

(No Model.)

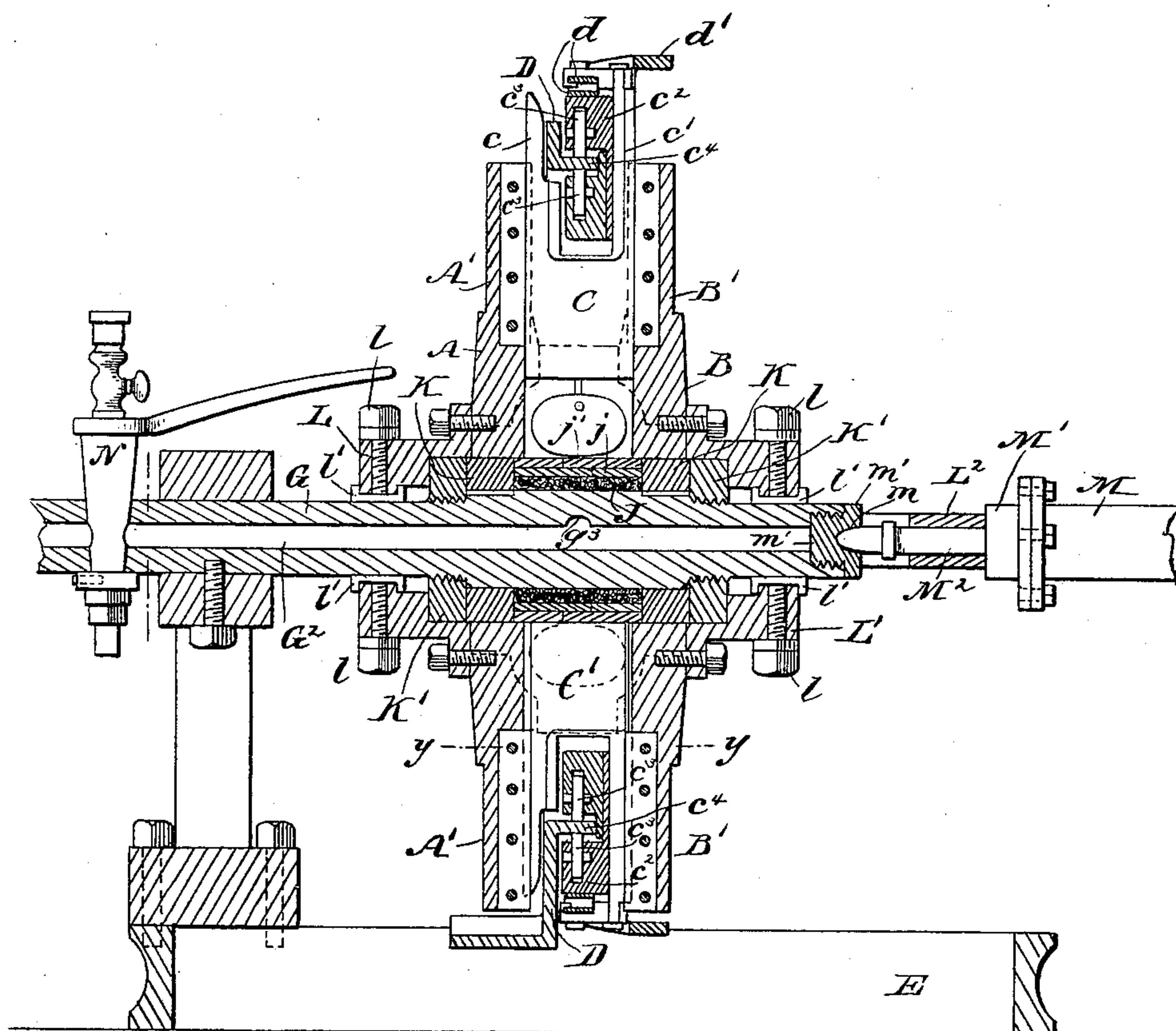
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J. MARVIN.  
ROTARY ENGINE.

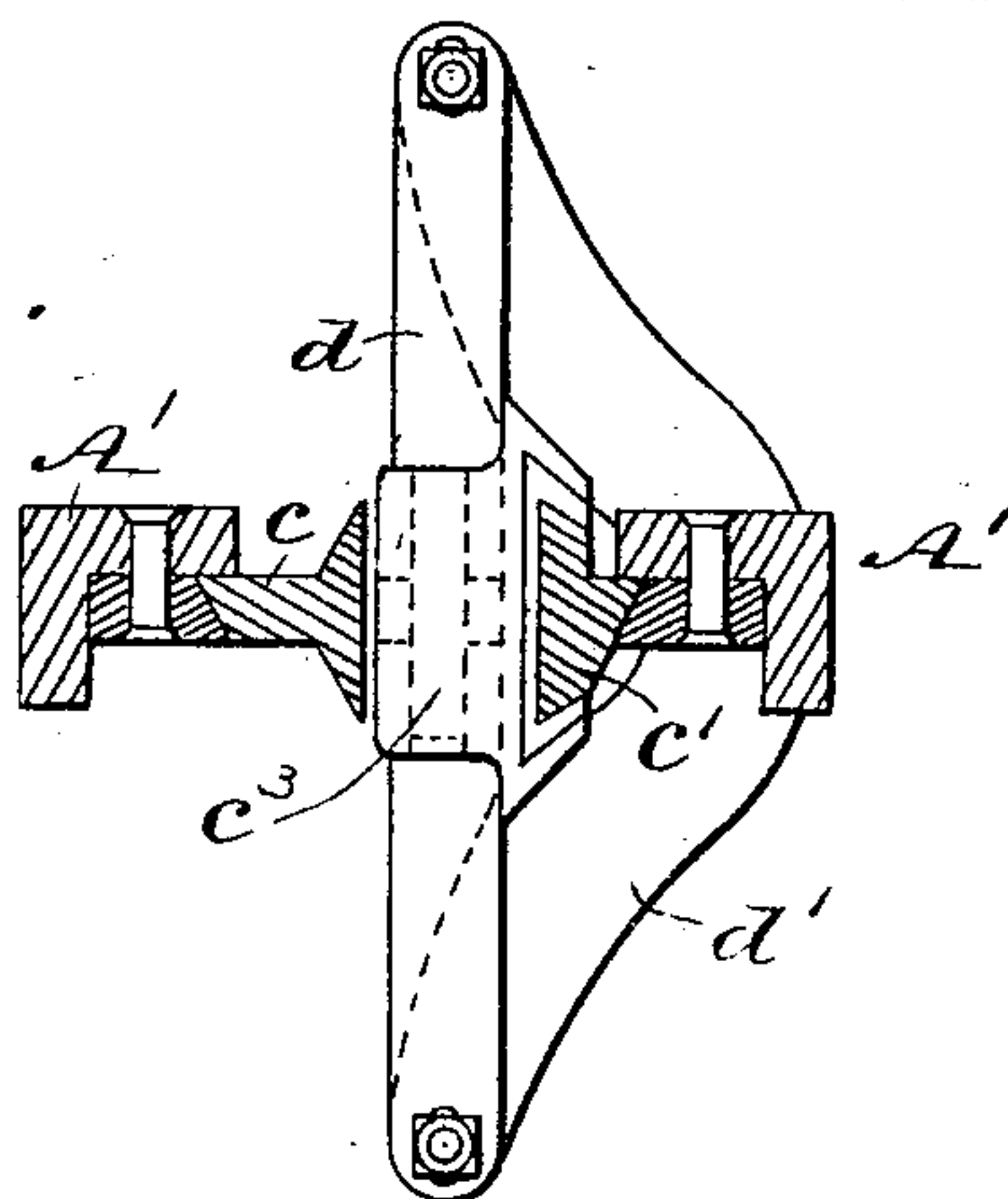
No. 388,210.

Patented Aug. 21, 1888.

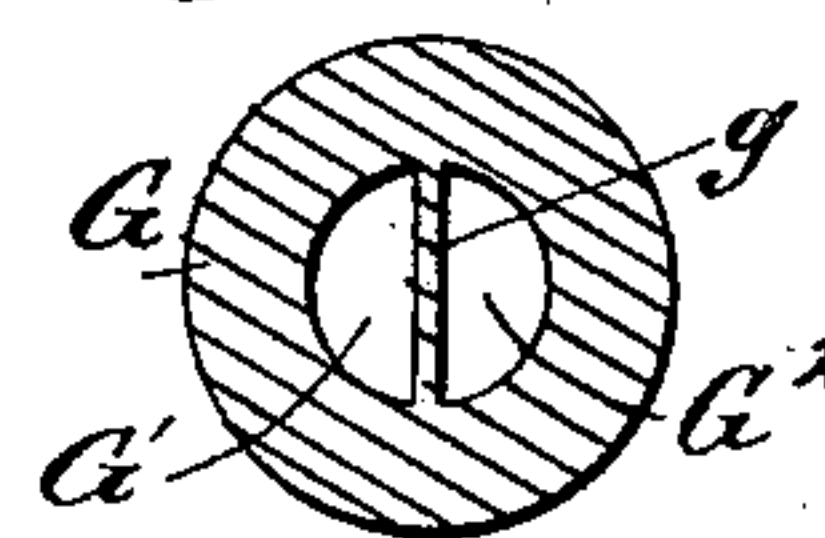
*Fig. 1.*



*Fig 4.*



*Fig. 5.*



WITNESSES:

John M. Deemer  
C. Sedgwick

INVENTOR:

INVENTOR:  
J. Marvin.  
BY Munn & Co.

ATTORNEYS.

(No Model.)

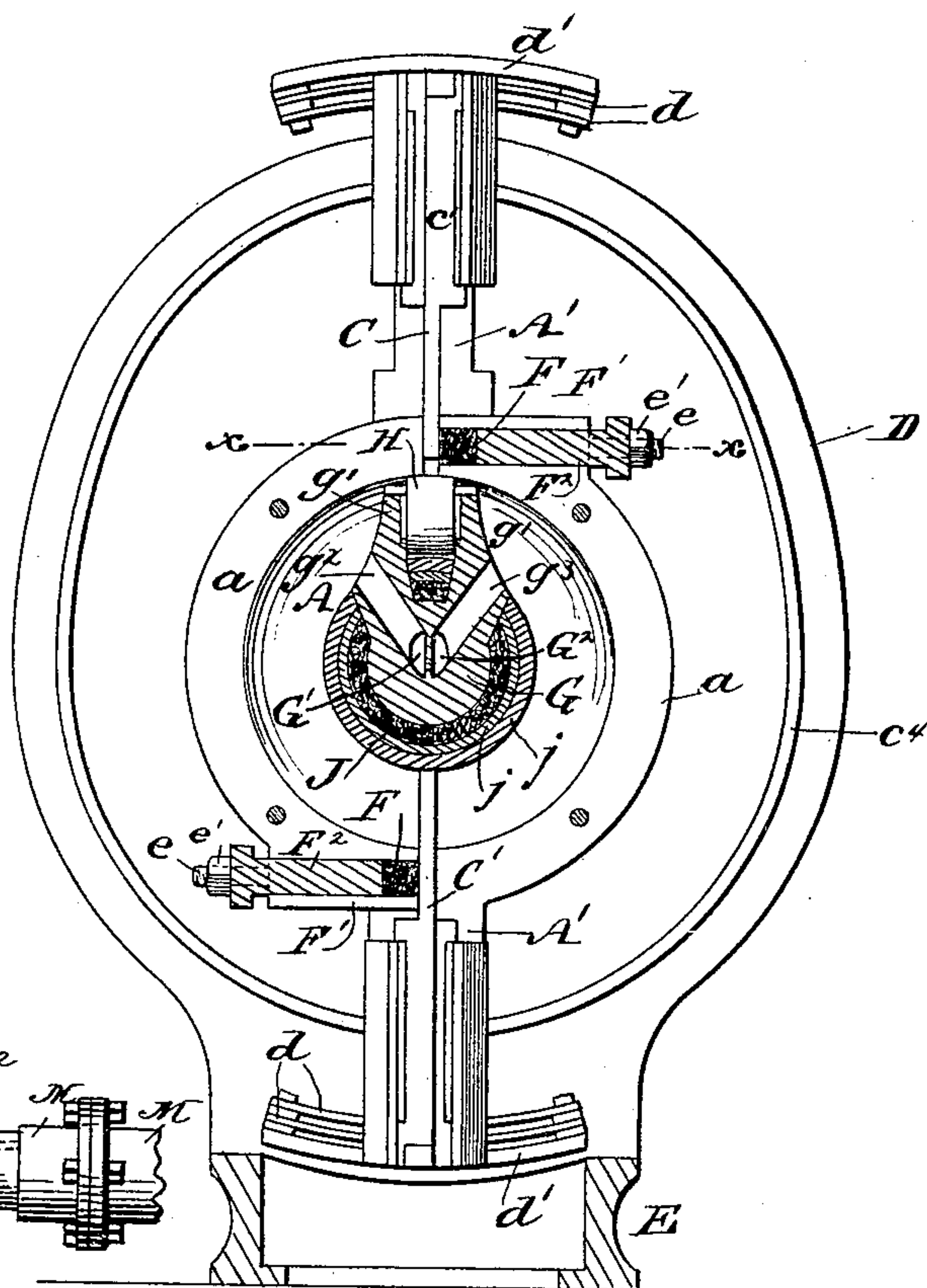
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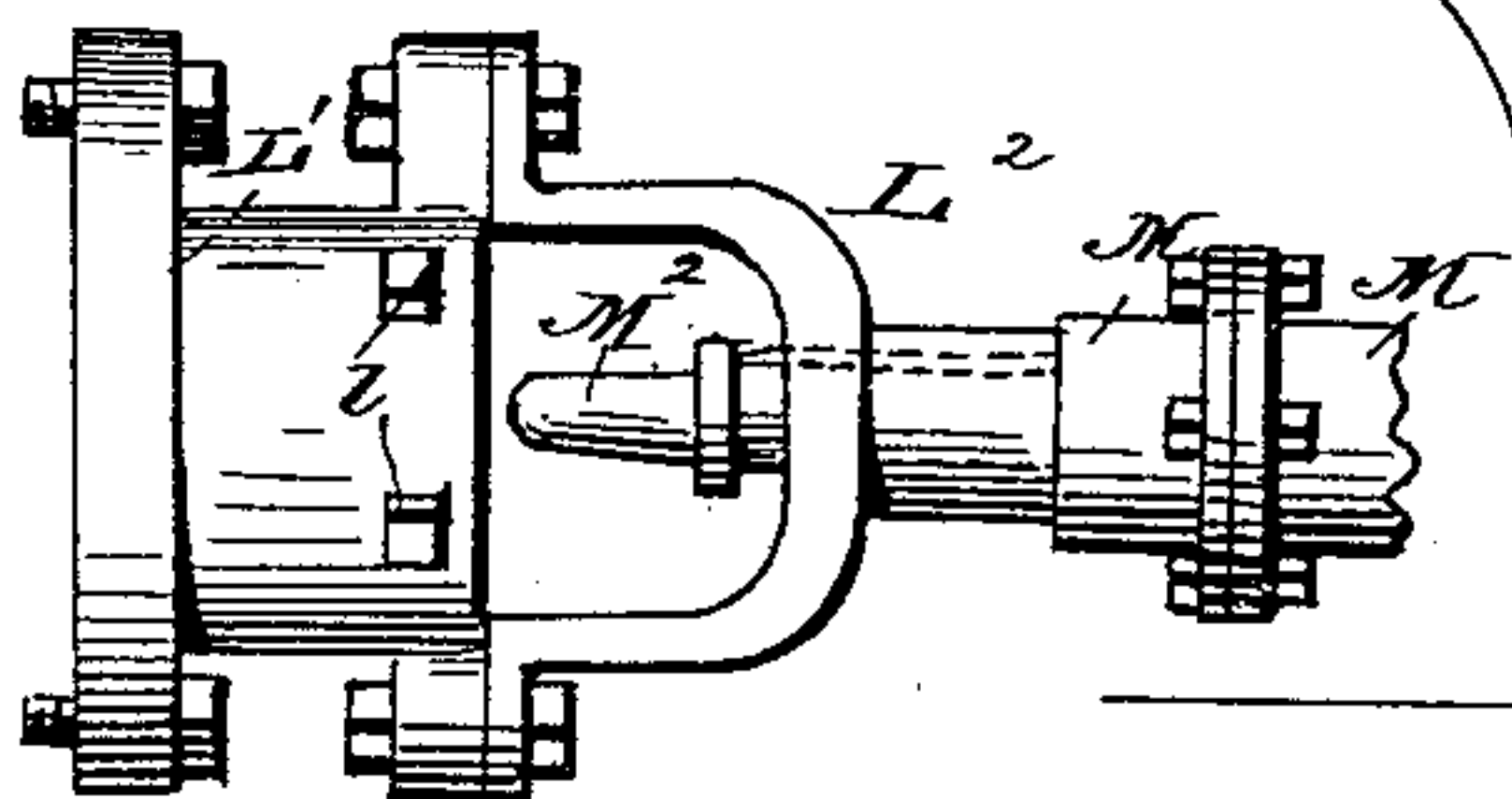
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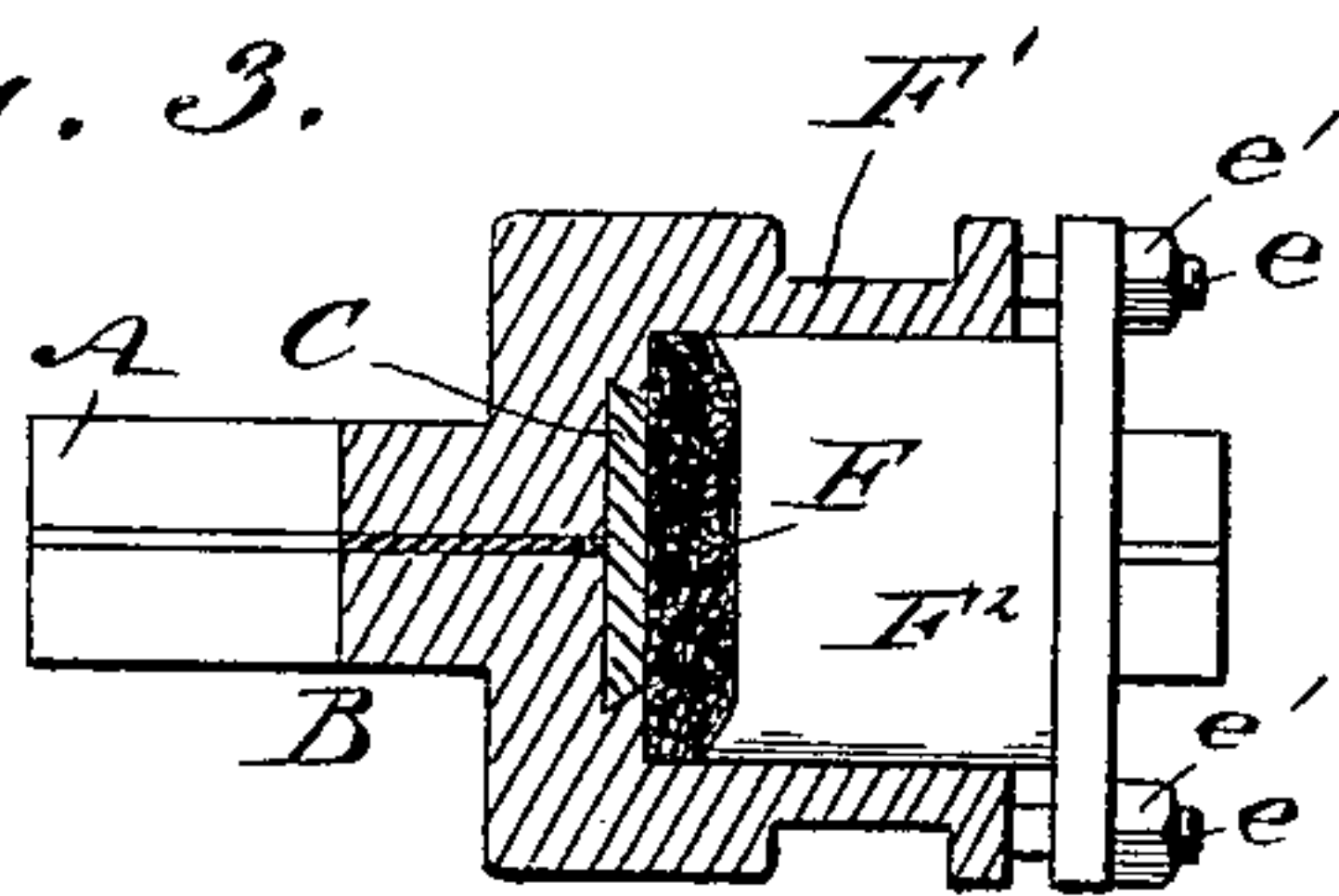
*Fig. 2.*



*Fig. 6.*



*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

JOHN MARVIN, OF NORTHPORT, NEW YORK.

## ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 388,210, dated August 21, 1888.

Application filed December 13, 1886. Serial No. 221,483. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN MARVIN, a citizen of the United States of America, and a resident of Northport, town of Huntington, Suffolk county, State of New York, have invented a new and useful Rotary Engine, of which the following is a specification.

The object of my invention is to furnish an engine for general use which shall exert continuous pressure upon a revolving shaft in the direction of its revolution and avoid all dead-centers, the pressure being equal at all points of the revolution; and the invention consists principally in operating the vanes by an external eccentric.

The invention also consists in constructing the plates which form the steam-chest to rotate upon a fixed shaft, through which steam is admitted to and exhausted from the chest.

The invention also consists of the packing of the engine and of its general construction, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal central sectional elevation of the engine. Fig. 2 is a transverse sectional elevation showing one of the side plates of the steam-chest removed. Fig. 3 is a detailed sectional plan view taken on the line  $x x$  of Fig. 2. Fig. 4 is an enlarged sectional view on the line  $y y$  of Fig. 1. Fig. 5 is a sectional view of the axis of the steam-chest, showing the steam-passages therein. Fig. 6 is a detached plan view of means for connecting the engine to the shaft.

The steam-chest is formed of two disked or annular plates, A B, placed face to face upon the shaft G, and bolted together through the flanges  $a$ . The said plates A B are formed with corresponding diametrical arms, A' B', in channels in which the vanes C C' are held, and between which they are moved radially by the eccentric D, which is held stationary, being secured to the frame E. The vanes are each divided to form the members  $c c'$ , which straddle the eccentric D, and to the member  $c'$  is secured a block,  $c''$ , in which are journaled the small wheels  $c^3 c^3$ , which run in contact with the horizontal flange  $c^4$  of the eccentric

D to reduce friction, as will be understood from Fig. 1. The outer wheel,  $c^3$ , is held in contact with the flange  $c^4$  by plate-springs  $d$ , secured at their ends to the plates  $d'$ , held at the outer end of the member  $c'$ , as shown clearly in Figs. 2 and 4, so that the spring will relieve the vanes of shock, and at the same time give them a desirable elasticity in their longitudinal movement. The vanes are packed each by soft packing F, held in a box, F', and said packing is forced in contact with the vanes by a longitudinal follower, F<sup>2</sup>, and fixed bolts  $e$  and nuts  $e'$ , as shown clearly in Figs. 2 and 3.

The axis or shaft G is made hollow, with a central longitudinal partition,  $g$ , which forms two passages, G' G<sup>2</sup>, for the admission of steam to and exhaust from the engine. At the center of the shaft G is formed within the engine the parallel side projections or plates,  $g' g'$ . (See Fig. 2.) Between these two side plates is held the packing H, preferably of rubber. This packing hugs the inner surface of the cylinder and prevents steam from blowing from the induction to the exhaust side. The passage G' communicates with the cylinder through the lateral passage  $g^2$  shown in Fig. 2, and the passage G<sup>2</sup> by the side passage,  $g^3$ . The shaft G is packed around the projections  $g' g'$  by the soft packing J, held next to the shaft by the rings  $j j'$ , which are divided, as shown in Fig. 2, to form less than a complete circle. The rings  $j j$  are held in place by the rings K and ring-nuts K' K', screwed upon the shaft G. The steam-cylinder turns upon the rings K and ring-nuts K', being held thereupon by the stepped and annular side plates, L L', and the cylinder is centered upon the said rings and nuts by the adjusting-screws  $l$ , passed through the hubs of the side plates, L L', the inner ends of said screws acting upon the blocks or shoes  $l'$ , which run in contact with the shaft G, as will be clearly understood from Fig. 1.

The shaft M, to be turned by the engine, is connected to the said annular side plate, L', by the yoke L<sup>2</sup>, which carries at its center the coupling M', to which said shaft is bolted, and this coupling is aligned with the center of the shaft G by the rod M<sup>2</sup>, the inner end of which enters a socket,  $m$ , in plug  $m'$ , which closes the end of the shaft G.

Steam is admitted to the cylinder and per-



mitted to exhaust therefrom by the four-way cock or valve N, fitted in one end of the hollow shaft G shown in Fig. 1.

The eccentric D is arranged to slide each vane C C' in contact with the central ring, j, after it passes one of the steam-ports, and to hold it in such contact until it nearly reaches the opposite steam port, and then the eccentric lifts the vane to permit exhaust and to carry the vane over the projections g' g' and packing H.

The vanes C C' are diametrically arranged, so that the steam acting against each will impart a one-half revolution to the cylinder, and the exhaust at one port will be opened by the lifting of the vane by the eccentric just at the time the other is closed down to take steam from the opposite port, so that only one vane is in action at a time.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the cylinder of a rotary engine, of an eccentric surrounding the same, radial vanes working in the cylinder and connected to the horizontal flange c<sup>4</sup> of the eccentric by the anti-friction wheels c<sup>3</sup>, carried by the vanes, one upon the outer and the other

upon the inner surface of said flange, substantially as shown and described.

2. The plate A B of the cylinder placed upon a fixed hollow shaft and provided with radial vanes C, connected to the surrounding eccentric D, and formed with tangential boxes F', adjacent to the vanes, in combination with the packing following F<sup>2</sup>, fitted in the boxes, substantially as described.

3. The shaft G, formed with steam-passages and with the projections g' between the steam-ports, in combination with the packing J, rings j K K', and the cylinder placed thereon, and the vanes C C', and eccentric D for operating the vanes, substantially as described.

4. The cylinder placed upon the fixed shaft G and provided with radial vanes, in combination with the eccentric D, and the yoke L<sup>2</sup>, for connecting the shaft M to the cylinder, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 23d day of November, 1886.

JOHN MARVIN.

Witnesses:

JESSE CARLL, Jr.,  
JOS. M. BRUSH.