

No. 649,043.

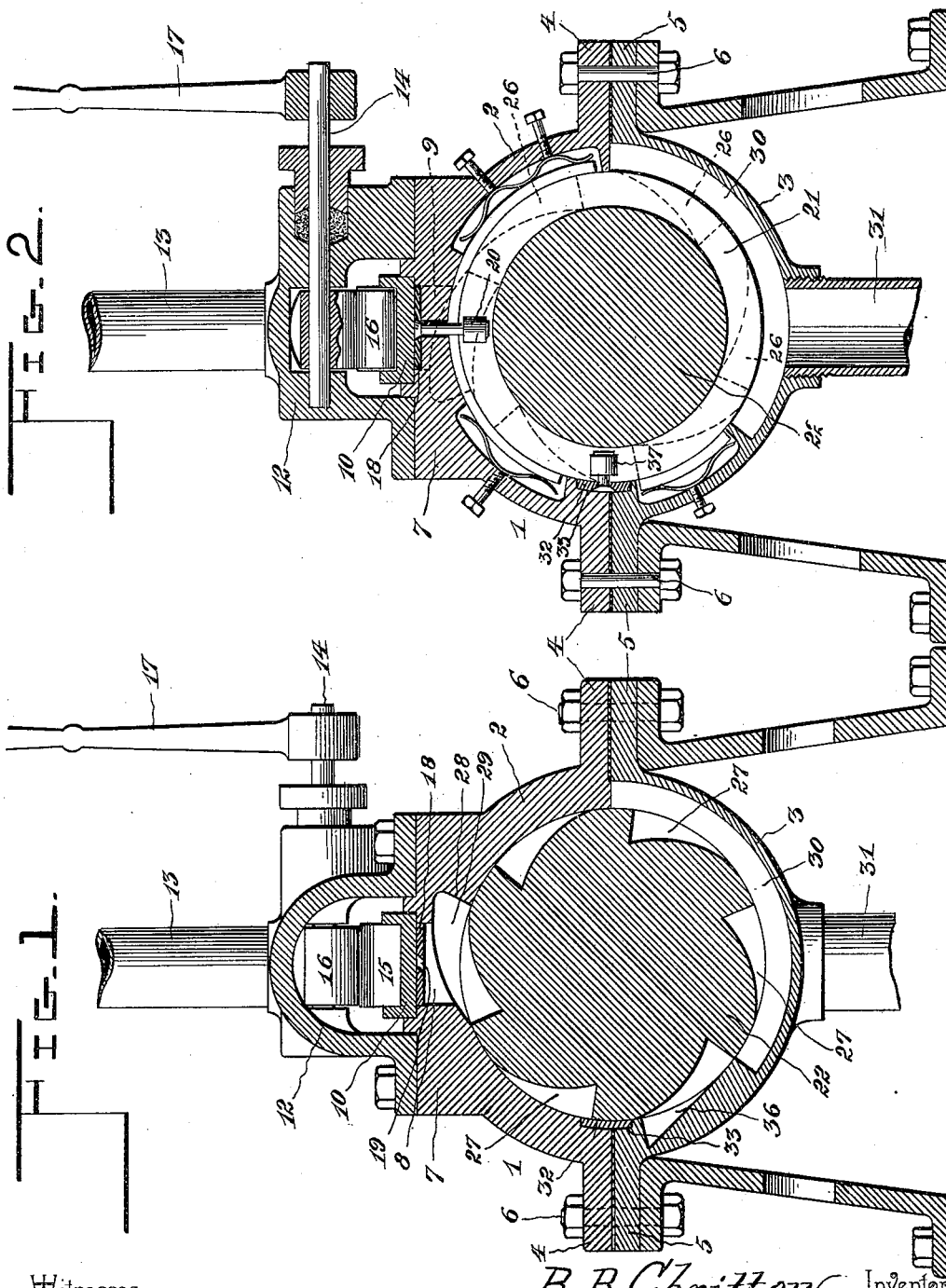
Patented May 8, 1900.

R. B. CHRITTON.
ROTARY ENGINE.

(Application filed Sept. 18, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

John F. Deuffermel
Geo. H. Chandler

By his Attorneys,

R. B. Chritton, Inventor

C. A. Snow & Co.

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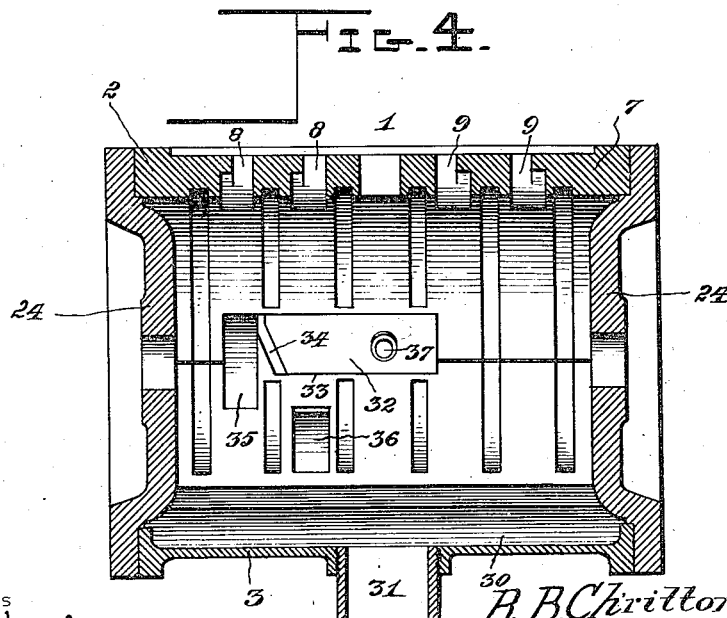
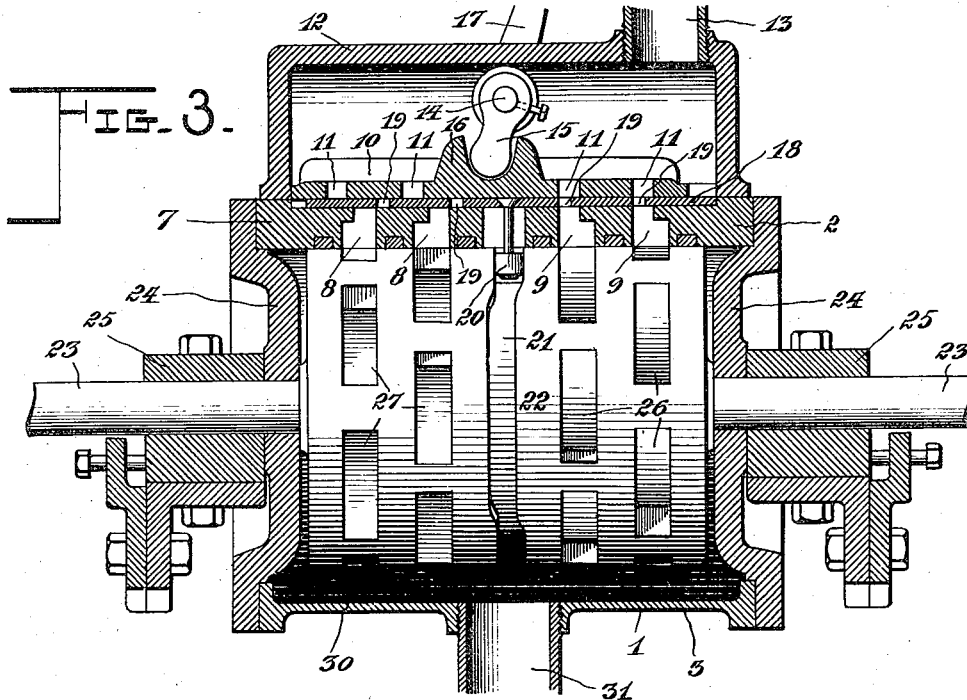
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UNITED STATES PATENT OFFICE.

ROBERT B. CHRITTON, OF NORTH ENID, OKLAHOMA TERRITORY.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 649,043, dated May 8, 1900.

Application filed September 18, 1899. Serial No. 730,899. (No model.)

To all whom it may concern:

Be it known that I, ROBERT B. CHRITTON, a citizen of the United States, residing at North Enid, in the county of Garfield, Oklahoma Territory, have invented a new and useful Rotary Engine, of which the following is a specification.

My invention relates to improvements in rotary engines; and one object is to provide a simple and effective rotary motor designed to be actuated by the impact of a fluid led to the interior of the cylinder and adjacent a rotary piston.

Another object of the invention is to compound a single-acting engine by providing several series of abutments, both fixed and movable, bearing different relations and so arranged that the live steam after its effective operation between two abutments will pass between the abutments of another series to obtain the compound action usually obtainable only in double-acting engines.

A still further object of the invention is to provide simple means for reversing the motor.

Referring to the drawings, Figure 1 is a central vertical sectional view of my engine. Fig. 2 is a similar view, the section being taken at right angles to the line of section of Fig. 1. Fig. 3 is a sectional view through the cylinder with the piston removed. Fig. 4 is a detail view of the piston detached.

Referring to the numerals of reference, each of which designates a corresponding part throughout the several views of the accompanying drawings, 1 indicates a cylinder preferably comprising sections 2 and 3, provided with abutting flanges 4 and 5, secured together by bolts 6 to form a cylinder. The upper section 2 is provided, as usual, with a port-casing 7, through which adjacent to one end of the cylinder are located a pair of supply-ports 8 and through which adjacent to the opposite end of the cylinder are located supply-ports 9.

The ports 8 and 9 are controlled by a controlling-valve 10, provided with four ports 11 and located within a valve-casing 12, to which is led the steam through a steam or other fluid supply pipe 13. The ports 11 through the valve are so related that either the ports 8 or the ports 9, leading from the casing 12 to the interior of the cylinder, may be brought into

coincident relation therewith alternately—that is to say, when either pair of ports is open the other must be closed.

14 indicates a rock-shaft extending through the valve-casing and carrying a rocker 15, seated in a cradle 16, constituting a part of the valve 10.

Any suitable means for actuating the controlling-valve may be employed, but as the sole function of the controlling-valve is to stop, start, or reverse the motor I prefer to employ an ordinary valve-lever 17 upon the end of the shaft 14 at the outside of the valve-casing.

18 indicates a cut-off valve situated in a depression in the upper face of the cylinder and provided with ports 19 intermediate of the ports in the cylinder and controlling-valve. This cut-off valve is provided with a roller-stud 20, extending from the cut-off valve 18 to the interior of the cylinder, where it engages a cut-off-valve-actuating groove 21 at the center of the rotary piston 22, fitting within the cylinder and mounted upon the shaft 23. The ends of the cylinder are covered by a head 24, and suitable bearings 25 are provided for the shaft 23.

Upon opposite sides of the peripheral cam-groove 21 are formed in the face of the piston several series of oppositely-disposed steam-pockets 26 and 27. There are preferably four series of these pockets, two of which at one end of the piston are disposed with their abutments in one direction and are in staggered relation—that is to say, the two series of pockets to one side of the cam-groove have their pockets arranged staggered and all of the abutments being disposed in a direction to drive the piston in opposition to the direction in which it is driven when the steam is admitted to the pockets at the opposite side of the groove, which also have this staggered arrangement. Now as these pockets are presented before the ports 8 or 9, according to the direction in which it is desired to rotate the piston, steam is admitted to them alternately, and by its impact against the abutments of the pockets the piston is rotated. As the pocket in the piston progresses beyond the abutment-recess 29 in the cylinder the steam imprisoned therein will be carried with the piston until the pocket arrives opposite a

chamber 30, formed by enlarging the internal diameter of the cylinder-section 3. The steam now escapes into this chamber and in striking against the end thereof drives the piston farther. From thence the steam passes to the exhaust 31. During this operation the live steam is being admitted from the controlling-valve chamber 12 through the ports in the controlling-valve, cut-off valve, and cylinder. Unrestricted admission of the steam would be, as is well understood in the art, wasteful, and the cut-off valve is therefore provided for cutting off the supply of steam either during a half or quarter of the movement of the piston, or, if desired, during the progress of a portion of each pocket before the port, the extent of movement of the cut-off valve and the number of its reciprocations to a complete revolution of the piston being determined by the form of the cam-groove 21 and corresponding to the number of pockets in a series.

In Fig. 4 I have illustrated a second cut-off valve 32, seated within the valve-recess 33 in the wall of the cylinder at any desired point and serving to control a port 34, leading between a pair of pockets 35 and 36, formed in the inner face of the piston just beyond the abutment-recesses 29. These pockets are arranged in alinement with each of the contiguous series of pockets, and the abutment of one is arranged opposite the shallow extremity of the other. This second "cut-off," as it may be termed, is, like the cut-off valve 18, reciprocated by a roller-pin 37, extending into the cam-groove 21. Now as certain or all of the series of pockets 27 adjacent to the end of the piston pass beyond the abutment-recesses 29 the live steam will escape from the pocket into the pocket 35 in the cylinder and the impact of the steam will be utilized. As the pocket 27 passes the pocket 35 and while still in communication therewith the second cut-off or valve is operated to open the port 34, permitting the imprisoned steam to pass from the pocket 35 to the pocket 36 opposite the inner series of pockets 27, where further impact will take place.

When it is desired to reverse the engine, it is simply necessary to shift the position of the controlling-valve to close the ports 9, for instance, and open the ports 8 in the cylinder, the operation of the engine being precisely the same, except in the opposite direction and with the further exception that a second cut-off valve is not usually employed in connection with the pockets 26, which serve when the engine is running backward. Such a valve may, however, be employed, if desired, although I have not deemed it necessary to illustrate and describe more than the single valve, the construction and arrangement of which would be a mere duplication at the opposite side of the cylinder.

From the foregoing it will be seen that I have invented a rotary engine embodying a

novel construction which makes the engine capable of reversal and effects the compound impact of the steam and the utilization of its expansive energy almost to the point of atmospheric pressure; but while the present embodiment of my invention appears at this time to be preferable I do not desire to limit myself to the structural details defined, but reserve the right to change, modify, and vary such details within the scope of the protection prayed.

What I claim is—

1. In a rotary engine, the combination with a cylinder and rotary piston provided with oppositely-disposed series of staggered pockets, of a controlling-valve controlling the steam-supply, and an automatically-actuated cut-off valve intermediate of the piston and controlling-valve and adapted to permit and control the passage of steam from one line of pockets to the other of a staggered series, substantially as specified.

2. In a rotary engine, the combination with a cylinder provided with an abutment-recess, and ports leading thereto, of a piston within the cylinder and provided with oppositely-disposed pockets, and with a cam-groove, a manually-actuated controlling-valve and a cut-off valve intermediate of the controlling-valve and piston and provided with a projection in engagement with the cam-groove in the piston, substantially as specified.

3. In a rotary engine, the combination with a cylinder provided with oppositely-disposed abutment-recesses and ports leading thereto, of a rotary piston within the cylinder provided with a medial cam-groove and with oppositely-disposed pockets at opposite sides of the cam-groove, said pockets being arranged in alternating circumferential series, a controlling-valve provided with ports and controlling the ingress of steam to the interior of the cylinder, a cut-off valve intermediate of the controlling-valve and piston and provided with a projection engaging the cam-groove in the latter, substantially as specified.

4. In a rotary engine, the combination with a cylinder provided with abutment-recesses and with progressively-arranged pockets and an intermediate port, a controlling-valve and a cut-off valve cooperating to regulate the ingress of steam to the cylinder, an expansion-valve controlling the port intermediate of the pockets, a rotary piston provided with circumferential series of alternating pockets and mechanism for effecting the automatic actuation of the cut-off and expansion valves, substantially as specified.

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

ROBERT B. CHRITTON.

Witnesses:

FRANK WORCESTER,
JOHN L. MCATEE, Jr.