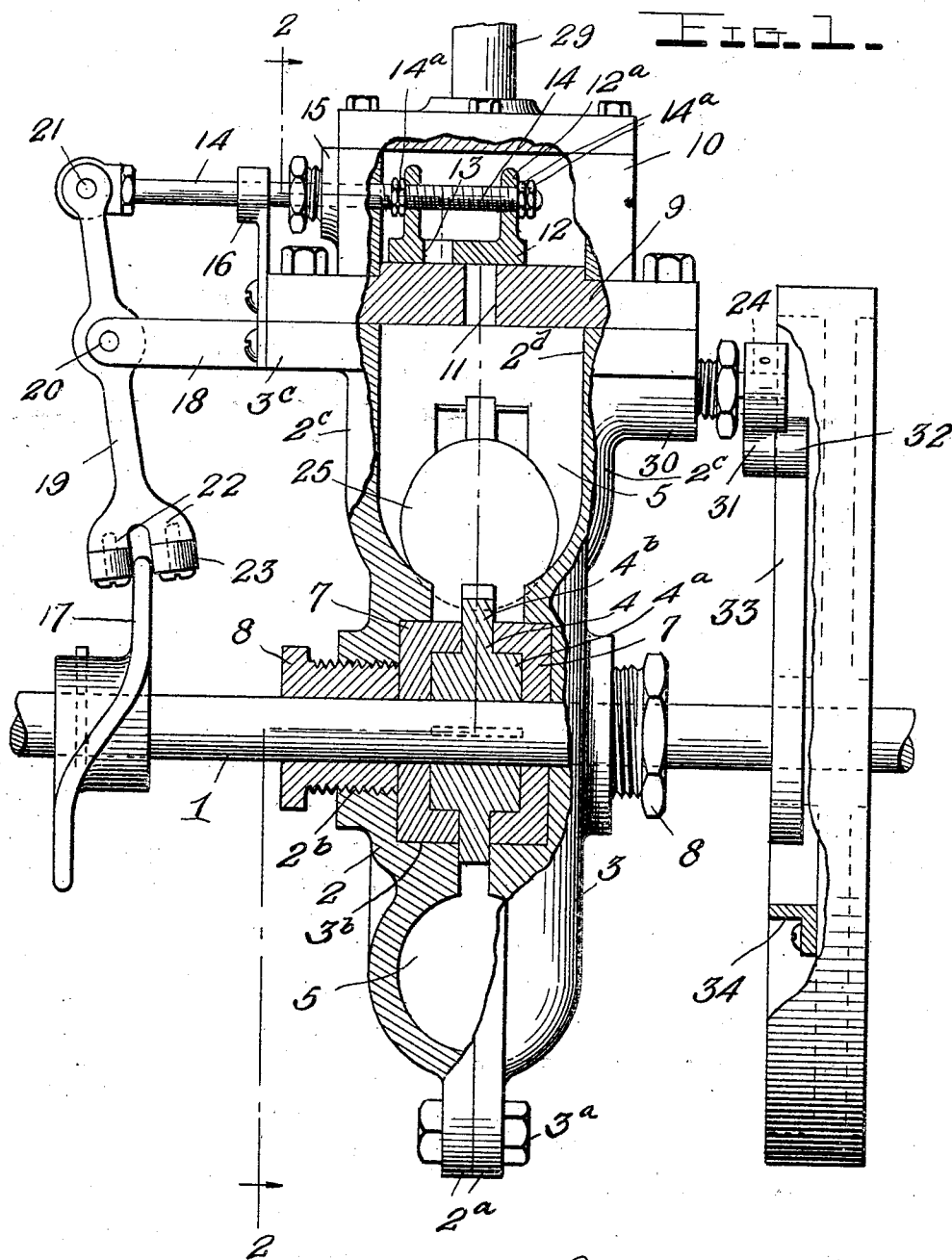


J. A. QUILL.
 ROTARY ENGINE.
 APPLICATION FILED APR. 7, 1909.

939,861.

Patented Nov. 9, 1909.

3 SHEETS—SHEET 1.



Witnesses

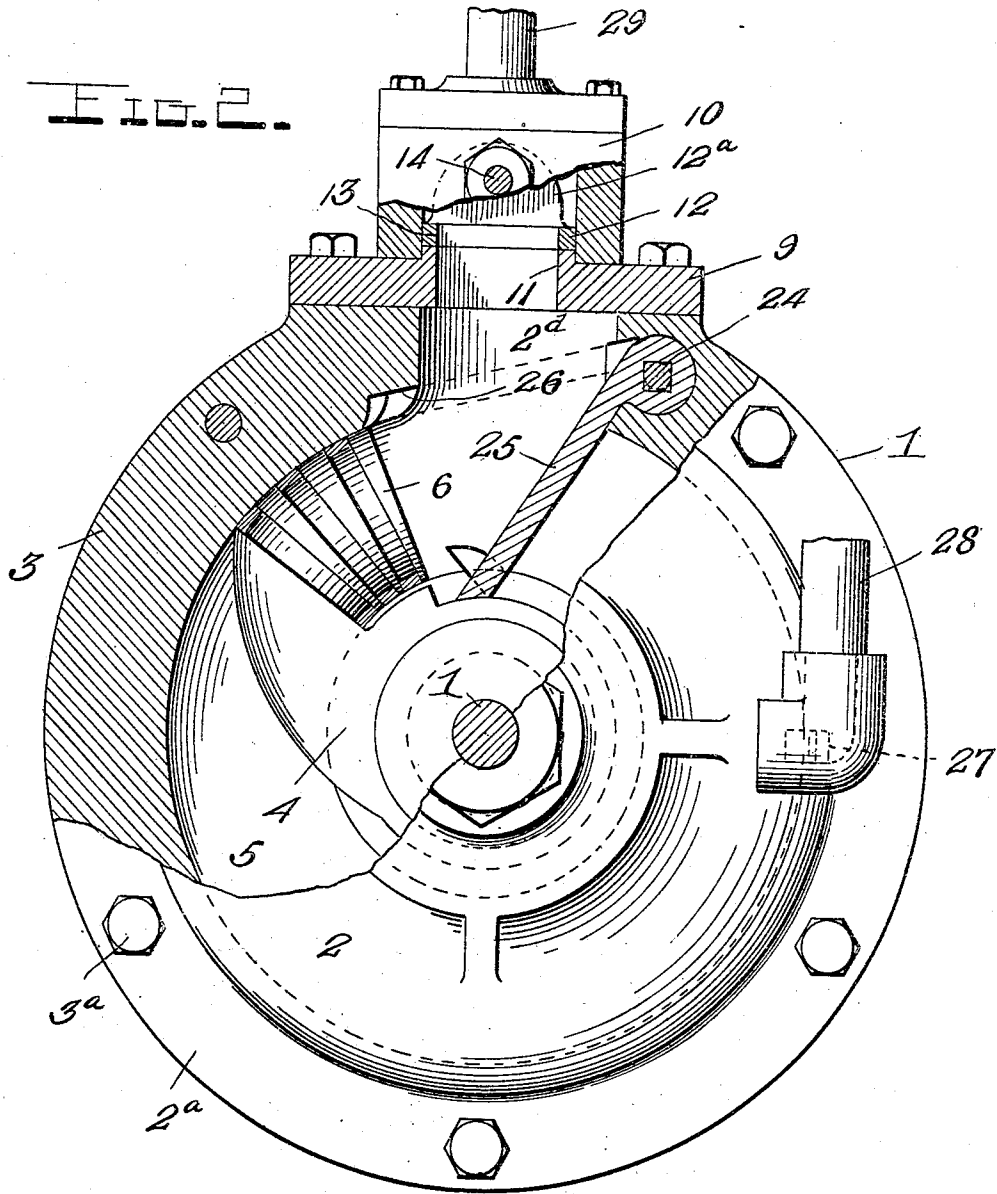
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 3 SHEETS—SHEET 2.



Witnesses

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 3 SHEETS—SHEET 3.

Fig. 3.

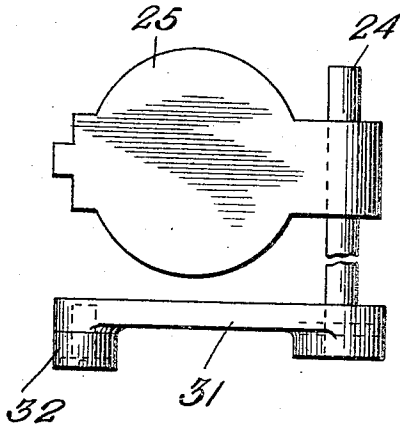


Fig. 4.

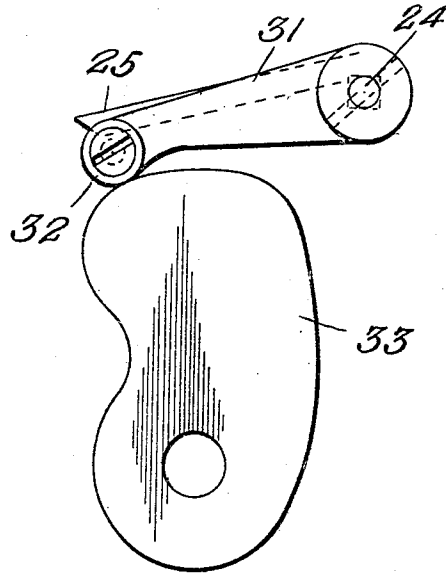


Fig. 5.

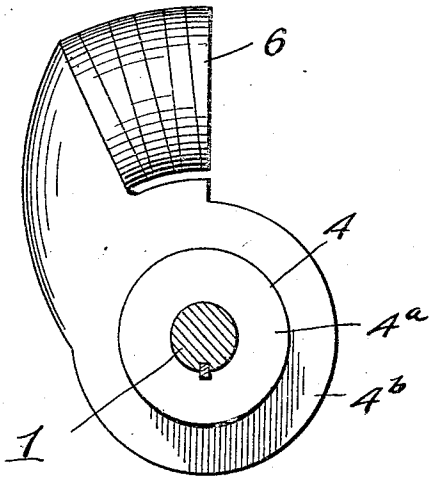
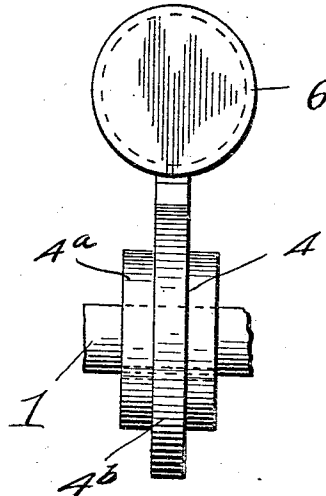


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

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ROTARY ENGINE.

939,861.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed April 7, 1909. Serial No. 438,439.

To all whom it may concern:

Be it known that I, JAMES A. QUILL, a citizen of the United States, residing at Eureka, in the county of Humboldt and State of California, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to that class of rotary engines in which is provided an annular cylinder in which a piston head secured upon a central piston body is driven around by the primary and secondary pressure of steam admitted into the cylinder at one point and exhausted at another point in said cylinder.

My invention consists in the improved construction, arrangement and combination of the parts of an engine of this class which I will now proceed to fully describe, the specific novelty being particularly set forth in the appended claim.

I will now describe my invention in connection with the accompanying drawings, in which—

Figure 1 is a view of an engine embodying my invention, parts being shown in elevation and parts being broken away, Fig. 2 is a view in side elevation, partly sectional on the plane of the broken line 2—2 of Fig. 1, Fig. 3 is a detail view showing the abutment and its shaft detached, in plan view, Fig. 4 is a detail view showing the abutment cam and intervening lever detached, in elevation, and Figs. 5 and 6 are respectively side and edge elevation of the piston, detached.

1 indicates the main shaft of the engine which is journaled in suitable bearings (not shown), of any usual construction and rotates within the cylinder which is composed of two similar side plates 2, 3. The latter are of substantially circular shape and have formed in their opposing inner faces annular depressions, which when the two plates are brought together, form an annular space or race 5 which will hereinafter be designated the cylinder. The edges of the plates 2, 3 project beyond the depressions which form the cylinder to provide annular radially projecting flanges 2^a united by transverse bolts 3^a. The central portion of the plates 2^a are formed upon their outer faces with circular enlargements or bosses having concentric screw threaded openings 2^b, and

upon their inner faces said central portions of the plates are formed with circular concentric recesses 3^b. A piston 4 comprises a hub 4^a keyed to the shaft 1, and from which radiates the centrally disposed circular plate 4^b carrying the piston head 6, which latter is shaped to rotate through the cylinder 5, as will be readily understood on reference to the drawing. The projecting ends of the hub 4 are embraced by flange packing rings 7 of soft metal, which rings fit the recesses 3^b in the plates 2, 3 and have central openings to receive the shaft 1 and inwardly extending flanges to receive said ends of the hub. Glands 8 concentrically arranged on the shaft 1 have threaded portions to screw into the threaded openings 2^b in the plates 2, 3 and to bear against the packing rings 7 to take up lost motion and provide an effective steam-tight joint.

The upper portions of the plates 2, 3 are formed with flanged enlargements 2^c containing a steam inlet passage 2^d and having bolted to their flanges 3^c a top plate 9, which latter contains the steam chest 10 and has a steam port 11. In the steam chest is located a slide valve 12 containing a port 13 and having rising from its top at its opposite ends lugs 12^a formed with screw threaded openings to receive the threaded inner end of a stem 14, retaining and locking nuts 14^a being provided on said stem outside of the lugs 12^a to adjustably retain the valve on the stem. Said slide valve stem 14 slides through a stuffing box 15 in the chest 10, and also through a bearing bracket 16 secured to the edge of the plate 9. Outside of the cylinder a cam plate 17 is secured to the main shaft. A bracket 18 on the cylinder, carries at its outer end a rocking lever 19, a pivot 20 of which is in a line at a right angle to the main shaft. The upper end of the rocking lever is pivotally connected at 21 to the outer end of the valve stem 14, which latter is parallel with the main shaft, and at the lower end of said rocking lever are provided forked arms 22 which embrace the edges of the cam disk and are provided with anti-friction rollers 23, the latter contacting with the cam disk or plate.

Journaled in the walls of the cylinder is a shaft 24 upon which is mounted, within the cylinder, an abutment 25 properly shaped and located to close the annular race or cylinder when down and to be outside

of the path of the piston head when up, with its outer end seated in a recess 26 provided to receive it.

27 indicates the exhaust opening from the cylinder, which may be located at any desired point of the annular race, and which communicates with an exhaust pipe 28. A steam pipe 29 leads as usual into the steam chest.

10 The shaft 24 projects beyond the walls of the cylinder through a suitable stuffing box 30 and has secured upon it at a short distance from the cylinder a radial arm 31 carrying at its outer end a friction roller 32
15 which bears upon the periphery of a cam 33 secured upon the main shaft, the end of the shaft 24, as well as the radial arm and the cam, being protected by a suitable guard 34. Any spring or pendulum governor may
20 be used in connection with the engine, if desired.

In the operation of the machine, assuming the port of the slide valve to be in position to open communication with the cylinder,
25 steam, admitted through the steam pipe, will act upon the piston head and cause it to rotate to the left as it is illustrated in Fig. 2. By the action of the cam disk, the slide valve is closed when the piston has made a
30 partial revolution and from this point, until the piston head passes the exhaust opening, the secondary, or expansive pressure of the steam will be utilized. During this movement of the piston, and consequently of the
35 shaft, the pivoted abutment has been raised out of the position shown in Fig. 2 in full lines, into the position shown in dotted lines, so that the piston may pass again to the position illustrated in Fig. 2 and the slide
40 valve again open for another admission of steam.

While I have particularly described the construction of the various parts, I desire it

to be understood that changes and variations may be made in the form thereof without departing from the spirit and scope of my invention. 45

Having thus described my invention, what is claimed is:

An engine of the character described comprising a main shaft, a rotary piston consisting of a hub fixed to said shaft, a circular plate centrally arranged on said hub, and a cylindrical head at one point on said plate, a cylinder having an annular chamber to receive the piston head and composed of opposing circular plates formed with annular depressions to form the cylinder chamber, said plates having united flanges on their projecting edges, and having their central portions formed on their outer faces with internally screw threaded bosses, and on their inner faces concentric circular seats, flanged packing rings arranged in said recesses of the plates and having central openings to receive the main shaft, and annular flanges to receive the projecting ends of said hub, externally screw threaded glands on the main shaft and arranged in the threaded bosses of said plates to impinge against said packing rings, a swinging abutment in the cylinder, a rock shaft for said abutment, a cam mechanism for actuating the rock shaft from the main shaft, a steam chest connected to the cylinder, a slide valve in said steam chest, a cam disk fixed to the main shaft, and a rocking arm actuated by said cam disk and operatively connected to the stem of said slide valve. 50 55 60 65 70 75

In testimony whereof I hereunto affix my signature in the presence of two witnesses. 80

JAMES A. QUILL.

Witnesses:

DENNIS BARRY,
LAWRENCE E. MAHAN.