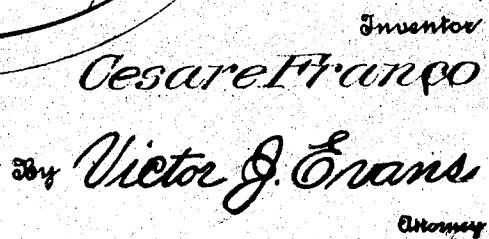


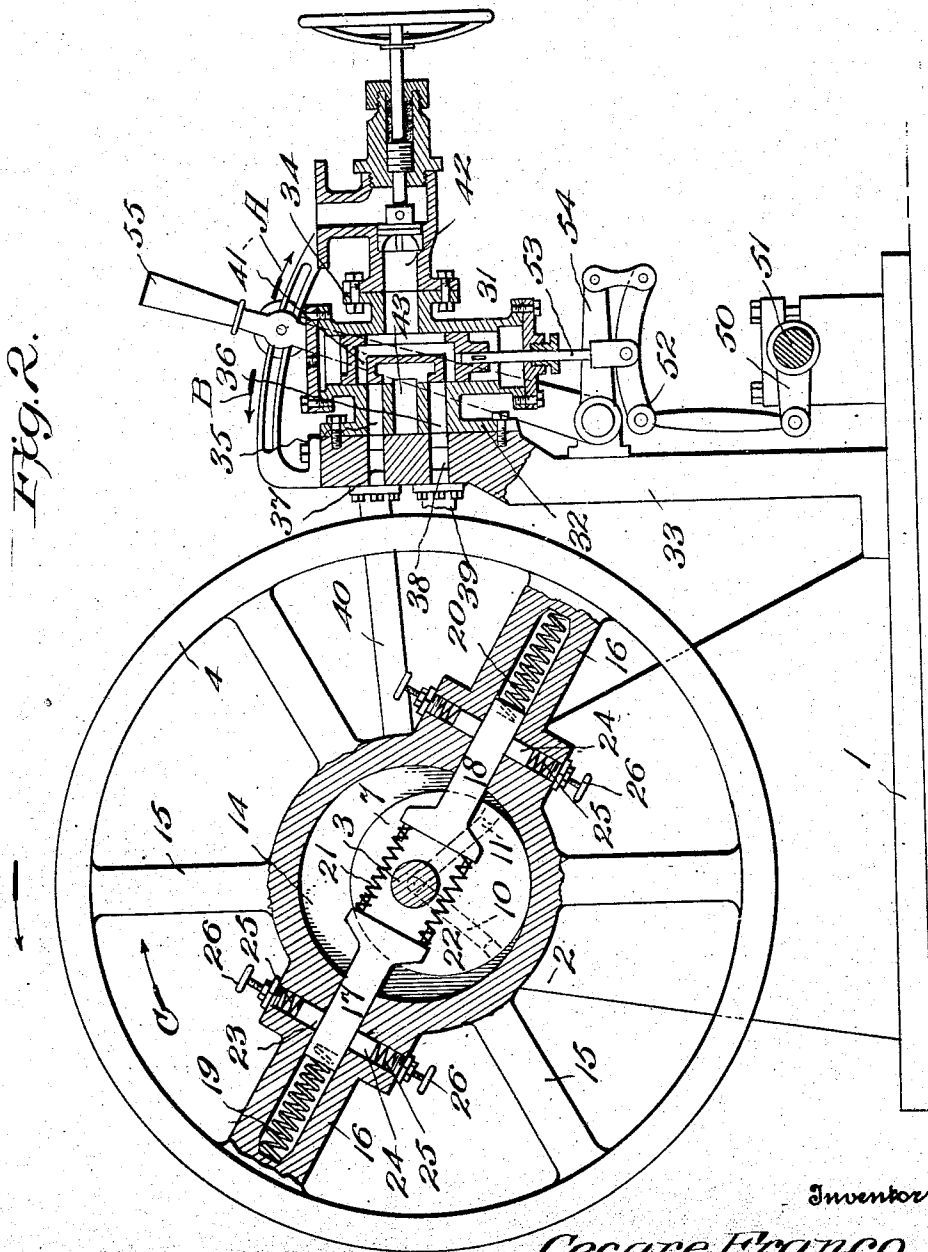
3 SHEETS—SHEET 1.



C. FRANCO.
 ROTARY ENGINE.
 APPLICATION FILED OCT. 25, 1912.

Patented June 17, 1913.
 3 SHEETS—SHEET 2.

1,065,232.



Inventor

Cesare Franco

Witnessed:

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Geo. S. Payne.

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Victor J. Evans

Attorney

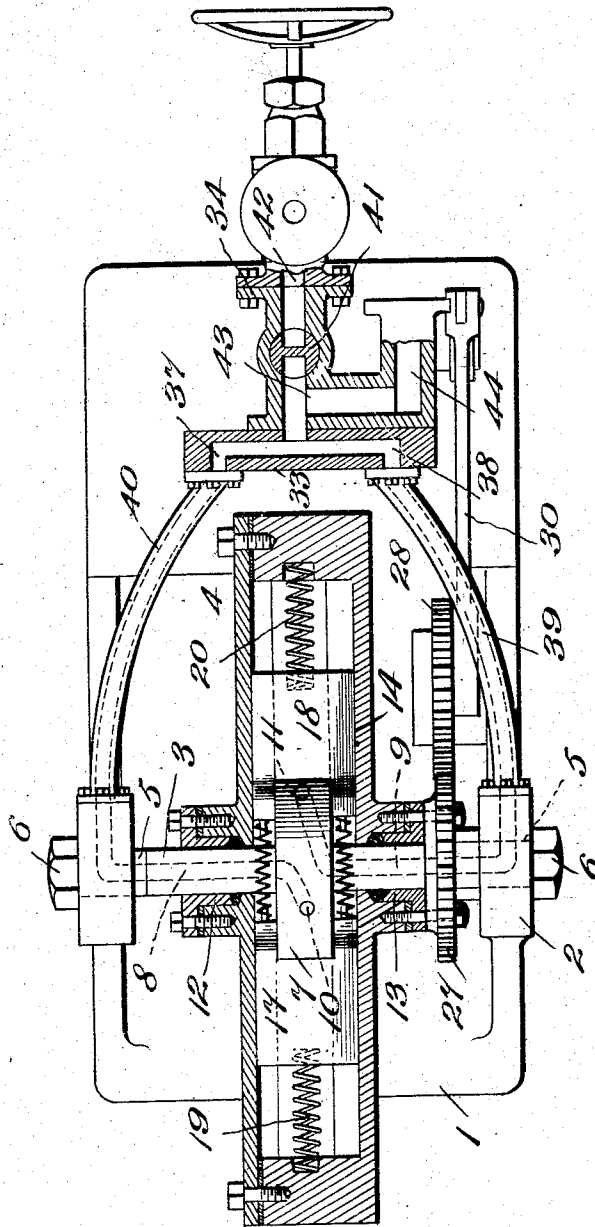
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3 SHEETS—SHEET 3.

Fig. 3.



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CESARE FRANCO, OF NEW YORK, N. Y.

ROTARY ENGINE.

1,065,232.

Specification of Letters Patent.

Patented June 17, 1913.

Application filed October 25, 1912. Serial No. 727,766.

To all whom it may concern:

Be it known that I, CESARE FRANCO, a subject of the King of Italy, residing at New York city, in the county of New York and State of New York, have invented new and useful Improvements in Rotary Engines, of which the following is a specification.

This invention relates to improvements in rotary engines, and has for its object to provide an efficient and comparatively simple engine of this type that may be used for various purposes and one in which the reversing of the same may be effected in a simple, expeditious and easy manner.

To these ends the invention consists in the novel details of construction and combination of parts more fully hereinafter described and particularly pointed out in the claims.

Referring to the accompanying drawings forming a part of this specification in which like numerals designate like parts in all the views:—Figure 1 is a side elevational view of my improved engine. Fig. 2 is a vertical sectional view thereof. Fig. 3 is a horizontal sectional view thereof.

My improved engine consists of a base 1 in the upper bearing portion 2 of which is secured the shaft 3 for supporting the cylindrical rotor 4. The shaft has its squared ends 5 held within the bearings by means of the nuts 6 and is provided at its central portion with the enlarged eccentrically mounted stationary head 7. Central ports 8 and 9 in each end of the shaft communicating with the radial ports 10 and 11 in the stationary head, form the passages through which steam is admitted to the rotor.

The rotor consists of a cylindrical wheel 4 revolvably held by the bearings 12 and 13 to the shaft 3 and provided with the enlarged central or cylinder portion 14 and radial spokes 15 and 16, the spokes 16 of which are of different construction than the spokes 15 to provide a housing for the opposed pistons 17 and 18. The pistons are slidably fitted in the spokes 16 and cylinder 14, and are preferably of fork formation so that their opposed inner ends straddle the eccentric stationary cylinder head 7, as shown in Fig. 3. Helical compression springs 19 and 20 mounted within the outer ends of the spokes 16 and bearing against

the outer end of the pistons, normally hold the same in contact with the cylinder head 55 7. Extending springs 21 and 22 bearing against the inner ends of the pistons, form the yielding connection therebetween. Packing bars 23 and 24, located in the spokes 16, are normally held in contact with 60 the sides of the pistons by means of the compression springs 25 the tension of which is controlled by means of the adjusting screws 26. These packing bars as is evident, are adapted to prevent the escapement of 65 steam behind the pistons.

A gear 27 mounted on the cylindrical wheel and meshing with a gear 28 held by the bearing 29 to the frame of the engine, is adapted to operate through the eccentric 70 drive rod 30 the means for controlling the admission of steam to the rotor.

The valve chest 31 has on one side a flange 32 which is bolted on one side to the valve supporting frame 33, and on its other 75 side has a flange 34 which is bolted to the main steam supply pipe. The passages 35 and 36 in the valve chest, communicate respectively, with the exhaust passage 37 and steam passage 38 and these in turn commu- 80 nicate with the interior of the cylinder by means of the supply pipes 39 and 40 and supply ports in the shaft, respectively. The valve 41 slides in the valve box and operates to control the admission of steam from the 85 steam inlet 42 to the steam passage 38, and to effect communication between the exhaust passage 35 and the outlet 43 which communicates with the exhaust pipe 44. Thus when the parts are arranged as shown in 90 Fig. 2, the valve 41 moves upwardly so as to clear the passage 36, the steam will pass from the inlet 42 through the passages 36 and 38, pipe 39, ports 9 and 11 and into the cylinder. Here it will act on the piston 95 18 turning the same together with the wheel in the direction of the arrow until the piston passes beyond the port 10, whereupon the steam will pass outwardly through the passages 10, 8, pipe 40 and valve passage 35 100 and when the valve is raised so as to place the chamber therein in communication with the passage 35, the steam moving into this chamber will seek outlet through the outlet 43 and exhaust pipe 44. The movement of 105 the valve is controlled by the eccentric

mounted on the gear 28 on one side of the engine, and through a drive rod 30 movement is given to a crank arm 50 on the shaft 51, and by means of the arm a link is actuated which rocks the lever 52 to reciprocate the valve rod 53 and shift the valve so as to permit the entrance of the steam or its exhaust. The fulcrum of the lever 52 is located at the end of an arm 54 which may be raised or lowered by means of the lever 55 and locked in a segment at the outer end of the lever 55 so that the movement may be in the direction of the arrow A or reversed in the direction of the arrow B.

As illustrated in Fig. 2 the position of the valve is neutral, but when steam is admitted through the passage 36, the wheel is rotated in the direction of the arrow C, the exhaust taking place through the ports 10, 8, pipe 40 and ports 37 and 35, but when the lever 55 is thrown into the position indicated in Fig. 2 by A, steam is admitted through the ports 35, 37, pipe 40 and ports 8 and 10 to drive the eccentric to the left, the steam exhausting through the port 11. It will thus be seen that by changing the position of the fulcrum through the lever 55, the engine may be driven in one direction or the other.

It is obvious that those skilled in the art may vary the details of construction and arrangements of parts without departing from the spirit of my invention and therefore I do not wish to be limited to such features except as may be required by the claims.

What is claimed as new is:

1. In a rotary engine having a suitable base, journal bearings provided upon said base, a stationary shaft suitably supported in said bearings, an eccentrically held cylindrical head rigidly mounted upon the shaft, steam ports in the ends of the shaft and steam ports in said eccentric cylindrical head communicating with the ports in the shaft, a rotor having a cylindrical chamber adapted to admit said cylindrical head mounted upon the shaft, reciprocal pistons upon the rotor adapted to contact with the surface of the eccentric head, suitable packing plates yieldingly impinging the pistons, a steam chest and valve chamber having a suitable reciprocal valve suitably seated therein and ports connected with the steam ports of the shaft by radial steam pipes, in combination with means for controlling the valve and reversing the engine, comprising a gear rigidly secured upon the rotor and meshing with a gear wheel held upon a bearing provided upon the base adapted to rotate an eccentric having a drive rod thereon, the drive rod being connected with the arm of a crank shaft, said arm being connected by a link with the arm of a lever adapted for reciprocating the valve of the engine, said lever having its fulcrum connected by a

link with the arm of a hand lever, said hand lever being pivotally mounted upon the frame and having one arm suitably supported upon a segmental guide, substantially as and for the purposes set forth.

2. In a rotary engine having a suitable base, journal bearings provided in said base, a shaft rigidly held in said bearings, an eccentrically held cylindrical head rigidly mounted upon the shaft, a rotor having a cylindrical chamber centrally disposed therein adapted for admitting the cylindrical head, spring controlled reciprocal pistons adapted to contact with the surface of the head with suitable inlet and outlet ports for steam, and a steam chest having a valve seat therein, a valve seated in said seat and a rod provided upon said valve, said rod extending through the wall of the valve chamber, the combination of suitable means for controlling the admission of steam to the engine whereby the engine may be reversed, comprising a rocking lever having its central portion pivotally connected to the end of said valve rod, its fulcrum end connected by a link to one arm of a hand lever pivotally mounted upon the base of the engine, said lever having its other arm adjustably secured to a segment supported upon the wall of the steam chest and the opposite arm of the rocking lever being secured by a link to the arm of an eccentrically controlled crank shaft, whereby the valve is reciprocated, said hand lever serving as means for shifting the position of the reciprocating valve whereby the rotary movement of the engine may be reversed.

3. In a rotary engine having a suitable base, journal bearings, shaft, rotor and pistons adapted to propel the rotor, suitable steam pipes, and inlet and outlet ports communicating with the steam pipes, and a steam chest having a suitable supply pipe connected therewith, a suitable valve for admitting steam from the supply pipe and a suitable exhaust pipe, the combination of a reciprocable valve disposed within a valve seat provided within the steam chest, said valve having a valve rod rigidly secured to the valve and disposed through suitable bearings in the wall of said steam chest, said valve being adapted for reciprocal movement whereby the inlet and outlet ports of the steam chest communicating with the steam pipes communicating with the piston chamber and the rotor, are alternately opened and closed, said valve having a chamber provided in the central portion thereof whereby communication may be established with the exhaust pipe and either one of the ports communicating with the pipes leading to the chamber of the rotor and pistons, said valve and ports being so disposed within the valve seat that the supply pipe is in communication with the other of said ports at

such times whereby the steam may be admitted to the engine through either port, said valve rod being suitably connected with a rocking lever adapted for reciprocating
5 the valve, said lever being connected by a link to the end of one arm of an adjustable hand lever whereby the position of the rocking lever may be changed as required to re-

verse the movement of the engine, substantially as and for the purposes set forth.

In testimony whereof I affix my signature
10 in presence of two witnesses.

CESARE FRANCO.

Witnesses:

GEO. ACKMAN, Jr.,

GEO. A. BYRNE.

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