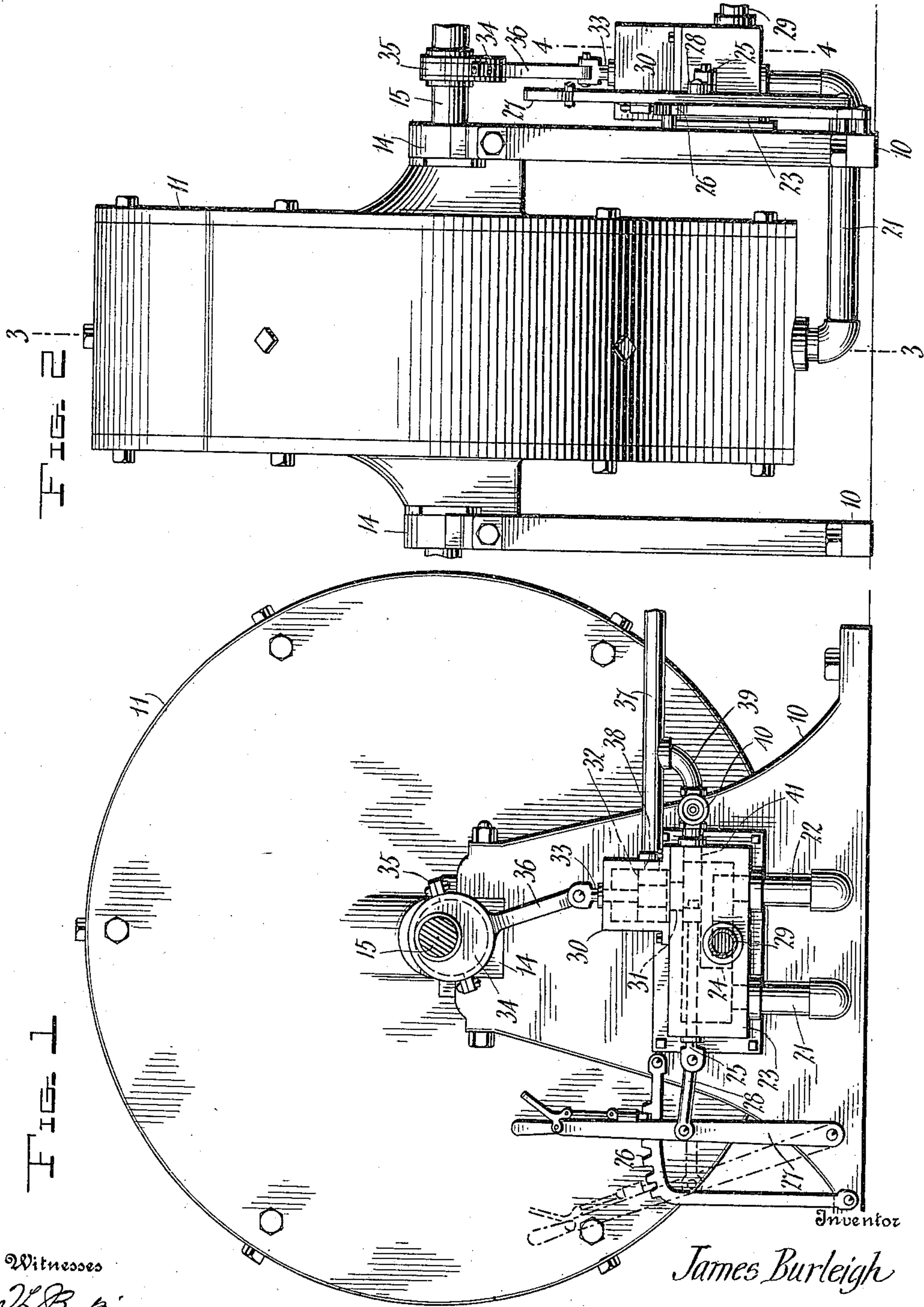


963,207.

J. BURLEIGH.
ROTARY ENGINE.
APPLICATION FILED DEC. 19, 1908.

Patented July 5, 1910.

3 SHEETS—SHEET 1.



Witnesses

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3 SHEETS—SHEET 2.

FIG. 4

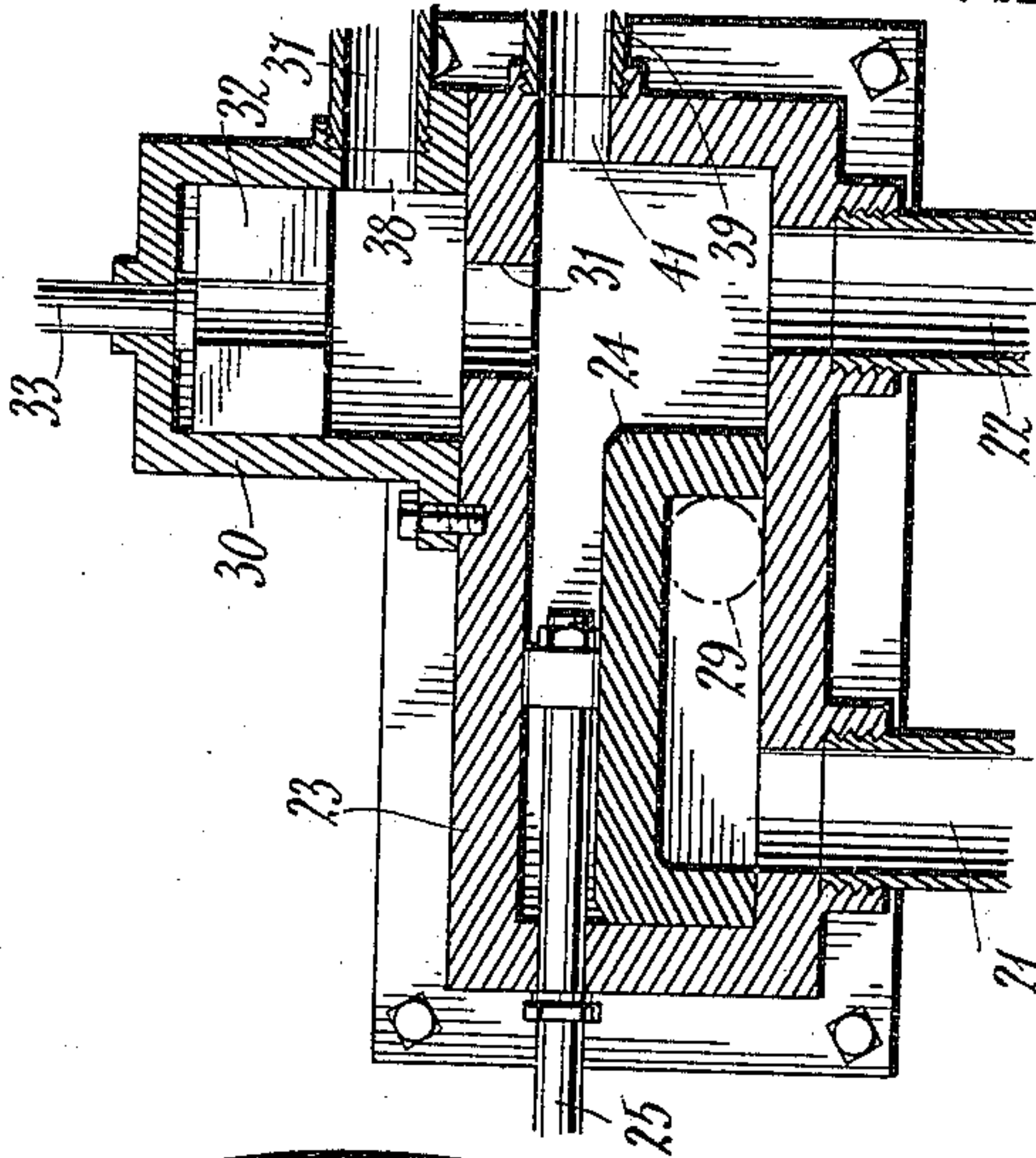
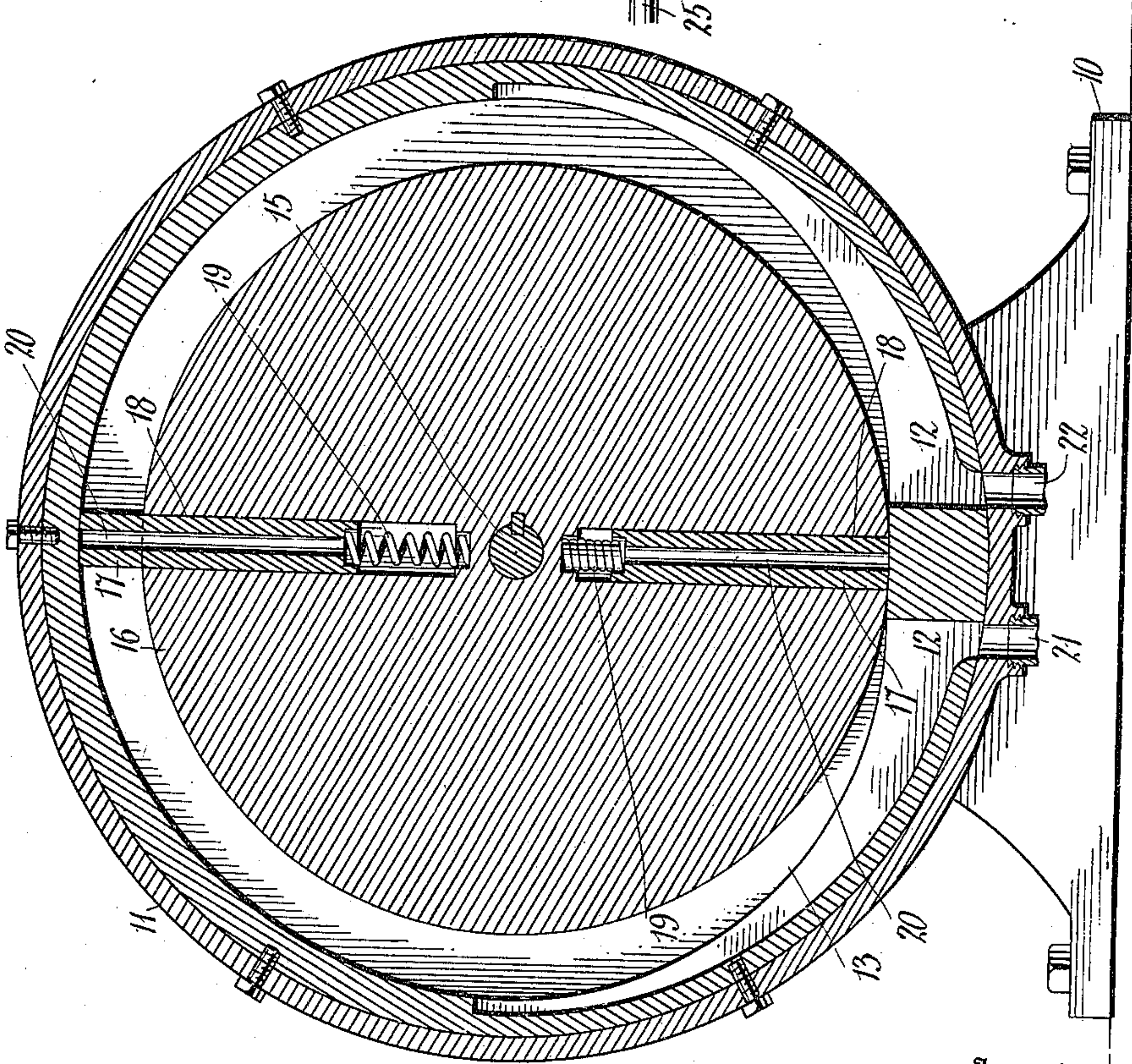


FIG. 3



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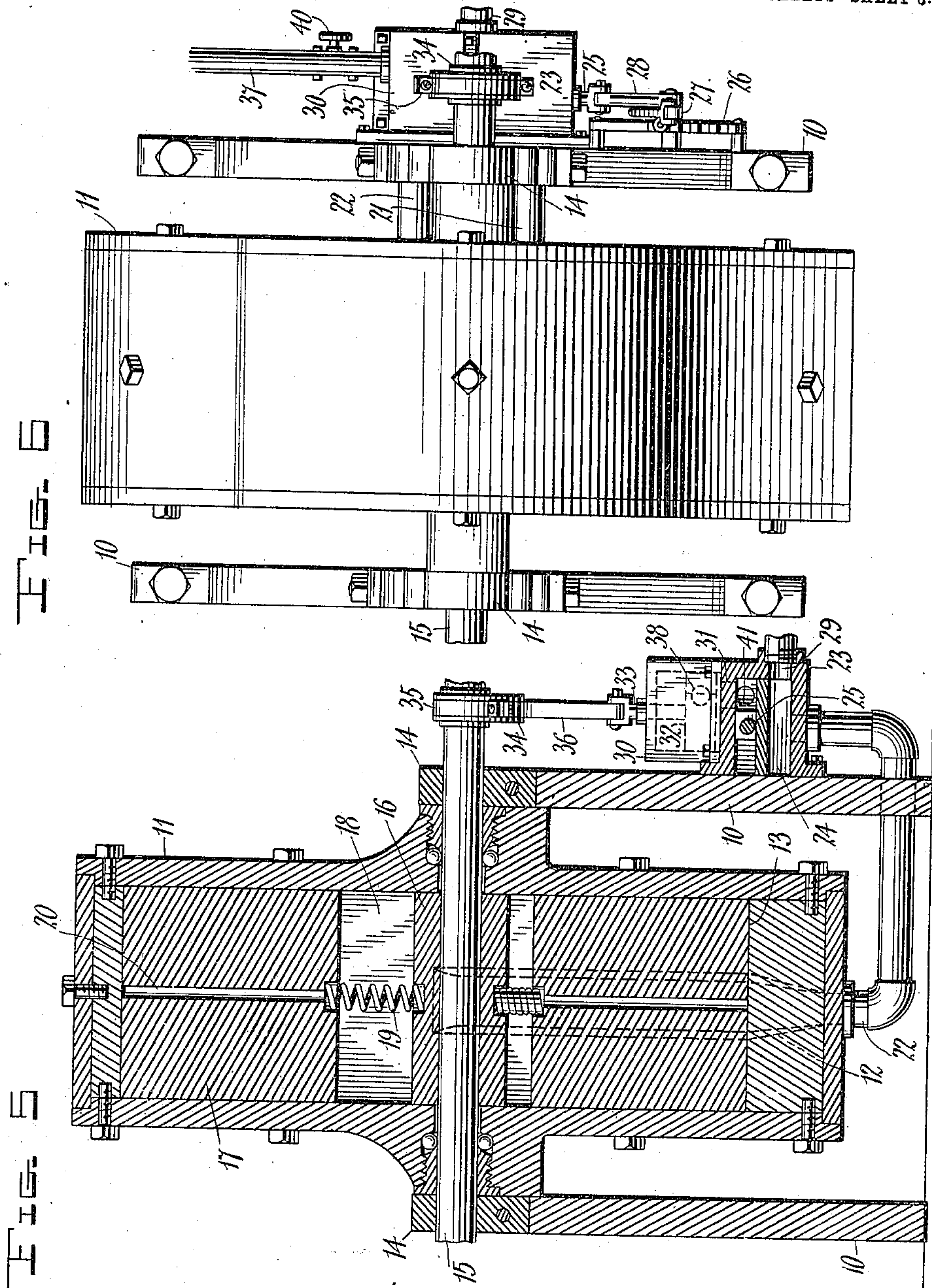
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JAMES BURLEIGH, OF KALAMAZOO, MICHIGAN.

ROTARY ENGINE.

963,207.

Specification of Letters Patent.

Patented July 5, 1910.

Application filed December 19, 1908. Serial No. 468,382.

To all whom it may concern:

Be it known that I, JAMES BURLEIGH, a citizen of the United States, residing at Kalamazoo, in the county of Kalamazoo, State of Michigan, have invented certain new and useful Improvements in Rotary Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which is appertains to make and use the same.

This invention relates to rotary engines, and its principal object is to provide a novel form of valve gear for such an engine.

Another object of the invention is to provide a novel means whereby the steam may be cut off during certain portions of the movement of such an engine.

A still further object of the invention is to provide, in connection with the last described improvement, a novel form of reversing gear.

With the above and other objects in view, the invention consists of a stator, a rotor mounted therein, and a novel form of valve gear in connection therewith.

The invention further consists in certain novel arrangements of details and combinations of parts hereinafter fully described, illustrated in the accompanying drawings, and specifically set forth in the claim.

In the accompanying drawings, like characters of reference indicate like parts in the several views, and:—Figure 1 is a side elevation of an engine constructed in accordance with this invention. Fig. 2 is an end elevation thereof. Fig. 3 is a sectional view on the line 3—3 of Fig. 2. Fig. 4 is a detail section on the line 4—4 of Fig. 2. Fig. 5 is a vertical section through the engine taken longitudinally of its axis. Fig. 6 is a top plan view of the engine.

The numeral 10 indicates the base plate or bed of this device. Upon this base plate is mounted a casing 11. The casing 11 is preferably circular in exterior contour and is provided with steam and exhaust ports 12 which open into an interior substantially circular in outline and arranged eccentrically to the outer periphery of the casing as indicated at 13.

Mounted in suitable bearings 14 is a shaft 15 which supports a rotor 16 held within the casing 11 and provided with a pair of pistons 17. While the pistons are here indicated as two in number, it is to be noted that

any desired number may be used as may be found most efficient for the specific purpose. These pistons 17 are held in slots 18 formed in the rotor 16 and behind each of the pistons is a spring 19 normally forcing the same outward. Each of these pistons is provided with a suitable port 20 to admit and discharge steam into the slot 18 behind the piston.

In the operation of the device as thus far described, if steam be admitted through one of the ports 12, the other port being utilized as an exhaust port, the steam will press against the piston 17 and force the rotor 16 around. By reason of the piston 17 being provided with a port 20, when the piston passes over the steam port 12 steam will be admitted behind the piston and it will be forced outward not only by the spring 19 but also by the pressure of the steam in the slot 18. The steam ports 12 extend through the casing and communicate with pipes 21 and 22 which open into a steam chest 23. Within the steam chest 23 is mounted a slide valve 24 which is provided with a stem 25. Upon the bed or base plate 10 is mounted a quadrant 26 and a latch lever 27. The latch lever 27 is pivotally connected intermediate its ends with the valve stem 25 by means of a link 28. The steam chest 23 is provided with an exhaust port 29 and the valve 24 is so arranged as to cover the port leading to the pipes 21 and 22 or to open either one of said pipes and extend over the other pipe and the exhaust port 29. By reason of this construction, it will be obvious that steam may be admitted to the casing 11 through either one of the pipes 21 and 22, while at the same time it is exhausted through the other pipe and the steam port 29.

Upon the upper side of the steam chest there is formed a supplementary steam chest 30 which communicates with the steam chest 23 by means of a port 31. Within the steam chest 30 is a vertically movable valve 32 provided with a stem 33. Upon the shaft 15 above the supplementary steam chest 30 is mounted an eccentric 34 having the usual eccentric strap 35 and blade 36 which is connected to the valve stem 33. Steam is admitted to the supplementary steam chest 30 through a pipe 37 which opens into said chest through a port 38 located in the side thereof.

In order to admit steam directly to the chest 23 there is provided a by-pass 39 hav-

ing a valve 40 therein, which communicates with the steam chest 23 by means of a port 41. By this arrangement a constant pressure may be maintained within the steam chest by opening the valve 40 or a variable pressure may be maintained in the chest by opening the valve slightly, the pressure resultant therefrom being the minimum and the pressure resultant from the admission of steam through the ports 38 and 31 being the maximum. This is the preferred manner of operating the device for the reason that it is desired at all times to have sufficient steam in the steam chest to operate the piston, while it is not desired to admit the full pressure until the piston has arrived at such point in its rotation that this pressure will be most effective. For this reason the eccentric is so arranged that the piston 17 will be substantially at right angles to the port 12 or in other words fully protended before the valve 32 is moved from its position over the port 38. It is thus to be observed that this device is very efficient and economical in the use of steam, while at the same time being certain of operation.

It is obvious that minor changes may be made in the form and construction of the invention without departing from the material principles thereof. It is not therefore desired to confine the invention to the exact

form herein shown and described, but it is wished to include all such as properly come within the scope thereof.

Having thus described the invention, what is claimed as new, is:—

In a rotary engine, a rotor provided with pistons adapted to be protended by steam pressure, a main steam chest provided with a steam admission port, a manually operable reversing valve slidably held in said main steam chest, an auxiliary steam chest provided with a port communicating with the main steam chest and further provided with a steam admission port, a cut-off valve in said auxiliary steam chest to intermittently close said admission port, a steam pipe communicating with said steam admission port in the auxiliary steam chest, means to operatively connect the valve in the auxiliary steam chest to the rotor, and a valved bypass extending from said steam pipe to the steam admission port of said main steam chest whereby the minimum pressure in the main steam chest may be controlled.

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

JAMES BURLEIGH.

Witnesses:

MIL O. BENNETT,
H. L. DIVER.