O. L. R. JONES.

ROTARY INTERNAL COMBUSTION ENGINE.

APPLICATION FILED AUG. 8, 1910.

985,907.

Patented Mar. 7, 1911.

2 SHEETS—SHEET 1.

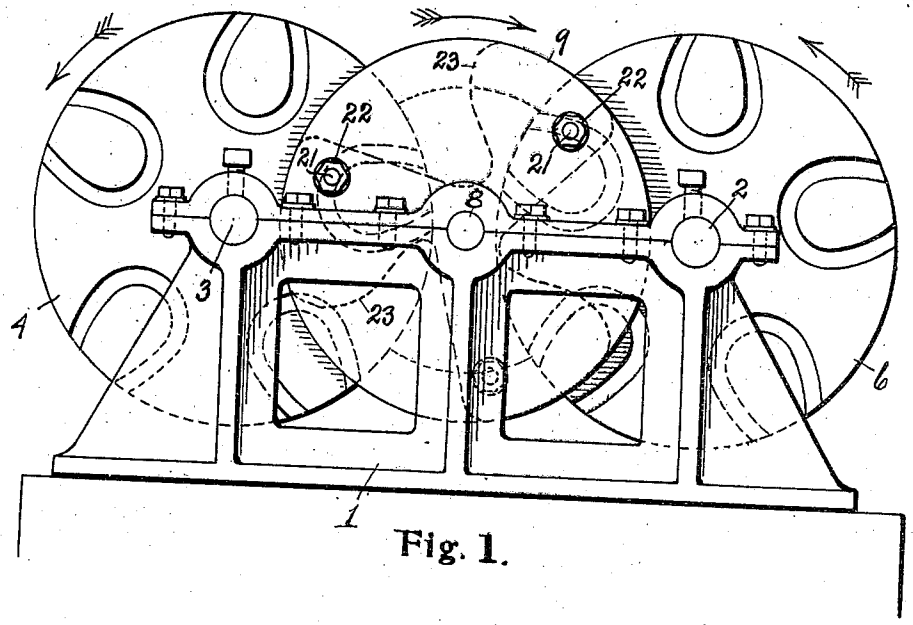

Fig. 1.

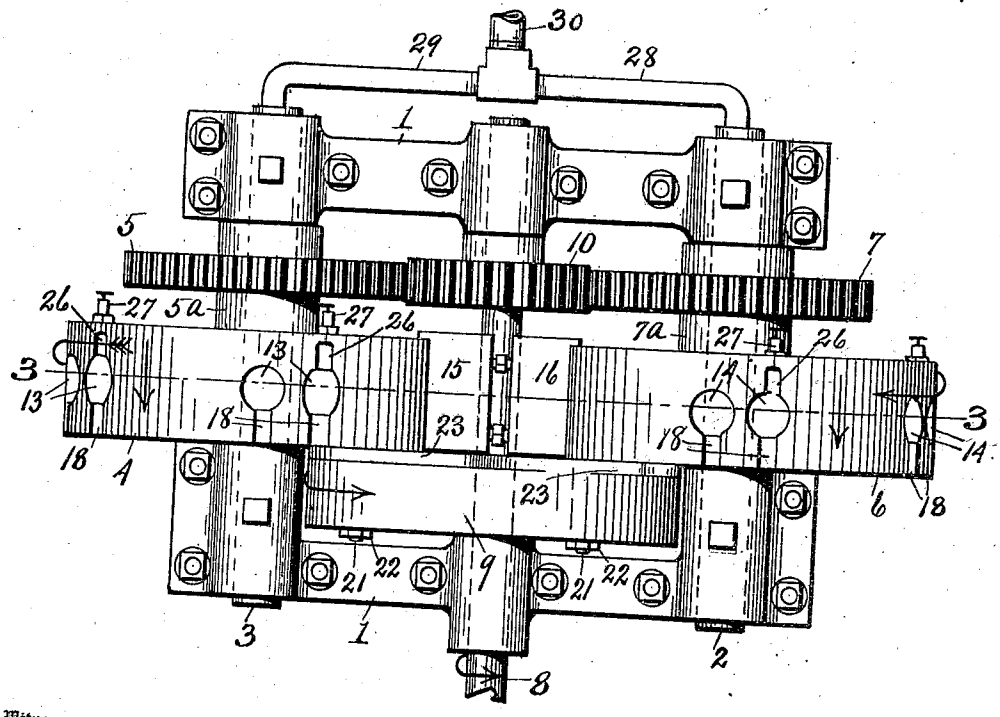

Fig. 2.

Witnesses

O. B. Baenziger.

I. L. Howlett.

Inventor

Orsemus L. R. Jones.

E. G. Keeler.

Attorney.

O. L. R. JONES.

ROTARY INTERNAL COMBUSTION ENGINE.

APPLICATION FILED AUG. 8, 1910.

985,907.

Patented Mar. 7, 1911.

2 SHEETS—SHEET 2.

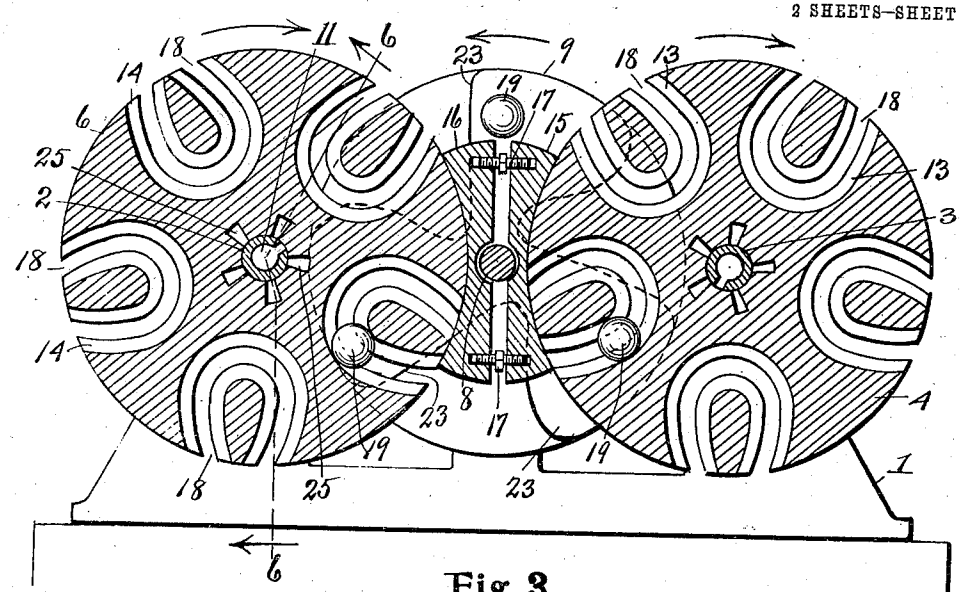

Fig. 3.

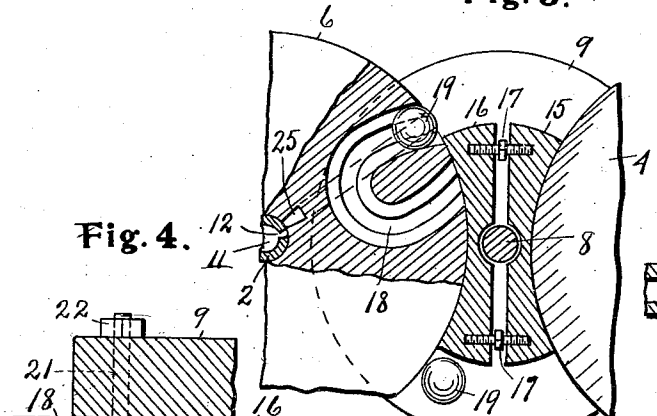

Fig. 4.

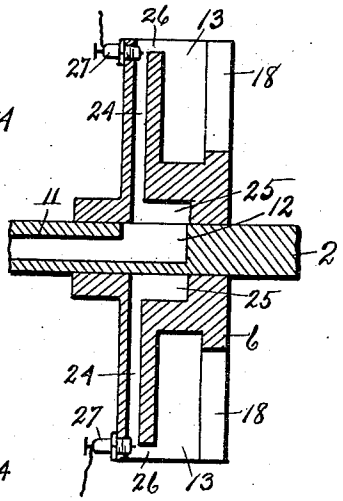

Fig. 6

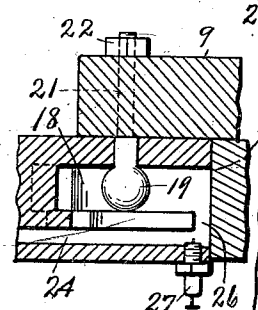

Fig. 8.

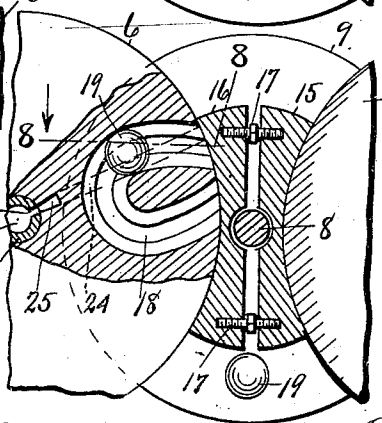

Fig. 5.

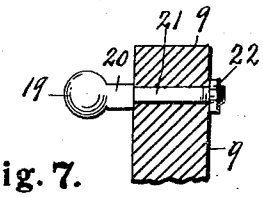

Fig. 7.

Witnesses

O. B. Baenziger.

F. G. Howlett.

Inventor

Orsemus L. R. Jones.

By E. W. Wheeler Attorney.

UNITED STATES PATENT OFFICE.

ORSEMUS L. R. JONES, OF DETROIT, MICHIGAN.

ROTARY INTERNAL-COMBUSTION ENGINE.

985,907. Specification of Letters Patent. Patented Mar. 7, 1911.

Application filed August 8, 1910. Serial No. 576,089.

To all whom it may concern:

Be it known that I, ORSEMUS L. R. JONES a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Rotary Internal-Combustion Engines; and I do 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, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to rotary internal combustion engines, and consists in the construction and arrangement of parts hereinafter more fully set forth and pointed out particularly in the claims.

The object of the invention is to provide multiple cylinder disks rotatable in unison and operatively associated with the fly-wheel on the engine shaft which carries the pistons adapted to traverse the curved cylinders in the cylinder disks as said parts are rotated in unison, the power developed by the explosion of the charges in the cylinders being transmitted to the engine shaft through the fly-wheel or piston disk on which the pistons are mounted.

The above object is attained by the mechanism illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of an engine embodying my invention. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a sectional view as on line 3—3 of Fig. 2. Fig. 4 is a fragmentary view in detail showing one of the pistons in the position which it occupies upon entering one of the curved cylinders in one of the cylinder disks. Fig. 5 is a similar view, showing the position of parts at the instant of explosion. Fig. 6 is a transverse section through one of the cylinder disks, as on line 6—6 of Fig. 3. Fig. 7 is a fragmentary view in section through a portion of the fly-wheel or piston disk, showing a globular piston projecting therefrom. Fig. 8 is a fragmentary view in section, as on line 8—8 of Fig. 5.

Referring to the characters of reference, 1 designates a suitable frame at the ends of which are mounted the horizontal shafts 2 and 3, respectively, which are non-rotative. Mounted on the shaft 3 and rotatable thereon is a cylinder wheel or disk 4. Also mounted said shaft to rotate is a gear wheel 5 which is connected to disk 4 by means of a hub 5^a. Mounted on the shaft 2 and rotatable thereon is a cylinder wheel or disk 6 and journaled on said shaft 2 is a gear wheel 7 connected to the disk 6 by means of a hub 7^a. Journaled in the frame equidistant from the shafts 2 and 3 is a third shaft 8 on which is mounted a fly-wheel or piston-carrying disk 9, and also mounted on said shaft is a gear wheel 10 which meshes with the gears 5 and 7, whereby the two cylinder disks and the piston-carrying disk are caused to rotate in unison in fixed relations. Both of the shafts 2 and 3 are provided with a longitudinal passage 11 leading to their respective disks 4 and 6 and terminating in a port 12, as shown in Fig. 6, which opens within the center of said disks. Cylinder disk 4 is provided with a plurality of cylinders 13, each of which is cylindrical in cross section and describes a loop or oval, the ends of the cylinders opening through the periphery of said disk and the body of the loop lying within the wall thereof. In like manner disk 6 is provided with a plurality of cylinders 14 of the same shape and character as the cylinders 13 in disk 4. Mounted upon the engine shaft 8 and interposed between the disks 4 and 6 are the abutments 15 and 16, respectively, the outer faces of which are concaved coincident with the peripheries of said disks which lie therein, said abutments being adjustable toward said disk to make a tight closure between their curved faces and the peripheries of said disks by means of the right and left screws 17. Each of the cylinders in disks 4 and 6 is provided with a looped channel 18 opening through one side thereof conforming in shape to the shape of the cylinder. The inner face of the piston-carrying disk 9 extends onto a portion of the adjacent faces of the disks 4 and 6. Projecting laterally from the inner face of said disk 9 are the globular pistons 19 having reduced cylindrical stems 20 (see Fig. 7). Said pistons by a rotation of the disks 4, 6 and 9, are adapted to successively enter into and pass from the cylinders in the disks 4 and 6, the stems 20 of the pistons

while passing through the cylinders, lying in and filling transversely the channels 18 of said cylinders. The globular pistons are secured to the disk 9 by means of bolts 21 which extend from the stems thereof through said disks and receive the nuts 22. As the disks 4, 6 and 9 revolve in unison, disk 9 of which turning in a direction opposite to disks 4 and 6, the pistons on said disk 9 are caused to enter one end o curved cylinders and pass from the opposite end thereof, the shape of said cylinders corresponding to the figure described on the faces of the disks 4 and 6 by the movement of a fixed point on the face of the disk 9 across the face of the disks 4 and 6 as said disks revolve, said movement describing a looped course from a point on the periphery of said disks toward the axis thereof and back to the periphery.

The pistons on the disk 9 enter the cylinders in disk 6 from the upper side as said pistons are swinging downwardly, and enter the cylinders in disk 4 from the under side as they are swinging upwardly, said pistons describing in their travel a complete circle concentric with the axis of shaft 8. The whole surface of the disk 9 does not lie flatly against the sides of the disks 4 and 6, but instead the disk 9 is provided with raised surfaces 23 of uneven shape and within certain zones around the pistons 19, as shown in Figs. 2 and 3 and by dotted lines in Fig. 1. These raised surfaces are of such shape and so positioned as to cover the channels 18 in the explosion ends of the cylinders at the time said cylinders are passing the abutments 15 and 16, the exhaust ends of said cylinders being left open, as shown at 23 in Fig. 3, to admit of the escape from the cylinders of any air contained therein in advance of the moving pistons.

Formed in the wall of each of the disks 4 and 6 are radial passages 24, each of which communicates at its inner end with a chamber 25 in the hub of the disk, the outer ends of said passages 24 communicating with the explosion end of the cylinders by way of the transverse passages 26. Located at the juncture of the radial passages 24 and the transverse passages 26, or otherwise properly disposed, are spark plugs 27 through the medium of which the explosive charge may be ignited at the proper time, as will be well understood in the art.

Communicating with the ends of the hollow shafts 2 and 3 are conductor pipes 28 and 29, respectively, coupled to a supply pipe 30. (see Fig. 2) which leads to a source of gas or other explosive mixture under pressure, not shown, said explosive mixture being delivered to the ports 12 in the shafts 2 and 3 under constant compression, so that as the disks revolve a charge of explosive mixture is successively admitted at predetermined periods to the chambers 25 and thence to the cylinders of the disks through the passages 24. The arrangement of parts is such that the chambers 25 communicating with the passages 24 remain closed until the pistons shall have entered the explosion ends of the cylinders and passed thereinto, by the concurrent rotation of the piston disk and the cylinder disks, such distance as to form an explosion chamber between the piston and the face of the abutment, which will at that time close the explosion end of the cylinder, and the port 12 in the hollow shaft of the cylinder disk will register with the chamber 25 and passage 24 of the cylinder which is in position for firing, permitting an explosive charge under pressure to enter the explosion end of the cylinder between the abutment and the piston 19, a position of parts illustrated in Fig. 5, at which time the charge is ignited to drive the pistons through the curved cylinders and impart a rotary movement to the disk 9 and the driving shaft 8. Two cylinders are in operation at substantially the same time; one cylinder in disk 4 and the other in disk 6, the pistons entering the cylinders in disk 4 from the lower side, and entering the cylinders in disk 6 from the upper side. As the explosion ends only of the cylinders are closed, no back pressure is created in the cylinders in advance of the moving pistons, so that the full force of the exploded charge is exerted to drive the pistons throughout the course of the curved cylinders. The cylinders being open at their ends, they exhaust as soon as the pistons pass therefrom or as soon as the explosion ends thereof pass the abutments; said cylinders remaining open during the remaining portion of the rotation of their respective disks, are permitted to cool and free themselves entirely from the burned gases. The successive passage of the pistons through the cylinders of the cylinder disks under the impetus of the exploded charges, will impart a continuous rotary movement to the disk 9 carrying the pistons, in the direction indicated by the arrows in Figs. 1 and 3, thereby developing power in the driven shaft 8.

Because of the fact that all of the moving parts travel in a circle, the attainment of high speed is possible, and in the arrangement shown, because of the greater number of cylinders in the cylinder disks, in excess of the pistons carried by the piston disk, and because of the small gear 10 on the shaft of the piston disk, shaft 8 will be driven at a higher rate of speed than attained by the cylinder disks.

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

1. A rotary engine comprising a cylinder disk rotatable about its axis, a piston disk

rotatable about its axis eccentric to the axis of the cylinder disk, the sides of said disks overlapping, the cylinder disk having a plurality of curved cylinders therein, the piston disk having a plurality of pistons adapted to enter the explosion ends of said cylinders to traverse the course thereof and leave said cylinders at their exhaust ends as said disks are rotated in opposite directions, an abutment for closing the explosion ends of said cylinders during a part of their rotary movement, and means for exploding a combustible mixture in the exlposion ends of said cylinders between the movable piston therein and said abutment.

2. A rotary engine comprising a cylinder disk rotatable about its axis and having therein a plurality of cylinders curved in the form of a loop, both ends of which open through the periphery of said disk, a piston disk rotatable about its axis eccentric to the axis of the cylinder disk, said disks lying with their adjacent faces in contiguous parallel relation, a plurality of pistons on the piston disk adapted to enter said cylinders at their explosion ends to traverse the course of said cylinders and leave said cylinders at the exhaust ends as said disks revolve in opposite directions, means for admitting an explosive charge to the explosion ends of said cylinders in the rear of the pistons therein, means for exploding said charges to drive the pistons through the course of the curved cylinders, and an abutment for closing the explosion end of each cylinder during the period the exploded charge is acting on the piston.

3. A rotary engine comprising a cylinder disk rotatable about its axis and having therein a plurality of cylinders curved in the form of a loop, both ends of which open through the periphery of said disk, a piston disk rotatable about its axis eccentric to the axis of the cylinder disk, said disks lying with their adjacent faces in contiguous parallel relation, a plurality of pistons on the piston disk adapted to enter said cylinders at their explosion ends to traverse the course of said cylinders and leave said cylinders at the exhaust ends as said disks revolve in opposite directions, means for admitting an explosive charge to the explosion ends of said cylinders in the rear of the pistons therein, means for exploding said charges to drive the pistons through the course of the curved cylinders, an abutment for closing the explosion end of each cylinder during the period the exploded charge is acting on the piston, and means connecting said disks to cause them to turn in unison.

4. A rotary engine comprising a disk rotatable about its axis having a plurality of curved cylinders therein, the ends of which open through the periphery of said disk, a piston disk rotatable about its axis eccentric to the axis of the cylinder disk, the faces of said disks lying contiguous in parallel relation, globular pistons projecting laterally from a side of the piston disk mounted upon stems of a lesser diameter, the side of the cylinder disk having curved channels therethrough coincident with the curve of the cylinders and communicating therewith, the pistons being adapted to enter the explosion ends of said cylinders with their stems lying in said channels, an abutment for closing the explosion ends of said cylinders during the period the exploded charges are acting upon the pistons therein, means for admitting explosive charges to the explosion ends of said cylinders between the pistons and said abutment and for exploding said charges to drive the pistons throughout the course of said cylinders.

5. A rotary engine comprising two cylinder disks in juxtaposition, each mounted to rotate about a horizontal axis, the axis of said disks lying in parallel relation, a piston disk rotatable in opposite direction to the cylinder disks eccentric thereto and disposed with a side thereof overlapping the side of the cylinder disks, each of the cylinder disks having a plurality of curved cylinders therein whose ends open through the periphery thereof, a plurality of pistons projecting laterally from a side of the piston disk adapted to successively traverse the cylinders of the cylinder disks as the three disks revolve, each of said pistons in succession after passing from a cylinder in one disk entering a cylinder in the succeeding disk, abutments embracing a portion of the peripheries of said disks so disposed as to close the explosion ends of the cylinders therein during the period of work of each cylinder, means for admitting explosive charges to the explosion ends of the cylinders in said disks between said abutments and the pistons in said cylinders, and means for exploding said charges when so confined.

6. An internal combustion engine comprising a cylinder disk, a hollow shaft on which said disk is mounted, the opening in said shaft terminating in a port within the hub of said disk, a plurality of curved cylinders formed within the wall of said disk, the ends of said cylinders opening through the periphery thereof, a rotatable piston disk having a plurality of pistons adapted to enter and traverse said cylinders, an abutment disposed to close the explosion ends of said cylinders after the entrance of a piston thereinto, there being a passage connecting the explosion end of each cylinder with said port in said hollow shaft at a predetermined time in each revolution of the cylinder disk, whereby an explosive charge may be admitted to the explosion end of each cylinder upon the instant said cylinder end becomes closed by the abutment, and means for ex-

ploding said charges in the closed ends of the cylinders to drive the pistons therethrough.

7. A rotary engine comprising a plurality of cylinder disks in juxtaposition, each mounted to rotate about its axis, a piston disk rotatable in a direction opposite to that of the cylinder disks and disposed with a side thereof overlapping a side of the cylinder disks, each of the cylinder disks having a plurality of curved cylinders therein whose ends open through the periphery thereof, a plurality of pistons mounted on the piston disk adapted to successively traverse the cylinders of the cylinder disks as said disks revolve, abutments embracing a portion of the peripheries of the cylinder disks so disposed as to close the explosion ends of the cylinders therein during the period of work of each cylinder, means for admitting explosive charges between said abutments and the pistons in said cylinders, means for exploding said charges when so confined, and means connecting all of said disks to cause them to rotate in unison in fixed relation.

8. An explosive engine, comprising a rotatable cylinder disk having a curved cylinder therein normally open at its end, a rotatable piston disk carrying a piston adapted to enter and traverse said curved cylinder as said disks revolve, means for causing said disks to revolve in unison, an abutment for closing the explosion end of said cylinder during a portion of the rotary movement of the cylinder disk, and means for exploding a combustible mixture in the explosion end of said cylinder when closed by said abutment.

In testimony whereof, I sign this specification in the presence of two witnesses.

ORSEMUS L. R. JONES.

Witnesses:
E. S. WHEELER,
I. G. HOWLETT.