H. P. McCANN.

ROTARY ENGINE.

APPLICATION FILED JULY 1, 1908.

912,253.

Patented Feb. 9, 1909.

2 SHEETS—SHEET 2.

Fig. 3.

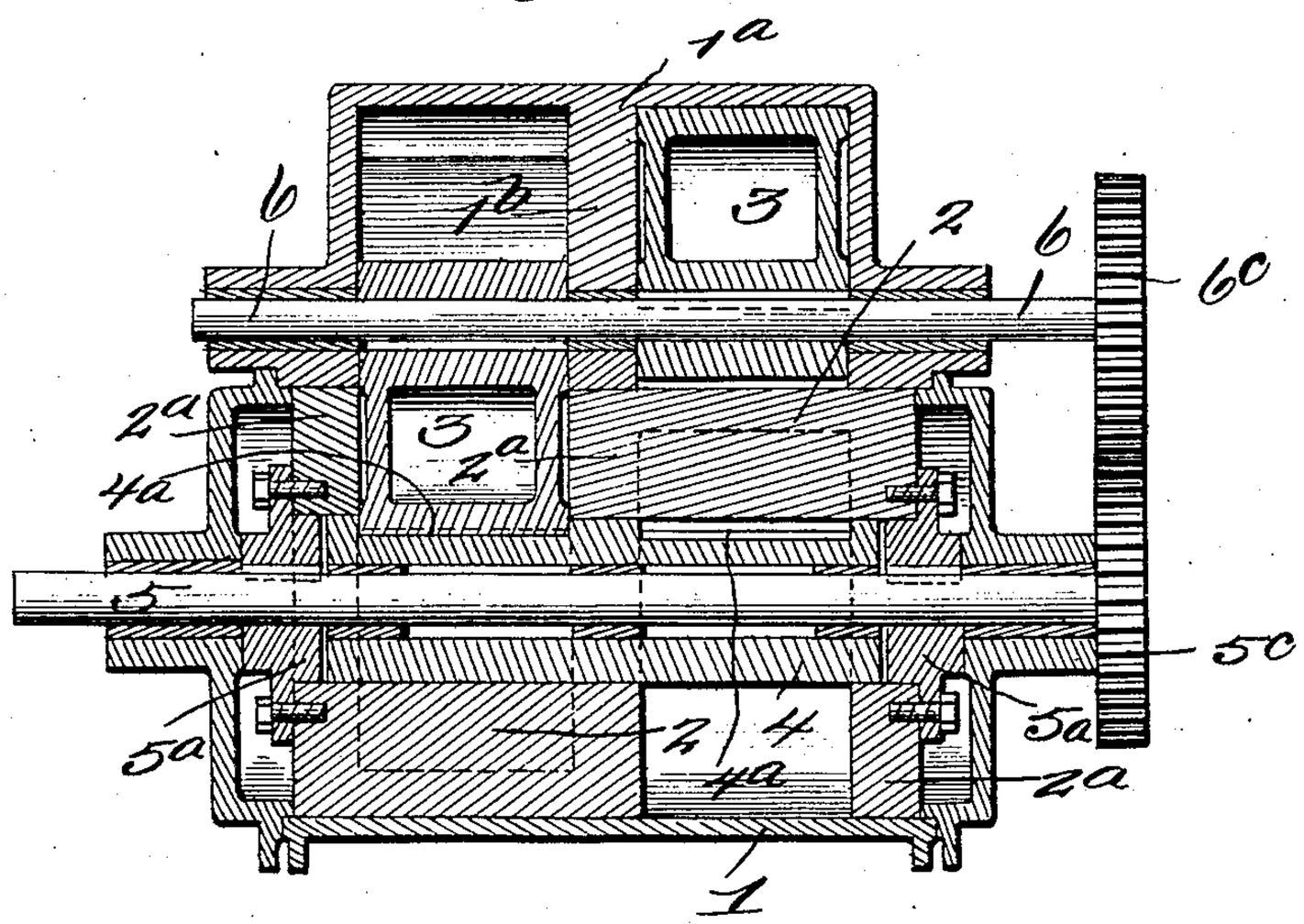


Fig. 4.

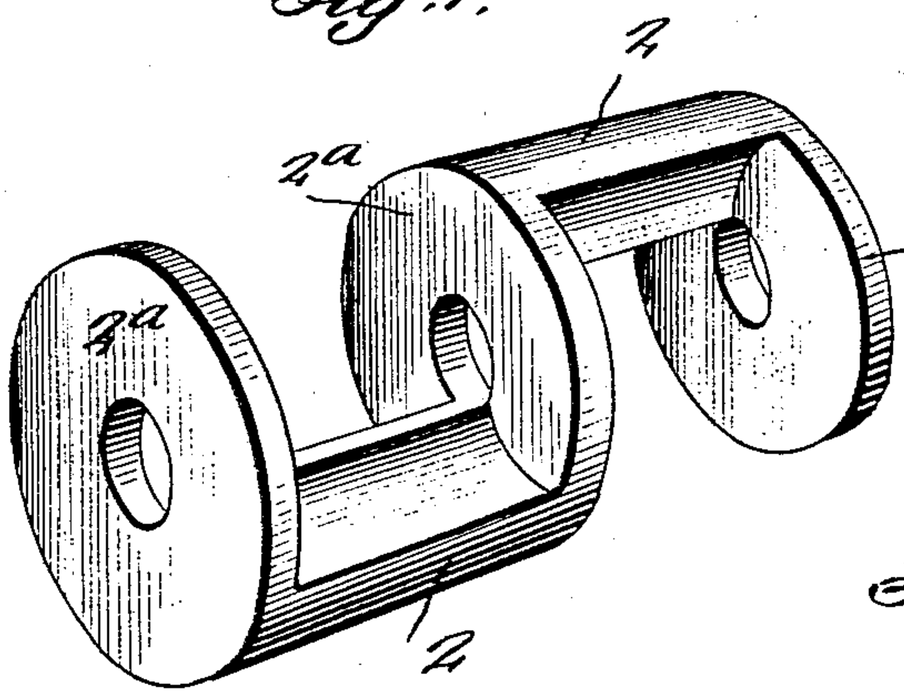
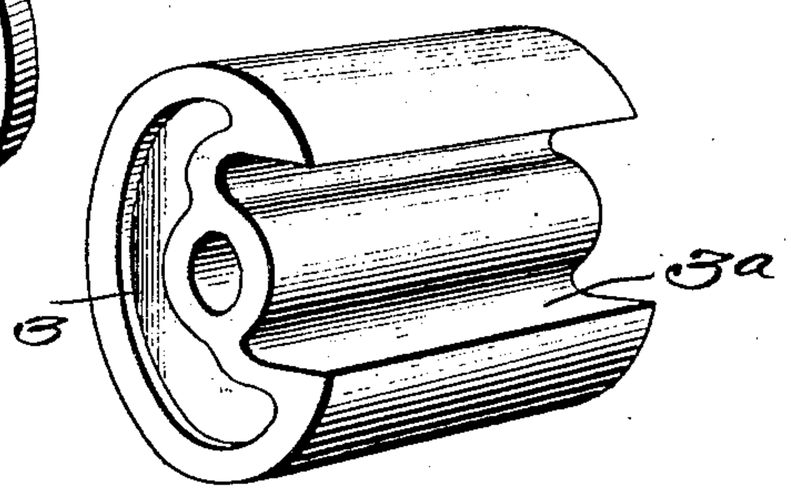


Fig. 6.



Witnesses.

R. A. Bosworth

James B. Mansfield

Inventor.

Harry Paul McCann.

By Alexander & Dowell

Attys.

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Fig. 1.

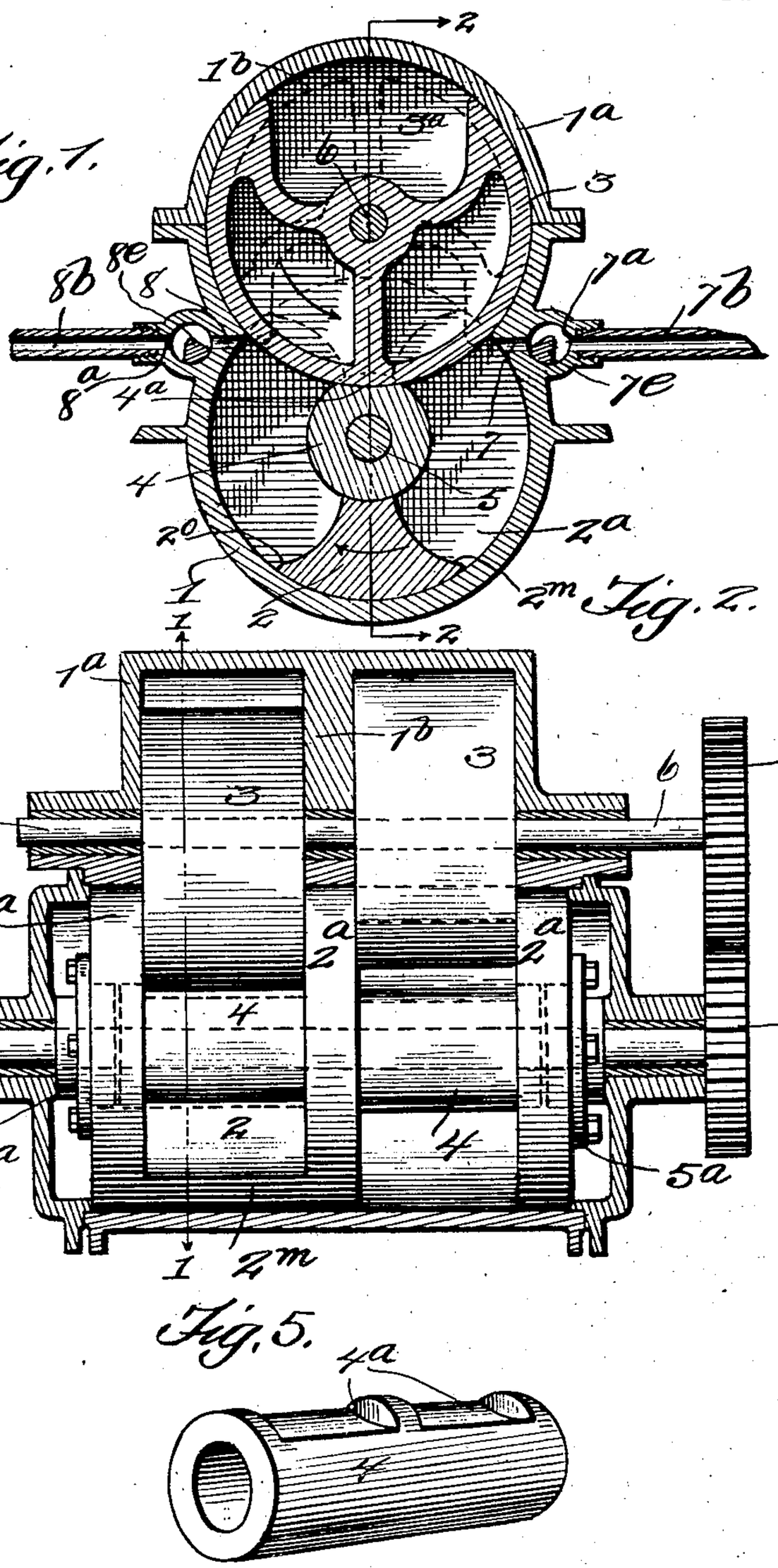

Fig. 5.

Witnesses.

R. L. Boswell.

James E. Mansfield

Inventor

Harry Paul McCann.

By Alexander & Dowell

Attys.

UNITED STATES PATENT OFFICE.

HARRY PAUL McCANN, OF COLUMBUS, OHIO.

ROTARY ENGINE.

No. 912,253. Specification of Letters Patent. Patented Feb. 9, 1909.

Application filed July 1, 1908. Serial No. 441,282.

To all whom it may concern:

Be it known that I, HARRY PAUL MCCANN, of Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Rotary Engines; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in rotary engines and has particular reference to that type of rotary engines wherein the pistons revolve in annular chambers concentric to the axis of the shaft to which the pistons are fastened.

The objects of the invention are: (1) To provide suitable surfaces of contact for all the revolving parts; these surfaces being of such a form as to be readily adapted to the use of suitable packing strips and rings to prevent leakage of the motive fluid. (2) To construct and arrange the several parts of the engine in such a manner as to balance the strains due to the pressure of the motive fluid within the working chambers, thereby eliminating any excessive friction between the revolving and stationary members of the engine. (3) To provide an engine having no reciprocating parts, and therefore adapted for high speed, and to have all the rotating members properly balanced. (4) To produce an engine simple in construction, and compact in form, yet permitting the use of relatively large piston areas; thereby enabling maximum power to be obtained from each unit in the engine. (5) To provide an engine adapted to the use of any motive fluid, together with suitable cut-off devices, whereby the full expansive force of the fluid can be utilized. (6) To provide an engine capable of being reversed by simply reversing the direction of the flow of the motive fluid.

The invention will be clearly understood from the following detailed description of the engine illustrated in the accompanying drawings, and the parts and combination of parts for which protection is desired are set forth in the appended claims.

In said drawings—Figure 1 is a vertical cross-section of the engine on the line 1—1, Fig. 2. Fig. 2 is a vertical cross-section of the engine housing on the line 2—2, Fig. 1, the rotating members being shown in elevation. Fig. 3 is a vertical cross-section at the line 2—2, Fig. 1, showing the housing and rotating members in section. Fig. 4 is a perspective view of the rotary pistons detached. Fig. 5 is a perspective view of the stationary core; and Fig. 6 is a perspective view of one of the revolving abutments.

The engine as shown comprises two similar connected units, each containing a rotary piston 2 and a co-acting rotary abutment 3; the pistons working in the lower part 1 of the inclosing casing, and the abutments working in the upper part 1^a of said casing. While but two units are shown their number can be varied according to the H. P. it is desired to derive from the engine.

Extending axially through the lower part 1 of the casing is a shaft 5 upon which are mounted three disks 2^a, a core 4 being loosely strung on the shaft between it and the disks, which can rotate freely around the core, and are rigidly supported on and attached to the shaft 5 by end-plates 5^a keyed to the shaft and bolted to the outermost disks 2^a, as shown.

The pistons 2, 2, are rigidly connected to and between the central and outer disks 2^a at diametrically opposite sides of the shaft; and the pistons 2 and disks 2^a may be formed integrally, if desired, as indicated in Fig. 4.

The upper part 1^a of the casing is divided by a central partition 1^b into two chambers. Opposite the pistons 2, and passing axially through these chambers is a shaft 6, journaled in the ends of the casing. On shaft 6 within the casing are mounted rotary abutments 3, 3, one opposite each piston 2. Said abutments are of such diameter that they extend into the part 1 of the casing, and between the disks 2^a, and contact with the upper side of the core 4, which is recessed at 4^a, to contact with the abutments, and said abutments keep the core from rotating with the pistons, and shaft 5.

It will be seen that the space between two adjacent disks 2^a, the wall of the casing, the periphery of the adjacent abutment, and the core 4, forms a closed chamber, in which the piston 2 can rotate. To permit the piston to pass by its related abutment 3, the abutment is recessed as at 3^a, and the shafts 5 and 6 are intergeared by gears 5^c, 6^c, so as to rotate synchronously, so that at the proper time the recess in the abutment will

meet the piston, and allows it to pass and thus rotate without hindrance. The pairs of pistons and related abutments are set about 180 degrees apart, so that one piston and abutment are in effective operation, while the other piston is passing through the pocket of its related abutment.

The pistons 2, 2, are adapted to revolve in the lower half of the casing as shown, and between said housing and the stationary core 4. This rotary motion is transmitted to the disks 2^a, and by these through plates 5^a to the main shaft 5.

The revolving abutments 3, 3, are adapted to revolve in the upper half of the casing, as shown, being indirectly connected to the main shaft 5 through shaft 6 and gears 6^c, 5^c. The recesses 3^a in the abutments 3 allow the pistons 2, 2, to pass through the space in the upper half of the casing. After such passage of the pistons 2, 2, these revolving abutments 3, 3, are adapted to close up the ends of the annular working chambers, the walls of which are formed by the casing, stationary core 4, and the disks 2^a, thereby forming closed chambers on each side of the pistons 2, 2, which chambers are adapted to receive pressure from a motive fluid or gas on one side and to exhaust or compress the fluid or gas at the other side.

The stationary core 4 is kept from revolving by the revolving abutments 3 alternately engaging the depressions 4^a on its surface, thereby preventing its turning. The function of this stationary core 4 is to provide suitable surfaces of contact for the revolving parts to engage, thereby preventing the passage of the gases or motive fluid form one chamber to the other.

The motive fluid can be admitted into the working chambers through ports 7 connecting with a valve chamber 7^a, to which fluid is supplied through a pipe 7^b from any suitable source. And the fluid can be exhausted from the working chambers through ports 8, connecting with a valve chamber 8^a, communicating with a pipe 8^b. The ports 7 and 8 may be controlled by valves 7^e, 8^e, controlled by suitable mechanism, not shown, so that the ports can be opened and closed as desired. By simply admitting fluid through ports 8, and discharging it through ports 7 the direction of rotation of the engine shaft can be reversed.

In operation for example the motive fluid enters the working chambers through the port 7 (Fig. 1) after the foot or rear edge 2^m of the piston 2 has passed the port. The pressure upon the face of the piston 2 then causes it to revolve in the direction shown by the arrows until the foot 2^m passes the port 8 on the opposite side, thereby permitting the fluid to escape. At this point motive fluid is admitted to the other working chamber and the piston 2 therein receives pressure on its face, thereby keeping up the movement of both pistons. The fluid is exhausted from the forward side 2^o of the piston during its movement from the point 7 to the point 8.

Having described my invention what I claim as new and desire to secure by Letters Patent thereon is:

1. In combination, in a rotary engine, a casing, a pair of pistons mounted between disks therein, a main shaft connected to said disks, a stationary core surrounding said shaft and extending between said disks, and revolving abutments coöperating with said pistons.

2. In a rotary enigne, the combination of a casing, a main shaft, disks therein, a plurality of pistons mounted between adjacent disks, a stationary core surrounding said shaft and extending between said disks, an auxiliary shaft, abutments on said shaft coacting with the pistons, and gearing between said shafts.

3. The combination, in a rotary engine, of a casing, a piston mounted between revolving disks, a stationary core having a depression in its surface and extending between said disks and adapted to contact the inner portion of said piston, a shaft extending through said stationary core and connected to said disks, and a revolving abutment engaging the recess in the core and having a recess to accommodate the piston.

4. In a rotary engine, the combination of a casing, a pair of pistons therein mounted between revolving disks, a stationary core, having depressions in its surface, between said disks, and extending between the disks and adapted to be contacted by the inner portions of said pistons, a shaft extending through said stationary core and connected to said disks, and a pair of revolving abutments engaging the recesses in the core and having recesses to accommodate the pistons.

5. In a rotary engine, the combination of a casing, pistons therein mounted between revolving disks, a stationary core having suitable depressions on its surface, and extending between said disks and adapted to contact the inner portion of said pistons, a shaft extending through said stationary core and connected to said disks, and revolving abutments engaging the depressions in said core, and having recesses to receive the pistons.

6. In a rotary engine, the combination of a casing, a pair of adjacent pistons therein mounted between pairs of revolving disks, a stationary core having suitable depressions on its surface between the disks and extending through said disks, a shaft extending through said stationary core, and connected to said disks, an auxiliary shaft, a pair of revolving abutments thereon engaging the depressions in said core, and having recesses

to receive the pistons, and gearing between said shafts.

7. In a rotary engine, the combination of a casing, a main shaft, a pair of pistons mounted between circular disks on said shaft, a pair of abutments revolving in connection with said pistons and disks, said revolving abutments having recesses adapted to receive the said pistons; a core between said disks, having depressions on its surface adapted to engage the revolving abutments and held stationary by contact therewith, said abutments alternately engaging the said depressions.

8. In a rotary engine, the combination of a casing, a main shaft, a plurality of pistons mounted between pairs of circular disks on said shaft, a plurality of abutments one for and revolving in connection with said pistons, an auxiliary shaft carrying said abutments, gearing between said shafts, each abutment having a recess adapted to permit the passage of the related piston; a core surrounding the main shaft between said disks having depressions on its surface engaged by the revolving abutments, said core being held stationary by contact with said abutments.

9. The combination in a rotary engine, of a casing, a pair of pistons mounted between circular disks adapted to revolve in the lower portion of the said casing, a main shaft extending through said casing and connected to said disks, a pair of abutments revolving in connection with said pistons, an auxiliary shaft carrying said abutments, gearing between said shafts, said revolving abutments having recesses on their surfaces to receive the said pistons as they rotate, and a stationary core mounted on the main shaft and extending between said disks, and having depressions on its surface engaged by the revolving abutments, said pistons operating alternately.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

HARRY PAUL McCANN.

Witnesses:
HARRY D. REISSER,
FRED. A. PAWSEY.