No. 746,420. PATENTED DEC. 8, 1903.

J. J. WALLEY.

ROTARY STEAM ENGINE.

APPLICATION FILED SEPT. 10, 1901. RENEWED NOV. 10, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 4.

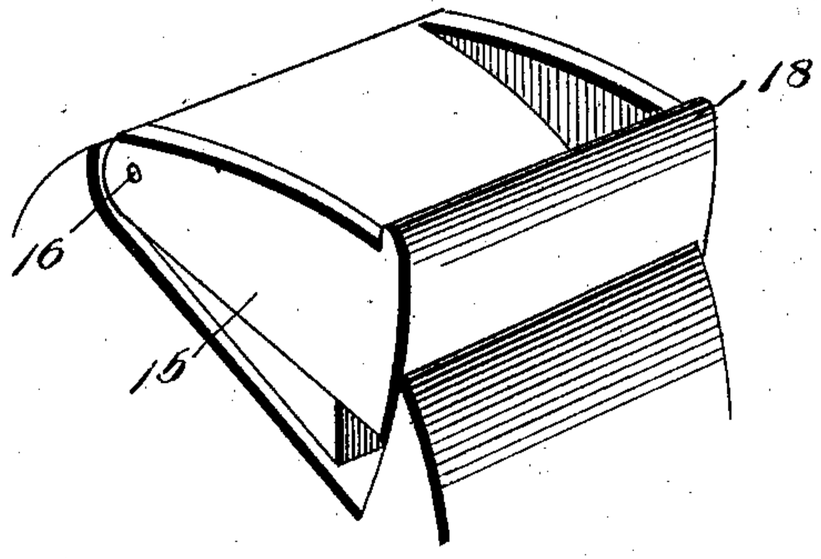
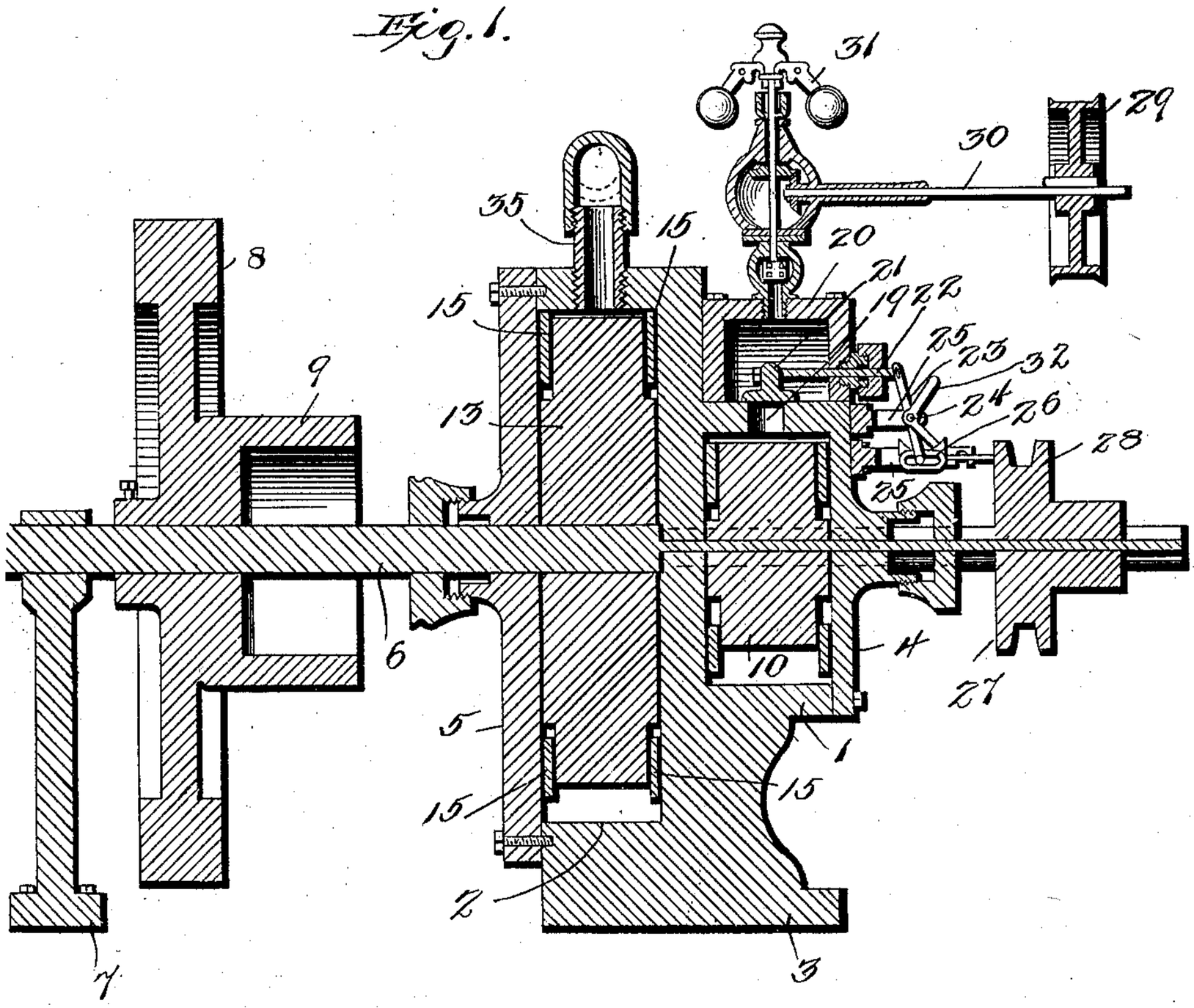


Fig. 1.



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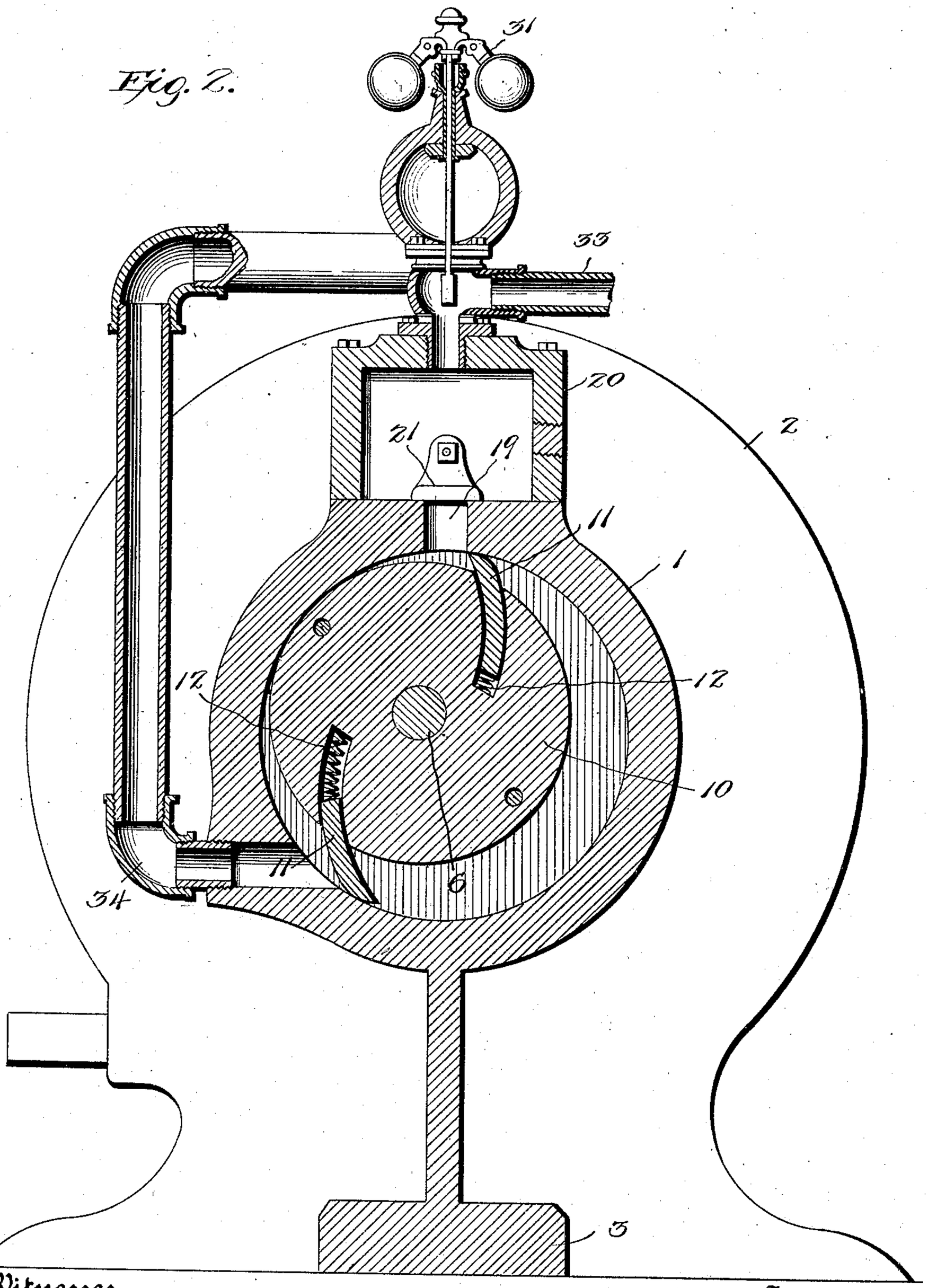
NO MODEL. 4 SHEETS—SHEET 2.

Fig. 2.



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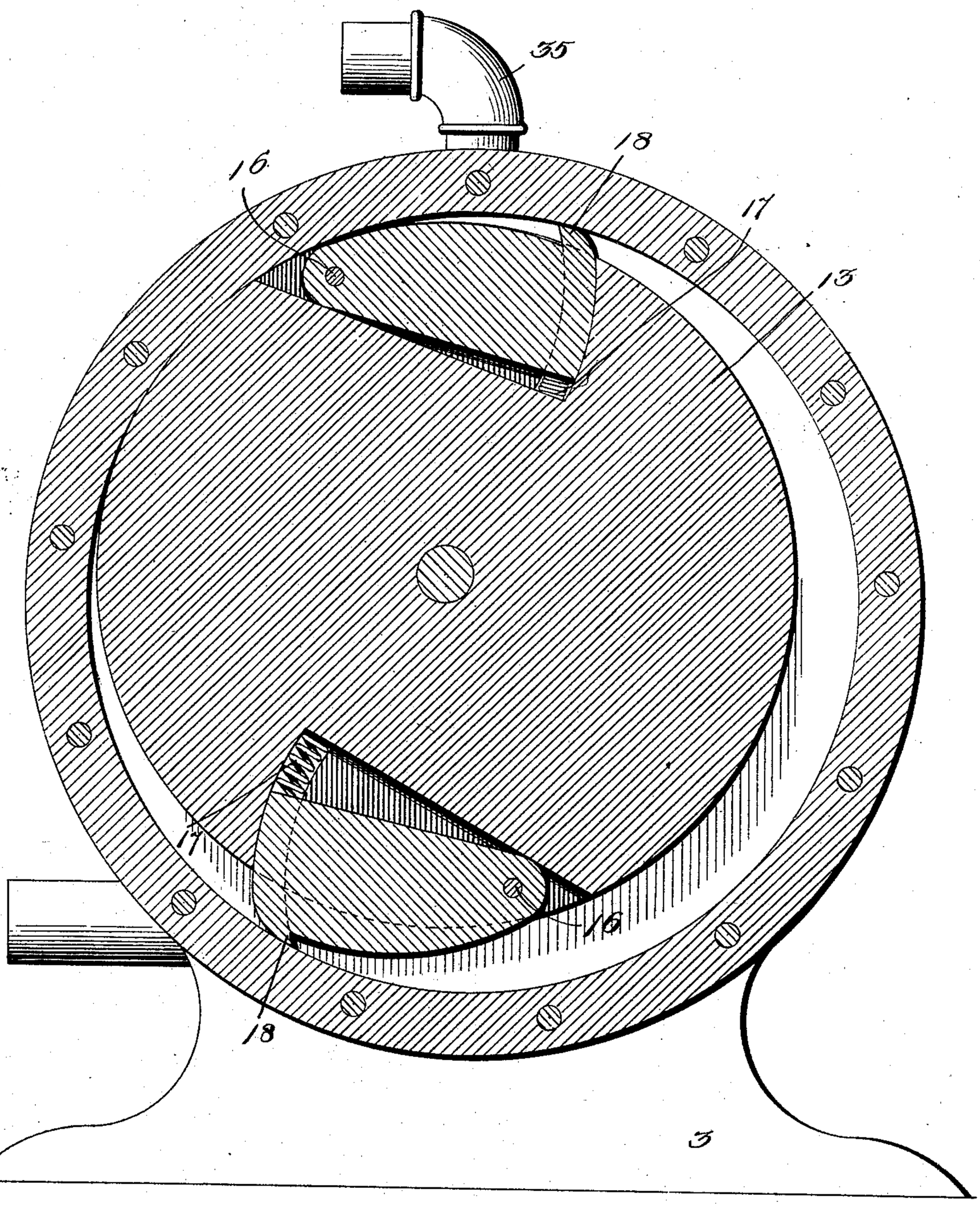
NO MODEL. 4 SHEETS—SHEET 3.

Fig. 3.



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NO MODEL. 4 SHEETS—SHEET 4.

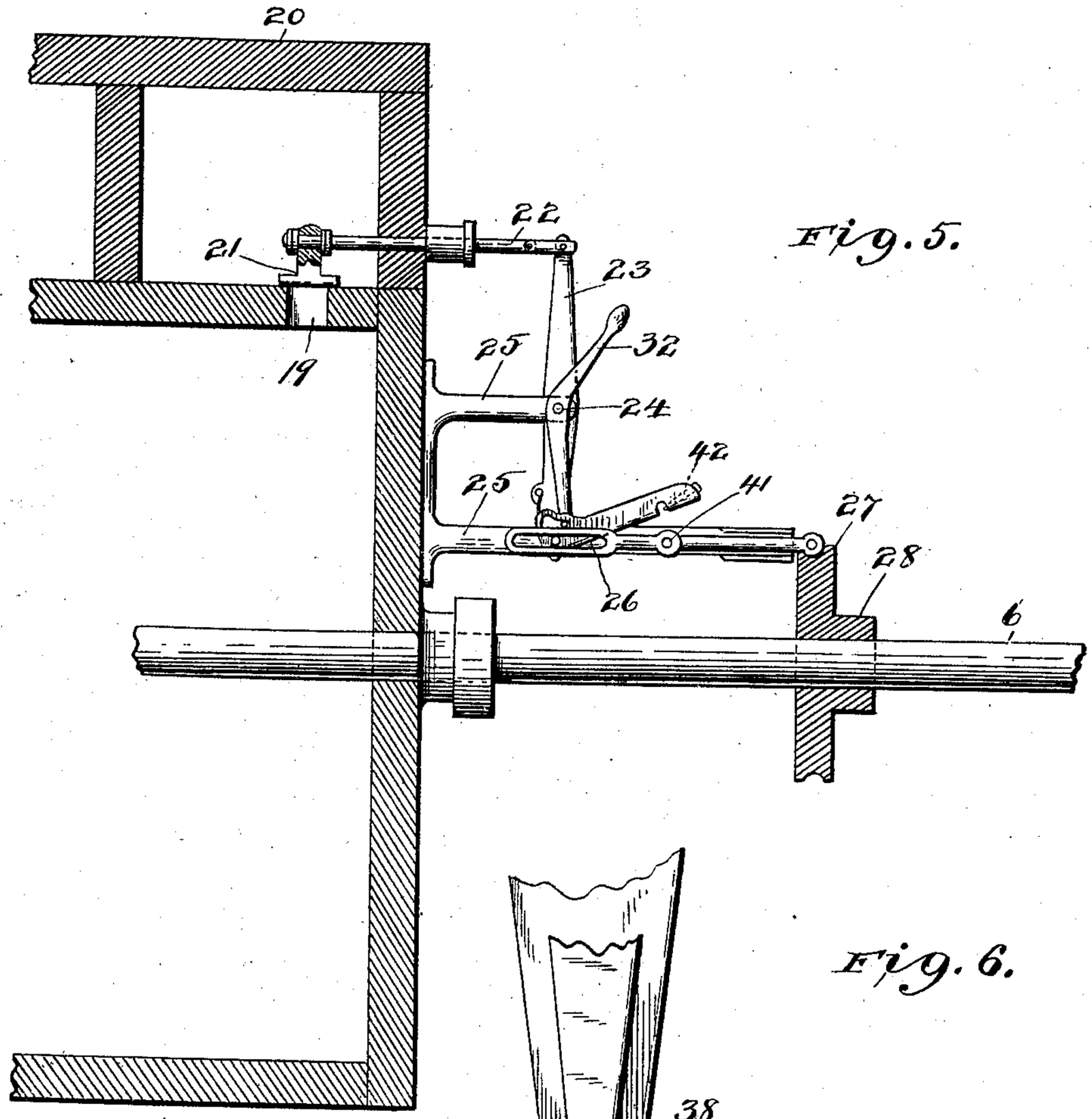

Fig. 5.

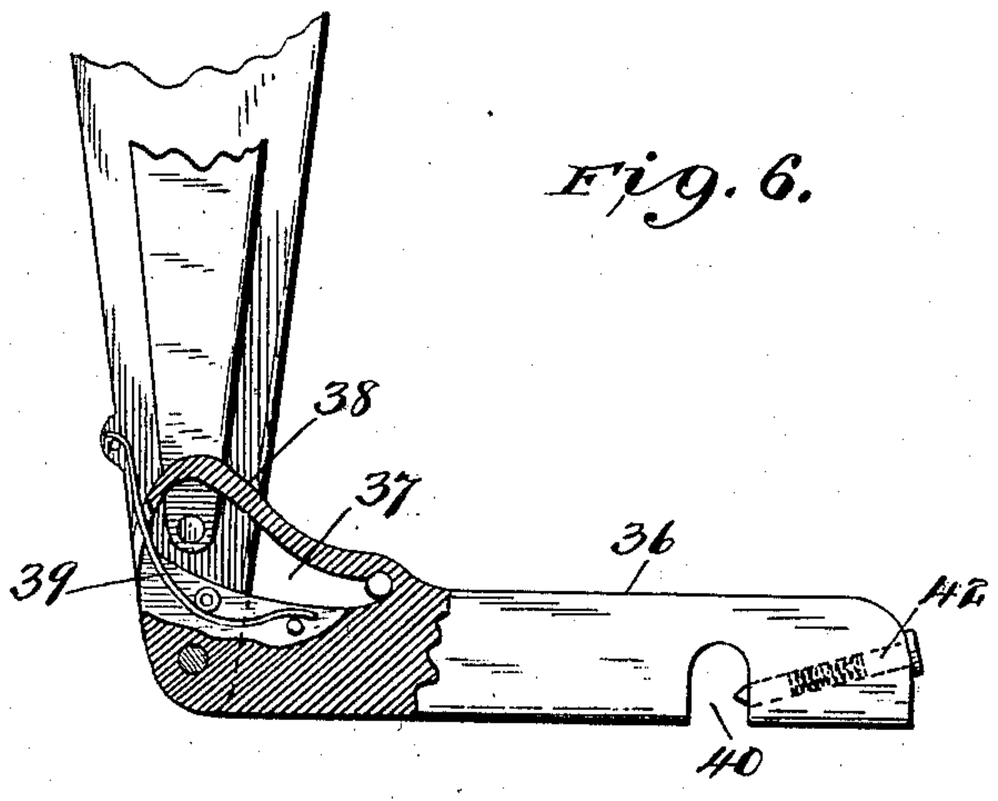

Fig. 6.

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No. 746,420. Patented December 8, 1903.

UNITED STATES PATENT OFFICE.

JAMES J. WALLEY, OF ANOKA, MINNESOTA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-HALF TO JOHN A. HEFFILFINGER, OF ANOKA, MINNESOTA.

ROTARY STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 746,420, dated December 8, 1903.

Application filed September 10, 1901. Renewed November 10, 1903. Serial No. 180,576. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. WALLEY, a citizen of the United States, residing in the city of Anoka, county of Anoka, and State of Minnesota, have invented certain new and useful Improvements in Rotary Steam-Engines, of which the following is a specification.

My invention relates to improvements in rotary steam-engines; and the objects of the same are to provide an engine which may be run at a high rate of speed, which will create but little friction, and which will have practically no lost motion.

Another object is to provide a single or compound engine which may be started and stopped at any point or which will be practically without a dead-center.

Still another object is to provide an engine that will run rapidly, steadily, economically, and in any position and which will occupy but little floor-space.

Another object is to provide an engine comprising comparatively few parts and which will dispense with valves and the steam-chest between the high and low pressure cylinders.

These objects and advantages are attained by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section through the center of the entire engine. Fig. 2 is an enlarged sectional elevation of the high-pressure cylinder and its rotary piston. Fig. 3 is a sectional elevation of the low-pressure cylinder and its rotary piston. Fig. 4 is a detail perspective view of one of the buckets detached from the piston, said bucket being of the same construction for the high and low pressure cylinders. Fig. 5 is a side view and partial section of the cut-off slide-valve and its operative mechanism. Fig. 6 is a detail view and partial section of a cam-latch which I may utilize.

Like numerals of reference designate like parts wherever they occur in the different views of the drawings.

Referring to Fig. 1 of the drawings, the numeral 1 designates the high-pressure cylinder, and 2 the low-pressure cylinder. These cylinders may be formed as a single casting with the base or support 3 and may be provided with removable cylinder-heads 4 5. A shaft 6 extends eccentrically through both cylinders and is journaled at one end in a standard 7. A combined fly-wheel 8 and driving-pulley 9 is keyed to the shaft 6. Secured to the shaft 6 within the cylinder 1 is a rotary piston 10, Fig. 2, carrying spring-actuated buckets 11, which bear upon the interior surface of the cylinder 1 by means of the spring 12. Secured to said shaft 6 within cylinder 2 is a rotary piston 13, also provided with spring-actuated buckets 15, similar in construction to the buckets 11. These buckets are fitted in recesses in the periphery of the piston 13 and are pivoted at 16 to the piston, as shown in Fig. 4. Springs 17 exert an outward pressure upon the buckets 15 and always keep the edge 18 in contact with the interior wall of the cylinder. An inlet-port 19 is formed at the top of the cylinder 1, and a steam-chest 20 is seated upon said cylinder above the inlet-port 19. A cut-off slide-valve 21 is actuated to intermittently cover and uncover the port 19 by means of a valve-stem 22, which passes through one wall of the steam-chest and at its outer end is pivotally connected to a lever 23. The lever 23 is centrally pivoted at 24 to a bearing 25, and the opposite end of said lever 23 is pivoted to a slide 26, actuated by a cam 27, formed as an integral portion of a band-pulley 28, secured to the shaft 6. A cam-latch 36 is pivoted to the lower end of the lever 33 and is provided with a slot 37 to accommodate the pin 38 on the hand-lever 32, and a spring 39 returns the latch 36 to its original position after it has been moved by the lever 32. A notch 40 in the latch is designed to catch over a pin 41 to hold the latch in one position, and a spring-bolt 42 retains the latch in place against displacement until the latch is moved by the lever 32. The pulley 28 may be connected by a belt to the pulley 29 on the governor-shaft 30. The ball-governor 31 is actuated directly from the driving-shaft and regulates the speed of the engine expansively. A hand-lever 32 controls the slide-valve 21 and is used for starting and stopping the engine.

Referring to Fig. 2, a steam-inlet pipe 33

connects with the steam-chest 20, and when the hand-lever 32 is moved the steam is admitted through port 19 to the high-pressure cylinder 1 to rotate the piston 10, as will be understood. At each rotation of the cylinder 10 the steam passes through the outlet-pipe 34, which leads to the low-pressure cylinder 2 at 35, Fig. 1, and thus utilizes the exhaust from the high-pressure cylinder to drive the shaft 6. The buckets 11 and 15 may be secured to the pistons 10 and 13 at relatively opposite points in order to overcome the dead-center.

Without desiring to be limited to the exact details of construction, as these may be varied within certain limits without departing from the spirit and scope of my invention, what I claim is—

1. A rotary engine comprising two cylinders of relatively different areas, a shaft passing centrally through said cylinders and having secured thereto a piston for each cylinder, spring-actuated buckets upon the peripheries of said pistons, a slide-valve for intermittently admitting steam to one of the cylinders, a pipe communicating with both cylinders, and means for actuating the slide-valve, substantially as described.

2. A compound rotary engine comprising a high and low pressure cylinder, a shaft passing through the cylinders, and carrying eccentrically-mounted pistons, yielding buckets secured to the peripheries of said pistons, a steam-chest seated upon the high-pressure cylinder, a slide-valve in the steam-chest, means for intermittently actuating said slide-valves, and a hand-lever for moving the valve to start and stop the engine, substantially as described.

3. In a compound rotary engine, high and low pressure cylinders formed as a single casting and having detachable cylinder-heads, in combination with a shaft passed centrally through the casting and carrying eccentrically-mounted pistons, an inlet-port in the high-pressure cylinder, and means for automatically opening and closing said port, substantially as described.

4. In a compound rotary engine, high and low pressure cylinders, a shaft passing through said cylinders and carrying eccentrically-mounted pistons, a combined fly-wheel and belt-pulley secured near one end of said shaft, a combined cam and band-pulley secured near the other end of said shaft, a slide-valve actuated by said cam, a governor, and means for actuating the governor directly from the main driving-shaft, substantially as described.

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