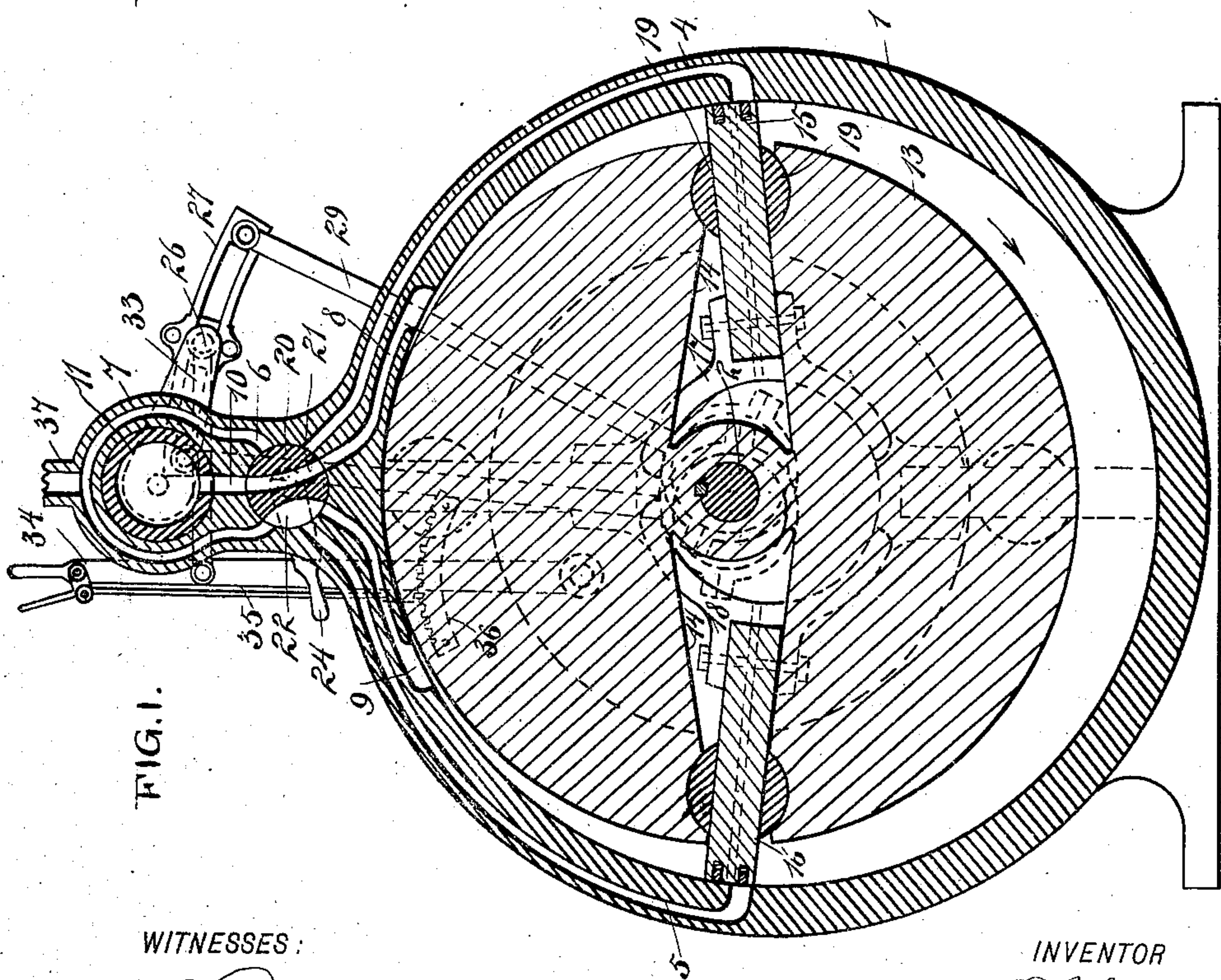
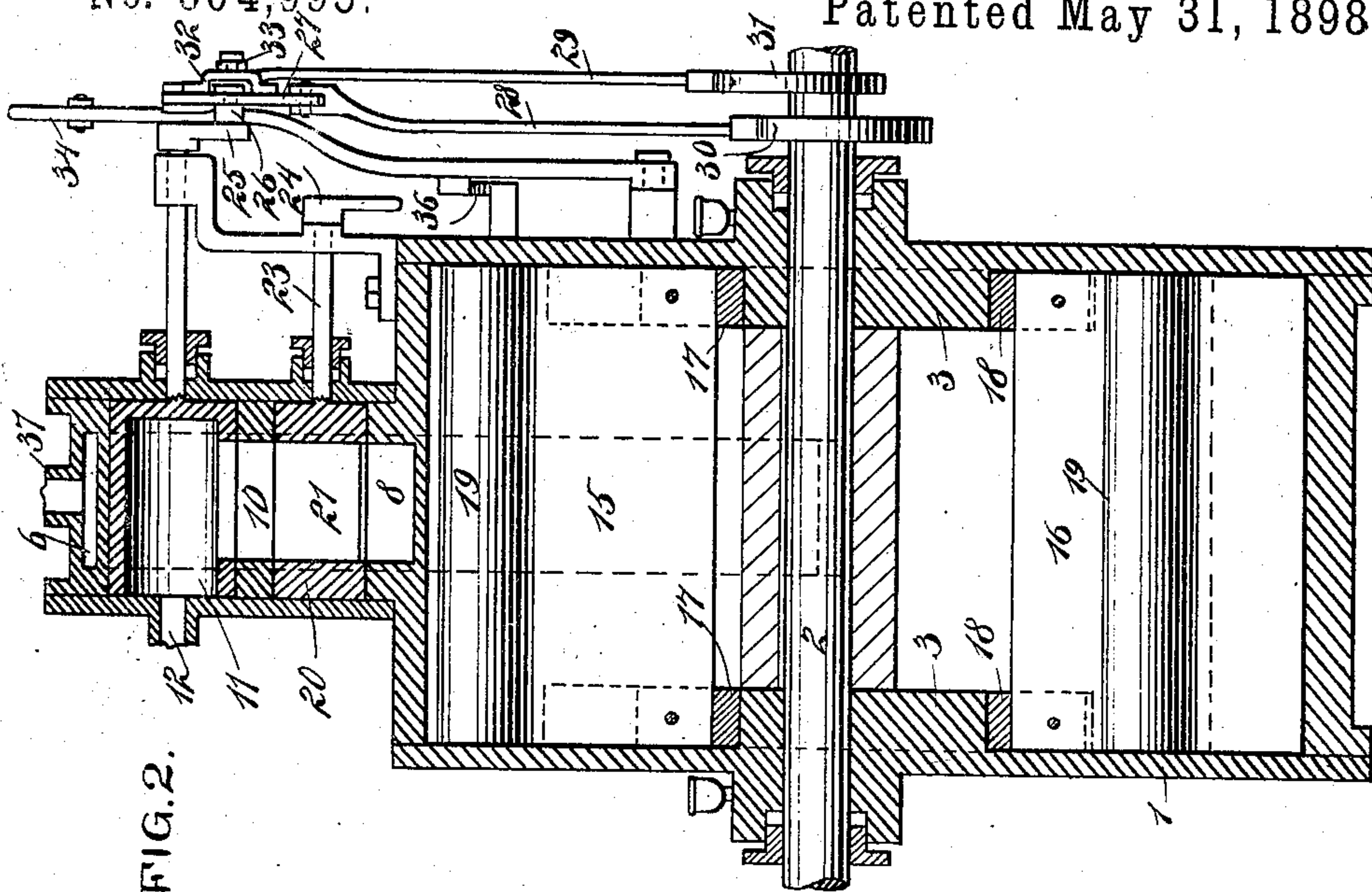


(No Model.)

F. J. MACEY.  
ROTARY ENGINE.

No. 604,995.

Patented May 31, 1898.



WITNESSES:

*Donn Twitchell*  
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ATTORNEYS.



# UNITED STATES PATENT OFFICE.

FRED J. MACEY, OF ONTONAGON, MICHIGAN.

## ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 604,995, dated May 31, 1898.

Application filed June 21, 1897. Serial No. 641,662. (No model.)

*To all whom it may concern:*

Be it known that I, FRED J. MACEY, of Ontonagon, in the county of Ontonagon and State of Michigan, have invented new and useful  
5 Improvements in Rotary Engines, of which the following is a full, clear, and exact description.

This invention relates to engines of the rotary type; and the object is to provide an engine of this character of comparatively few  
10 parts in which the expansion of the steam will be utilized to the greatest extent, thus producing a maximum of power with a minimum of steam and in which a simple means  
15 is provided for adjusting the steam cut-off.

I will describe a rotary engine embodying my invention, and then point out the novel features in the appended claim.

Reference is to be had to the accompanying  
20 drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both views.

Figure 1 is a vertical section of a rotary engine embodying my invention; and Fig. 2 is  
25 a vertical section at right angles to Fig. 1, but showing the piston-wings in the position indicated by dotted lines in Fig. 1.

Referring to the drawings, 1 designates a steam-cylinder having a power-shaft 2 extended transversely through it and eccentric thereto. Integral with or secured to the heads of the cylinder are rings 3, which are eccentric to the shaft 2, but concentric with the cylinder. The peripheral wall of the cylinder 1 has exhaust-ports 4 5 leading from about its central portion and designed to communicate with an exhaust-port 6 in a head 7 on the cylinder. The peripheral wall of the cylinder is also provided with steam-inlet ports 8 and 9, their inlets being near the top of the cylinder. The head 7 has a steam-port 10, designed to communicate with a hollow cut-off valve 11, mounted to oscillate in the head and having an open end into which steam may enter from  
45 the steam-pipe 12.

Mounted on the shaft 2 is a piston-disk 13. This piston-disk is concentric with the shaft, and therefore its upper portion will engage with the upper portion of the interior of the  
50 cylinder, thus providing an abutment for the steam. The piston-disk 13 has oppositely-extended openings 14, and in these openings

piston-wings 15 and 16 are movable. The opposite ends of the inner portions of the piston-wings 15 and 16 are respectively provided with segmental straps 17 and 18, engaging with the rings 3, and the outer ends of the piston-wings, which bear against the inner wall of the cylinder 1 and the cylinder-heads, will be provided with suitable packing-plates. 60 At the outer ends of the openings 14 the walls thereof are provided with segmental or concave recesses in which rocking blocks 19 may oscillate, and between the rocking blocks the piston-wings are adapted to slide as the piston-disk rotates. 65

Arranged in the head 7 is a reversing-valve 20, having a port 21, designed to be turned into register with the ports 8 and 10, depending, of course, upon which direction it is designed to rotate the piston. This reversing-valve 20 has also at one side a port 22, designed to be turned into communication with the exhaust-ports. The reversing-valve 20 has an outwardly-extending stem 23, provided with a handle 24. 75

On the outwardly-extending stem of the valve 11 is a crank 25, having a pin 26 extended into a link-block in an arc-slot in a link 27, to the ends of which link are pivotally connected eccentric-rods 28 and 29, operated by the eccentrics 30 and 31 on the shaft 2. Secured to the center of the link 27 is a bridge-piece 32, from which a link 33 extends to a lever 34, pivoted to the outer side of the cylinder 1. This lever 34 has a spring-pressed dog 35, designed to engage with a curved rack 36, secured to the side of the cylinder. 85

In operation the lever 34 will be placed in position to provide a communication between the valve 11 and the port 10, and the reversing-valve 20 will be placed in position to provide communication between the ports 10 and 8. Then the stem, operating through the port 8, will act upon the piston-wing 15 and rotate the piston in the direction indicated by the arrow in Fig. 1, and when the piston-disk makes a half-revolution the wing 16 will take steam from the port 8 and the exhaust from the piston-wing 15 will be through the ports 5, 22, and 6 and out through the exhaust-pipe 37. As soon as the engine gets under motion the lever 34 may be shifted 100

- in the desired direction to change the position of the link 27, so that the eccentric-rods 28 and 29 will oscillate the valve 11 to cut off the steam at any point where it is desired that the expansion shall take place. Of course when it is desired to reverse the motion of the engine the reversing-valve will be rotated to place its port 21 in communication with the ports 6 and 9.
- 10 It will be noted that the recess or cavity 22 in the reversing-valve 20 is sufficiently broad to communicate not only with the exhaust-ports but with the steam-inlet ports 8 and 9, and thus back pressure is avoided.
- 15 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

A rotary engine comprising a cylinder having exhaust-ports leading from a head on the cylinder and extending through the peripheral wall of the cylinder and communicating with the interior of the cylinder at about its center, the said peripheral wall also having inlet-ports, the inlets being at the upper portion of the cylinder, a reversing-valve, a hollow rocking valve for controlling admission of steam, a piston-disk eccentrically mounted in the cylinder, and radially-movable piston-wings carried by the piston-disk, substantially as specified.

FRED J. MACEY.

Witnesses:

W. W. WENDELL,  
C. MEILLEUR.