T. W. MOORE, DEC'D.

T. V. MOORE, ADMINISTRATOR.

ROTARY ENGINE.

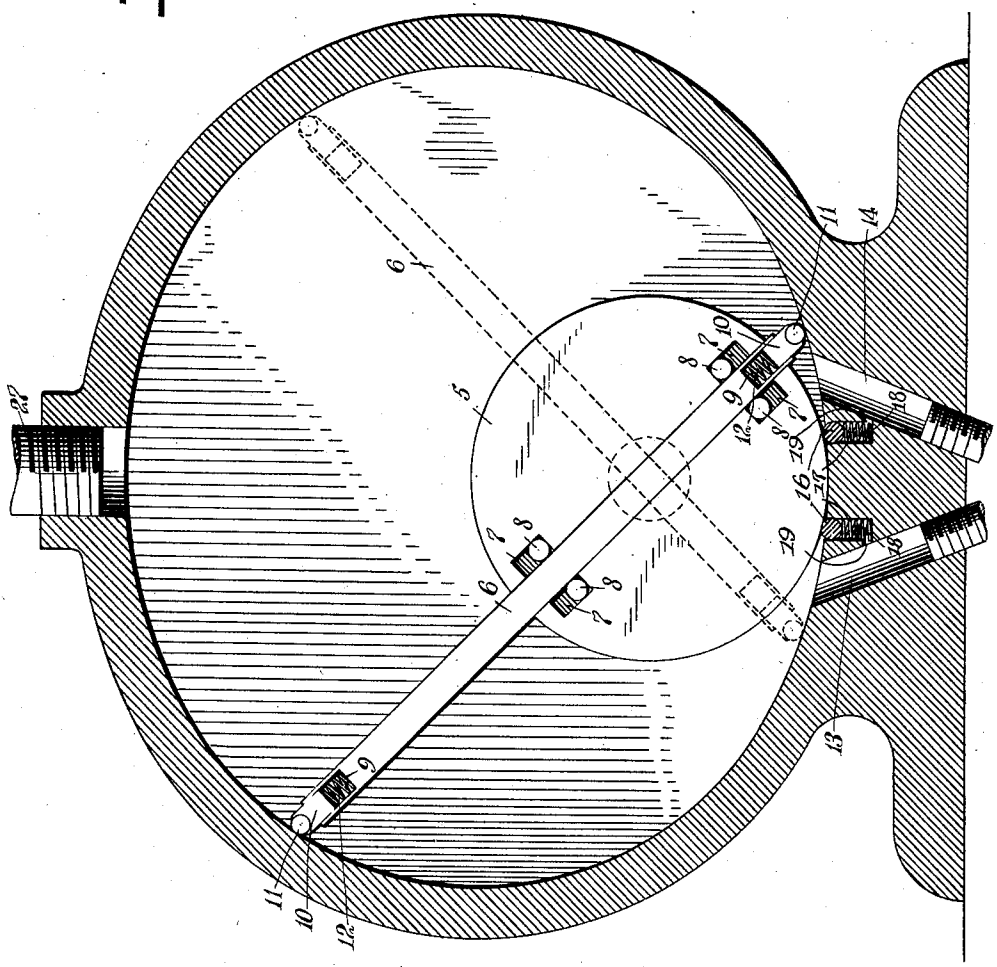
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1,078,301.

Patented Nov. 11, 1913.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

FIG. 2.

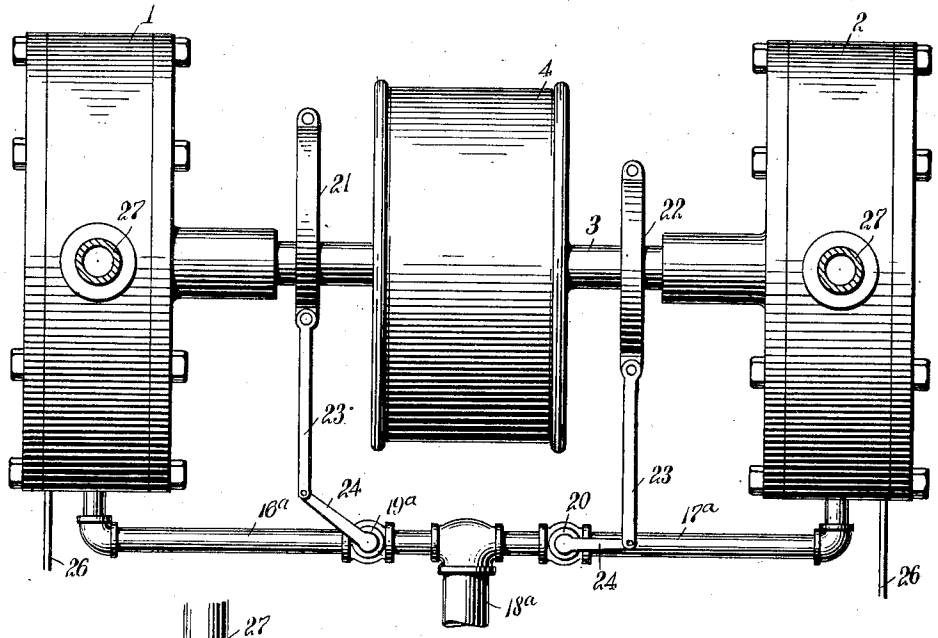
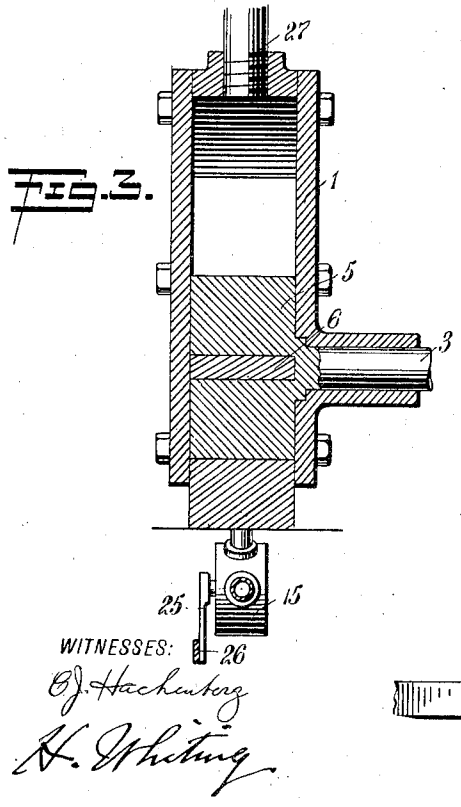


FIG. 3.



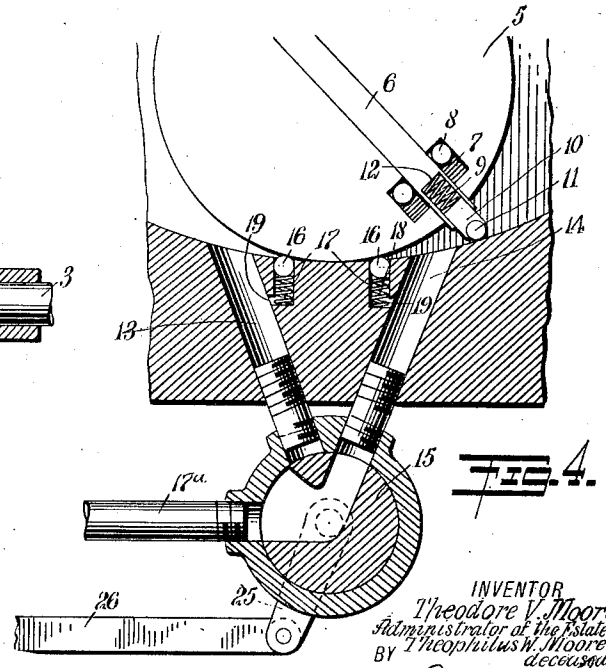


FIG. 4.

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UNITED STATES PATENT OFFICE.

THEOPHILUS W. MOORE, DECEASED, LATE OF ALACHUA, FLORIDA, BY THEODORE V. MOORE, ADMINISTRATOR, OF MIAMI, FLORIDA, ASSIGNOR OF ONE-HALF TO JUNIUS M. HORNER, OF ASHEVILLE, NORTH CAROLINA.

ROTARY ENGINE.

1,078,301. Specification of Letters Patent. Patented Nov. 11, 1913.

Application filed January 12, 1910. Serial No. 537,596.

To all whom it may concern:

Be it known that I, THEODORE V. MOORE, a citizen of the United States, and a resident of Miami, in the county of Dade and State of Florida, administrator of the estate of THEOPHILUS W. MOORE, deceased, late a citizen of the United States, and late a resident of Alachua, in the county of Alachua and State of Florida, as by reference to the duly-certified copy of letters of administration hereto annexed will more fully appear, who did in his lifetime invent certain new and useful Improvements in Rotary Engines, do hereby declare the following to be a full, clear, and exact description of said invention.

This invention relates to a new and improved engine of the rotary type, in which the force is supplied directly to the shaft.

An object of this invention is to provide a device which will be simple in construction, inexpensive to manufacture, strong, durable, and both positive and efficient in its operation.

This and further objects, together with the construction and combination of parts, will be more fully described hereinafter and particularly set forth 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 all the views, and in which—

Figure 1 is a vertical section through one of the casings, showing in full and dotted lines the relation of the pistons in the two casings; Fig. 2 is a top plan view; Fig. 3 is a reduced vertical section of one of the casings, taken at right-angles to the view illustrated in Fig. 1; and Fig. 4 is an enlarged vertical fragmentary section, similar to the section illustrated in Fig. 1, showing in detail one of the valves for reversing the direction of rotation of the pistons.

Referring more particularly to the separate parts of the device, 1 and 2 indicate casings, in the heads of which is journaled a shaft 3. The shaft 3 is provided intermediate its ends with a pulley 4, whereby the power generated may be transmitted to any suitable place. Each end of the shaft 3 is provided with a head 5, each of which are provided with diametrical slots, in which are adapted to slide pistons 6. The piston in the casing 1 is set preferably at right-angles to the piston in the casing 2, so that the action of the motive fluid thereon will be balanced, thereby distributing the force exerted on the shaft 3 over a continuous revolution.

The heads 5 are provided with cavities 7 adjacent the slots therein, which form suitable pockets for anti-friction bearings 8, which may be of any suitable form. The casings 1 and 2 are preferably elliptical in form, in order that a more uniform expansion of the steam may be obtained without necessitating an excessively large casing. The pistons 6 are adapted to reciprocate in the elliptical casings by sliding to and fro as the shaft 3 and the heads 5 rotate. The inner walls of the casings act as cams on the pistons and positively force them to reciprocate. In order that the extremities of the piston may contact with the inner wall of the casing at all times, these extremities are provided with cavities 9, in which are slidingly mounted packing members 10. These packing members 10 are provided at their outer ends with anti-friction rollers 11, so that there will not be excessive friction during their movement over the inner surface of the casings, and are also normally urged outwardly by springs 12 located in the cavities 9.

The center of the shaft 3 and the heads 5 is located at a point, such that all chords of an elliptical section of the casings passing therethrough, will be approximately equal. This is obtained by taking the smaller axis of the elliptical section and placing it at right-angles to the smaller axis at a point where its extremities will touch the circumference of the elliptical section. This point will locate the center of the shaft 3 and the heads 5. The heads 5 are of such a diameter that they will contact at their lower surfaces with the interior surfaces of the casings 1 and 2.

The steam or other motive fluid is let into the casings 1 and 2 adjacent the bottom thereof through either one of a pair of passages 13 and 14. The passage through which the steam flows controls the rotation of the shaft 3, and is in turn controlled by valves 15, one of which is clearly illustrated in Fig. 4. The valves 15 are operated by suitable levers 25 and links 26, which may be connected together if desired, so that they will operate simultaneously.

In order that the contact between the inner surface of the casings and the outer surface of the heads 5 may be steam-tight in whichever way the steam is let into the casing, there are provided roller valves 16, resting in pockets 17, and which are normally pressed outwardly by means of springs 18, whose action is aided by the steam passing into the cavity through passages 19 connected to the passages 13 and 14.

The valves 15 are connected by means of suitable auxiliary pipes 16^a and 17^a to a main supply pipe 18^a. It will thus be seen that by manipulating the valves 15, the direction of flow of the steam or other motive fluid into the cylinder can be changed, and thus the direction of rotation of the shaft 3 reversed. The admission of steam to each of the casings 1 and 2 is controlled by valves 19^a and 20, which in turn are operated by suitable eccentrics 21 and 22, secured on the shaft 3 and operated thereby. These eccentrics are connected to the valves 19^a and 20 by means of links 23 and levers 24. The eccentrics 21 and 22 are preferably set at about a quarter of a revolution apart, so that they will operate at the proper moment to correspond to the position indicated in Figs. 1 and 4, when their respective pistons approach the beginning of a semi-revolution.

The operation of the device will be readily understood when taken in connection with the above description. If it is desired to rotate the shaft 3 in a left-handed direction, or counterclockwise, looking at it from the front in Fig. 1, the valves 15 are rotated to the position indicated in Fig. 4, when the steam will be admitted through the passages 14 into the casings 1 and 2 between the heads 5 and the pistons 6.

Inasmuch as the eccentrics 21 and 22, which control the admission of the motive fluid to the casings 1 and 2 are set a quarter of a revolution apart, the motive fluid will be admitted back of the pistons 6 at the moment when the lower ends of the pistons have just passed the port openings or passages 14, and this takes place respectively in the casings 1 and 2 a quarter of a revolution apart.

Inasmuch as there are two ends to each of the pistons 6, there must be two admissions during the revolution. For this purpose, the valves 19^a and 20 are so formed that they will open the steam passage through themselves at each end of the stroke of the links 23, or twice during the revolution of the shaft 3. The cut-off can be varied by varying the eccentricities of the eccentrics 21 and 22. The steam, when once cut off, is permitted to expand behind the pistons 6 until its force is utilized, when it will be exhausted through the exhaust pipes 27. The elliptical form of the interior of the casing gives a cross-sectional area of a character best adapted to utilize the full force of the expanded steam in an efficient manner. The location of the center of the shaft 3 and the heads 5, permits the pistons 6 to touch the inner surface of the periphery of the casing at all times during their revolution.

While I have shown one embodiment of the invention, I do not wish to be limited to the specific form thereof, but desire to be protected in various changes, modifications and alterations which I may make within the scope of the appended claims.

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

1. In a rotary engine, a casing having an elliptical cavity, a revoluble cylindrical head mounted in the lower portion of the casing to contact at its lower portion with said casing, the head being slotted and of a diameter approximately equal to one-half of the shorter diameter of the elliptical cavity of the casing, and a piston sliding in the slot of the head and having in each end a sliding and spring pressed packing member.

2. A rotary engine, comprising two casings, each having an elliptical cavity, a shaft journaled in the opposing heads of the casings, a transmission pulley on the shaft, heads on the ends of the shaft within the casings, the heads being slotted and of a diameter approximately equal to one-half of the shorter diameter of the cavity of the casing, the slots of the heads being at right angles to each other, a piston sliding in the slot of each head and having a sliding and spring pressed packing member in each end thereof, and means controlled from said shaft for admitting the motive agent alternately to the said casings.

3. A rotary engine, comprising two spaced casings having elliptical cavities and each provided with passages in its bottom, a shaft having its ends mounted in the casings and provided within said casing with heads contacting with the lower portions of said casings, each head being provided with a slot, the slots being at right angles to each other, a piston sliding in the slot of each head, a pulley on the shaft between the casings, a manually controlled valve for controlling the passages of each casing, a main

supply pipe, a pipe connecting each valve with the supply pipe, a valve in each of the said pipes, and means for operating the last named valves from the shaft, said means being so arranged that the admission to one of the casings will take place intermediate the admission to the other casing.

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

THEODORE V. MOORE,
Administrator of the estate of Theophilus W. Moore, deceased.

Witnesses:
JOHN C. GRAMLING,
SADIE R. NELAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."