(No Model.)

2 Sheets—Sheet 1.

S. E. FERGUSON.

ROTARY ENGINE.

No. 592,284. Patented Oct. 26, 1897.

Fig. 1.

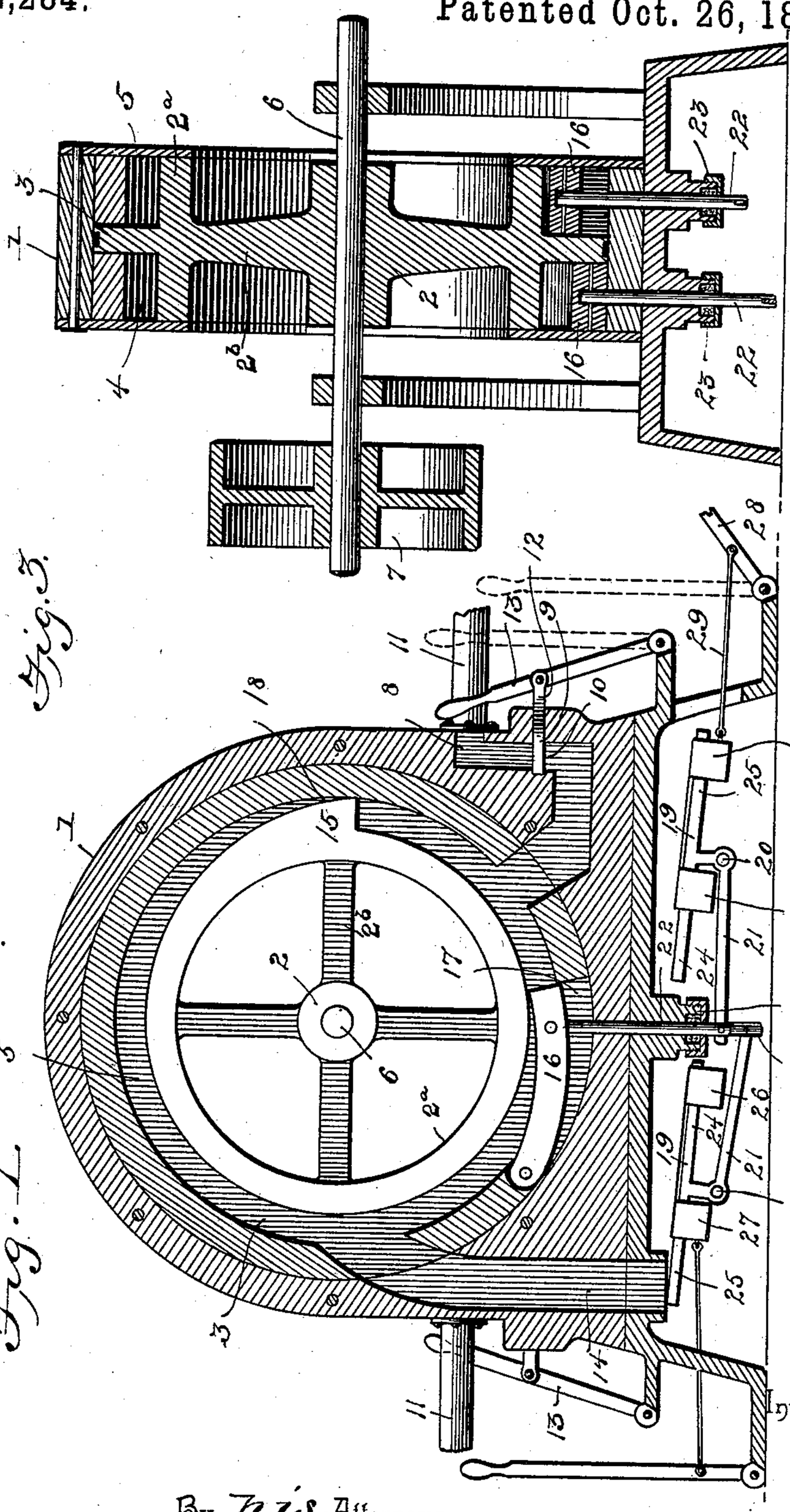
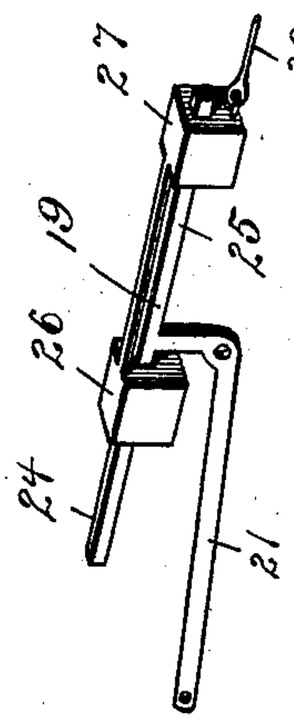


Fig. 3.



Witnesses

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By his Attorneys,

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(No Model.)

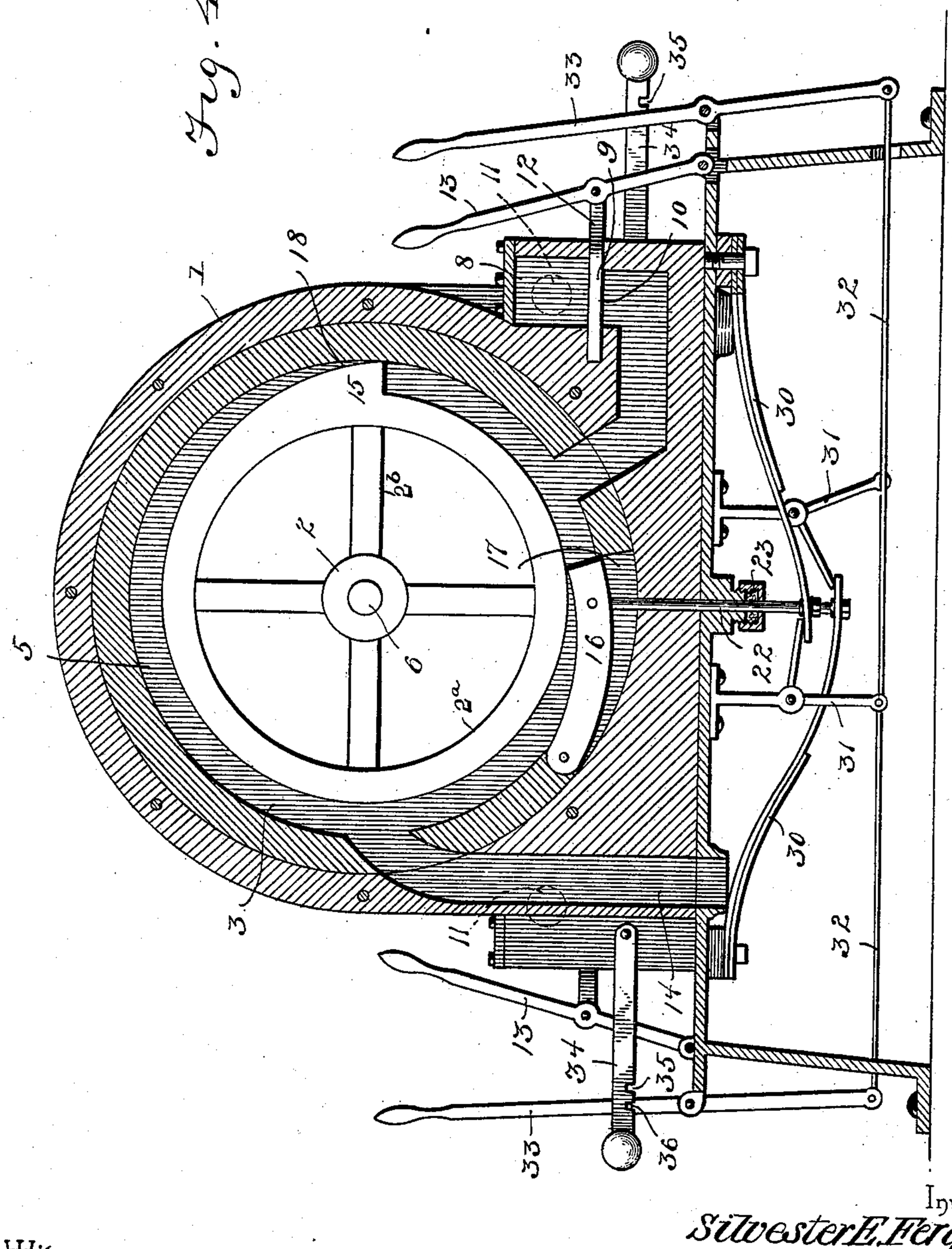
2 Sheets—Sheet 2.

S. E. FERGUSON.

ROTARY ENGINE.

No. 592,284. Patented Oct. 26, 1897.

Fig. 4.



Witnesses

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C. E. Hoag

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UNITED STATES PATENT OFFICE.

SILVESTER E. FERGUSON, OF EUREKA SPRINGS, ARKANSAS.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 592,284, dated October 26, 1897.

Application filed March 31, 1897. Serial No. 630,117. (No model.)

To all whom it may concern:

Be it known that I, SILVESTER E. FERGUSON, a citizen of the United States, residing at Eureka Springs, in the county of Carroll and State of Arkansas, have invented a new and useful Rotary Engine, of which the following is a specification.

My invention relates to rotary engines of the concentric-piston type, and has for its object to provide a simple and efficient construction and arrangement of parts, including a fixed abutment adapted to recede to allow the moving abutment or wing of the piston to pass without obstruction; to provide adjustable means for actuating or yieldingly holding the fixed abutment in its operative position; to provide actuating means for the fixed abutment whereby it may be locked in its repressed position, and, furthermore, to provide efficient means whereby the piston may be reversed.

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 vertical sectional view of an engine constructed in accordance with my invention, taken in the plane of and through one of the cylinders, and reversed, fixed, and moving abutments of the other cylinder being indicated in dotted lines. Fig. 2 is a transverse section in the plane of the axis of the piston. Fig. 3 is a detail view in perspective of one of the fixed abutment-actuating devices. Fig. 4 is a vertical sectional view of an engine, showing an improved arrangement of means for operating the fixed abutments.

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

The casing 1 of the engine embodying my invention incloses a rotary piston 2, having a peripheral web 3, by which the interior of the casing is divided to form independent cylinders 4 and 5, said piston having a shaft 6, fitted with any suitable means, as a pulley 7, for communicating power to mechanism to be driven.

The preferred construction of piston is illustrated in the drawings, wherein the inner wall of the annular casing is formed by a peripheral rim 2^a, connected with the hub by means of radial arms or spokes 2^b, the web 3 projecting from the outer face of said rim to divide the interior of the casing, as above indicated, and being seated in a groove in the inner surface of the outer annular wall of the casing, as clearly shown in Fig. 2.

The casing is provided with an inlet-port 8 in communication with each cylinder and controlled by a throttle-valve 9, arranged in a valve-chamber 10, said valve-casing being in communication with a supply-conductor 11 for steam, compressed air, or other motive agent. The stem 12 of the valve is attached to a reversing-lever 13. It will be understood that the valve, with its stem and lever, is duplicated when the engine is constructed with twin cylinders, as above described.

14 represents the exhaust-port.

The piston carries a moving abutment 15, which operates in the cylinder to receive the pressure of the motive agent and communicate motion to the piston, the motive agent being confined between this moving abutment and a fixed abutment 16, which is mounted in a cavity or recess 17 in the wall of the shell and is normally and yieldingly held extended in the path of the moving abutment, said moving abutment being beveled to form a cam-face 18, which bears against the upper surface of the fixed abutment to depress the latter out of its path.

The means which I have illustrated in the drawings for yieldingly maintaining the fixed abutment in its operative position include a rocker 19, fulcrumed to any suitable portion of the frame of the mechanism, as at 20, and having an arm 21, which is connected to the exposed end of a stem 22, pivotally connected to the free end of the fixed abutment. The stem extends through a stuffing-box 23.

The rocker is provided with oppositely-extending guides 24 and 25, upon which are mounted to slide the retracting and extending weights 26 and 27, connected for simultaneous movement, and adapted, by adjustment upon the arms 24 and 25, to actuate the rocker to hold the fixed abutment either extended or retracted. For instance, when the weights are

arranged as illustrated in Fig. 1 (the weight 26 being contiguous to the fulcrum of the rocker, while the weight 27 is at the outer extremity of the arm 25) the fixed abutment is yieldingly held in its extended position, whereas by reversing the position of these weights, to arrange the weight 26 near the outer extremity of the arm 24 and the weight 27 contiguous to the fulcrum of the rocker, the fixed abutment will be held in its retracted position, or out of the path of the moving abutment 15. The means which I have illustrated in the drawings for adjusting these weights includes a hand-lever 28 and a rod or pitman 29.

It will be understood that with the double-cylinder construction hereinbefore mentioned the moving abutment is arranged at opposite sides of the web 3 in reversed positions, as also is the fixed abutment, whereby the motive agent admitted respectively into the cylinders will cause rotation of the piston in opposite directions. It will be understood, furthermore, that the above-described mechanism for actuating the fixed abutment is duplicated, whereby when one abutment is arranged in operative position the other is retracted to enable the engine to be driven in either direction required.

In Fig. 4 I have shown an improved construction of operating device for the fixed abutment in which a spring 30 is employed in lieu of the yielding weighted lever shown in Figs. 1 and 3, one end of said spring being fixed to the base or bed plate of the casing and the other being attached to the projecting extremity of the stem 22, which is connected to the fixed abutment. The free end of the spring preferably projects slightly beyond the plane of the stem and is engaged by one arm of a rocking trip 31, of bell-crank construction, the other arm of said trip being connected by means of a rod 32 with a hand-lever 33. Any suitable means may be employed for securing the hand-lever at the desired adjustment, either with the fixed abutment depressed or released, such as a gravity-latch 34, having notches 35 for engaging a lateral pin 36 on said lever.

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 my invention, what I claim is—

1. A rotary engine having a casing comprising side walls and an annular outer wall, having a continuous groove in its inner surface, a concentric piston having a rim forming the inner of the concentric walls of the casing, and provided with a peripheral web projecting radially from the outer surface of its rim, and peripherally seated in said groove in the outer wall of the casing, to divide the interior of the casing into coaxial non-communicating cylinders, moving abutments carried by said web respectively at its opposite sides, to operate in said cylinders, the abutment in one cylinder being reversed in position to that in the other cylinder, relatively-reversed fixed abutments disposed respectively in the cylinders and yieldingly held in their operative positions in the paths of the moving abutments, means for securing either fixed abutment in a retracted position, out of the path of the coöperating moving abutments, and valve mechanism for controlling the admission of motive agent, whereby the same may be applied to either of said cylinders, substantially as specified.

2. A rotary engine having a casing, a concentric piston provided with a moving abutment having a cam-face, a fixed abutment arranged in the path of the moving abutment and capable of radial movement into and out of the path of said moving abutment, and means for yieldingly holding the fixed abutment in its operative position, said means including a rocker operatively connected with the fixed abutment and having adjustable opposing counterpoises adapted to hold the abutment either extended or retracted, substantially as specified.

3. In a rotary engine, the combination with a cylinder, a concentric piston having a moving abutment, and a fixed abutment mounted in the cylinder for movement into and out of the path of the moving abutment, of a rocker operatively connected to said fixed abutment and having oppositely-extended guides, and connected weights mounted respectively upon said guides and adapted to be arranged at relatively different distances from the fulcrum of the rocker to vary the position of the fixed abutment, substantially as specified.

4. In a rotary engine, the combination with a cylinder, a piston having a moving abutment, and a pivotal fixed abutment, of a rocker having an adjustable actuating-weight, a stem connecting the fixed abutment with an arm of said rocker, and means for securing the fixed abutment in its depressed position, substantially as specified.

5. In a rotary engine, the combination with a cylinder, a piston having a moving abutment, and a fixed abutment mounted for movement into and out of the path of the moving abutment, of a rocker having oppositely-extended guides, connections between the fixed abutment and the rocker, connected weights mounted respectively upon the guides of the rocker, and means, as a hand-lever, for simultaneously shifting the weights to vary their positions with relation to the fulcrum of the rocker, substantially as specified.

6. In a rotary engine, the combination with a cylinder, a piston having a moving abutment, and a fixed abutment adapted to be extended to normally occupy a position in operative relation with the piston, and mounted for retraction or folding by gravity, of actuating means, operatively connected with a stem of the fixed abutment, for holding the

fixed abutment yieldingly extended in opposition to gravity, and devices operatively connected with said actuating means, for relieving the stem of the abutment of the pressure thereof, whereby said abutment is allowed to fold by gravity, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

SILVESTER E. FERGUSON.

Witnesses:

J. N. HAGGARD,

J. A. DICKSON.