No. 869,397. PATENTED OCT. 29, 1907.

L. C. TIPPETT & C. L. REECE.

ROTARY ENGINE.

APPLICATION FILED FEB. 11, 1907.

2 SHEETS—SHEET 1.

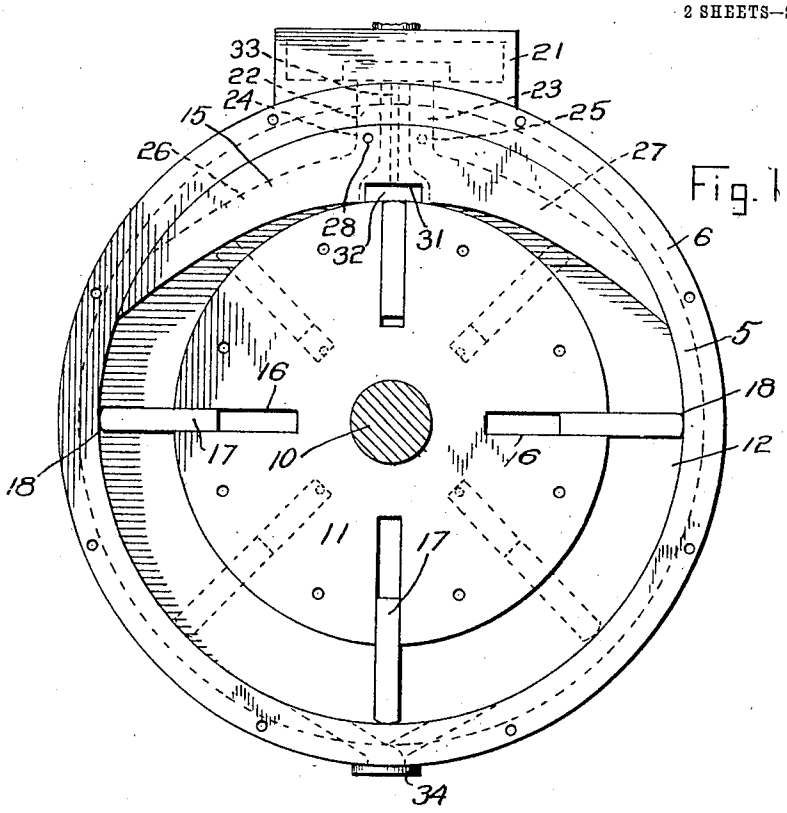


Fig. 1

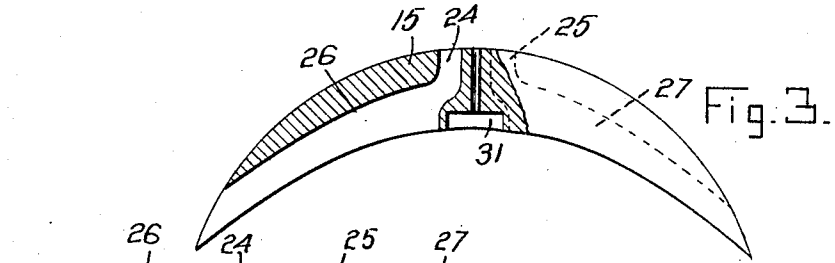


Fig. 3.

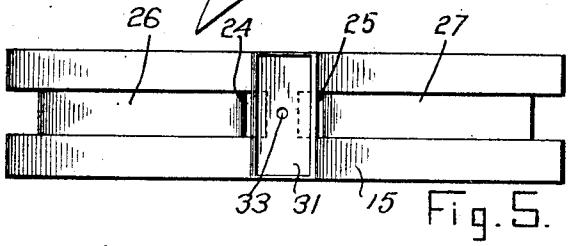


Fig. 5.

Witnesses

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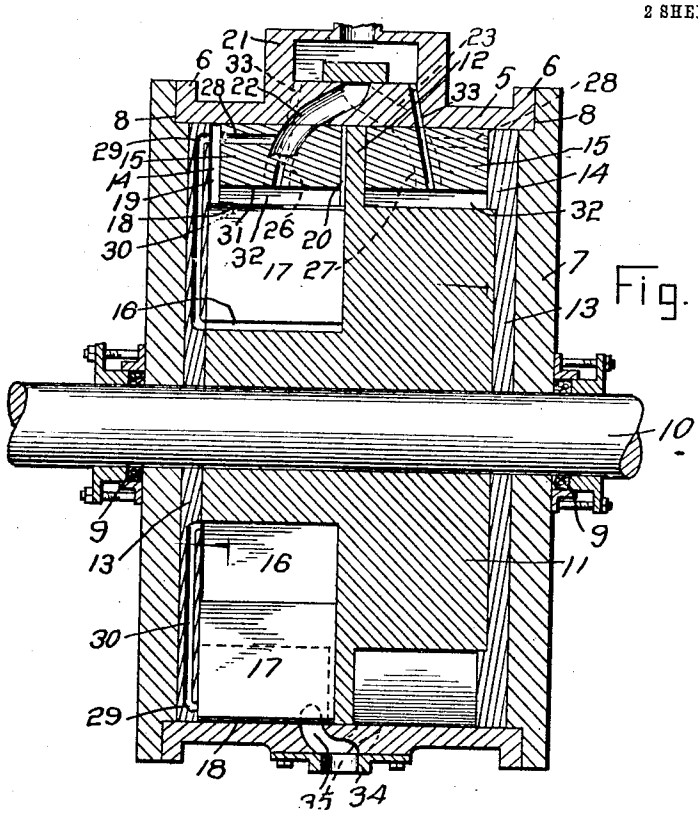


Fig. 2.

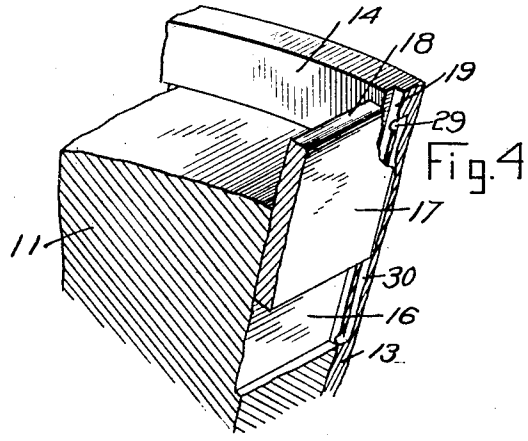


Fig. 4

Witnesses

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ROTARY ENGINE.

No. 869,397. Specification of Letters Patent. Patented Oct. 29, 1907.

Application filed February 11, 1907. Serial No. 356,829.

To all whom it may concern:

Be it known that we, L. C. TIPPETT and C. L. REECE, citizens of the United States, residing at Elverton, in the county of Fayette, State of West Virginia, 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 rotary engines and more particularly to that class including sliding pistons.

The primary object of the invention is to provide an engine of this class which, although it is simple in construction, will be thoroughly efficient in its action and further to provide a reversible engine.

A further object of the invention resides in providing a construction of rotary engine in which one of the pistons or blades of the series will be receiving at all times the full impact of the steam.

Broadly speaking the invention consists in a cylinder in which is rotatably mounted a core provided with slots in each of which is slidably received a piston in the form of a plate and in mounting in the cylinder above the core an arcuate bridge which has its under face gradually merging into the inner periphery of the cylinder and which is provided with a channel in its said under face through which the steam passes. The pistons or plates are normally held against the inner periphery of the cylinder or against the under face of the bridge by means of steam which is admitted through ports formed in circular plates carried by the core, and when one plate or piston is abutting the under face of the bridge, the next adjacent plate or piston in the series will be in contact with the inner periphery of the cylinder. It being understood that steam will pass through a channel in the under face of the bridge, over the edge of the first named plate or piston and will exert substantially the full force of the steam, part of the force however being directed against the first named plate.

In the accompanying drawings—Figure 1 is a view in side elevation of my engine with one of the cylinder heads and the adjacent plate, carried by the core of the engine, removed. Fig. 2 is a vertical longitudinal sectional view through the engine. Fig. 3 is a side elevation of one of the bridges and Fig. 4 is a detailed perspective view of a portion of one of the plates which is carried by the core, and also of a portion of the core, showing the manner of admitting steam beneath the plates forming the pistons. Fig. 5 is a bottom plan view of one of the bridges.

Referring more specifically to the drawings the numeral 5 denotes the cylinder which is provided at each of its ends with the usual continuous attaching flanges 6, and 7 denotes the cylinder heads which are recessed in their opposing faces and at their edges as at 8 for the reception of the flanged ends of the cylinder 5. The cylinder heads are provided centrally with the usual stuffing boxes 9 and journaled through the heads and the stuffing boxes is the engine shaft 10.

Mounted upon the engine shaft for rotation therewith within the cylinder is a core 11 which is substantially cylindrical in form and is provided upon its periphery and at its middle with an annular flange 12 which contacts with the inner periphery of the cylinder 5. Bolted or otherwise secured upon the ends of the core 11 are circular plates 13 which are provided upon their face which abuts the cores, directly outwardly of the periphery thereof, each with a flange 14, it being understood that the ends of the core is received within the inner peripheries of the flanges 14 upon the plates 13.

It will be seen that by reason of the flanges 12, the cylinder is divided substantially into two cylinders and seated in the inner faces between the flange 12 and the flanges 14 on the plates 13 are bridges 15, the said bridges being arcuate in form and having their upper faces fitting snugly against the inner periphery of the cylinder 5 at the upper end thereof and their under faces gradually merging into the said inner periphery of the cylinder the purpose of which construction will be presently fully explained.

The core 11 is provided upon opposite sides of the flange 12 with radial slots 16, the slots upon one side of the flange being located at points intermediate those upon the other side of the flange, and slidably disposed within the slots are the pistons of the engine which are in the form of rectangular plates 17 which have their outer edges rounded as at 18 to insure smooth running of the engine. The plates not only work in the slot 16 but they also work in alining slots 19 formed in the flanges 14 of the plates 13 and slots 20 forming opposite sides of the flange 12. It will of course be understood that the plates 17 will, during the rotation of the core 11 within the cylinder, contact with their rounded edges with the inner periphery of the cylinder and also at times with the under face of their relative arcuate bridges 15.

A steam chest 21 is formed upon the cylinder 5 at the top thereof and leading from the steam chest and through the cylinder are ports 22 and 23 which communicate by means of ports 24 and 25 which run through the upper face of each of the bridges 15, with channels 26 and 27 formed in the under face of each of the bridges, it being understood of course that the channels 26 and 27 extend in opposite directions and that the engine may be run in either direction or in other words is reversible, by admitting steam through one or the other of the ports 22 and 23. It will further be observed that when the plates 17 comprising the pistons of the engine are in engagement with the under face of their re-

spective bridges, and the next adjacent plate in the series is in contact with the inner periphery of the cylinder, steam will pass through one or the other of the channels 26 and 27 over the outer edge of the first named plate, and against the second named plate, this plate being in this manner arranged to receive nearly the entire force of the steam, although it will be understood that the first named plate receives a portion of the force of the steam.

In order to help to force the blades outwardly against the under side of the other respective bridges and the inner periphery of the cylinder, a port 28 leads laterally from each of the ports 24 and 25 in the bridge 15 and communicates successively with the slots 19 formed in the flange 14 of the adjacent plate 13. Communicating with each of these slots 19 as at 29 is one end of a port 30 which is formed radially in the plate 13 and communicates with the slot 16 formed in the core 11, it being understood that during the rotation of the core within the cylinder, the steam will pass through one of the ports 28 of each bridge and be discharged successively into the slots 19. At this time the plates 17 forming the pistons of the engine will be substantially entirely within their respective slots 16 and the pressure of the steam upon the inner edges of the plates after its passage through the port 30, will serve to force the plates outwardly from their slots.

In order to prevent communication of steam from one side of the cylinder to the other between the core and the bridges, each of the bridges is provided upon its under side and at its point of intersection with the core, with a recess 31 in which is snugly received a wear block 32 which is forced into close contact with the core by means of steam pressure which is admitted through the port 33 leading from the steam chest 21 to the recess.

The exhaust for the engine is located at the bottom of the cylinder 5 and is indicated by the numeral 34, there being ports 35 formed through the underside of the cylinder and branching in such a manner as to communicate with the interior of the cylinder upon opposite sides of the flange 12.

It is to be understood that I do not desire to be limited to the exact details of construction shown and described for obvious modifications will occur to a person skilled in the art.

What is claimed is—

1. An engine of the class described comprising a cylinder, a core rotatably mounted within the cylinder, a bridge located within the cylinder and above the core and having ports formed therethrough, a steam chest located upon the cylinder and communicating with the ports, the underside of the bridge being merged within the inner periphery of the cylinder and being provided with a channel with which the ports communicate, pistons mounted in the core for sliding movement and for contact with the inner periphery of the cylinder and the underside of the bridge, and means communicating with the ports in the bridge for supplying steam to the core beneath the pistons.

2. An engine of the class described comprising a cylinder, a core mounted for rotation within the cylinder and provided with radial slots, pistons slidably seated in the slots, a steam chest located upon the cylinder at the top thereof, an arcuate bridge located within the cylinder and having its upper face lying against the inner periphery of the cylinder at the upper end thereof and having its under face merging with the inner periphery of the cylinder, said bridge being provided in its under face with channels and having ports formed therethrough for establishing communication between the steam chest and the channels, circular plates carried by the core at each of its ends, said plates being provided with grooves in which the side edges of the pistons are received, said grooves being in alinement with the slots in the core, said plate being provided with ports establishing communication between the corresponding grooves and slots, said bridge being provided with ports for communication between its ports and the grooves in the plate, and an exhaust for the cylinder.

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

LUCIUS C. TIPPETT.
CHARLES L. REECE.

Witnesses:
S. L. WALKER,
S. W. SETTLE.