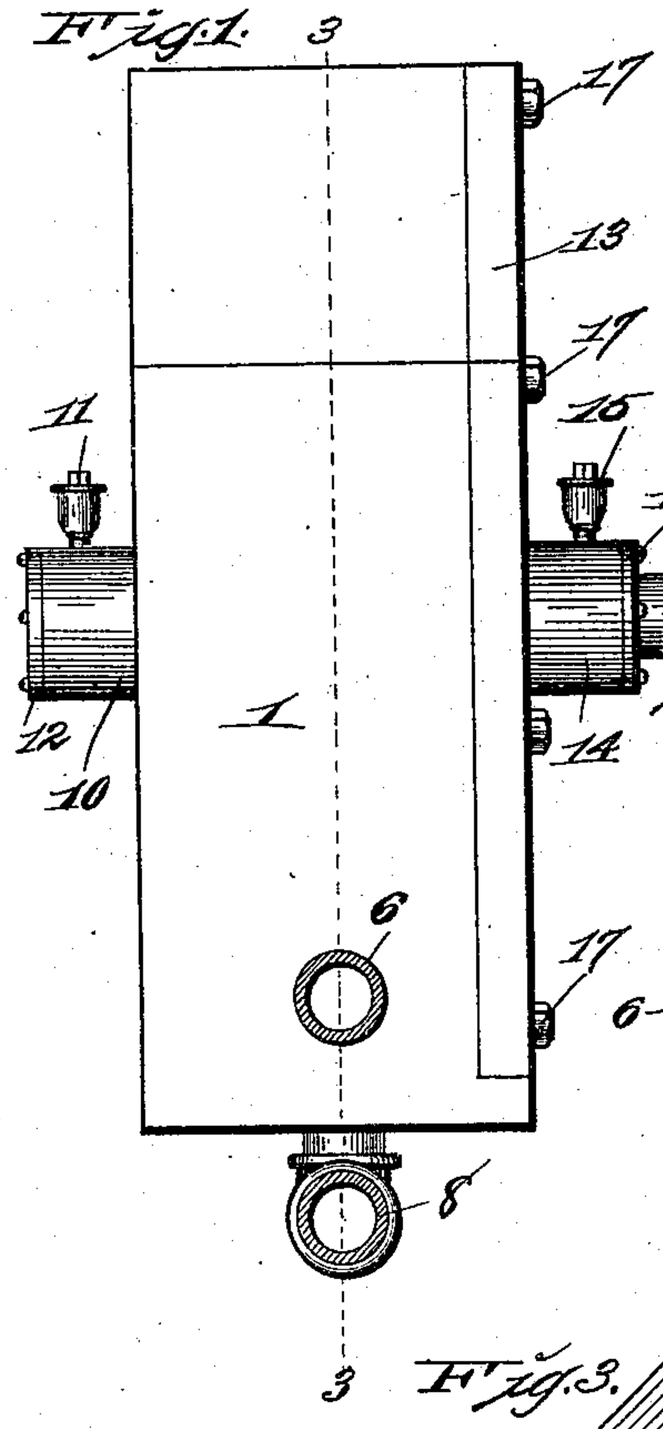



Fig. 2.

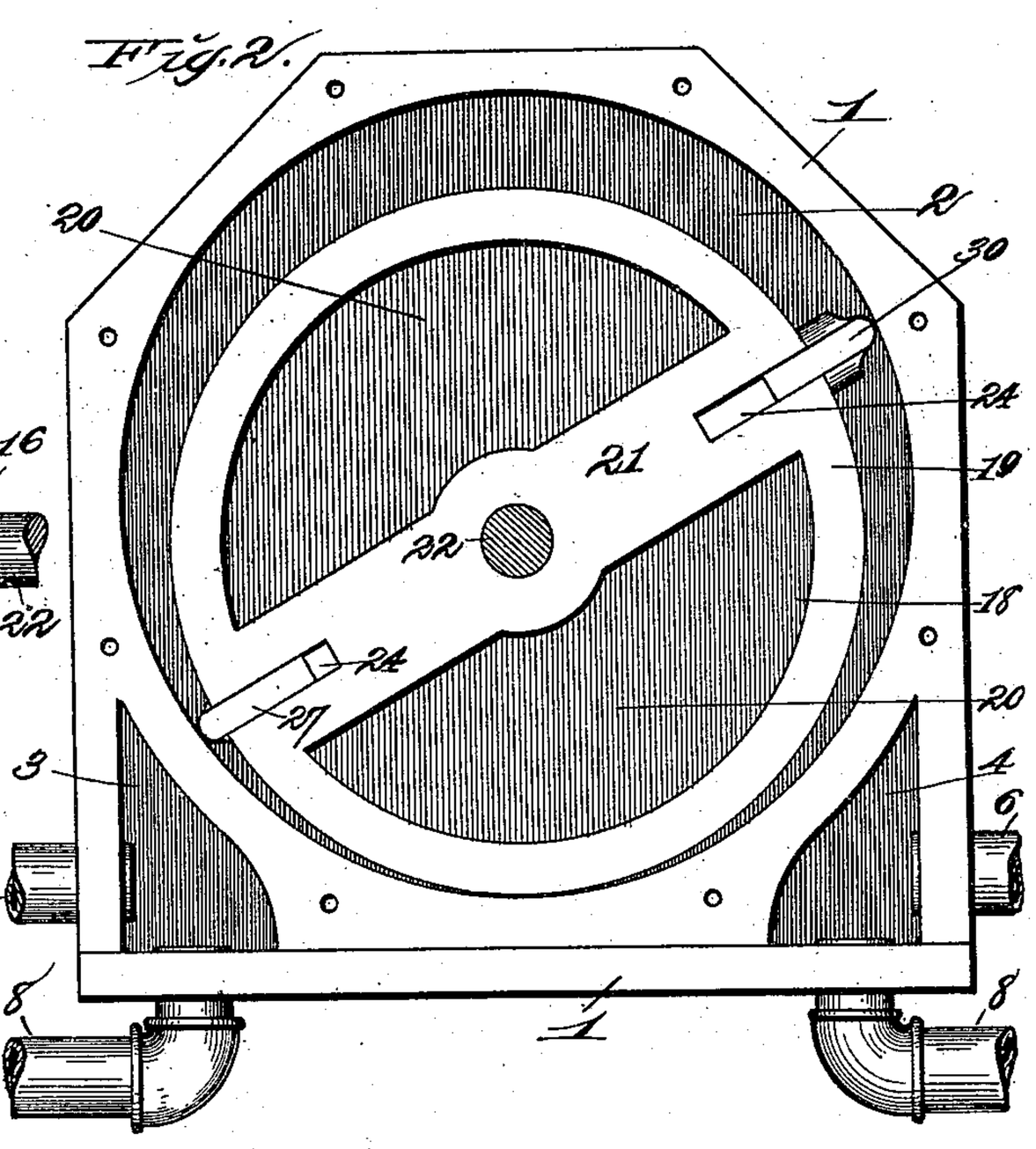
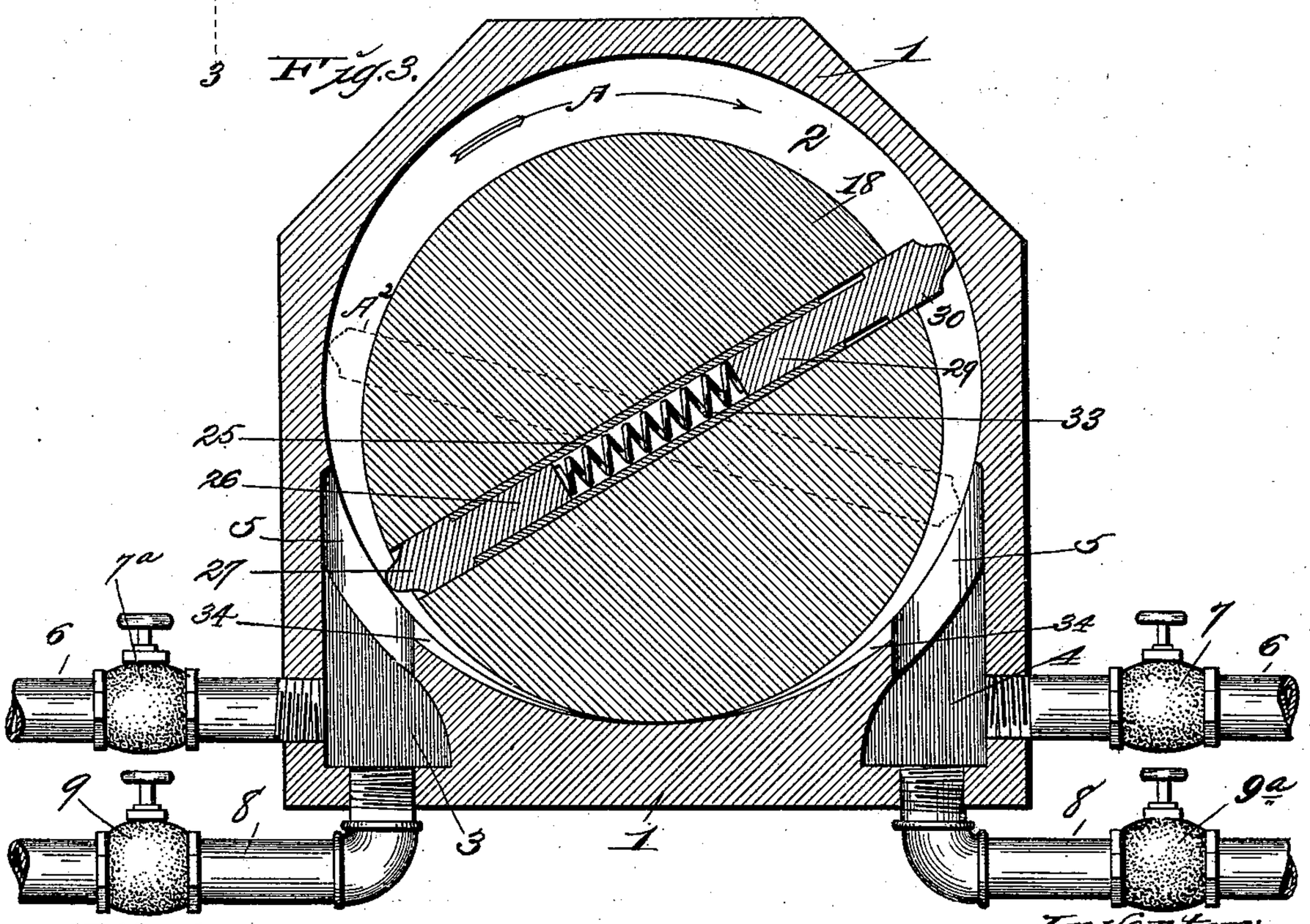



Fig. 3.




Attest

M. P. Smith

A. A. Blankenmeister.

Inventor:-

Henry Saxton.

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(No Model.) 2 Sheets—Sheet 2.

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## ROTARY ENGINE.

No. 549,615. Patented Nov. 12, 1895.

Fig. 4.

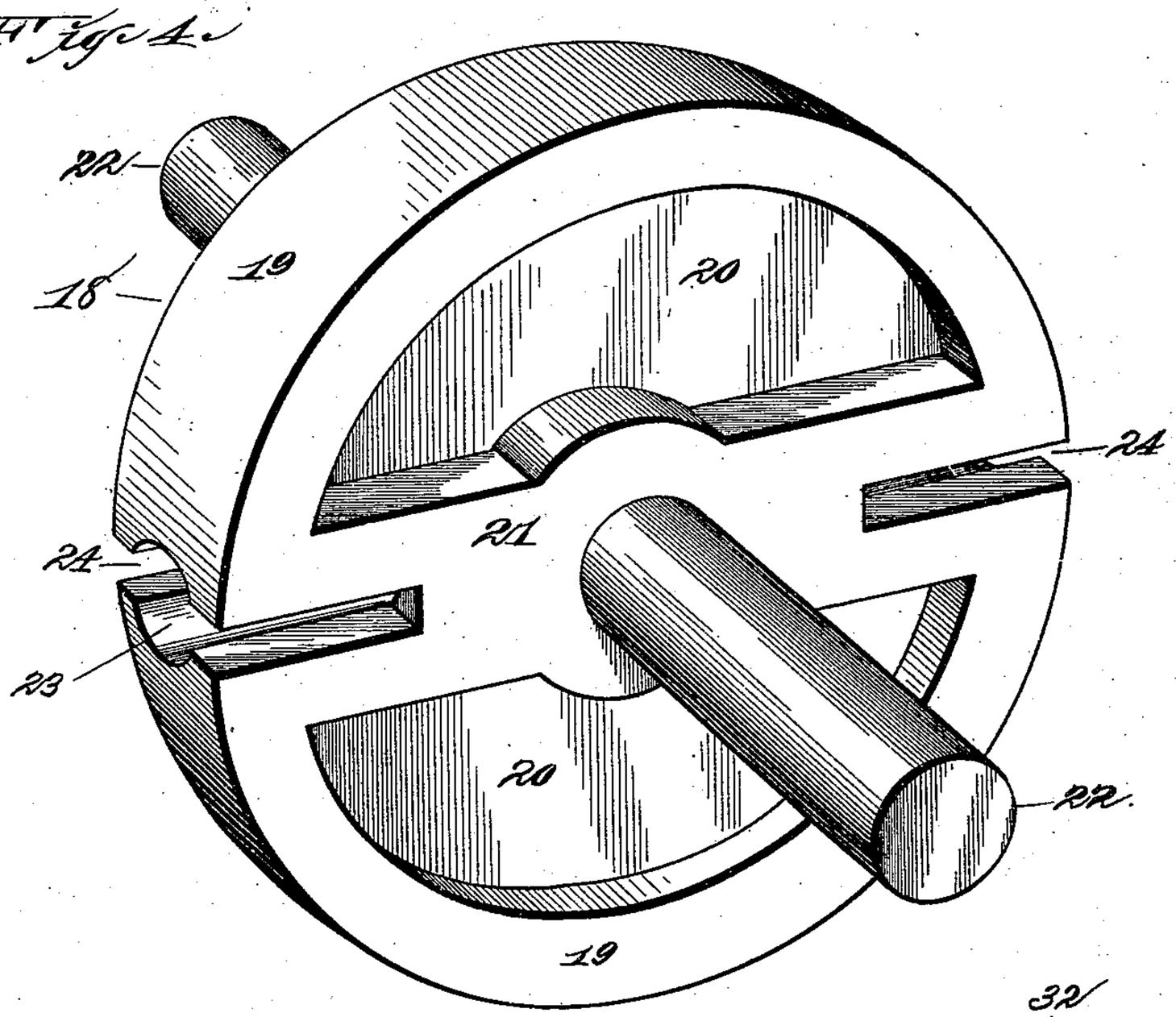
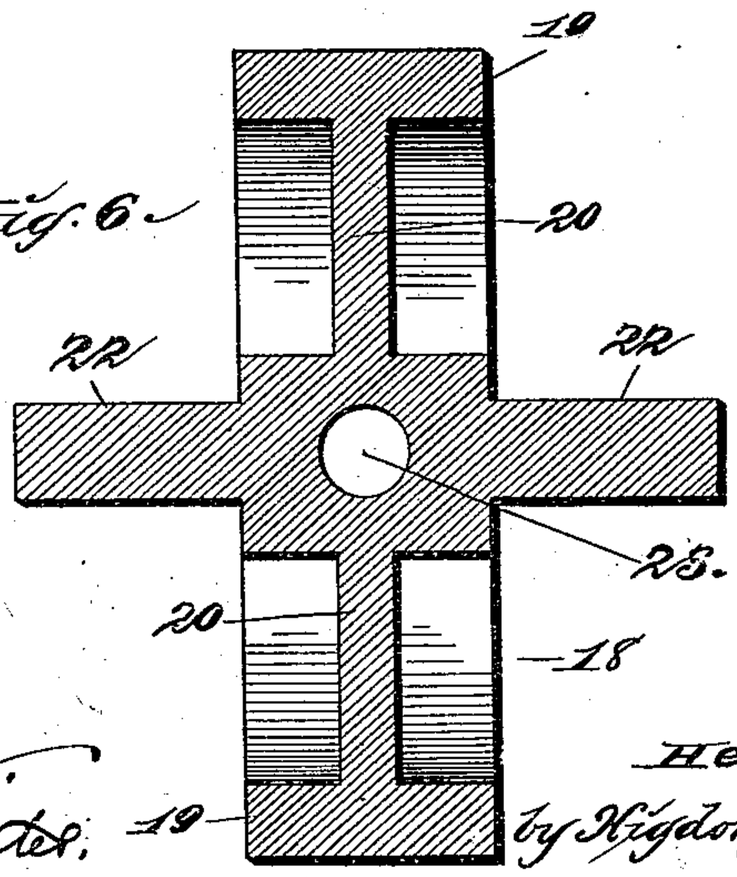



Fig. 5.




Fig. 6.




Attest:
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Inventor:
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# UNITED STATES PATENT OFFICE.

HENRY SAXTON, OF NEOSHO, MISSOURI.

## ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 549,615, dated November 12, 1895.

Application filed December 3, 1894. Serial No. 530,668. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY SAXTON, of the city of Neosho, Newton county, and State of Missouri, have invented certain new and useful Improvements in Rotary Engines or Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to an improved rotary engine or pump of that class in which a piston is eccentrically mounted for rotation upon the axis within the casing or cylinder, said piston carrying a plurality of sliding piston-plates.

The object of my invention is to construct a rotary engine or pump of this class that will be compact in form, simple in construction, and extremely efficient in operation.

A further object of my invention is to entirely dispense with the use of valves in the engine or pump, and to so construct the same as that it may be expeditiously reversed.

I attain these objects by certain novel features of construction hereinafter described and illustrated.

Figure 1 is a side elevation of a complete engine or pump constructed in accordance with my invention. Fig. 2 is a front elevation of the engine or pump, the front plate thereof being removed to more clearly illustrate the interior parts of said engine or pump. Fig. 3 is a vertical sectional view on the indicated line 3 3 of Fig. 1. Fig. 4 is a view in perspective of the rotating piston, the piston-plates carried thereby being removed. Fig. 5 is a perspective view of the piston-plates and the connection between same. Fig. 6 is a vertical cross-sectional view of the rotating piston.

Referring by numerals to the accompanying drawings, 1 indicates the cylinder or casing of my improved engine or pump, the same being approximately rectangular in form and provided with a rotating piston-chamber 2 and chambers 3 and 4, said chambers being located at the lower opposite corners of said casing 1. Vertically arranged and passing through the wall of the casing between the chambers 3 and 4 and the rotating piston-chamber 2 are ports 5. Leading from the sides of the chambers 3 and and 4 are exhaust-pipes 6, the same being provided with ordinary cut-off valves 7.

Leading from the bottom of the chambers 3 and 4 are inlet-pipes 8, the same being provided with ordinary cut-off valves 9. Formed integral with the rear face of the casing 1, and located eccentrically thereon relative to the rotating piston-chamber 2, is a bearing 10, the same being provided with an ordinary oil-cup 11 and stuffing-box 12. Adapted to be positioned directly upon the front of the casing 1 and to close the rotating piston 2 is a face-plate 13, the same being provided with a bearing 14 that is in direct alignment with the bearing 12, formed integral with the rear side of the casing 1. This bearing 14 is provided with an ordinary oil-cup 15 and stuffing-box 16. The face-plate 13 is positioned upon the casing 1 by means of screw-bolts 17.

Positioned within the chamber 2 is a rotating piston 18, the same consisting of an annular ring 19, that is connected by integral webs 20 to a diametrically-arranged bearing portion 21, from each side of which axial trunnions 22 extend and pass through the bearings 10 and 14. Thus will be seen how the rotating piston 18 is eccentrically located within the rotating piston-chamber 2. The periphery of the ring 19 contacts with the inner face of the rotating piston-chamber at a point on said face in direct vertical alignment below the axial trunnions 22. The side faces of the ring 19 bear directly upon the face of the side wall of the casing 1 and the inner face of the face-plate 13.

Passing longitudinally through the bearing portion 21 is a circular bore or passage 23, the ends of which communicate with rectangular slots or bearings 24 that are formed parallel with and in the ends of the bearing portion 21.

Mounted for oscillation in the longitudinal bore or passage 23 is a tube 25. Rigidly mounted in one end of said tube 25 is a cylindrical pin 26, that projects from the rear end of a piston-plate 27, that is mounted to slide in one of the rectangular slots or bearings 24. The outer edge of this piston-plate 27 is rounded, as indicated by 28, said edge bearing directly upon the inner face of the rotating piston-chamber 2. Loosely mounted in the other end of the tube 25, by means of a

cylindrical pin 29, is a piston-plate 30, which is a counterpart of the piston-plate 27, it being provided with the rounded forward edge 31.

Semicircular raised portions 32 are formed integral with each side of the piston-plates 27 and 30 and thus form a bearing of the same diameter as is the tube 25, in order to engage in the longitudinal bore or passage 23 through the rotating piston 18.

An expansive coil-spring 33 is interposed between the ends of the pins 26 and 29 of the piston-plates and within the tube 25, the pin 26 of the piston-plate 27 being rigidly fixed in the end of the tube 25. The tendency of said spring is to force the piston-plate 30 outwardly and cause the rounded edge 31 thereof to engage with the inner face of the rotating piston-chamber 2. Grooves 34 are formed in the inner face of the rotating piston-chamber 2 and extend in opposite directions from the point where the periphery of the rotating piston 18 engages with the inner face of the rotating piston-chamber 2 to the chambers 3 and 4. The purpose of these grooves 34 will be presently shown.

Belt and fly-wheels (not shown) may be located as desired upon the trunnions or shafts 22 that extend outside the bearings 10 and 14.

In the following operation we will assume that the device is being used as a steam-engine: Assuming that it is desired to cause the piston to rotate in the direction of the arrow A in Fig. 3, the exhaust-valve $7^a$ on one side of the engine and the inlet-valve $9^a$ on the other side of the engine are closed and the inlet-valve 9 and the exhaust-valve 7 opened. The steam-inlet pipe being connected to a suitable steam-supply will discharge live steam into the chamber 3. From this point the live steam will pass through the vertically-arranged port 5, leading from said chamber 3 into the rotating piston-chamber 2. Said live steam will engage against the piston-plates 27 and 30 and drive the same, together with the piston 18, in the direction of the arrow A, Fig. 3. When the piston-plates have in the rotation of the piston 18, reached a point indicated by dotted lines $A^2$ in Fig. 3, the entire flow or supply of live steam will be directed into that part of the chamber in the rear of the piston-plate 27. The piston-plate 30 now having passed the point where the vertical port 5 of the chamber 4 communicates with the chamber 2, the steam that was in the rear of the plate 30 and in front of the plate 27 will commence to exhaust through the vertically-arranged port 5, chamber 4, and exhaust-pipe 6. Thus will be seen how a continuous flow of live steam is had through the chamber 2 to engage the piston-plates and rotate the piston. The coil-spring 33 will at all times exert sufficient power to cause the rounded edges 28 and 31 of the piston-plates 27 and 30 to engage the inner face of the chamber 2, thus causing said plates to be self-packing and prevent any blowing through of the steam. The edges of said plates 27 and 30 being rounded, the friction from said plates will be reduced to a minimum. By providing the grooves 34, that are located in the face and extend from the chambers 3 and 4 to the point on the inner face of the chamber 2, where the piston 18 engages with said inner face, no dead air or steam space will be formed to result in a back-pressure against either of the piston-plates 30 or 27, as any steam that may be in the spaces between the piston 18, inner face of the chamber 2, and either one of the piston-plates 27 or 30 will readily find an outlet through whichever of the ports 5 that is being used as an exhaust-port.

If the device is to be used as a pump, when the piston 18 is rotated by a belt passing around a belt-wheel located upon the shaft 22 water or other liquid will pass through the device in a manner identical with the passage of steam hereinbefore described.

Should it be desired to reverse the movement of the piston 18, the valve 9 in the inlet-pipe 8 and the valve 7 in the exhaust-pipe 6 are closed and the valve $9^a$ in the inlet-pipe 8 and the valve $7^a$ in the exhaust-pipe 6 are opened. The steam or water supply now being connected to the pipe 8 a movement of the piston 18 would be in a reverse direction to that previously described.

Thus will be seen how I have constructed a rotary pump or engine that possesses superior advantages in point of simplicity, durability, and general efficiency.

What I claim is—

In a rotary engine or pump, the combination of a suitable casing, a piston 18 mounted for rotation in said casing and provided with a diametrically-extending circular bore or passage 23, a single tube 25 mounted to slide in said passage, two piston plates 27, 30, each having a cylindrical stem and mounted one stem to slide within one end of said tube and the other stem to slide within the opposite end of said tube, and an expansive spring 33 located within and centrally of the length of said tube, whereby said stems are urged apart and said tube is held in position, substantially as herein specified.

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

HENRY SAXTON.

Witnesses:
T. J. CARTER,
J. V. FLEMING.