

No. 725,580.

PATENTED APR. 14, 1903.

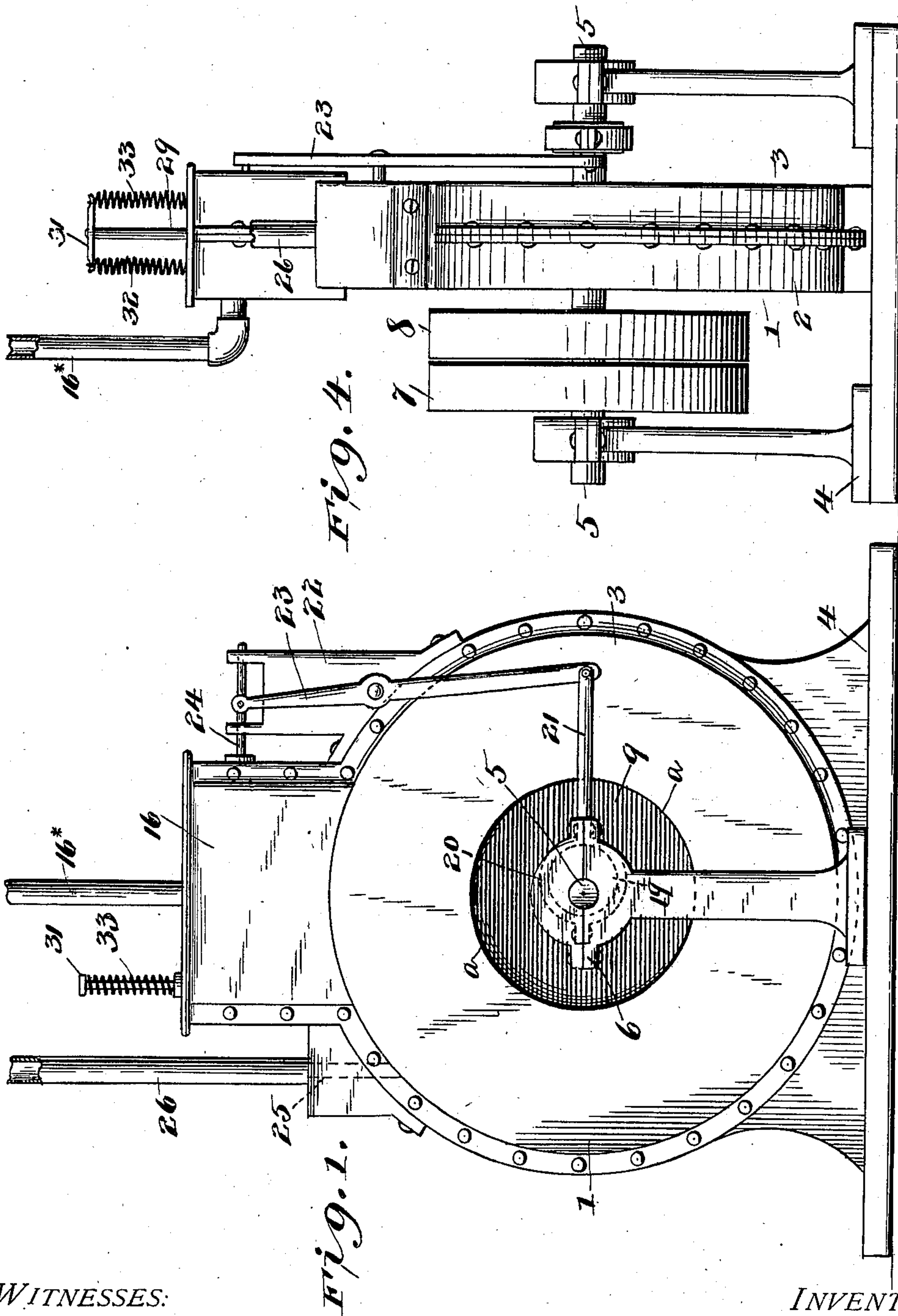
J. McCALLEY & H. L. COLLMAN.

ROTARY STEAM ENGINE.

APPLICATION FILED SEPT. 19, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

Joseph Blackwood
E. Hart

INVENTORS
James McCalley
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Attorney.

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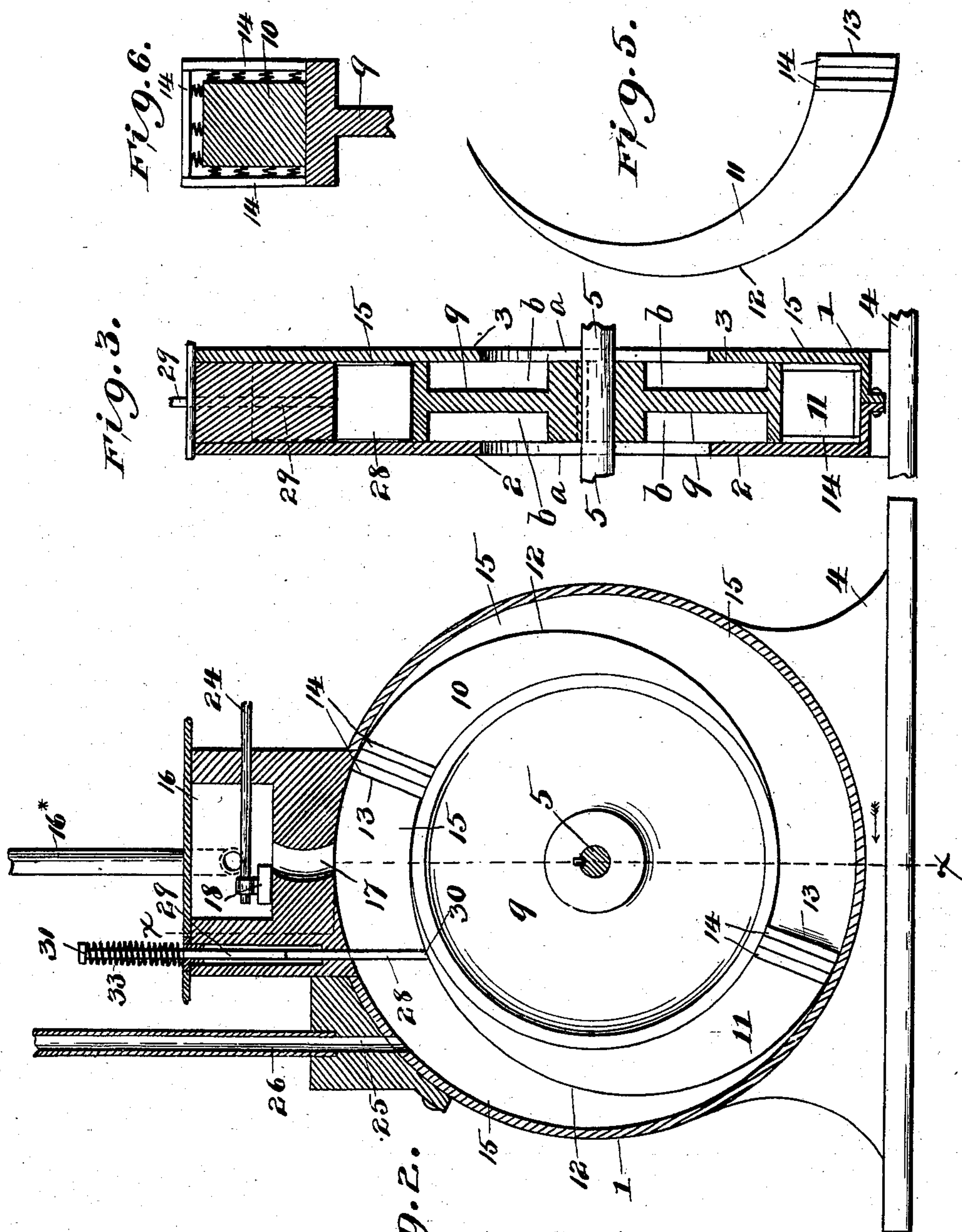
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UNITED STATES PATENT OFFICE.

JAMES MCCALLEY AND HENRY L. COLLMAN, OF MOUNT ETNA, IOWA.

ROTARY STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 725,580, dated April 14, 1903.

Application filed September 18, 1902. Serial No. 124,122. (No model.)

To all whom it may concern:

Be it known that we, JAMES MCCALLEY and HENRY L. COLLMAN, citizens of the United States, residing at Mount Etna, in the county of Adams, State of Iowa, have invented certain new and useful Improvements in Rotary Steam-Engines; and we do 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.

Our invention relates to improvements in steam-engines, and more particularly to rotary steam-engines, and has for its object to provide a rotary engine which is adapted to be operated by steam, water, hot air, gas, or other analogous fluid having sufficient pressure, to obviate many of the defects in rotary engines heretofore made by obtaining the direct impact of the steam on the pistons and employing a slide-valve which can be set to cut off at any desired point, and thus allow sufficient space for expansion before the steam exhausts, and also to prevent back pressure.

Our invention still further has for its object to provide a rotary steam-engine which is steam-tight, very durable, simple and inexpensive in construction, and exceedingly easy to operate.

In the preferred form of our invention the pistons are formed with a continuously-curved tapering front face, and the valve operated by said pistons is provided with a beveled end against which the said tapering faces of the pistons engage and force said valve outward. Said valve is returned to its normal position by the action of the springs.

The invention consists in the several features and combination of features, as more fully hereinafter described and claimed.

Referring to the drawings which illustrate our invention, Figure 1 is a side elevation; Fig. 2, a central longitudinal section; Fig. 3, a cross-section on line X X of Fig. 2; Fig. 4, an edge view in elevation; Fig. 5, a detail view of one of the pistons, and Fig. 6 a detail sectional view of the head of one of the pistons.

In the drawings, in which like characters of reference denote like parts throughout the

several views, 1 represents the circular casing of the rotary steam-engine, which is preferably square in cross-section and is made in two parts or halves 2 3, bolted together, each provided with a central opening *a* and having any suitable packing between the edges of said parts, so as to make a steam-tight joint. Said casing is supported on a base 4. A drive-shaft 5 is mounted in boxes 6 on the base 4 and passes centrally through an aperture in each half of the casing and on one end carries a fly-wheel 7 and a drive-pulley 8, which is adapted to receive a belt to transmit power from the engine to a ventilator, compressor, dynamo, lathe, harvester, pump, or any other machinery to be driven.

A wheel 9 is mounted on and keyed to the shaft 5 inside the casing, and to its outer periphery are bolted or otherwise secured pistons 10 and 11, preferably square in cross-section, each having a continuously-curved tapering face 12, and a head 13, having expansion-rings 14 for the purpose of preventing the passage of steam past said heads.

b represents annular grooves in the opposite faces of the wheel 9. The central openings in the casing communicate with the annular grooves in the wheel, which permits air to be admitted to cool and thereby prevent the overheating of the parts.

The pistons travel in an annular square channel 15 between the outer periphery of the wheel 9 and the inner walls of the two-part casing. A steam-chest 16 is provided at the top of the casing, and a steam-supply pipe 16*, leading from a suitable boiler, (not shown,) connects with the top of said steam-chest, by which steam is supplied to the engine.

17 is a port connecting the steam-chest with the channel 15, and 18 is a slide-valve, preferably made solid and with a smooth face, which controls the inlet of steam through the port 17 into the channel 15.

On the shaft 5 at one side of the casing is mounted an eccentric 19, with a two-part strap 20 surrounding the same, said strap being secured to the end of a rod 21. A bracket 22 projects upwardly from the top of the casing and has a rocker-arm 23 pivoted thereon, the upper end of said rocker-arm being con-

connected to the slidable link 24 of the slide-valve 18 and the lower end connected to the rod 21.

By adjusting the eccentric and rocker-arm 5 the length of stroke or cut-off of the slide-valve 18 may be regulated to suit the requirements of the various and different classes of work which the engine may be used for.

25 is the exhaust-port, to which is connected 10 an exhaust-pipe 26.

28 is a vertically-slidable abutment mounted in grooves in one end of the steam-chest and having a stem 29 and a beveled lower edge 30. In its normal position the slidable 15 abutment 28 is within and closes the channel 15 at a point between the inlet and exhaust ports and with its lower end resting on the curved face of one of the pistons.

To the upper end of the stem 29 of the slidable abutment 28 is secured an arm 31, and spiral springs 32 33 are attached to the opposite ends of said arm, each of said springs having its lower end attached to the top of the steam-chest. The springs 32 33 are for 25 the purpose of returning the slidable abutment 28 to its normal position in the channel 15 when not forced outward by contact with one of the pistons.

The abutment 28 prevents back pressure 30 of the steam and is made steam-tight by suitable packing.

The motion of the engine may be regulated by any suitable throttle-valve placed at a convenient point. (Not shown.)

35 We do not wish to limit ourselves to the precise construction as herein shown and described, as the same may be varied somewhat without departing from the spirit of our invention.

40 In operating steam or other fluid is admitted into the steam-chest through the inlet-pipe 11 and then passes through the port 17 to the channel 15 (the passage of the steam from the steam-chest to the channel being regulated by means of the slide-valve 18) and fills 45 that portion of the channel between the head

of one of the pistons and the slidable abutment 28, and the pressure of the steam against the head of the piston causes the same to move, turning the wheel 9. As the piston 50 moves forward more and more of the channel is presented to be filled with steam and the tapering face of the piston contacts with and gradually lifts the slidable abutment and at the same time the used steam is being ex- 55 hausted through the exhaust-port 25.

The pistons are so arranged that just before one of them has made half of a revolution a fresh supply of steam will be admitted and the other piston will commence to move 60 and the same operation will be repeated as for the other piston. Thus it will be seen that the operation is a continuous one. As soon as the head of each piston has passed the abutment it will be forced inward by the 65 coiled springs and close the channel at that point.

Having thus described our invention, what we claim is—

A rotary engine, provided with a casing 70 having inlet and exhaust ports, a shaft mounted independently and out of contact with said casing provided with a wheel having pistons with continuously-tapering faces from end to end, a channel between the inner wall of said 75 casing and the outer periphery of the wheel, a steam-chest provided with a slide-valve, a vertically-slidable abutment designed to close said channel between the inlet and exhaust ports, an arm rigidly fixed at the upper end 80 of said abutment, and springs connecting each end of said arm to the steam-chest, said abutment being moved inward by said springs and outward by the curved faces of the pistons, substantially as described. 85

In testimony whereof we affix our signatures in the presence of two witnesses.

JAMES MCCALLEY.

HENRY L. COLLMAN.

Witnesses:

T. C. DAVIS,

GEO. HICKMAN.