No. 612,868. Patented Oct. 25, 1898.

W. F. PRICE & A. M. GRIFFIN.

ROTARY ENGINE.

(Application filed Dec. 17, 1897.)

(No Model.) 2 Sheets—Sheet 1.

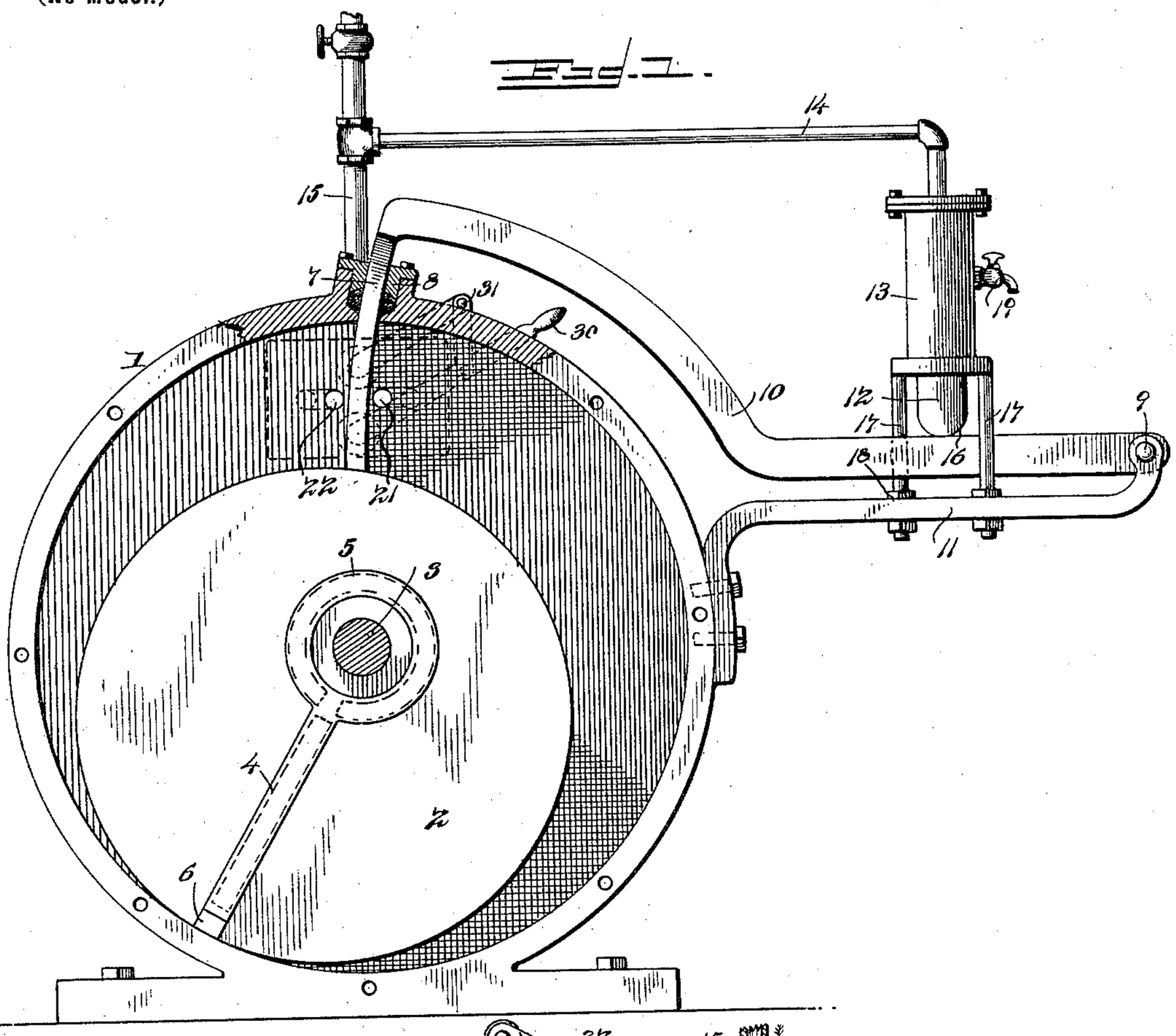

Fig. 1.

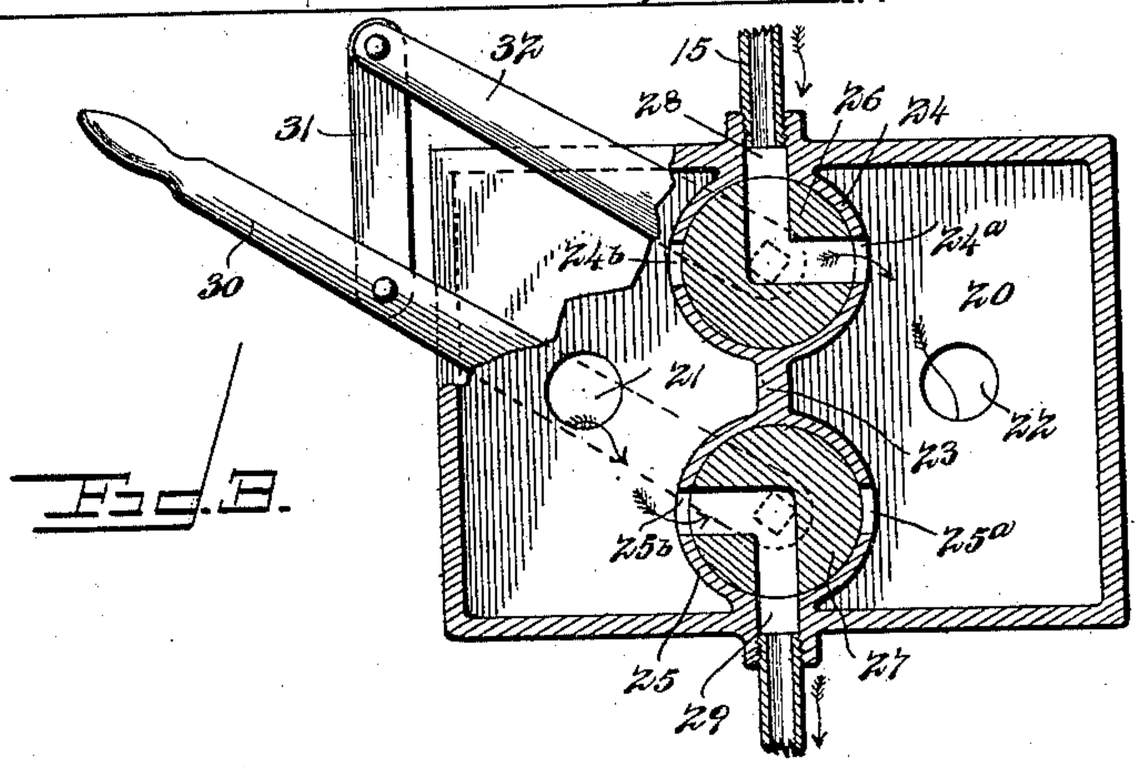

Fig. 2.

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Fig. 2.

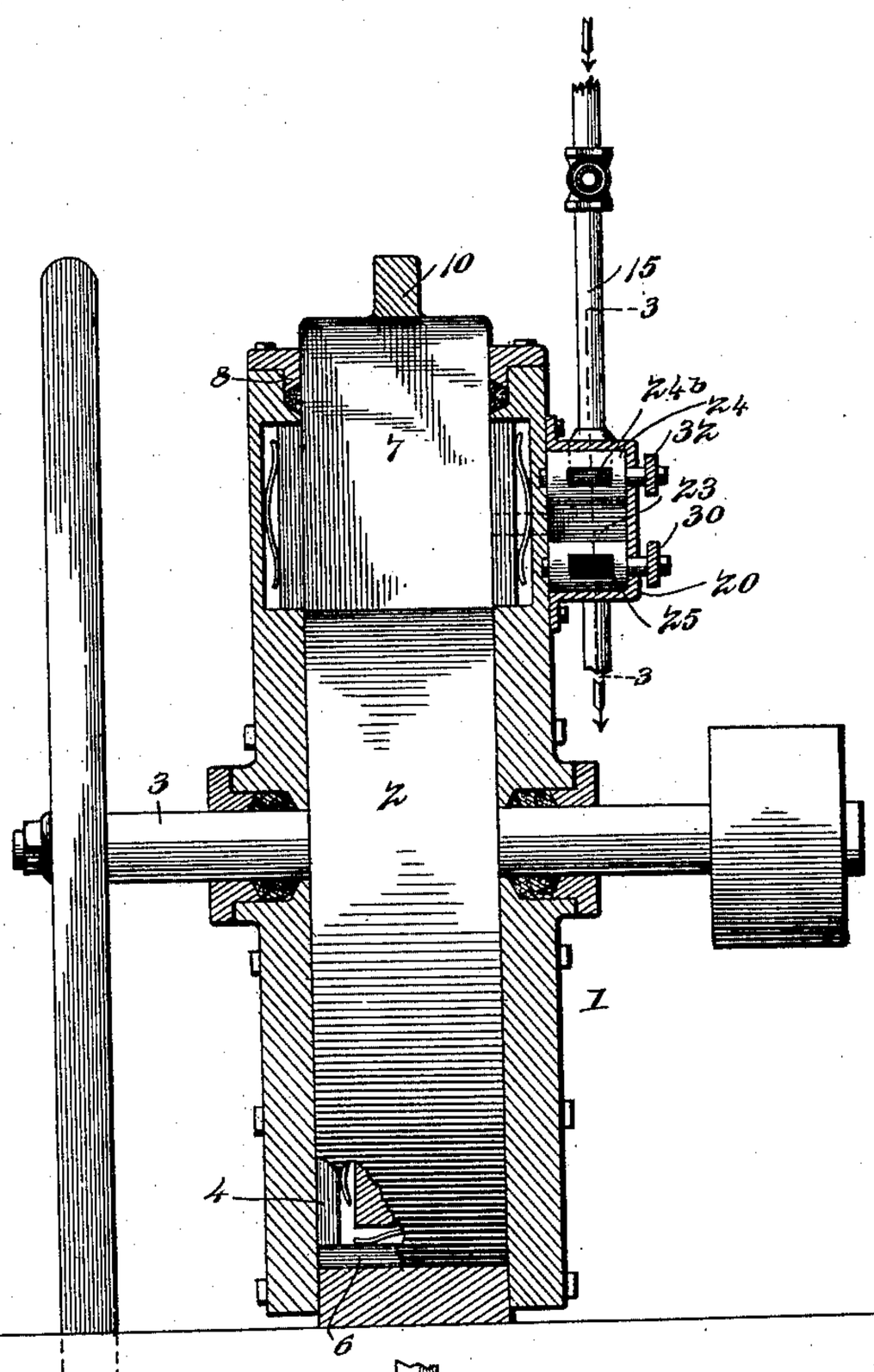
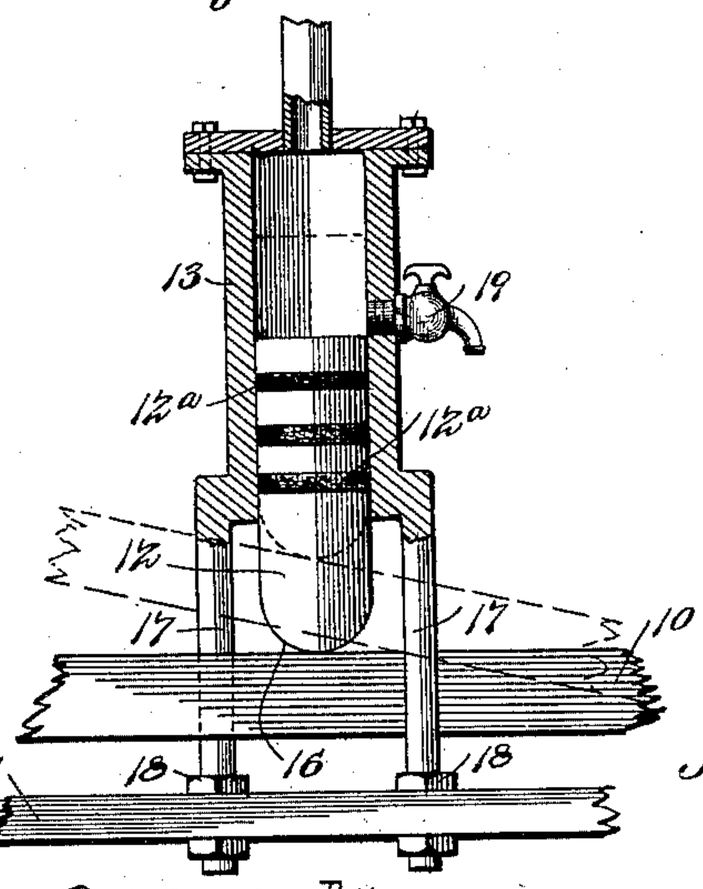


Fig. 3.



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UNITED STATES PATENT OFFICE.

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ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 612,868, dated October 25, 1898.

Application filed December 17, 1897. Serial No. 662,342. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM F. PRICE and ALVAH M. GRIFFIN, citizens of the United States, residing at Marysville, in the county of Marshall and State of Kansas, have invented a new and useful Rotary Engine, of which the following is a specification.

Our invention relates to rotary engines of the eccentric-piston type, and has for its object to provide a simple, compact, and efficient construction and arrangement of parts particularly relating to the cut-off or fixed abutment and the means for controlling the inlet and exhaust of motive agent and for reversing the direction of rotation of the piston or moving abutment.

Further objects of the invention are to provide improved means for yieldingly maintaining the cut-off or fixed abutment in operative position with relation to the piston, the pressure of the cut-off upon the surface of the piston being variable in intensity to correspond with the pressure of the fluid motive agent admitted to the cylinder, whereby said pressure of the cut-off is increased as the pressure of the motive agent is increased to prevent leakage of the motive agent between the cut-off and the piston.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side view, partly in section, of an engine constructed in accordance with our invention, the contiguous cylinder-head being omitted to show the interior thereof. Fig. 2 is a vertical sectional view of the cylinder in a plane parallel with the axis of the piston. Fig. 3 is a vertical sectional view of the valve mechanism on the line 3 3 of Fig. 2. Fig. 4 is a detail sectional view of the means for maintaining the cut-off in operative relation with the piston.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

The cylinder 1 of the engine embodying our invention incloses an eccentric piston 2, having a shaft 3, said piston being provided on its side surfaces with packing-strips 4, arranged coincidentally with the major axis of the piston, or radiating from its axis of rotation toward the most remote point of its periphery, a second packing-strip 5 of annular construction being arranged in each side surface at the inner end of the strip 4, said annular packing-strip encircling the shaft 3; also, a transverse peripheral packing-strip 6 is employed in the planes of said side packing-strips 4 for contact with the inner surface of the annular wall of the cylinder.

Coöperating with the piston is a reciprocable cut-off 7, constituting a fixed abutment and extending through a packing-box 8 in the wall of the cylinder with its inner extremity or edge in contact with the peripheral surface of the piston. Said cut-off is preferably of curved or segmental construction concentric with a fulcrum-point 9 and is carried by an arm 10, arranged exteriorly of the cylinder and mounted at said fulcrum-point 9, yielding means being employed for maintaining said supporting-arm 10 in position to hold the extremity of the cut-off in yielding contact with the periphery of the piston. The extremity of the cut-off rides on the surface of the piston, and hence the cut-off is moved outwardly by the eccentric or cam action of the piston at each stroke to allow the eccentric portion of the piston, which constitutes the moving abutment, to pass the cut-off.

The supporting-arm 10 is mounted upon a bracket 11, preferably projecting from the cylinder, and the means which we have shown in the drawings for yieldingly maintaining the cut-off in its operative position with relation to the piston consists of a fluid-pressure-actuated plunger 12, operating in a cylinder 13, which is in communication by means of a suitable conductor 14 with the supply-pipe 15 for the motive agent. Hence the plunger 12 is actuated by the fluid motive agent which is employed for driving the piston of the engine, and the tension of the pressure of the cut-off on the surface of the piston is proportionate to the pressure of motive agent within the cylinder, thereby insuring a correspondence between the fluid-pressure and the resistance offered by the cut-off to backward pressure of said motive agent. In the construction illustrated said

plunger 12, which is cross-sectionally cylindrical, is fitted with suitable packing-rings 12^a and is provided with a rounded extremity forming a bearing-surface 16, which projects through the open lower end of the cylinder 13 to bear upon the supporting-arm 10, thus forming a rocking connection whereby the friction due to the transmission of pressure to the supporting-arm is reduced to the minimum. The cylinder 13 is supported upon the bracket 11 by means of rods or legs 17 and engaging nuts 18. Furthermore, the cylinder 13 is preferably provided with a blow-off cock 19.

The supply-pipe 15 for fluid motive agent communicates with a valve-chest 20, which in turn communicates by means of cylinder-ports 21 and 22 with the interior of the piston-cylinder 1 upon opposite sides of the plane of the cut-off 7. The valve-chest is divided into compartments respectively communicating with said ports 21 and 22 by means of an interposed partition 23, and said partition is constructed at spaced points to form cylindrical valve-seats 24 and 25, having lateral feed-ports. The feed-ports 24^a and 24^b of the inlet-valve seat 24 are controlled by an inlet-valve 26, while the lateral ports 25^a and 25^b of the exhaust-valve seat 25 are controlled by an exhaust-valve 27, said valves being of the three-way type and having channels which are adapted to connect either of said lateral ports with the inlet-port 28 and exhaust-port 29, respectively, of the said valve-seats. These valves are connected for simultaneous reversal with a common reversing-lever 30, said lever being preferably secured to the stem of one of the valves and being connected by a link 31 with an auxiliary lever 32, which is attached to the stem of the other valve. Obviously the supply-pipe 15 communicates with the inlet-port 28 of the inlet-valve seat.

From the above description it will be seen that the steam-chest is carried by one head of the piston-cylinder and is of compartmental construction, with connected inlet and exhaust valves, respectively, controlling opposite valve-seat ports, which communicate, respectively, with the compartments of the steam-chest, thus insuring the reversal of the passage of motive agent with facility. Furthermore, it will be seen that the means employed for yieldingly maintaining the cut-off in operative position with relation to the piston provides for the variation of the pressure of the cut-off to correspond with the pressure of the motive agent employed for actuating the piston.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described our invention, what we claim is—

1. In a rotary engine, the combination with an eccentric piston and cylinder, and a reciprocatory cut-off coöperating with the piston, of an exterior supporting-arm carrying said cut-off, a reciprocatory plunger having a rolling connection with said supporting-arm and operating in a fixed guide, and means for yieldingly actuating the plunger, substantially as specified.

2. In a rotary engine, the combination with an eccentric piston and cylinder, and a reciprocatory cut-off coöperating with the piston, of an exterior supporting-arm for the cut-off, a reciprocatory plunger having a rolling bearing upon said supporting-arm, and a fixed open-ended plunger-cylinder in which said plunger operates, said plunger-cylinder being in communication with the supply-pipe of the piston-cylinder, substantially as specified.

3. In a rotary engine, the combination with an eccentric piston and cylinder, and a reciprocatory cut-off coöperating with the piston, of a pivotal supporting-arm for the cut-off, a bracket upon which said supporting-arm is fulcrumed, a reciprocatory plunger provided with a rounded extremity having a rolling bearing upon the supporting-arm at an intermediate point, and a plunger-cylinder supported by said bracket and having the plunger mounted therein, said plunger-cylinder being in communication with the fluid motive agent supply pipe, and being attached to the bracket by supporting-rods 17, which straddle and guide the cut-off-supporting arm, substantially as specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

WILLIAM F. PRICE.
ALVAH M. GRIFFIN.

Witnesses:
S. B. TIBBETT,
CARL H. BRICE.