G. W. SNEAD.

ROTARY ENGINE.

APPLICATION FILED APR. 23, 1913.

1,068,282.

Patented July 22, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

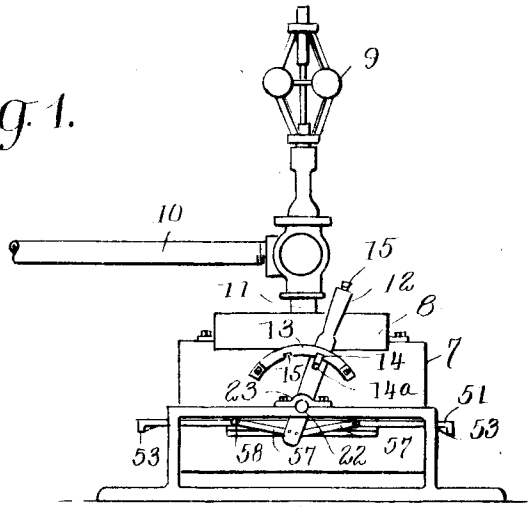
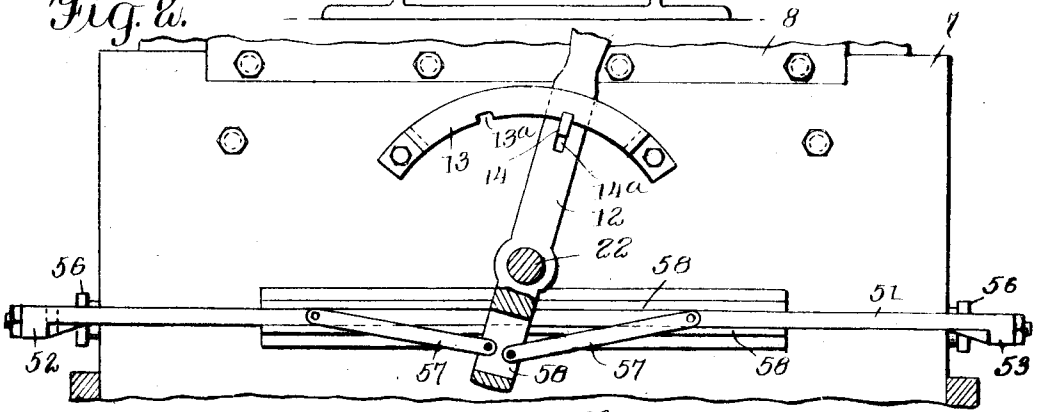


Fig. 2.



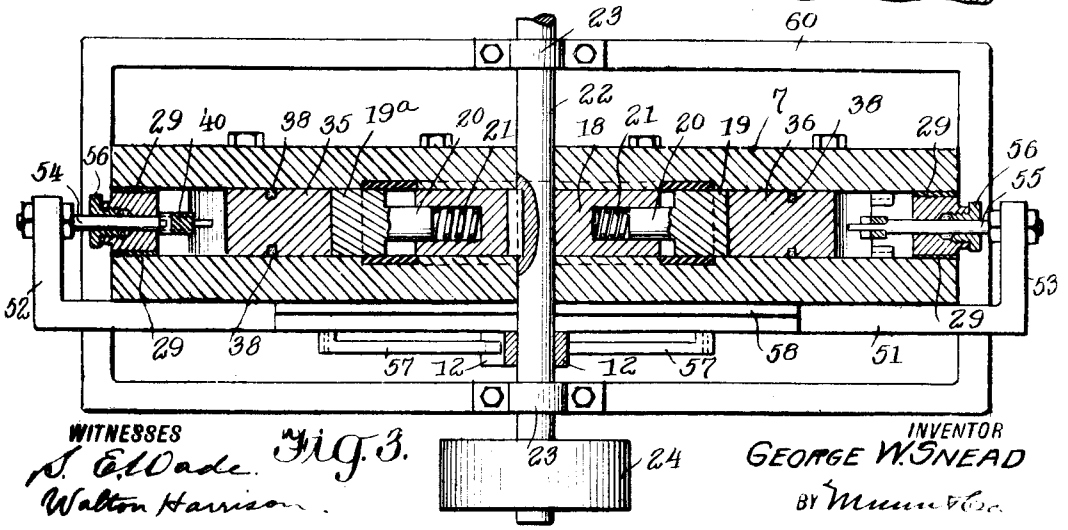


Fig. 3.

WITNESSES

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2 SHEETS—SHEET 2.

Fig. 4.

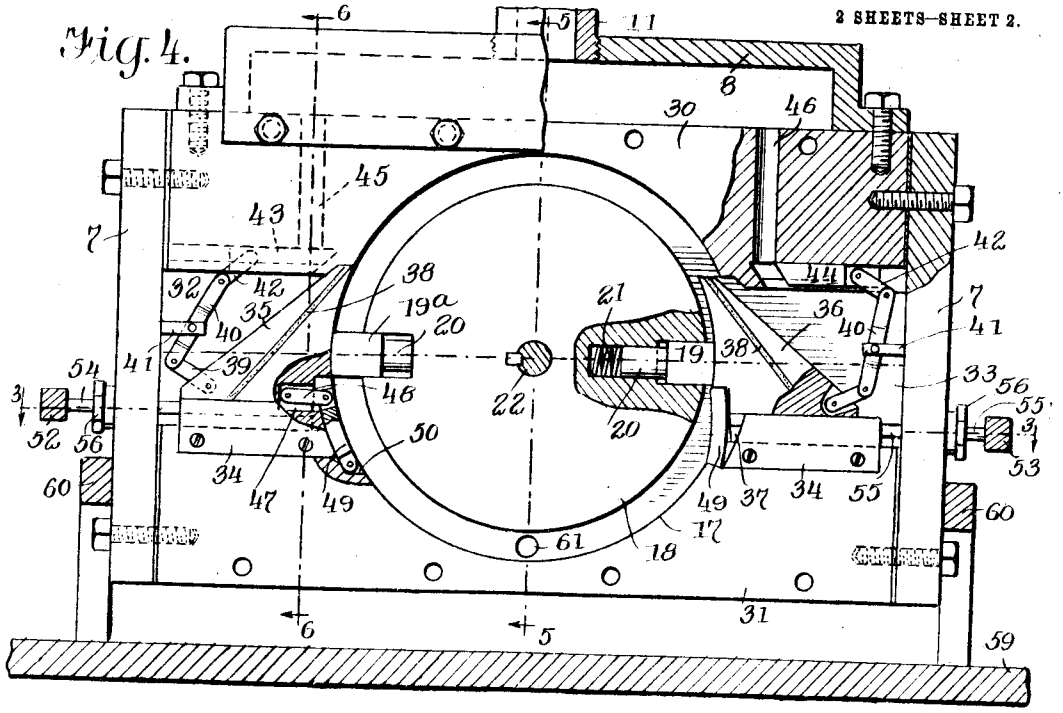


Fig. 5.

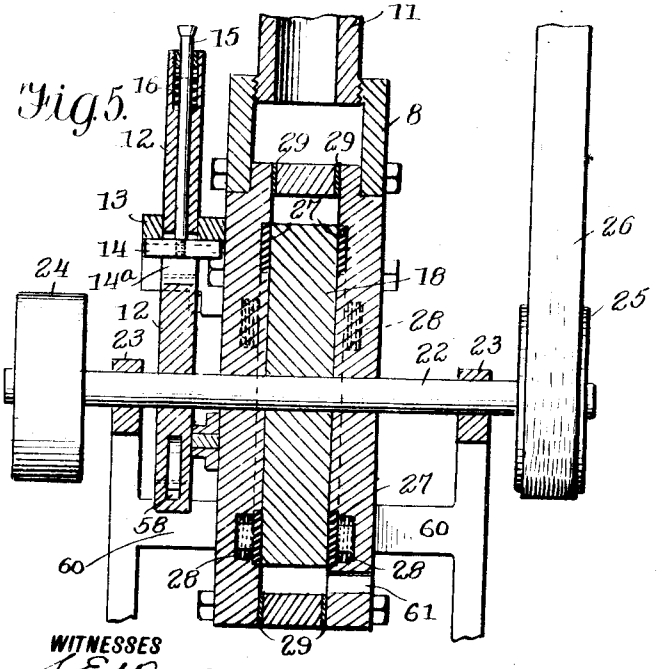
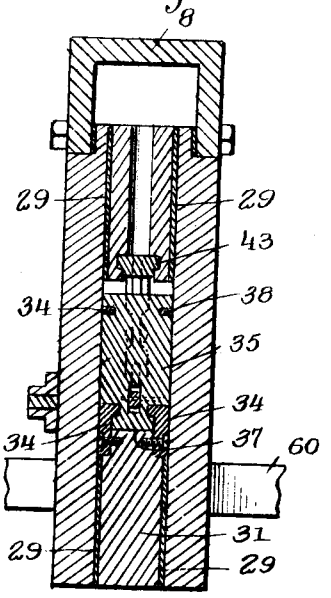


Fig. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE WASHINGTON SNEAD, OF RINGGOLD, LOUISIANA.

ROTARY ENGINE.

1,068,282. Specification of Letters Patent. Patented July 22, 1913.

Application filed April 23, 1913. Serial No. 763,050.

To all whom it may concern:

Be it known that I, GEORGE W. SNEAD, a citizen of the United States, and a resident of Ringgold, in the parish of Bienville and State of Louisiana, have made certain new and useful Improvements in Rotary Engines, of which the following is a specification.

My invention relates to rotary engines, my more particular purpose being to provide an engine of this type with improved reversing mechanism and with sliding abutments of special form and controlled, together with movable guides coacting therewith, and also with reversing valves to reverse the engine by practically a single manual movement.

My invention further comprehends various improvements in rotary engines for the purpose of increasing the general efficiency of the same.

Reference is made to the accompanying drawings forming a part of this specification and in which like letters indicate like parts.

Figure 1 is a front elevation of the engine complete. Fig. 2 is a fragmentary view, partly in elevation and partly in section, showing the manner in which the reversing lever is connected. Fig. 3 is a section on the line 3—3 of Fig. 4 looking in the direction of the arrow. Fig. 4 is a view partly in elevation and partly in section, showing the engine with a part of the casing removed. Fig. 5 is a section on the line 5—5 of Fig. 4 looking in the direction of the arrow. Fig. 6 is a section on the line 6—6 of Fig. 4 looking in the direction of the arrow.

The casing of the engine is shown at 7, the steam chest at 8, a governor at 9, and a steam pipe at 10. Connected with this steam pipe and with the governor is a pipe section 11 communicating with the steam chest 8. The reversing lever is shown at 12 and adjacent to this reversing lever is a sector 13 secured to the casing and provided upon its concave edge with notches 13^a. A pawl 14 is carried by the reversing lever 12, which is provided with a slot 14^a for this purpose. The pawl is mounted upon the lower end of a rod 15, which extends axially through a portion of the reversing lever 12. A spring 16 encircling the rod 15 is connected with this rod, and is housed within the reversing lever as indicated in Fig. 5. The operator by placing his thumb upon the upper end of the rod 15 and pressing this rod downwardly can move the pawl 14 so as to disengage it from either of the notches 13^a, and when the reversing lever is moved into such position that the plate 14 can enter the opposite notch 13^a, it does so.

A substantially cylindrical compartment, formed as hereinafter described, contains a rotor 18 having generally the form of a disk. This rotor carries two pistons 19, 19^a slidably mounted within it and provided each with a neck 20 which engages a spiral spring 21, these parts being also housed within the rotor as may be understood from Figs. 3 and 4. The engine shaft is shown at 22 and is mounted in bearings 23. The shaft is provided adjacent its ends with pulleys 24, 25 secured rigidly upon it. A belt 26 may engage either of these pulleys but in this instance is shown as engaging the pulley 25. Annular packings 27, of flexible material such as leather, are disposed internally of the casing and sunken thereinto. These packings are engaged by spiral springs 28 which press the packings against the rotor and in so doing form steam tight joints. Other packings 29 made of flexible sheet material are employed for rendering the casing steam tight.

Two massive plates 30, 31 are spaced apart so as to form compartments 32, 33 between the walls of the casing, as indicated more particularly in Fig. 4. Mounted upon the plates 31 and sunken thereinto are cheek pieces 34 which are stationary in relation to the plate 31 and extend slightly upward therefrom, the tops of these cheek pieces being slightly wider than other portions thereof. Two abutments 35, 36 are provided at their lower edges with sliding heads 37, the latter extending down between the cheek pieces 34. Each sliding abutment 35, 36 is provided with packings 38 sunken into its opposite faces and engaging the adjacent inner surfaces of the casing. These packings are approximately tangential to the compartment 17. Pivotally connected with the abutments 35, 36 are links 37 and pivotally connected with these links are levers 40. These links are pivotally mounted upon stationary posts 41 supported by the casing and extending inwardly therefrom. Pivotally connected with the levers 40 are links 42, the latter being pivotally connected with two slides 43, 44. The plate 30 is provided with two holes 45, 46 communicating with the

steam chest and constituting inlet ports for the steam.

Each abutment 35 is provided with a slot 47. A link 48 extends into this slot and is pivotally connected with the abutment. This link is also pivotally connected with a guide plate 49, the latter extending into a slot 50 with which the plate 31 is provided and being pivoted within said slot so as to be able to swing relatively to the plate when the abutment is moved.

A sliding bar 51 is provided with laterally extending portions 52, 53 and connected with these portions are rods 54, 55 which extend through stuffing boxes 56, and are connected with the sliding abutments. Two links 57 are pivotally connected to the sliding bar 51 and extend into the slot 58 of the reversing lever 12. Within this slot the ends of the links 57 are pivotally connected to the reversing lever. A base 59 is provided for supporting the casing and parts carried thereby. A railing 60 mounted upon the base is employed for supporting the reversing lever and protecting various other parts.

The operation of my device is as follows: The parts being assembled and arranged as shown and described, the reversing lever 12 is shifted into one or the other of its normal positions. I will suppose that it is moved to the right according to Figs. 1, 2, and 3, as indicated in said figures. The shifting of the reversing lever 12 causes the links 57, 58 to move the bar 51 to the left. This slides the abutments 35, 36 into their extreme positions to the left, as indicated in Fig. 4. This movement of the abutments causes the guide plate 49 at the left to swing outwardly to its limit so that its inner surface is brought into registry with the adjacent inner surface of the compartment 17. The guide plate 49 at the right, that is the one associated with the abutment 36, is swung inwardly at its upper end until it is approximately in contact with the rotor 18. The slide 43 now closes the inlet port 45 and the inlet port 46 is opened owing to the fact that the slide 44 is at its limit to the right according to Fig. 4. Steam is now turned into the steam chest. Being unable to pass through the port 45, the steam passes through the port 46, and being unable to otherwise escape, passes obliquely upward to the left over the abutment 36 and into contact with the piston 19ª. The rotor 18 is thus turned in a contra-clockwise direction according to Fig. 4. The piston 19 now passes upwardly out of engagement with the abutment 36, and a supply of live steam now presses against this piston and continues the rotary motion of the rotor. Each time a piston 19, 19ª passes the exhaust port 61 the exhaust steam is permitted to escape. By swinging the reversing lever 12 into its other normal position—that is to the left according to Figs. 1, 2, and 3—the abutments 35, 36 are reversed; that is they are moved to the right according to Fig. 4, and the various parts carried by them are likewise thrown into their respective reversed positions. The effect of the steam now is to turn the rotor 18 in a clockwise direction according to Fig. 4. No matter into what direction the motor is turning, each time either of the pistons 19 makes a complete revolution it passes idly by one of the guide plates 49—say the one at the left of Fig. 4—and upon reaching the other guide plate 49 the piston is forced radially inward relatively to the rotor, as indicated at the right of Fig. 4. The tension of the springs 21, by pressing always against the stems 20, has a tendency to force the pistons outwardly and maintain them steam tight.

I do not limit myself to the precise construction shown as variation may be made therein without departing from the spirit of my invention.

I claim:

1. In a rotary engine the combination of a casing provided with a compartment, a rotor revolubly mounted within said compartment, pistons carried by said rotor, abutments slidably mounted within said casing and slidable in said rotor, links connected with said sliding abutments, valves connected with said links and actuated by movements thereof for controlling the admission of steam, guide plates pivotally connected with said abutments and with said casing for forcing said pistons into one of their extreme positions as said rotor turns, a reversing lever, and connections from said reversing lever to said abutments for enabling movements of said reversing lever to slide said abutments.

2. A rotary engine comprising a casing provided with a compartment, a rotor mounted within said compartment, pistons carried by said rotor, springs for forcing said pistons outwardly from said rotor, movable abutments mounted within said casing, guide plates pivotally connected with said casing and with said abutments, said guide plates being shiftable into different relative positions by movements of said abutments, said guide plates being movable partially into the path of travel of said pistons for the purpose of shifting the positions of said pistons relatively to said rotor, valves for controlling the supply of steam, each of said valves being adapted to be opened for admitting steam to drive the rotor in one direction and to be closed for driving the rotor in the opposite direction, links connected with said valves, levers pivotally connected with said links, connections from said levers to said abutments for enabling movements of said abutments to actuate said levers, and means controllable at

the will of the operator for shifting the positions of said abutments.

3. A reversible rotary engine comprising a casing provided with plates and with inlet ports extending through said plates, valves slidably connected with said plates and adapted to open and close said inlet ports, links pivotally connected with said valve, levers pivoted to said links, slideways mounted in said casing, sliding abutments supported upon said slideways, and controllable by said levers, a rotor located between said sliding abutments and adapted to be engaged by either of said sliding abutments, guide plates connected with said sliding abutments and adapted to be swung to different angles as said abutments are moved, a rotor mounted within said casing, pistons carried by said rotor, springs for forcing said pistons outwardly, said pistons being forced inwardly by one of said guiding plates when the latter occupies a predetermined position controllable by the position of the abutments with which it is connected, a reversing lever, and mechanism connected with said reversing lever and controllable thereby for shifting the positions of said abutments.

4. The combination in a rotary engine provided with a compartment and with a rotor mounted in said compartment, of a sliding abutment moved toward and from said rotor, a guide plate pivotally connected to said sliding abutment and to said casing so that said guide plate swings to different angles relatively to said casing as said abutment is moved in to different positions, a reversing lever, and connections from said reversing lever to said abutment for the purpose of sliding the latter when said reversing lever is actuated.

5. In a rotary engine the combination of a casing provided with plates, the latter being shaped to form a compartment, cheek pieces carried by one of said plates, said cheek pieces being provided with oppositely disposed portions extending toward each other, a sliding abutment provided with a portion extending between said cheek pieces, a rotor located within said compartment, a guiding plate pivotally connected with said abutment and also pivotally connected with the plate carrying said cheek pieces for the purpose of enabling movement of said abutment to swing said guide plate to different angles relatively to the casing, a rotor mounted within said compartment, pistons carried by said rotor and adapted to be moved inwardly as said pistons are brought successively into engagement with said guide plate during the rotation of the rotor, springs carried by said rotor for forcing said pistons outwardly after passing said abutment, a link pivotally connected with said abutment, a lever in operative relation to said link, another link connected with said lever and a slide pivotally connected with said last mentioned link for the purpose of controlling the admission of an elastic fluid for turning the rotor, a reversing lever and connections from said reversing lever to said abutment for sliding said abutment.

GEORGE WASHINGTON SNEAD.

Witnesses:
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TOM A. LOCKMAN.

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