

No. 609,049.

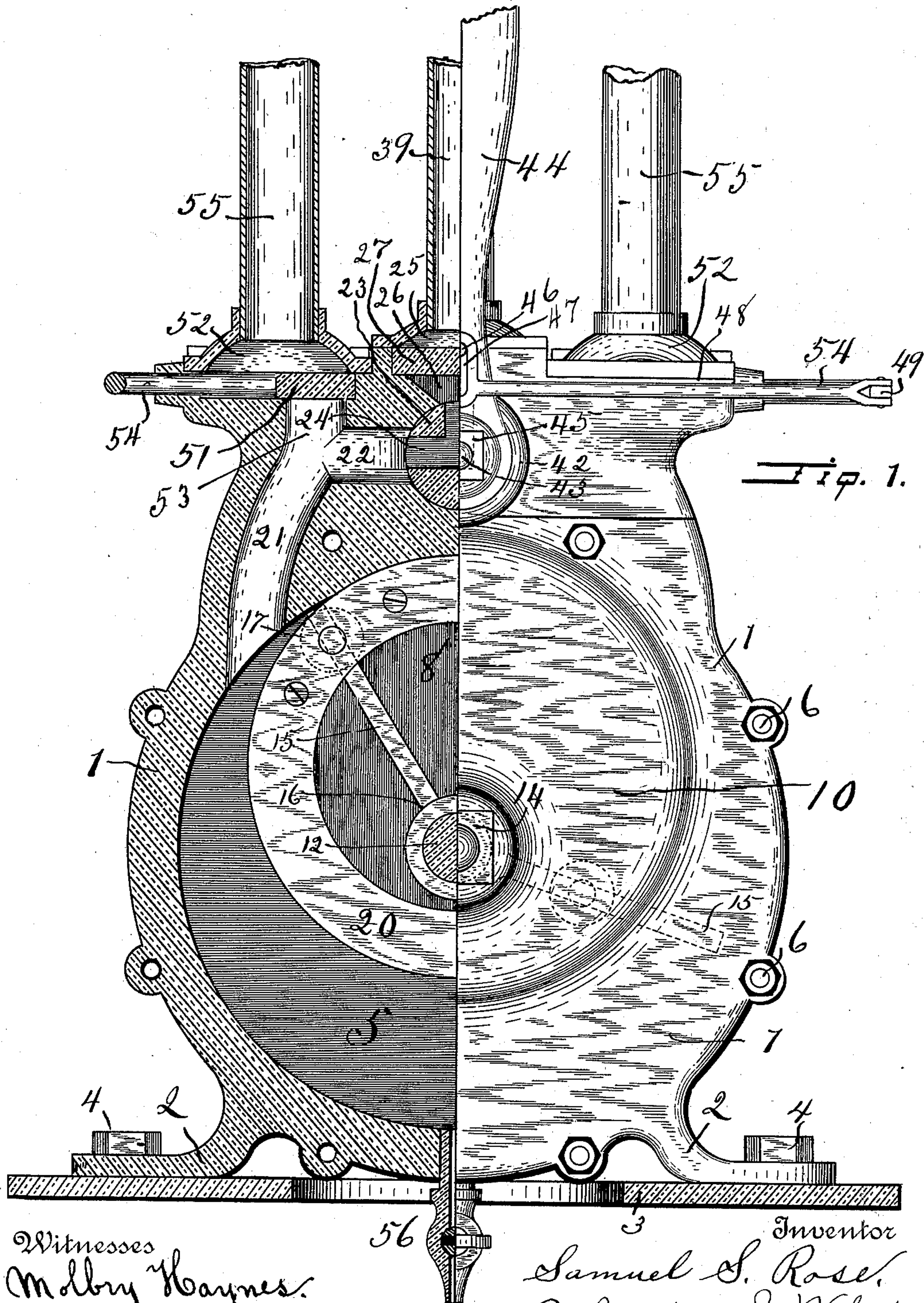
Patented Aug. 16, 1898.

S. S. ROSE.  
ROTARY ENGINE.

(Application filed Sept. 2, 1897.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses  
Moby Haynes.  
Violet A. Webster.

Inventor  
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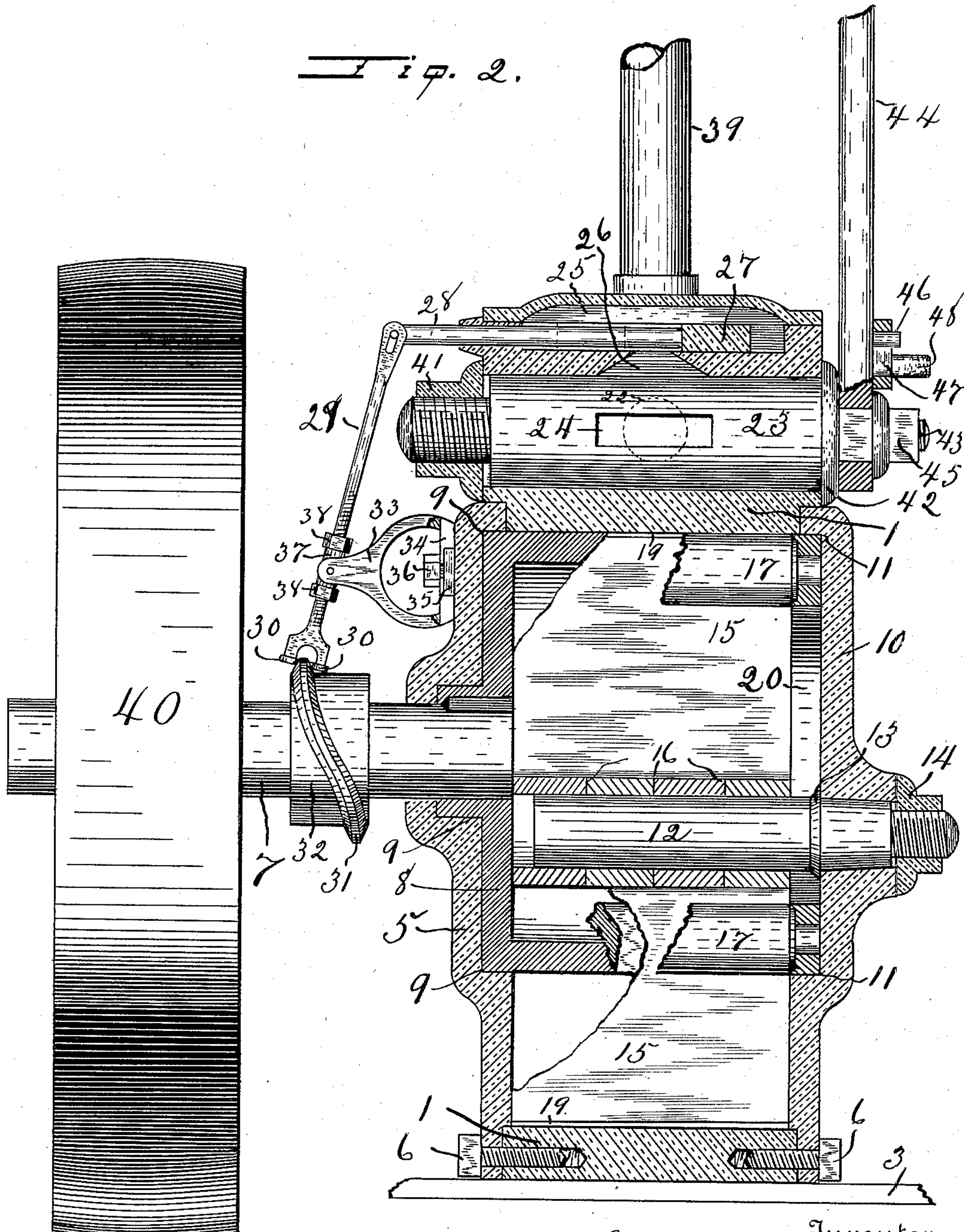
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3 Sheets—Sheet 2.



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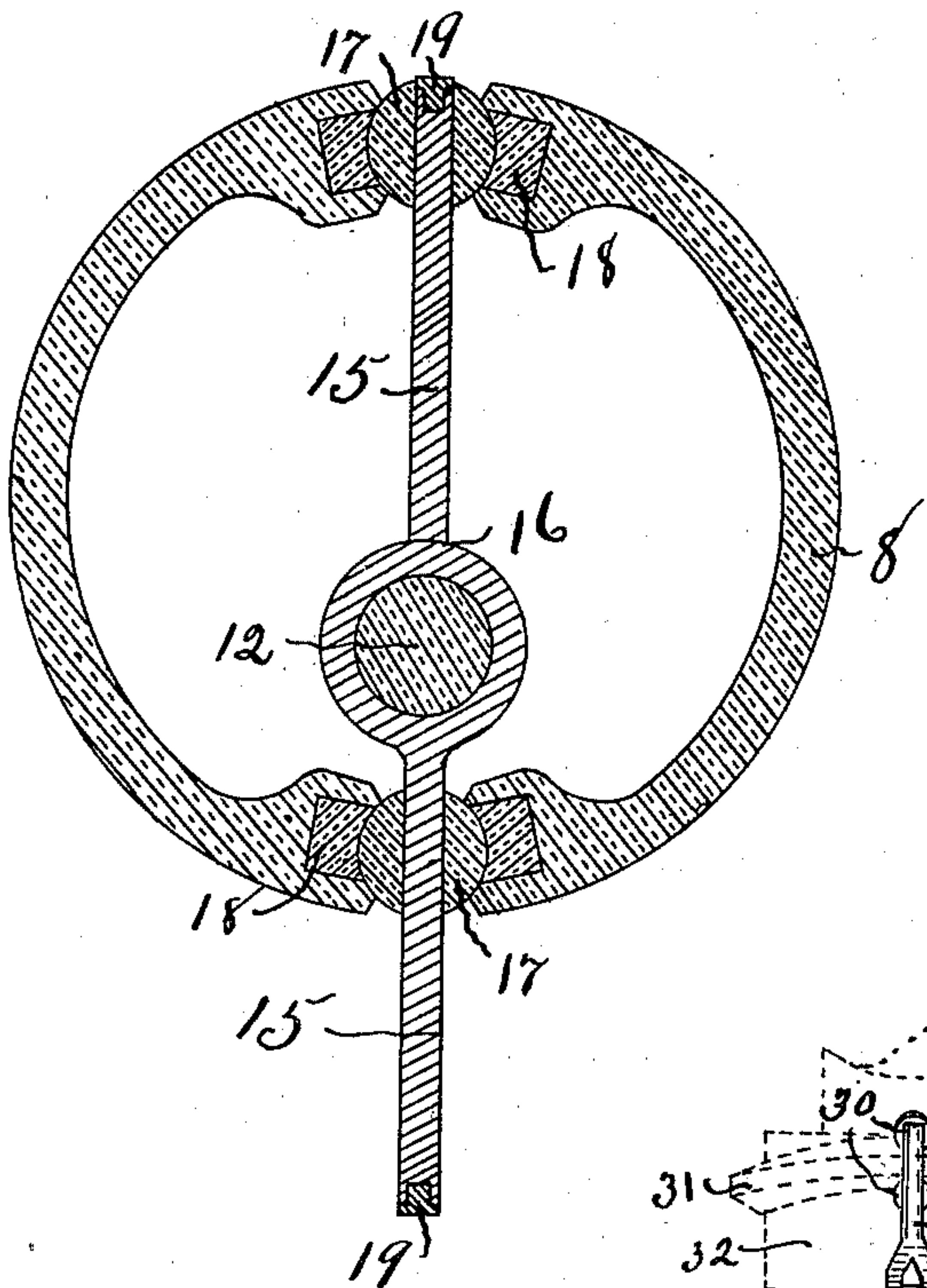


Fig. 4.

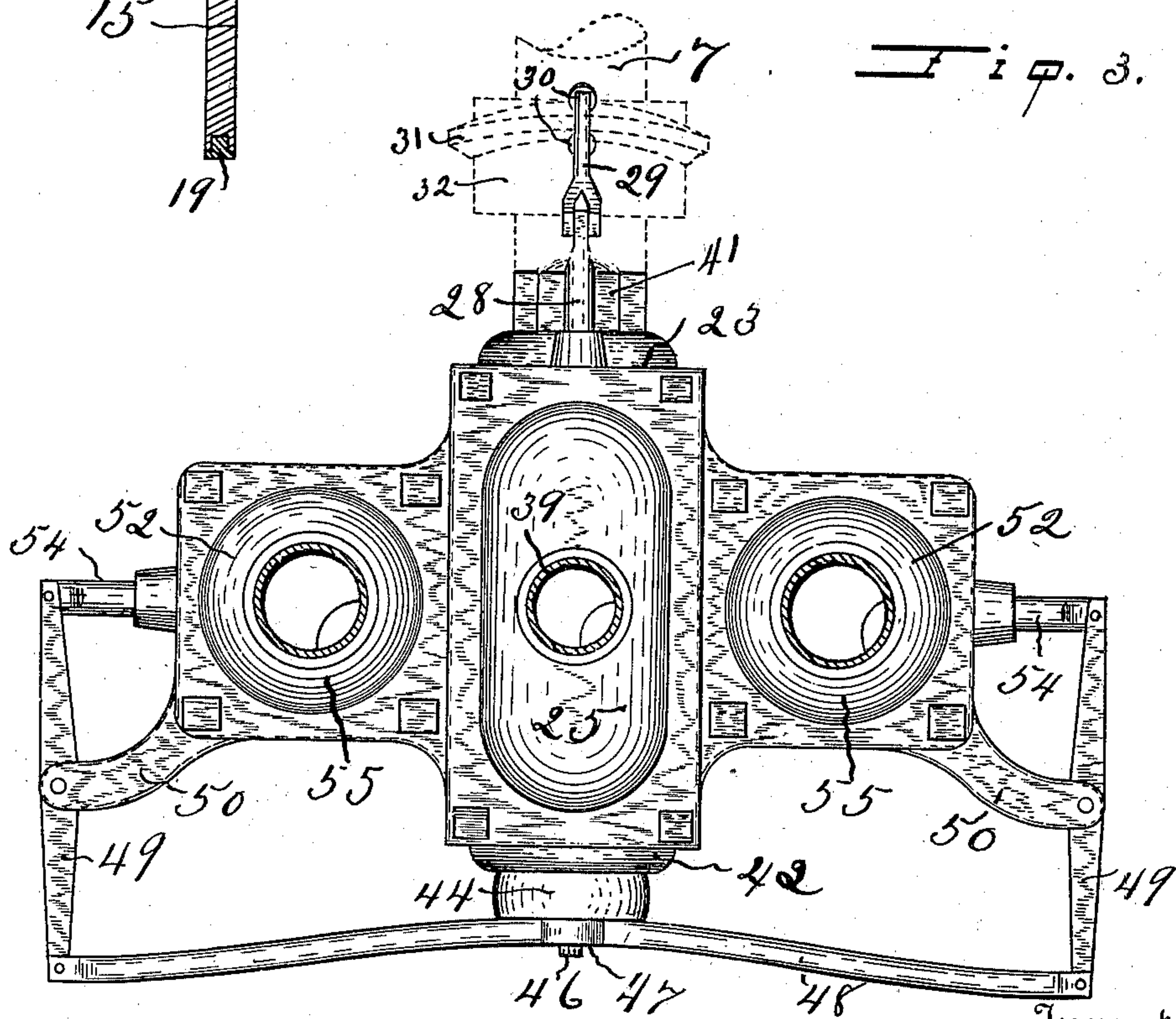


Fig. 3.

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# UNITED STATES PATENT OFFICE.

SAMUEL S. ROSE, OF AMADOR CITY, CALIFORNIA.

## ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 609,049, dated August 16, 1898.

Application filed September 2, 1897. Serial No. 650,349. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL S. ROSE, a citizen of the United States, residing at Amador City, in the county of Amador and State of California, have invented certain new and useful Improvements in Rotary Engines; and I do 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 it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to certain new and useful improvements in rotary engines; and my object is to provide a rotary engine which will more effectually utilize the power and expansion of steam and may be cheaply constructed.

It consists in the peculiar construction, novel combination, and adaptation of parts hereinafter described, and particularly pointed out in the claims hereunto annexed, reference being had to the accompanying drawings for a better understanding hereof, in which—

Figure 1 is an end elevation of my newly-invented rotary engine, part of the same being in section, showing the parts in position to take steam from that side. The other part shows the parts in a neutral position. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a top view of the ports and valve mechanism. Fig. 4 is a detached cross-sectional view of the rotary piston.

Similar figures of reference indicate corresponding parts in the several views.

A circular steam-cylinder 1, having the legs or braces 2, is rigidly attached on a suitable foundation 3 and secured thereto by means of the bolts and screws 4, which are inserted in the said braces 2. A cylinder cover or head 5 is rigidly secured to the rear side of the cylinder 1 by means of the screw-bolts 6. The main driving-shaft 7 is inserted eccentrically in the face of the cover or head 5 in a vertical line above the center of such head 5. The inner end of the said shaft 7 is rigidly secured to the center of the end of a revolving piston 8, which is adapted to fit in the circular grooves 9 in the head 5. On the front

side of the cylinder 1 a cylinder cover or head 10 is rigidly secured by means of the screw-bolts 6, and in the upper portion of the said head 55 a circular groove 11, similar to the grooves 9, is cut, into which the outer end of the revolving piston 8 is adapted to fit. In the center of the head 10 there is an opening, into which a wrist-pin 12 is inserted and rigidly maintained therein by means of a shoulder 13, which engages with the inner side of the said head 10, and a nut 14, which is inserted on the outer end of the said wrist-pin 12 and adapted to engage with the outer edge of the head 65 10. The wrist-pin 12 is adapted to receive operating-fans, which are formed in the shape of a hinge or knuckle joint at 16, and their loose ends are inserted through slots in oscillating bearings 17, which are pivotally journaled in the ends on opposite sides of the said piston 8.

18 represents bushings which are inserted in recesses in the wall of the piston 8 and adapted to engage with the oscillating bearings 17 for the purpose of relieving the said piston of the consequential wear.

The outer ends of the operating-fans 15 have a groove in the end of each, into which groove a bushing 19 is inserted for the purpose of receiving the wear.

The oscillating bearings 17 are inserted in the rotating piston 8 by means of a ring 20, which is removably attached to the face of the piston 8, thereby permitting the easy removal of the said bearings 17. The said ring 20 is also for the purpose of strengthening the said piston 8. The revolving piston 8 is located in the cylinder 1, so as to closely engage with the upper side of the said cylinder, so as to prevent the passing or escape of steam between the said parts.

The cylinder 1 has an interchangeable steam and exhaust port 21 in either side, near the top thereof, and the said ports 21 are connected by means of a passage 22. Midway between the parts 21 a three-way rocking valve 23 is inserted in an opening transversely in the cylinder 1 and intersecting the passage 22, such valve 23 having an angular slot 24 therein communicating with the passage 22 and a steam-chamber 25 by means of a double fan-shaped passage 26. In the chamber 25 is a cut-off valve 27, suitably located and



provided with a stem 28, which protrudes through an opening in the rear side of the said chamber 25 and is flexibly connected to the upper end of an oscillating lever 29, which  
 5 is forked at its other end and provided with wheels or ball-bearings 30, which engage with either side of the tongue 31 of an eccentric or cam wheel 32, which is rigidly attached to the shaft 7. The fulcrum for the said lever  
 10 29 is formed of an adjustable bracket 33, which is provided with a slot 34 in its base, which is inserted over a lug 35 on the side of the head 5 and secured thereto by means of a screw-bolt 36. The outer end of the said  
 15 bracket 33 is adapted to receive a ferrule 37 between its parts, such ferrule having lugs or pins on opposite sides which engage openings in the end of said bracket. The ferrule 37 is inserted over the lever 29 and maintained  
 20 in proper position by means of set-nuts 38, adapted to engage with either end of the said ferrule 37, there being screw-threads cut on the periphery of the said lever 29 for that purpose.

25 39 represents a steam-pipe which is mounted on, attached to, and adapted to communicate with the steam-chamber 25.

The pulley 40 is of ordinary construction and is rigidly attached to the main shaft 7,  
 30 from which pulley 40 power may be distributed as desired. On one end of the three-way valve 23 a nut 41 is inserted, which is adapted to engage with the rear side of the cylinder 1, and on the other end of the said  
 35 valve 23 a flange 42 is rigidly attached and adapted to engage with the front side of the said cylinder 1. The front end of the valve 23 is provided with a stem 43, on which an operating-lever 44 is rigidly secured by means  
 40 of a nut 45. Such lever 44 has a pin 46 rigidly attached in the front side thereof, which pin 46 is inserted in a slot 47 in the center of a connecting-rod 48, which is flexibly attached at each end to the outer ends of levers 49,  
 45 which are fulcrumed on brackets 50, which extend from and are rigidly attached to the two front corners of the cylinder 1, near the top thereof. On either side of the steam-chamber 25 an exhaust-valve 51 is inserted in  
 50 a chamber 52 therefor, and such chambers 52 are connected with the ports 21 by means of the passages 53. The exhaust-valves 51 are flexibly connected to the loose ends of the levers 49 by means of the rods 54, which are  
 55 rigidly attached to said valves 51. The exhaust-pipes 55 are suitably attached to the said chambers 52 for the purpose of conducting the steam therefrom. A cylinder-cock 56 is attached to the cylinder 1 at the bottom  
 60 thereof, whereby the condensed steam may be removed.

The mode of operating my improved rotary engine is as follows: The different parts having been connected and placed in normal  
 65 position, the operator grasps the lever 44 and presses the same to the left, whereupon the valve 23 is given an eighth-turn, thereby

connecting the passage 22 and the chamber 25 by means of the angular slot 24. As the lever 44 is depressed the pin 46 engages with  
 70 the slot 47, and by means of the connecting-rod 48 and levers 49 the exhaust-valves 51 are opened and closed on the right and left sides, respectively. As will be seen, the steam rushes in through the passage 26 from the  
 75 chamber 25 into the passage 22 by way of the angular slot 24 in the valve 23, on through the steam-port 21 into the cylinder 1, where it engages with the fans 15, which are adapted to closely engage with the walls of the cylinder 1, therefore forcing such fans around, carrying with them the revolving piston 8, which  
 80 imparts in turn motion to the shaft 7 and wheel 40. The cam or eccentric wheel 32 having been suitably adjusted on the shaft 7, such cam-wheel 32 engages with the lever 29, whereupon the same engages and operates the cut-off valve 27 by means of the stem 28. As the piston 8 reaches a certain point in its rotation the supply of steam is cut off, whereupon the expansion of the steam forces such  
 90 piston around until the steam engages with another fan 15, whereupon the valve 27 allows a new supply of steam to enter the cylinder, the cam-wheel 32 having been adjusted so to do. The oscillating bearings 17 are for the purpose of allowing the irregular motion of the fans 15 as the piston revolves. When it is desired to reverse the motion of the engine, the lever 44 is pressed to the right, thereby directing the steam into the port on the right side, and by the same operation the exhaust-valve 51 on the left side is opened and the exhaust-valve on the right side is closed. As will be seen, the steam enters  
 105 the port on the opposite side and engages the fans 15 from the opposite direction, thereby reversing the motion of the piston and its attendant parts. When the lever 44 is placed in a vertical position, the angular slot 24 communicates with neither steam-port, and consequently allows no steam to escape. The bushing 19 may be replaced with new when the same is worn.

I am aware that rotary engines have been  
 115 made which comprise a revolving cylinder, and that feature I do not claim, broadly; but

What I do claim as new, and desire to secure by Letters Patent, is—

1. In a rotary engine of the class described  
 120 the combination with a circular steam-cylinder suitably mounted on and attached to a rigid foundation, of a revolving piston fitted closely against the top wall of said cylinder, such piston having a driving-shaft and suitable pulley rigidly attached thereto, the wrist-pin rigidly attached to the side of the cylinder and extending within the piston, the fans pivotally mounted on the wrist-pin and extending through oscillating bearings in opposite sides of the piston, the steam-ports 21,  
 125 on either side of the said piston, which are connected by the passage 22, the exhaust-ports 53 adapted to communicate with the



steam-ports 21 and provided with the valves 51, the angle-valve 23 inserted transversely in the passage 22, such valve 23 having the slot 24 therein and the lever 44 rigidly attached to one end, the steam-chamber 25 and fan-shaped way 26, the pin 46 in the lever 44, the connecting-rod 48 having the slot 47 therein, such slot engaging with the pin 46, the levers 49 flexibly attached at either end of the rod 48 and fulcrumed near their centers on the brackets 50, such levers being flexibly attached to the outer ends of valve-stems 54, which are rigidly attached to the valves 51, and suitable means for supplying steam and disposing of the same, all arranged and operating substantially as shown and for the purpose specified.

2. In a rotary engine of the class described, the combination of a circular steam-cylinder rigidly secured to a suitable foundation, a revolving piston arranged eccentrically within such cylinder, a series of fans provided with bushings in the ends thereof and journaled in the center of the cylinder and eccentrically with relation to the piston such fans extending through oscillating bearings in the sides of the piston aforesaid, such oscillating bearings journaled in the ends of the piston and having the bushings engaging with, interchangeable steam and exhaust ports arranged above, on either side, and communicating with the cylinder, a connecting-passage having a double operating angle-valve arranged transversely therein, such valve having the angular passage therein communicating with a steam-chest located thereon, an operating-lever rigidly attached to one end of the operating-valve, a pin on the lever aforesaid adapted to engage a slot in a connecting-rod 48, arranged horizontally in front of the said lever, such connecting-rod pivotally attached at either end to one of the levers 49, such levers 49 fulcrumed on the side of the cylinder and pivotally attached to the outer ends of valve-stems 54, such valve-stems 54 inserted in the sides of valve-chambers and rigidly at-

tached to exhaust-valves arranged over the exhaust-ports 53, the driving-shaft rigidly attached to the piston, a cam-wheel rigidly attached to said driving-shaft, such cam-wheel provided with an endless zigzag flange or tongue on the periphery of the same, an oscillating lever adjustably fulcrumed on the side of the cylinder, the lower end of which is adapted to engage with the flange or tongue of the cam-wheel, a valve-stem flexibly attached to the upper end of the said oscillating lever and inserted horizontally in the steam-chest above the operating-valve aforesaid, a valve rigidly attached to the inner end of the said valve-stem and suitable means for introducing steam and conducting the same from the cylinder, all arranged and operating substantially as shown and for the purposes specified.

3. In a rotary engine of the class described the combination with a suitable cylinder and piston of a cut-off valve located in the steam-chest a suitable stem rigidly attached thereto, the oscillating lever 29 flexibly attached at its top end to such valve-stem and its lower end adapted to engage the tongue of a cam-wheel by means of the rollers 30, such cam-wheel 32 rigidly attached to the main driving-shaft and provided with the tongue 31 on the periphery of the same, the sleeve 37 inserted on the lever 29 and held in position by the adjusting-nuts 38, the bracket 33 adapted to engage the sleeve 37 at its outer end, such bracket being inserted over the lug 35 by means of the slot 34, the lock-nut 36 inserted in the lug 35 and adapted to engage with the bracket 33, the valve 23, steam-ports 21, and suitable reversing mechanism, all arranged and operating substantially as shown and for the purposes specified.

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

SAMUEL S. ROSE.

Witnesses:

MALBRY HAYNES,  
JOSHUA B. WEBSTER.