No. 767,207. PATENTED AUG. 9, 1904.

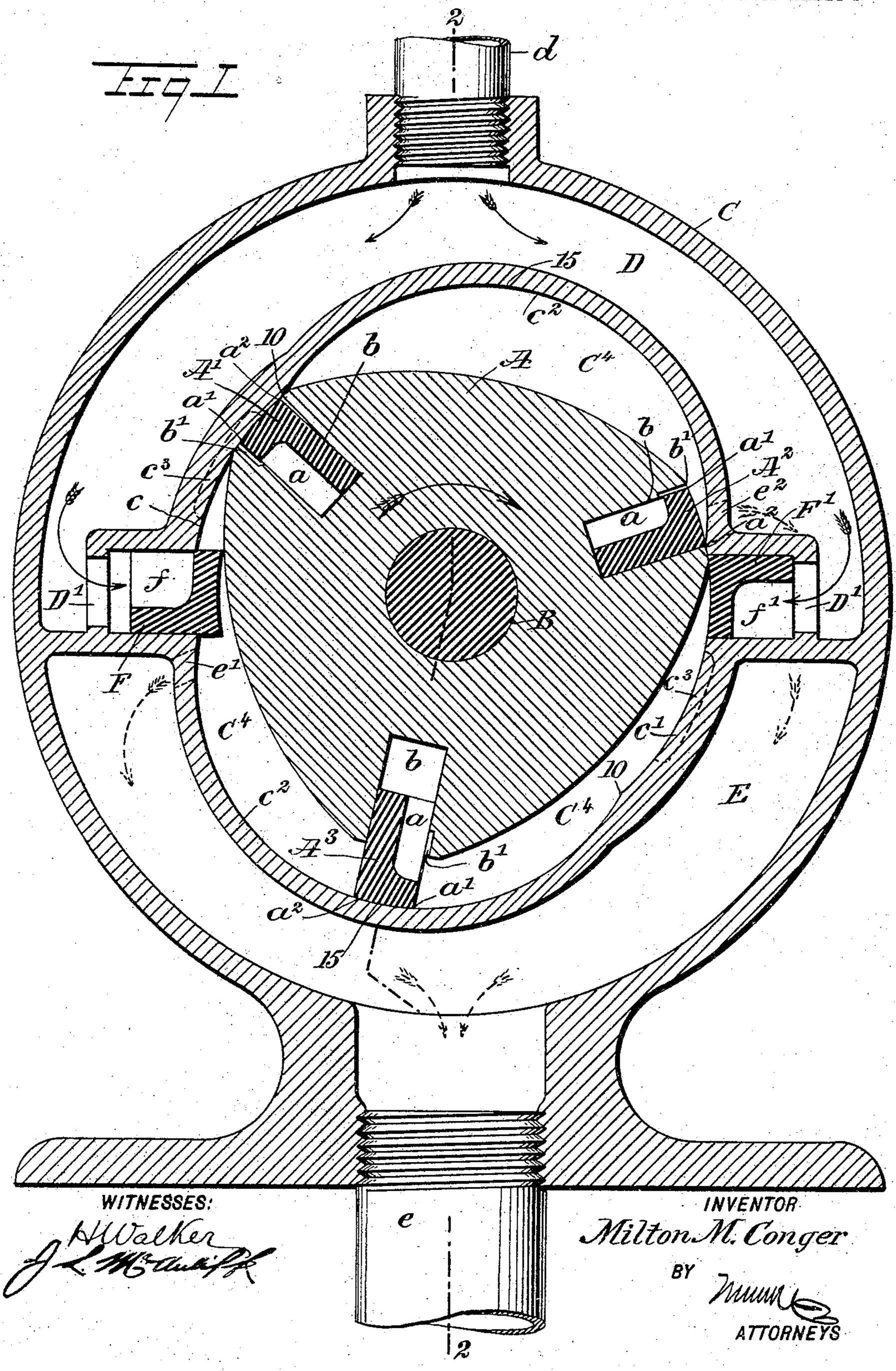
M. M. CONGER.

ROTARY MOTOR.

APPLICATION FILED SEPT. 1, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig 1



WITNESSES:

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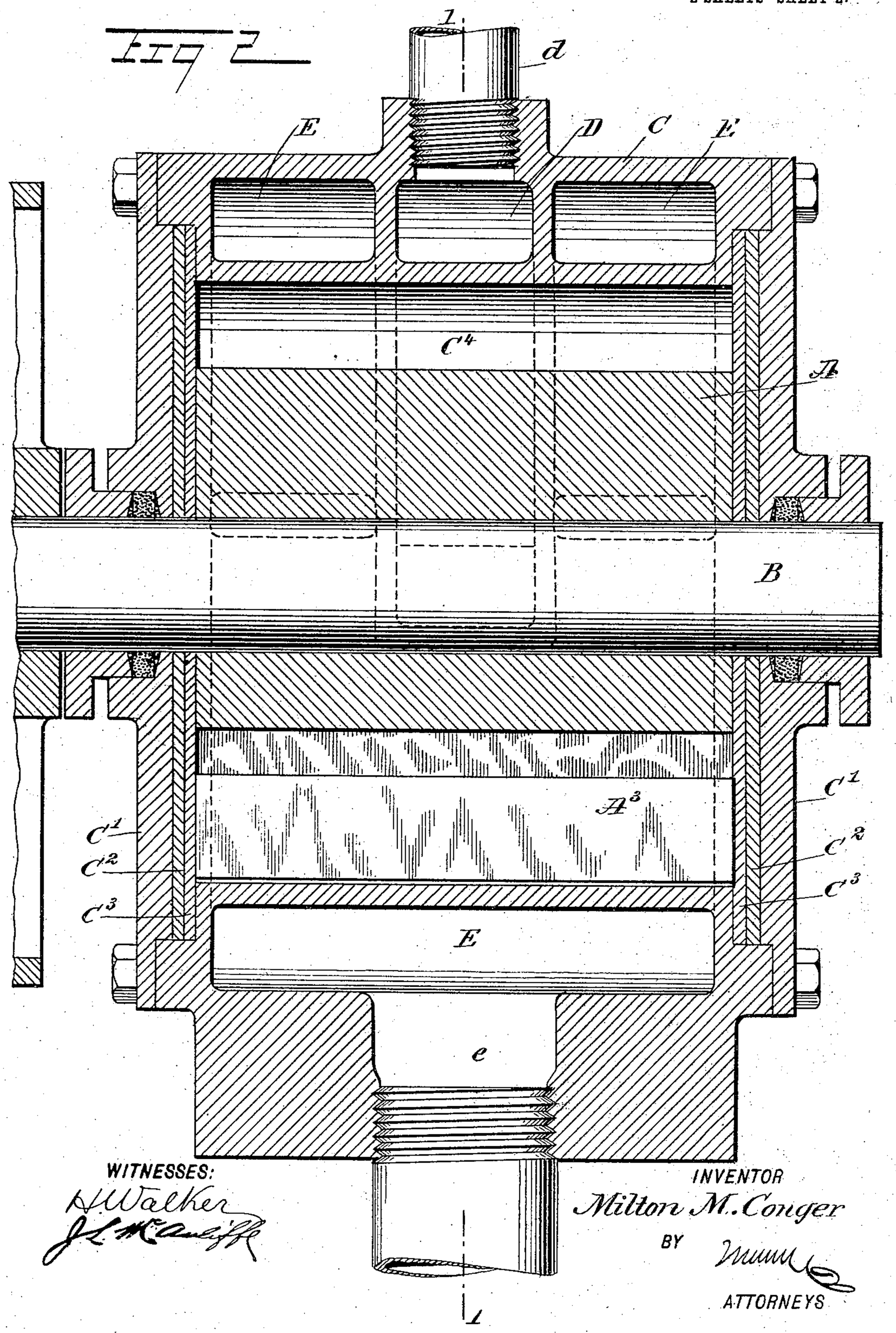
NO MODEL. 2 SHEETS—SHEET 2.

Fig 2



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No. 767,207. Patented August 9, 1904.

UNITED STATES PATENT OFFICE.

MILTON MARSHALL CONGER, OF LINNEUS, MISSOURI.

ROTARY MOTOR.

SPECIFICATION forming part of Letters Patent No. 767,207, dated August 9, 1904.

Application filed September 1, 1903. Serial No. 171,481. (No model.)

To all whom it may concern:

Be it known that I, MILTON MARSHALL CONGER, a citizen of the United States, and a resident of Linneus, in the county of Linn and State of Missouri, have invented a new and Improved Rotary Motor, of which the following is a full, clear, and exact description.

The object of the invention is to provide a rotary motor of an improved type characterized by increased efficiency and a very simple construction requiring a minimum amount of attention.

My improved motor embodies a rotary piston provided with valves or wings which are pressed outward by the steam and during a portion of their travel act against inclined surfaces on the case, giving a turbine action, the outward thrust against the inclines serving by the force of reaction to move the piston forward. The direct action of the motive agent is also utilized effectively against the piston-valves, and when the valves reach the point of farthest projection beyond the periphery of the body of the piston steam is admitted to their outer faces to balance the pressure and reduce to a minimum the work required to be done by the motive agent in the forcing of the said valves inward.

The invention will be more particularly described hereinafter and then defined in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both the figures.

Figure 1 represents a vertical section of a motor embodying my invention, the section being taken on the line 1 1 of Fig. 2; and Fig. 2 represents a vertical section on line 2 2 of Fig. 1.

The piston A is mounted on a shaft B within a case C, said piston being provided with valves or wings A' A^2 A^3, there being three of these in the specific construction illustrated. The ends of the case are closed by the heads C′, packing-disks C^2 at the inside of said heads, and metallic gaskets C^3 at the inside of the packing, and the walls of the case are hollow and partitioned, forming the central live-steam chamber D and exhaust-chambers E E at the sides of and also extending below the live-steam compartment. The inlet *d* or supply-pipe leads to the chamber D and the outlet *e* leads from the exhaust-chamber at the bottom of the engine. The chamber D terminates just below the horizontal center of the case and inlet-ports D′ lead therefrom at opposite sides to the working chamber C^4, said inlet-ports being provided with the abutment-valves F F′. The exhaust-chambers E E communicate with the working chamber C^4 by a suitable number of exhaust-ports e' e^2 at each side adjacent to the abutment-valves F F′. The interior of the casing is oblong and the piston is in general triangular in shape, having three curved sides, the wings or valves A' A^2 A^3 being located at the angles. With the valves A' A^2 A^3 thus disposed at one hundred and twenty degrees from each other and the abutment-valves at diametrically opposite points in the casing the working chamber C^4 will at no time be exposed wholly to exhaust conditions. The interior surface of the casing, it will be observed, is composed of different curves, there being short curves *c c′* at the sides adjacent to the abutment-valves F F′ and extending to points 10, from which points to the opposite inlet-port the surface c^2 c^2 is in the form of a longer curve eccentric to the first-named curves and which when a side of the piston is opposite forms with the latter a crescent-shaped space into and across which the valves A' A^2 A^3 are successively projected. In the curved surfaces *c c′* depressions c^3 are produced, forming steam-channels.

The valves or wings A' A^2 A^3 are hollowed out at one side, as at *a*, to form steam-chambers between the same and the walls of the pockets *b*, in which said valves are fitted, and leading to said steam-spaces from the working chamber C^4 are channels or ports *b′*. The abutment-valves F F′ are similarly made hollow, as at *f f′*, and the faces or front surfaces of the abutment-valves are concaved to a conformity with the curved front faces of the valves A' A^2 A^3.

The motor having been started by moving the piston to bring a valve thereof sufficiently past an abutment-valve to admit steam—as,

for instance, just beyond the position of the valve at the left of Fig. 1—steam will be admitted from the back of the abutment-valve and act to turn the piston A in the direction of the arrow. When the valve has passed the point 10, the valve will be thrust outward against the curved surface c^2 by the steam beneath the valve, and from the point 10 to about the point 15 the said valve acts against the curve c^2 as an inclined plane, the reaction tending to move the piston around. Until the point 15 or thereabout is reached it will be observed the valve contacts by its rear outer corner a', so that no live steam is admitted to its outer face. When, however, the point 15 is passed, the reverse condition takes place in order that the thrust outward against the outward incline may not be neutralized by the inward incline from the point 15 to the next abutment-valve, F'. Thus after each valve A' A^2 A^3 has passed the point 15 its forward edge a^2 will be in contact with the curved surface c^2, as is seen by the position of the valve A^2 at the right of Fig. 1, whereby live steam is admitted to the outer face of the valve to balance the pressure beneath and permit the valve to move inward without the material expenditure of energy. It will therefore be seen that the steam acts directly against the wings or valves and indirectly by reaction or turbine effect due to the thrust of the valves against the inclined planes from the points 10 to 15. It will also be clear that the abutments are subject only to the outward pressure of the steam or other motive agent behind them when being forced outward, while when being pressed inward the live steam acts on the outer faces of said valves to balance the pressure thereon, as will appear from a comparison of the relative positions of the said abutment-valves. Furthermore, by my form of casing and piston and the special arrangement of wings and abutment-valves the motive agent will be used expansively during a large portion of the travel of the piston. Thus, taking the positions of wing A' and abutment F, (at the left of Fig. 1,) steam is about to be admitted through the said abutment; but it will be cut off before the wing A' reaches the point 15, and in the further travel of the said wing to the next exhaust-port *e* the wing will be under the influence of the expansive action of the steam. During the movement of the wing A' under the expansive action of the steam the abutment F will be moved to the inner position by the opposed curved side of the piston.

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

1. In a rotary motor a casing having a working chamber and valve-controlled inlet-ports and suitable exhaust-ports, the surface of the chamber presenting curves adjacent to the inlet-ports, and longer curves beyond and adjacent to the first-named curves and presenting outward and inward inclines, and a rotary piston having sliding valves, the said valves being subject at their backs to the action of the live steam, to force them outward against the mentioned outward inclines of the casing whereby to tend to force the piston forward, the smaller curved surfaces of the casing having channels therein.

2. In a rotary motor, the combination of a casing having valve-controlled inlets, and a rotary piston having a plurality of sides which form with the casing, a series of steam-spaces, the said piston having movable wings or valves adapted to be projected into said spaces, and the sides of the piston serving to act on the valves of the inlets and cut off the steam during a portion of the travel of the wings, the front faces of the valves of the piston being curved to correspond with the curved outer faces of the inlet-valves.

3. In a rotary motor, a casing having an oblong working chamber formed with inlet-ports controlled by opposite abutment-valves and with exhaust-ports, and a rotary piston of general triangular shape having wings or valves at the angles, the valves being movable in inward and outward directions and subject at the backs thereof to the action of the motive agent in the working chamber.

4. In a rotary motor, a casing having a working chamber, and valve-controlled inlet-ports and suitable exhaust-ports, the surface of the chamber presenting curves adjacent to the inlet-ports, and longer curves beyond and eccentric to the first-named curves, and a rotary piston of general triangular shape having sliding valves located at the angles of the piston; and subject at their backs to the action of the motive agent in the working chamber.

5. In a rotary motor, a casing having a working chamber and valve-controlled inlet-ports and suitable exhaust-ports, the surface of the chamber presenting curves adjacent to the inlet-ports, and longer curves beyond and eccentric to the first-named curves, and a rotary piston having sliding valves subject at their backs to the action of the motive agent in the working chamber; the piston being of general triangular shape and the valves thereof being arranged at the angles.

6. In a rotary motor, a casing having a working chamber and valve-controlled inlet-ports and suitable exhaust-ports, the surface of the chamber presenting curves adjacent to the inlet-ports, and longer curves beyond and eccentric to the first-named curves, and a rotary piston having sliding valves subject at their backs to the action of the motive agent in the working chamber; the first-named curves of the casing having channels therein.

7. In a rotary motor, a casing having a working chamber and inner and outer walls forming a steam-space outside the working chamber, said outer space being divided into

a central live-steam compartment and side exhaust-compartments, the live-steam compartment extending about half-way around the casing having an inlet, and valve-controlled ports leading to the working chamber, and the exhaust-compartments extending completely around the casing having ports leading from the working chamber and an outlet, and a rotary piston having valves at the periphery and movable in inward and outward directions to follow the surface of the working chamber.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MILTON MARSHALL CONGER.

Witnesses:
S. W. FURNAS,
GEORGE W. WRIGHT.