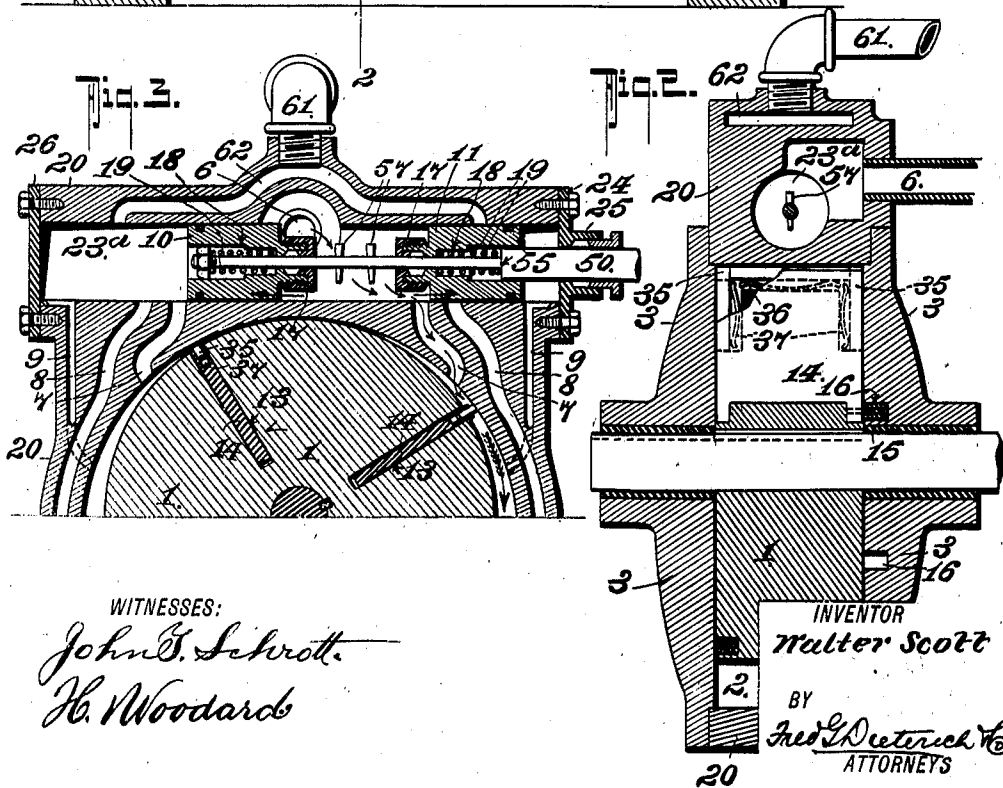
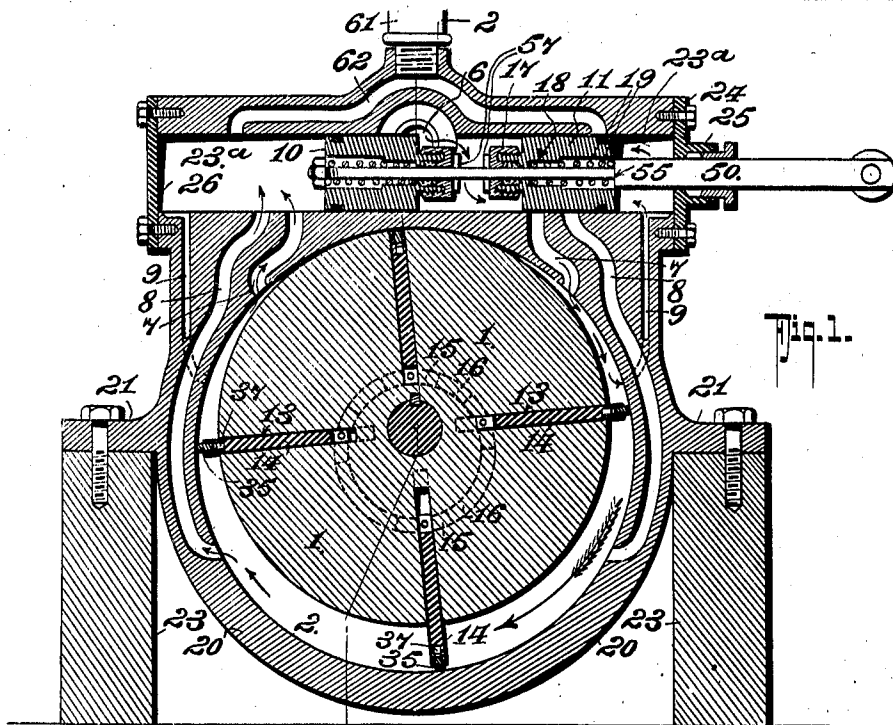


1,056,949.

W. SCOTT.
ROTARY ENGINE.
APPLICATION FILED MAY 31, 1912.

Patented Mar. 25, 1913.

2 SHEETS—SHEET 1.



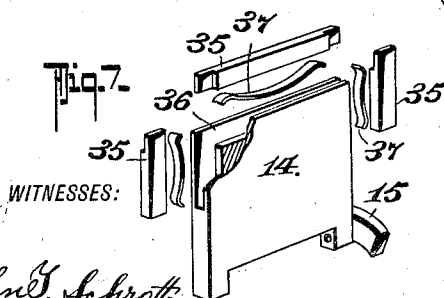
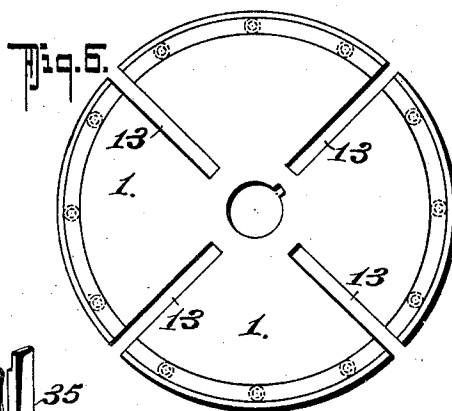
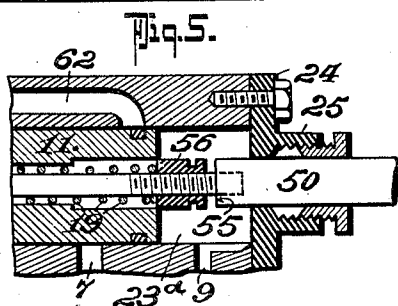
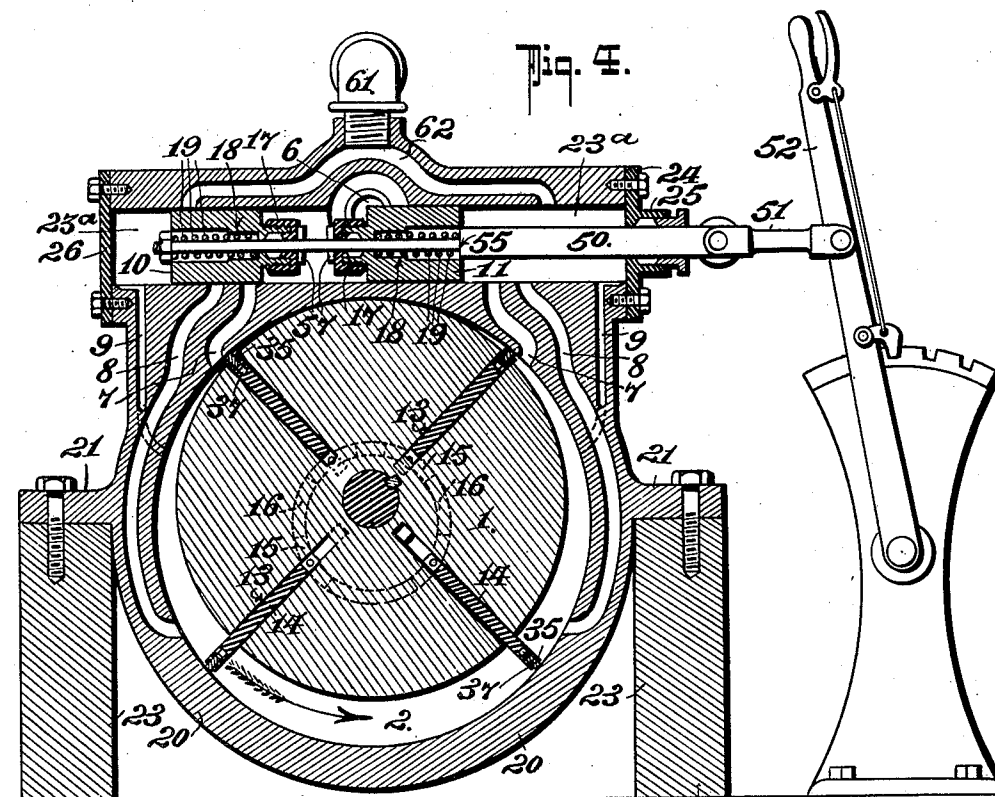
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2 SHEETS--SHEET 2.



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UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF COTTAGE GROVE, OREGON.

ROTARY ENGINE.

1,056,949.

Specification of Letters Patent.

Patented Mar. 25, 1913.

Application filed May 31, 1912. Serial No. 700,698.

To all whom it may concern:

Be it known that I, WALTER SCOTT, residing at Cottage Grove, in the county of Lane and State of Oregon, have invented a new and Improved Rotary Engine, of which the following is a specification.

This invention has for its object to provide a simple and compactly constructed rotary engine and in its generic nature it comprehends an improved construction of slidable or controlling valve devices in which the valves are automatically shifted by the infeed or live steam force for intermittently cutting off the said infeed and effecting a return of some of the partially spent live steam charge to the steam chest for effecting the shifting action of the valve for cutting off, temporarily, the live steam feed to the steam chamber.

This invention further consists in certain details of construction and novel combination of parts, all of which will be hereinafter fully explained, specifically pointed out in the appended claims and illustrated in the accompanying drawings, in which:—

Figure 1, is a vertical section of my construction of rotary engine, the valve devices being positioned as cutting off the live steam to the piston chamber. Fig. 2, is a cross section thereof on the line 2—2 on Fig. 1. Fig. 3, is a vertical longitudinal section of the upper end of the engine, the valve devices being shifted for opening the steam feed against the rotary piston. Fig. 4, is a vertical longitudinal section of my engine, the valve devices being shown as shifted to operate the engine reverse to the direction indicated on Figs. 1 and 3. Fig. 5, is an enlarged longitudinal section of the adjustable buffer spring devices that cooperate with the steam controlling valves. Fig. 6, is a side view of the rotor or piston head. Fig. 7, is a detail perspective view of one of the radially slidable pistons and the packing and guide members therefor.

In the practical application of my invention, the rotator or piston head 1 is eccentrically mounted in the steam chamber 2 that is fulcrumed by the annular ring-like body 20 and the opposite heads 3—3 in practice are clamped against the body 20 in any approved manner to form the steam tight chamber 2. The body 20 is rigidly mounted in any suitable manner, for example, by casting it with foot flanges 21, for

bolting onto base timbers 23 as shown in Figs. 1 and 4. The upper end of the body 20 has a longitudinal bore 23^a that forms the valve receiving cylinder or steam chest, one end of which is closed by a cap 24 with a gland 25 for the valve rod 50, and the other end closed by a cap 26. Rod 50 has a link connection 51 that joins with a shifting lever 52, in practice positioned as conditions may make desirable, the said lever having the usual rack and pawl connections as clearly indicated in Fig. 4.

6 designates the steam pipe that connects with the centrally disposed inlet to the bore or steam chest 23^a, and 61 denotes the exhaust pipe that joins with an exhausting passage 62 in the crown of the steam chest and which communicates with both ends of the said chest, as shown.

7—8 and 9 indicate steam passages that connect the piston chamber 2 with the steam chest and of these a set is provided for each end of the said chamber 2. The ports 7 are live steam passages, the ports 8 being emergency ports, and the ports 9 primary exhausting ports, their purpose being to lead a part of the live steam back into the valve chest for aiding in the automatic shifting of the controlling valve for intermittently closing off the live steam feed against the radially shiftable blades of the rotator or piston head. Each set of ports 7, 8 and 9, is controlled by a slide valve, and the said valves are mounted on a single valve rod, it being understood when the engine is set to work direct or forwardly as indicated by the arrows, as in Figs. 1 and 3, the slide valve 10 is dead, so far as controlling its respective set of ports 7, 8 and 9, and the said set of ports 7, 8 and 9 now serve as exhausting passages only, the same condition existing with respect to the slide valve 11 and its respective ports 7, 8 and 9, when the parts are shifted to operate the engine on the reverse, as indicated in Fig. 4.

As before stated, the live steam enters the chest midway thereof and hence between the slide valves 10—11 so that pressure is exerted in the two valves uniformly in reverse directions moving the two slide valves on the valve rod away from each other, spreading the said slide valves, as it were, the shifting of the valve 10 being that of a free movement, since when set in the direct or forward engine thrust, the said slide valve 10 plays

freely within the steam chest without effect, further than acting as an abutment for the live or infeed steam.

Referring now more particularly to Figs. 1 and 3, it will be noticed the piston head or rotator 1 has a series of equidistantly spaced radial sockets 13, in each of which plays a radial piston 14. Each piston 14 has a shoe 15 at the inner end for riding in the eccentric groove 16 in the adjacent cap member of the casing, see dotted lines on Fig. 4, by reason of which a positive and freely movable radial shifting of the pistons 14 is provided for, for making a steam-tight connection, between the wiping or outer end of the said piston and the annular wall of the said steam chamber 2 packing strips 35 are held in sockets 36 in the said ends of the pistons and are forced downward by the leaf springs 37, similar packing strips and springs being provided at the opposite edges of the piston blades 14 to effect a steam-tight contact of the said piston blades with the sides and the annular wall of the steam chamber 2.

The slide valves 10 and 11 operate alike, so far as they cooperate with their respective sets of ports 7, 8 and 9, and hence a detailed description of the operation of the valve 11 will be sufficient, it being understood the construction of both valves 10 and 11 and their connections with the valve rod are alike.

Referring now again to Fig. 1, it will be noticed that the port 7 on the down-going side opens into the steam chamber at a point about midway between the vertical axis of the chamber 2 and the adjacent end of the steam chest 23^a, while the outlet port 7 at the other side likewise opens into the chamber 2 and the steam chamber 23^a. The port 9, hereinbefore referred to, and which is of considerable less area than the ports 7 and 8, opens into the chamber 2 about midway between where the ports 7 and 8 open into the said chamber 2.

Valve 11 is slidably mounted on a reduced end of the valve rod, it having a stuffing box connection 17 on the inner or live steam portion of the chest, and it has a seat 18 for receiving a stout coiled spring 19 disposed about the valve rod and having bearing against an abutment shoulder 55 on the said rod. The tension of the spring 19 is set to suit the requirements by means of an adjusting nut 56 on the rod, arranged as shown in the detail view, Fig. 5.

Assuming now the engine to be running forwardly as in Figs. 1 and 3, and the parts as in Fig. 1, the piston blade last impelled under live steam pressure just having passed the port 9, a part of the live steam force on the said piston blade has now been divided and caused to enter at the back of the valve 11 and the force thereof added to the increased tension applied to the spring 19 under the

direct steam force on the valve 11 (see Fig. 3) and has shifted the valve on its rod back to cover the feed port, it being understood that by reason of the set of the two valves 10 and 11, the valve 10, although forced away from the other valve does not move far enough to affect the ports 7, 8 and 9, at its respective end of the steam chest.

The piston head 1 under momentum moves in the direction of the arrow on Figs. 1 and 3, until the next piston blade reaches the position shown in Fig. 3, and it should be here stated, that the adjustment of the spring devices for creating an excess or stored up energy to aid in shifting the valve 1, is such, that as the said next blade passes the port 7, the force of the steam back of the valve 11 is spent and the live or infeed steam shifts the valves 10 and 11 again to the position shown in Fig. 3, thereby opening up the port 7 to feed the live steam against the said next piston blade, it being understood that the exhausting is done through the ports 7, 8 and 9, at the other end of the chamber 2.

57 designates keys on the valve rod for stopping the sliding movement of the valves 10 and 11 when inwardly impelled.

Ports 8 are only brought into play, under emergencies, such as when starting a heavy load, in which event the live steam pressure is sufficient to move the valve 11 back far enough against its buffer spring, to uncover the port 8, which leads a fresh charge of live steam against the blade in advance of the blade receiving impact through port 7.

When the reverse motion of the engine is required, it is only necessary, through the medium of the lever devices 52, to shift the valves 10 and 11 to the position shown in Fig. 4.

From the foregoing description taken in connection with the drawing, it is believed the complete construction, the manner of its operation and the advantages of my invention will be readily apparent to those skilled in the art to which it appertains.

What I claim is:

1. In a valve mechanism for engines, a valve chest, a pair of slide valves in the said chest, means for setting the said valves to their operative position, the said valves having a limited movement toward and from one another and of the setting means, live steam outlet ports for conveying steam out of the valve chest, means for admitting live steam into the valve chest between the said valves to cause the said valves to separate and thereby open the live steam outlet port controlled by one of the said valves, other means continuously tending to cause the said valves to move toward each other and further means operating when the said live steam outlet port is opened to convey live steam back into the valve chest against one of the said valves whereby to counterbal-

ance the steam and permit the continuously actuating means of the valve to move the steam to a position to close the steam outlet port controlled thereby.

5 2. In a valve mechanism for engines, a valve chest, a pair of slide valves in the said chest, means for setting the said valves to their operative position, the said valves hav-
10 ing a limited movement toward and from one another and of the setting means, live steam outlet ports for conveying steam out of the valve chest, means for admitting live steam into the valve chest between the said
15 valves to cause the said valves to separate and thereby open the live steam outlet port controlled by one of the said valves, other means continuously tending to cause the said valves to move toward each other, and
20 further means operating when the said live steam outlet port is opened to convey live steam back into the valve chest against one of the said valves whereby to counterbalance the steam and permit the continuously actu-
25 ating means of the valve to move the steam to a position to intermittently close the steam outlet port controlled thereby.

3. In a rotary engine; a rotator chamber and a rotary piston mounted in the said chamber, a valve chest having a steam inlet,

a set of steam ports from each end of the 30 valve chest to the corresponding sides of the rotary chamber, one set of the said ports acting as exhausts as the other act as feed ports, live steam pressure outlets within the valve chest, one for each set of ports for 35 controlling the live steam feed through their respective sets of ports, means for relatively shifting the two valves for effecting a direct or reverse motion of the engine, and means at each end of the valve chest and the rota- 40 tor chamber for conveying live steam back against that one of the valves that is set as a controlling valve whereby to balance the steam pressure on the said valve, and other means tending to constantly force the slide 45 valves toward each other and to their respective live steam port closing positions, the said sets of ports including an emergency port for leading live steam into the rotator chamber to effect a second forward 50 impact on the rotator at one part thereof as it is moving under a primary impact of live steam against another portion thereof.

WALTER SCOTT.

Witnesses:

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JOHN STONEBURG.