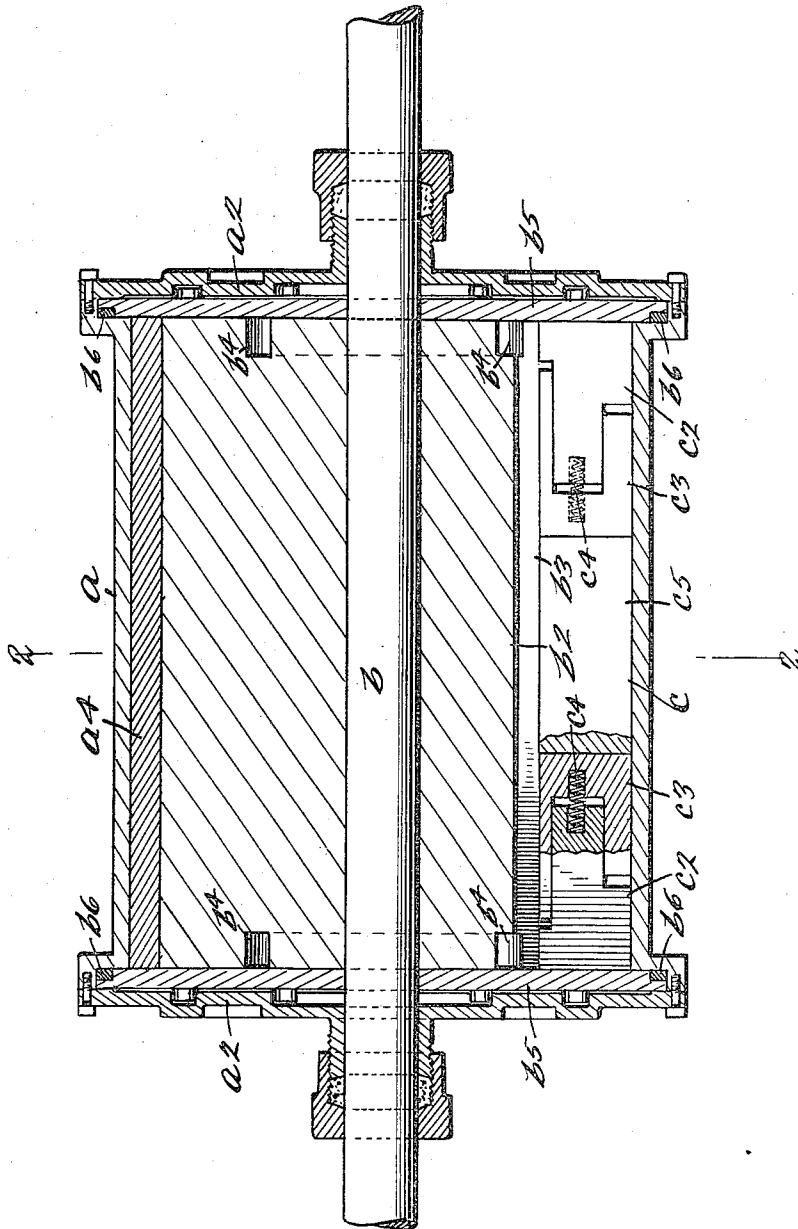


1,144,258.

L. G. SMITH.
 ROTARY ENGINE.
 APPLICATION FILED JUNE 27, 1914.

Patented June 22, 1915.
 2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES
F. B. Barry
J. C. Larsen

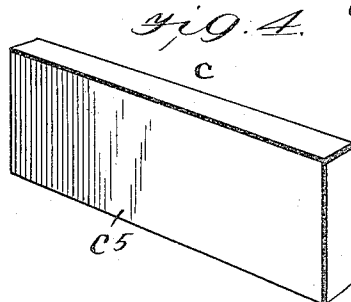
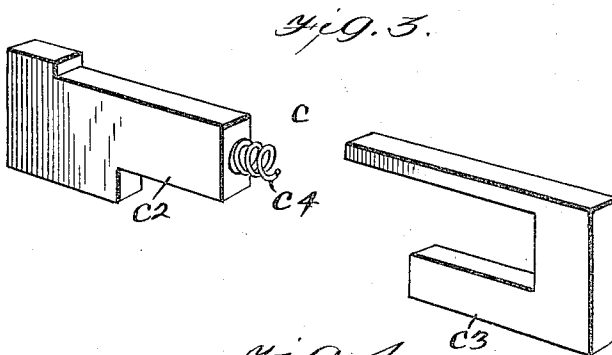
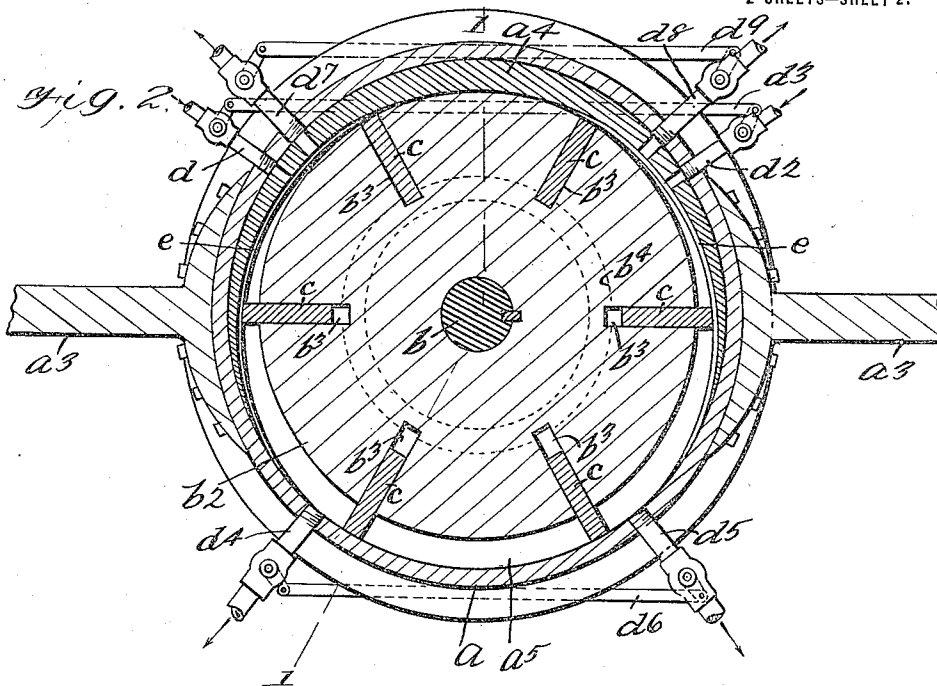
INVENTOR
Lyle G. Smith
 BY *Mumford Co*
 ATTORNEYS

L. G. SMITH.
 ROTARY ENGINE.
 APPLICATION FILED JUNE 27, 1914.

1,144,258.

Patented June 22, 1915.

2 SHEETS—SHEET 2.



WITNESSES
H. B. Barry
J. C. Larsen

INVENTOR
Lyle G. Smith
 BY *Mumford & Co.*
 ATTORNEYS

UNITED STATES PATENT OFFICE.

LYLE GROW SMITH, OF ST. LOUIS, MICHIGAN.

ROTARY ENGINE.

1,144,258.

Specification of Letters Patent.

Patented June 22, 1915.

Application filed June 27, 1914. Serial No. 847,650.

To all whom it may concern:

Be it known that I, LYLE G. SMITH, a citizen of the United States, and a resident of St. Louis, in the county of Gratiot and in the State of Michigan, have invented certain new and useful Improvements in Rotary Engines, of which the following is a specification.

My invention relates to rotary engines, and the main object thereof is to provide such an engine which consumes relatively little fuel, and takes but little space, in the degree of its power, as compared with reciprocating engines; a further object is to provide sliding pistons for the said rotor, and which are maintained in constant contact with the casing interior surface by means of the engine actuating fluid, as steam or explosive gases, automatically; a further object is to provide suitable valves for the said casing, inlet and outlet, and which may be reversed in action to reverse the engine; and a further object is to provide pistons formed of a plurality of parts, the outer of which are maintained in contact with the ends of the casing by means of springs, to prevent leakage of the actuating fluid.

My invention is fully described in the following specification, of which the accompanying drawings form a part, in which the same reference characters are used to designate the same parts in each of the views, and in which:—

Figure 1 is a section taken through a present preferred form of my invention, on the line 1—1 of Fig. 2; Fig. 2 is a section on the line 2—2 of Fig. 1; Fig. 3 is a perspective view of two elements of my pistons; and Fig. 4 is a similar view of another element thereof.

In the drawings forming a part of this application I have shown a circular casing a , having removable ends a^2 , and a shaft b arranged centrally therethrough, said casing being provided with suitable supports a^3 , and with a crescent shaped insert or abutment a^4 forming an eccentric chamber a^5 .

Keyed to the shaft b is a rotor b^2 , concentric with said shaft and with the exterior of said casing, provided with a plurality of radial slots b^3 extending throughout the length thereof, for the reception of sliding pistons c , said rotor having, also, a concentric channel b^4 at each end thereof in

communication with all of said slots, and said rotor is provided with a plate b^5 at each end thereof and, which, together with expanding rings b^6 , serve to make said rotor steam-tight, and proof against leakage.

The pistons c comprise, each, end members c^2 in longitudinally slidable engagement with complementary members c^3 and between each pair of which is an expansive, coil, spring c^4 , and I also provide a central member c^5 which serves to maintain the members c^3 in position, and which, through the coil springs c^4 , maintain a close contact of the members c^2 with the plates b^5 , this being clearly shown in Fig. 1.

I also provide two inlet pipes d and d^2 , on opposite sides of the casing a , each having a valve said valves being linked together as shown by a connecting rod d^3 , whereby but one may be open to the casing interior at one time; I also provide two outlet ports d^4 and d^5 having valves linked together as shown at d^6 , whereby the outlet or exhaust port on the same side of the casing as the open inlet port is closed, and the one on the same side of the casing as the closed inlet port is open; I also provide a supplemental outlet port at each side of the casing, as shown at d^7 and d^8 , the valves of which are linked together as shown at d^9 .

The action of the valves of the inlet and outlet ports will probably be automatic and synchronized, no means for such action having been deemed necessary to be shown as many forms thereof are now in use and may be designed; when steam is admitted into the casing a , through either of the inlet ports, said steam expands and, being blocked at the point of contact of the rotor b^2 with the insert a^4 exerts its force on the adjacent piston c and successively on the remaining pistons whereby the rotor is revolved, carrying the shaft b with it, the expanded steam being exhausted through the port d^5 or, if the exhaust valves are so set, through the port d^4 , this being arbitrary with the builder or engineer, and when the pistons successively reach the position of the port d^2 any steam or air in front of said pistons is forced out through the port d^8 .

When it is desired to reverse the engine, all that is necessary is to open the valve of the port d^2 to the admission of steam, instead of the port d^4 , and the rotor is revolved in opposite direction, as is also the shaft b .

As stated, I do not desire to limit myself to any specific type of valves or valve actuating means, my invention relating more particularly to the rotor b^2 and the sliding pistons therein and, in connection with the latter, attention is drawn to the fact that as a piston is forced inwardly, by the interior surface of the casing, or the insert therein, the air or steam in the corresponding slot is forced into the other piston slots, through the channel b^4 , and thus forcing the corresponding pistons outwardly, as there is no escape for air or steam from said slots and channels.

By reference to Fig. 2 it will be seen that I provide a groove e on the interior of the insert a^4 , at each side of the casing, these grooves permitting a portion of the steam to pass the pistons, in the positions of said grooves, to allow steam on each side thereof, whereby said pistons are balanced and may move into and out of the rotor b^2 freely, it having been found that the pistons would bind when pressure was exerted by the steam on but one side thereof.

While I have shown a specific form of my invention, I do not limit myself thereto, but may make changes therein and modifications thereover, within the scope of the following claims, without departing from the spirit of my invention or sacrificing its advantages and, with such reservation,

What I claim as new, and desire to secure by Letters Patent, is:—

1. A rotary engine, comprising a casing having a circular chamber therein, an eccentrically disposed abutment in said chamber having pressure equalizing grooves extending inwardly from each end, a shaft arranged within said chamber, a rotor concentric with said shaft, a plate at each end of said rotor, said rotor being provided with radial slots and concentric end channels in communication with said slots, the said plates closing the said end channels and the ends of the radial slots, pistons slidably arranged in said slots, and spring means for maintaining said pistons in contact with the end plates, said pistons being maintained in contact with the casing interior by a fluid cushion held in the said slots and end channels, the fluid cushion in one slot when the corresponding piston is moved inwardly by said abutment being forced through the said end channels into the other piston slots, whereby the corresponding pistons are forced outwardly.

2. A rotary engine, comprising a casing having a chamber therein, a shaft eccen-

trically arranged therein, a rotor concentrically mounted on said shaft, and provided with a plurality of radial slots and connecting concentric end channels for containing a fluid cushion, a piston movable in each of said slots, plates at each end of the rotor and closing the ends of the radial slots and the said end channels, to prevent escape of the cushioning fluid, and spring means for maintaining the pistons in contact with the said end plates, said pistons each comprising a central block or spacing member, and end members each comprising a pair of interlocking blades normally forced apart by spring pressure.

3. A rotary engine, comprising a casing having a chamber therein, a shaft eccentrically arranged therein, a rotor concentrically mounted on said shaft, a plate at each end of said rotor, said rotor being provided with radial slots, and concentric end channels in communication with all of said radial slots, the ends of said slots and the said end channels being closed fluid tight by said end plates, a piston slidably arranged in each of said slots, and spring means for maintaining said pistons in contact with the end plates, said pistons being maintained in contact with the circular surface of said casing interior by a fluid cushion held in said slots and end channels.

4. A rotary engine, comprising a casing having an eccentric chamber therein, a shaft eccentrically arranged therein, a rotor concentrically mounted on said shaft and provided with a plurality of radial slots and a concentric channel at each end communicating with all of said slots, the said slots and channels being adapted to contain a cushion of steam or air, a piston in each of said slots and maintained in contact with the circular surface of said chamber by means of the cushion of steam or air, in said slots, and end channels, plates held at each end of the casing and engaging the ends of the rotor, the said plates forming a fluid tight closure for the ends of the radial slots and the said end channels, means for maintaining said piston ends in contact with the rotor end plates, said casing being provided with inlet and exhaust ports, and supplemental outlet ports adjacent the inlet ports.

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses.

LYLE GROW SMITH.

Witnesses:

FLOSSIE R. FOSTER,
VERE E. NUNN.