(No Model.) 2 Sheets—Sheet 1

J. G. ROSLING.

ROTARY ENGINE.

No. 553,428. Patented Jan. 21, 1896.

Fig. 1.

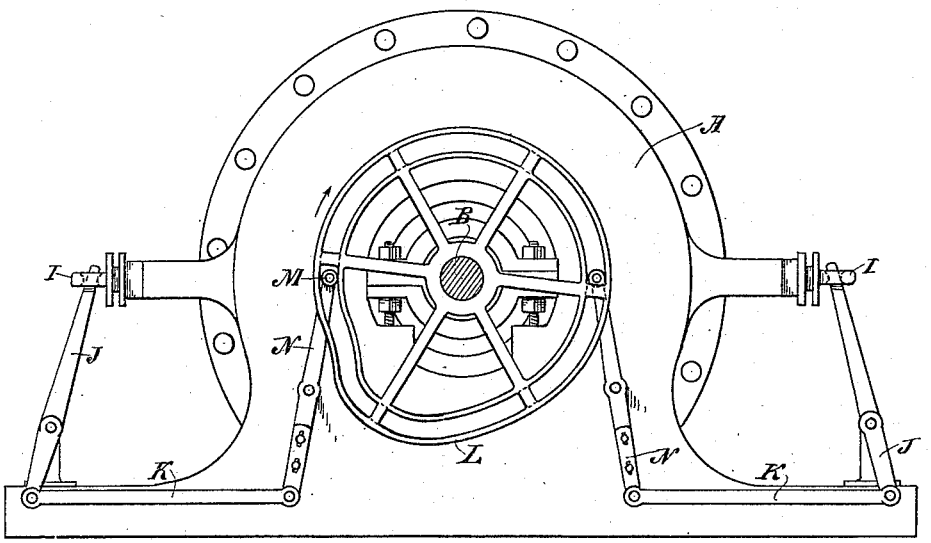
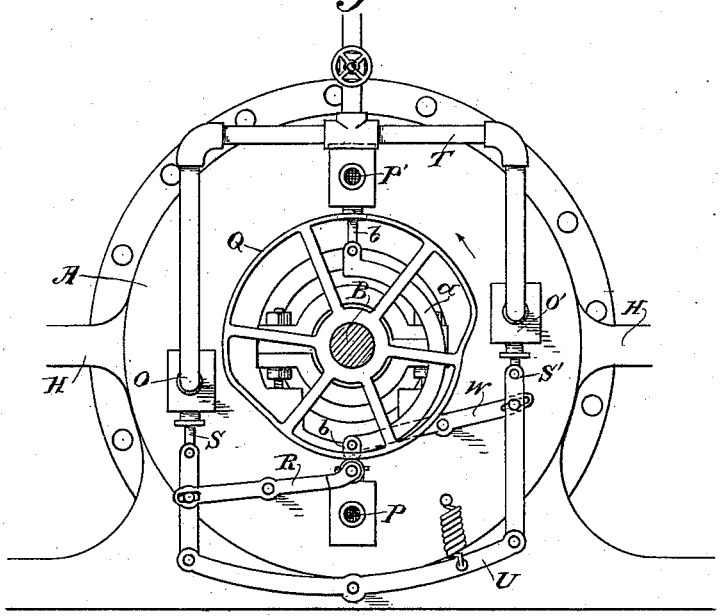


Fig. 2.



Witnesses,
L. L. Amee
H. F. Ascheck

Inventor,
John G. Rosling
By Dewey & Co.
Attys.

(No Model.) 2 Sheets—Sheet 2.

J. G. ROSLING.

ROTARY ENGINE.

No. 553,428. Patented Jan. 21, 1896.

Fig. 3.

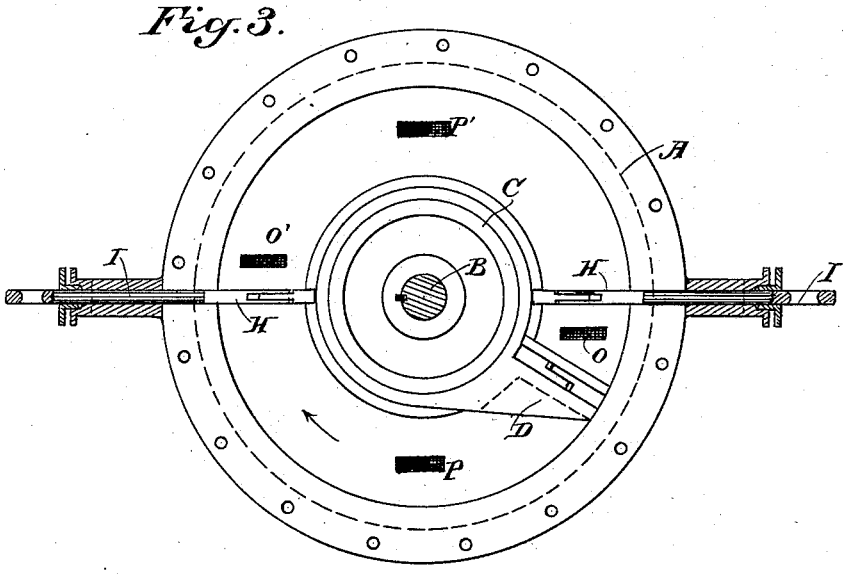


Fig. 4.

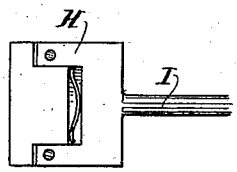
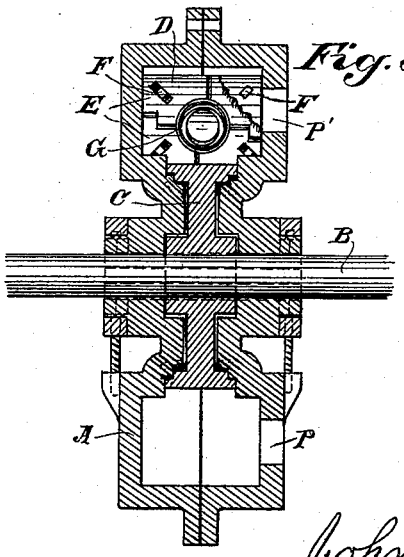


Fig. 5.



Witnesses,
J. H. Louse
H. F. Ascheck

Inventor
John G. Rosling
By Dewey & Co.
Attys

UNITED STATES PATENT OFFICE.

JOHN G. ROSLING, OF OAKLAND, CALIFORNIA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 553,428, dated January 21, 1896.

Application filed September 23, 1895. Serial No. 563,295. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. ROSLING, a citizen of the United States, residing in Oakland, Alameda county, State of California, have invented an Improvement in Rotary Engines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in rotary engines.

It consists in certain details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a view showing the mechanism for actuating the abutments. Fig. 2 is an exterior view from one side, showing the valve-operating mechanism. Fig. 3 is an interior view of the piston-chamber, one-half of the case being removed. Fig. 4 is a top view of one of the abutments. Fig. 5 is a vertical cross-section through the case.

A is a circular case having within it an annular piston-chamber, and a shaft B extending through the center, suitably journaled exterior to the case and having a disk C keyed to it within the case, and one or more pistons D extending outwardly from the periphery of the disk and fitting the interior of the annular piston-chamber.

The piston has suitable packing upon the edges to form a steam-tight joint between itself and the interior of the case as it rotates.

I have shown the packing as consisting of diagonally-sliding spring-actuated plates E, which are slotted so as to fit over diagonal guides F upon the rear face of the piston. These plates are also made to overlap at their meeting edges, and as there are four of them, one for each angle of the piston, it will be seen that when they move outwardly from the center upon the diagonal guides F, the two outer edges of each plate, which are at right angles with each other, will fit into a corresponding angle of the interior of the case in which the piston moves. The interior angles of these plates are cut away so as to leave a circular space, and within this space is fitted a spring or springs G, which act to force the packing-plates outwardly and thus form the steam-joint. This packing is fitted upon the rear face of the piston, which is a plane essentially radial with the shaft.

The front face is inclined, as shown, so as to follow the abutments as the latter are drawn outwardly to allow it to pass. The abutments H are slidable radially to and from the center, and have a suitable packing and cushion at the inner end to relieve the shock of closing. In the present case I have shown two upon opposite sides of the shaft, and these abutments pass through suitable packing-chambers, extending outwardly from the case in the plane in which the abutments slide. These abutments have stems or shanks I extending in a line outwardly in their line of travel, and they are connected with rocker-arms J, suitably fulcrumed to oscillate backward and forward and thus alternately move the abutments in and out of the piston-chamber. These rocker-arms J are connected by connecting-rods K with a suitable means for oscillating them at the proper times to withdraw or close the abutments. In the present case I have shown these means to consist of a cam L fixed upon one of the projecting ends of the shaft B and suitably grooved to receive a roller M upon one end of a lever-arm N. The opposite end of this lever-arm is connected with the pitman or rod K, and through it motion is thus communicated to actuate the rocker-arms J and the stems I of the abutments.

The piston moving in the direction shown by the arrow, the inclined front face arrives at the abutment with that portion tangent with the interior of the piston-chamber in advance, and at this instant the abutment is drawn backward at a rate of speed corresponding with the forward revolution and advance of the piston, so that the backwardly-inclined front face of the piston follows the receding edge of the abutment closely until the latter is out of its path. As soon as the piston has fairly passed the abutment, the latter is instantly forced back so as to close the annular piston-chamber behind the piston, and the valve which admits steam through the port O or O′ will be opened so that steam will be admitted behind the piston to force it through the first half of its travel. At the same time the exhaust-port P will be closed to prevent the escape of steam through this port. The other steam-valve O′ will be closed and the exhaust-port P′ will be opened. The piston

impelled by steam admitted through this port O will travel through an arc of one hundred and eighty degrees, and the steam will then be shut off. The next abutment to which the piston now approaches will be withdrawn to allow it to pass and then closed in behind it, the steam-port O will also have been closed before the piston passes this abutment, and as the abutment returns to close the piston-chamber the exhaust-port P will be opened to allow the escape of the steam which had operated to impel the piston through this portion of its travel. The same operation takes place with the next steam-port and exhaust-port, thus alternately continuing so that the impulses of the steam upon the piston are very nearly continuous. In order to operate these valves I have shown a cam Q fixed upon the projecting end of the shaft B, and the periphery of this cam engages an antifrictional roller upon one end of a lever R suitably fulcrumed with relation to the cam and the case.

The valve-stems S and S′ connect with any suitable form of slide, rotary or other valve, (not here shown,) said valves controlling passages in the steam-pipe T which connects with each of the valve-chambers so as to admit steam under pressure into them.

Exteriorly the valve-stems connect with an oscillating lever U so that when one valve is opened the other will be closed.

The lever R has its outer end connected with the valve-stem S, and by this means the two valve-stems and their intervening rocker-arm U are oscillated.

The valve-stem S′ has one end of a lever-arm W connected with it, the lever-arm being centrally fulcrumed, and its opposite end is connected with a yoke *a* so disposed as to be oscillated by the movement of the lever W. This yoke *a* is, in turn, connected with the exhaust-valve stems *b*, and these valve-stems and the valves which they actuate are alternately opened and closed at the proper intervals by this connection. The opening and closing of these exhaust-valves is by these connections, and the operation of the cam, thus effected at the proper time with relation to the opening and closing of the steam-ports and the movement of the abutment, to allow the steam which has finished its work of impelling the piston to escape, and the operation thus becomes approximately continuous.

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

In a rotary engine, a case having an annular piston chamber, a central shaft, a disk fixed thereto projecting into the piston chamber, a triangularly shaped suitably packed piston fitting in said piston chamber, abutments slidable radially, and mechanism driven from the shaft whereby the abutments are alternately reciprocated to open the chamber for the passage of the piston, and to close behind it, steam valves opening into the piston chamber adjacent to the abutments, and exhaust ports correspondingly opening outwardly from the chamber, with controlling valves, a mechanism whereby said valves are actuated consisting of valve stems projecting outwardly from the valve chambers, a rocker arm by which the stems are connected, a lever connected with one of said valve stems, a cam fixed upon the engine shaft engaging an anti-friction roller upon said lever whereby the steam valves are reciprocated, a second lever connected with one of the steam valve stems at one end, and a yoke at the other, said yoke being connected with the exhaust valve stems whereby the latter are actuated in unison, and in conjunction with the steam valves.

In witness whereof I have hereunto set my hand.

JOHN G. ROSLING.

Witnesses:
S. H. NOURSE,
JESSIE C. BRODIE.