No. 674,298. Patented May 14, 1901.

J. D. R. LAMSON.

ROTARY ENGINE.

(Application filed July 7, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

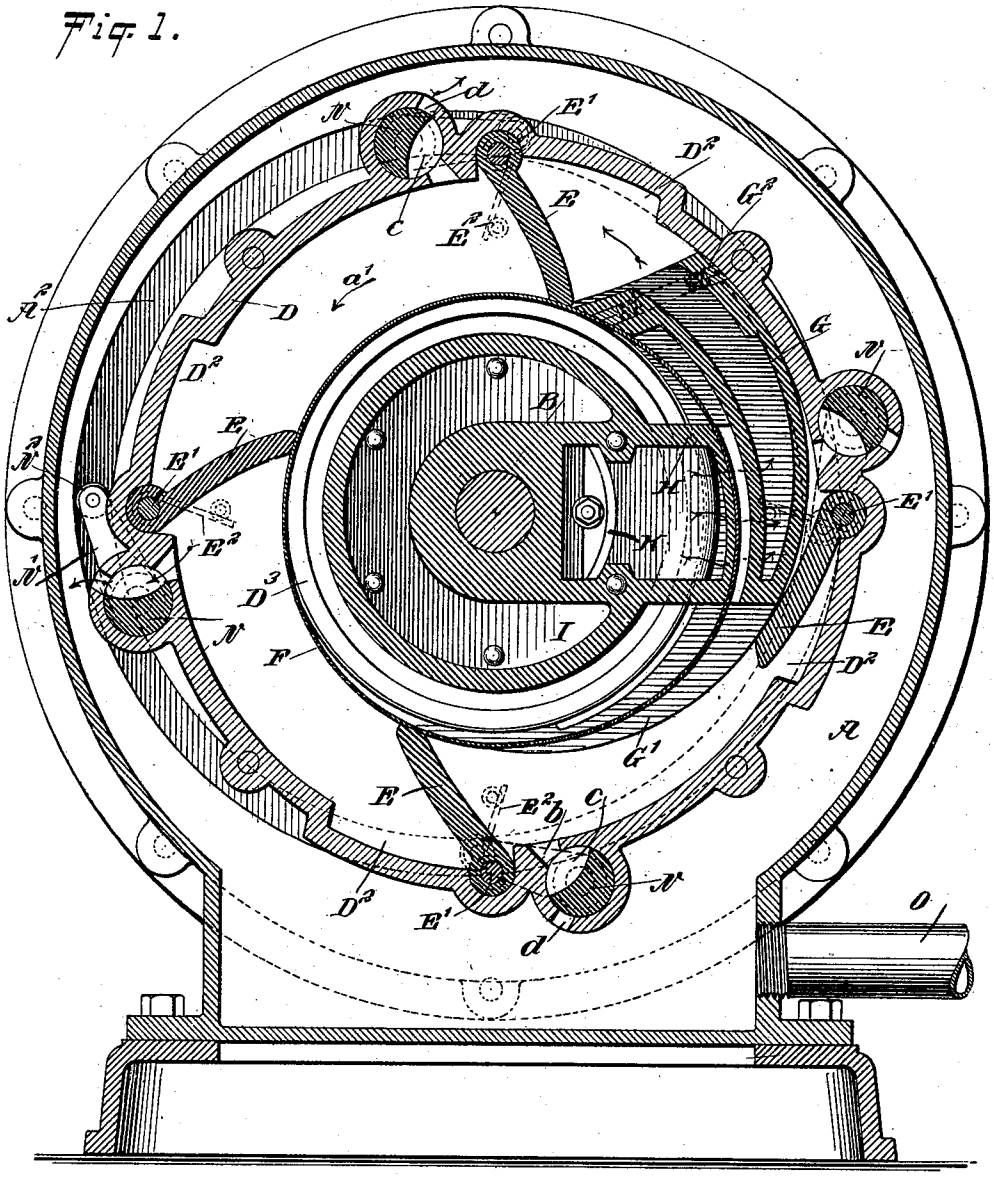
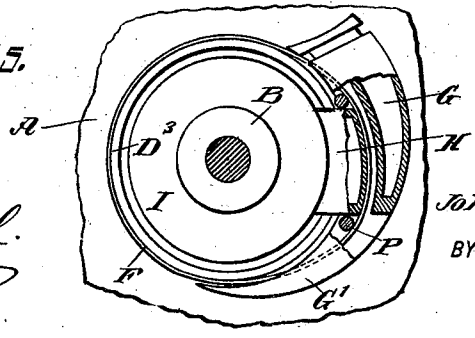


Fig. 5.



WITNESSES:

William P. Goebel.

Rud. J. Hoskins

INVENTOR

John D. R. Lamson.

BY Munn & Co.

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 2.

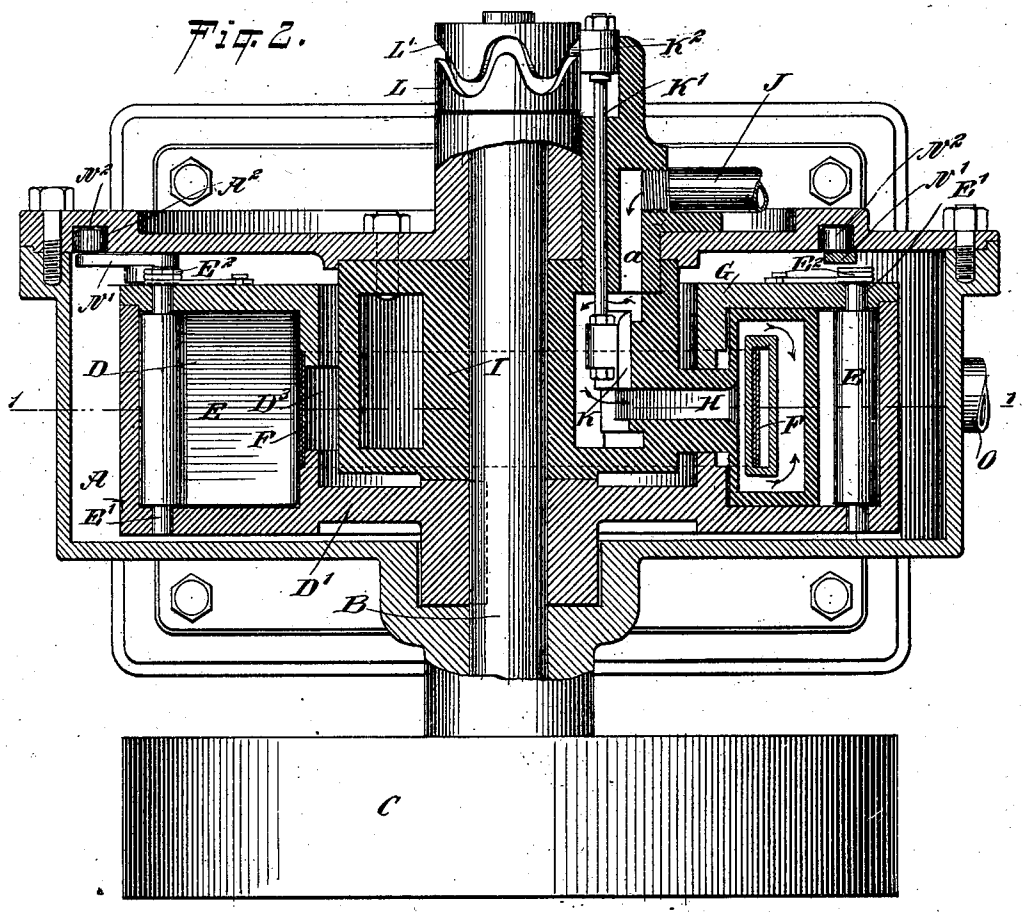


Fig. 3.

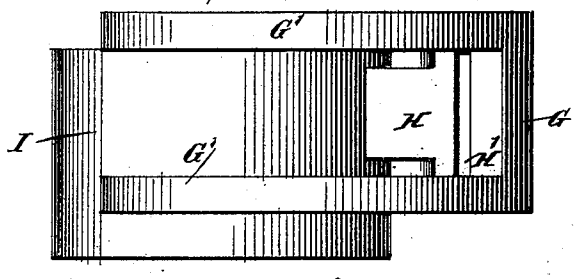
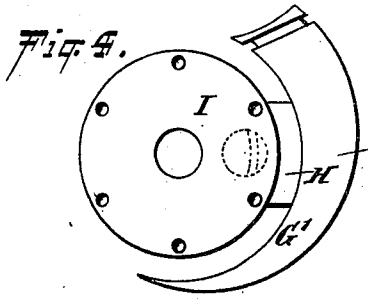


Fig. 4.



WITNESSES:

William P. Goebel.

Percy Hoskins

INVENTOR

John D. R. Lamson.

BY Munn & Co.

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN DICKENSON RHOADES LAMSON, OF TOLEDO, OHIO.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 674,298, dated May 14, 1901.

Application filed July 7, 1900. Serial No. 22,822. (No model.)

To all whom it may concern:

Be it known that I, JOHN DICKENSON RHOADES LAMSON, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a new and Improved Rotary Engine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved rotary engine which is simple and durable in construction, very effective in operation, and arranged to utilize the motive agent to the fullest advantage.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a cross-section of the improvement on the line 1 1 in Fig. 2. Fig. 2 is a sectional plan view of the same. Fig. 3 is a plan view of the fixed steam-chest and abutment. Fig. 4 is a reduced side elevation of the same, and Fig. 5 is a sectional elevation of a modified form of packing for the cylinder.

The improved rotary engine is mounted on a suitably-constructed housing A, in which is journaled the main shaft B, carrying a pulley C or other device for transmitting the rotary motion of the main shaft to other machinery. On the shaft B is secured the head D′ of a cylinder D, made ring-shaped and containing a plurality of spaced piston-heads E, mounted to swing at E′ in the heads of the cylinder and adapted to fold or close into recesses D^2 in the peripheral outer face of the cylinder D. Each of the piston-heads E is pressed on at its fulcrum end by a spring E^2, so as to hold the piston-heads normally in an innermost position, the free ends of the piston-heads being in engagement with an annular packing-ring F, serving to close the annular opening D^3 in the inner face of the cylinder, as will be readily understood by reference to the drawings.

In the cylinder D is arranged a fixed abutment G, connected by a neck H with a steam-chest I, secured at one head of the housing A, as is plainly shown in Fig. 2, the steam-chest having a port *a* leading to a steam-supply pipe J, connected with a boiler or other motive-agent supply. A valve K is arranged in the steam-chest for controlling the connection between the steam-chest and the hollow neck H, which latter connects with the interior of the abutment G, opening at one end into the cylinder D, so that the motive agent can pass from the steam-chest I by way of the valve K through the neck H into the abutment G and from the latter into the cylinder to press against the piston-head E at the time it is in front of the discharge end of the fixed abutment G, as will be readily understood by reference to Fig. 1. Thus when the several parts are in the position shown in Fig. 1 and steam or other motive agent passes into the cylinder a rotary motion is given to the said cylinder in the direction of the arrow *a′*.

The abutment G is provided with cam ends G′ for the free ends of the piston-heads E to travel on at the time said piston-heads have to pass the abutment G in order to again reach a working position when reaching a top position, as shown in Fig. 1. The neck H is provided with an opening H′ for the passage of the packing-ring F, so that said packing-ring firmly closes the annular opening D^3 in the inner wall of the cylinder during the time live steam is in the cylinder to prevent leakage of live steam from the cylinder.

In the discharge end of the abutment G is arranged a packing G^2 for engaging the wall of the cylinder D and the packing-ring F to prevent leakage of the steam past the abutment.

The slide-valve K for controlling the admission of the motive agent from the steam-chest to the abutment and cylinder by way of the neck H is secured on a stem K′, mounted to slide longitudinally in suitable bearings arranged in the housing A. On the outer end of the stem K′ is arranged a friction-roller K^2, in engagement with a cam-groove L′, formed on the peripheral surface of a cam L, secured to the main shaft B, so that when the latter is rotated a reciprocating motion is given to the valve K by the cam L, the friction-roller K^2, and the stem K′. The valve K closes at the time the corresponding piston-head E swings from a closed or folded

position into an open position at the discharge end of the abutment G, it being understood that when the motive agent is cut off for the time being the spring E^2 of the said piston-head in question readily causes the piston-head to swing into an innermost position—that is, with its free end in engagement with the packing-ring F—so that when the motive agent is now admitted to the abutment and cylinder then the piston-head is in proper position and another impulse is given to the cylinder to rotate the same in the direction of the arrow a'.

Adjacent to each pivotal end of a piston-head is an exhaust-port b in the outer wall of the cylinder D, and this port leads to an exhaust-cavity c in an oscillating valve N, mounted to turn in suitable bearings in the cylinder D. On the stem of each valve is secured an arm N′, carrying a friction-roller N^2, traveling in a cam-groove A^2, formed in one head of the housing A, to impart the desired swinging motion to the exhaust-valve N, so as to connect the exhaust-port b by the cavity c with a port d, opening into the housing A, so that the exhaust-steam from the cylinder can pass into the housing and from the latter by way of an exhaust-pipe O to the outer air. The exhaust for each piston-head remains closed during about one-quarter turn of the cylinder after giving an impulse to a particular piston-head, and then the valve moves into an open position to allow the motive agent to escape from the cylinder into the housing and to the pipe O.

It is evident from the foregoing that any desired number of piston-heads may be employed with a corresponding number of exhaust-valves, and hence I do not limit myself to the particular arrangement shown in the drawings.

In order to reduce the friction between the traveling packing-ring F and the neck H and in order to keep said packing stretched perfectly taut over the opening D^3, I may employ rollers P, as indicated in Fig. 5.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A rotary engine, comprising a revoluble ring-shaped cylinder, piston-heads mounted to swing therein, a fixed hollow abutment arranged in said cylinder and discharging the motive agent into the cylinder against a piston-head, and a fixed steam-chest around which the cylinder revolves, the said chest being connected with said abutment through an opening in the inner wall of said cylinder, to furnish the motive agent to said abutment, as set forth.

2. A rotary engine, comprising a revoluble ring-shaped cylinder, piston-heads mounted to swing therein, a fixed hollow abutment arranged in said cylinder and discharging the motive agent into the cylinder against a piston-head, a fixed steam-chest around which the cylinder revolves, the said chest being connected with said abutment through an opening in the inner wall of said cylinder, to furnish the motive agent to said abutment, and a hollow neck for rigidly connecting the steam-chest with the abutment, the neck extending through said opening in the cylinder, as set forth.

3. A rotary engine, comprising a revoluble ring-shaped cylinder, piston-heads mounted to swing therein, a fixed hollow abutment arranged in said cylinder and discharging the motive agent into the cylinder against a piston-head, a fixed steam-chest connected with said abutment through an opening in the inner wall of said cylinder, to furnish the motive agent to said abutment, and a slide-valve for controlling the motive agent from said steam-chest to said abutment, as set forth.

4. A rotary engine, comprising a revoluble ring-shaped cylinder having an annular opening at the inner side, piston-heads mounted to swing in said cylinder, exhaust-valves in said cylinder and adapted to connect the interior thereof with the exhaust, a fixed hollow abutment arranged in said cylinder and having one end opening into the cylinder, a neck extending through said annular opening in the cylinder and carrying said abutment, and a fixed steam-chest containing a valve and rigidly carrying said neck, as set forth.

5. A rotary engine, comprising a revoluble ring-shaped cylinder having an annular opening at the inner side, piston-heads mounted to swing in said cylinder, exhaust-valves in said cylinder and adapted to connect the interior thereof with the exhaust, a fixed hollow abutment arranged in said cylinder and having one end opening into the cylinder, a neck extending through said annular opening in the cylinder and carrying said abutment, a fixed steam-chest containing a valve and rigidly carrying said neck, and an annular packing-ring for closing said cylinder-opening and extending through a passage-way in said neck, as set forth.

6. A rotary engine, comprising a revoluble ring-shaped cylinder having an annular opening at the inner side, piston-heads mounted to swing in said cylinder, exhaust-valves in said cylinder and adapted to connect the interior thereof with the exhaust, a fixed hollow abutment arranged in said cylinder and having one end opening into the cylinder, a neck extending through said annular opening in the cylinder and carrying said abutment, a fixed steam-chest containing a valve and rigidly carrying said neck, and cam ends on said abutment opposite the open end thereof, for moving said piston-heads into a folded or closed position to pass the abutment, as set forth.

7. In a rotary engine, the combination with a revoluble ring-shaped cylinder, and swinging piston-heads mounted therein, of a fixed steam-chamber around which the cylinder revolves, a hollow fixed abutment arranged in the cylinder and provided with cams, said

abutment communicating with the said steam-chamber and opening at one end into the cylinder, and a valve operated from the cylinder-shaft and controlling the communication between the chamber and abutment.

8. In a rotary engine, the combination with a revoluble ring-shaped cylinder, and swinging piston-heads mounted therein, of a fixed steam-chest around which the cylinder revolves, a fixed abutment in the cylinder, said abutment communicating with the steam-chest and opening into the cylinder, a slide-valve in the steam-chest and controlling the communication between the steam-chest and abutment, and means for operating the valve from the shaft of the cylinder.

9. In a rotary engine, the combination of a revoluble ring-shaped cylinder, swinging piston-heads mounted therein, a fixed steam-chest around which the cylinder revolves, a hollow fixed abutment in the cylinder, said abutment opening at one end into the cylinder and communicating with the steam-chest, and an oscillating exhaust-valve mounted on the cylinder adjacent to the hinged end of each of the piston-heads, substantially as described.

10. In a rotary engine, the combination of a housing having a cam-groove on one inner face, a revoluble ring-shaped cylinder in the housing, swinging piston-heads in the cylinder, a fixed steam-chest around which the cylinder revolves, a hollow fixed abutment in the cylinder, said abutment communicating with the steam-chest and opening into the cylinder, an exhaust-valve mounted on the cylinder adjacent to the hinged end of each piston-head, and an arm secured to each valve and traveling in the cam-groove of the housing, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN DICKENSON RHOADES LAMSON.

Witnesses:
H. H. HAYNES,
J. K. ELDERKIN.