(No Model.)

J. MATTHEWS.

ROTARY ENGINE.

No. 494,069. Patented Mar. 21, 1893.

Fig. 1.

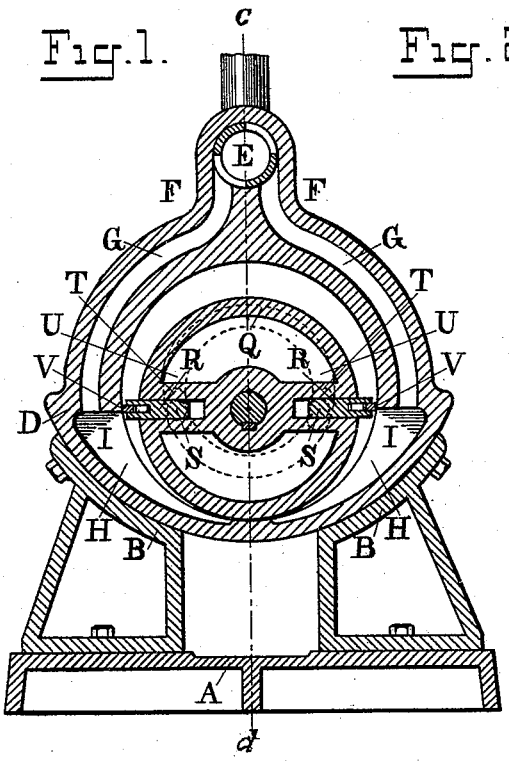


Fig. 2.

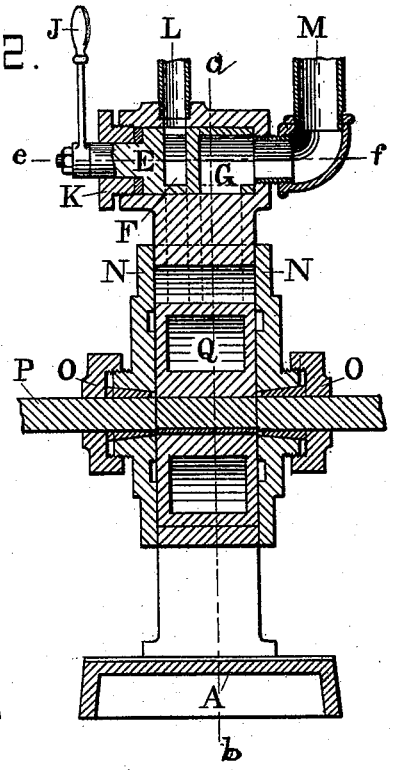


Fig. 3.

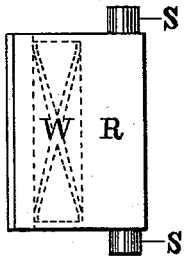
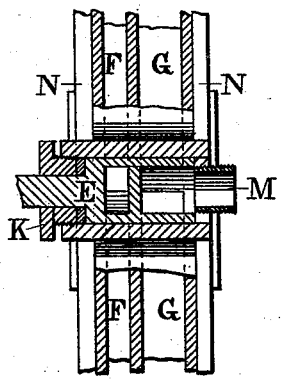


Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.



Witnesses

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JONATHAN MATTHEWS, OF BIRMINGHAM, ALABAMA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 494,069, dated March 21, 1893.

Application filed August 31, 1892. Serial No. 444,685. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN MATTHEWS, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Rotary Engines; 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.

My invention relates to that class of steam engines known as rotary engines in which the piston head is fixed on a driving shaft, and revolves within an annular chamber; and the objects of my improvements are, first, to construct an engine of the above described kind, that will have few, and simple parts, made plain and strong, to give long and durable service, and that will be cheap and easy to build; second, to provide a large area for the steam to operate upon the pistons, in the rotation of the head, so as to get a large amount of power, in proportion to the size of the engine, and to regulate the amount of steam admitted, at the point in which it commences to act on the pistons, in such a manner, that the piston area will increase for part of the revolution, thereby giving the steam an opportunity to expand, and fill the increased space; third, to construct a rotary engine, with large exhaust ports, in which the steam can freely escape, the head being provided with double pistons, and the steam acting on them alternately, the steam acting on each piston for half a revolution, and allowing the steam so used to exhaust, during the remaining half revolution of the head, thereby allowing time for the steam to escape freely through the ports. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1, is a vertical sectional view of my engine, on the line *a*, *b*. Fig. 2, is a cross vertical sectional view, on the line *c*, *d*. Fig. 3, is an enlarged detail plan view of one of the pistons. Fig. 4, is an enlarged detail end view of the same. Fig. 5, is an enlarged detail side view of one of the sliding shoes, that are placed on the piston pivots, and slides in the annular grooves formed in the casing heads. Fig. 6, is an enlarged detail plan view of the same. Fig. 7, is a horizontal cross sectional view on the line *e*, *f*, it shows the outside of the casing below, with part broken away, to show the position of the steam passages in the casing.

Similar letters refer to similar parts throughout the different views.

The base, or bed plate A, is made of cast iron and is provided with elevating blocks B, B′, secured to the bed plate by bolts, the said elevating blocks being formed on the upper side to fit the rim of the casing D, to which they are secured by bolts as shown, the said casing rim is made of cast iron, and provided on the upper end with a valve chamber, for the valve E, and extending downward from the valve chamber on both sides, are formed inlet ports F, F′, and exhaust ports G, G′, the said ports terminating at an offset formed in the casing, the space below the offset, forming steam chambers H, H′.

On the outer edges of the casing below the ports, are formed flanges extending inward, one of them being shown at I, the flanges and the upper part of the casing above the ports, are turned on the inside to form a true circle, the said flanges are for the purpose of guiding the pistons to pass the offset in the casing, the ends of the said piston sliding on the flanges, the lower half of their revolution, between the flanges at the lowest point of the casing, a partition is formed between the steam chambers H, H′, which makes a steam tight joint with the head.

The steam valve E is made of any suitable metallic substance, formed hollow on the inside, with a head and stem on one end, to which is secured a hand lever J, the said valve is held to place by a gland K secured to the casing, on the inside of the head of the valve E, leaving sufficient space for an inlet passage, leading from the steam pipe L, to the inlet ports F, F′, is placed a partition, on the outside of the partition, are formed outlet passages, leading from the exhaust ports G, G′, to the inside of the valve, and through the end to the exhaust pipe M, the steam passages through the valve, are formed by cutting out one fourth of the material, at right angles, alternately for inlet and outlet ports, the hand lever when standing vertical shutting both ports.

Placed on both sides of the casing D, are

cast iron heads N, N′, secured to the casing in the usual manner, the said heads are provided below the center line, with stuffing boxes fitted with glands O, O′, the said glands forming bearings for the main shaft P, on the said shaft is fitted and secured a head Q, made of cast metal, having slots formed in it on two sides, for the pistons R, R′ to work in; the said pistons are made of wrought metal, and have pivots S, S′ formed on their ends; the said pivots fit into shoes T, T′, to slide in the annular grooves U, U′ formed in the casing heads N, N′; the shoes giving a large wearing surface prevent wear and give a steadier motion to the pistons, the said pistons have recesses formed in them, in which metallic packing strips V, V′ are inserted, and kept set out by X shaped springs inserted in a recess below the packing strips, one of which is shown in dotted lines at W.

To operate the engine the hand lever J standing vertical, which shuts steam from both ports, is moved in one direction one fourth of a turn, which admits steam to one of the inlet ports F, the steam passing down through the port formed in the casing, enters the steam chamber H, and acting on one of the pistons R, forces the head to rotate; the piston so acted upon, when it passes the offset on the opposite side, allows the exhaust steam to enter the chamber H′, and from the chamber through the exhaust port G′ to the exhaust pipe M; as each piston passes the offset in the casing, the steam acting against them alternately, during the upper half of their revolution, will continue to rotate the head; to reverse the engine, or rotate it in the opposite direction, the hand lever is moved in the opposite direction, which opens the opposite ports, and rotates the head in the opposite direction, the operation being the same with the ports reversed, as above described.

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

In a rotary engine as shown and described, having a cylinder casing with heads on both sides, an annular valve chamber in the casing, having inlet and exhaust ports from the valve chamber in both sides of the casing, said ports terminating in steam chambers formed on the inside of both sides of the cylinder below the center of the head, the said steam chambers having walls formed on the sides inside the casing heads, a partition, or steam wall separating the steam chambers at the bottom of the cylinder, a main shaft having bearings in the casing heads, a piston head secured on the main shaft inside the casing, the said head having two slots provided with pistons, recesses formed in the pistons provided with metallic strips and springs, the said pistons having pivots formed on their ends, the pivots on the ends of the pistons inserted in shoes, placed to slide in annular grooves formed in the casing heads, all combined as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JONATHAN MATTHEWS.

Witnesses:
B. E. GRACE, Jr.,
J. W. TAYLOR.