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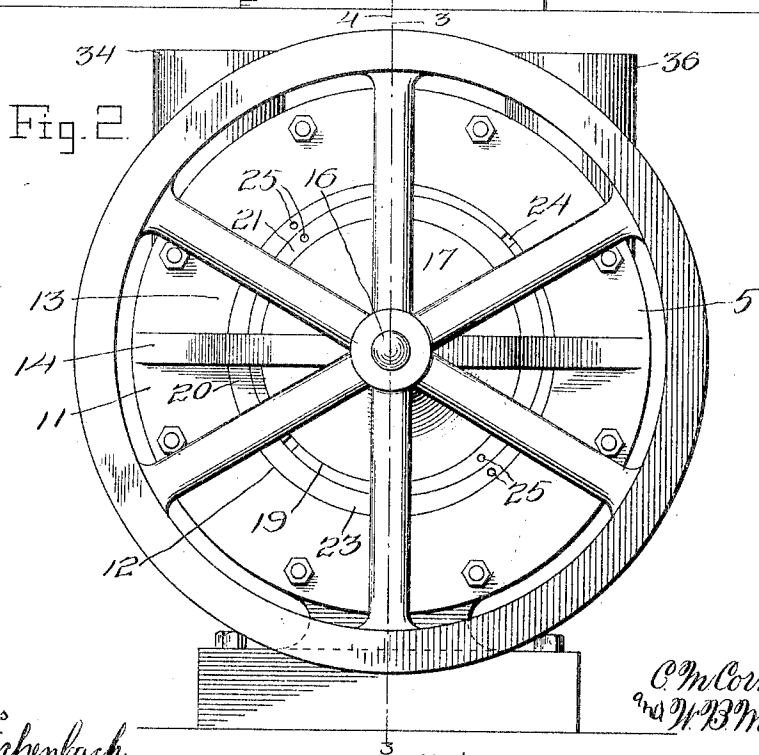
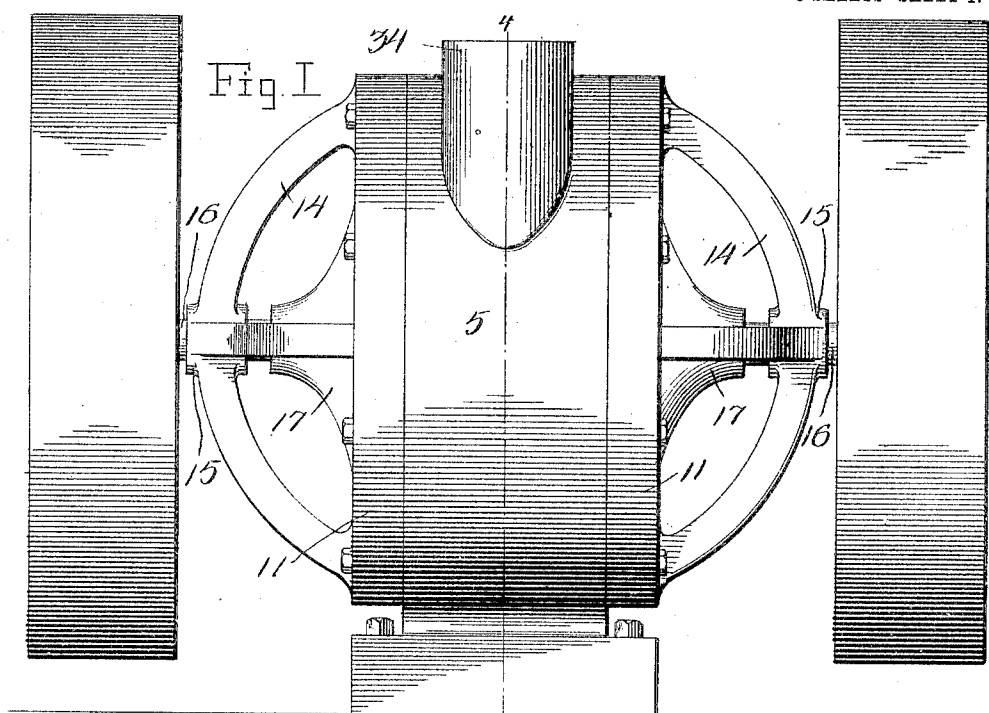
PATENTED OCT. 24, 1905.

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ROTARY ENGINE.

APPLICATION FILED MAY 10, 1905.

3 SHEETS—SHEET 1.



Witnesses  
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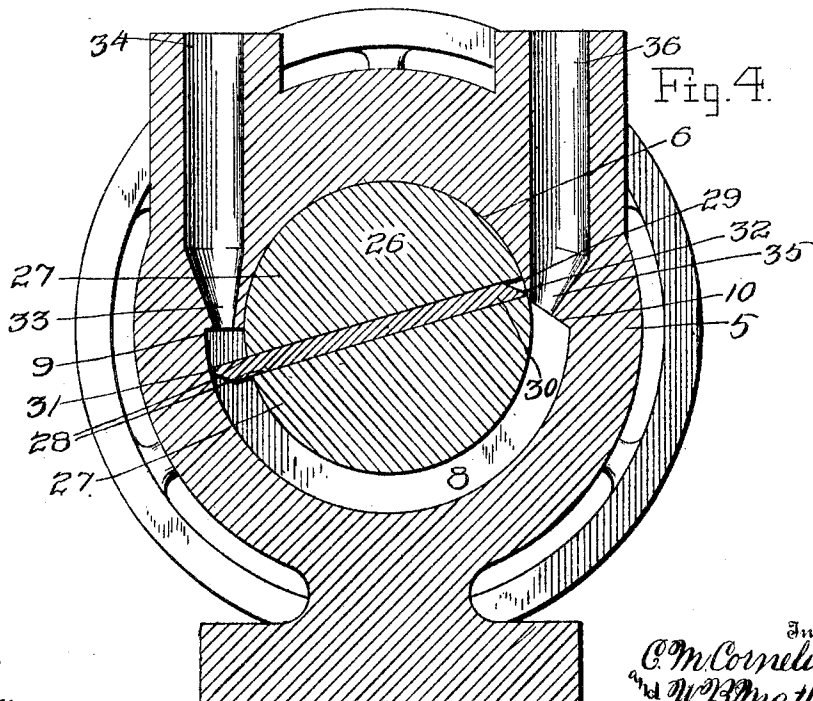
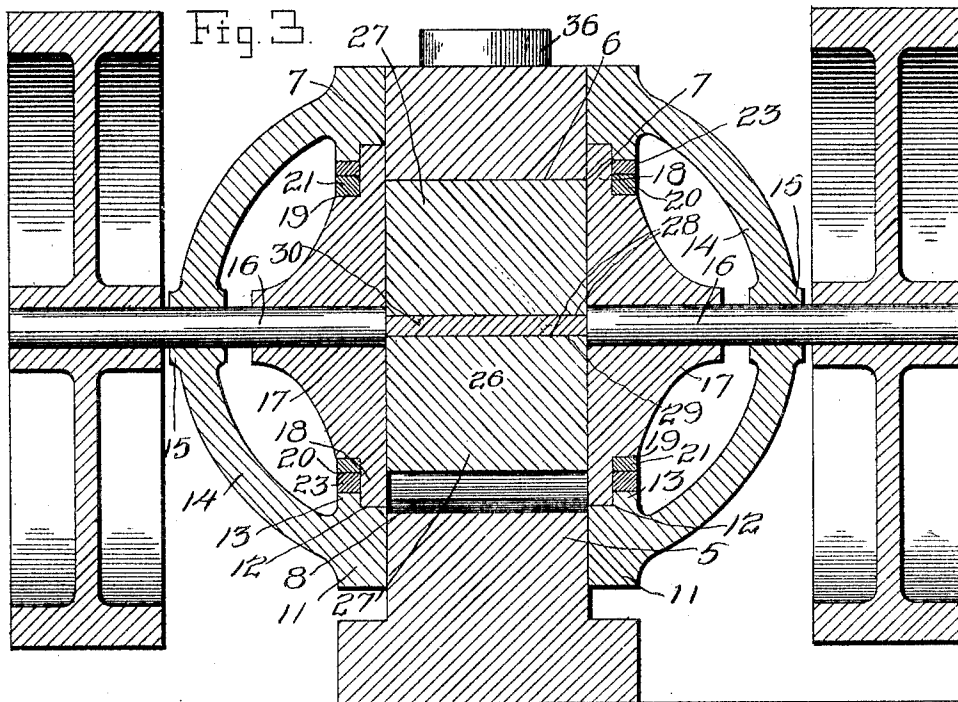
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

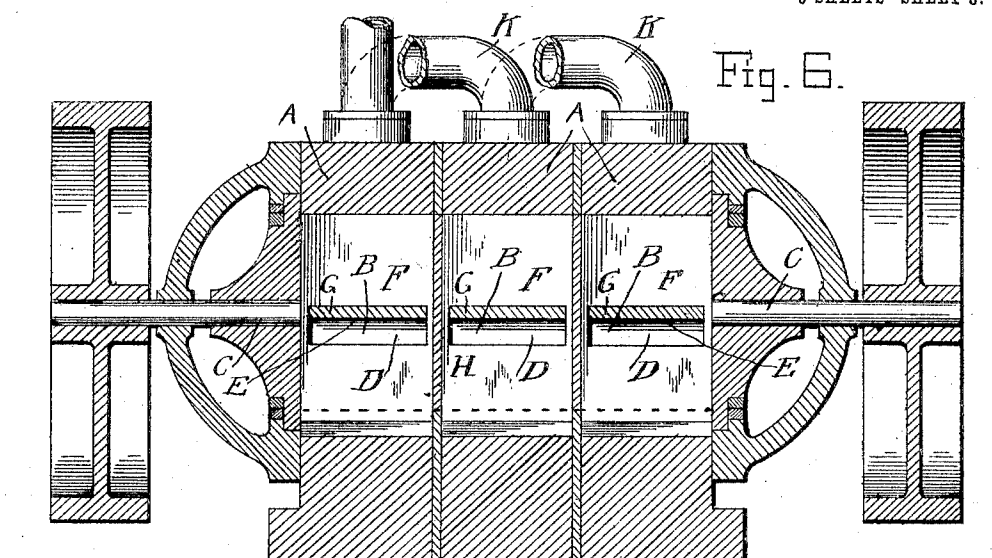


Fig. 5.

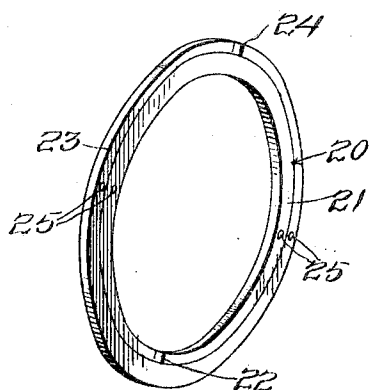
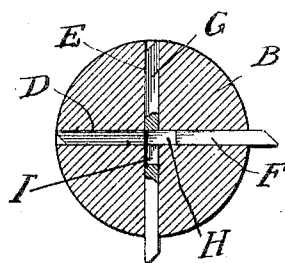


Fig. 7.



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# UNITED STATES PATENT OFFICE.

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## ROTARY ENGINE.

No. 802,843.

Specification of Letters Patent.

Patented Oct. 24, 1905.

Application filed May 10, 1905. Serial No. 259,745.

*To all whom it may concern:*

Be it known that we, CLARENCE M. CORNELISON and WILLIAM B. MATLACK, citizens of the United States, residing at Mahaffey, in the county of Clearfield, State of Pennsylvania, have invented certain new and useful Improvements in Rotary Engines; and we 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.

This invention relates to steam-engines, and more particularly to those of the rotary type, and has for its object to provide an engine of this kind which will be simple in arrangement, which will include few parts, and which may be manufactured at a low figure.

Other objects and advantages will be apparent from the following description, and it will be understood that changes in the specific construction shown and described may be made within the scope of the claim and that any suitable materials may be used without departing from the spirit of the invention.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a side elevation of the present invention. Fig. 2 is a view looking at right angles at Fig. 1. Fig. 3 is a central vertical section taken on line 3 3 of Fig. 2. Fig. 4 is a section on line 4 4 of Fig. 1. Fig. 5 is a detailed perspective view of the packing-rings. Fig. 6 is a longitudinal section of a triple expansion-engine embodying the present invention. Fig. 7 is a transverse section through one of the pistons shown in Fig. 6 and illustrating the arrangement of the sliding members.

Referring now to the drawings, the present invention comprises a cylinder 5, having a passage 6 formed therethrough and opening through its ends 7. The lower portion of this passage is enlarged, as shown at 8, and one end of this enlargement lies in the central horizontal axis of the cylinder, as shown at 9. At its other end the enlargement 8 extends somewhat above the end 9 and slants upwardly and inwardly, as shown at 10. With the exception of its end portions 9 and 10 the outer wall of the enlargement 8 follows a continuous curve, and the upper portion of the passage is similarly curved. The bore of the cylinder is thus bounded by two concentric

curves of different radii which are connected by straight portions, one extending radially of the curves, while the other extends at obtuse angles thereto. Removably secured against the end faces 7 of the cylinder there are plates 11, having circular openings 12 therein which register with the upper portion of the passage 6, the plates 11 thus closing the ends of the enlargement 8, and these plates are provided with flanges 13, extending into their openings 12 and lying flush with the outer faces of the plates. Connected at their ends with the plates 11 and extending outwardly therefrom are a plurality of legs 14, which join at their outer ends to form boxings 15, in which there are journaled the end portions of the shaft 16, which extends through the passage 6 and lies concentric with the curved portions of the walls thereof.

Mounted upon the shaft 16 there are a pair of tapered cross-sectionally circular members 17, the minor ends of which are directed outwardly, one of these members being disposed within the inclosure of the legs 14 of each plate 11, and at their inner ends these members 17 are provided with flanges 18, which lie within the openings 12 of the plates 11 and against the inner surfaces of the flanges 13. The members 17 include shoulders 19, which extend at right angles to the flanges 18 and lie in spaced relation to the inner faces of the flanges 13, and in each of these spaces there is engaged a pair of packing-rings 20. These pairs each consist of an inner ring 21, which is split, as shown at 22, and which is thicker at one side than at the other, so that the inner and outer peripheries of the ring lie eccentrically to each other. The ring 21 of each pair lies within the other ring 23 of the pair, the openings through these rings 23 being located eccentrically with respect to the outer peripheries thereof, and these rings 23 are split, as shown at 24. The openings through the rings 21 receive the shoulders 19 of the members 17 therewithin, and the rings are provided with wrench-receiving openings 25 in their outer faces by which they may be moved, and it will be observed that the rings may be moved with respect to each other to cause the outer rings to expand and fit tightly within the inclosures of the flanges 13.

A piston 26 is provided, which includes two sections 27, which are slightly less than semi-

cylindrical in form, and the curvature of these sections is such that they fit snugly within the upper portion of the passage 6, the sections being secured with their ends against the inner faces of the members 17 and with their inner flat faces 28 in spaced relation to each other, these faces lying parallel, as shown. There is thus formed a transverse passage 29 through the piston, and in this passage there is slidably mounted a plate 30, having its opposite ends 31 and 32 beveled, as shown, and this plate is of a length to lie with its extremities against the inner surface of the cylinder at opposite points thereof.

Formed in the cylinder 5 there is a steam-inlet passage 33, which opens at one end through the end 9 of the enlargement 8 and at its other end through the outer wall of the cylinder, this passage having a steam-supply pipe 34 connected therewith. An exhaust-passage 35 opens at one end through the end 10 of the enlargement 8 and communicates with an exhaust-pipe 36, extending outwardly of the cylinder. It will thus be seen that if steam be admitted to the cylinder through the passage 33 it will strike the portion of the plate 30 which extends into the enlargement 8 and will revolve the piston and the shaft 16 until this portion of the plate 30, or rather the beveled end thereof, comes into engagement with the slanting end 10 of the enlargement 8, when the plate 30 will be moved through the passage 29 to project its opposite end portion into the enlargement where it receives the pressure of the steam admitted through the passage 33 to further rotate the piston. By reason of the fact that the portion of the plate 30 which lies within the enlargement 8 extends between the ingress and egress ports of the steam the latter is prevented from passing from the cylinder until this portion of the plate has moved over the slanting end 10 of the enlargement to expose the exhaust-passage, when the expanded steam then within the enlargement is free to pass off through the exhaust-passage.

In Fig. 6 there is shown a modification in which the present invention is illustrated as embodied in a triple expansion-engine, this engine comprising a plurality of cylinders A, having pistons B therewithin, which are mounted upon a common shaft C, and these pistons are provided with intersecting transverse passages D and E, which extend at right angles to each other and which correspond to the passage 29. Sliding members F and G, corresponding in arrangement and operation to the plate 30, are engaged in the

passages D and E, the member F having a reduced portion H intermediate of its ends which is slidably engaged in a slot I, formed in the member G. Pipes K are provided which are arranged to conduct the exhaust-steam from one cylinder to the inlet-passage of the next cylinder.

What is claimed is—

A rotary engine comprising a cylinder having its bore opening through its ends, said bore being bounded by oppositely-directed concentric arcs of different radii the ends of said arcs being connected by two portions one extending radially of the arcs and the other extending at obtuse angles thereto, said cylinder having an inlet-passage opening through the first named of said connecting portions and an outlet-passage opening through the other connecting portion, plates secured against the ends of the cylinder and having alining openings therethrough said openings registering with the lesser arc, said plates having flanges extending into the openings at the outer portions thereof, brackets carried by the plates a shaft journaled in the brackets and extending through the cylinder, members mounted upon the shaft and lying in spaced relation to the inner peripheries of the flanges and within the inclosures thereof, expansible packing-rings engaged with the members and lying within the inclosures of the flanges, flanges carried by members at the inner ends of the latter and lying within the openings of the plates and against the inner faces of the first-named flanges, a piston including spaced sections secured at their ends to the inner surfaces of the members said piston lying in engagement with the inner wall of the cylinder which follows the lesser arc and lying in spaced relation to that portion following the greater arc, and a member slidably engaged between the sections of the piston and lying with one of its end portions in the space between the piston and the portion of the cylinder following the greatest arc with its extremity in engagement with said portion, said end portion of the member being adapted for engagement of the second-named connecting portion of the bore of the cylinder for movement of the member to project its opposite end portion beyond the piston.

In testimony whereof we affix our signatures in presence of two witnesses.

CLARENCE M. CORNELISON.  
WILLIAM B. MATLACK.

Witnesses:

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GEO. L. FLETCHER.