

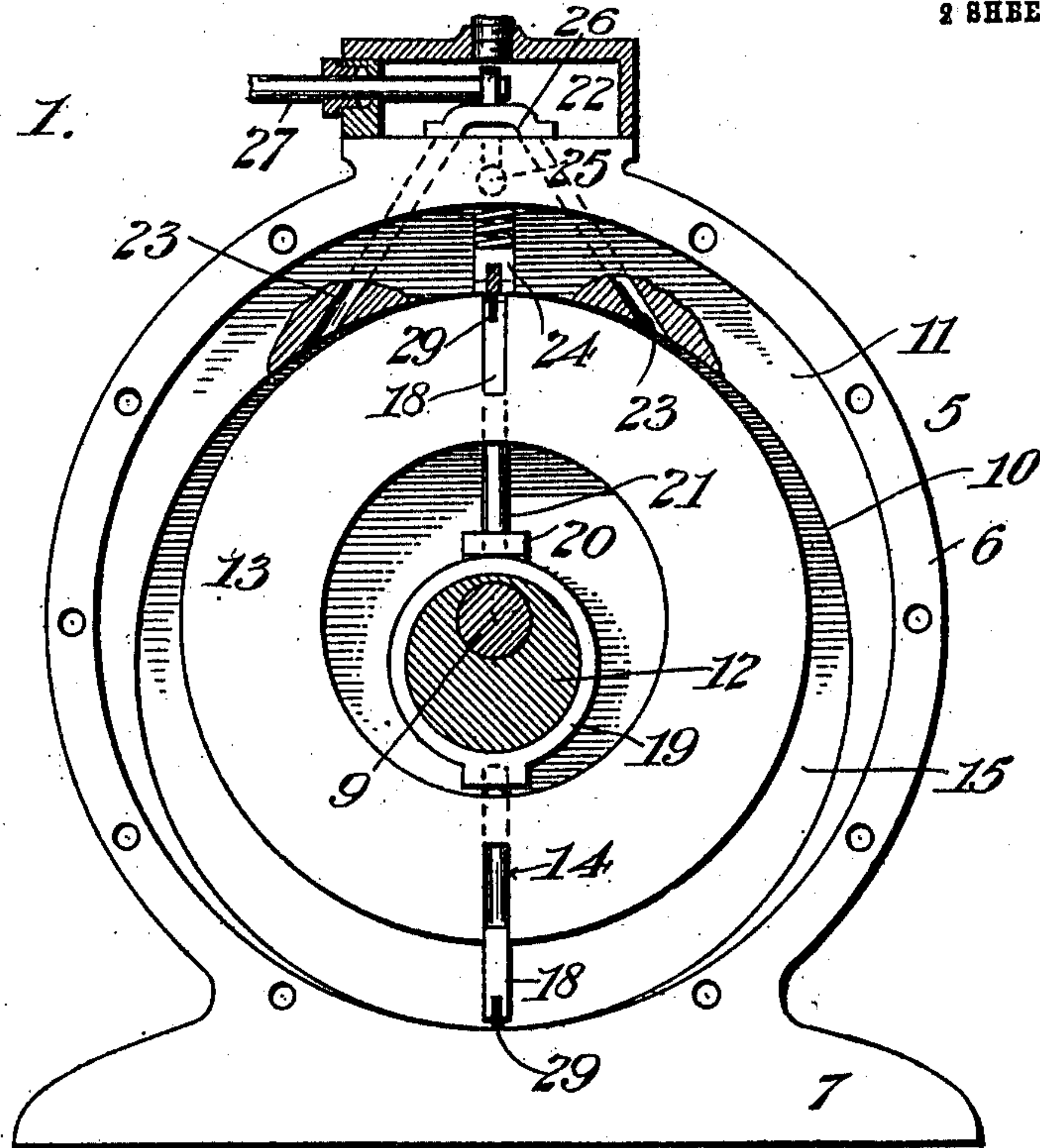
J. W. LARIMORE.  
 ROTARY ENGINE.  
 APPLICATION FILED NOV. 24, 1909.

978,602.

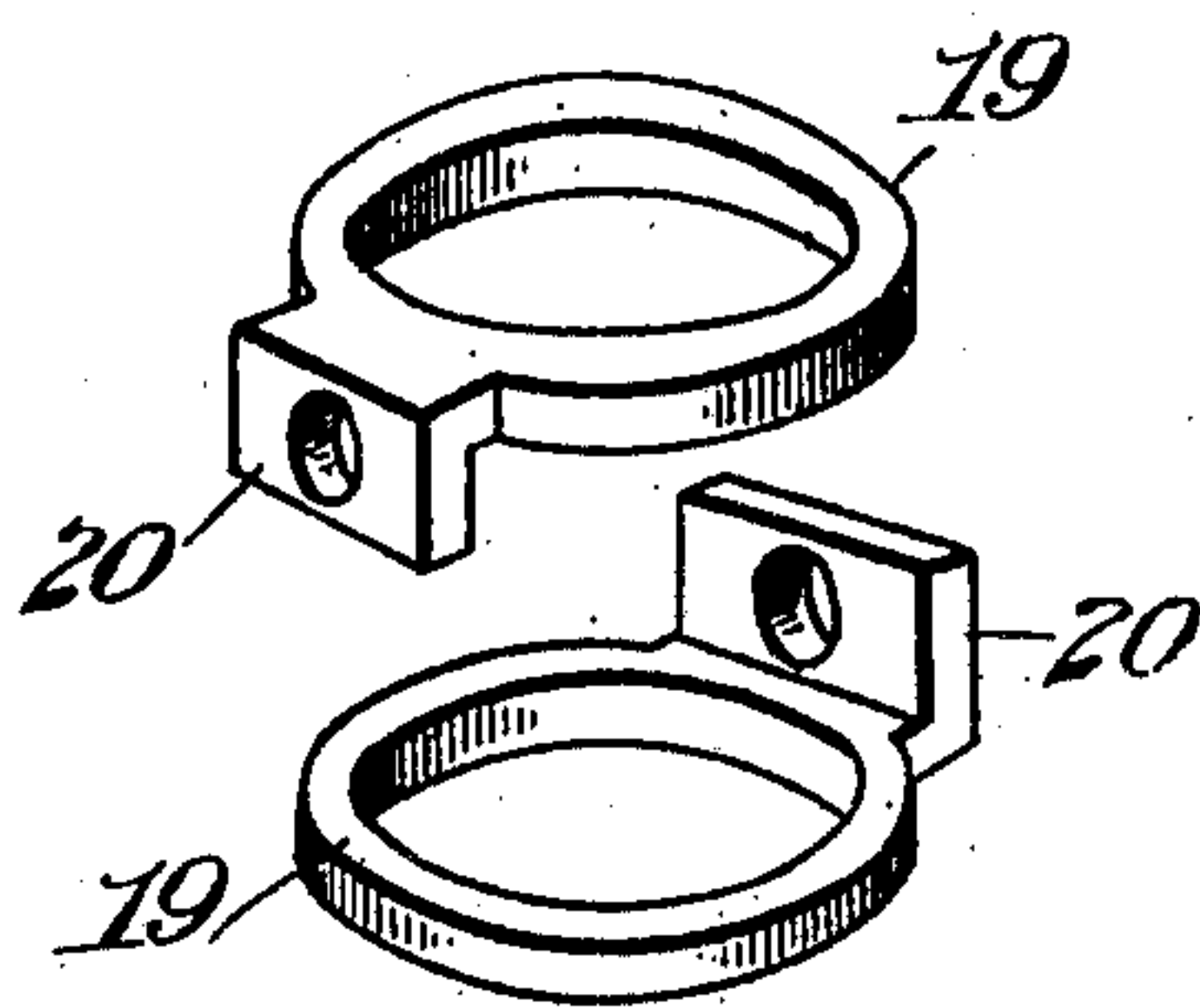
Patented Dec. 13, 1910.

2 SHEETS—SHEET 1.

*Fig. 1.*



*Fig. 4.*



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

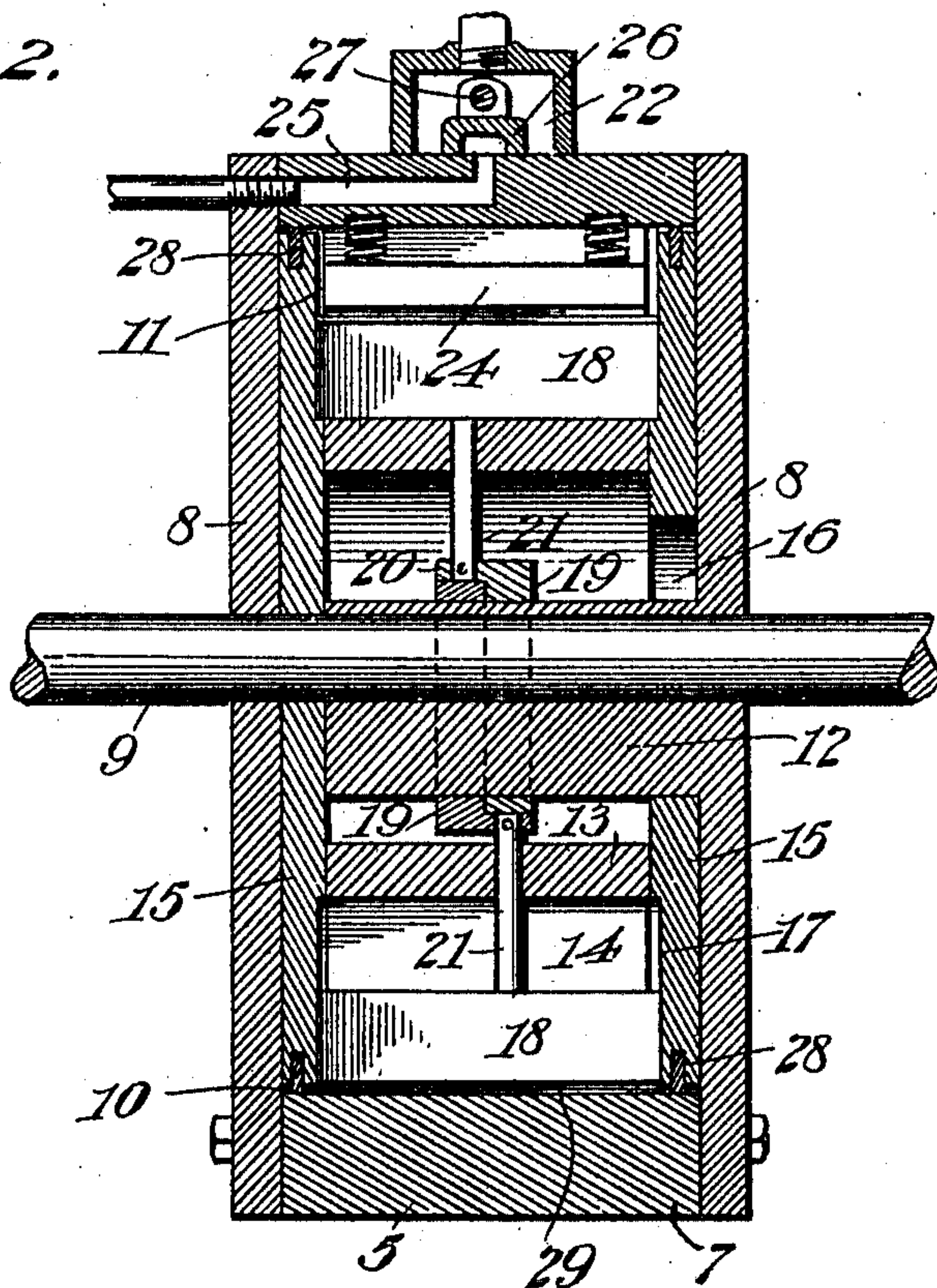
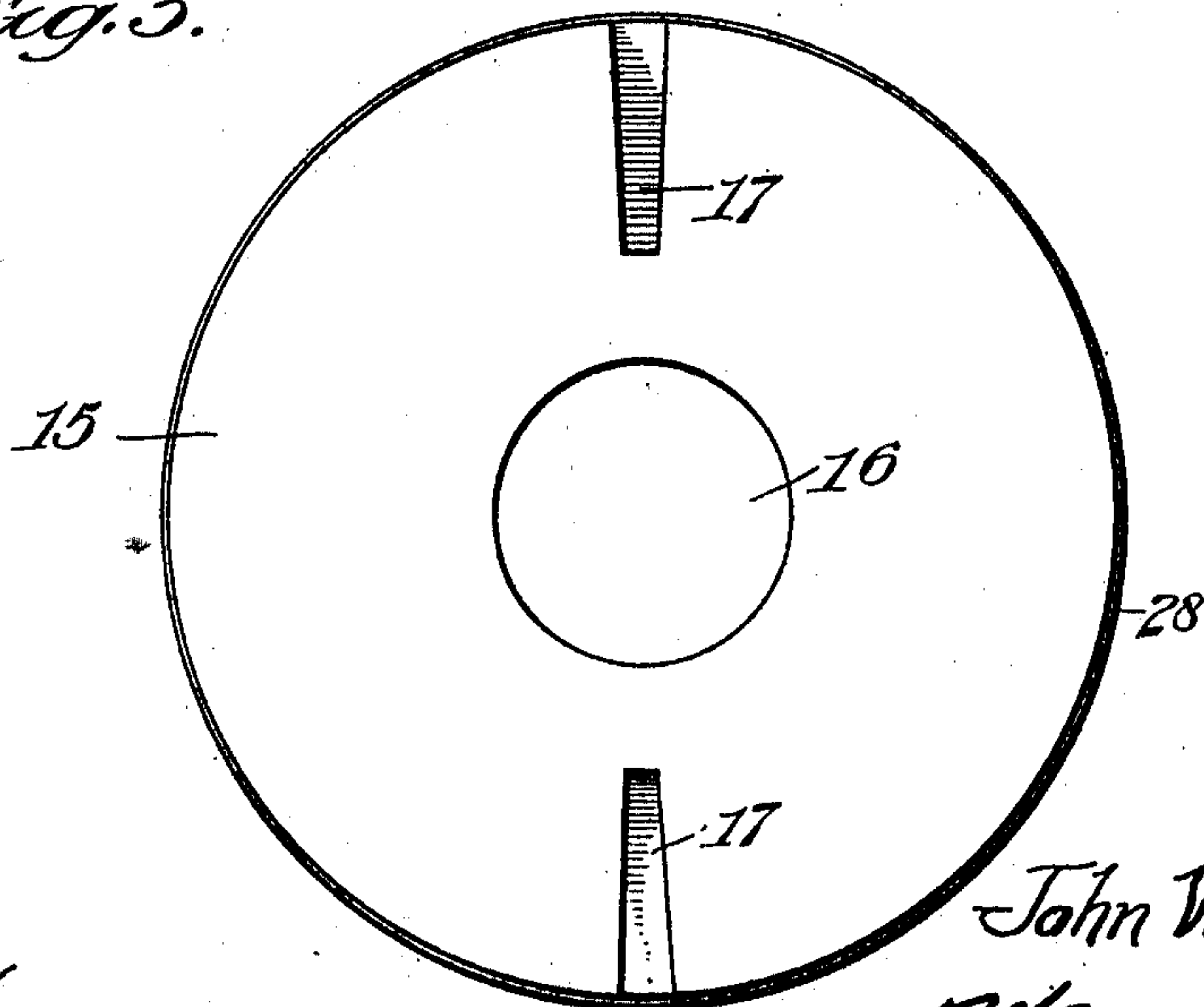


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## ROTARY ENGINE.

978,602.

Specification of Letters Patent.

Patented Dec. 13, 1910.

Application filed November 24, 1909. Serial No. 529,758.

*To all whom it may concern:*

Be it known that I, JOHN W. LARIMORE, a citizen of the United States, residing at Benton, in the county of Franklin and State of Illinois, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

This invention relates more particularly to that type of rotary engine, in which the piston operates in a piston chamber or bore that is disposed eccentrically to the axis of rotation of said piston.

The primary object is to provide a novel and exceedingly simple structure made up of few parts that can be readily manufactured and assembled, said parts not being liable to injury or derangement.

A further and important object is to arrange the parts or elements which are subjected to pressure and strain so that they are rigidly supported and braced, and are not liable to become sprung or misshapen.

The preferred form of construction is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of the engine, with one of the cylinder heads removed and portions illustrated in section. Fig. 2 is a vertical sectional view at right angles to Fig. 1. Fig. 3 is a detail view of the inner face of one of the piston heads. Fig. 4 is a detail perspective view of the cam rings.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment disclosed, a cylinder member 5 is employed comprising an outer wall 6, preferably mounted on a suitable base 7, and having heads 8 detachably secured to its opposite sides. Extending entirely through the cylinder member and through the heads thereof is an engine shaft 9, the said cylinder member being provided with a piston-receiving bore 10 that is eccentric to the axis of the shaft 9, and said member furthermore having in its opposite sides, counterbores 11 disposed concentrically to said shaft. The lower side walls of the counterbores are in line or register with the lower side wall of the piston-receiving bore. One of the heads 8 is provided with a stationary cam 12 that extends through one of the counterbores into the piston-receiving bore 10 and terminates at the opposite counterbore.

A rotary piston is located in the cylinder

member, and consists of a cylindrical body 13 arranged in the piston-receiving bore 10, and having in its opposite sides sockets 14. Heads 15 are secured to the opposite sides of the body, one of these heads having a central opening 16 through which the cam 12 passes, the other head 15 being suitably secured to the shaft 9. Said heads are provided on their inner sides with channels or guideways 17 that are alined with the sockets 14. Piston blades 18 are slidably mounted in said sockets and project beyond the body so that their opposite edges operate in the channel 17, as shown in Fig. 2. Cam rings 19, located side by side, are arranged upon the cam 12, and have offset ears 20, the ear of each ring overlying the opposite ring, as illustrated in Fig. 2. Connected to these ears are stems or links 21, which pass through the body 13 and are fastened to the piston blades.

Arranged upon the cylinder member is a suitable steam chest 22, from which lead opposite supply ports 23 that communicate with the piston-receiving bore 10 on opposite sides of a spring-pressed packing member 24 located in the upper central portion of the cylinder member. An exhaust port, shown in dotted lines at 25, leads from the steam chest. A controlling valve 26 is arranged in the steam chest, and has a stem 27 projecting therefrom. This valve can be either manually or automatically operated by any of the well known means, and it will be obvious that with the arrangement, if said valve is moved in one direction, steam or other motive fluid will be admitted from the steam chest into one side of the cylinder member, while the other port will be in communication with the exhaust 25. By reversing the position of said valve, the relation of the ports will be reversed, and by placing the valve in a central position, as shown in Fig. 1, the supply of motive fluid can be cut off from the engine, either permanently for stopping the same, or temporarily for permitting said engine to operate under the expansive force of the motive fluid. In order to prevent leakage, packing rings 28 are preferably arranged in the peripheries of the piston heads 15, and packing strips 29 are also preferably placed in the edges of the piston blades.

It will be evident that a simple structure is provided by this invention, inasmuch as the same consists of elements that can be



cheaply manufactured, and readily assembled. The engine is reversible, and will if desired operate under the expansive force of steam so that it is economical in operation.

5 Furthermore it is to be observed that the parts subjected to strain are supported and braced. For instance, the engine shaft 9 almost through the entire engine is supported by the cam 12 and by having the ends of  
10 the piston blades operating in the channels, there is no danger of said piston blades being sprung to one side. They will thus always move freely into and out of the sockets.

From the foregoing, it is thought that the  
15 construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size,  
20 shape, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In a rotary engine, the combination with a cylinder member having heads, of a shaft extending through the cylinder member,  
30 a cam carried by one of the heads and terminating short of the other head, said cam surrounding the shaft, a rotary piston operating in the cylinder member and surrounding the cam, said piston having a  
35 member lying between the one end of the cam and one cylinder head and being secured to the shaft, and a piston blade movably mounted on the piston and operated by the cam.

40 2. In a rotary engine, the combination with a cylinder member having heads and an eccentric piston chamber, of a cam carried by one of the heads and extending into the

piston chamber, said cam terminating short  
of the other head and being disposed concentrically in the piston chamber, a shaft extending through the piston chamber and  
45 cam and disposed eccentric to both, a rotary piston located eccentrically in the piston chamber and surrounding the cam, said piston  
50 lying between one end of the cam and one cylinder head and secured to the shaft, a piston blade slidably mounted in the piston, and a ring surrounding the cam and connected to the piston blade. 55

3. In a rotary engine, the combination with a cylinder member, of a shaft extending therethrough, said cylinder member having a piston-receiving bore eccentric to the shaft and having counterbores in its opposite sides  
60 that are concentric to the shaft, the counterbores having the walls at one side in substantial register with the corresponding walls of the piston-receiving bore, means  
65 for introducing motive fluid into the opposite side of the piston-receiving bore, heads for the cylinder member, a stationary cam carried by one of the heads and extending into the piston-receiving bore, a cam surrounding the shaft, a rotary piston comprising  
70 a body located in the piston-receiving bore and having sockets in its opposite sides, and heads secured to the body and operating in the counterbores, said heads having channels in their inner sides alined with the  
75 sockets, piston blades slidably operating in the sockets and channels, overlapping rings rotatably mounted on the cam, and link connections between the rings and the piston blades. 80

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

JOHN W. LARIMORE.

Witnesses:

W. H. WILLIAMS,

W. P. SEEGER.