

C. LECAIME.
 REVERSIBLE ROTARY ENGINE.
 APPLICATION FILED OCT. 27, 1909.

967,396.

Patented Aug. 16, 1910.

2 SHEETS—SHEET 1.

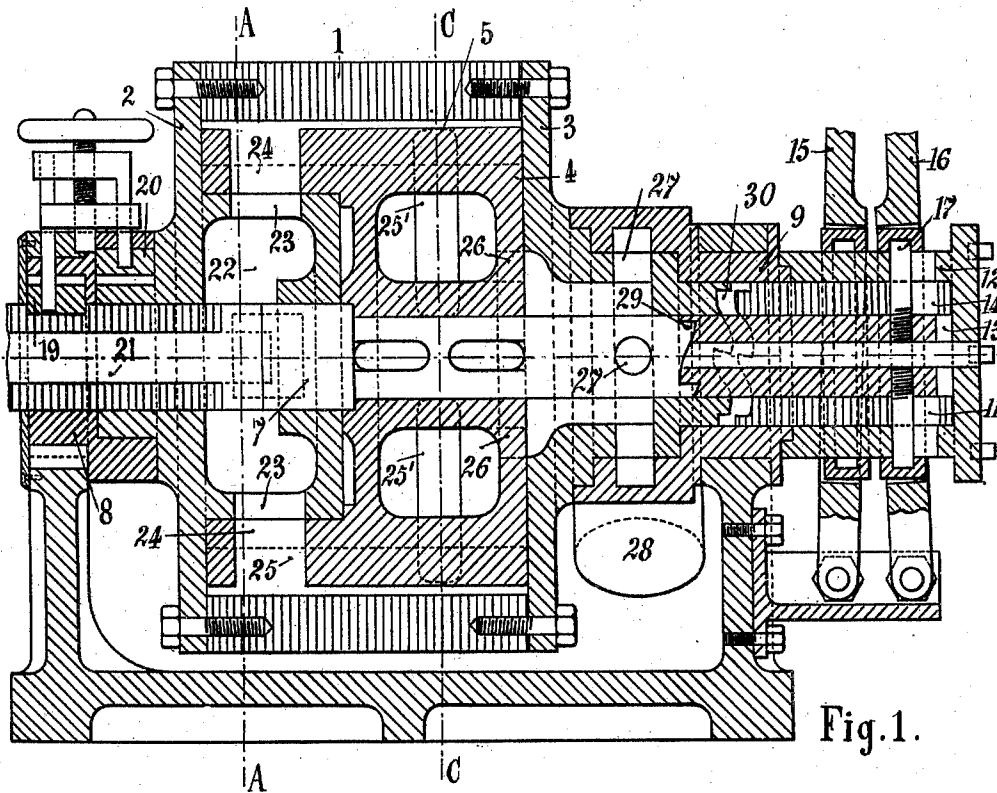


Fig. 1.

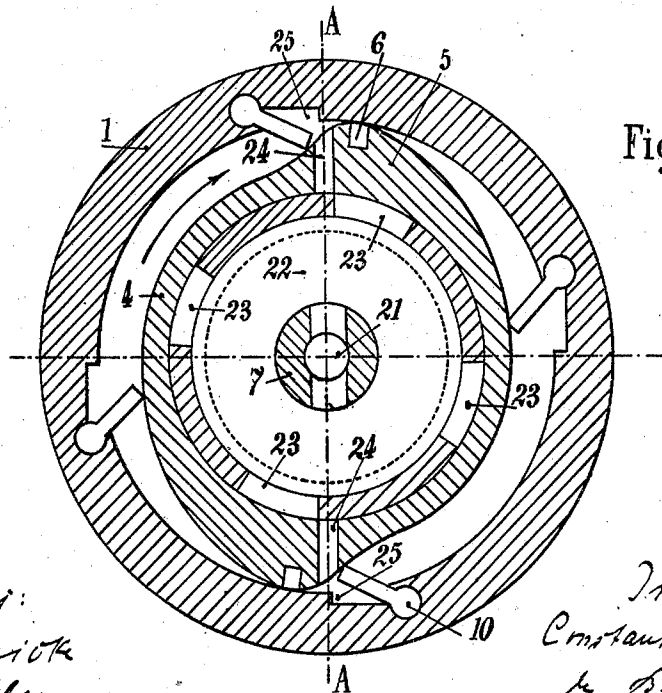


Fig. 2.

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Inventor:
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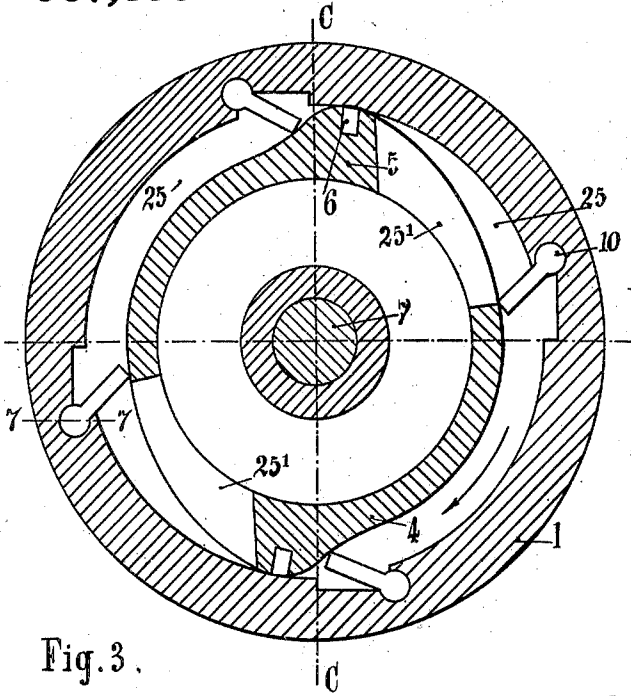


Fig. 3.

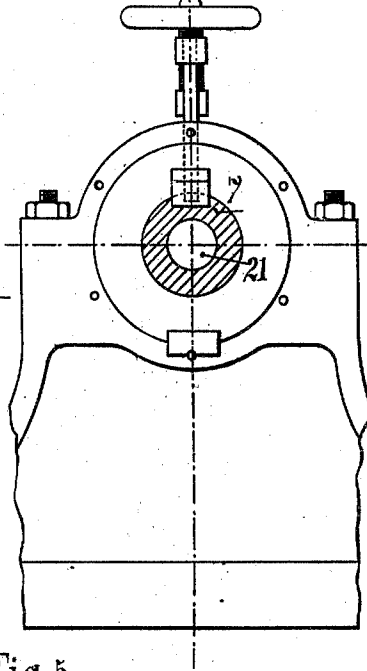


Fig. 5.

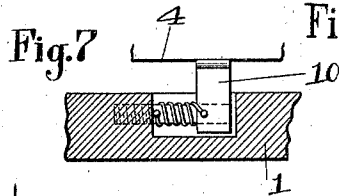
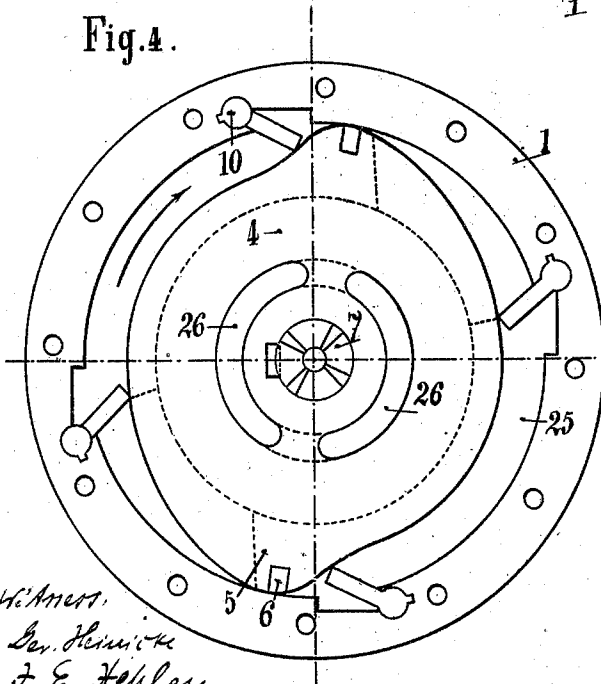


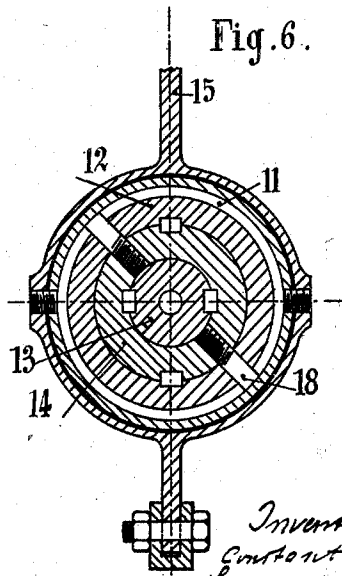
Fig. 7.

Fig. 4.



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Fig. 6.



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UNITED STATES PATENT OFFICE.

CONSTANT LECAIME, OF BORDEAUX, FRANCE.

REVERSIBLE ROTARY ENGINE.

967,396.

Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed October 27, 1909. Serial No. 524,860.

To all whom it may concern:

Be it known that I, CONSTANT LECAIME, a citizen of the Republic of France, and a resident of Bordeaux, France, have invented certain new and useful Improvements in Reversible Rotary Engines, of which the following is a full, clear, and exact specification.

This invention has for its object to provide a reversible rotary engine for continuous and balanced running which consists of a cylinder closed at its ends by two plates and inclosing a disk carrying two pistons arranged in the direction of its length. It is operated by a fluid of any kind pressing upon its pistons and may be constructed either for expansion or double or triple expansion and also act as a suction and force pump.

Figure 1 of the accompanying drawing represents a longitudinal section of the apparatus; Figs. 2 and 3 are cross sections thereof on the lines A and C in Fig. 1; Fig. 4 is a front elevation of the right hand side with the plate removed. Fig. 5 is a view of the left hand bearing and of the key for holding the main shaft; Fig. 6 is a cross section of the reversing gear through the middle of the lever 15. Fig. 7 is a detailed sectional view on the line 7-7 of Fig. 3 showing how the obturators are operated and forced outward by a spring.

This motor comprises the casing or cylinder 1, the right and left hand plates 2 and 3, the disk 4 and its two pistons 5 provided at the top with packing segments 6; the main shaft 7, a part of which is represented in section and upon which the disk is suitably guided; this shaft runs in bearings 9 and 8.

At 10 one of the four obturators is arranged (this number may vary); they are let into the thickness of the cylinder throughout its entire length and divided into four parts. They are provided with internal springs and lifted upon the passage of the pistons.

11 represents the reversing and clutch gear mounted upon an extension of the driving shaft; this gear is constituted by a hollow clutch crown 12 in which there slide the sleeves 13 clutched to the main shaft 7 and the sleeve 14 clutched to the extremity of the plate 3. These sleeves are displaced internally by means of levers 15 and 16 in the grooves in which retaining pistons 17 and 18 fixed to the said sleeves slide.

All these parts are assembled by means of longitudinal grooves or keys. The key 19 serves to hold the main shaft 7 and another key 20 holds the plate 2. These keys are provided with rods and are displaced by means of a lever or a screw hand wheel.

In cases where this motor is to run alternately forward and backward which is the case represented in the accompanying drawing it is mounted on an appropriate base plate; otherwise this base plate is cast with the cylinder, the ends of the plate forming bearings and the parts shown in Figs. 5 and 6 can be dispensed with. The motor may also be mounted upon a base plate to which the main shaft is fixed; the casing remaining free rotates upon the disk and may drive a machine directly by means of an appropriate transmission.

The operation is as follows:—Assuming the engine to be stopped at the beginning of the admission as shown in the drawing and that steam is admitted through the orifice in the shaft 21 into the steam chamber 22 constituting a reservoir, it will pass through the orifices 23 and 24 into the cylinder 25 where it will encounter the obturators 10 upon which it will bear so as to exert its pressure upon the pistons 5 which will drive the disk in the direction indicated by the arrows. When the admission ports 24 have passed beyond the end of the orifices 23 the steam will no longer enter the cylinder and the quantity contained therein will begin its expansion work which will continue for a given time until the beginning of the fresh admission, a moment after which it will escape through the ports 25 which will be uncovered into the cavity in the disk from which it will reach the final exhaust 28 through the passages 26 and 27 and so on in succession. The clutch and reversing gear, the sleeve 13 of which is clutched at 29 to the main shaft rotates with this shaft. In order to reverse the engine, the sleeve 13 is disengaged by means of the lever 16, and the sleeve 14 is clutched at 30 to the extremity of the plate 3 by means of the lever 15, then by a turn of the hand-wheel the keys 19 and 20 are actuated, these keys then assume the positions shown in the drawing, and the plate 2 will start to turn in a direction opposite to that indicated by the arrow and by means of the sleeve 14 will cause the part 12 to participate in its movement.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

5 1. In a rotary steam engine of the character described, the combination with a shaft, of a disk upon said shaft, a cylinder closed at its ends surrounding said disk, two pistons carried by said disk, means to actuate
10 said shaft and cylinder, a plurality of spring actuated obturators in the wall of said cylinder to be actuated by the pressure fluid, and in turn actuating the pistons and the disk, substantially as described and for the
15 purpose set forth.

2. In a rotary steam engine of the character described, the combination with a rotary piston, of a disk guided upon said shaft, a

cylinder closed at its ends by two plates, and surrounding said disk, two pistons carried
20 by said disk, means to actuate said shaft and cylinder, spring actuating obturators in the wall of said cylinder to be actuated by the pressure fluid, and in turn actuating
25 the pistons and the disk, ports opening into a cavity of the disk and exhaust passages leading the pressure fluid to the exhaust during the admission of a new charge, substantially as described and for the purpose
30 set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

C. LECAIME.

Witnesses:

ANDRÉ ODIN,
JEAN ODIN.