

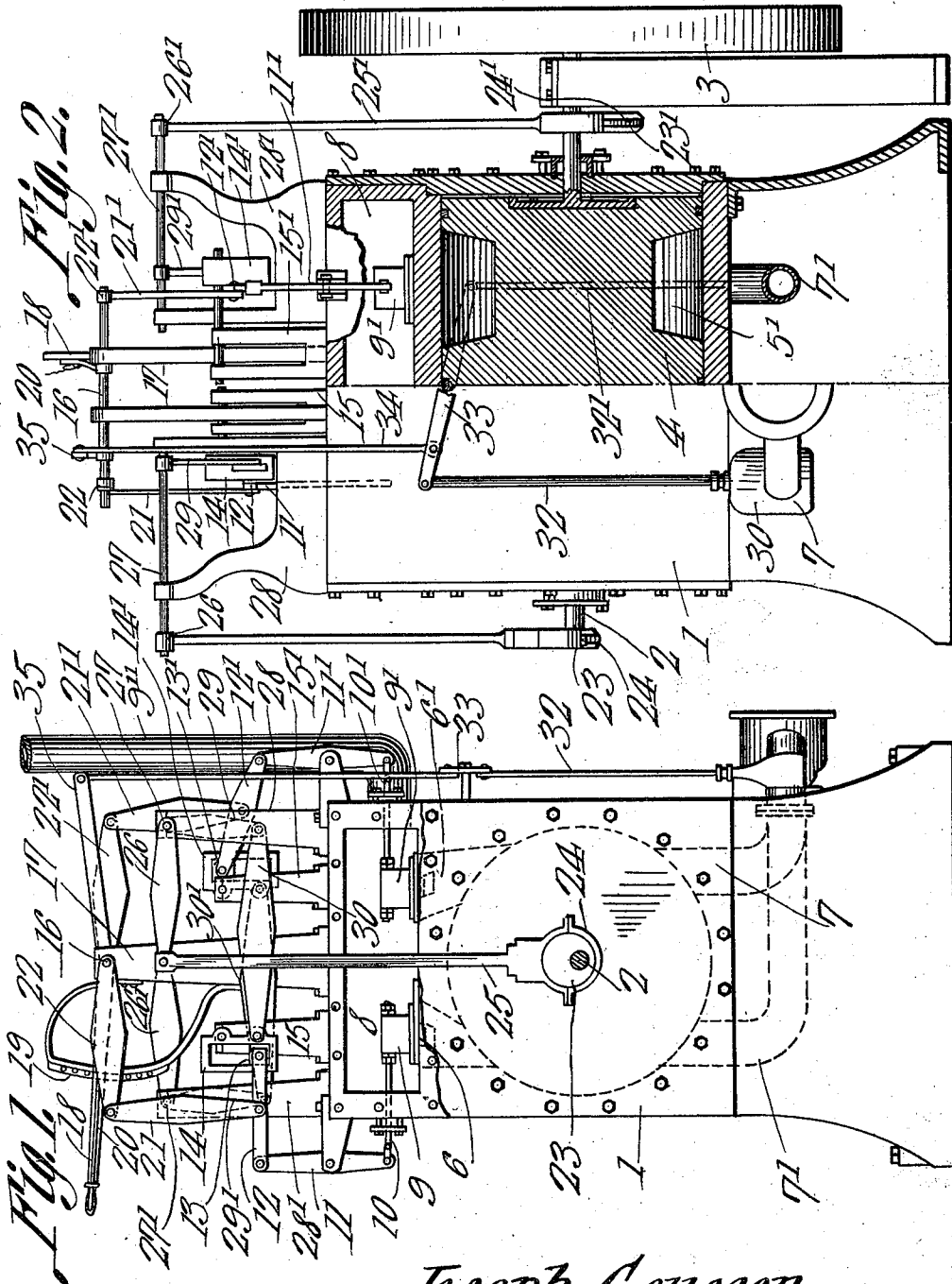
J. GOUGEON.
ROTARY ENGINE.

APPLICATION FILED NOV. 26, 1910.

Patented Aug. 15, 1911.

2 SHEETS—SHEET 1.

1,000,509.



Witnesses

J. P. Gordon
E. Easterday

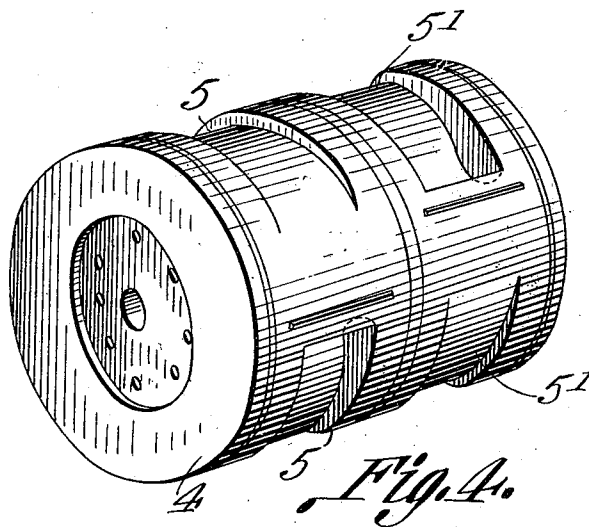
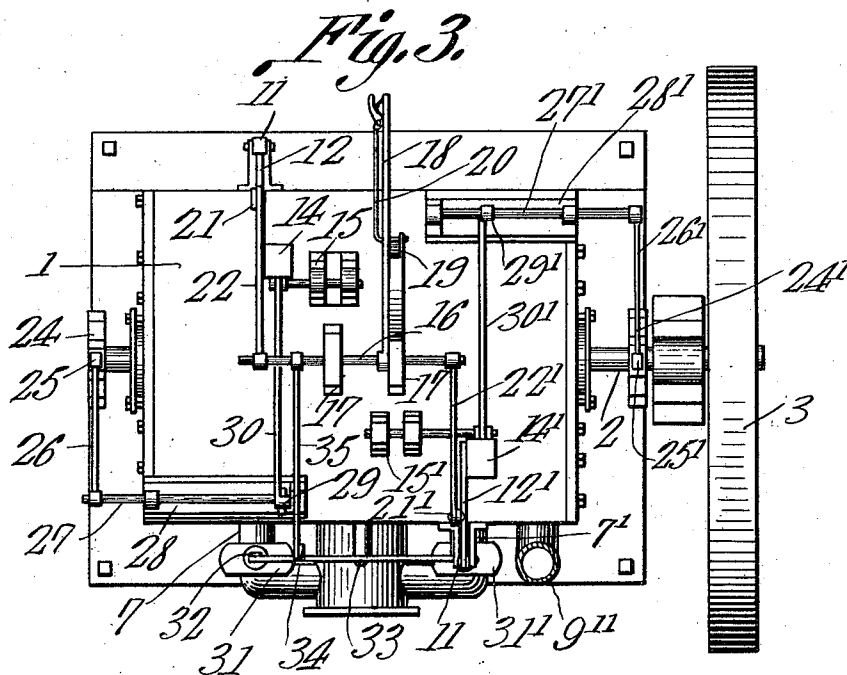
Joseph Gougeon, Inventor
by *C. A. Snow & Co.* Attorneys

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UNITED STATES PATENT OFFICE.

JOSEPH GOUGEON, OF BALTIC, MICHIGAN.

ROTARY ENGINE.

1,000,509.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed November 26, 1910. Serial No. 594,385.

To all whom it may concern:

Be it known that I, JOSEPH GOUGEON, a citizen of the United States, residing at Baltic, in the county of Houghton and State of Michigan, have invented a new and useful Rotary Engine, of which the following is a specification.

This invention relates to rotary engines and consists in the novel construction and arrangement of its parts as hereinafter shown, described and claimed.

The object of the invention is to provide a reversible engine of the rotary type which is provided with a series of link controlled valve gears which in turn are operatively connected with the engine shaft, means being provided for manually shifting the valves to change the direction in which the engine shall rotate the said means including mechanism for closing one or the other of the exhaust ports of the engine. That is to say when the cut-off valve which controls the steam to drive the engine in one direction is held closed over its port its coöperating exhaust valve is also closed. Thus when the engine is to rotate in one direction, the cut-off and exhaust valves at one side of the piston are closed while the valves at the other side are open and when the engine is to rotate in the opposite direction, the first mentioned valves are open while the last mentioned valves are closed. The parts of the valve gears are manually shiftable with relation to the links whereby the movement of the cut-off valves may be controlled.

In the accompanying drawings:—Figure 1 is a side elevation of the engine with parts broken away. Fig. 2 is a side elevation of the engine viewing the same at a right angle to the side illustrated in Fig. 1 with parts of the side in section. Fig. 3 is a top plan view of the engine. Fig. 4 is a perspective view of the piston of the engine.

The engine includes a casing 1 in which is journaled a shaft 2 a fly wheel 3 being mounted upon the said shaft. A piston 4 is located in the casing 1 and is fixed to the intermediate portion of the shaft 2. The piston 4 is provided in its periphery and in the vicinity of its opposite ends with steam cavities 5 and 5'. These cavities are deeper at one end than at the other and in fact at the shallow end they vanish in the periphery of the piston. The cavities 5 and 5' are alike except that the deep end portions of the cavities 5 are disposed in the opposite

direction from the deep end portions of the cavities 5'. The casing 1 is provided with steam inlet ports 6 and 6' and steam exhaust ports 7 and 7'. The cavities 5 and 5' are arranged to move under the inlet ports and over the exhaust ports. A steam chest 8 is formed in the upper part of the casing 1 and a steam supply pipe 9' communicates with the said steam chest. The ports 6 and 6' lead from the interior of said chest to the chamber in which the piston 4 is located. Valves 9 and 9' are located in the chest 8 and are arranged to move over the ports 6 and 6' respectively. Operating rods 10 and 10' are connected with the valves 9 and 9' and project through the sides of the casing 1. Levers 11 and 11' are fulcrumed at sides of the casing 1 and their lower ends are pivotally connected with the outer ends of the rods 10 and 10'. Bars 12 and 12' are pivotally connected at their outer ends with the upper ends of the levers 11 and 11' and the said bars are provided at their inner ends with pivoted blocks 13 and 13' respectively. Links 14 and 14' are pivotally mounted on standards 15 and 15' respectively which are mounted upon the top of the casing 1 and the blocks 13 and 13' are slidably mounted in the said links.

A shaft 16 is journaled in standards 17 which are mounted upon the top of the casing 1 and an operating handle 18 is fixed to the said shaft. A segment 19 is located adjacent said lever 18 and the lever is provided with a spring pawl 20 adapted to engage the said segment whereby the said lever is held in an adjusted position. Links 21 and 21' are pivotally connected at their lower ends with the intermediate portions of the bars 12 and 12' respectively and at their upper ends the said links 21 and 21' are pivotally connected with arms 22 and 22' which in turn are fixed at their inner ends to the shaft 16 and project beyond the opposite side thereof.

Eccentrics 23 and 23' are mounted upon the shaft 2 at the opposite sides of the casing 1 and the deep portion of the eccentric 23 projects beyond the opposite sides of the shaft 2 from the deep portion of the eccentric 23'. The eccentrics 23 and 23' are surrounded by eccentric straps 24 and 24' and rods 25 and 25' are connected at their lower ends with the straps 24 and 24' in the usual manner. The upper ends of the pitman rod 25 and 25' are pivotally connected with the

inner ends of the arms 26 and 26' respectively and the said arms 26 and 26' are fixed to shafts 27 and 27' respectively which are journaled in standards 28 and 28' located at the top of the casing 1. Arms 29 and 29' are fixed at their upper ends to the shafts 27 and 27' respectively and extend downwardly approximately at right angles to the arms 26 and 26'. Bars 30 and 30' are pivotally connected at their outer ends to the lower ends of the arms 29 and 29' respectively and at their other ends the said bars 30 and 30' are pivotally connected with the links 14 and 14' respectively.

Valves 31 and 31' are located in the exhaust passages 7 and 7' respectively and are operatively connected with rods 32 and 32' respectively. A lever 33 is fulcrumed to the side of the casing 1 and its ends are connected with the upper ends of the rods 32 and 32'. The lower end of a rod 34 is pivotally connected with the lever 33 at one side of the fulcrumed point of the latter and the upper end of the rod 34 is pivotally connected to the end of an arm 35 which in turn is rigidly fixed upon the shaft 16. By this arrangement a valve gear is provided which may be manually adjusted in connection with the pivoted links to cause one or the other of the valves to move to a greater or less extent over the port that it governs and by reference to the drawings it will be seen that the parts are so proportioned and arranged that when one valve is at a state of rest or approximately so over the port that it governs the other valve is movable over that port which it governs. This is for the reason that when the shaft 16 is turned by using the lever 18, the arms 22 and 22' are swung whereby the links 21 and 21' are moved longitudinally and the bars 12 and 12' are moved so that when one of the blocks 13 or 13' is at the lower end of its link, the other block is at the upper end of its receiving link. Also when the shaft 16 is turned the arm 35 is moved about the axis of the said shaft whereby the rod 34 is moved longitudinally and the lever 33 is rocked upon its fulcrum. The arrangement of the rods 32 and 32' with relation to the valves 9 and 9' is such that when for instance the rod 32 closes the valve 31 in the exhaust passage 7, the valve 9' is uncovered from its port or is permitted to move to uncovered position with relation to the same while the valve 9 is held in covered position over its port 6. On the other hand when the valve 31 in the exhaust passage 7' is closed the valve 9 is permitted to move over its port 6 while the valve 9' is held in closed position over the port 6'. By this arrangement the steam or fluid pressure can pass through one side of the casing 1 while the valves at the opposite side of said casing are closed and vice versa. Inasmuch as the deep

portions of the cavities 5 and 5' in the piston 4 are disposed in opposite directions upon the periphery of the said piston it will be readily understood that the steam when projected through the tangentially disposed duct 6 into the cavities 5 will impact the shouldered portion thereof and rotate the piston 4 in one direction while when the steam is projected oppositely into the cavities 5' to impact the shouldered portion thereof to rotate the piston 4 in an opposite direction. Therefore it will be seen that means is provided for reversing or changing the direction in which the engine shaft is rotated.

Any form of impact receiving and pressure fluid expanding blades may be used upon the piston 4, the essential feature of the invention being the arrangement of the inlet and exhaust valve operating mechanism operated from the main shaft of the engine.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:—

1. A rotary engine comprising a casing having induction and exhaust ports, a piston journaled in the casing between the induction and exhaust ports and having steam cavities, valves movably mounted over the induction ports, links pivoted upon the casing, valve gears operatively connecting the valves with the links and a manually operable mechanism connected with the valve gears and adapted when operated to engage one of the valve gears with the active end of one of the links while the other valve gear is engaged with the passive end of the other link.

2. A rotary engine comprising a casing having induction and exhaust ports, a piston journaled in the casing between the induction and exhaust ports and having steam cavities, valves arranged to move over the induction ports, links pivoted upon the casing, valve gears operatively connecting said valves with said links, a manually operable means located upon the casing and connected with the valve gears and adapted to hold the terminal member of one of the valve gears in contact with the active end portion of one link while the terminal member of the other valve gear is held in contact with the passive end of the other link, valves located in the exhaust passage and operatively connected together and means connecting the operating mechanism of the exhaust valves with the means for manually adjusting the valve gears with relation to said links.

3. A rotary engine comprising a casing having induction and exhaust ports, a piston journaled in the casing between the induction and exhaust ports and having steam cavities, valves arranged to move over the

said induction ports, links pivoted upon the casing, valve gears operatively connecting said valves with said links, a shaft journaled upon the casing and operatively connected with the terminal members of the valve gears to slide the same simultaneously along the links whereby one valve gear is connected with the active end of one link, while the other valve gear is connected with the passive end of the other link, valves located in the exhaust passages, a valve gear connecting the said exhaust valve together and means operatively connecting the said exhaust valve gear with said shaft, the valve gear of the exhaust valves having its parts so arranged that when one exhaust opens the other exhaust valve closes and vice versa.

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

JOSEPH GOUGEON.

Witnesses:

WILLIAM BOYLE,
AMADIE DESTRAMPE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."