

No. 642,005.

Patented Jan. 23, 1900.

G. B. ROBINSON & N. SEYLLER.  
ROTARY ENGINE.

(Application filed Feb. 7, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 4.

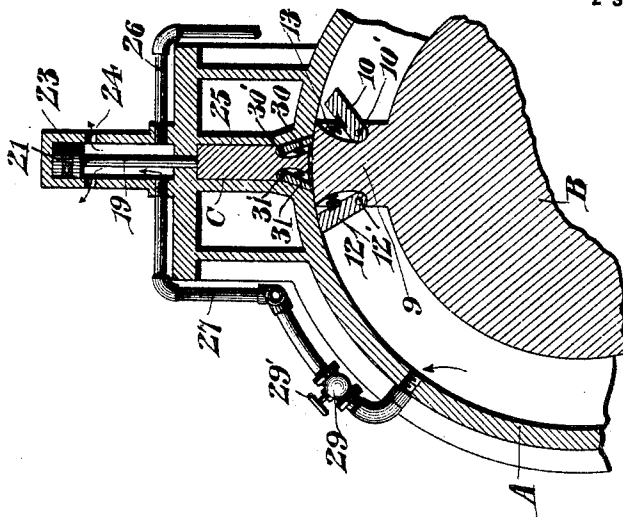
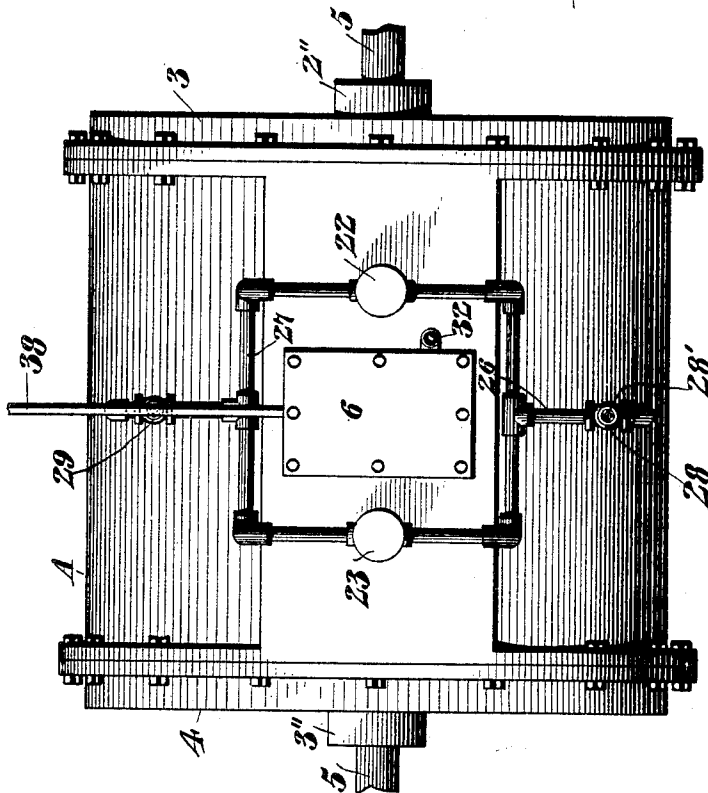


Fig. 1.



Witnesses  
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Fig. 3.

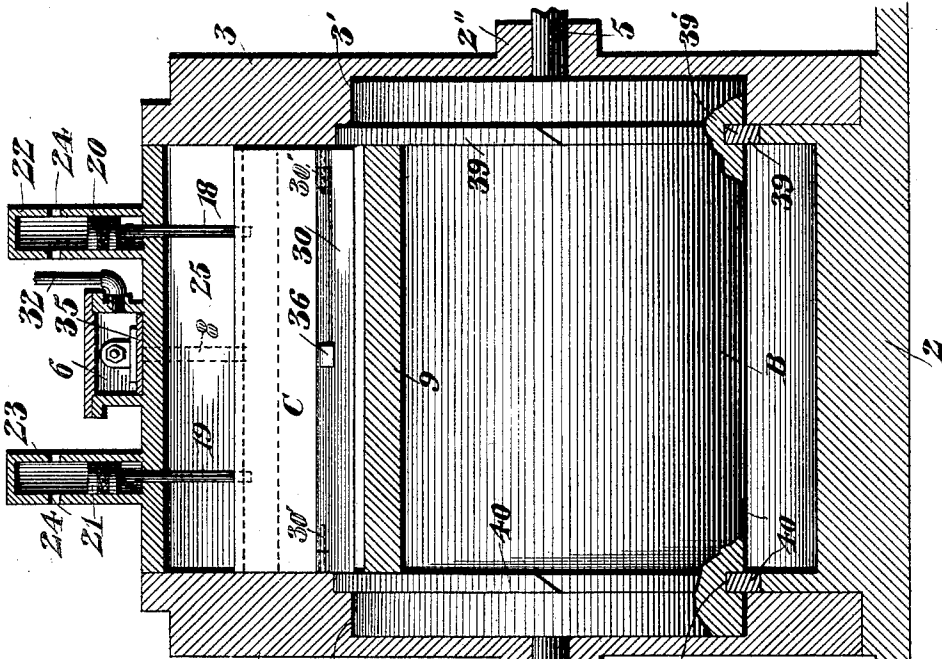
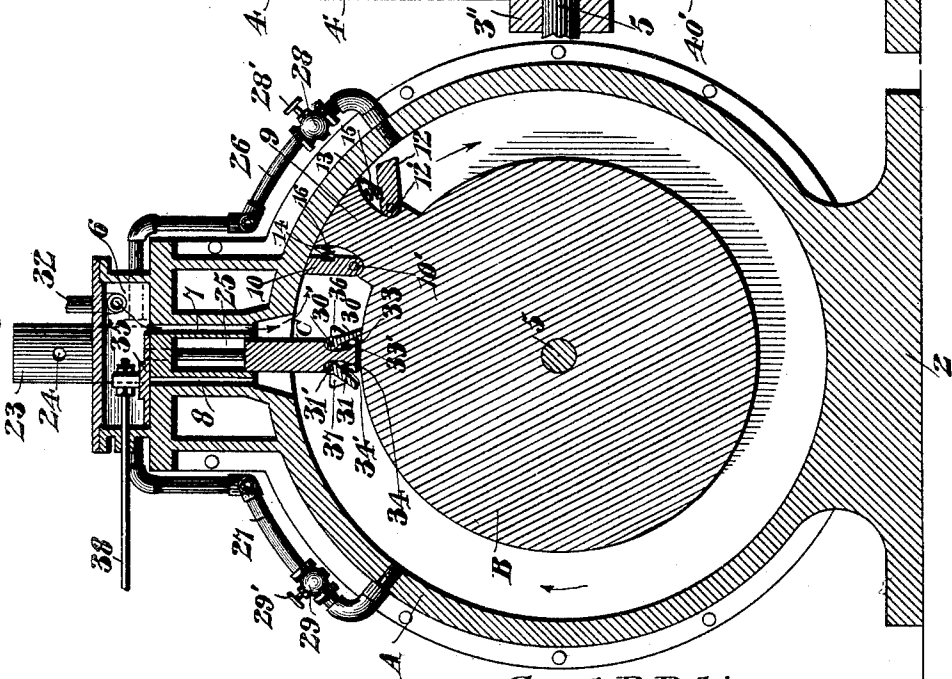


Fig. 2.



Witnesses

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# UNITED STATES PATENT OFFICE.

GRANT B. ROBINSON AND NELSON SEYLLER, OF SEWARD, OKLAHOMA TERRITORY.

## ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 642,005, dated January 23, 1900.

Application filed February 7, 1899. Serial No. 704,828. (No model.)

*To all whom it may concern:*

Be it known that we, GRANT B. ROBINSON and NELSON SEYLLER, citizens of the United States, residing at Seward, in the county of Logan and Territory of Oklahoma, have invented a new and useful Rotary Engine, of which the following is a specification.

This invention relates to steam-engines of that class known as "rotary;" and the object of the invention is to provide a simple and efficient apparatus of this character wherein all of the steam supplied thereto is employed to its best advantage and in which the exhaust can be properly controlled and in which the piston can be driven in opposite directions with equal facility.

The rotary engine herein illustrated consists of a cylinder or shell, a piston wheel or drum supported for rotation in opposite directions therein, said wheel or drum being provided with a piston, an abutment-valve, a piston-rod connected with said abutment-valve and having a piston, a tube or jacket for incasing said last-mentioned piston, and exhaust-pipes leading from the cylinder or shell and into said tube or jacket, so that the exhaust-steam can pass from the said cylinder to the tube for the purpose of utilizing the same to strike that piston which is connected with the abutment-valve for the purpose of operating the latter, a steam-chest, and a valve in the latter, and these parts may be constructed of any suitable material.

As a means for obtaining a close union between the abutment-valve and piston-wheel and also between the piston and the outer wall of the piston chamber or cylinder these parts will be provided with hinged leaves, which are forcible into contact with the piston-wheel and piston-cylinder by the pressure of steam thereagainst and are held out of such contact by springs acting against the same.

With these ends in view the invention consists in the novel combination of elements and in the construction and arrangement of parts, which will be hereinafter fully described and claimed.

To enable others to understand the invention, the preferred construction thereof is illustrated in the accompanying drawings,

forming a part of this specification, and in which—

Figure 1 is a plan view of a rotary steam-engine constructed in accordance with the invention. Fig. 2 is a central vertical section of the same. Fig. 3 is a transverse central section. Fig. 4 is a sectional detail showing the abutment-valve in its extreme elevated or retracted position.

Like characters denote like and corresponding parts in each of the several figures of the drawings.

In the drawings the cylinder is denoted by A, and it has a widened base 2, adapted to rest upon and to be secured to a floor or foundation, and the heads or ends 3 and 4 of said cylinder are recessed to receive the ends of the wheel or drum B, the ends of the latter freely fitting within the two recesses, as indicated clearly in Fig. 3. The drum or wheel B carries the shaft 5, projecting centrally therethrough and supported for rotation in journal-openings formed, respectively, in the cylinder-heads 3 and 4 and the hubs 2' and 3' thereon, said shaft carrying a pulley or other power-transmitting device. (Not shown.) The cylinder H is provided upon the upper side thereof with the steam-chest 6, communicating with the interior of the cylinder by the vertical ports 7 and 8, which are located at opposite sides, respectively, of the abutment-valve C, hereinafter more particularly described. The piston-wheel B is separated from the outer wall of the cylinder A by a comparatively wide space or chamber, into which the steam from the ports 7 or 8 can pass for the purpose of striking the piston 9 to rotate the piston-wheel, said piston consisting in the present case of a radial projection upon the periphery of the wheel, the outer face of which is in proximity to the cylinder, as clearly shown in Fig. 2. The piston 9 carries upon the opposite faces thereof the plates or leaves 10 and 12, pivoted at their inner edges, as at 10' and 12', respectively, to said piston and movable into the cut-away portions 13 and 14 therein. These plates are adapted to be thrown into engagement with the outer wall of the steam-cylinder A by the pressure of the steam thereagainst, thereby to secure a close joint between the parts, and

for the purpose of holding the same in their outer positions, the coiled springs 15 and 16 are provided, (see Fig. 2,) which act, respectively, against the plates and the piston.

5 The abutment-valve C consists of a main plate 17, from the upper side of which the stems or rods 18 and 19 extend, said rods being vertically disposed and having at their upper ends the pistons 20 and 21, located in  
10 the tubes 22 and 23 upon the upper side of the cylinder A, said tubes having exhaust-ports, as 24, in their walls, near the top thereof, and being closed at their upper ends. The abutment-valve has a vertical movement up into  
15 the chamber or compartment 25 (see Fig. 4) for the purpose of crossing the path of the piston 9, as shown clearly in Fig. 4. The exhaust-conveying pipes 26 and 27 connect the tubes 22 and 23 with the cylinder A at opposite  
20 sides of the abutment-valve, and each of said pipes is substantially of Y shape, the branched ends of each of them being connected with the exhaust-tubes 22 and 23, as shown clearly in Fig. 1, and each of these  
25 pipes is provided with a valve, (designated, respectively, by 28 and 29,) which valves are preferably of the globe type and are located adjacent to the cylinder A and are provided with wheels, as 28' and 29', by which they  
30 can be operated.

The abutment-valve is provided upon its lower side with the leaves or plates 30 and 31, pivoted to opposite sides thereof, as at 30' and 31', and adapted to be thrown into engagement alternately with the periphery of the  
35 wheel or drum B by steam-pressure, although the abutment-valve is not intended to come directly in contact with the drum when in its lowermost position, as indicated in Fig. 2.

40 In Fig. 2 the piston 9 is shown as being adjacent to and to the right of the abutment-valve C, said abutment-valve being in its lowermost position and the exhaust-valve 28 being closed, while the exhaust-valve 29 is  
45 open. When steam is admitted into the steam-chest 6 through the supply-pipe 32, leading thereinto, such steam will pass through the longitudinal port 7 and from thence into the cylinder A, where it will strike the plates  
50 or leaves 30 and 31, thereby forcing the same into their shifted positions, as aforesaid, and consequently moving the piston and rotating the wheel or drum B, which carries the same, the direction of steam and of rotation of the  
55 drum being indicated by the arrows in Fig. 2.

When the piston in its revolution has passed a point beyond the exhaust-pipe 27, the valve 29 of which is open, the exhaust will pass into said pipe and from thence to the tubes 22  
60 and 23 and will strike the pistons 20 and 21, thereby elevating the latter, and consequently the abutment-valve A, so that the latter will be moved across the path of the piston. To secure the reverse operation, the valve 28  
65 will be opened and the valve 29 closed, so that the exhaust can then pass from the pipe 26 and into the tubes 22 and 23. When the

pistons 20 and 21 have reached the limit of their movement, the exhaust-steam will pass out the ports 24 in the tubes, so that the  
70 abutment-valve will be released. The direction of the exhaust from the pipes 26 and 27 is indicated by the arrows in Fig. 4.

For the purpose of holding the plates or leaves 30 and 31 out of contact with the outer  
75 surface of the drum or wheel B the coiled springs 33 and 34 are provided, the opposite ends of said springs being adapted to act against the plates and abutment-valve, respectively, and being fitted in depressions or  
80 concavities, as 33' and 34', formed in the abutment-valve from the opposite faces thereof.

The steam-chest 6 contains a slide-valve 35, adapted to cover the upper ends of the ports 7 and 8 alternately, said valve being  
85 shown as uncovering the upper end of the port 7, whereby steam can enter the cylinder to the right of the abutment-valve C for the purpose of rotating the piston-wheel in the direction indicated. When said valve is op-  
90 erated to cover the port 7, it will uncover the port 8, so that steam can pass through the latter to the left-hand side of the abutment-valve for the purpose of operating said piston-wheel in the opposite direction.  
95

The supply of steam to the cylinder for the purpose of operating the piston 9 is controlled by valves, as 36 and 37, secured to the abutment-valve C and preferably fixed to the  
100 plates or leaves 30 and 31 hinged thereto. When the abutment-valve is operated in the manner hereinbefore set forth, these supply-controlling valves 36 and 37, which are carried therewith, are adapted to cover the lower  
105 ends of the ports 7 and 8, so as to prevent the entrance of live steam from the steam-chest into the steam-cylinder A.

The slide-valve 35 is connected with the stem or rod 38, which extends through the steam-chest 6 and which is provided with or  
110 is connected with a suitable device (not shown) for operating said slide-valve.

The drum or wheel B is provided near its opposite ends with the split packing-rings 39 and 40, which fit in grooves 39' and 40' there-  
115 in, and which rings are adjacent to the heads or ends 3 and 4 of the cylinder, and when steam is admitted into said cylinder in the manner hereinbefore set forth it presses against said packing-rings to force them  
120 tightly against the outer walls of the grooves, thereby to prevent the escape of steam between the piston-wheel and cylinder, and said packing-rings are preferably of resilient material and are adapted to spring outwardly  
125 by their own action into proper contact with the walls of the recesses 3' and 4'.

From the preceding description it will be evident that the apparatus is simple in construction, that the piston-wheel can be oper-  
130 ated equally well in opposite directions, and that the exhaust and supply of steam can be properly and automatically controlled without the loss of any steam.

Changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new is—

1. In a rotary engine, the combination with a cylinder, of a piston-wheel therein provided with a piston, an abutment-valve movable across the path of said piston, a stem connected with the said abutment-valve, a piston on said stem, a tube inclosing said piston and having a port, and an exhaust-pipe leading from the exhaust side of the cylinder to said tube to deliver exhaust-steam to the latter and move the piston therein to move the abutment from the cylinder, substantially as described.

2. In a rotary engine, the combination with a cylinder, of a piston-wheel therein provided with a piston, an abutment-valve movable across the path of said piston, a stem connected to said abutment-valve and provided with a piston, a tube surrounding said last-mentioned piston and having a port, an exhaust-pipe leading from the cylinder to said tube and adapted to deliver exhaust-steam from the cylinder to the tube to move the abutment-valve from the cylinder, means for supplying live steam to the cylinder, and means connected with said abutment-valve for controlling the supply of steam to the cylinder, substantially as described.

3. In a rotary engine, the combination with a cylinder, of a piston-wheel supported therein and provided with a piston, an abutment-valve movable across the path of the piston, a stem connected with said abutment-valve, a tube surrounding said last-mentioned piston and having a port, and valved exhaust-pipes leading from the cylinder at opposite sides of the abutment-valve to said tube to deliver exhaust-steam to the tube and move the abutment-valve from the cylinder, substantially as described.

4. In a rotary engine, the combination with a cylinder, of a piston-wheel therein provided with a piston, an abutment-valve movable across the path of said piston and having wings hinged thereto and adapted to engage the periphery of the piston-wheel, springs arranged between the wings and the abutment-valve and adapted to hold the latter normally from engagement with the surface of the piston-cylinder, a stem connected with said abutment-valve, a piston on said stem, a tube inclosing said piston and having a port, an exhaust-pipe leading from the cylinder to said tube, a supply-port leading into the cylinder, and a valve carried by said abutment-valve for covering said port thereby to cut off the supply, substantially as described.

5. In a rotary engine, the combination with a cylinder, of a piston-wheel therein provided

with a piston, an abutment-valve movable across the path of the piston, plates connected respectively with the abutment-valve and piston, springs arranged to hold said plates normally from engagement with their respective opposing surfaces and a supply-port communicating with the cylinder, substantially as described.

6. In a rotary engine, the combination with a cylinder, of a piston-wheel therein provided with a piston, an abutment-valve movable across the path of said piston, plates hinged to the abutment-valve and to the piston and movable respectively into contact with the piston-wheel and the outer wall of the cylinder by steam-pressure, springs arranged to hold said plates normally from engagement with their respective opposing surfaces, steam-supplying means, and an exhaust-pipe connected with the cylinder, substantially as described.

7. In a rotary engine, the combination with a cylinder, of a piston-wheel therein provided with a piston, an abutment-valve movable across the path of said piston and separated therefrom when in its lowermost position, a stem connected with said abutment-valve, a piston on said stem, a tube inclosing said piston and having a port, exhaust-pipes leading from the cylinder to said tube at opposite sides of the abutment-valve, and each of said pipes having valve plates or leaves hinged respectively to the abutment-valve and to the piston at opposite sides of each of said parts, springs acting against the plates and also against the piston and abutment-valve, ports leading into the cylinder, and supply-valves carried by the plates on said abutment-valve and serving to close said supply-ports, substantially as described.

8. In a rotary engine, the combination with a cylinder, of a piston-wheel therein provided with a piston, an abutment-valve movable across the path of said piston, vertical stems connected with said abutment-valve and provided with pistons, tubes inclosing said pistons and having ports, valved exhaust-pipes leading from the cylinder at opposite sides of the abutment-valve to said tubes, a steam-chest, ports connecting the steam-chest with the cylinder, a slide-valve in said steam-chest, spring-actuated plates connected respectively with the abutment-valve and piston upon the opposite faces thereof, and supply-controlling valves on said plates carried by the abutment-valve and adapted to close said supply-ports, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

GRANT B. ROBINSON.  
NELSON SEYLLER.

Witnesses:

JOHN H. SIGGERS,  
ROBT. E. CRUMP.