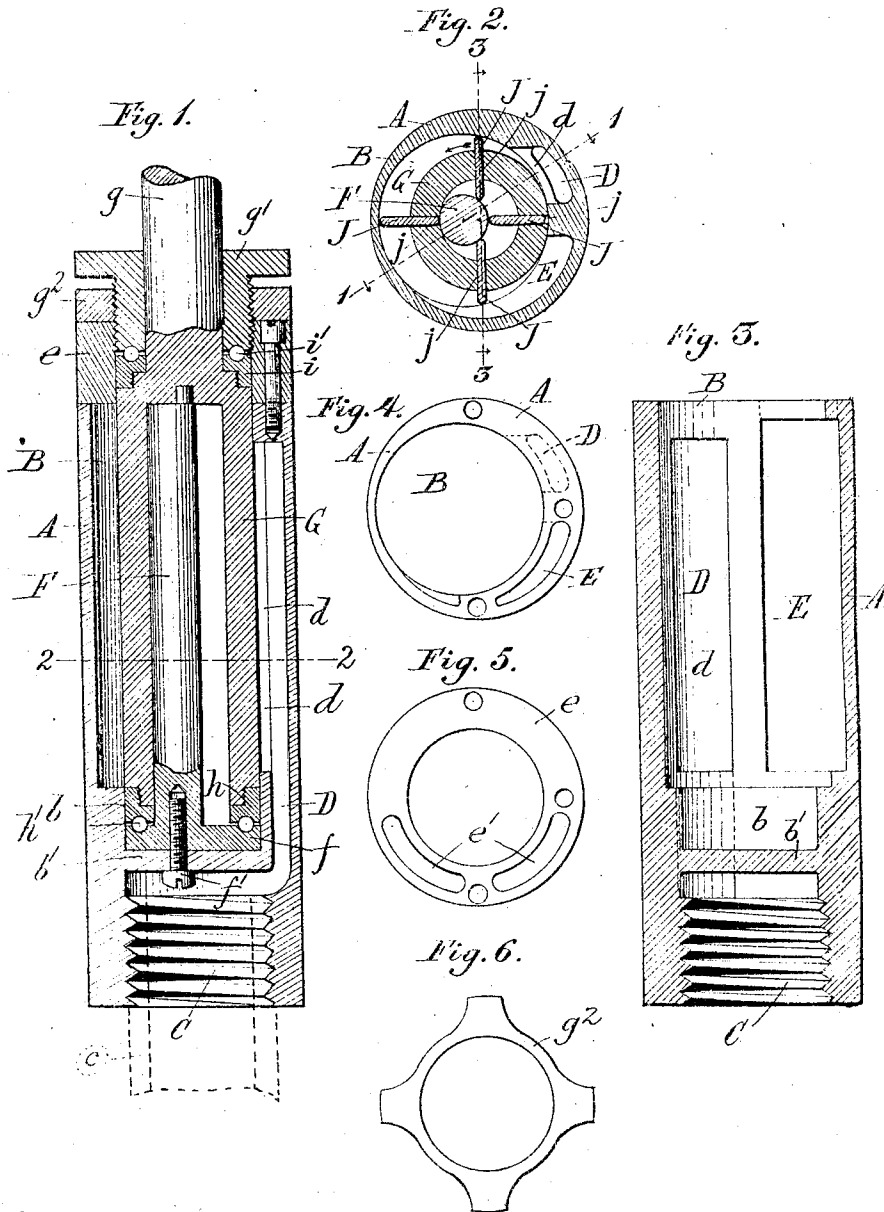


No. 813,815.

PATENTED FEB. 27, 1906.

R. S. McINTOSH.
ROTARY ENGINE.
APPLICATION FILED NOV. 5, 1902.



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UNITED STATES PATENT OFFICE.

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ROTARY ENGINE.

No. 813,815.

Specification of Letters Patent.

Patented Feb. 27, 1906.

Application filed November 5, 1902. Serial No. 130,143.

To all whom it may concern:

Be it known that I, ROSS S. McINTOSH, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Rotary Engines, of which the following is a specification.

This invention relates to a rotary steam, water, or other fluid operated engine or motor of that type in which a piston is journaled to rotate in a piston-chamber eccentric thereto and is provided with movable blades or wings upon which the fluid acts to rotate the piston and which rotate with the piston and are held in contact with the interior wall of said eccentric piston-chamber in the rotation of the piston.

The object of the invention is to provide an efficient, desirable, and economical rotary engine which is of simple and compact construction and of small diameter, whereby it is especially adapted for use in steam-boiler tubes or flues for driving a flue cleaner or scraper.

In the accompanying drawings, Figure 1 is a longitudinal section in line 1 1, Fig. 2, through a rotary engine or motor embodying the invention. Fig. 2 is a transverse section thereof in line 2 2, Fig. 1. Fig. 3 is a longitudinal section of the casing in line 3 3, Fig. 2. Fig. 4 is an end view of the casing. Fig. 5 is a plan view of the end cap for the casing. Fig. 6 is a plan view of the lock-nut for the end bushing.

Like letters of reference refer to like parts in the several figures.

A represents a cylinder or casing which is provided with a longitudinal eccentric piston chamber or bore B, which extends part way of the casing from one end thereof. The casing is provided at one end of the piston-chamber with a cylindrical bore or bearing socket b, which is concentric with the exterior of the cylinder, the lower end of the concentric bore or socket being closed by a transverse partition b'. The end of the casing adjacent to said concentric bore or socket b is provided with a screw-threaded opening C, adapted to receive the end of a supply-pipe c for steam, water, or other motive fluid. The wall of the casing is provided with a longitudinal inlet-passage D for the motive fluid, which communicates at one end with the opening C and also communicates by a port

or ports d with the piston-chamber and also with an exhaust-passage E, which is formed longitudinally in the wall of the casing adjacent to the inlet-passage. The exhaust-passage extends to the end of the casing opposite to which the inlet-port leads and communicates with the piston-chamber by one or more ports or openings.

e represents a cap-ring which is secured to the open end of the casing by bolts or otherwise. The cap-ring is provided with one or more openings e', which connect with the exhaust-passage to permit the escape of the exhausting fluid.

F represents a stationary cylindrical part or abutment which is provided at one end with a circular enlargement f, which rests on the transverse partition b' of the casing, to which it is secured by a screw f' or in any other preferred manner. This stationary abutment is arranged concentrically within the piston-chamber and extends substantially from end to end thereof.

G represents a hollow or tubular rotary piston which is arranged eccentrically in the piston-chamber surrounding the stationary abutment F, with one side of the piston in contact with or in close proximity to the interior surface of the wall of the casing.

g represents the engine-shaft, which is secured to, or formed with one end of the piston. The shaft extends out of the casing or cylinder through the cap-ring e.

g' represents a hollow bushing or sleeve which surrounds the shaft and is screwed into the threaded opening of the cap-ring.

g² represents a lock-nut for the bushing. The nut is provided with external depressions or notches to prevent it from obstructing the exhaust-openings in the cap-ring.

The piston is preferably journaled in the following manner: The piston is provided at one end with a ball-bearing ring or collar h, which is screwed on the reduced end portion of the piston and is provided with a circular ball-groove. The face of the enlargement f of the stationary abutment is provided with a complementary ball-groove, and a circular series of bearing-balls h' is confined between said grooves. The opposite end of the piston is provided with a corresponding bearing ring or collar i, which is screwed on a reduced threaded portion of the piston and is provided with a ball-groove in its outer face.

The bushing *g'* is provided in its inner face with a ball-groove between which and the groove in the bearing-collar *i* is arranged a circular series of bearing-balls *i'*. The bearings can be readily adjusted by tightening or loosening the bushing *g'*. The hollow piston is provided with a series of longitudinal slots *j*, in which are loosely arranged longitudinal blades or wings *J*, which bear at their inner edges against the stationary cylindrical abutment *F* and at their outer edges against the interior surface of the wall of the casing or cylinder.

The supply-pipe *c* is connected to any suitable source of supply of steam, water under pressure, or other motive fluid which is delivered by the supply-pipe to the inlet-passage *D*, from which it passes through the inlet ports or openings into the piston-chamber behind the blades *J*. The motive fluid acts on said blades in a well-known manner to cause the rotation of the piston in the direction indicated by the arrow in Fig. 2. As the blades are carried around with the piston they are held out in contact with the interior surface of the wall of the piston-chamber by reason of their inner edges bearing against the cylindrical face of the stationary abutment *F*, which is concentric with the interior surface of the wall of the piston-chamber. As each blade reaches the exhaust-ports the motive fluid in front of the same finds its way to the exhaust-passage, from which it escapes through the openings in the cap of the casing or cylinder.

I claim as my invention—

1. The combination of a casing provided with a longitudinal concentric piston chamber or bore, an inlet-passage for said chamber extending longitudinally thereof and communicating therewith by ports, an exhaust-passage also extending longitudinally of said chamber and communicating therewith, a cylindrical part fixed concentrically in said piston-chamber, and journaled at its ends, and a series of blades loosely arranged in longitudinal radial slots of said piston, said blades bearing at one edge against the

fixed cylindrical part, and at the opposite edge against the wall of said chamber; substantially as described.

2. In a rotary engine, a cylinder or casing having therein a longitudinal, eccentric piston-chamber, longitudinally-extending inlet and exhaust passages in the wall of said chamber, and communicating therewith, one end of said chamber being closed by a transverse partition-wall around which the inlet-port extends, and which forms a seat for a piston-bearing, and a piston in said chamber; substantially as described.

3. In a rotary engine, a casing having a longitudinal piston-chamber therein open at one end and closed at the other by a partition-wall, a cap-ring closing the other end of the chamber around the piston, said ring having an exhaust-port therein communicating with longitudinal exhaust-passages in the wall of said chamber, and a piston in said chamber; substantially as described.

4. The combination of a casing provided with a piston-chamber, an inlet-passage communicating with said chamber and extending to one end of said casing, and an exhaust-passage communicating with said chamber and extending to the other end of said casing, a cylindrical part arranged concentrically in said piston-chamber and fixed at one end to one end of said casing, a tubular piston surrounding said fixed part, arranged eccentrically in said piston-chamber, and journaled at one end on said fixed part and at its other end on said casing, a shaft secured to one end of said piston, and blades loosely arranged in longitudinal slots in said tubular piston and bearing at their outer edges against the wall of said piston-chamber, and at their inner edges against said fixed cylindrical part, substantially as set forth.

Witness my hand this 7th day of October, 1902.

ROSS S. McINTOSH

Witnesses:

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