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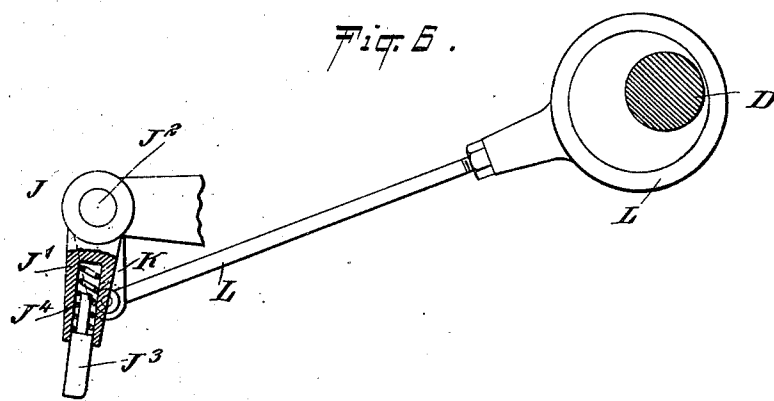
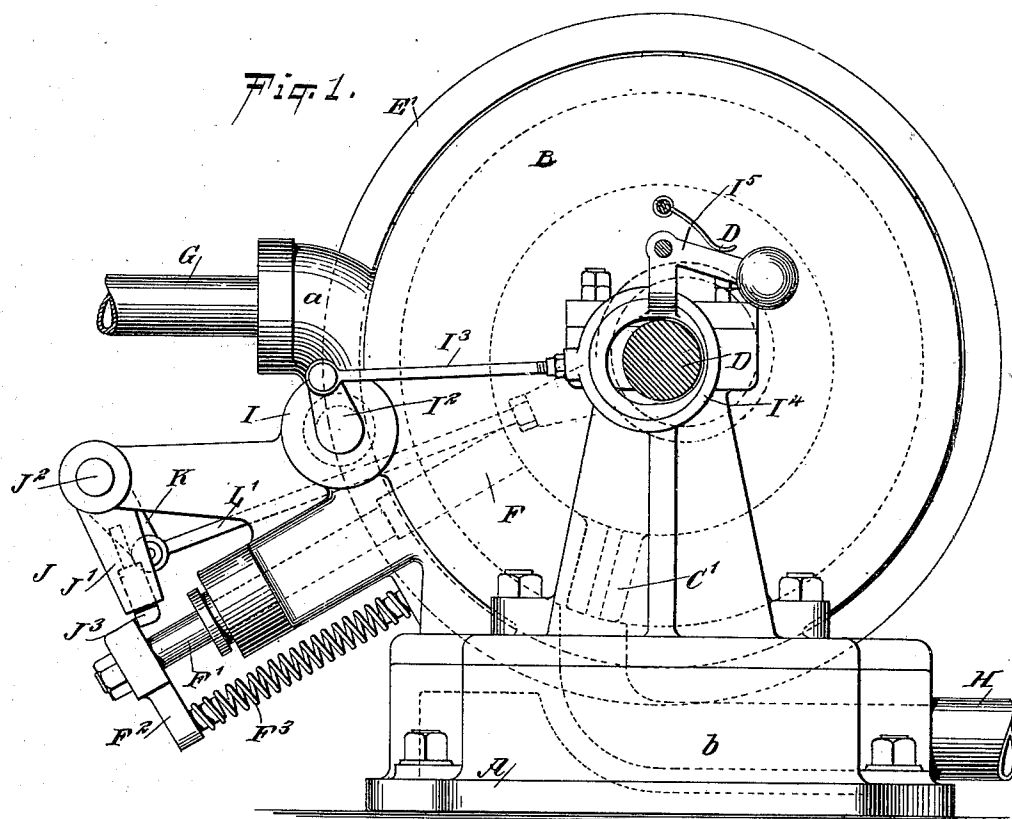
Patented Apr. 23, 1901.

W. H. CROWE.
ROTARY ENGINE.

(Application filed June 27, 1900.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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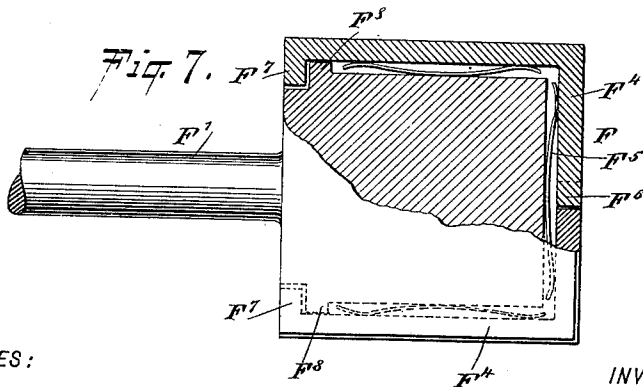
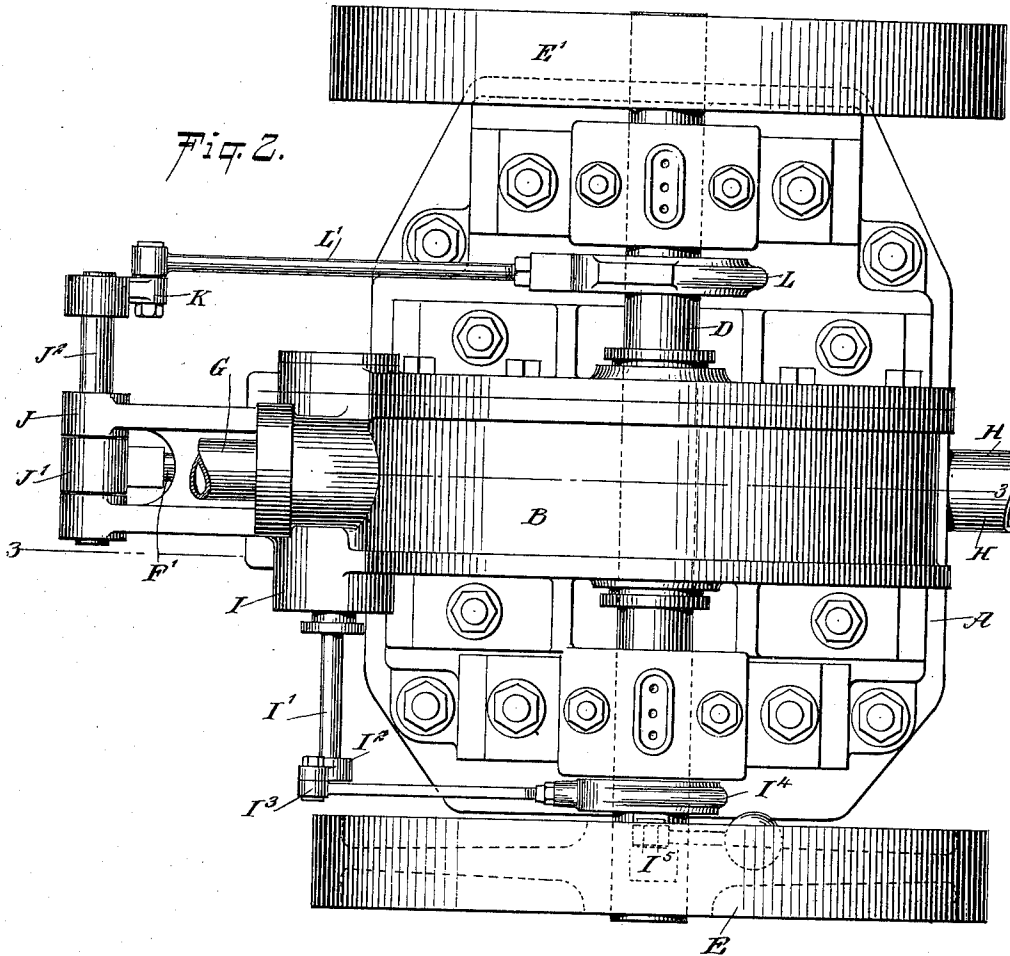
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3 Sheets—Sheet 2.



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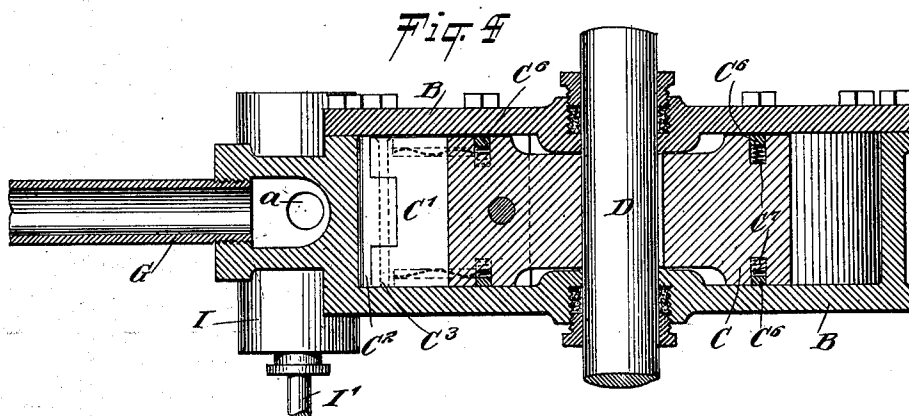
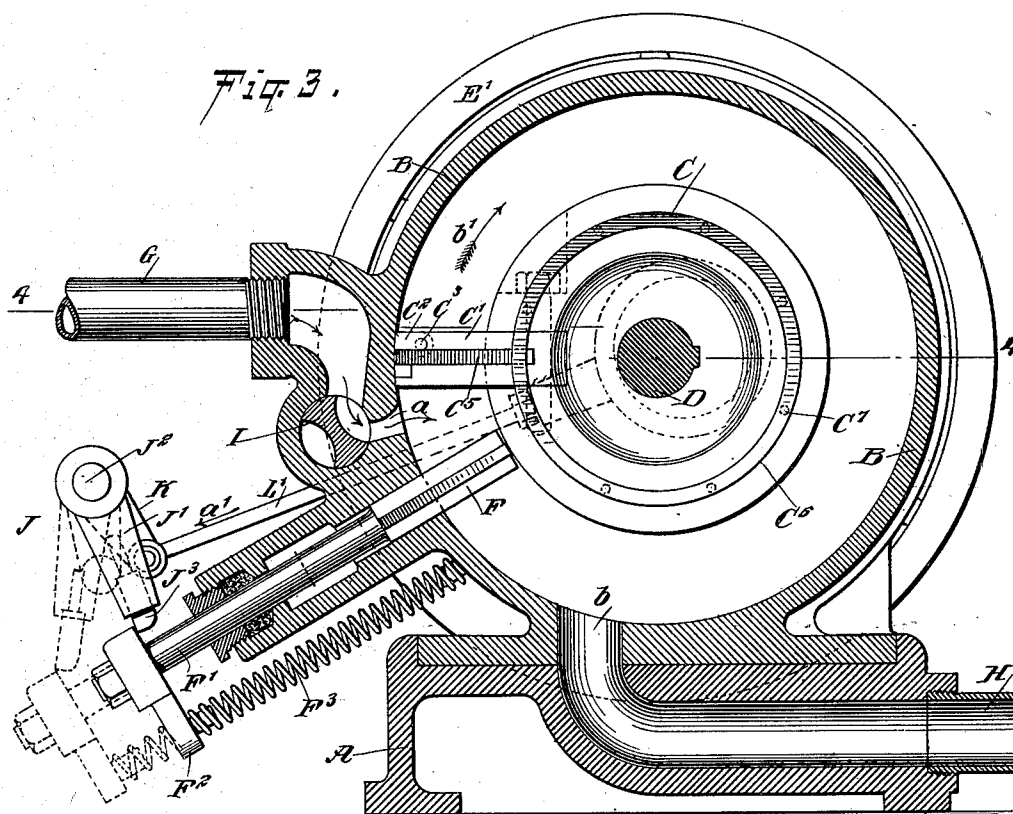
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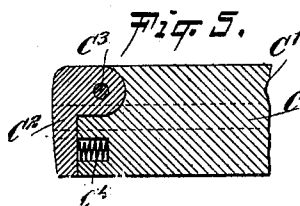
(No Model.)

3 Sheets—Sheet 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM HENDRY CROWE, OF YOUNGSTOWN, OHIO.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 672,700, dated April 23, 1901.

Application filed June 27, 1900. Serial No. 21,779. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENDRY CROWE, a citizen of the United States, and a resident of Youngstown, in the county of Mahoning 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 sectional side elevation of the improvement with the fly-wheel removed and with parts in position at the beginning of the exhaust. Fig. 2 is a plan view of the same. Fig. 3 is a sectional side elevation of the same on the line 3 3 in Fig. 2. Fig. 4 is a sectional plan view of the same on the line 4 4 in Fig. 3. Fig. 5 is an enlarged sectional side elevation of the packing for the piston-head. Fig. 6 is a side elevation of the tripping device for the abutment, with parts shown in section; and Fig. 7 is an enlarged plan view of the abutment, with parts in section.

The rotary engine shown in the accompanying drawings is of the single type, but may be combined by the addition of a low-pressure cylinder and the necessary connections, and hence I do not limit myself to the particular single-type engine shown and presently more fully described in detail.

On a suitably-constructed base A is held a cylinder B, in which rotates a piston C, secured on a shaft D, extending through stuffing-boxes in the cylinder-heads and journaled in suitable bearings carried by the base A, as is plainly shown in the drawings. On the ends of the shaft D are secured fly-wheels or pulleys E E' for transmitting the rotary motion of the engine to other machinery.

On the piston C is secured a radially-ex-

tending piston-head C', extending with its outer end in contact with the inner surface of the cylinder, and said piston-head C' operates in conjunction with the abutment F, mounted to slide radially in the cylinder B between the inlet-port *a* and the exhaust-port *b*, said inlet-port being connected by a pipe G with a suitable source of motive-agent supply and said exhaust-port being connected with an exhaust-pipe H for carrying the exhaust motive agent to the outside.

In the inlet-port *a* is arranged an admission or cut-off valve I, mounted to rock and having its valve-stem I' provided with an arm I², pivotally connected with the eccentric-rod I³ of an eccentric I⁴, controlled by a centrifugal governor I⁵, of any approved construction, held on the fly-wheel E, so that the valve I is rocked in its valve-seat to admit the motive agent to the cylinder at the proper time and to cut off the steam according to the speed of the engine.

The stem F' of the abutment F extends through a suitable stuffing-box to the outside of the cylinder B, and on the outer end of this stem F' is secured an arm F², drawn on by a spring F³, attached to the cylinder, so as to hold the abutment F normally in an innermost position.

In order to move the abutment F outward at the proper time for the passage of the piston-head C', the following device J is provided: An arm J', secured on a rock-shaft J², contains a slidable pin J³, pressed on by a spring J⁴ and rounded off at one side, so that when the arm J' rocks in the direction of the arrow *a'* then the pin J³ engages the arm F² and pushes the stem F' and abutment F outward against the tension of the spring F³, and when the pin J³ finally passes off the said arm F² at the time the abutment F is in an outermost position and the piston-head C' has just passed the abutment then the spring F³ quickly returns the abutment F to an innermost position. When this takes place, the valve I moves into an open position to allow the motive agent to pass into the cylinder between the abutment F and the piston-head C' to turn the latter and the piston C in the direction of the arrow *b'*. (See Fig. 3.) When the arm J' swings backward, then the pin J³, owing to the rounded-off portion

thereof, readily glides over the arm F^2 and the front face of the pin again engages the inner face of the arm, so as to be ready to move the abutment outward again on the next forward rocking of the arm J' in the direction of the arrow a' .

In order to impart the desired rocking motion to the shaft J^2 , the latter is provided with an arm K , pivotally connected with the eccentric-rod L' of an eccentric L , held on the piston-shaft D , so that the desired rocking motion is given to the said shaft in unison with the movement of the piston C in the cylinder B .

In order to prevent leakage of steam past the abutment F , I provide the abutment at the sides and inner end with packing-bars F^4 , made L -shaped and pressed outward by springs F^5 , the ends of the bars overlapping, as at F^6 , at the rear of the abutment, the forward ends of the bars being formed with lugs F^7 , abutting against shoulders F^8 on the abutment.

In order to prevent leakage past the piston-head C' , I provide the same at its outer end with a packing-bar C^2 , hinged at C^3 to the head C' and pressed outwardly by a spring C^4 , set in a recess in said head, as is plainly shown in Figs. 3 and 5. Packing-bars C^5 engage the sides of the head C' , and spring-pressed packing-rings C^6 are arranged in the base of the piston C and pressed outward by springs C^7 , so as to prevent leakage of steam past the base of the piston. (See Figs. 3 and 4.)

The operation is as follows: When the several parts are in the position shown in Fig. 3, then the motive agent passes through the port a into the cylinder between the abutment F and the piston-head C' , so as to turn the piston in the direction of the arrow b' , and when the piston has made approximately a half-revolution or so then the valve I is actuated to move into a closed position, so as to cut off the motive agent from the cylinder and allow that part of the motive agent in the cylinder to act on the piston-head C' by expansion until the piston-head passes the exhaust-port b , when the steam will exhaust from the cylinder through the port b . At this time the shaft J^2 is actuated, so that the arm J' , with its pin J^3 , imparts an outward-sliding movement to the abutment F to allow the piston-head C' to pass the abutment, and as soon as this is accomplished the abutment F is tripped by the tripping device and is immediately returned to its normal position

by the action of the spring F^8 . When the piston-head C' is passing the port a , the valve I again opens to admit steam to the cylinder between the abutment F and the piston-head and give another impulse to the piston-head C' to turn the piston C in the direction of the arrow b' , and the above-described operation is then repeated.

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

1. A rotary engine, comprising a cylinder having an inlet and an outlet for the motive agent, a piston mounted to turn in the cylinder and having a head, a spring-pressed abutment slidable in the cylinder and adapted to engage the piston, a rock-shaft actuated from the piston-shaft, an arm on said rock-shaft, and a spring-pressed catch slidable lengthwise of said arm to engage the abutment-stem and shift the same.

2. A rotary engine, comprising a cylinder having an inlet and an exhaust for the motive agent, a piston mounted to turn in said cylinder and having a piston-head, a spring-pressed abutment slidable in said cylinder between said inlet and said exhaust and moved into an innermost position by the tension of its spring, and means for moving said abutment outward against the tension of its spring for the passage of the piston-head and releasing said abutment after the piston-head has passed the abutment, the said means comprising a rock-shaft actuated from the piston-shaft, an arm on said rock-shaft, and a spring-pressed catch held to move lengthwise of said arm for engaging a projection on the abutment-stem and moving the abutment outward, and for finally releasing said projection for the spring of the abutment to return the latter into an innermost position, as set forth.

3. A rotary engine comprising a cylinder, a piston held to rotate therein and provided with a piston-head, and a spring-pressed packing-bar pivoted to the piston-head at one side thereof and extending transversely from one side of the piston-head to the other, said bar being adapted to engage the inner face of the cylinder.

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

WILLIAM HENDRY CROWE.

Witnesses:

ROBERT HOGG,

EDGAR J. REILLY.