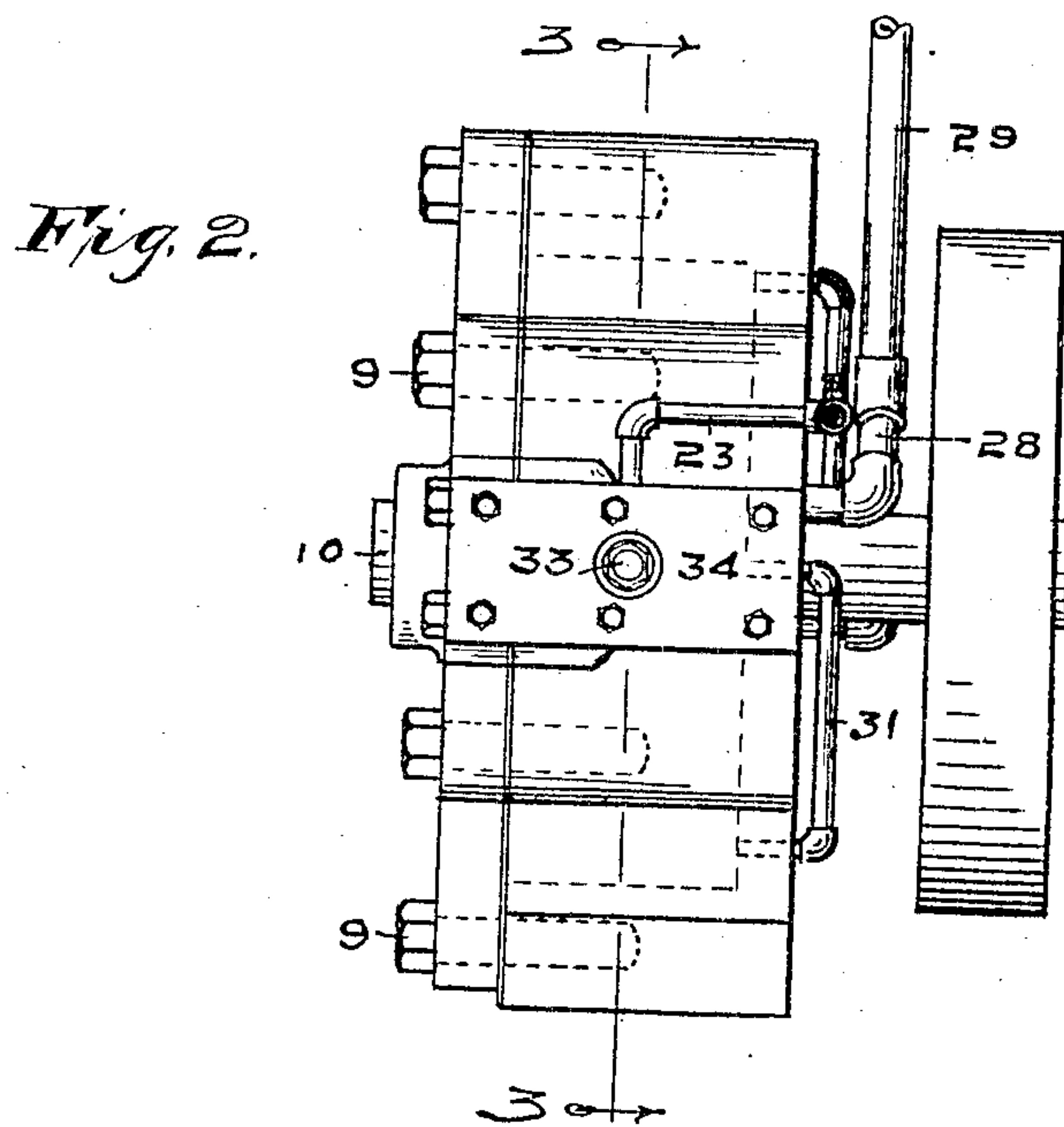
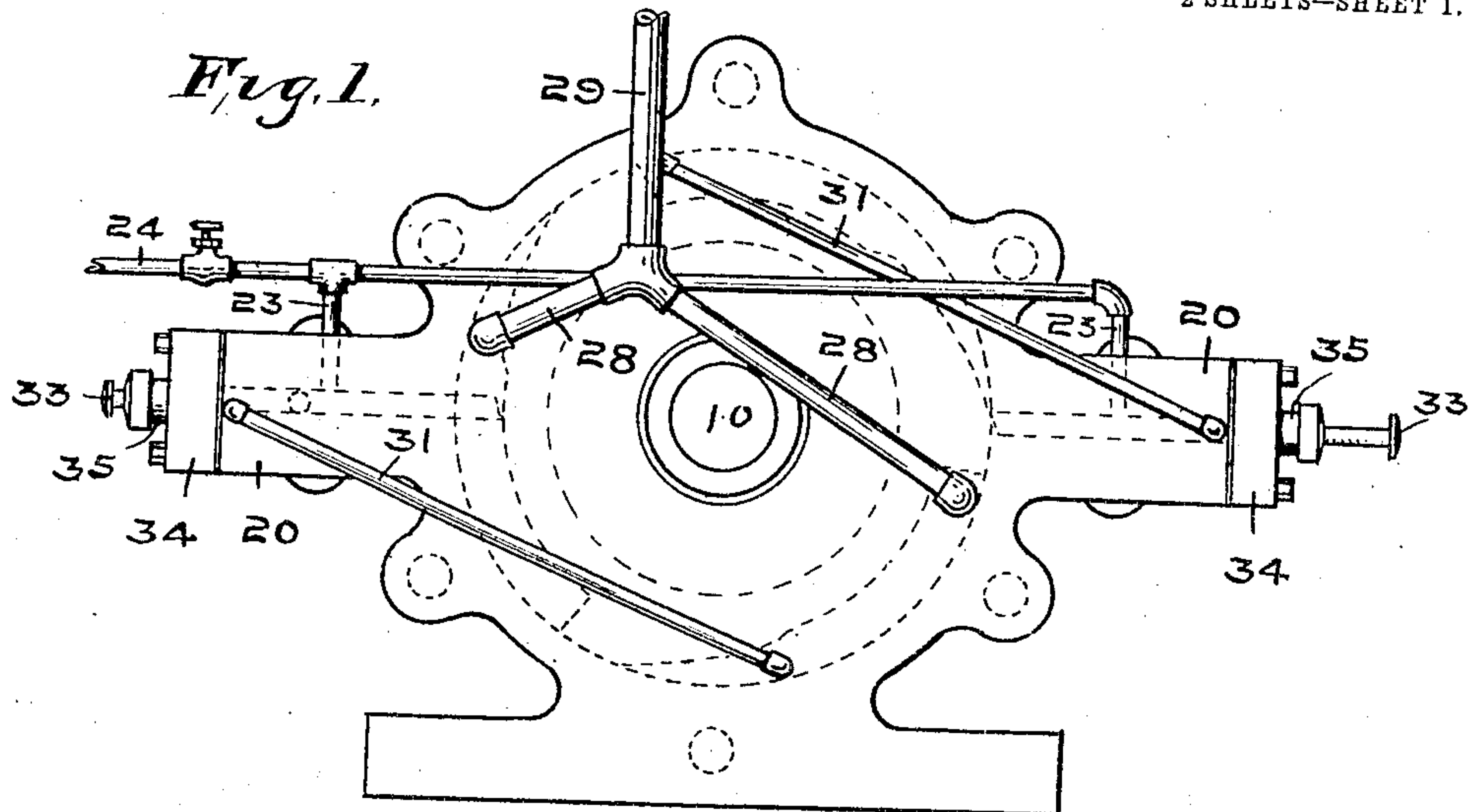


No. 882,168.

PATENTED MAR. 17, 1908.

C. E. RHORER.  
ROTARY ENGINE.  
APPLICATION FILED MAY 6, 1907.

2 SHEETS—SHEET 1.



WITNESSES:

L. B. Woerner  
J. C. Dyres.

INVENTOR:

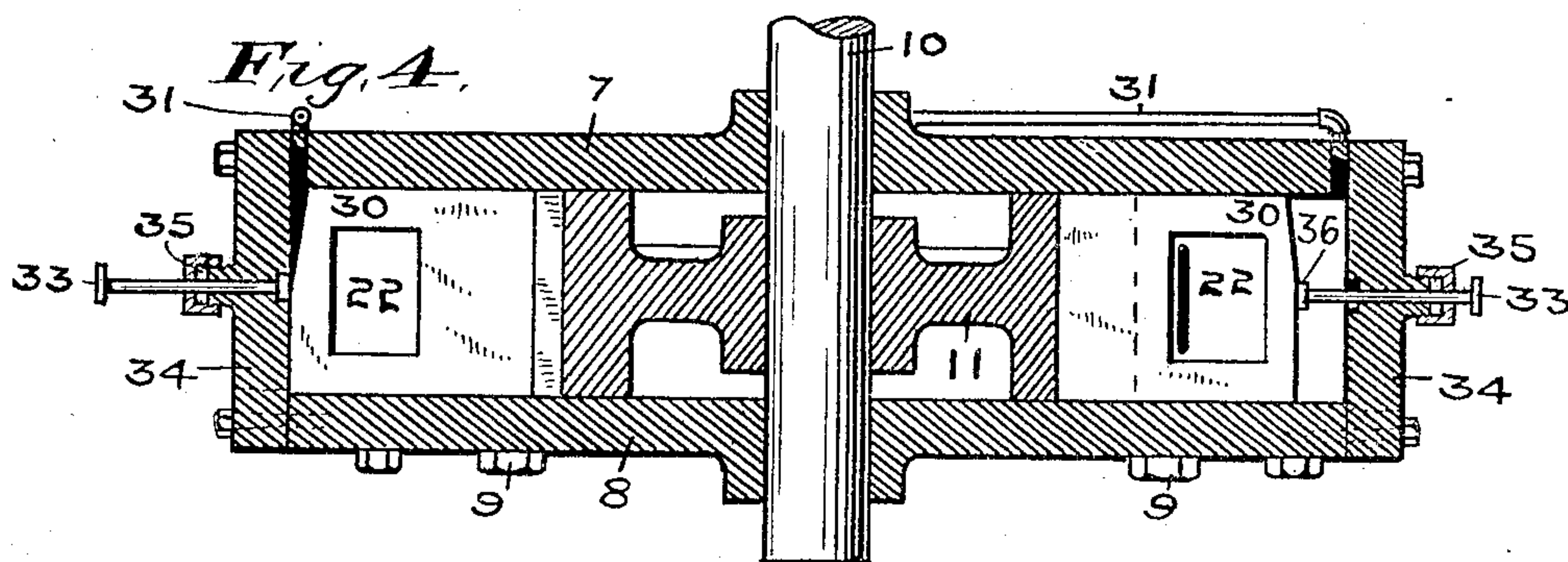
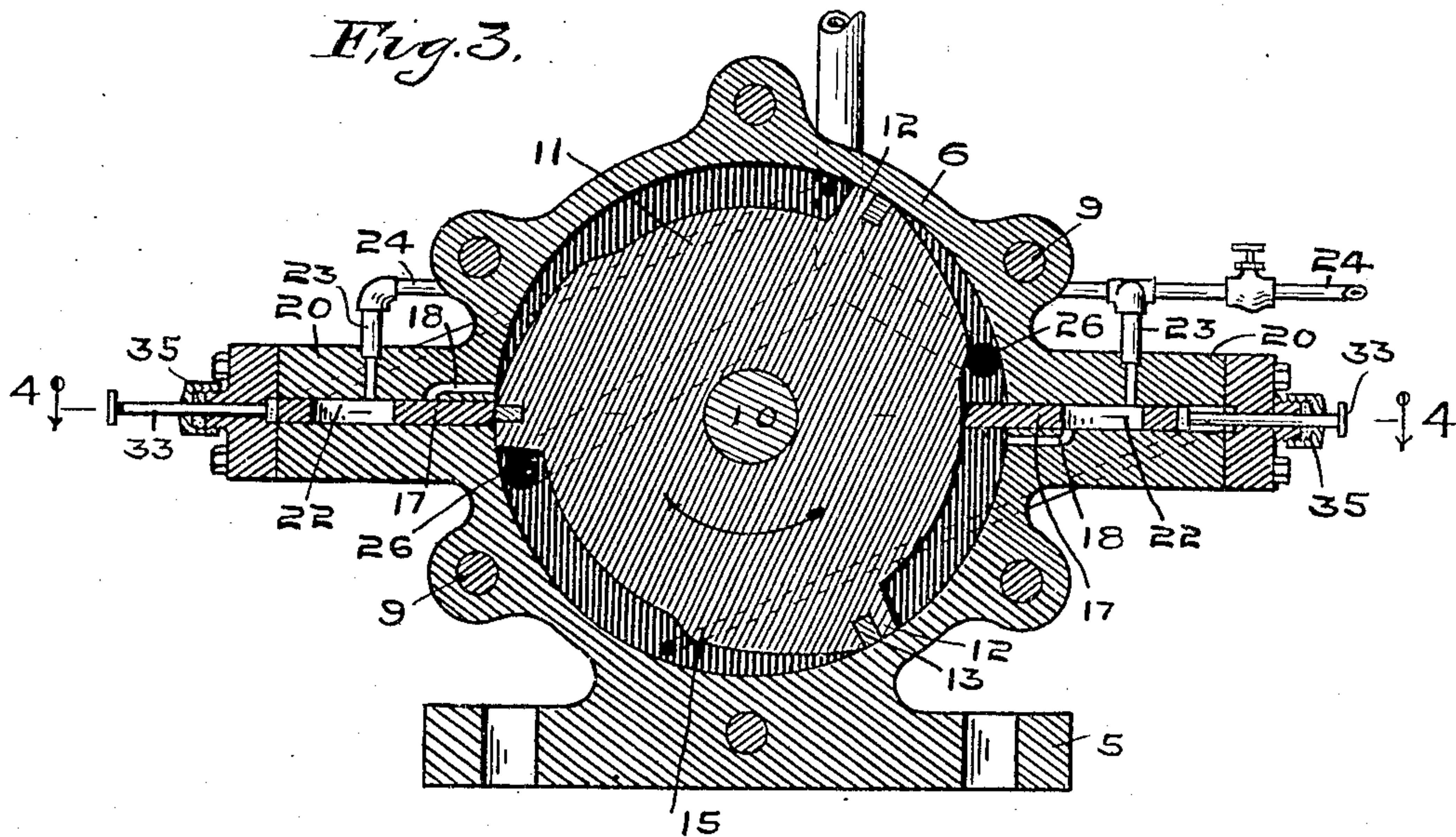
Chas. E. Rhorer,  
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WITNESSES:

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*F. C. Dyner.*

INVENTOR:

*Chas. E. Rhorer,*  
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# UNITED STATES PATENT OFFICE.

CHARLES E. RHORER, OF COLUMBUS, INDIANA.

## ROTARY ENGINE.

No. 882,168.

Specification of Letters Patent.

Patented March 17, 1908

Application filed May 6, 1907. Serial No. 372,269.

*To all whom it may concern:*

Be it known that I, CHARLES E. RHORER, a citizen of the United States, residing at Columbus, in the county of Bartholomew and State of Indiana, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

This invention relates to improvements in rotary steam engines having steam actuated valves, and the object of the invention is to provide a machine which is simple and inexpensive to construct, and operate, and which will require the minimum amount of packing to prevent leakage, and which will utilize the steam expansively to the best possible advantage.

I accomplish the objects of the invention by the mechanism illustrated in the accompanying drawings in which—

Figure 1 is a view in side elevation of my invention; Fig. 2 an end elevation of same; Fig. 3 a vertical section on the line 3—3 of Fig. 2 and Fig. 4 a horizontal section on the line 4—4 of Fig. 3.

Like characters of reference indicate like parts throughout the several views.

5 is the engine base and 6 the cylinder which is preferably an integral portion of the base. The cylinder is inclosed by means of the heads 7 and 8. One of these heads, as 7, may be formed integrally with the cylinder, but the other one, 8, will be bolted to the cylinder so as to permit access to the interior for assembling and making repairs of the parts therein. The head 8 will be secured by means of the bolts 9 which will enable the head to be adjusted laterally to take up any wear between the piston and the cylinder heads.

10 is the main shaft of the engine which is supported by suitable boxes in the cylinder heads.

11 is a rotary piston mounted on the shaft 10 within the cylinder. This piston, at three equi-distant parts 12 of its circumference, makes a close running fit with the inside of the cylinder, and is provided at these points with the transverse packing strips 13. A recess or pocket for steam is formed by reducing the diameter of the piston abruptly to form the shoulder 14 against which the expansive force of the steam will be directly impressed. The recess will continue with a uniform width or distance from the inner wall of the cylinder

for approximately two-thirds of the entire length of said recess, to the shoulder 15, which will quickly reduce the width of the recess, mainly for the purpose of moving the sliding valves 17 in an outward direction far enough to cut off the steam supply through the inlet port 18. The cylinder 6 is provided with the two diametrically opposite steam chests 20, each of which have slide ways in which the valves 17 are slidingly operated. The valves 17 are flat-sided metal plates which project into the cylinder 6 into contact with the irregular face of the piston 11. Each valve 17 has a transverse opening 22 to which steam is supplied through branch pipes 23 from the main steam supply pipe 24. The ports 18 form communications for the passage of steam into the cylinder from the chambers in the valves formed by the openings 22, and when the valves are at the inner ends of their strokes the ports 18 are full-open, and so remain until the valves are forced out by contact against them of the shoulders 15 of the revolving piston 11. The port 18, then being closed by its valve 17, the steam in the cylinder will act expansively until the next extension 12 of the piston has passed the valve 18. When the latter condition arises the valves 17 will move inwardly of the cylinder and the spent steam back of it will discharge through the exhaust opening 26. There are two exhaust openings 26 on diametrically opposite sides of the cylinder head 7, adjacent to the respective valves 17, which discharge into the branch pipes 28 and thence into the pipe 29.

As shown at 30 in Fig. 4 the valves 17 are beveled at one of their outer corners to form a steam space for steam transmitted from the cylinder through the pipes 31. The purpose of this is to start the valve toward the piston 11 by the pressure of steam admitted through the pipes 31 and the steam thus admitted keeps the valves in constant contact with the piston.

Some mechanical means is required to move the valves 17 in starting up the engine, and this is provided by the push rods 33 which extend to the outside of the engine through the ends 34 of the steam chests. The packing glands 35, of usual construction, prevent leakage of steam around said rods. The inner end of each rod will preferably have an enlargement or knob 36 to bear against the respective valves 17. These



rods 33 will preferably have enlargements or knobs on their outer ends for convenience in operating them. These rods 33 provide means by pressing them longitudinally against their respective slide valves 17, for sliding said valves in against the piston 11 in starting up the engine, so as to open the steam-port 18 which will admit steam with which to continue the operation of the engine.

The operation of the engine is so simple and obvious that further description is deemed unnecessary.

Having thus fully described my invention what I claim as new and wish to secure by Letters Patent of the United States, is—

1. In a rotary engine, a stationary cylinder having a round bore, heads at each end of the cylinder, a shaft, a rotary piston mounted in the cylinder upon said shaft in close running contact with the cylinder heads, said piston making steam-tight fits at a plurality of its peripheral points and being reduced in diameter back of said points to form steam receptacles, steam ports emptying into the cylinder, valves sliding radially of the cylinder to open and close said ports and making constant contact with the periphery of the piston, each valve having a transverse opening forming a chamber through which the live steam passes, and said piston increasing in diameter near the ends of its steam receptacles to force out the valves and thereby close the port inlets.

2. In a rotary engine, a stationary cylinder having a round bore, end heads bolted to the cylinder, means for varying the distance between the heads, a shaft, a rotary piston mounted in the cylinder upon said shaft in close running contact with the cylinder heads, said piston making steam-tight fits at a plurality of its peripheral points and being abruptly reduced in diameter back of said points to form steam receptacles, steam ports emptying into the cylinder at two diametrically opposite points, radially sliding valve-plates intersecting said steam-ports and having a transverse opening forming a continuation of the steam port therethrough when the valve is at its inner position, said valve closing the port when the valve is in its outer position and said valve making constant contact with the periphery of the piston, said piston increasing in diameter near the ends of said steam receptacles to force out the valves and close the port inlets.

3. In a rotary engine, a stationary cylinder having a round bore, a shaft, a rotary piston mounted in the cylinder upon said shaft, heads at each end of the cylinder in close con-

tact with the sides of the piston, means for varying the distance between the heads to take up wear, said piston making steam-tight fits at a plurality of its peripheral points and being abruptly reduced in diameter back of said points to form steam receptacles the diameter of the piston being uniform for the major portion of the length of the said receptacles and then being increased to form an oblique shoulder, steam ports emptying into the cylinder, valves sliding radially of the cylinder to open and close said ports and making constant contact with the periphery of the piston, spaces at the outer ends of the valves and pipes supplying steam to said spaces to press the valves normally against the piston.

4. In a rotary steam engine, a stationary cylinder having a round bore, heads at each end of the cylinder, a shaft, a rotary piston mounted in the cylinder upon said shaft, said piston making steam-tight fits at a plurality of its peripheral points and being reduced in diameter between said points to form steam receptacles, steam ports emptying into the cylinder, valve plates crossing said steam ports and sliding radially of the cylinder to open and close the ports and making constant contact with the periphery of the piston, said valve-plates having transverse openings for the free passage of live steam therethrough and said piston periphery being shaped to properly regulate the movements of the valve plates and means by the pressure of partly spent steam against the outer ends of the valve plates for forcing the latter normally into contact with the piston.

5. In a rotary steam engine, a stationary cylinder having a round bore, a rotary piston mounted within the cylinder and making steam-tight fits therewith at a plurality of its peripheral points, radially sliding valve plates making constant contact with the periphery of the piston, steam ports entering the cylinder and opened and closed by the sliding valve plates, the periphery of said piston being shaped to impart the required movement to the valve plates and push-rods bearing loosely against the outer ends of the valve plates and terminating outside of the engine.

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this 9th day of March, A. D. one thousand nine hundred and seven.

CHARLES E. RHORER. [L. s.]

Witnesses:

F. W. WOERNER,  
L. B. WOERNER.