

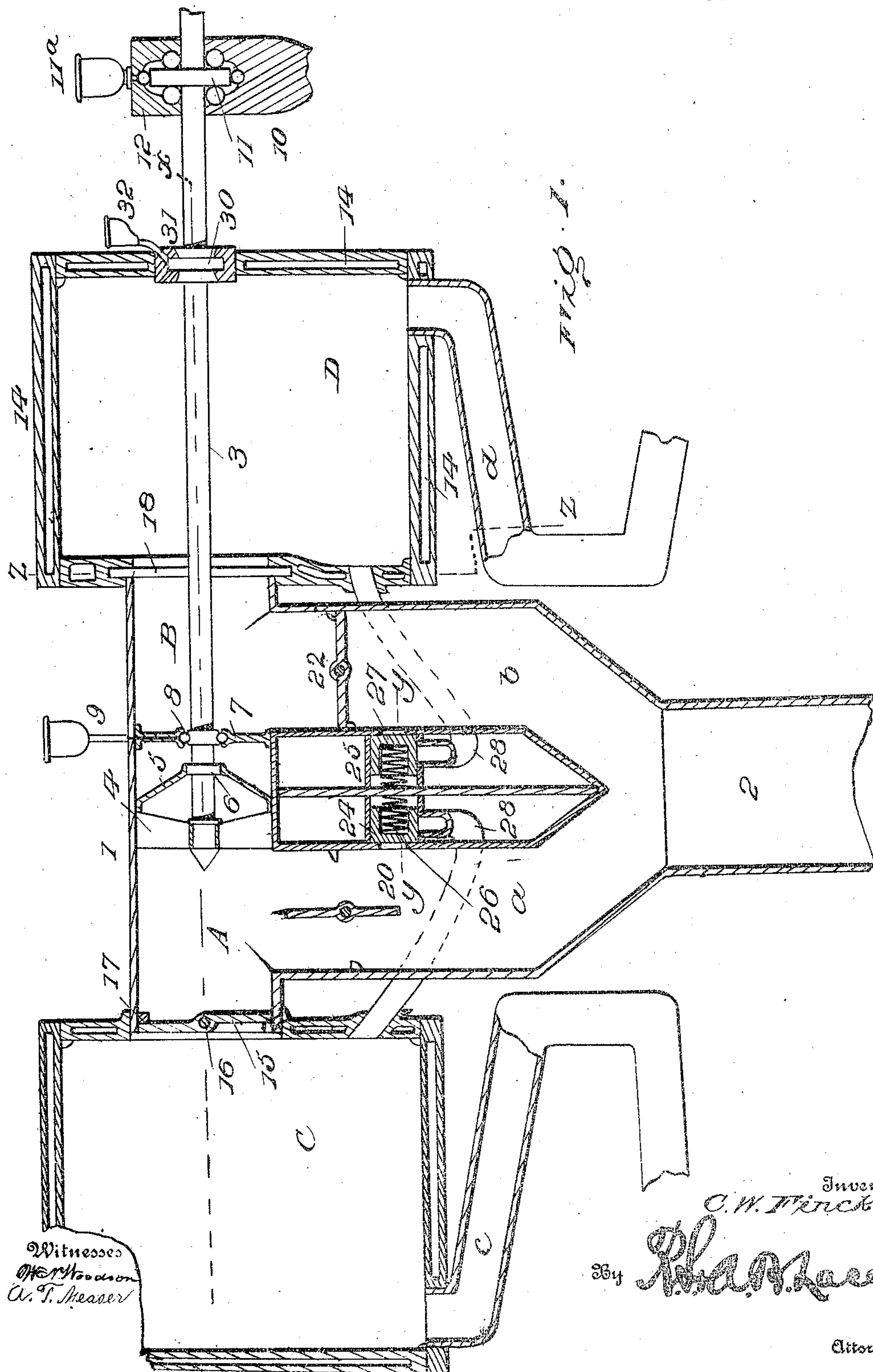
No. 862,462.

PATENTED AUG. 6, 1907.

C. W. FINCKE.
ROTARY ENGINE.

APPLICATION FILED DEC. 4, 1906.

3 SHEETS—SHEET 1.



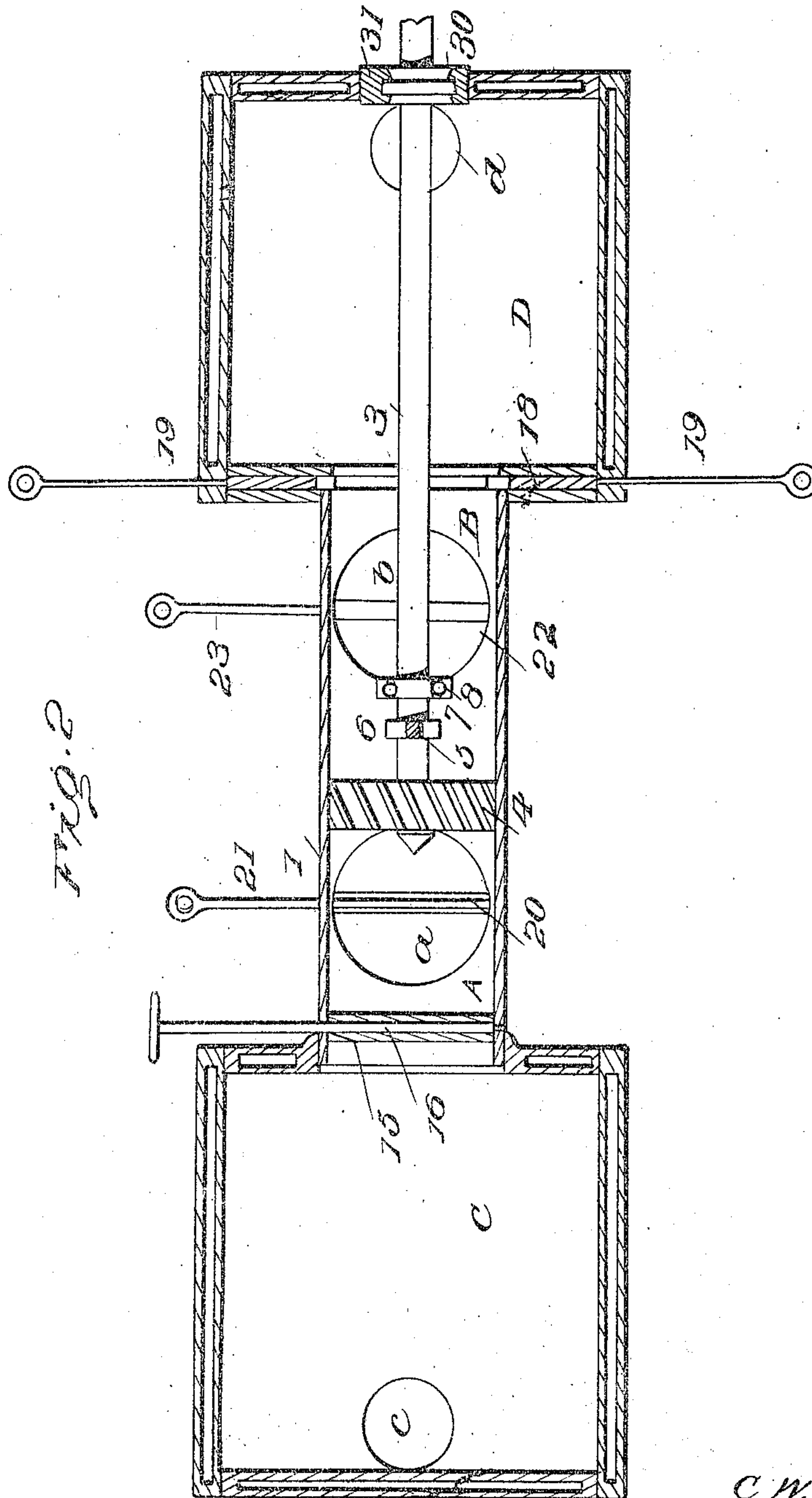
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Witnesses
W. R. Woodson
A. T. Measer.

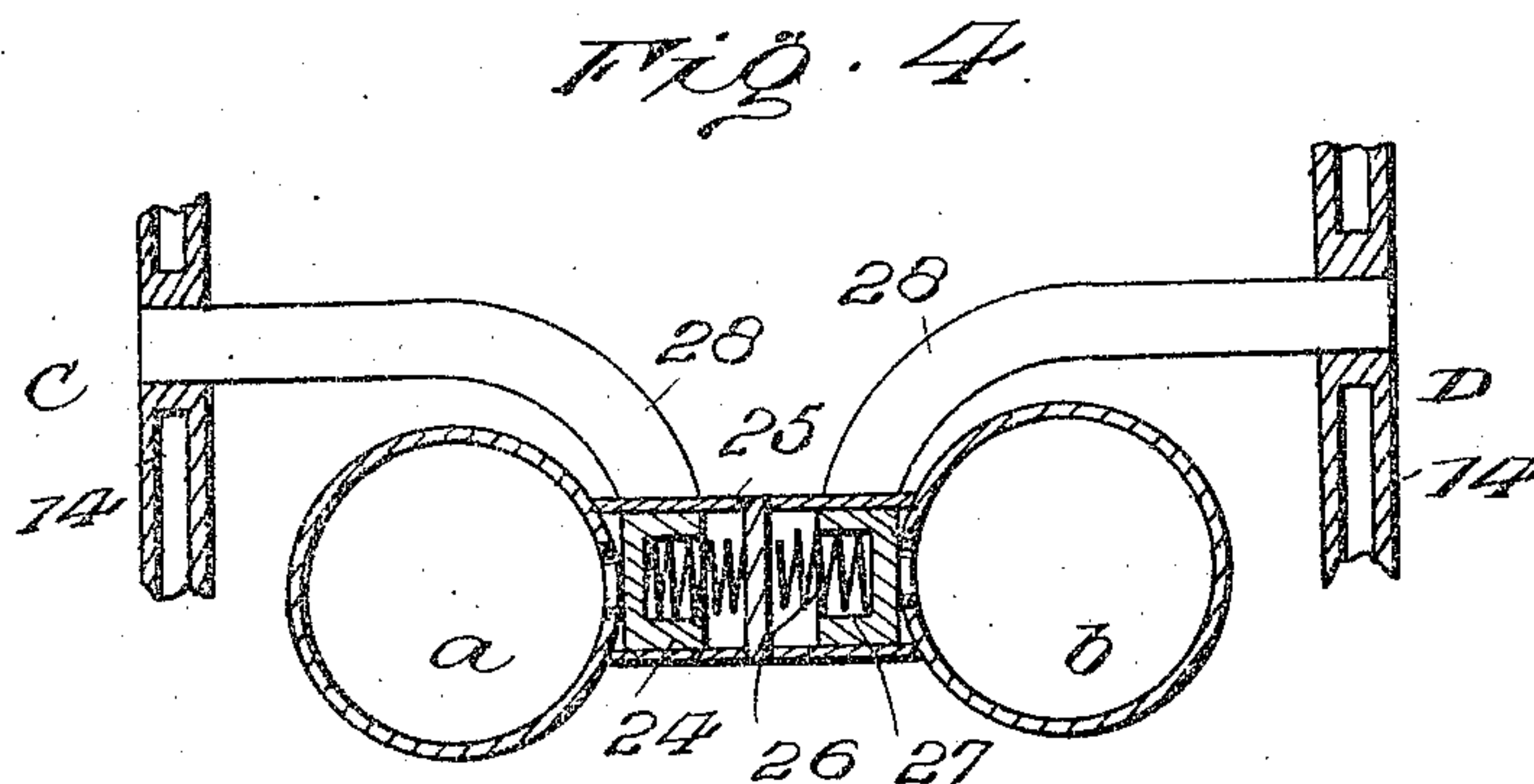
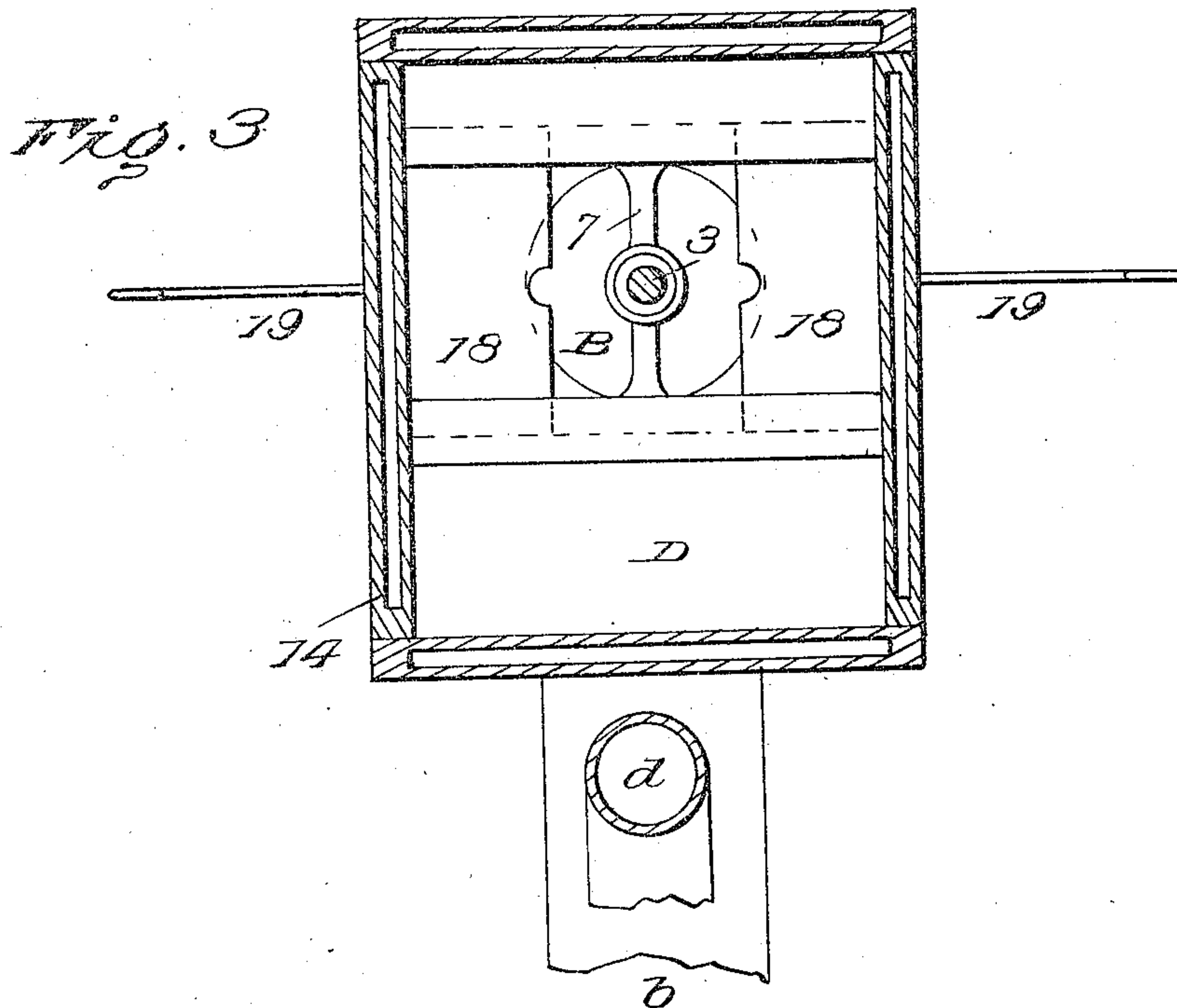
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

CHARLES W. FINCKE, OF BELLASYLVA, PENNSYLVANIA.

ROTARY ENGINE.

No. 862,462.

Specification of Letters Patent.

Patented Aug. 6, 1907.

Application filed December 4, 1906. Serial No. 346,356.

To all whom it may concern:

Be it known that I, CHARLES W. FINCKE, a citizen of the United States, residing at Bellasylda, in the county of Wyoming and State of Pennsylvania, have
5 invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the
10 details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a longitudinal sectional view of my improved rotary engine. Fig. 2 is a horizontal sectional
15 view thereof. Fig. 3 is a transverse sectional view through one of the condensers. Fig. 4 is a detail sectional view illustrating the safety valve mechanism.

Corresponding and like parts are referred to in the following description and indicated in all the views of
20 the drawings by the same reference characters.

Referring to the drawings, the numeral 1 designates the cylinder of my improved rotary engine or motor, which embodies, in operation, two working chambers
25 A and B into which lead branch passages *a* and *b* from a common inlet passage 2 for the steam or other motive fluid, the said passage 2 being formed by a tube which connects with the boiler in any suitable manner. Communicating with the respective working chambers
30 A and B are separate condensing chambers C and D from which lead pipes *c* and *d* and leading back to the boiler.

The drive shaft 3 extends through the condenser D and is journaled within the cylinder 1, preferably by means of a spider 7, the hub of which is ball bearing,
35 as indicated at 8. The other end of the drive shaft 3 is supported in a standard 10 and is provided preferably with a collar 11 mounted in an anti-friction bearing box in the said standard and held therein by means of the bolted plates 12. This bearing of the shaft may
40 be oiled by means of an oil cup 11^a, while the opposite bearing 8 may be oiled by a cup 9. Intermediate of its ends, the shaft 3 is provided with a collar 30 which extends through a stuffing box 31 formed in the outer
45 head of the condenser D, the bearing formed by said stuffing box being oiled, if desired, by means of an oil cup 32. In the preferable arrangement, the pulley or band wheel or the like by which power is communicated from the shaft 3 to the part that is to be rotated,
50 is secured to said shaft between the condenser D and the standard 10.

The inner end of the drive shaft 3 carries a series of radial blades 4 that are set at their inner ends into the periphery of the shaft and which may be braced by
55 diagonal braces 5 converging and connected to a collar 6 mounted on the shaft.

Steam or the like is admitted from the inlet passage

2 through either of the passages *a* or *b* to the working chambers A or B by means of valves 20 or 22, that are provided with handles 21 and 23, respectively, so that the said valves may be turned and opened and closed
60 from the outside of the engine casing.

24 designates safety valves that are mounted within a frame 25 and are designed to control communication between the steam inlet passages and vent pipes 28 leading into the condensers. If desired, these vent pipes may
65 be directed back to the boiler at a point where the water fed therein is at its lowest temperature. The safety valves 24 are pressed to their seats to close the communication between the live steam inlet passages and the vent pipes 28 by means of expansion springs 26.
70

27 designates a plate which is mounted within the casing of the engine and assists in supporting the casing 25 for the safety valves 24.

In the practical operation of my improved rotary engine or motor, steam is admitted into either of the
75 compartments A or B according to the direction in which it is desired the shaft 3 shall turn. If it is desired that the shaft 3 shall drive the part to which it is connected forwardly, the valve 22 is closed and the valve 20 is opened. Steam will thereupon be ex-
80 cluded directly from the live steam passage B, but will be admitted directly to the chamber A and will thence act upon the blades 4 and turn the shaft in the desired direction. It is, of course, essential that the steam be cut off from one of the condensers or the
85 other according to the direction in which the shaft is turning, and for this purpose the working chambers A and B, while they are connected to the condensers C and D, have their communication between the chambers and condensers controlled by valves. The com-
90 munication between the chamber B and the condenser D is controlled by means of gate valves 18 which slide laterally upon opposite sides of the shaft 3 in suitable guide ways in the engine casing and which are manipulated to close around the shaft and shut off the com-
95 munication or air from the shaft to open the communication, by means of screw rods 19, extending in opposite directions out through the casing. The communication between the working chambers A and condensers C is controlled by a turning valve 15 which
100 is mounted to turn in one direction only, on a pivot 16, and which is adapted to abut against a seat 17. The valve 15 is controlled by means of the handle 16^a as seen best in Fig. 2. Hence as the steam enters through passage *a* and into working chamber A to
105 drive the shaft in one direction, the valves 18 must be held open, so that the steam as it works upon the blades 4 may pass directly into the condenser B, while the valve 15 must be closed. If it be desired to turn the shaft in the opposite direction, valves 18
110 are closed, valve 15 is opened the valve 20 is closed, and the valve 22 opened, whereupon the steam will

enter through inlet passage *b* and thence through working chamber B to act against the blade 4 in the opposite direction and finally escape through the valve 15 into the condenser C.

5 From the foregoing description in connection with the accompanying drawings, it will be seen that I have provided a very simple construction of rotary engine which is composed of comparatively few parts, and which may be easily manipulated to reverse the direction of rotation of the drive shaft 3 whenever desired, and in which the steam passes directly into condensers at opposite sides of the working chambers, after the steam has effectively acted upon the revoluble blades 4.

10 Preferably, the condensers C and D are water jacketed, as indicated at 14, and they may be provided with removable ribs or covers 14 which are also jacketed, the provision of said ribs enabling the interior of the condensers to be exposed so that they may be cleaned whenever desired.

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

1. In a rotary engine, the combination of a cylinder embodying two working chambers in open communication with each other and a series of revoluble blades mounted in the passage establishing such communication, and a shaft on which said blades are mounted, means for admitting steam directly into one chamber or the other, condensers in direct communication with the respective working chambers, and means for shutting off the communication from either of the said working chambers to the said condensers.

2. In a rotary engine, the combination of a cylinder embodying two working chambers in communication with each other, a series of revoluble blades mounted in the passage establishing such communication, a drive shaft upon which said blades are mounted, a motive fluid inlet pipe adapted to be connected to any source of supply and provided with two branches adapted to communicate with

the working chambers, respectively, independently movable valves controlling said communication, condensers in communication with the respective working chambers beyond the valves that control the communication between said chambers and the branches of the inlet pipe, and valves controlling communication between the condensers and the working chamber.

3. In a rotary engine, the combination of a cylinder embodying two working chambers and an inlet pipe provided with distinct branches adapted to communicate with the said chambers respectively, independently operable valves adapted to control the communication between the respective branches and the working chambers, a series of revoluble blades between said chambers and in communication with both of them, a drive shaft upon which said blades are mounted, condensers adapted to communicate with the working chambers upon opposite sides of said blades, a manually operable valve mechanism controlling the communication between one chamber and one condenser, and a valve controlling the communication between the other chamber and the other condenser.

4. In a rotary engine, the combination of a cylinder embodying two working chambers, there being provided inlet passages leading to the respective chambers, valves controlling the communication between said passages and the respective chambers, a series of blades mounted to revolve between the chambers, a drive shaft upon which said blades are mounted, condensers adapted to communicate with the respective working chambers on opposite sides of said blades, valves controlling said communication, and a safety valve mechanism, the same comprising a pair of valves 24, spring pressed towards their seats, and vent pipes arranged to establish communication with the branch inlet passages and the respective condensers, the said safety valves controlling the said communication.

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

CHARLES W. FINCKE. [L. S.]

Witnesses:

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HENRY M. LEWIS.