

No. 686,363.

Patented Nov. 12, 1901.

F. R. STRUNK.
ROTARY ENGINE.

(Application filed June 22, 1901.)

(No Model.)

2 Sheets—Sheet 1.

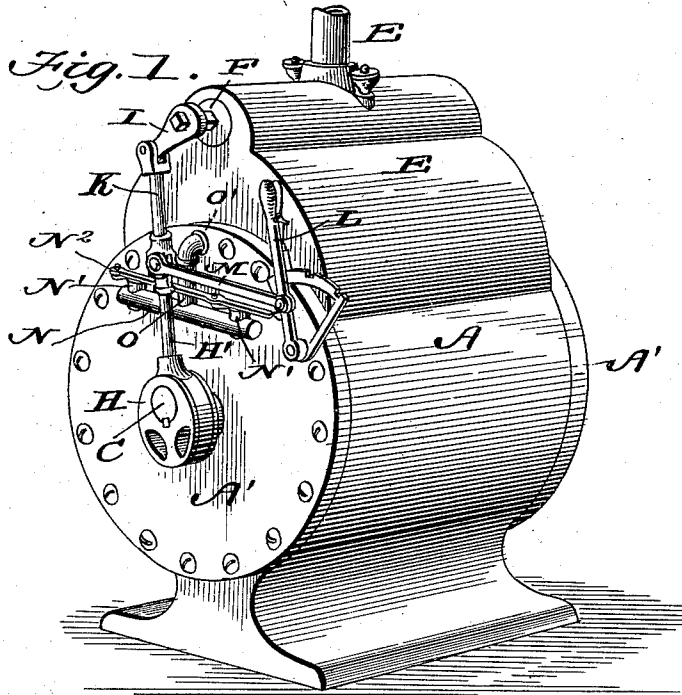
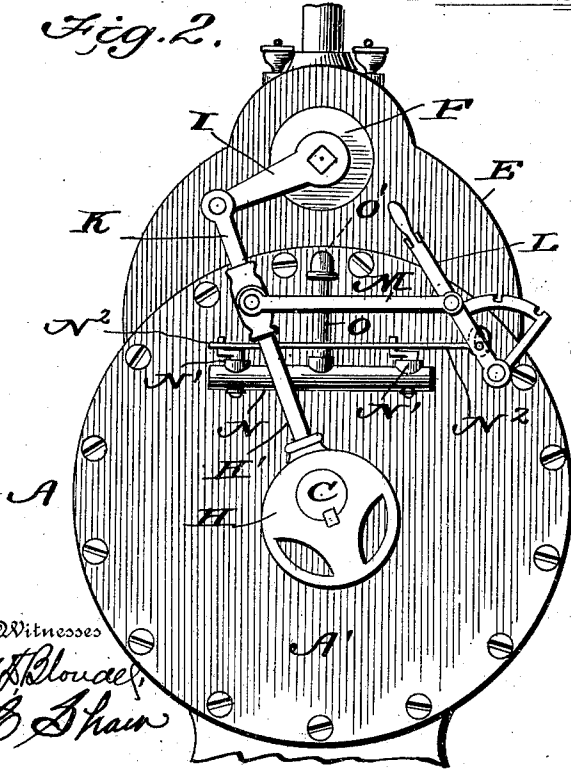


Fig. 2.



Witnesses
M. H. Blouet,
C. Shaw

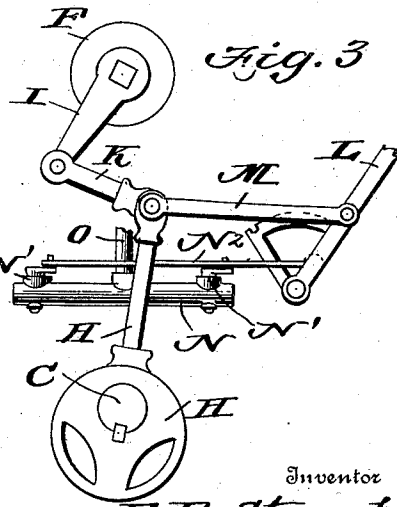


Fig. 3

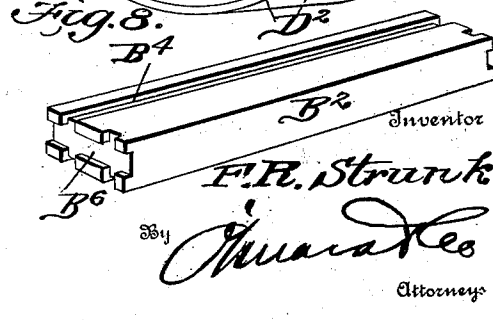
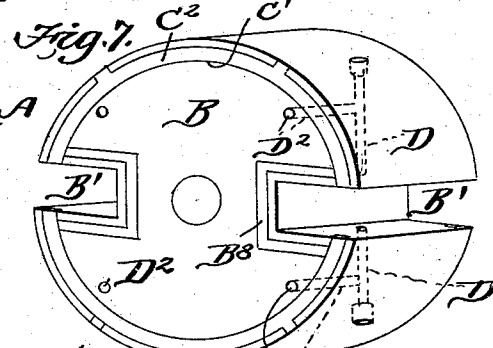
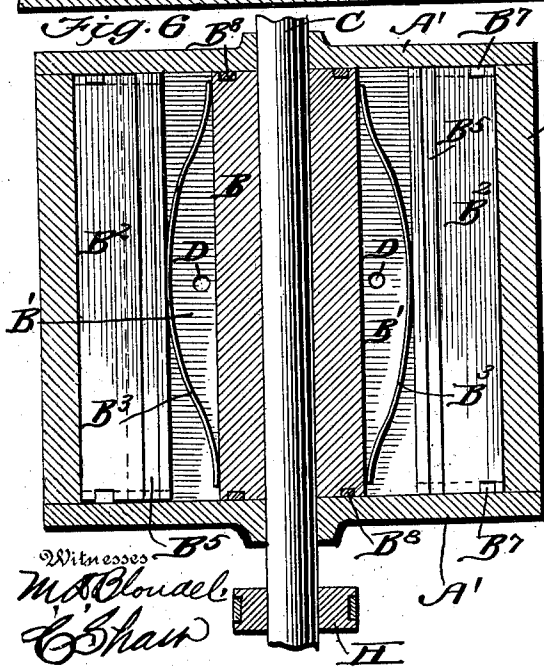
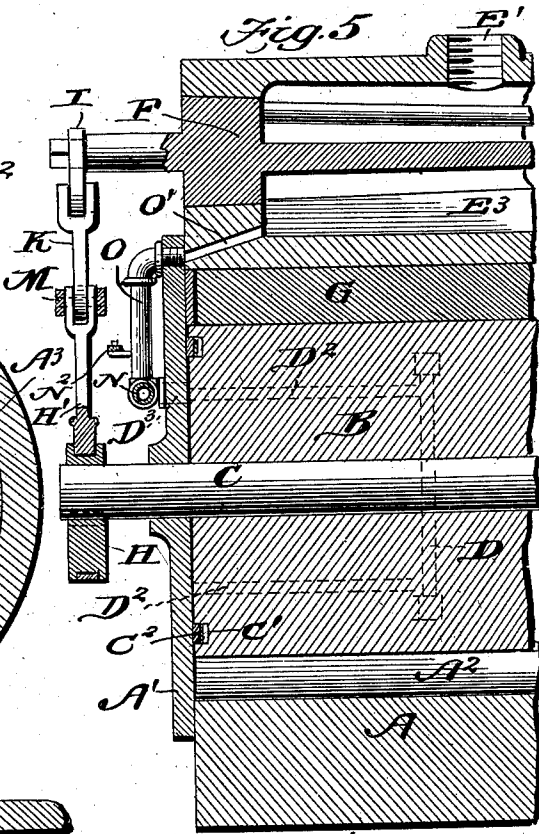
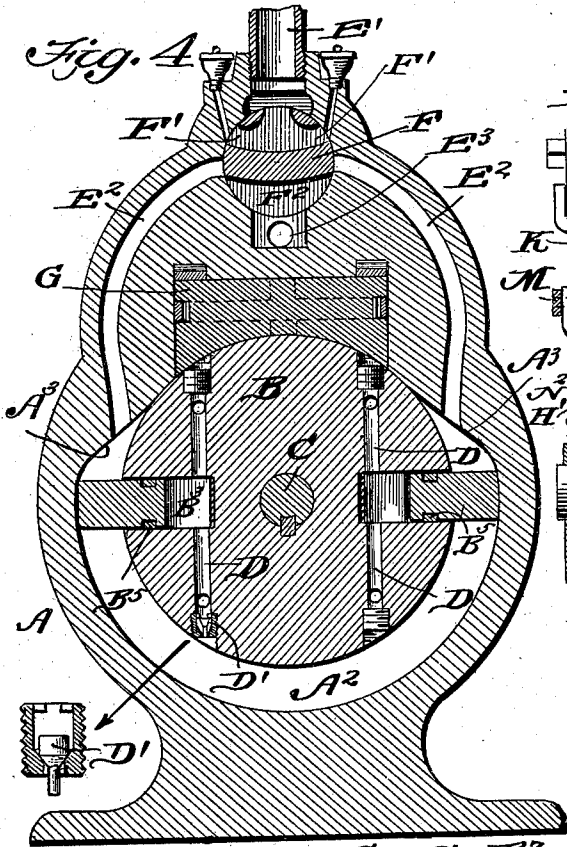
Inventor
F. R. Strunk.
Munroe & Co.
Attorneys

F. R. STRUNK.
ROTARY ENGINE.

(Application filed June 22, 1901.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses
M. A. Clouet
E. Shaw

Inventor
F. R. Strunk.
 384
M. A. Clouet
 Attorneys

UNITED STATES PATENT OFFICE.

FRANK R. STRUNK, OF ELWOOD, MISSOURI.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 686,363, dated November 12, 1901.

Application filed June 22, 1901. Serial No. 65,709. (No model.)

To all whom it may concern:

Be it known that I, FRANK R. STRUNK, a citizen of the United States, residing at Elwood, in the county of Greene and State of Missouri, have invented a new and useful Rotary Engine, of which the following is a specification.

This invention relates generally to rotary engines, and more particularly to a reversible rotary engine.

The object of the invention is to provide an engine of this kind which shall be exceedingly simple in construction and efficient in operation and one in which the expansive force of steam can be utilized for the purpose of rotating the piston.

Another object of the invention is to provide for a complete exhaustion of the steam; and a still further object is to provide a rotary engine in which the action of the piston-blades shall be accomplished by steam-pressure.

With these objects in view the invention consists in the peculiar construction of the various parts and in their novel combination or arrangement, all of which will be fully described hereinafter and pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a perspective view of an engine constructed in accordance with my invention. Fig. 2 is an end view. Fig. 3 is a detail elevation showing the position of the valve-reversing mechanism in a position the reverse of that shown in Figs. 1 and 2. Fig. 4 is a vertical longitudinal sectional view. Fig. 5 is a transverse sectional view on the line 5 5 of Fig. 4. Fig. 6 is a horizontal section on the line 6 6 of Fig. 4. Fig. 7 is a detail perspective view of the rotary piston, the blades being removed. Fig. 8 is a detail perspective view of one of the piston blades or wings.

In carrying out my invention I employ a cylinder A, having gears A' bolted thereon, and this cylinder has a chamber A² produced therein, said chamber being of peculiar formation, the lower portion being semicircular in shape, while the upper portion is of peculiar formation, the walls A³ being drawn in somewhat less than a semicircle, and thereby rendering the entire shape of the chamber A²

essentially cam or eccentric. A rotary piston B is mounted within the chamber A² of the cylinder, said piston being mounted upon the shaft C, which turns freely within the cylinder-heads A'. This piston B is of a width to fit snugly within the cylinder between the heads, and in order to provide a steam-tight joint between the piston and cylinder heads I provide grooves C', in which are located the packing-strips C². The piston-head B is formed with pockets or openings B' at diametrically opposite points, and working in the said pockets are the piston blades or wings B², a leaf-spring B³ being arranged at the rear of each blade or wing, the tendency of said spring being to normally throw the blade or wing outwardly. The blade or wing B² is formed with grooves B⁴ upon the upper and lower faces, in which the packing-strip B⁵ is located, and the ends are grooved or recessed, as shown at B⁶, to receive packing-blocks B⁷, thereby insuring steam-tight joints between the various portions of the blade and piston. The ends of the piston are also provided with packing-strips B⁸ at the ends of the opening or pocket B', thereby completing the steam-joint between the cylinder and piston heads. As before stated, there are two pockets or openings B', and leading into the said pockets from opposite directions are the passages D, having check-valves D' arranged at their outer ends, the inner ends of said passages communicating with the inner portions of the openings B', each passage D having a lateral branch D², the end of which is adapted to be brought into register with an opening D³, produced in the cylinder-head and in which is secured a pipe leading to the exhaust-chamber.

A valve chamber and casing E are arranged above the cylinder A, said casing having a rotary valve F journaled therein, said valve having the steam-ports F' and the exhaust-port F². E' indicates the inlet-pipe and E² the steam-ports discharging into the chamber A² of the cylinder A. E³ indicates the exhaust-chamber located directly below the rotary valve and with which the exhaust-port F² is in constant communication.

A packing-block G is arranged within the casing and is provided with suitable packing-strips, said block resting directly upon the

upper surface of the piston, as most clearly shown in Figs. 4 and 5. An eccentric H is mounted upon the shaft C and has a rod H' connected thereto in the usual manner, said rod H' being pivotally connected to the arm I, arranged upon the end of the valve-stem, said connection being effected by means of the link K. An operating-lever L is also pivotally connected to the rod H' by means of a link-rod M, and by shifting the lever back and forth the position of the eccentric-rod is shifted, and consequently the position of the valve is reversed, thereby reversing the motion of the engine. In Fig. 2 I have shown the valve and operating parts in one position, while in Fig. 3 the various parts are indicated in the reverse position.

N indicates a pipe which connects with the openings D³ to receive the steam exhausting from the passages D and D², said pipe N having turn-plugs N' arranged therein, said plugs being connected to an operating-link N², the end of which is attached to the operating-lever L, so that when one of the turn-plugs N' is open the other is closed. The pipe O leads from the pipe N and communicates with a passage O', which leads into the exhaust-chamber E³.

In operation the steam enters through the supply-pipe and passes through the valve to the steam-ports and will enter at one side or the other, according to the position of the valve. The steam acting upon the blade, which is projected outwardly, will cause the piston-head to rotate within the chamber, and the valve is so constructed that it will operate to let the steam in and cut the same off twice during each revolution of the piston, this being necessary inasmuch as two blades are employed. As the piston rotates the passages D² will be brought into register with the openings D³, and the steam contained within the passage and within the pocket to the rear of the blade or wing will exhaust through the pipes N and O and passage O' into the exhaust-chamber. Whenever it is desired to reverse the motion of the engine, the hand-lever is shifted.

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

1. A rotary engine comprising a cylinder and valve-casing, a rotary piston arranged within the cylinder and a rotary valve arranged within the valve-casing, the rotary piston having oppositely-arranged pockets or openings, the piston blades or wings arranged

in said openings, the passages arranged within the piston and communicating with the said openings at the rear of the blades or wings, and the exhaust-pipes adapted to communicate with the said passages, substantially as described.

2. In a rotary engine, the combination with the cylinder and valve-casing, said valve-casing having steam-ports and an exhaust-chamber arranged therein, of a rotary valve arranged in the valve-casing and having inlet and exhaust ports, a rotary piston arranged within the cylinder, said piston having oppositely-disposed pockets or openings, a piston blade or wing arranged in each opening, passages arranged in the piston and communicating with the said pockets or openings, each passage having a lateral branch communicating with openings produced in the head of the cylinder, together with the valve operating and reversing mechanism, substantially as described.

3. In a rotary engine, a rotary piston having oppositely-disposed pockets or openings, the blades or wings arranged therein, passages produced in the piston and communicating with the pockets or openings, each passage having a check-valve at its outer end and also having a lateral branch adapted to register with an opening in the cylinder-head, substantially as described.

4. In a rotary engine, the combination with the cylinder and valve-casing, of the rotary piston arranged within the cylinder, the rotary valve arranged within the casing, the eccentric arranged upon the piston-shaft, the strap arranged upon the eccentric, the rod connected to the strap, the link connecting the said rod and rotary valve, the operating-lever and the link connecting said operating-lever and the eccentric-rod, substantially as shown and described.

5. In a rotary engine, the combination with the cylinder and casing, of the piston and valve, the eccentric and rod, the operating-lever and link connections between the operating-lever and eccentric-rod and also between the eccentric-rod and rotary valve, the exhaust-pipe arranged upon the side of the cylinder and establishing a communication between the cylinder and exhaust-chamber, substantially as shown and described.

FRANK R. STRUNK.

Witnesses:

J. D. L. WADDLE,
J. J. RICHESIN.