No. 719,045. PATENTED JAN. 27, 1903.

O. G. RIESKE.

ROTARY GAS ENGINE.

APPLICATION FILED DEC. 16, 1901.

NO MODEL. 2 SHEETS—SHEET 1.

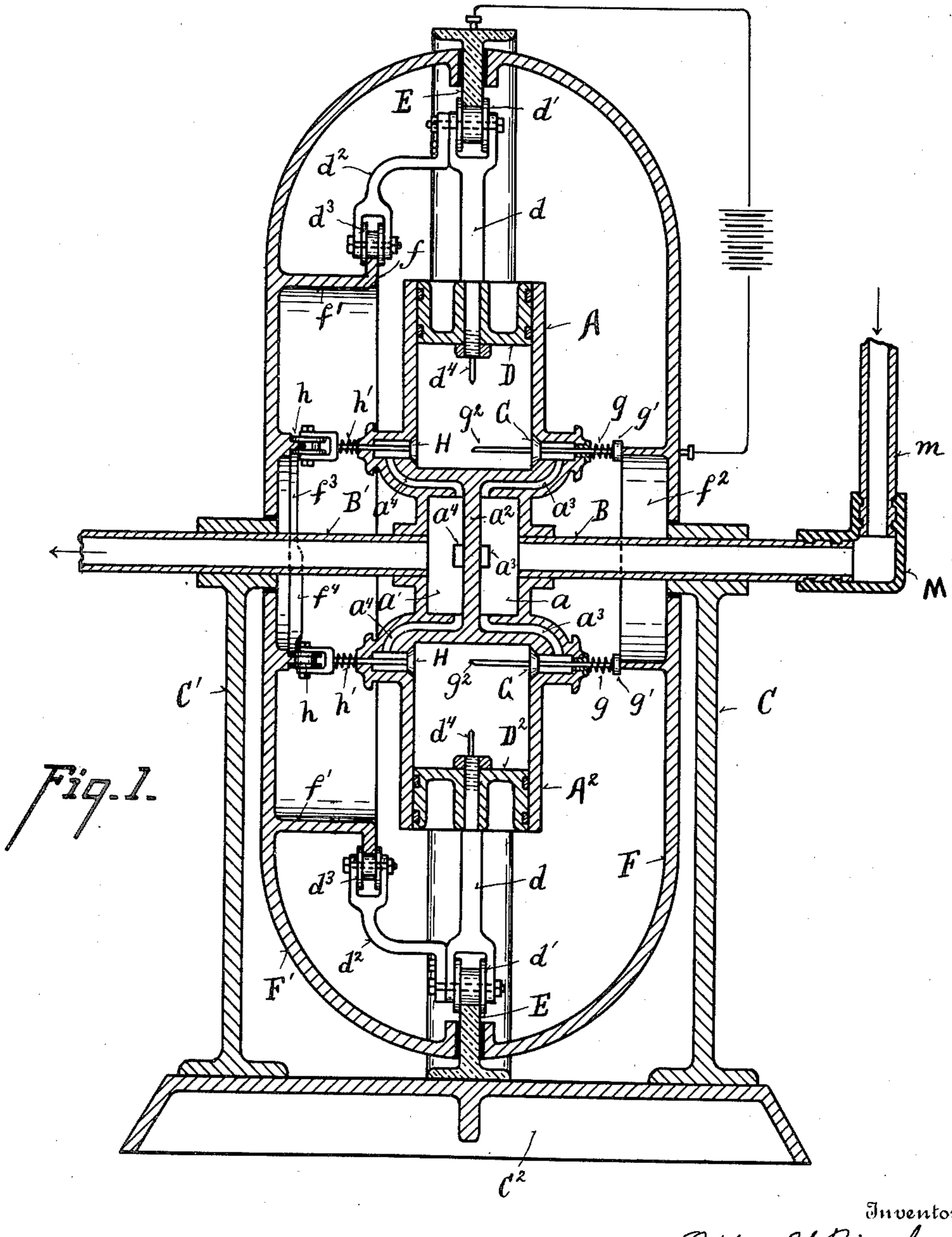

Fig. 1.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

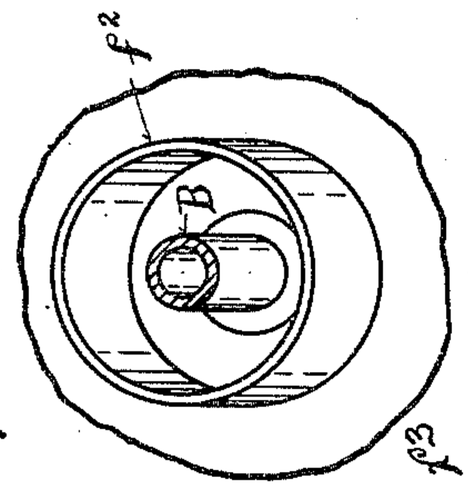


Fig. 4.

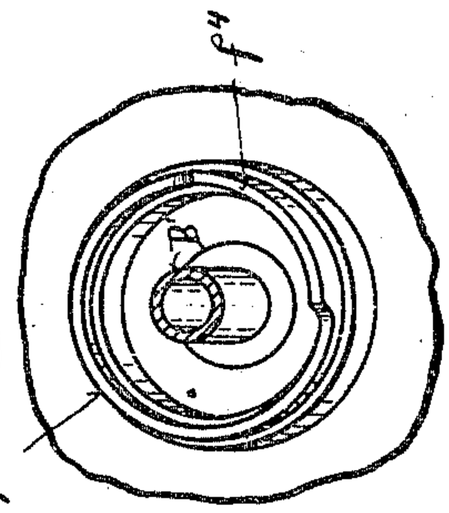


Fig. 5.

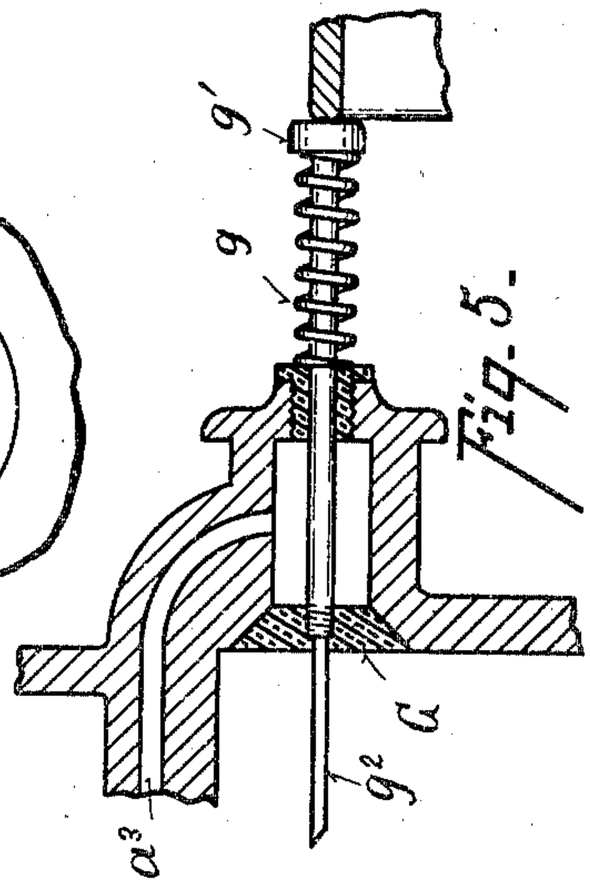
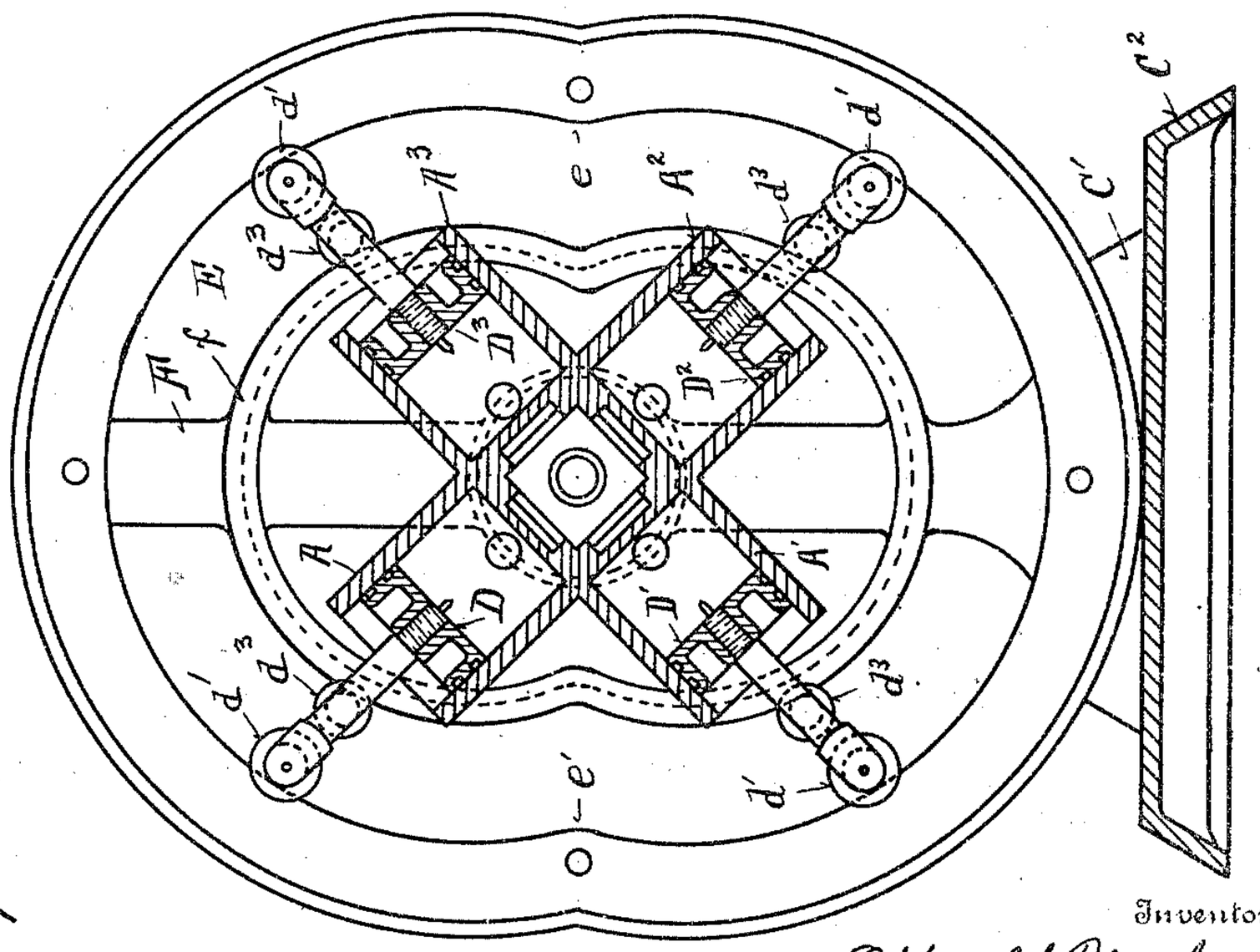


Fig. 2.



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UNITED STATES PATENT OFFICE.

OTTO GEORGE RIESKE, OF DAYTON, KENTUCKY, ASSIGNOR OF TWO-THIRDS TO JAMES J. GROGAN AND JAMES E. O'CONNELL, OF CINCINNATI, OHIO.

ROTARY GAS-ENGINE.

SPECIFICATION forming part of Letters Patent No. 719,045, dated January 27, 1903.

Application filed December 16, 1901. Serial No. 86,139. (No model.)

To all whom it may concern:

Be it known that I, OTTO GEORGE RIESKE, a citizen of the United States of America, and a resident of Dayton, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Rotary Gas-Engines, of which the following is a specification.

The object of my invention is a rotary gas-engine run by the explosion of gas within its cylinders which has improved means for taking, compressing, exploding, and exhausting the gas within the cylinders and which is simple in construction and efficient in operation. This object is attained by the means described in the specification and illustrated in the accompanying drawings, in which—

Figure 1 is a central longitudinal vertical sectional view of a gas-engine embodying my invention. Fig. 2 is a transverse central sectional view of the same upon a somewhat-reduced scale, the parts being shown rotated an eighth of a revolution beyond the position shown in Fig. 1. Fig. 3 is a detail perspective view of the annular way against which bear the ends of the stems of the valves for controlling the admission of gas into the cylinder. Fig. 4 is a similar view of the camway for controlling the opening of the exhaust-valves. Fig. 5 is an enlarged detail sectional view of one of the admission-valves.

Referring to the parts, a central hollow hub, which is internally divided into an admission and an exhaust chamber a and a', respectively, by a web a^2 and which has formed integral with it four radiating-cylinders A, A', A^2, and A^3, open at their outer ends, is secured to rotating hollow shafts B B', which are journaled at their outer ends in standards C C', supported by base C^2, and at their inner ends lead into chambers a and a', respectively. In each of cylinders A, A', A^2, and A^3 is a reciprocating piston D, D', D^2, and D^3, each of which has an outwardly-projecting piston-rod d, at the outer end of which is journaled a wheel d', which bears outwardly against a stationary transverse rim or way E, which is secured to base C^2. Rim E is in the shape of an ellipse, with its sides drawn inward at diametrically opposite points e e', so that wheel d' in going from an uppermost or lowermost point of the rim to points e or e' would push piston D to the inner end of its cylinder. Piston-rods d have each an inwardly-projecting bent arm d^2, which carries at its inner end a wheel d^3, which engages a transverse flange f upon an annular rim f', which projects inward from a longitudinal oblong frame F, which is secured at top and bottom to transverse rim E and at its sides to standards C C'. Flange f is of the same shape as rim E, and its periphery is at all points equidistant from the inner edge of said rim. A wheel d^3 in going from either of the sides of flange f to its uppermost or its lowermost point draws its piston D from its innermost to its outermost position in its cylinder. Thus as the cylinders A A' A^2 A^3 rotate, pistons D, D', D^2, and D^3 are reciprocated within the cylinders by the action of wheels d' and d^3 upon rim E and flange f, respectively. Leading from admission-chamber a into the bottom of each of cylinders A, A', A^2, and A^3 are channels a^3, the openings of which in the cylinders are controlled by valves G, which are normally held to their seats by light coiled springs g. The outer ends g' of the valve-stems normally travel in contact with an annular flange f^2, which projects inward from frame F, and the inner ends g^2 of the stems project inward to the axis of cylinders A, A', A^2, or A^3 to contact similar projections d^4 upon the inner ends of piston-rods d. Piston-rods d and valve-stems g are oppositely charged from a source of electricity, so that an electric spark results when projections d^4 contact the ends g^2 of the valve-stems. From exhaust-chamber a' channels a^4 lead into the bottom of each of cylinders A, A', A^2, and A^3, the entrance thereof into the cylinders being controlled by valves H, the outer ends of whose valve-stems carry wheels h, which are held by a coiled spring h' in contact with an annular rim f^3, which projects inward from frame F. Rim f^3 has a cam f^4 in the fourth quarter of its circle, counting from the right-hand side of the rim in Fig. 2 around in a direction the reverse of that of the hands of a clock. When riding on cam f^4, wheels h open their respective valves H, which in the other quarters of

the rim are closed. Shaft B at its outer end is rotatably connected to a stationary elbow M, to which is attached a pipe *m*, which leads to a source of gas.

In operation, supposing cylinder A^3 to be at *e* and the cylinders to be rotating in a direction the reverse of that of the hands of a clock, in going from *e* to the topmost point of rim E cylinder D would take in gas. In going thence to point *e'* piston D would compress this gas. At *e'* projection d^4 touching g^2 would cause the gas to explode, the explosion forcing piston D outward and carrying the cylinder around to the lowest point of rim E, at which point wheel *h*, riding upon cam f^4, would open the exhaust and the cylinder upon reaching *e* would have expelled all the old exploded gas and be ready for a fresh supply. This same course is pursued in turn by each cylinder, so that at any time the cylinder in the first quarter of the revolution is taking in gas, in the second quarter the cylinder is compressing it, in the cylinder in the third quarter the gas is expanding from the explosion, and from the cylinder in the fourth quarter is exhausting.

What I claim is—

1. In a rotating engine the combination of a central rotatably-mounted chamber, radiating-cylinders secured thereto and communicating therewith, a hollow shaft leading into the chamber to supply gas thereto, an elliptic rim encircling the cylinders, reciprocating pistons in the cylinders with outwardly-projecting piston-rods having slipping contact with the rim and means for exploding the gas in a cylinder when compressed and exhausts for the escape of the exploded gases, substantially as shown and described.

2. In a rotating engine the combination of a central rotatably-mounted chamber, radiating-cylinders secured thereto and communicating therewith, a hollow shaft leading into the chamber to supply gas thereto, an elliptic rim encircling the cylinders, reciprocating pistons in the cylinders with outwardly-projecting piston-rods having slipping contact with the rim, electrically-charged projections carried by the pistons, oppositely-charged rods in the bottoms of the cylinders to contact said projections to explode the compressed gas and means for exhausting the exploded gas after expansion, substantially as shown and described.

3. In a rotating engine the combination of a central rotatable chamber, radiating-cylinders secured thereto and communicating therewith, means for supplying the chamber with gas, an outer stationary elliptic rim encircling the cylinders, an inner similar-shaped rim within the outer rim, pistons within the cylinders with outwardly-projecting rods having slipping contact at their outer ends with the outer rim and having inwardly-projecting arms having slipping contact with the inner rim, means for exploding the gas when compressed in a cylinder and means for exhausting it after expansion in a cylinder, substantially as shown and described.

4. In a rotating engine the combination of a central hub containing an admission-chamber, a hollow shaft leading into the chamber at the inner end and rotatably journaled at the outer end, radiating-cylinders secured to the hub, pistons within the cylinders having outwardly-projecting piston-rods, an elliptic rim surrounding the cylinders and with which the piston-rods have slipping contact, channels connecting the bottom of each cylinder with the admission-chamber, valves in the admission-channels to open by the suction of the outwardly-moving pistons for the admission of gas into the cylinders, means for exploding the gas when compressed and means for exhausting the exploded gas after expansion, substantially as shown and described.

5. In a rotating engine the combination of a central hub containing an admission and an exhaust chamber, means for admitting gas into the admission-chamber, radiating-cylinders secured to the hub, channels connecting the bottom of the cylinders with both the admission and the exhaust chambers, an elliptic rim encircling the cylinders, reciprocating pistons in the cylinders having slipping contact with the elliptic rim, valves in the admission-channels to open inward by the suction of the outwardly-moving pistons to take in gas from the admission-chamber, exhaust-valves in the cylinders having outwardly-projecting valve-stems, cams for contacting the valve-stems to open the cylinders to exhaust, and means for exploding the compressed gas in the chambers, substantially as shown and described.

6. In a rotating engine the combination of a central hub containing an admission and an exhaust chamber, hollow alined shafts secured to and leading at their inner ends into the chambers for the admission and exhaust of gas to and from the chambers and at their outer ends rotatably journaled in stationary bearings, radiating-cylinders secured to the hub, channels connecting the bottom of the cylinders with both the admission and the exhaust chambers, an elliptic rim encircling the cylinders, reciprocating pistons in the cylinders with outwardly-projecting rods having slipping contact with the elliptic rim, valves in the admission-channels to open inward by the suction of the outwardly-moving pistons to take in gas from the admission-chamber, exhaust-valves in the cylinders having outwardly-projecting valve-stems, cams for contacting the valve-stems to open the cylinders to exhaust, and means for exploding the compressed gas in the cylinders, substantially as shown and described.

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