

A. A. EDWARDS & A. OLSON.

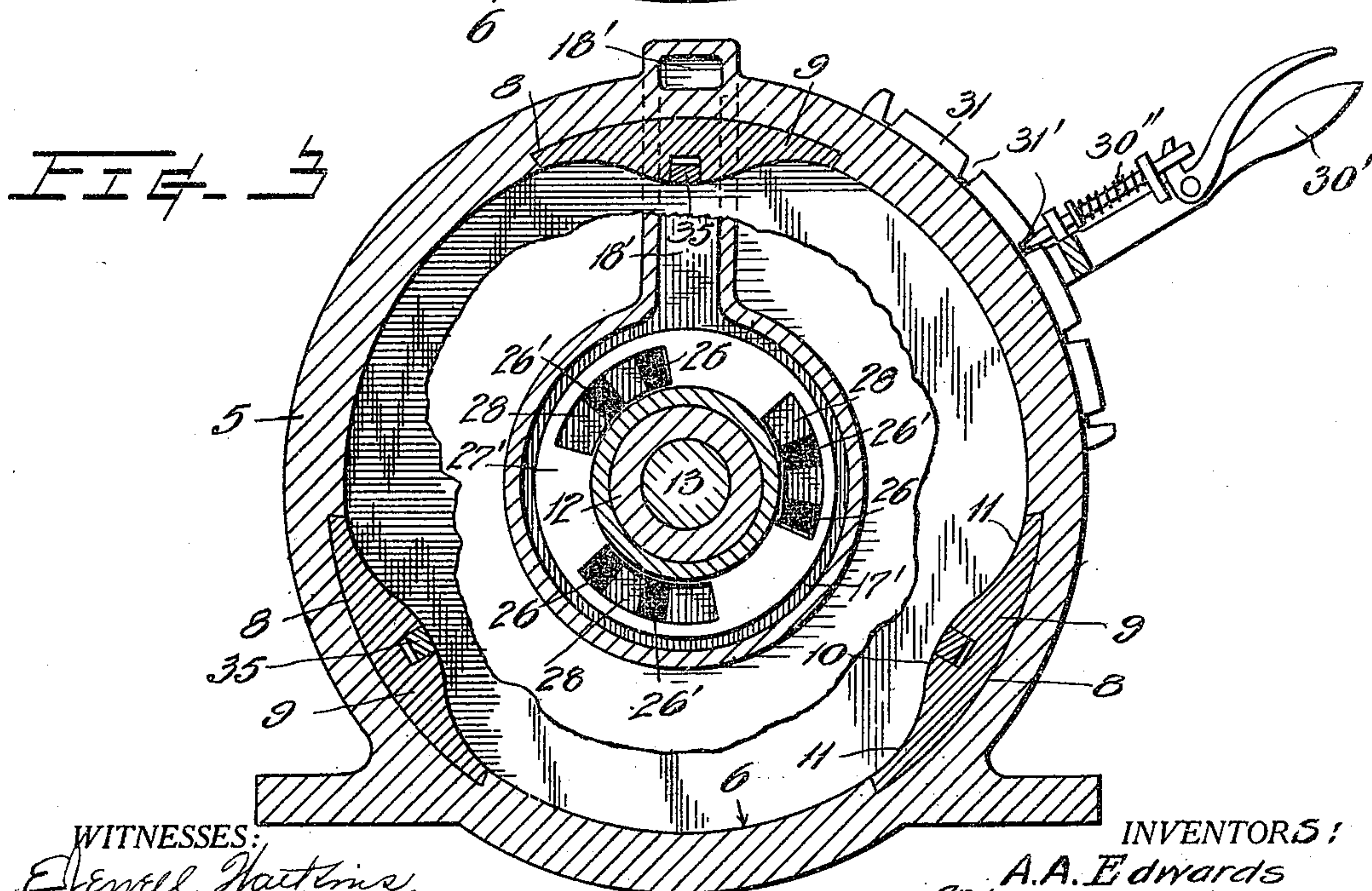
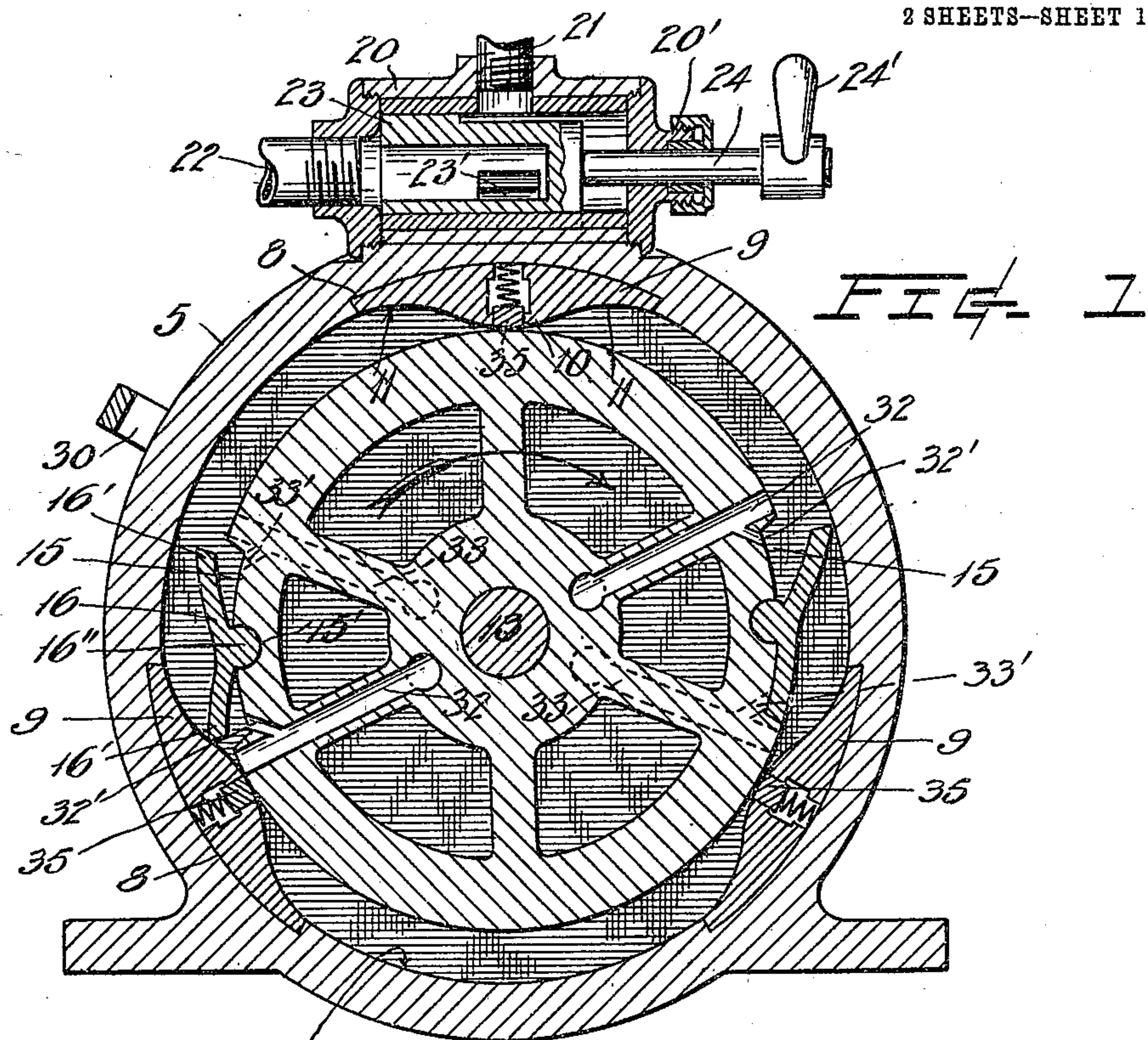
ROTARY ENGINE.

APPLICATION FILED JULY 22, 1908.

961,849.

Patented June 21, 1910.

2 SHEETS—SHEET 1.



WITNESSES:
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INVENTORS:
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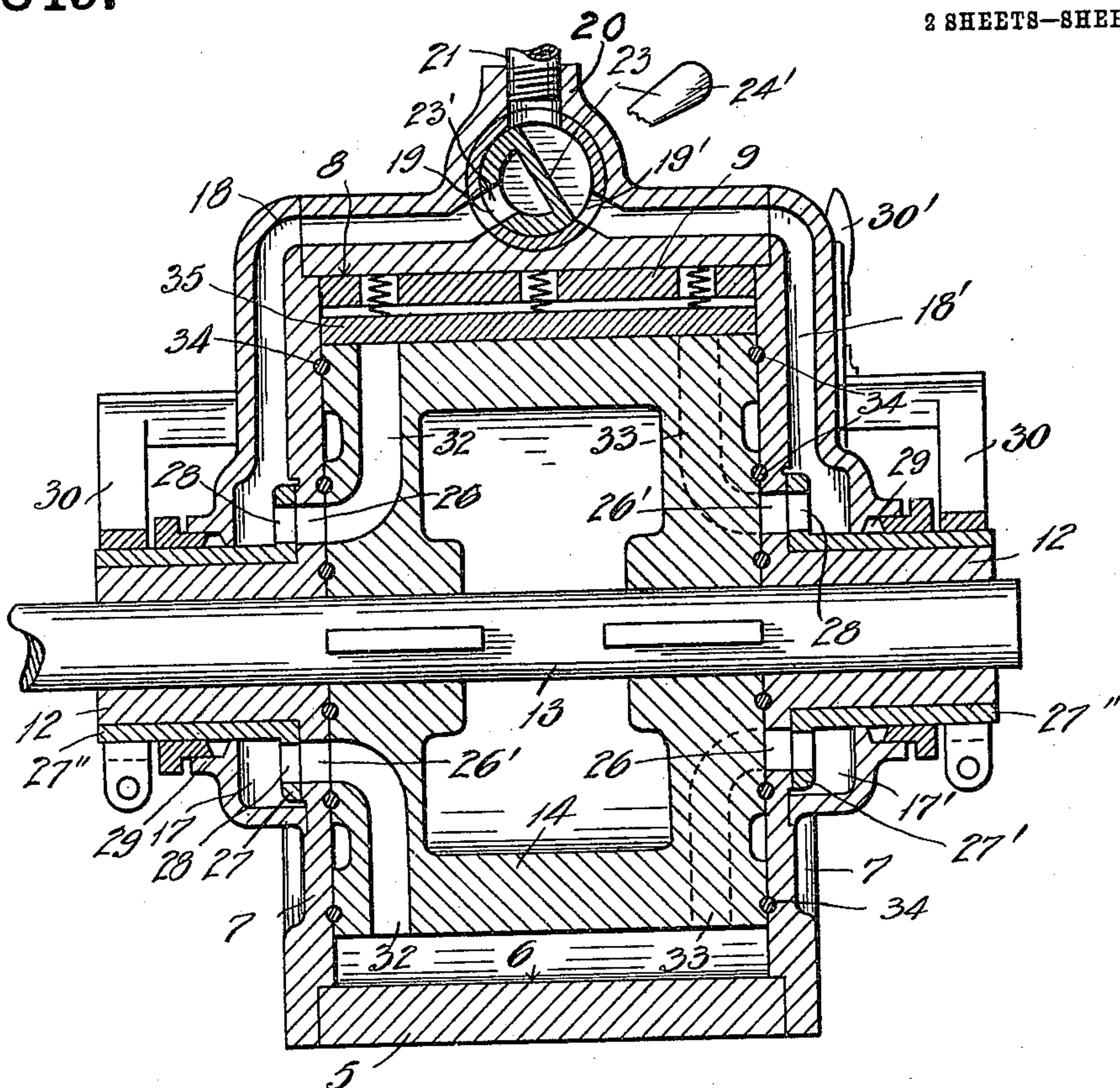


FIG. 2

WITNESSES:

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UNITED STATES PATENT OFFICE.

ANDREW A. EDWARDS AND ADNA OLSON, OF STANWOOD, WASHINGTON.

ROTARY ENGINE.

961,849.

Specification of Letters Patent. Patented June 21, 1910.

Application filed July 22, 1908. Serial No. 444,814.

To all whom it may concern:

Be it known that we, ANDREW A. EDWARDS and ADNA OLSON, citizens of the United States, residing at Stanwood, in the county of Snohomish and State of Washington, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

The object of this invention is to produce a rotary engine which shall be of simple and inexpensive construction, and durable and efficient in operation.

With these ends in view, the invention consists in certain novel features of construction and combinations thereof, as will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a vertical transverse sectional view of an engine embodying our invention; Fig. 2 is a longitudinal section of the same; and Fig. 3 a sectional view taken partly through one of the steam-chambers and partly through the engine cylinder, and with the piston drum omitted.

The reference numeral 5 designates the engine casing having a cylindrical bore 6 and provided with removable ends 7.

Seated in recesses 8 formed in the periphery of the cylinder-bore are abutments 9 which are spaced at equal distances apart and extend longitudinally from one of the cylinder ends to the other. These abutments are each formed with a face having a centrally arranged convex portion 10 with co-extensive concave portions 11 which merge with the peripheral face of the cylinder bore.

Centrally of the cylinder ends 7 are bosses 12 which are bored to furnish journal bearings for a power shaft 13 extended axially through the cylinder and carrying the piston-drum 14.

The drum is provided upon diametrically opposite sides with cavities 15 to accommodate the wings 16', of piston heads 16 which are connected to the drum so as to be free to oscillate as they successively revolve past the abutments. Such connection between the heads 16 and the drum is accomplished by the provision of a centrally disposed circular segmental rib 16'' upon each head being respectively socketed in correspondingly shaped recesses 15' in the drum.

Annular shaped steam chambers 17 and 17' are provided in the respective ends of the cyl-

inder and are connected by passages 18 and 18' and ports 19 and 19' with a valve-casing 20 which, in turn, is connected by a steam supply pipe 21 and an exhaust pipe 22. Within this casing is a valve 23 which is chambered from one end to make communication between said exhaust pipe and one of the passages 18 or 18' through an inlet opening 23' of the valve; while the valve is cut away upon the outside to allow of a direct flow of the steam between the pipe 21 and the other of these passages. This valve is provided with a spindle 24 which extends through a stuffing box 20' on the valve-casing and carries a handle 24' whereby the valve may be rotated when the direction of the shaft's rotation is to be reversed.

The passages 18 and 18' terminate, as aforesaid, in annular chambers 17 and 17' located at the opposite ends of the engine and are provided with groups of spaced openings, or ports, 26 and 26' in the respective ends of the cylinder, as illustrated in Fig. 3. These groups, or pairs, of ports at one end of the cylinder are severally arranged to be adjacent to the aforesaid abutments and at one side of radial planes respectively projected through the same; and the pairs of ports at the other end are correspondingly placed but upon the opposite sides. Positioned within the chambers 17 and 17' respectively are rotary cut-off valves 27 and 27' having ports 28 arranged to be brought into register with either or both ports, 26 and 26', of the various pairs according to the point at which the steam is to be intermittently cut off upon the steam-intake end and with respect to the travel of the piston-heads. In order that all of the ports at the exhaust end will remain open, while the ports on the intake end are more or less closed, the ports of the cut off valve are made of greater arcuate lengths than is necessary to expose the respective pairs of ports 26 and 26'. The cut off valves are each formed with a sleeve 27'' which are mounted for rotation upon the bosses 12 and extend through stuffing boxes 29. Rigidly connected to the protruding ends of the valve-sleeves are the branches 30 of a lever 30' which is employed to manipulate the cut off valves in unison and, to facilitate the proper setting of the same, a plate 31 is provided with notches 31' which are spaced to accommodate a spring-pressed latch-bolt

30'' upon the lever for various predetermined amounts of openings to be afforded through the valve ports.

In the drum are conduits 32 and 33 extending from its periphery to positions upon the drum ends such as to oppose the ports 26 and 26' at the opposite ends of the cylinder. The conduits 32 and 33 are disposed to be in proximity of and upon opposite sides of the respective pistons whence it is seen that when one of these sets of conduits, as 32 for example, is employed for steam induction the other set would serve as exhaust passages.

32' and 33' are branches to the conduits for conveying steam to or from the recesses 15 to actuate the piston heads in their oscillating movements.

Packing rings, such as 34, are provided where they are deemed necessary to prevent the leakage of steam between the drum and the cylinder ends; and, for a like service, packing strips 35 may advantageously be utilized to intercept any leakage between opposite sides of the various abutments.

Assuming that the reversing valve 23 is adjusted as shown in Fig. 2, the steam will be admitted through passages 18 to the steam chamber 17, and, when the conduits 32 are presented to the chamber ports 19 the steam acting under the wings 16' of the piston heads to maintain their extremities against the inner periphery of the cylinder and likewise causes the drum to rotate in the direction indicated by the arrow in Fig. 1. As the piston heads revolve, the relatively sloping faces of the abutments when encountered by the heads effect the oscillation of the latter to permit them to progressively pass the abutments.

In the travel of the heads by the abutments the steam supply is temporarily cut off by the valve 27 at some distance in advance of the respective abutments and is

readmitted after the rear ends of the heads successively pass the medial planes of the abutments, thus allowing the heads to be readily affected by the abutments upon the one hand and by the force of the steam upon the other.

When the points of cut off of the steam are to be varied, the cut off valve is adjustably moved through the offices of the lever 30'. When steam is admitted through the conduits and passes, as just explained, at one end of the engine, the conduits and passages with accented (') corresponding numbers at the other end serve to convey the exhaust steam away. To reverse the engine, the valve 23 is adjusted to direct the currents of steam, both the intake and exhaust, in opposite directions from their previously assumed courses.

What we claim, is—

1. A rotary engine comprising a cylinder, spaced abutments, a drum in said cylinder, two-blade piston heads pivoted on said drum, a passage for conducting motive fluid to the rear of either blade, the passages for one set of blades being constructed to serve as exhausts when the other passages serve as inlets.

2. A rotary engine comprising a cylinder, spaced abutments, a drum in said cylinder, two-blade piston heads pivoted on said drum, a main passage for each blade of the piston head, branch passages leading directly to the under face of said blades, said main passages being open at any position of the blades.

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

ANDREW A. EDWARDS.
ADNA OLSON.

Witnesses:

D. CARL PEARSON,
ALLAN BARTZ.