No. 844,094. PATENTED FEB. 12, 1907.

A. BRETSCHER.

ROTARY ENGINE.

APPLICATION FILED DEC. 18, 1906.

3 SHEETS—SHEET 1.

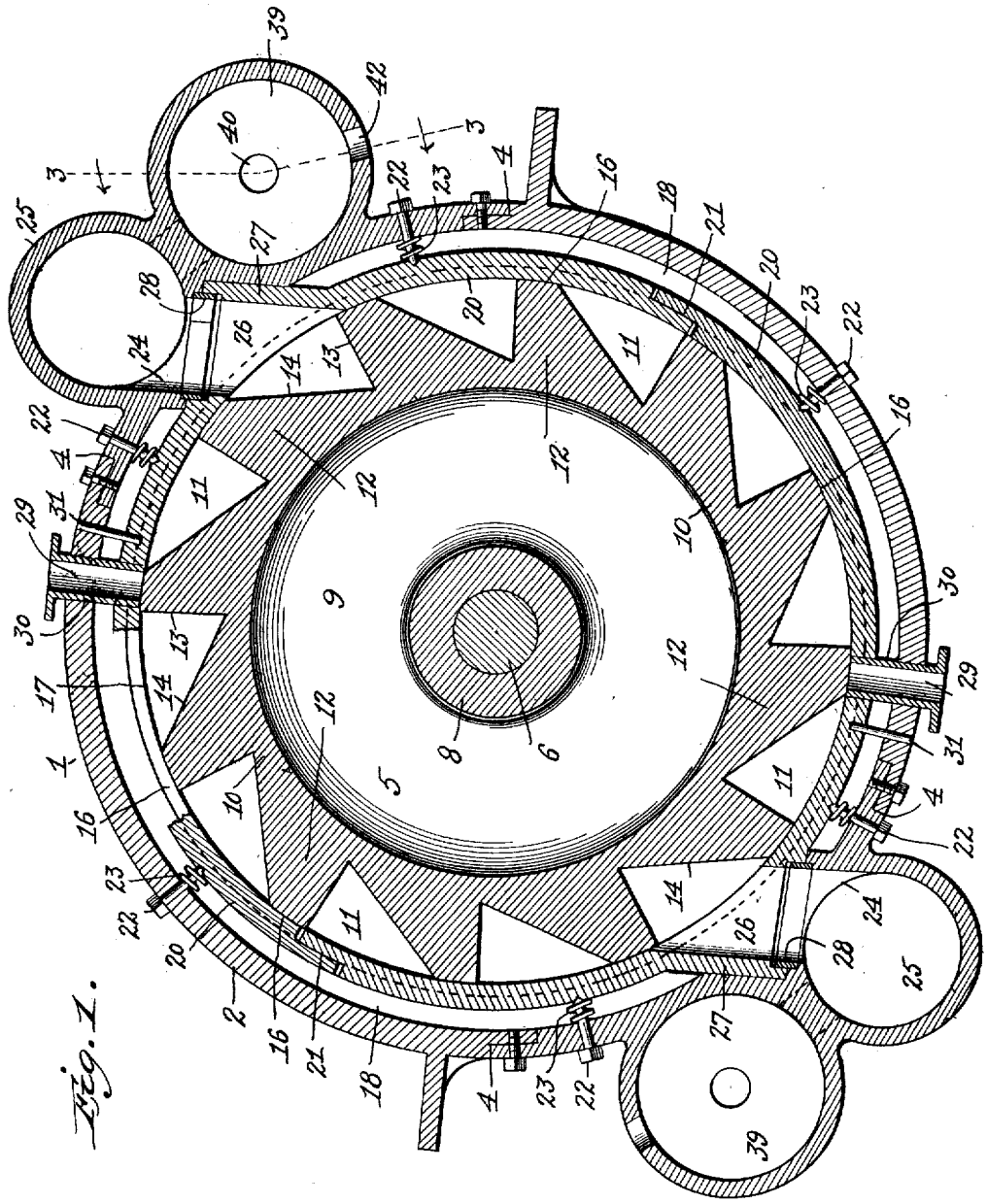


Fig. 1.

Witnesses

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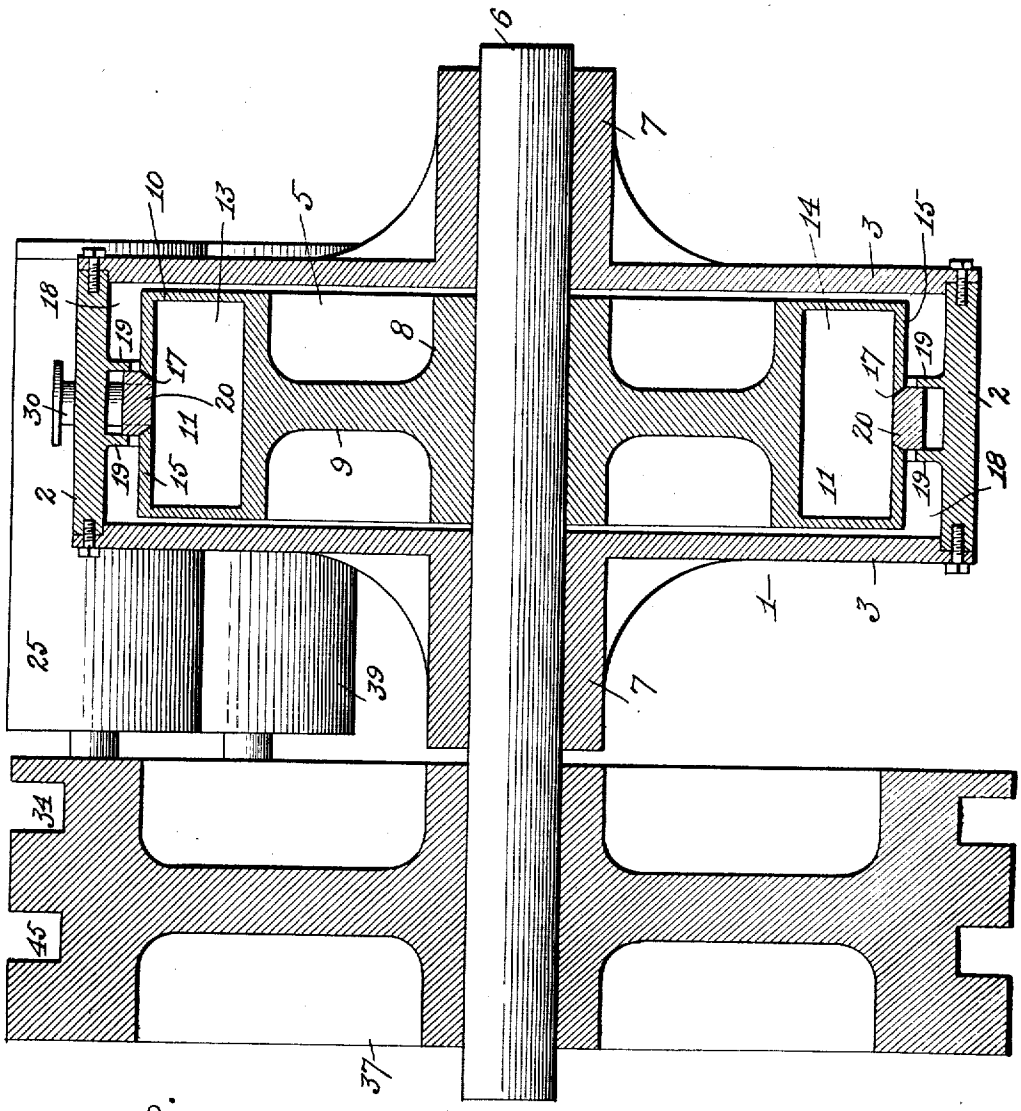


Fig. 2.

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3 SHEETS—SHEET 3.

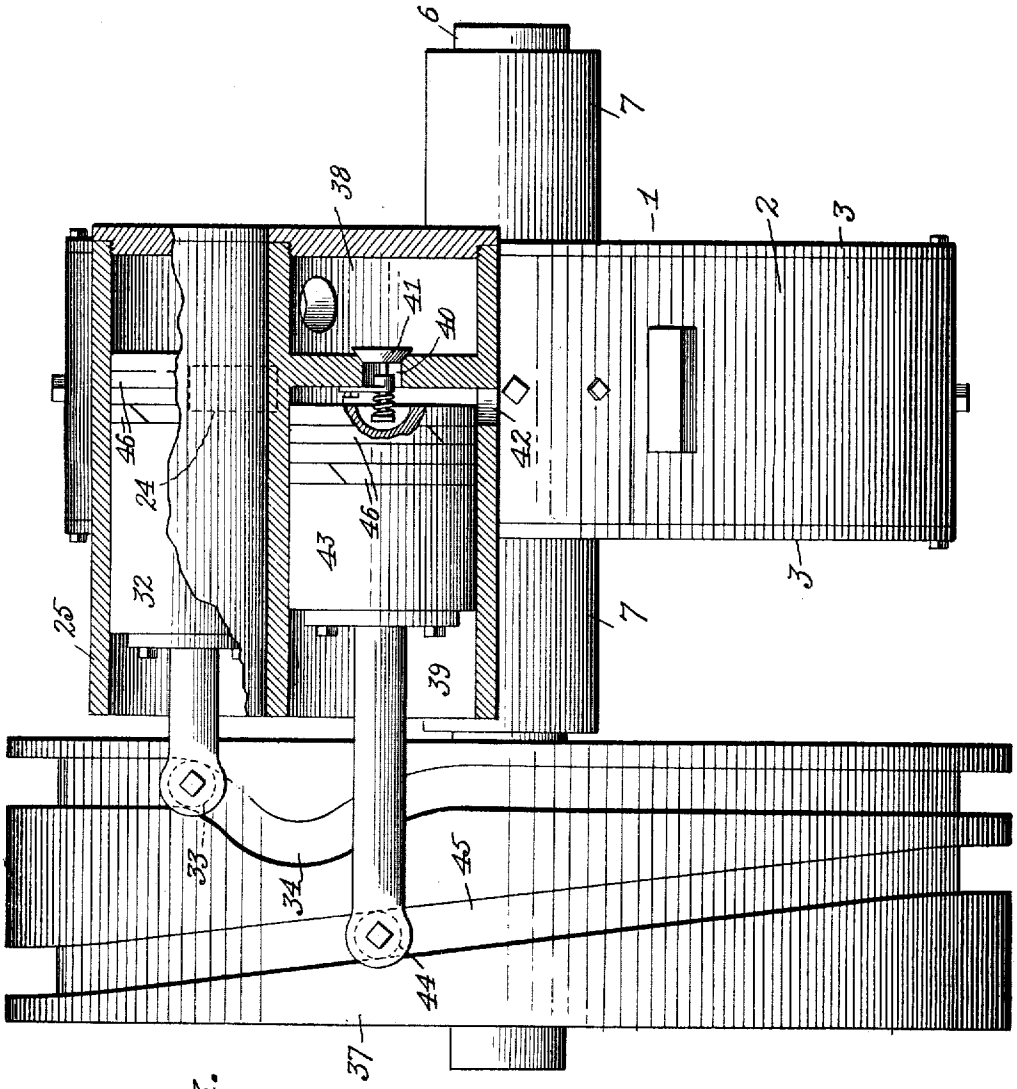


Fig. 3.

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UNITED STATES PATENT OFFICE.

AUGUST BRETSCHER, OF MUSKEGON, MICHIGAN.

ROTARY ENGINE.

No. 844,094. Specification of Letters Patent. Patented Feb. 12, 1907.

Application filed December 18, 1906. Serial No. 348,442.

To all whom it may concern:

Be it known that I, AUGUST BRETSCHER, a citizen of the United States, and a resident of Muskegon, in the county of Muskegon and State of Michigan, have invented certain new and useful Improvements in Rotary Engines, of which the following is a full, clear, and exact description, such as will enable those skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

The invention relates to that class of rotary engines in which the fixed member is provided with supply and exhaust ports and the movable member is provided with a series of buckets which successively register with the ports in the fixed member to receive and to discharge the elastic fluid, the force of which causes the movable member to rotate.

The invention consists in the novel construction, combination, and arrangement of parts, such as will be hereinafter fully described, pointed out in the appended claims, and illustrated in the accompanying drawings.

In the drawings, in which similar reference characters designate corresponding parts, Figure 1 is a transverse vertical sectional view of a rotary engine embodying the invention. Fig. 2 is a similar view at right angles to that shown in Fig. 1. Fig. 3 is a detail sectional view of the valve and pump mechanism.

Referring to the drawings in detail, the fixed member or casing 1 comprises a cylindrical shell 2 and sides 3, secured at their edges to the edges of the shell. The cylindrical shell consists of a plurality of sections connected by lap-joints, as at 4. Inside of the casing is the movable member or wheel 5, mounted on the shaft 6, journaled in bearings 7 on the casing. The wheel comprises the hub 8, the web 9, and the rim 10, connected with the hub by the web. In the rim of the wheel are the buckets 11, separated by the partitions 12. Each bucket is rectangular in cross-section and has the radial impact-face 13, the bottom 14, inclined from the lower edge of the impact-face, and the top 15. Extending around the periphery of the wheel is the annular groove 16, forming openings 17 in the tops of the buckets. This groove is wedge-shaped in cross-section, with its sides converging inwardly.

Intermediate of the casing 1 and the periphery of the wheel 5 is the annular chamber 18, into which project the ribs 19 on the inner face of the shell 2. The ribs form an annular channel in which is seated the ring 20, encircling the wheel. The inner side of the ring is shaped to register with the annular groove 16 in the periphery of the wheel. The contacting faces of the wheel and ring are polished, so that a close registration of the ring with the groove can be secured. The ring is made in sections, connected by slip-joints 21, so that it can contract and expand to meet the contraction and expansion of the wheel. Passing through the shell 2 are the set-screws 22, impinging on the ring and serve to hold the latter in close engagement with the groove in the wheel. On the set-screws are the coil-springs 23, bearing on the ring to normally press the latter inwardly.

At intervals in the casing are the supply-ports 24, leading from the valve-cylinders 25. While only two valve-cylinders are shown, their number may vary to meet the different requirements. Each supply-port registers with an opening 26, passing through the ring 20. On the ring is the abutment 27, in which the opening 26 is formed. To prevent leakage into the annular chamber 18, a sleeve 28 is seated in the abutment and the opposite wall of the cylinder and surrounds the port and opening. This sleeve has endwise play, so that it will not oppose the contraction and expansion of the ring. Immediately back of each supply-port is the exhaust-port 29, passing through the ring 20 and the shell 2. To prevent leakage at this port, the sleeve 30 is provided. The end of the ring-section adjacent to the exhaust-port is firmly held in place against the sleeve 30 by the pin 31 keying it to the casing.

In the valve-cylinder 25 is the piston 32, reciprocated by the roll 33 on its stem engaging with the cam-groove 34 in the periphery of the fly-wheel 37 on the shaft 6. This valve mechanism controls the supply-port 24, leading through the casing 1. The cylinder 25 opens into the explosion-chamber 38, into which the explosive charge passes from the pump-cylinder 39 through the opening 40,

controlled by the check-valve 41. The pump-cylinder communicates with the source of the explosive compound through the passage 42. The explosive compound is compressed and forced through the opening 40 by the piston 43, reciprocated by the roll 44 on its stem engaging with the cam-groove 45 in the periphery of the fly-wheel 37. On the pistons 32 and 43 are the usual packing-rings 46. When the explosive compound enters the explosion-chamber 38, it is ignited by any of the well-known devices used for the purpose. By means of the cam-grooves in the fly-wheel the timing and movement of the pistons are controlled.

The operation of the device is as follows: The expansive fluid passes through the supply-port 24 and enters the buckets 11 through the openings 16 as the buckets successively pass the port. The inclination of the port is such that the energy of the elastic fluid is directed against the impact-faces 13 of the buckets, and thereby rotary movement is imparted to the wheel 5. As the latter rotates the opening 16 in the top of each bucket as it leaves the port is closed by the ring 20, and the bucket retains its charge until it registers with the succeeding exhaust-port 29, where the charge escapes and the bucket is free to receive a fresh charge of the expansive fluid at the next supply-port. Before the machine is started the ring 20 is adjusted by means of the set-screws 22, so that there is a close engagement between it and the annular groove 17 in the periphery of the wheel. After the engine has started the wheel will expand to some extent, and the expansion will be taken up by the springs 23. The latter will also take up the force of an excessive impact of the expansive fluid on the buckets.

While the invention has been described as being applied to an explosive-engine, it can also be applied to steam-engines and also to any others in which an expansive or elastic fluid is used to produce the energy.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a rotary engine, a casing provided with supply and exhaust ports, a wheel rotatable in said casing and provided with buckets and having an annular groove in its periphery to form openings in said buckets to register with said ports, and a ring seated in said annular groove to close the openings in the buckets between the ports.

2. In a rotary engine, a casing provided with supply and exhaust ports, a wheel rotatable in said casing provided with buckets and having an annular groove in its periphery to form openings in said buckets to register with said ports, and an adjustable ring seated in said annular groove in the periphery of the wheel to close the openings in the buckets between the ports, and means for adjusting said ring into and out of said groove.

3. In a rotary engine, a casing having supply and exhaust ports, a wheel rotatable in said casing and provided with buckets and having an annular groove in its periphery to form openings in said buckets to register with said ports, and a ring adjustably mounted in said casing and engaging with the annular groove in the periphery of said wheel to close the openings in the buckets between the ports.

4. In a rotary engine, a casing provided with supply and exhaust ports, a wheel rotatable in said casing provided with buckets and having an annular groove in its periphery to form openings in said buckets to register with said ports, a ring adjustably mounted in said casing and engaging with the annular groove in the periphery of said wheel to close the openings in said buckets between the ports, and set-screws in said casing and impinging on said ring to adjust the latter in said annular groove in the periphery of the wheel.

5. In a rotary engine, a casing provided with supply and exhaust ports, a wheel rotatable in said casing and provided with buckets and having an annular groove in its periphery to form openings in said buckets to register with said ports, a ring adjustably mounted in said casing and engaging with the annular groove in the periphery of said wheel to close the openings in the buckets between the ports, and springs bearing on said ring to normally press the latter into said groove.

6. In a rotary engine, a casing provided with supply and exhaust ports, a wheel rotatable in said casing and provided with buckets having an annular groove in its periphery to form openings in said buckets to register with said ports, a ring adjustably mounted in said casing and engaging with the annular groove in the periphery of said wheel to close the openings in the buckets between the ports, set-screws in said casing impinging on said ring to adjust the latter in said annular groove, and springs on said set-screws bearing on said ring to normally press the latter into said groove.

7. In a rotary engine, a casing provided with supply and exhaust ports, a wheel rotatable in said casing provided with buckets and having an annular groove in its periphery to form openings in said buckets to register with said ports, and a ring formed of relatively movable sections seated in said annular groove to close the openings in said buckets between said ports.

8. In a rotary engine, a casing provided with supply and exhaust ports, a wheel rotatable in said casing provided with buckets

and having an annular groove in its periphery to form openings in said buckets to register with said ports, a ring seated in said annular groove and having openings to register with said ports and with the openings in said buckets, and sleeves inclosing said ports and the openings in said ring.

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

AUG. BRETSCHER.

Witnesses:
W. F. CHRYSTAL,
ALEX RODGERS.