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J. PUTMAN.
ROTARY ENGINE.
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Patented Nov. 29, 1910.

2 SHEETS—SHEET 1.

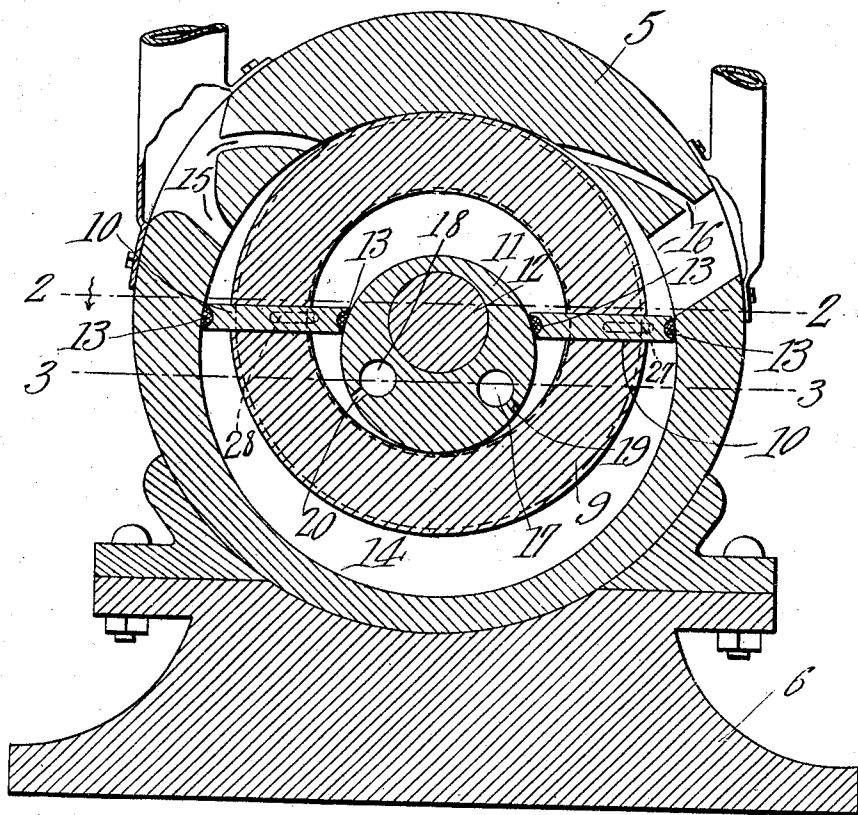


Fig. 1.

Witnesses

J. C. G. G. G.
M. G. G. G.

John Putman,

Inventor

by

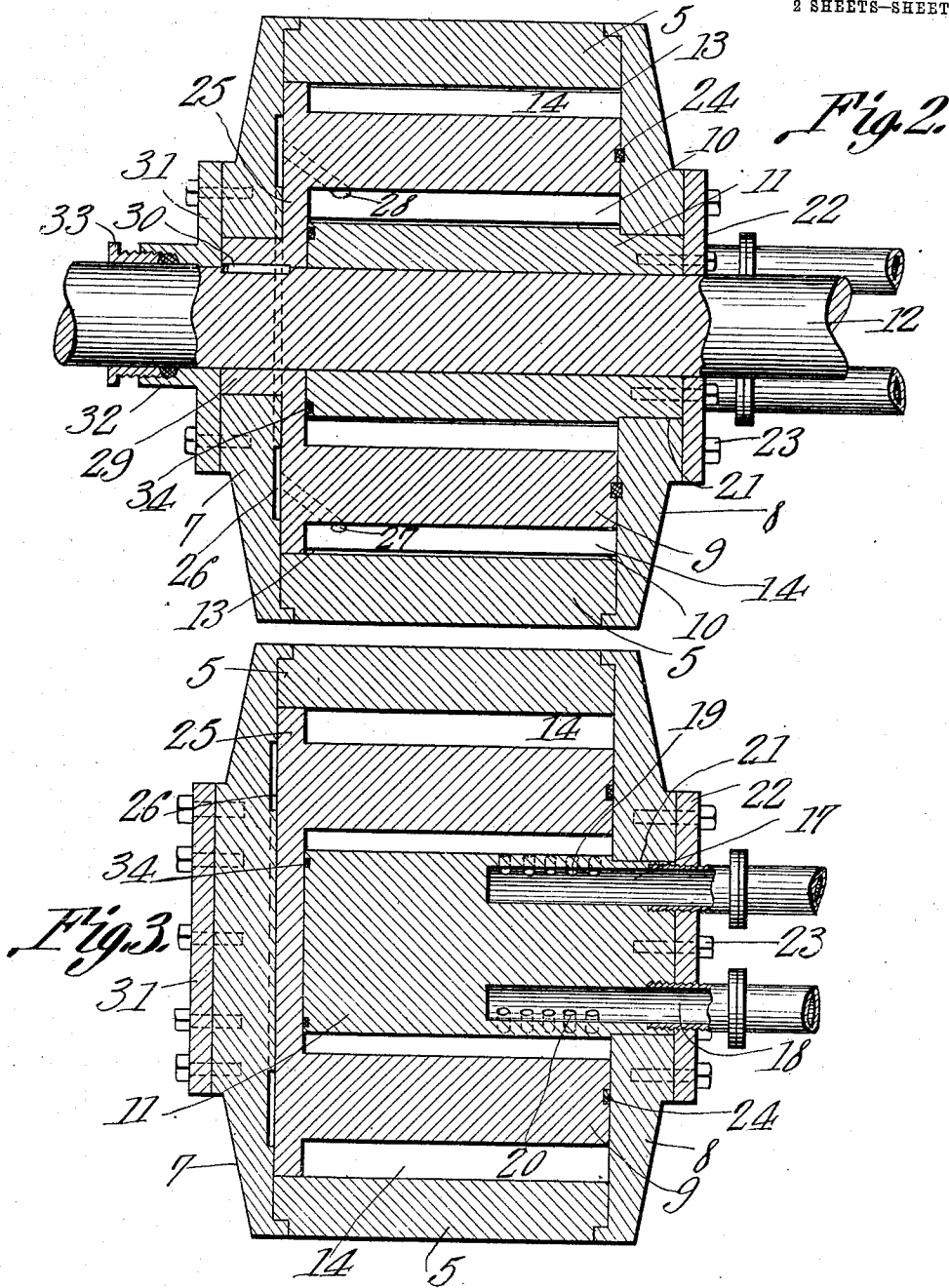
C. A. Snow & Co.

Attorneys

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2 SHEETS-SHEET 2.



Witnesses

W. C. Connelley
H. K. Schmitt

John Putman,
 Inventor

by *C. A. Snow & Co.*
 Attorneys

UNITED STATES PATENT OFFICE.

JOHN PUTMAN, OF PARIS, ILLINOIS.

ROTARY ENGINE.

976,913.

Specification of Letters Patent. Patented Nov. 29, 1910.

Application filed May 25, 1910. Serial No. 563,346.

To all whom it may concern:

Be it known that I, JOHN PUTMAN, a citizen of the United States, residing at Paris, in the county of Edgar and State of Illinois, have invented a new and useful Rotary Engine, of which the following is a specification.

This invention relates to rotary engines of that type in which the motive fluid is expended against a cam-actuated radially sliding piston blade.

The objects of the invention are to improve and simplify the construction of rotary engines as well as to increase their efficiency in operation.

In order that the invention may be fully understood, reference is had to the accompanying drawings forming a part of this specification, in which drawings—

Figure 1 is a vertical section of the engine. Figs. 2 and 3 are horizontal sections on the lines 2—2 and 3—3, respectively, of Fig. 1.

Referring more particularly to the drawings, 5 denotes a cylinder which is supported in horizontal position on a suitable base 6, said cylinder being closed at its ends by heads 7 and 8, respectively. In the cylinder is mounted a rotor comprising a drum 9 carrying diametrically opposite, radially sliding blades 10. On the inside of the drum 9 is located a cam 11 having an opening through which the engine shaft 12 passes, said shaft being free to turn in the opening. The cam is a cylindrical member arranged eccentrically with respect to the shaft. The blades 10 are slidably mounted in radial openings made in the drum, and they project into the latter, as well as into the interior of the cylinder, the ends of the blades being in contact with the cylinder wall and the periphery of the cam, respectively. The cylinder wall is concentric with respect to the periphery of the cam, and the drum is concentric with respect to the shaft, by reason of which the ends of the blades are held in sliding contact with the cylinder wall and the periphery of the cam when the drum rotates. The ends of the blades are fitted with packing blocks 13 to provide a steam tight joint. The internal diameter of the cylinder 5 is greater than the external diameter of the drum 9, and said drum is in contact with the cylinder wall at one point, thus forming a crescent-shaped channel 14 in the cylinder across which the outer ends of the blades 10 extend.

On one side of the point of contact between the cylinder wall and the drum, inlet ports 15 open into the channel 14, one of said ports being located slightly in advance of the other. On the other side of the point of contact between the cylinder wall and the drum, exhaust ports 16 lead from the channel 14, one of said ports also being located in advance of the other. One of the ports 15 is located quite close to the point of contact between the cylinder wall and the drum so that the steam or other motive fluid can get behind the blade as soon as it passes this point. The slight inequality of pressure against this side of the blade due to the difference of its area on opposite sides, is negligible in view of the larger area of the blade which has already passed the inlet port, and against which the full pressure is working. One of the exhaust ports 16 also extends in close proximity to the point of contact between the cylinder wall and the drum, so that steam can exhaust until the blades come quite close to this point.

The steam supply to and the exhaust from the interior of the drum 9 is by the way of ducts 17 and 18 respectively, in the cam 11, said ducts extending from one end thereof, and parallel to its longitudinal axis. From the duct 17 a plurality of ports 19 open through the side of the cam into the interior of the drum, and a similar series of ports 20 open from the duct 18 into the interior of the drum. The periphery of the cam is in contact with the interior surface of the drum at one point, and the ports 19 and 20 are located on opposite sides of this point. Steam or other fluid under pressure enters the interior of the drum through the ports 19, and is expended against that end of the blades extending into the drum. The exhaust is through the ports 20 into the duct 18.

The head 8 is formed with an opening 21 into which the cam 11 extends, and to the outer face of the head is bolted or otherwise fastened a plate 22. This plate comes against the outer end of the cam, and the latter is fastened to the plate by bolts or other suitable means 23, whereby the cam is held stationary. The shaft 12 rotates in the cam.

One end of the drum 9 is open, and this end is closed by the head 8, a packing ring 24 being interposed therebetween. The other end of the drum is closed by a head 25 which is in contact with the interior sur-

face of the head 7, said surface having an annular channel 26 opposite the head 25. This channel is placed in communication with the channel 14 by means of a duct 27 made in the drum. The drum is also formed with a duct 28 which leads into the channel 26 from the interior of the drum. By thus establishing communication between the channel 26 and the two steam spaces of the engine, the end pressure is balanced.

That end of the drum which is provided with the head 25, has a hub extension 29 through which the shaft 12 passes, said shaft being made fast to the drum by means of a key or other suitable means 30, so that the shaft will rotate with the drum. In the head 7 is an opening to receive the hub extension 29 of the drum, and to the outside of this head is bolted or otherwise secured a plate 31 which fits against the outer end of the hub extension. This plate is formed with a stuffing box 32 through which the shaft 12 extends, said stuffing box being provided with a suitable gland 33. One end of the cam 11 is in contact with the closed end or head 25 of the drum 9, and between said parts is interposed a packing ring 34.

What is claimed is:

1. In a rotary engine, a cylinder having inlet and exhaust ports, a drum in the cylinder, a shaft carrying said drum, a stationary cam in the drum through which cam the shaft loosely passes, said cam having longitudinal inlet and exhaust ports opening through the sides of the cam into the drum, and radially sliding blades carried by the drum, and extending into the cylinder and the interior of the drum, the ends of the blades being in sliding contact with the cylinder wall and the periphery of the cam, respectively.

2. A rotary engine having a stationary casing, a shaft eccentric to the interior of the casing, a fixed abutment eccentric to the shaft and concentric to the interior of the casing, a drum concentric to the shaft, the exterior of the drum touching the inner wall of the casing at one point and the inner wall

of the drum touching the exterior of the abutment at a point opposite the point of contact of the drum with the casing, blades carried by the drum and extending from the abutment outward to the casing, an inlet in the casing on one side of the center of the shaft, an inlet in the abutment at an opposite point with relation to the center of the shaft, an exhaust port in the casing, and an exhaust port in the abutment, the exhaust port of the abutment being at an opposite point with relation to the center of the shaft from the exhaust port in the casing.

3. A rotary engine having a casing, a shaft eccentric to the interior of the casing, an abutment fixed with relation to the casing and eccentric to the shaft, said abutment being concentric to the interior of the casing, a drum concentric to the shaft and being movable relatively to the abutment and casing, the exterior of the drum touching the inner wall of the casing at one point and the inner wall of the drum touching the exterior of the abutment at a point opposite the point of contact of the drum with the casing, blades carried by the drum and extending radially from the exterior of the abutment to the interior of the casing, inlet and exhaust ports through the abutment on opposite sides of the point of contact of said abutment with said drum, and inlet and exhaust ports through the casing on opposite sides of the point of contact of the drum with said casing, the exhaust port in the abutment being on one side of the shaft, and the exhaust port of the casing being on the opposite side of the shaft, the inlet of the abutment being on one side of the shaft and the inlet of the casing being on the opposite side of the shaft.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN PUTMAN.

Witnesses:

CHAS. FLICKNER,
FRANK C. FISHBACK.