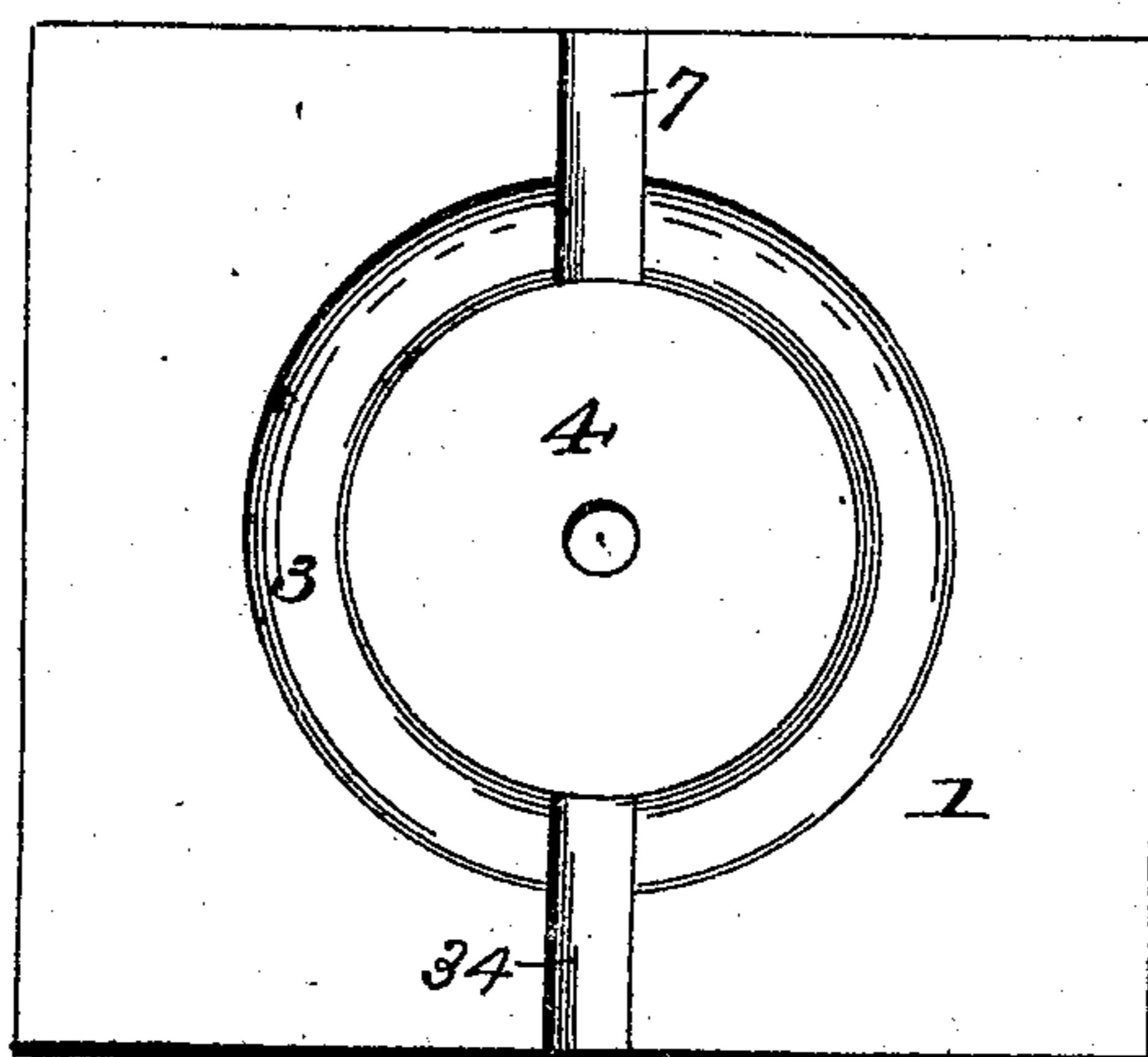
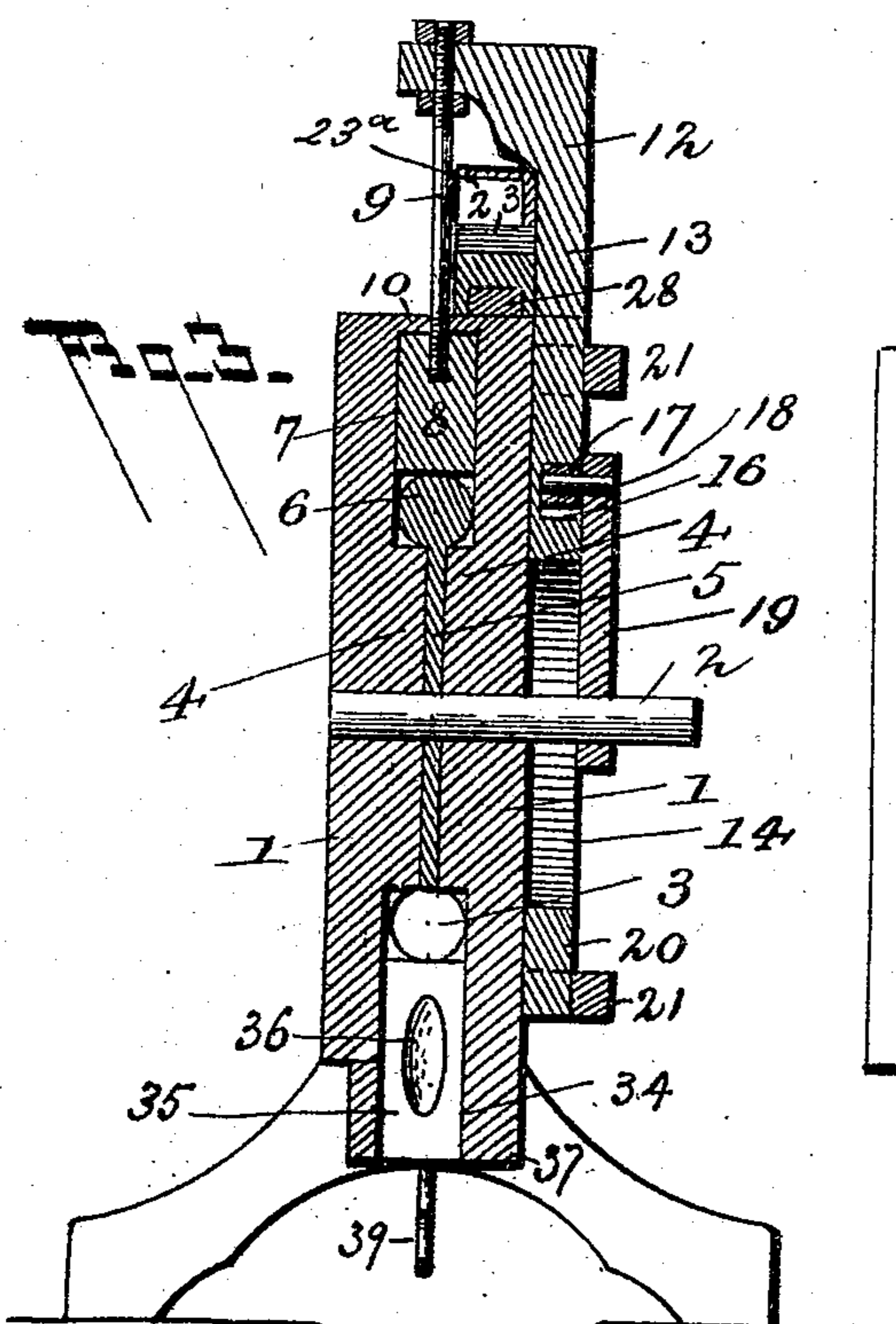
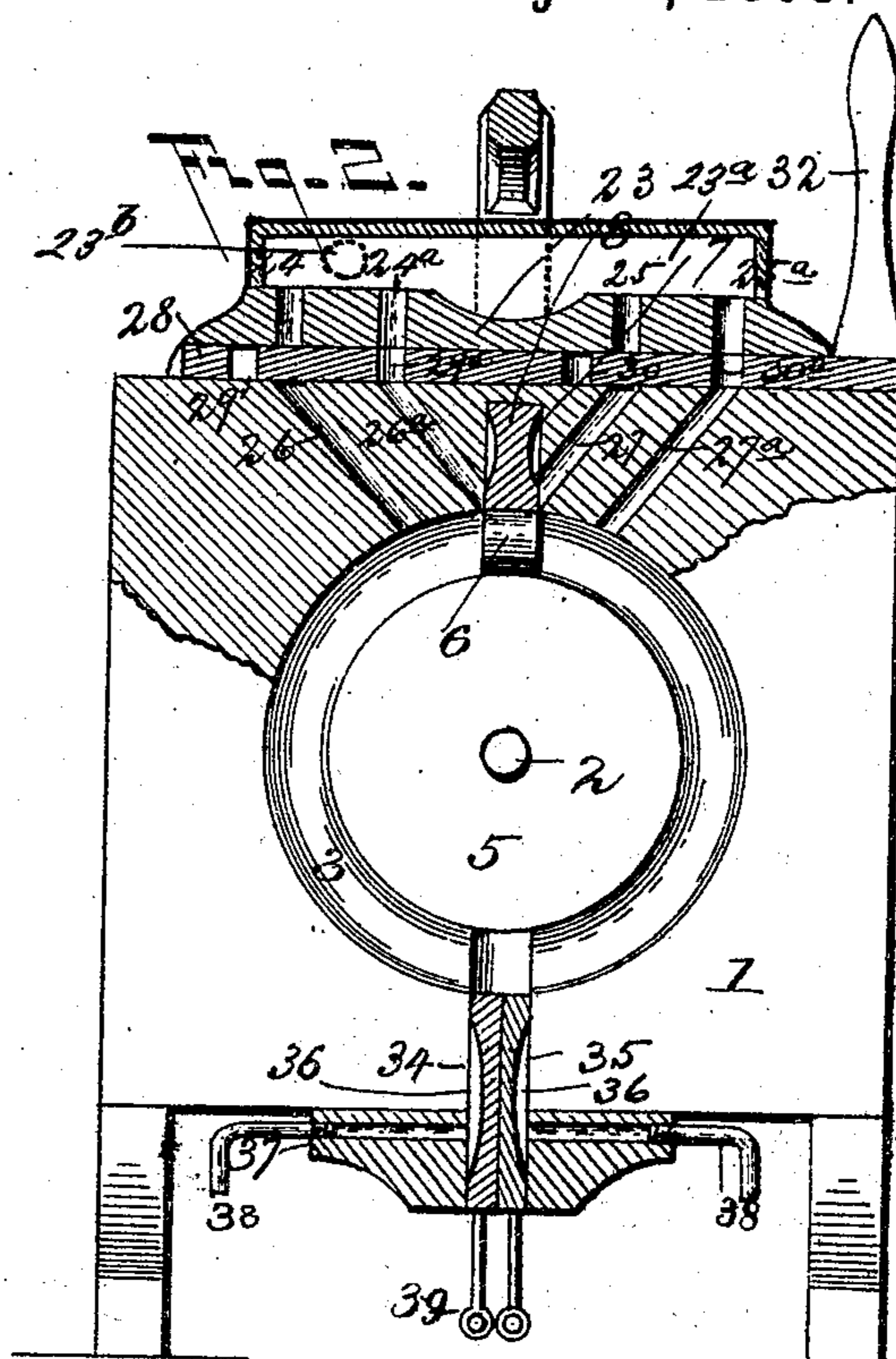
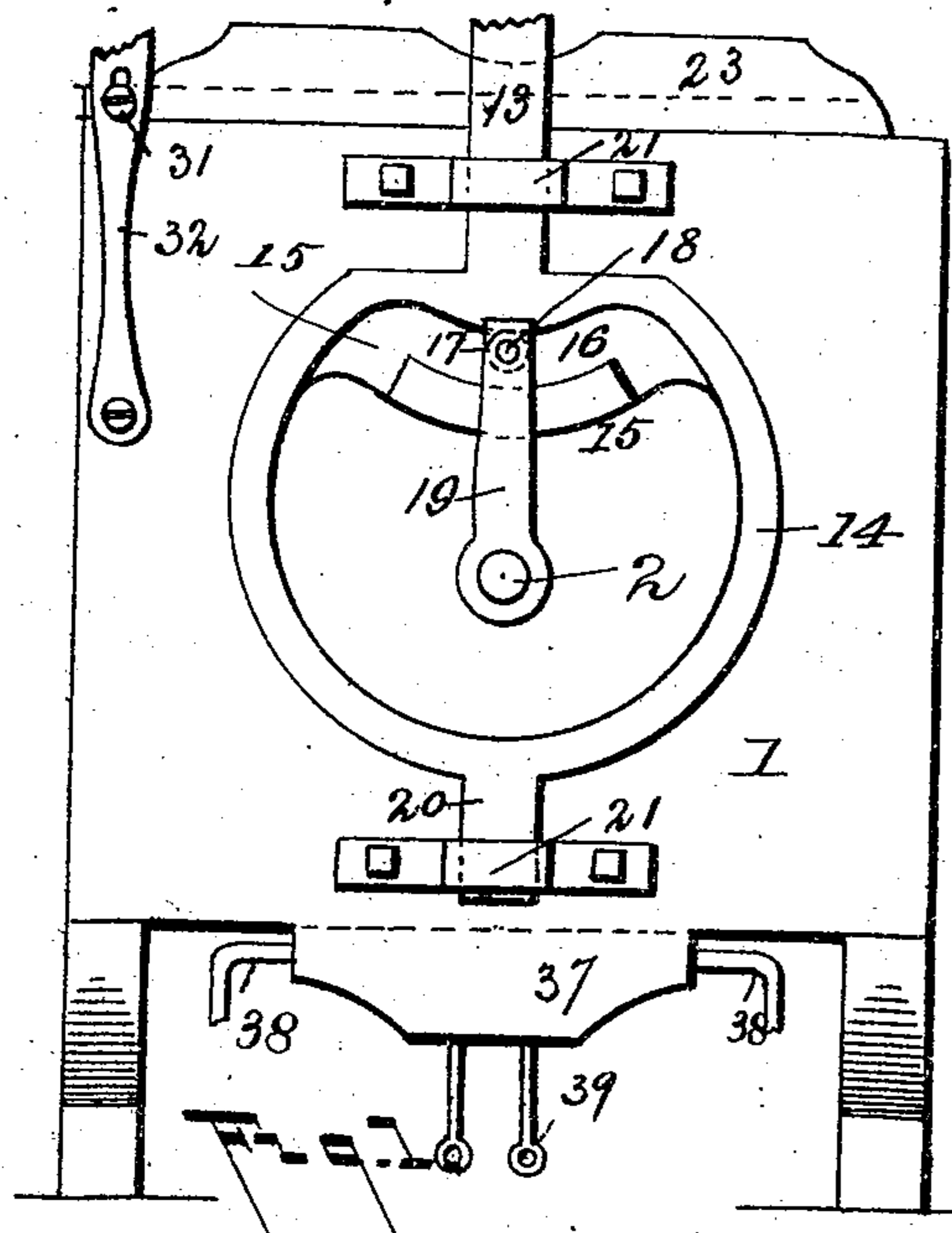


(No Model.)

D. C. GIVENS.
STEAM ENGINE.

No. 501,829.

Patented July 18, 1893.



WITNESSES:

F. L. Orvand.

H. L. Coombs

INVENTOR.

Dwight C. Givens. INVENTOR.

RI

BY Lewis Ragner & Co.
ATTORNEYS

ATTORNEYS

UNITED STATES PATENT OFFICE.

DWIGHT C. GIVENS, OF REGER, MISSOURI.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 501,829, dated July 18, 1893.

Application filed February 14, 1893. Serial No. 462,318. (No model.)

To all whom it may concern:

Be it known that I, DWIGHT C. GIVENS, a citizen of the United States, and a resident of Reger, in the county of Sullivan and State of Missouri, have invented certain new and useful Improvements in Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in rotary engines, the object being to provide a simple and economical construction of the same, which shall be very efficient in use.

The invention consists in the novel construction and combination of parts, herein after fully described and claimed.

In the accompanying drawings: Figure 1 is an elevation of a rotary steam engine, constructed in accordance with my invention. Fig. 2 is a longitudinal section of the same. Fig. 3 is a central cross section, and Fig. 4 is a front or face view of the back-plate of the engine, with its integral grooves or steam-channels.

Like numerals of reference denote corresponding parts in all the figures.

In the said drawings, the reference numeral 1 designates two rectangular plates, each provided with a central aperture for the passage of the driving-shaft 2. Each of these plates is formed with an annular semicircular groove 3, concentric with the central apertures, and when the plates are placed face to face and bolted together, an annular cylindrical steam space is formed. These grooves also form two central hubs 4, having their faces cut-away, so that when the plates are bolted together, there will be a space left between the hubs to receive a disk 5, fast to the driving-shaft. This disk is provided with a peripheral piston 6, which corresponds with and works in the annular steam chamber.

The plates or heads 1, at their upper sides, are formed with rectangular recesses 7, communicating with the steam chamber, and forming a chamber to receive the vertically reciprocating abutment 8, consisting of a rect-

angular block provided with a rod or stem 9, passing through an aperture in the top part 10. This rod is connected to a bracket 12, formed with or secured to a vertical arm 13, of the vertically movable yoke 14. This yoke is provided with a cam-groove on its face, and is also provided at its upper side or portion with a web 15, in which is formed a cam groove 16, so constructed that when the anti-friction roller 17, journaled on a stud 18 on the crank 19, secured to the driving-shaft and rotating therewith, engages with the groove 16, the yoke, and consequently the abutment 8, will be raised and lowered. At its lower side, the yoke is provided with an arm 20. Both the arms 13 and 20 work in brackets 21, which serve as guides therefor.

The numeral 23^a designates the steam-chest, the under side of which forms a guide-plate, 23, for the slide-valve 28. Steam from the boiler enters the steam-chest through a port on one side of the chest, as shown in dotted lines at 23^b. The slide-valve 28 works in the narrow space between the under side of the apertured guide-plate 23 and the flat heads, or top part, of the face-plates 1 and 1; said plates being provided with inlet and exhaust-ports 26 and 26^a, and 27 and 27^a, on opposite sides of the central abutment 8, and registering with corresponding ports 24 and 24^a, and 25 and 25^a, in the stationary guide-plate 23, which forms the bottom of the steam-chamber or steam-chest 23^a. The intermediate flat valve-plate 28 is also provided with apertures, viz: on one side, 29 and 29^a (adapted to register with ports 26 and 26^a in the face-plates 1 and 1, and 24 and 24^a in the guide-plate 23); and, on the other side, valve-plate 28 has apertures 30 and 30^a (similarly adapted to register with ports 27 and 27^a in the contiguous face-plates, and 25 and 25^a in the stationary guide-plate), so that communication between the steam-chest and engine proper may be cut off, opened, and regulated by means of the slide-valve 28. One end of the valve 28 passes out through the end of the steam chest and is provided with a pin 31, to which is connected a lever 32, pivoted to one of the heads 1.

Diametrically opposite the abutment, the heads or plates 1 are formed with recesses 34, forming a valve chamber in which is located

two vertically movable valves 35, provided on their outer or opposite faces with grooves 36 forming steam passages.

5 The casing 37 of the valves, is connected with the source of steam supply, or with the steam-chest, by means of pipes 38, and the valves are provided with stems 39, by which they may be actuated. These valves are normally depressed or lowered to their fullest extent so that they will not project up into the steam chamber thus allowing free passage for the piston. The purpose of these valves will be hereinafter explained.

15 From the foregoing description, taken in connection with the drawings, the operation of my improved rotary engine will be readily understood. Supposing the operative parts to be in the position illustrated in Fig. 2, steam will enter the circular steam-chamber, 20 3, on the left-hand side of piston 6, through the registering ports 24^a, 29^a and 26^a. The steam-pressure impels the piston to the right-hand side, thus revolving disk 5 and with it the central drive-shaft 2, the crank 19 of which 25 (with its anti-friction roller 17) also revolves. Now, by the time roller 17 reaches and enters the cam-groove at the upper end of yoke 14, the piston will have reached (on its circular travel) the abutment from which it started, 30 and as this is raised or lifted by the yoke 14 with its arm 13, bracket 12 and depending rod 9, it permits the piston to pass by and the steam confined in the circular chamber 3 to

exhaust through the registering open exhaust-ports 27^a, 30^a and 25^a. By shifting the slide-valve to the other side, by means of its lever 32, the inlet and exhaust-ports will be reversed, and the motion of the piston will be reversed accordingly and run in the opposite direction.

40 In case the engine should stop on the dead center, it can be readily thrown off the same, by raising or elevating one of the valves 35, allowing the steam to enter the steam chamber through the groove in the side, and the valve acting as an abutment, the steam will strike the piston, and move it past the center. The valve is then lowered, and the operation will go on as first above described.

Having thus described my invention, what 50 I claim is—

The combination, in a rotary steam-engine, with the revolving piston, of the starting-valves 35, having steam-passages 36 and located in a valve-chamber, 34, diametrically 55 opposite the main abutment-valve 8, and steam-pipes 38, whereby the engine may be thrown off a "dead center," substantially as set forth.

In testimony that I claim the foregoing as 60 my own I have hereunto affixed my signature in presence of two witnesses.

DWIGHT C. GIVENS.

Witnesses:

F. E. WOOD,

W. B. HUGHES.