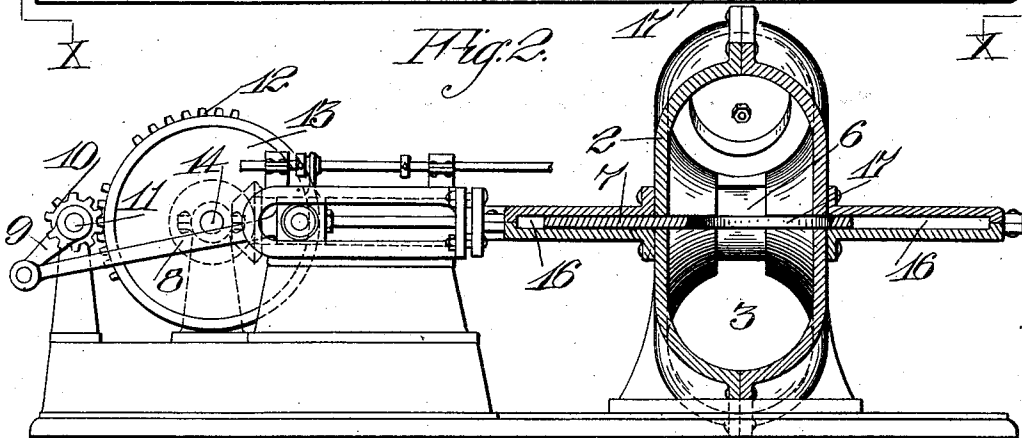
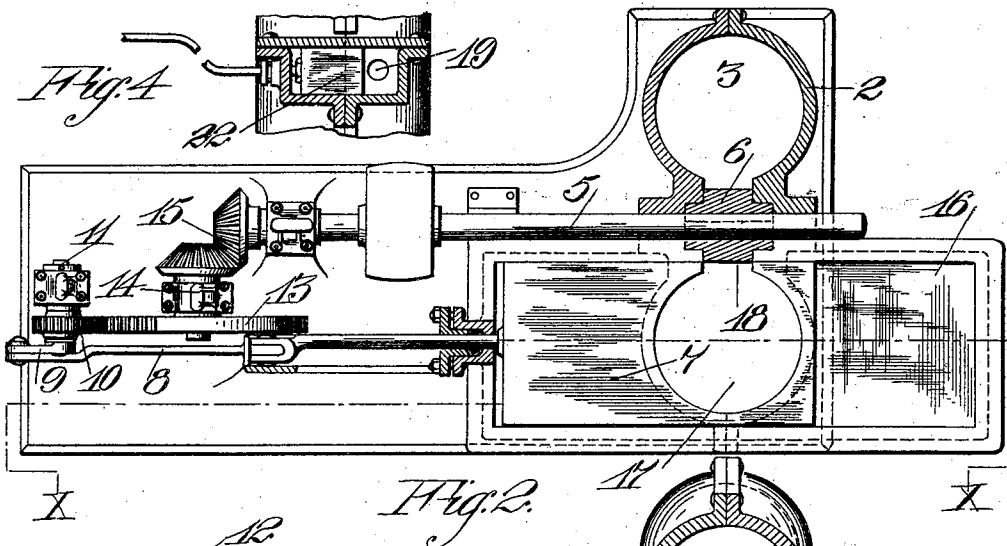
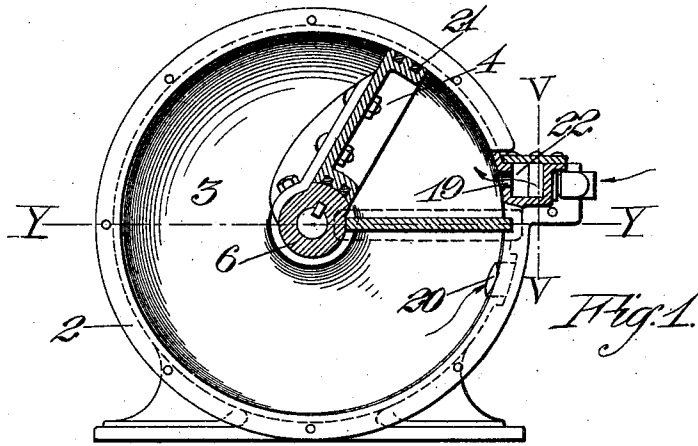


C. A. BURROWS.
 ROTARY ENGINE.
 APPLICATION FILED DEC. 8, 1908.

938,211.

Patented Oct. 26, 1909.



Witnesses.
J. Kasberg
Amos S. Burrows

Fig. 3.

Inventor.
Clinton A. Burrows
 by *Geo. H. Strong*
Att'y.

UNITED STATES PATENT OFFICE.

CLINTON A. BURROWS, OF LEMOORE, CALIFORNIA.

ROTARY ENGINE.

938,211.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed December 8, 1908. Serial No. 466,439.

To all whom it may concern:

Be it known that I, CLINTON A. BURROWS, citizen of the United States, residing at Lemoore, in the county of Kings and State of California, have invented new and useful Improvements in Rotary Engines, of which the following is a specification.

This invention relates to motors, and particularly that class of motors designated as "rotary engines".

It is the purpose of this invention to provide a simple, automatic motor adaptable to the use of steam, or other suitable expansible fluid.

A further object is to provide a motor of few parts, and of simple construction.

Other purposes of the invention will become apparent in the following specification.

The invention comprises the parts, the construction and combination of parts, or their equivalents as set forth in the specification, and shown in the accompanying illustrations, in which—

Figure 1 is a vertical section. Fig. 2 is a horizontal section on line Y—Y Fig. 1. Fig. 3 is a vertical section on line X—X Fig. 2. Fig. 4 is a section on line V—V Fig. 1, of the valve-box.

As shown in the drawings, the engine comprises a case 2 made up of suitable separable members, and contains an annular steam chamber 3 which is circular in cross section and in which is adapted to travel a suitable piston 4 mounted upon a vertical shaft 5 which is journaled in the casing 2. The piston is shown as being circular in form to fit the interior of the cylinder chamber 3, and is secured to the shaft 5; at this point of the shaft is formed a collar 6, which rotates in a groove formed in the casing of the engine.

7 is a movable abutment adapted to be thrust forward into the steam chamber 3, and withdrawn therefrom by any suitable form of mechanism, such for instance as shown as comprising a link 8, crank 9, and gear-wheel 10 mounted upon a shaft 11. The latter is rotated intermittently by engagement with suitable teeth 12, formed upon the circumference of a disk 13, secured to shaft 14 which shaft is revolved by suitable connections 15 with the engine shaft 5 so that the abutment 7 will have coördinate motion with respect to the piston 4 for the purpose hereinafter explained. The abutment 7 operates in a direction substantially

parallel with the engine shaft, and is adapted to move in and out of a steam tight chamber 16 formed in one side of the piston chamber. The two chambers are in communication through a slot just wide enough to pass the abutment, and the abutment has a width greater than the bore of the piston chamber, and operates in suitable grooves formed in the engine casing. The abutment has a hole 17 which is adapted to exactly register with the walls of the piston chamber, and to be in continuation therewith when the abutment is moved to its limit in one direction; one side of the abutment being cut away as at 18, to allow the stem of the piston to pass. As soon as the piston has passed, the abutment is moved to its limit in the opposite direction, and communication behind the piston is cut off between the inlet port 19, and the exhaust port 20. The piston is given a steam tight fit in the cylinder by suitable means, as the packing-rings 21.

The construction of abutment here shown, having the hole to pass the piston, and the walls of the hole adapted to be brought into perfect alinement and continuation with the walls of the piston chamber, obviates the difficulties that might otherwise arise if the piston with its packing-rings had to traverse in open grooves or channels formed in the casing, as would be the case if the abutment simply moved in and out of the piston chamber.

The admission of steam into the piston chamber or cylinder through the inlet port 16 is controlled by any desired form of valve, as represented at 22. The steam or other impelling fluid entering through port 19 expands against the abutment 7 when the latter is thrust into the piston chamber to drive the piston forward.

The operation of the part 7 is so timed that as the piston travels around in the annular steam chamber 3, the member 7 will be withdrawn at the proper moment to permit the piston to pass its inner edge, when it is again closed behind the piston, and the steam controlling valve 22 is then opened to admit steam behind the traveling piston, and in front of the abutment 7. The exhaust port 20 is normally open, and consequently need not be provided with any form of controlling valve although one may be used if desirable. At any time prior to the opening or outward movement of the part 7, the steam valve 22 is actuated to cut off

the incoming steam and allow the steam in chamber 3 and between the piston and the closed abutment 7 to act expansively.

Obviously, the steam valve 22 may be closed at any desirable point in the travel of the piston 4, whereby the piston may be subjected to high pressure during the initial portion of its travel, say, for 180°, of its movement, and then cutting off the steam and permitting the piston to travel the remainder of its cycle under expansive pressure.

It is apparent that by this construction I furnish an engine of this character in which the piston has a continued rotation, and does not carry any movable parts as is customary in most rotary engines.

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

1. A rotary engine comprising a casing having an annular chamber, a piston adapted to travel continuously in said chamber, a shaft to which the piston is secured, a movable abutment arranged at one side of the center of the casing and slidably mounted so that it may be moved across the chamber into and out of the path of the piston, a guide for the abutment arranged parallel with the axis of the piston, and driving connections between the abutment and the piston shaft, said connections including a link connected to the abutment, a crank shaft to which the link is attached, and gearing between the crank shaft and the piston shaft, said chamber having an inlet port on one side of the abutment and an exhaust port on the other, and a valve on the inlet port.

2. In a rotary engine, the combination of a casing having an annular steam chamber, said steam chamber being circular in cross section, a circular piston in the steam chamber, and a shaft to which the piston is secured, a horizontal abutment operative across the steam chamber and slidable into and out of the path of the piston, abutment being located at one side of the center of said shaft and slidable in a plane parallel with the shaft, intermittently operated connections between said shaft and the abutment to oper-

ate the latter, said connections comprising a link connected to the abutment, a crank shaft to which the link is attached, a gear wheel on said crank shaft, a transverse shaft, a mutilated gear on said transverse shaft adapted to engage the first-named gear, and intermeshing gears between the transverse shaft and the piston shaft, and said chamber having an inlet port on one side of the abutment, and an exhaust port on the other, a valve in the inlet port, and means for operating the latter intermittently.

3. In a rotary engine, the combination of a two-part casing having an annular chamber, a collar between the central portions of the two parts of the casing, said casing having grooves in which extended portions of the collar are rotatably mounted, a piston to travel continuously in the chamber, a shaft to which the piston is secured through the medium of said collar, and a movable abutment located at one side of the center of said shaft and having its major axis parallel therewith, said abutment being operative across the chamber and into and out of the path of the piston, means to operate the said abutment, said chamber having an inlet port on one side of the abutment, and the exhaust port on the other, and a valve for the inlet port, said abutment movable in a direction parallel with the shaft, and said abutment having an imperforate portion forming a partition within the piston chamber when the abutment is moved to its limit in one direction, and said abutment having an opening corresponding in size with the piston chamber, and the walls of which opening are registrable with the walls of the piston chamber when the abutment is moved to its limit in the opposite direction, and said abutment having a slot intersecting said hole to pass the stem of the piston.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CLINTON A. BURROWS.

Witnesses:

E. W. ENOS,
W. E. CLIFFORD.