

No. 627,038.

Patented June 13, 1899.

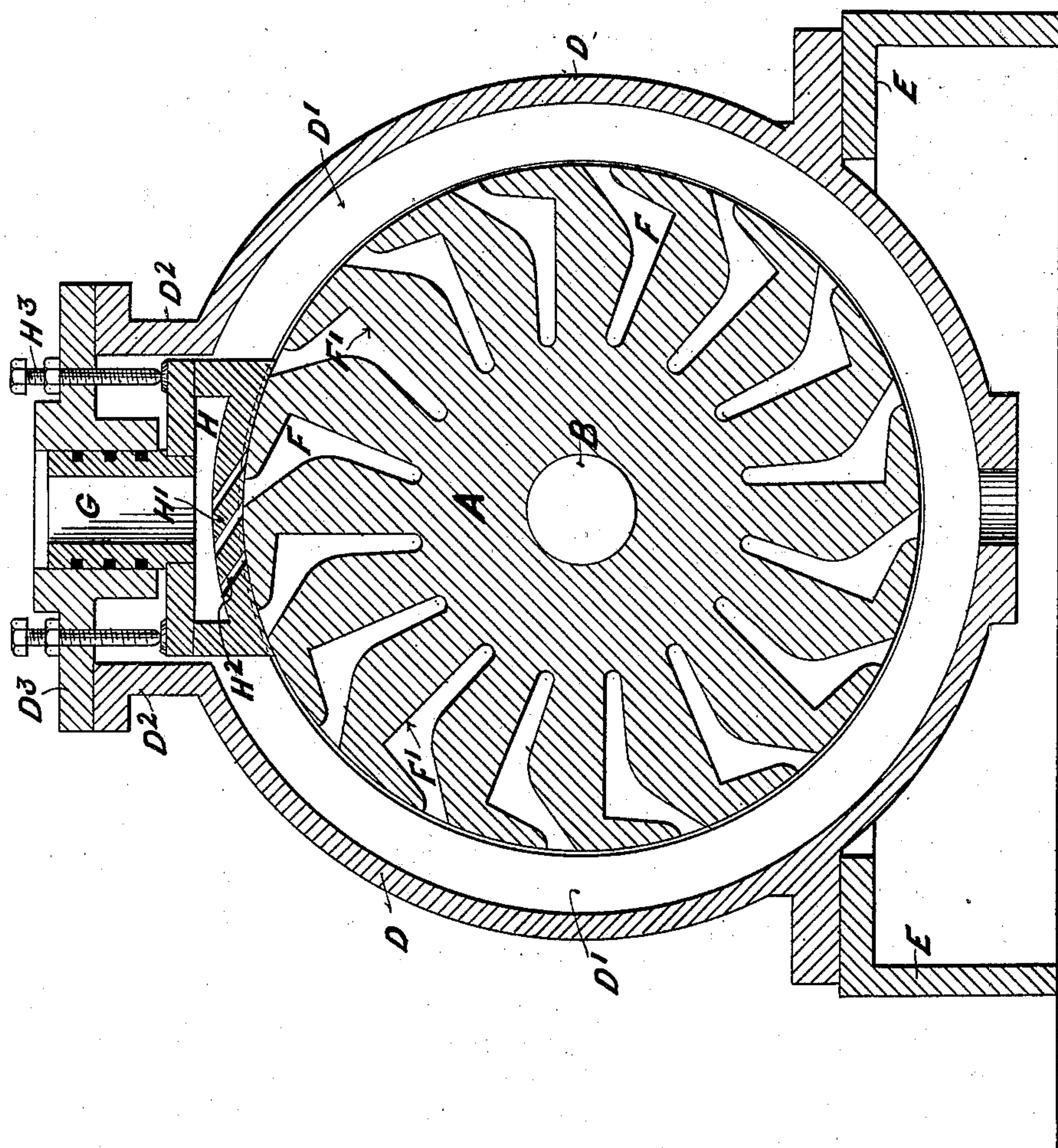
J. YATES.  
ROTARY ENGINE.

(Application filed July 15, 1898.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.



Witnesses:  
*John Chalmers White*  
*Percy O. Bowen*

Inventor:  
*Joseph Yates*  
—by *Thos. H. H. & Fisher*  
Attorneys.



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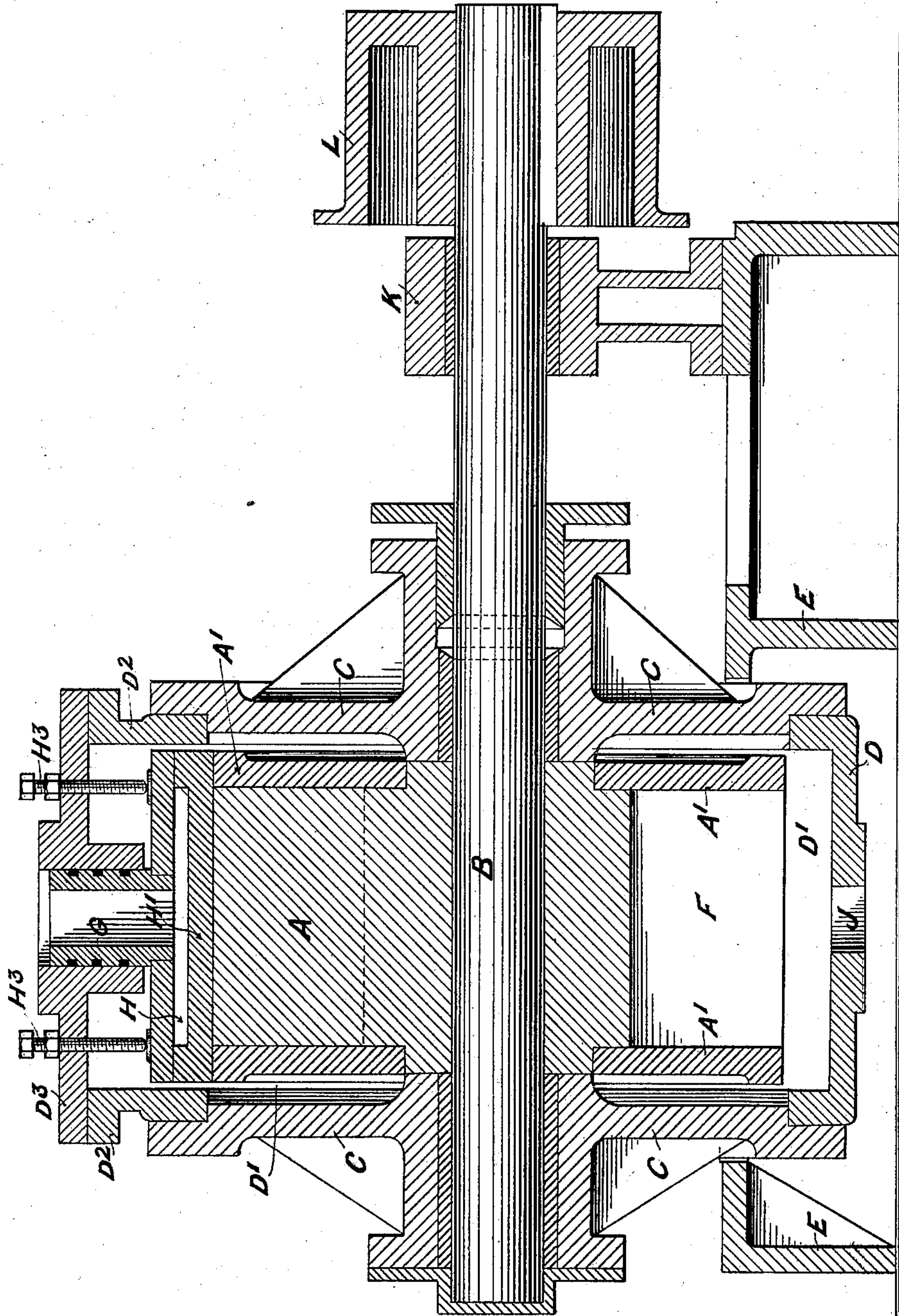
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(No Model.)

2 Sheets—Sheet 2.

FIG: 2.



Witnesses:  
*John Chalmers*  
*Wesley C. Bowen*

Inventor:  
*Joseph Yates*  
by *William H. Fisher*  
Attorneys.



# UNITED STATES PATENT OFFICE.

JOSEPH YATES, OF LONDON, ENGLAND.

## ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 627,038, dated June 13, 1899.

Application filed July 15, 1898. Serial No. 686,069. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH YATES, residing at London, in the county of Middlesex, England, have invented certain new and useful  
5 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 it appertains to make and use the same.

10 This invention refers to a new or improved rotary engine, essentially consisting of a rotary part, hereinafter termed the "rotator," which is of cylindrical form, mounted axially and concentrically on a shaft carried on bearings on the end plates of a cylindrical casing within which the rotator is located. The rotator is formed with a number of separate chambers opening on the periphery of its cylindrical surface and extending inwardly into  
20 the cylinder, but not in a direction at right angles to such surface, and each chamber has a closed inner end. The casing has a steam-inlet by which steam passes into a steam-chest and by ports formed in a bearing-plate  
25 of the steam-chest, which plate is in contact with the rotator to each chamber of the latter, as the chambers consequently pass the bearing-plate, the steam from the chambers being then exhausted into the casing, away  
30 from which it is conducted by a suitable passage.

The invention refers to the specific combination of the composing parts, which I will now proceed to more particularly describe  
35 with reference to the accompanying drawings.

Figure 1 is a vertical transverse section of the motor, and Fig. 2 is a longitudinal section of same.

Referring to the drawings, A is the rotator, keyed on a shaft B, which is carried in bearings, Fig. 2, in the end plates C C of a casing D, surrounding the rotator A, there being a clearance-space D' between the interior surface of the casing and the rotator-cylinder.  
45 The casing D is fixed to the foundation-bed E of the engine or otherwise secured.

F F, Fig. 1, are the chambers, formed in the body of the rotator, opening, as aforesaid, onto the cylindrical surface and extending  
50 into the interior, the ends being closed while the base or forward side F' of each chamber is at about right angles to the direction in

which the chambers extend into the body of the rotator. The direction in which the chambers extend is forward of a radial line drawn  
55 from the opening of a chamber on the surface of the rotator to its center, and so much so that the bases F' of the chambers in the interior of the rotator are nearly radial. The chambers may extend longitudinally, as  
60 shown at Fig. 2, nearly the whole width of the rotator-cylinder A and may be conveniently formed, as there shown, by slotting through the cylinder longitudinally and then applying fixed end plates A' thereto.  
65

At the upper part of the casing D, I provide an extension D<sup>2</sup>, fitted with a fixed cover D<sup>3</sup>, having a tubular bearing-sleeve in a radial line with the center of the rotator A to receive a vertically-movable tube-piece G. This tube-  
70 piece G is packed peripherally—say by metal packing-rings, as shown—to be steam-tight, and carries at its lower end a steam-chest H, with the interior of which the vertically-movable tube G communicates. The lower  
75 surface-plate H' of the steam-chest H is segmental and bears truly upon the circular surface of the rotator, apertures H<sup>2</sup> being formed through the segmental bearing-plate H', by which steam is admitted to the chambers F  
80 as they pass, consecutively, below the steam-chest. The apertures may be inclined, as shown, to correspond with the direction of inclination of the entrance to the chambers F in the rotator A.  
85

To prevent the part H' being lifted by underneath pressure of steam, set-screws H<sup>3</sup> are provided, the points of which bear upon the top of part H', as shown. These are set after the parts are hot. A steam-supply pipe (not  
90 shown in the drawings) is to be connected to the cover D<sup>3</sup> to supply the valve-chest H with pressure-steam, and at a convenient part of the casing—say at the lower part—a port J is provided to take off the exhaust-steam, which  
95 is thrown into the casing D from the chambers F as the latter pass away from the segmental plate H' of the steam-chest.

A steam-tight contact is preserved between the segmental plate H' and the circular surface of the rotator not only by the gravity of  
100 the valve-chest, but by the steam-pressure acting upon its upper surfaces. The valve-chest itself is maintained in position by the



walls D<sup>2</sup>, Fig. 1, of the extension of the casing D, and the valve-chest is rectangular in plan.

The shaft B is continued through a gland-packed bearing of one of the end plates C, Fig. 2, and can be utilized for any required purpose. It is shown in the drawings, Fig. 2, supported by a bearing-bracket K and having keyed at its end a driving-pulley L.

What I desire to claim as my invention is as follows:

1. In rotary engines the combination with a rotary cylindrical part, a shaft passing axially and concentrically therethrough to which the cylindrical part is keyed, a cylindrical casing inclosing the cylindrical part, a clearance-space between the cylindrical part and the casing-bearings in the side plates of the casing to receive the shaft of the cylindrical part, and a number of chambers in the cylindrical part opening onto the curved surface thereof, and each extending forwardly of a radial line drawn from the surface-openings to the center of the cylindrical part, of an extension of the upper part of the casing, a vertically-movable steam-chest in the extension, a segmental bearing-plate on the lower surface of the steam-chest to bear steam-tight on the circular surface of the cylindrical part, apertures in the segmental plate communicating with the steam-chest, a tubular extension on the steam-chest movable vertically in a sleeve-tube of the casing by which steam is applied to the steam-chest and delivered to the chambers of the cylindrical part as they consecutively pass beneath the segmental plate, and an exhaust-port in the casing to carry off the exhaust-steam thrown out from the chambers substantially as set forth.

2. In a rotary engine, the combination with a rotary cylindrical piston having a number of chambers opening onto the curved surface thereof; a shaft passing axially and concentrically through said piston to which said piston is fixed; a cylindrical casing inclosing

the said piston; bearings in the side plates of the casing to receive the said shaft; and an extension of the upper part of the casing; of a steam-tight cover fitting said extension and having a bearing-sleeve whose center is in a radial line with respect to the center of the shaft of the piston; a vertically-movable steam-chest in the extension; a segmental bearing-plate on the lower surface of the steam-chest to bear steam-tight on the circular surface of the rotary piston; steam-passages through said segmental bearing-plate; a tubular extension on the steam-chest movable in said bearing-sleeve, by which steam is delivered to the steam-chest, and thence through the passages in the segmental bearing-plate to the chambers of the piston as they pass consecutively beneath said plate; and an exhaust-port in the casing to carry off the exhaust-steam, substantially as described.

3. In a rotary engine, the combination with a rotary cylindrical piston having a number of chambers opening upon its periphery; a cylindrical casing inclosing said piston and having bearings for said piston, and an extension opposite the periphery of said piston; of a steam-tight cover fitting said extension and having a bearing-sleeve whose center is in a radial line with respect to the axis of said piston; a steam-chest in said extension movable therein, and having a segmental bearing-plate making contact with the periphery of the piston; steam-passages through said segmental bearing-plate; a tubular extension on the steam-chest fitting said bearing-sleeve and movable therein in a radial line with respect to the axis of the piston; means for holding said segmental plate in close relation to the piston; and an exhaust-port in the casing to carry off the exhaust-steam, substantially as described.

JOSEPH YATES.

Witnesses:

FREDERIC GRINEL,  
W. LILLYWHITE.