

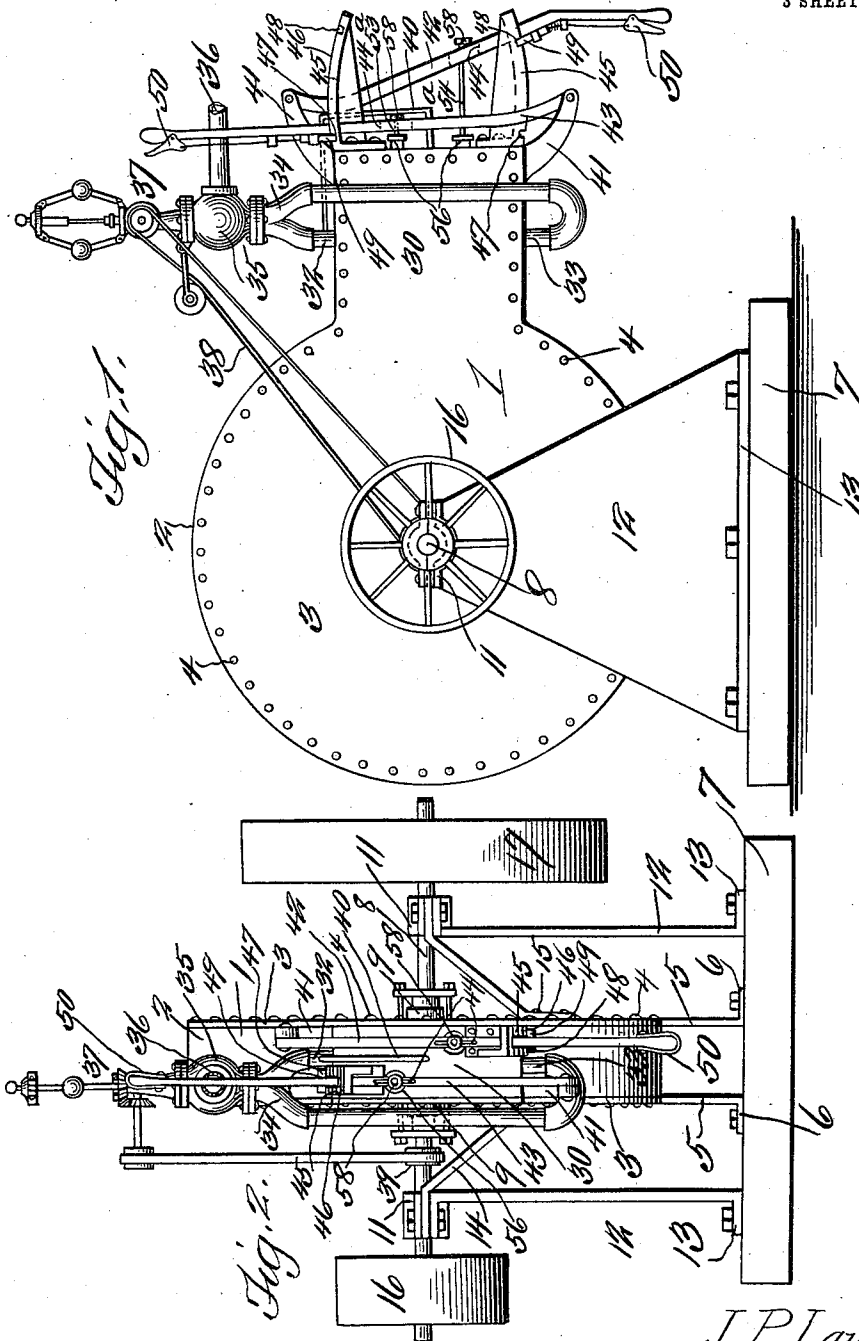
J. P. LAWRENSON.
ROTARY ENGINE.

APPLICATION FILED MAY 14, 1912.

1,046,203.

Patented Dec. 3, 1912.

3 SHEETS—SHEET 1.



Witnesses

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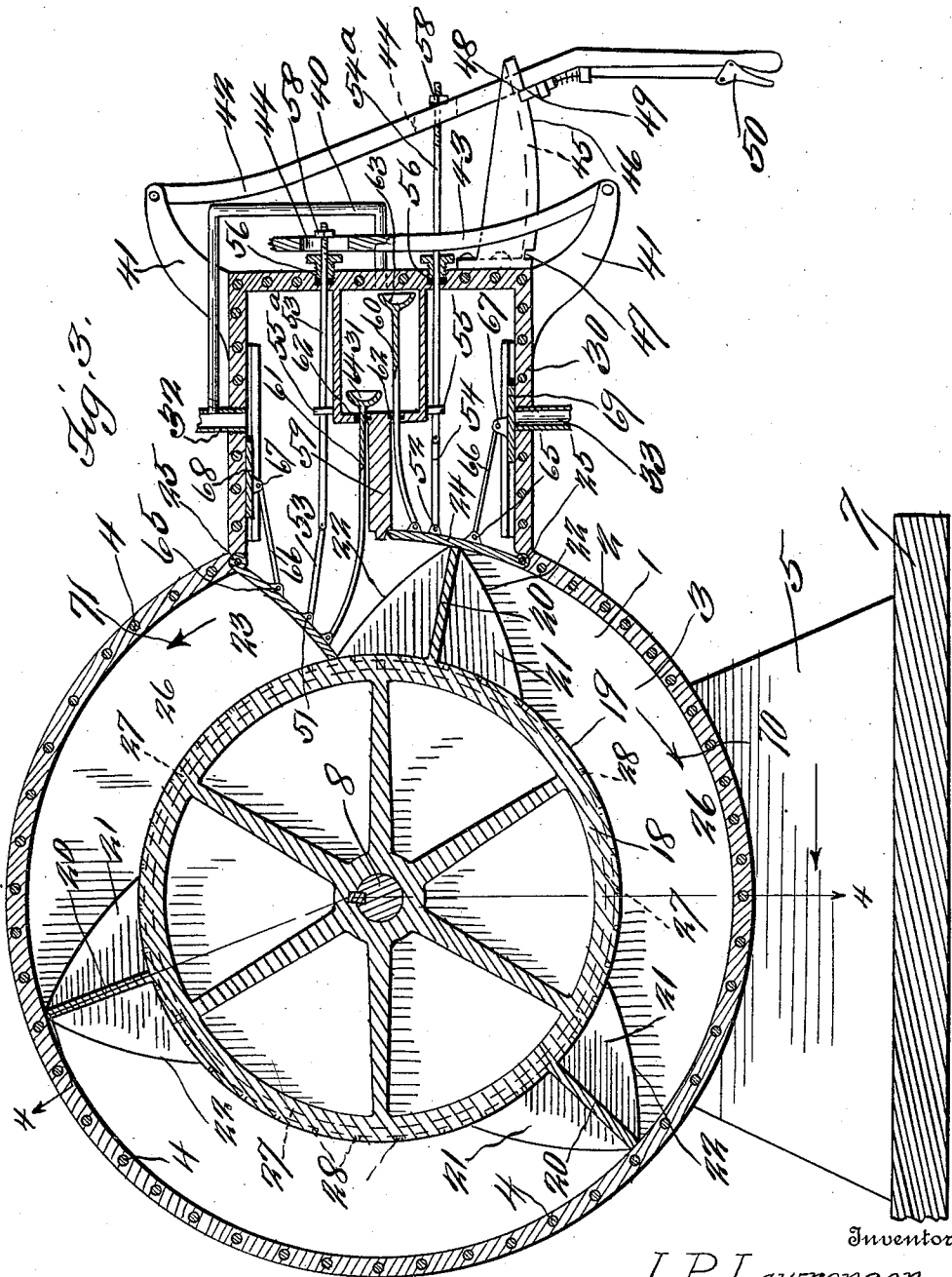
Attorneys

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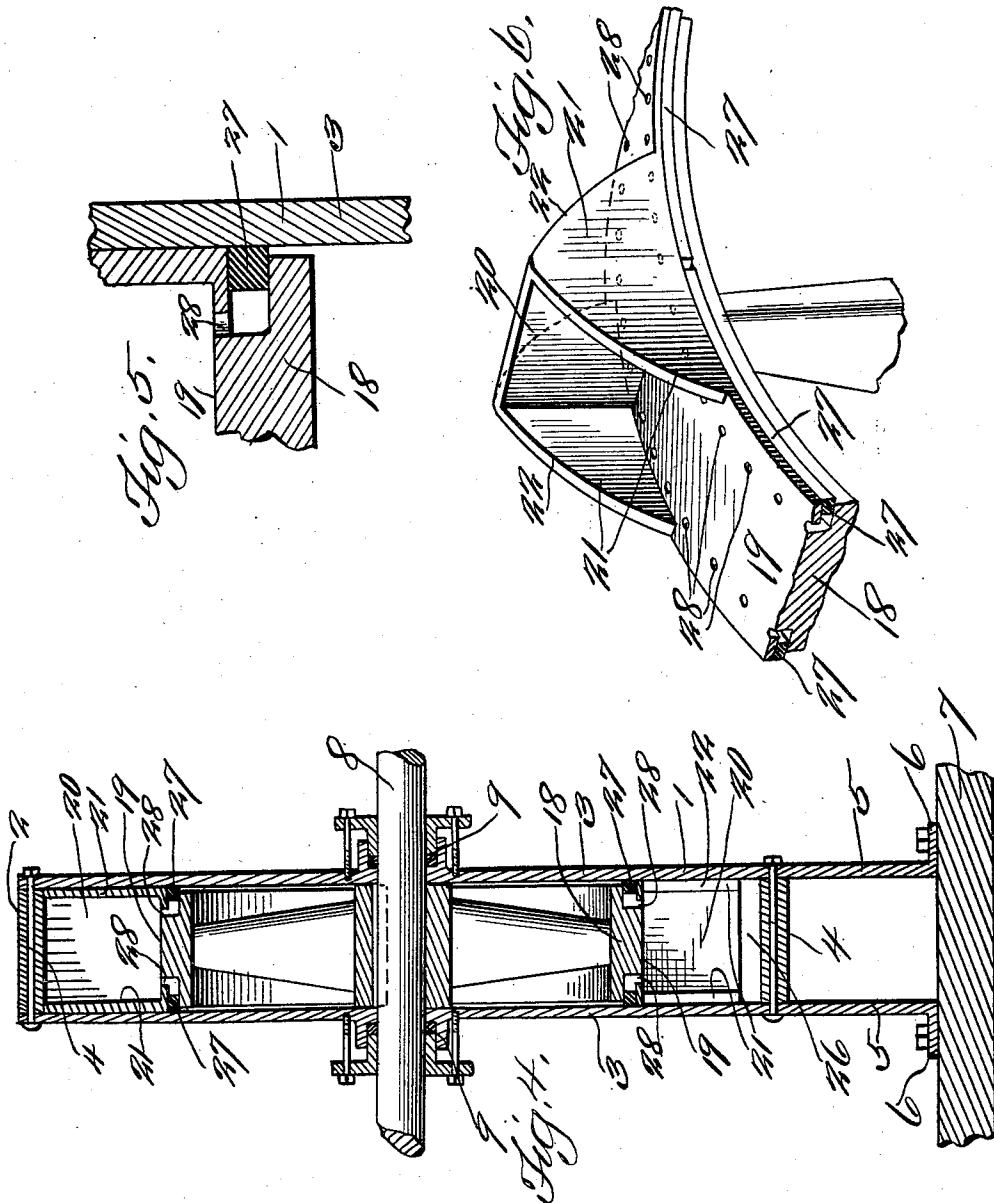
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UNITED STATES PATENT OFFICE

JUDGE PECK LAWRENSON, OF PALESTINE, TEXAS.

ROTARY ENGINE.

1,046,203.

Specification of Letters Patent.

Patented Dec. 3, 1912.

Application filed May 14, 1912. Serial No. 697,332.

To all whom it may concern:

Be it known that I, JUDGE P. LAWRENSON, a citizen of the United States, residing at Palestine, in the county of Anderson and State of Texas, have invented a new and useful Rotary Engine; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a new and useful steam engine, and one of the rotary type.

One of the objects of the invention is the provision of a steam cylinder having a hinged abutment, which operates a slide or throttle valve, as it is moved from the path of the piston of the rotor of the engine for intermittently cutting off the supply of steam through the steam inlet of the steam chest, in combination with an auxiliary steam chest, into which a bar plate, terminating in a cup shaped portion at one end, enters, as the abutment oscillates, to which abutment the bar plate is pivotally connected. The steam in the auxiliary steam chest acts against the cup shaped portion to cushion the abutment, and to return the same in the path of the piston. Steam is fed to the auxiliary steam chest by means of a bypass pipe from the steam supply pipe 32.

The invention comprises further features and combination of parts, as hereinafter set forth, shown in the drawings and claimed.

In the drawings:—Figure 1 is a view in side elevation of the improved rotary engine constructed in accordance with the invention. Fig. 2 is an edge view. Fig. 3 is a vertical sectional view. Fig. 4 is a sectional view on line 4—4 of Fig. 3. Fig. 5 is an enlarged detail view showing one of the packing rings. Fig. 6 is a detail of one of the pistons of the rotor.

Referring to the drawings 1 designates the casing of the engine, which comprises the cylindrical outer wall 2 and the head plates 3, which are bolted to the cylindrical outer wall 2 by the bolts 4. The head plates 3 are provided with downwardly extending portions 5, which terminate in feet 6, which are secured to a base 7.

Mounted in bearings of the head plates is the drive shaft 8, which extend through the

packing boxes or glands 9. The shaft 8 is also mounted in the bearings 11, which are secured to the upper portions of the supports 12. These supports 12 terminate in feet 13, which are also secured to the base. Also secured to the bearings 11 are the bracket plates 14, the ends 15 of which are bolted or otherwise secured to the head plates, thereby bracing the engine casing and the support 12 relatively to one another. Mounted upon the shaft 8 is the usual drive pulley 16, and the usual fly wheel 17.

Keyed to rotate with the shaft 8 and within the casing is the rotor 18. This rotor is provided with a cylindrical portion 19, and projecting therefrom radially is a plurality of pistons 20 having brace walls 21, the edges 22 of which are curved to correspond with the contour of the abutments 23 and 24, which are pivoted at 25, so that as the pistons 20 travel through the steam chamber or cylinder 26, the edges 22 of the walls 21 will contact with one or the other of the abutments, in order to raise the same from their paths. Embedded in the cylindrical portion 19 of the rotor is a series of rings 27, one series on each side or edge of the cylindrical portion 19 of the rotor. The cylindrical portion 19 is also constructed with a series of perforations 28, which open in the rear of the rings, thereby permitting an admission of steam from the steam chamber or cylinder, to act upon the rings, in order to force the same against the head plates, thereby preventing the escape of steam. The rings are constructed in section, each terminating adjacent the pistons, and as the steam enters in the rear of each piston to act thereon, each section of ring following the piston will be forced against the head plates, and after the utilized steam exhausts, each section tends to cool off, until again acted on by the steam.

Projecting laterally and forming a part of the cylindrical wall 2 of the casing of the engine is a steam chest casing 30, in which an auxiliary chamber 31 is arranged. Entering the steam chest are two pipes 32 and 33, one above and one below the steam chest. These pipes 32 and 33 connect to a union 34, which is connected integrally or other-

wise with a casing 35, in which the usual governor valve (not shown) is designed to be arranged. Connecting the casing 35 is the steam main 36. The governor valve (not shown) is adapted to be operated by the usual form of governor 37 having belt connections 38 with the pulley 39 on the drive shaft 8. As the drive shaft 8 increases or decreases in speed, it will be noted that the governor valve (not shown) will be raised or lowered, in order to control the admission of steam from the steam main 36, into one or another of the pipes 32 and 33. Connecting the steam pipe 32 and the auxiliary chamber 31 is a steam by-pass pipe 40, the purpose of which is to permit a small supply of steam to enter the auxiliary chamber 31.

Projecting from the steam chest casing is an arm 41, to the extremity of which two levers 42 and 43 are pivoted. Each lever is provided with an elongated slot 44. A rack quadrant 45 also projects from the steam chest casing, constructed with two upper bars 46, each having two notches 47 and 48, to be coöperated by the dogs 49 of the levers 42 and 43. The dogs 49 are operated by the hand grips 50. Pivoted at 51 and 52 to the abutments are rods 53 and 54, which are mounted in guides 55. These rods 53 and 54 also extend through the packing glands 56, and through the slots 44 of the levers 42 and 43. Threaded on the ends of the rods 53 and 54 are nuts 58, against which the levers 42 and 43 contact, for throwing one or the other of the abutments 23 and 24 out of operation. When one or another of the abutments is thrown out of operation, its free end portion seats against the end of the wall 59. Pivoted adjacent the free end portions of the abutments are bar plates 60 and 61, which extend into the auxiliary chamber 31. At the point where the bar plates penetrate the wall of the chamber 31 packing 62 is arranged. The extremities of the bar plates terminate in cup-shaped or hollowed-out members 63 and 64, which, when one or the other of the abutments is in operation, are acted upon by the steam in the auxiliary chamber 31, to cushion one or the other of the abutments, when thrown from the path of the pistons, and to restore the same to its normal position after each piston passes.

Pivoted to each of the abutments as at 65 is a rod 66 which connects at 67 to the slide valves 68 and 69. These slide valves 68 and 69 are designed for the purpose of cutting off steam from the steam chest. When the abutment 23 is in operation, the slide valve 68 is intermittently operated, as the said abutment is thrown from the path of the pistons, while the slide valve 69 is held closed, because the abutment 24 is held out of the path of the pistons by the lever 42,

when the rotor is traveling in the direction of the arrow 70. When the rotor is traveling in the direction of the arrow 71, the abutment is thrown into operative position, and the abutment 23 is thrown out of operative position, by the lever 43. When the abutment 24 is in operation, the slide valve is intermittently operated, in order to permit steam to enter in the rear of each piston, as it passes the abutment.

Operation: To rotate the pistons in the direction of the arrow 70, the abutment 23 being disposed angularly across the steam chamber or cylinder, as shown in Fig. 3 as each piston raises the abutment 23 and passes it, steam from the chest, which steam enters the chest through the pipe 32 past the slide valve 68, acts upon each piston, and imparts a revoluble movement to the rotor. As each piston passes the abutment 23 the same is cushioned, and then returned to its normal position by the action of the steam in the auxiliary chamber 31. To reverse the engine, the abutment 23 is thrown from the path of the pistons while the abutment 24 is thrown in the path of the pistons, by reversing the levers 42 and 43 in their positions, after which the operation of the engine is correspondingly similar to that previously set forth.

The invention having been set forth, what is claimed as new and useful is:—

In a rotary engine, a casing having a steam cylinder, a rotor revolubly mounted in the casing and provided with a plurality of pistons operable in the steam cylinder, a steam chest having an auxiliary steam chest and provided with two steam compartments, each having a steam inlet pipe, one of said steam inlet pipes having a by-pass pipe connection with the auxiliary steam chest, slide valves in the steam chest for controlling the steam inlet pipes, abutments hinged in the steam cylinder for controlling communication between the steam chest and the steam cylinder, connections between said abutments and the slide valves, a mechanism for throwing and holding one or the other of said abutments in an inoperative position when the engine operates in one direction to hold one of the slide valves closed, while the other abutment intermittently operates for intermittently operating its respective slide valve for throttling one of the inlets, the abutments having bar plates hingedly connected thereto and extending into the auxiliary steam chest, each of said bar plates terminating at one end in a cup shaped member, when the operative abutment intermittently oscillates from the path of the pistons its respective slide valve and bar plate including its cup shaped member are simultaneously actuated, its respective cup shaped member acting against the steam in the auxiliary

steam chest to cushion the operative abutment, the steam in the auxiliary steam chest acting against one of said cup shaped members to return the operative abutment intermittently in the path of the traveling pistons.

name to this specification in the presence of two subscribing witnesses.

JUDGE PECK LAWRENSON.

Witnesses:

R. C. SEWELL,
J. E. JACKSON.

In testimony whereof I have signed my

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