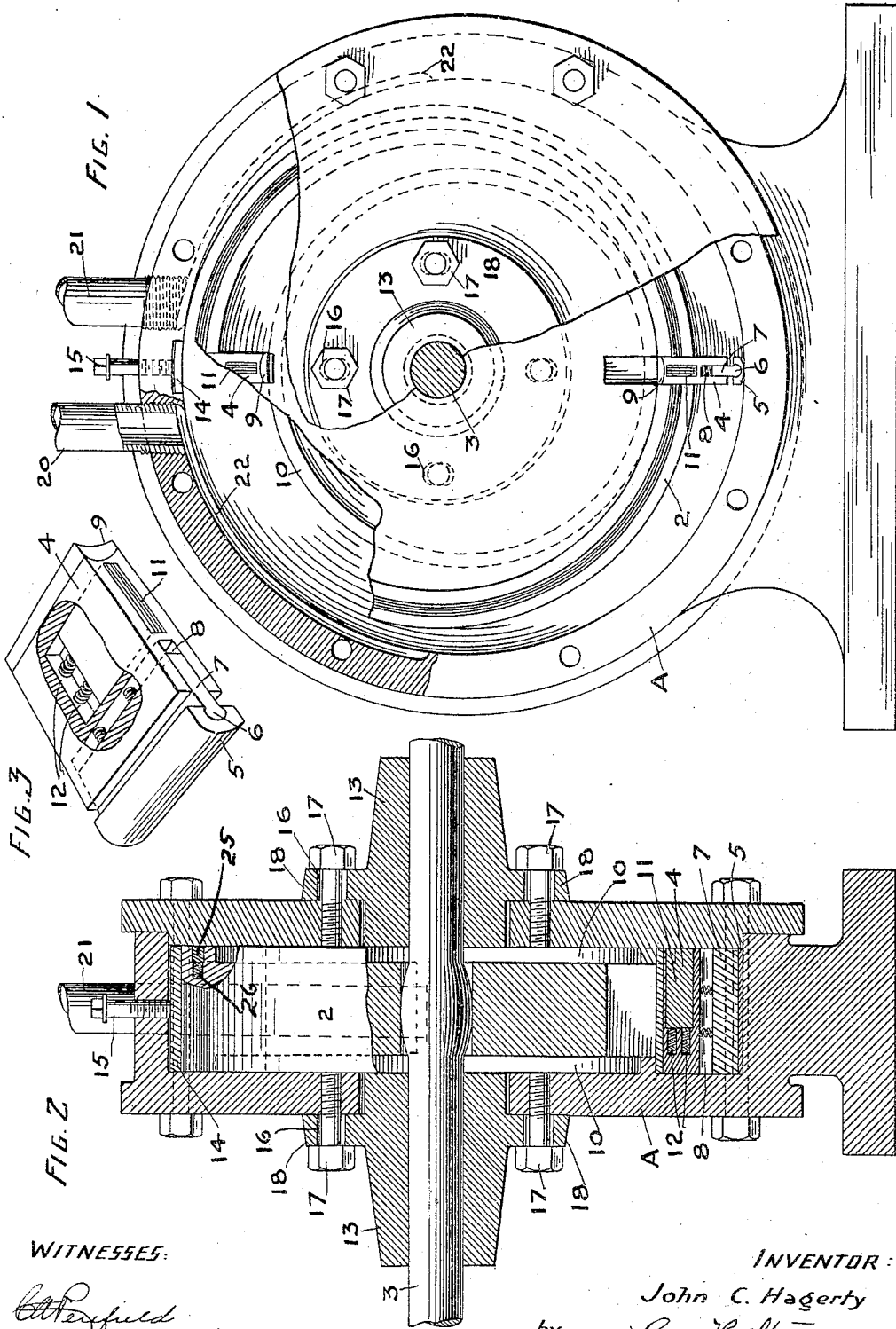


J. C. HAGERTY.
 ROTARY ENGINE.
 APPLICATION FILED AUG. 24, 1908.

940,246.

Patented Nov. 16, 1909.



WITNESSES:

Wm. H. H. H.
Leon B. H.

INVENTOR:

John C. Hagerty

Geo. B. H.

Att'y.

UNITED STATES PATENT OFFICE.

JOHN C. HAGERTY, OF SANTA CRUZ, CALIFORNIA.

ROTARY ENGINE.

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Specification of Letters Patent.

Patented Nov. 16, 1909.

Application filed August 24, 1908. Serial No. 449,964.

To all whom it may concern:

Be it known that I, JOHN C. HAGERTY, citizen of the United States, residing at Santa Cruz, in the county of Santa Cruz and State of California, have invented new and useful Improvements in Rotary Engines, of which the following is a specification.

My invention relates to improvements in rotary engines; and it consists of an exterior circular case, and an interior drum mounted upon a shaft and revoluble eccentrically with relation to the case, radially sliding pistons carried by the drum, with means for adjusting the drum with relation to the case, means for packing the pistons, and combinations of parts, and details of constructions which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is an elevation of the engine, broken in places. Fig. 2 is a vertical section at right angles of Fig. 1. Fig. 3 is an enlarged detail of piston 4.

The apparatus as shown in the drawings consists of an exterior cylindrical case A, an interior drum 2 mounted upon a shaft 3 which passes through the ends of the case at such a point that the drum is revolved on an axis, which is not the axis of the case, the drum being practically eccentric to the case with which it fits in close contact on one edge, and forms a crescent space around the remainder of the drum; this space serving for the action of the fluid under pressure upon pistons which are carried by the drum, and which are maintained in contact with the interior of the casing so as to form chambers and abutments against which the fluid may press to revolve the drum.

The pistons 4, of which I have here shown two upon substantially opposite sides, are radially slidable within the drum, and have their outer edges provided with packing-plates or blocks 5; the outer edges of which are curved and form a close fit with the interior surface of the casing. These packing-blocks 5 are channeled or grooved as shown, and these channels or grooves fit upon the cylindrical heads 6 of plates 7, which plates extend into slots or channels 8 in the edges of the pistons 4. The packing 5 thus has a free rocking movement about the heads 6, and thus fits itself continually to the changing curvature of the interior of the casing with relation to the piston-carrying drum, which change occurs by reason of the eccen-

tricity of the drum within the casing, and whatever the position of the pistons a tight joint will be preserved against the inner periphery of the casing.

The inner edges of the pistons 4 are provided with transversely disposed blocks 9, the inner faces of which are curved and adapted to travel upon fixed rings or flanges 10 formed on the interior of the ends of the case, and concentric with its interior, so that as the piston-carrying drum revolves, the inner ends of the pistons moving over the rings or flanges 10 will be caused to slide within the drum, and to maintain the outer edges in operative contact with the interior of the drum.

In order to form sufficiently tight joints between the sides of the pistons 4, and the ends of the case, I have shown transversely slidable packing-plates 11 fitted within slots in the pistons, and they may be actuated by springs as shown at 12, so that the outer edges are constantly maintained in contact with the ends of the case, and thus prevent the escape of the impelling fluid past the pistons.

In order to prevent binding in case of parts getting out of alinement, and to assist in maintaining close joints in the operating parts, I have shown the drum 2 so mounted upon the shaft 3 that it may have a slight rocking motion from side to side; this being effected by a concavo-convex contact between the interior of the drum and the exterior of the shaft. The shaft passes through bearings 13 upon either end of the case, and forms therewith sufficiently tight joints through which the shaft revolves. The edge of the piston-carrying drum forms a substantially tight joint between itself and the case at one point, and the crescent-shaped opening between the two is correspondingly the widest at the opposite side. The meeting point of the two must be substantially tight to prevent leakage, and in order to effect this I have shown a contact block 14 fitted in a channel in the case at the point of contact, and this is adjustable by screws, as at 15, so that it may be advanced, as occasion and wear require.

I have further shown the device as having slots in a line through the plate 18, and the shaft 3; these slots being indicated at 16 and being arranged upon each side of the center of the shaft, and through these slots pass bolts 17 by which the drum may be

locked to flanges 18 on the journal-boxes or hubs 13. If any wear occurs which requires adjustment of the drum with relation to the packing 14 and the interior of the casing, this adjustment may be effected by loosening the bolts 17, and moving the drum until it makes perfect contact with the interior of the casing, or its joint-forming plate 14. I am thus enabled to maintain all parts in operative condition, and to compensate for any wear which may take place.

The fluid under pressure may be admitted through a pipe or passage 20 opening into the casing at one side of the contact plate 14, and the exhaust may take place through a similar pipe 21 upon the opposite side of the contact. In order to properly supply the fluid to actuate the pistons, I have shown grooves or channels 22 made in the interior of the casing, and extending about one-quarter, more or less, of its circumference, from their point of connection with the inlet and outlet passages. These grooves or channels opening into the space between the drum and the interior of the casing, serve to admit the pressure fluid and allow it to follow the pistons so as to impel them and the drum, and parts carried thereby.

The operation will be as follows: The fluid under pressure, of any desirable character, being admitted through the passage 20, as soon as a piston has passed the contact point 14, and the passage 20, the fluid will press upon this piston and commence to impel it, but a portion of the fluid being allowed to pass through the groove or channel 22, will pass the edge of the piston, and pass into the wider portion of the piston chamber so as to act with a greater force upon the piston which is in advance; this piston operating in the closed and unchanneled portion of the interior of the drum, the full pressure of the fluid would be received by it, and the pressure increases with the area of the crescent-shaped channel through which the piston is passing. When this piston has reached the end of the opening 22, the rear-most piston will have passed the end of the opening 20, and will begin to receive pressure as before; while the fluid which has impelled the first piston to that point, will be allowed to escape through the passage 22 and through the exhaust 21, so that when this piston has again passed the abutment plate 14, it will be in readiness to receive a new impulse.

It will be understood that by properly proportioning the passages 22, a different number of pistons may be used; but in the present case I have illustrated the apparatus as having two of these pistons.

By means of a suitable four-way cock or valve, it will be seen that communication between the source of pressure, and the interior of the engine may be made through

either of the pipes 20 or 21, and that by the proper changing of the valve, the movement of the engine may be reversed; either of the pipes serving as an inlet or outlet as the case may be.

It will be understood that the apparatus may be supported upon any suitable base or fixture, and that the relative position of the parts to the base, may be varied to suit. Thus, the contact point between the drum and the interior of the casing, may be conveniently arranged on the side contiguous to the base, and the admission and exhaust ports may pass through this base; or if preferred, the arrangement may be made so that the inlet and exhaust pipes are upon the opposite side from the base, or with other suitable relation.

Segmental channels are made around one edge of the drum flange, these channels forming segments extending in close proximity to the channels in which the pistons slide. Packing rings 25 fit these channels, and springs 26 serve to force the rings into contact with one end of the case, thus forming a yielding joint. The opposite edge of the drum will be maintained in close contact with the end of the case on that side and will also make a tight joint.

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

1. In an apparatus of the character described, a cylindrical casing, a journal shaft extending through said casing at one side of the center, a cylindrical piston-carrying drum mounted upon the shaft, means for adjusting the drum to maintain a close contact between its periphery and one side of the casing, said means comprising bolts arranged at each side of the center of the shaft and extending through the casing, and a fixed flange bearing against the casing and provided with slots for the reception of said bolts, said drum being so mounted upon the shaft as to be capable of a slight rocking movement.

2. In an apparatus of the character described, the combination of an exterior cylindrical casing, a journal-shaft extending through said casing at one side of the center, a cylindrical piston carrying drum mounted upon the shaft and adjustable therewith to maintain a close contact between its periphery and one side of the casing, bearings for said shaft, said bearings having outstanding flanges fitting the outer sides of the casing and provided with slots, bolts passing through said flanges and casing and engaging the drum whereby the shaft and drum may be adjustably moved with relation to the casing to compensate for wear of the parts, pistons slidable radially within the drum having automatically projecting packing-plates at the outer edges, rings or flanges

projecting concentrically from the interior of the drum ends, and automatically adjustable bearings on the inner ends of the pistons adapted to travel upon said flanges whereby
5 the pistons are moved in contact with the interior of the casing while the drum revolves eccentrically thereto.

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

JOHN C. HAGERTY.

Witnesses:

CHARLES A. PENFIELD,
A. NOHWICSNER.