

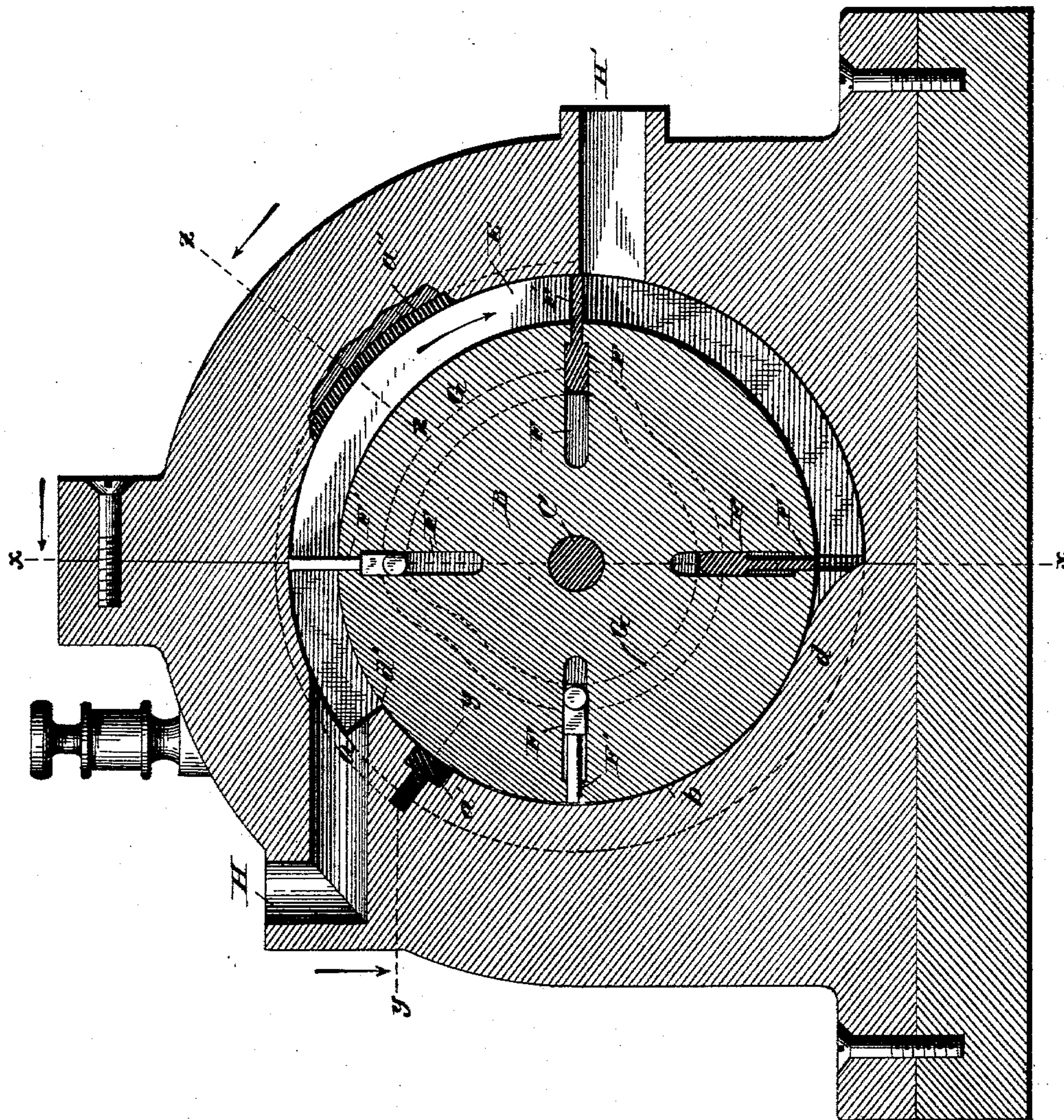
(No Model.)

2 Sheets—Sheet 1.

G. E. TOLIVER.
ROTARY ENGINE.

No. 327,621.

Patented Oct. 6, 1885.



SECRET

Witnesses
Wm. R. Shelden.
R. Henderson.

Inventor
George C. Toliver
By his Attorney
Franklin A. Hough

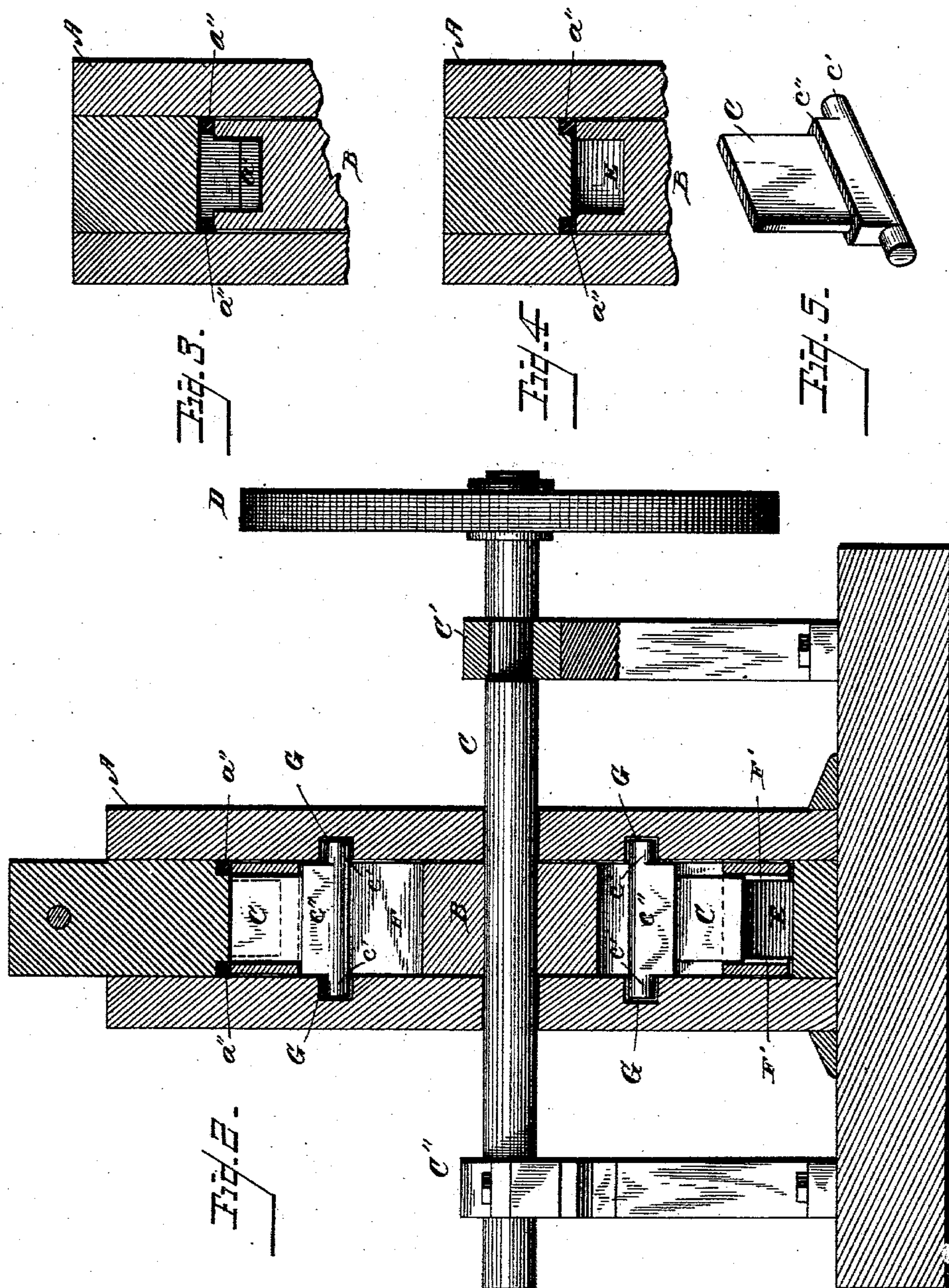
(No Model.)

2 Sheets—Sheet 2.

G. E. TOLIVER.
ROTARY ENGINE.

No. 327,621.

Patented Oct. 6, 1885.



Witnesses
Wm. S. Hayden
W. C. Anderson

Inventor
George E. Toliver
By his Attorney
Franklin W. Hough

UNITED STATES PATENT OFFICE.

GEORGE E. TOLIVER, OF NEWPORT, MO., ASSIGNOR OF TWO-THIRDS TO HENDERSON W. POUNDSTONE AND ELI SCHOPF, BOTH OF SAME PLACE.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 327,621, dated October 6, 1885.

Application filed May 11, 1885. Serial No. 165,012. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. TOLIVER, a citizen of the United States, residing at Newport, in the county of Barton and State of Missouri, have invented certain new and useful Improvements in Rotary Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and letters of reference marked thereon, which form a part of this specification.

Like letters refer to similar parts throughout the several views.

My invention relates to that class of rotary engines employing sliding valves in connection with a wheel provided with an annular steam-passage in its periphery; and the novelty consists in certain novel features of construction and arrangement of parts, hereinafter more fully described and claimed.

Reference being had to the accompanying drawings, Figure 1 is a longitudinal vertical section of the cylinder and steam-wheel, showing the steam-valves, the guiding cam-groove in the head of the cylinder being indicated in dotted lines. Fig. 2 is a vertical transverse section through the center of the engine, taken on line *xx* of Fig. 1. Fig. 3 is a section on line *yy* of Fig. 1, showing the packing-block in position. Fig. 4 is a section on line *zz* of Fig. 1. Fig. 5 is a perspective view of one of the valves detached.

A represents a stationary cylinder, within which the solid drum or steam-wheel B revolves, the same being secured to the power-shaft C, which passes through and has its bearings at C' and C'' upon the outside of the cylinder. At one end of the power-shaft the pulley or band wheel D is carried.

B is the steam-wheel, which is cylindrical in form. This wheel is recessed around its entire periphery, to form a peripheral channel, E, leaving flanges *f*, one upon either side of said channel. These flanges serve to guide the valves in their sliding movement, and also to retain the steam in said channel, thus rendering the device more positive and powerful in its action.

F F are valve-slots cut through the body of

the wheel, upon lines radiating outward from its center and terminating at the base of the flanges *f*. At the outer ends of the slots F the narrow opening F', or vertical slot formed in the inner walls of each of the flanges *f*, affords a communication with the interior of the peripheral channel of the steam-wheel and forms a guide for the outer ends of the valves. It will thus be seen that the slots for the valves do not extend through the sides of the flanges forming the sides of the peripheral channel, and thus the said channel is rendered perfectly steam-tight, which would not be the case were the slots extended through the sides of the flanges.

The inner faces of the cylinder-heads are furnished with cam-grooves G G, which are indicated by dotted lines in Fig. 1 of the drawings.

Each of the steam-valves *e* is provided with a flat outer end, adapting it to fit within the narrow opening F'. The opposite end of the valve is provided with projecting necks *e''*, which fit within the grooved eccentric cams upon the inner faces of the fixed cylinder-heads. The valve is also provided with the shoulder *e'*, which, by contact with the outer ends of the slots F, checks the outward throw of the valve.

The forms of the eccentric grooves or cams upon the inner faces of the cylinder-heads, and within which the projections or pins *e''* of the sliding valves are fitted, are such as to cause the valves to move automatically within the slots F. The outer end of each valve when closed extends across the peripheral channel and terminates at the extreme circumference of the wheel. In order to insure a close joint and render the valve more effective, the flat or outer end of the same is made wider than the peripheral channel, its outer edges fitting within narrow grooves upon the inner sides of the flanges forming the sides of the peripheral channel.

H represents the steam inlet-passage, and H' the exhaust-pipe. The packing-block *a'* and packing-ring *a''* serve to securely prevent leakage and confine the steam to its proper course within the peripheral channel.

A portion of the inner edge of the case-ring upon the side of the steam-wheel which is opposite the exhaust-pipe is provided with an

inwardly-projecting flange, *d*, which fits securely within the peripheral channel and serves to steady the wheel and in a measure prevent vibration.

5 In operation the steam enters the peripheral channel through the inlet-pipe H. Its passage in one direction, being prevented by the shoulder *d'* and packing-block *a'*, its force is expended against the flat face of the valve
10 which extends across the peripheral channel. The wheel is thus turned until the valve has passed the entrance to the exhaust-passage, where the steam escapes, and the next succeeding valve is closed or forced out into the
15 peripheral channel by reason of the engagement of its pins with the cam-grooves, to receive the steam from the inlet, while the valve which has discharged its steam into the exhaust is drawn back into the wheel by reason
20 of its pins traveling in the cam-grooves, as will be readily understood.

Although I have shown and described an engine provided with four valves, it is evident that the number may be varied and the form
25 of the cam-grooves in the cylinder-heads varied so as to operate the valves without departing from the spirit of my invention.

I am aware of the Patents Nos. 225,226 and 227,753, and make no claim to the construction shown therein as forming a part of my
30 invention.

Having thus described my invention and set forth its merits, what I claim as new is—

35 1. In a rotary engine, substantially as described, a revolving steam-wheel having formed therein a peripheral channel, combined with the case-ring, having formed integral therewith an inwardly-projecting flange, *b*, fitting in and partially closing said channel,
40 substantially as and for the purpose specified.

2. In a rotary engine, substantially as described, the combination, with a revolving

steam-wheel having a peripheral channel formed therein between the flanges *f*, of a case-ring provided with inwardly-projecting
45 flange *b*, constructed to close a portion of said channel, and provided with a recess to receive a packing-block, and the packing-block *a'* inserted in said recess and projecting beyond the edges of said flange, as and for the pur-
50 pose specified.

3. In a rotary engine, substantially as described, a revolving steam-wheel provided with a peripheral channel and slots, as described, combined with valves, as *c*, adapted
55 to slide in said slots, and provided with shoulders *c'*, constructed to limit the outward throw of said valves, as set forth.

4. In a rotary engine, substantially as described, the steam-wheel B, recessed around its
60 entire periphery to form a peripheral channel, E, having flanges *f* surrounding said channel upon either side, and having slots F formed in the body of said wheel and terminating at the base of said flanges, and slots F' formed in the
65 inner walls of said flanges, combined with the valves *c*, sliding in said slots in the wheel and guided by the slots in the flanges, as set forth.

5. In a rotary engine, substantially as described, a case-ring made in two parts, with
70 an exhaust-port through one part and the other part formed with an inwardly-projecting flange, *d*, having shoulders *d'*, and a packing-block, *a'*, inserted in a recess in said flange, and a steam-inlet through said part adjacent
75 to said shoulder, substantially as herein shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE E. TOLIVER.

Witnesses:

L. L. AMICK,
EMMER LONGENECKER.