

May 23, 1944.

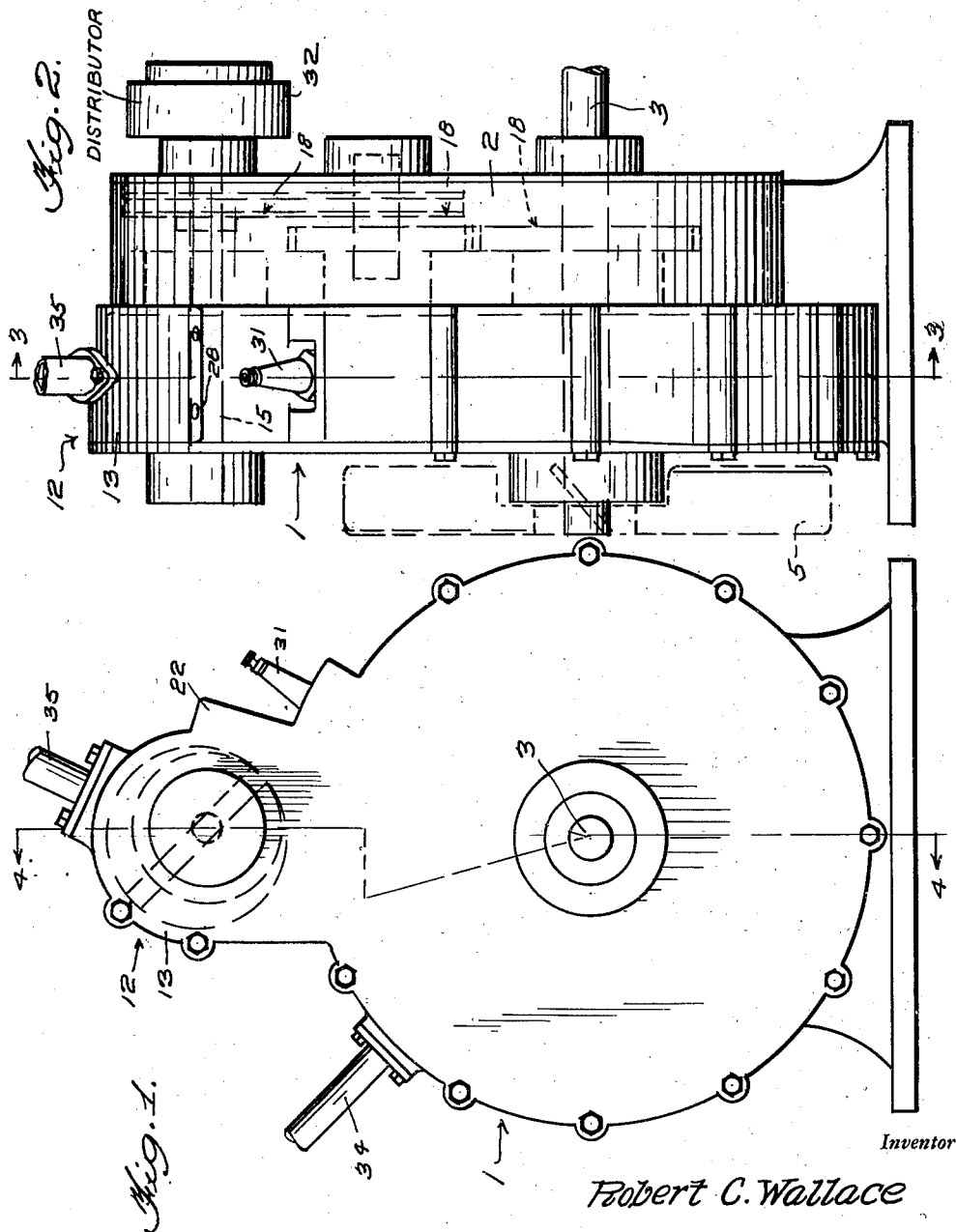
R. C. WALLACE

2,349,481

ROTARY ENGINE

Filed Aug. 27, 1942

4 Sheets-Sheet 1



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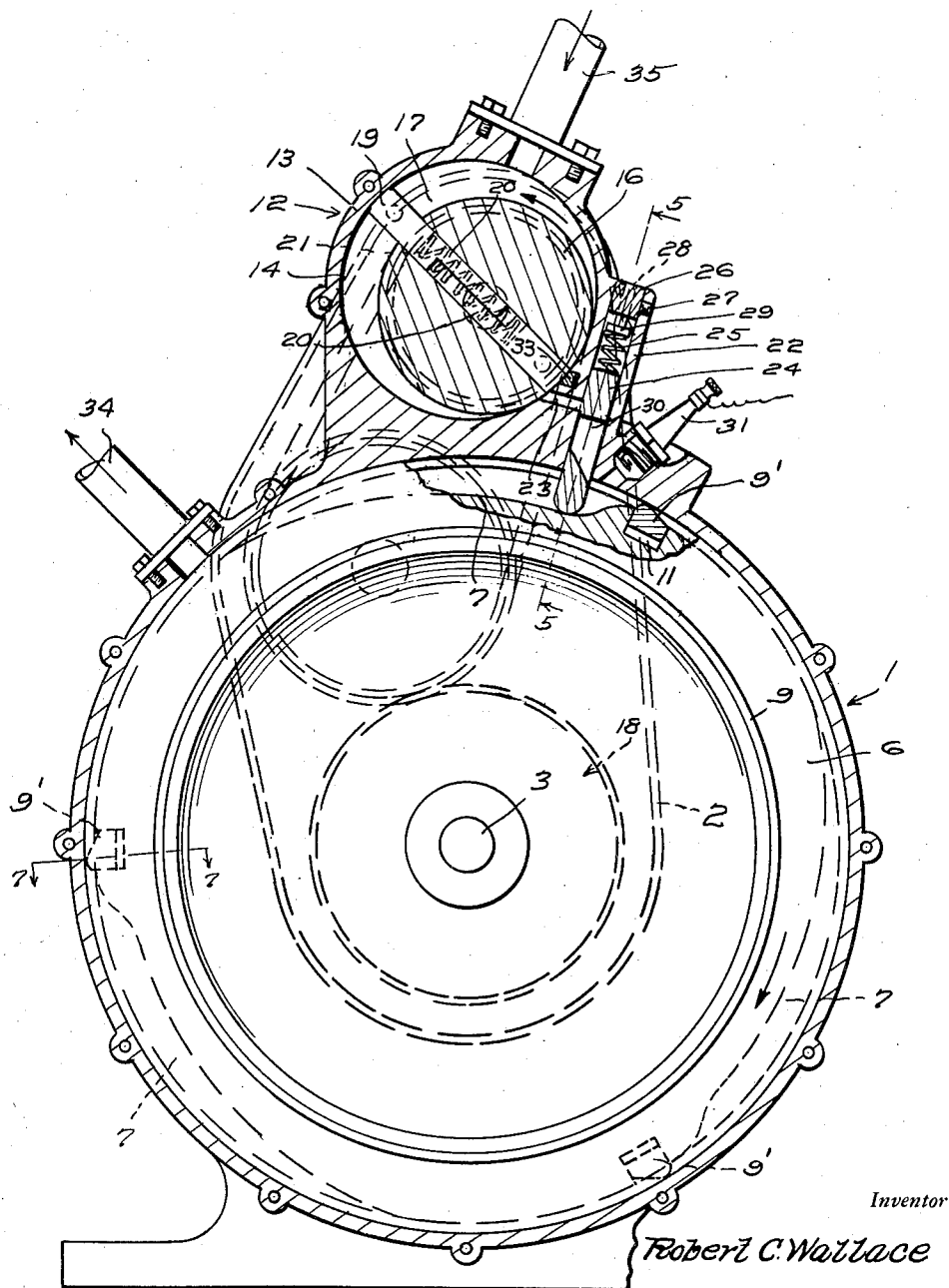
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4 Sheets-Sheet 3

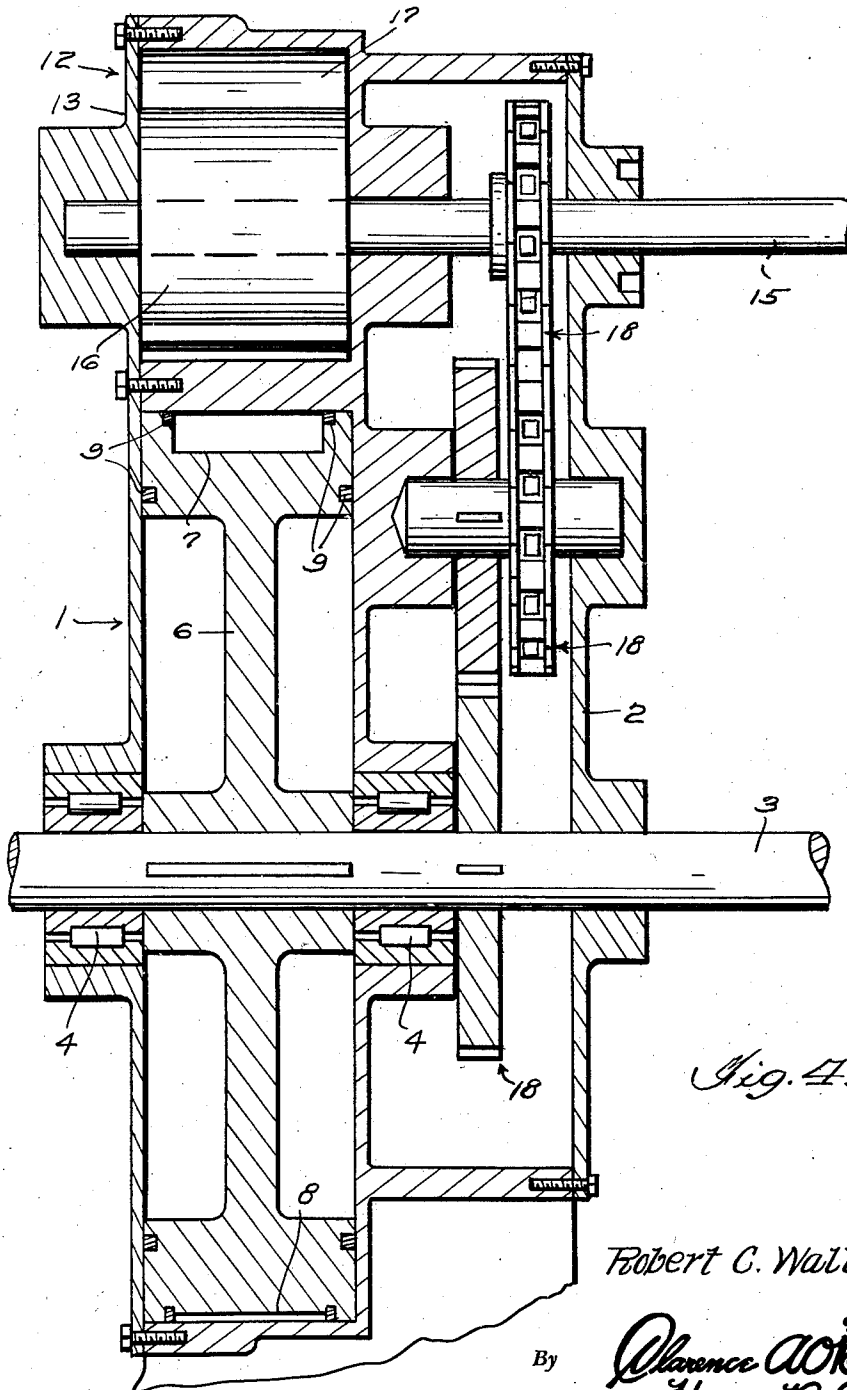


Fig. 4.

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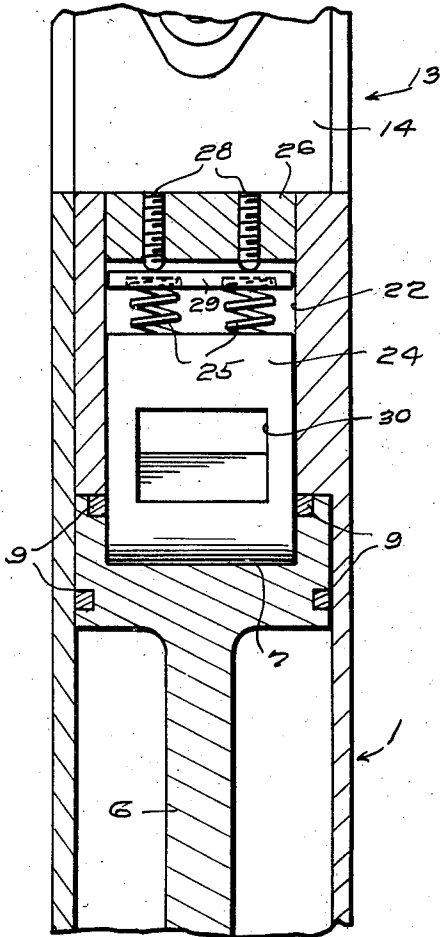


Fig. 5.

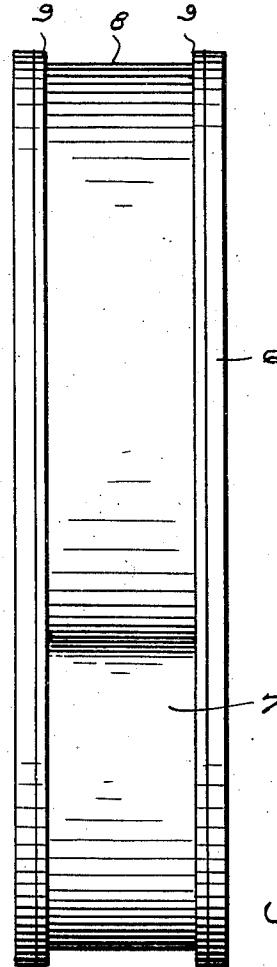


Fig. 6.

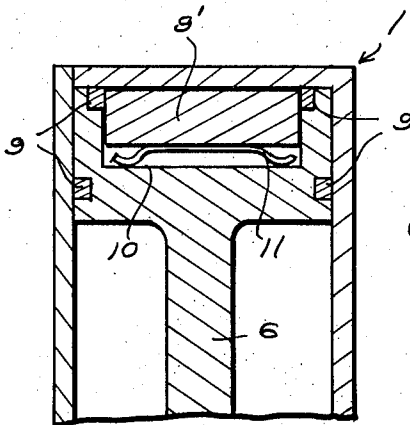


Fig. 7.

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UNITED STATES PATENT OFFICE

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ROTARY ENGINE

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Application August 27, 1942, Serial No. 456,406

1 Claim. (Cl. 123—14)

The present invention relates to new and useful improvements in rotary internal combustion engines, and has for one of its important objects to provide, in a manner as hereinafter set forth, a device of this character comprising unique fuel injecting and control means.

Another very important object of the invention is to provide an engine of the aforementioned character embodying a novel construction and arrangement whereby a plurality of power impulses will be had with each complete revolution of the rotor.

Other objects of the invention are to provide an engine of the character described which will be comparatively simple in construction, strong, durable, highly efficient and reliable in use, compact, light in weight, and which may be manufactured at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a view in end elevation of a rotary internal combustion engine constructed in accordance with the present invention.

Figure 2 is a view in side elevation thereof.

Figure 3 is a cross-sectional view, taken substantially on the line 3—3 of Figure 2.

Figure 4 is a view in vertical section, taken substantially on the line 4—4 of Figure 1.

Figure 5 is a sectional view, taken substantially on the line 5—5 of Figure 3.

Figure 6 is an elevational view of the rotary piston or rotor, looking at the periphery thereof.

Figure 7 is a sectional view, taken substantially on the line 7—7 of Figure 3.

Referring now to the drawings in detail, it will be seen that the embodiment of the invention which has been illustrated comprises a substantially circular metallic housing which is designated generally by reference numeral 1, which housing may be of any suitable dimensions. On one end of the housing 1 is a gear case 2. Journaled in the housing 1 is a shaft 3, said shaft passing through the case 2 and projecting beyond both ends of said housing. Suitable bearings 4 are provided for the shaft 3. A cooling fan 5 is mounted on the shaft 3 adjacent one end of the housing 1.

A rotor 6 is fixed on the shaft 3 and operable in the housing 1. The rotor 6 has formed in its periphery at spaced points a plurality of circum-

ferentially elongated combustion chambers 7 of substantially the shape shown to advantage in Figure 3 of the drawings, said combustion chambers merging gradually with the periphery of said rotor toward their rear or trailing ends. The rotor 6 is further provided in its periphery with a channel 8 communicating with the combustion chambers 7. Sealing rings 9 are provided at the sides of the peripheral channel 8 and on the sides of the rotor 6.

Sealing vanes 9' are slidably mounted in transverse grooves 10 (see Fig. 7) which are provided therefor in the periphery of the rotor 6. It will be noted that the sealing vanes 9' are located adjacent the forward or leading ends of the combustion chambers 7. Springs 11 in the grooves 10 yieldingly urge the vanes 9' outwardly against the housing 1.

A fuel pump 12 is provided on top of the housing 1. The pump 12 includes a casing 13 which rises from the housing 1, said casing having formed therein a circular chamber 14. An off-center shaft 15 is provided in the chamber 14, said shaft being journaled in the casing 13 and paralleling the shaft 3. The shaft 15 extends through the upper portion of the gear case 2. Fixed on the shaft 15 for rotation in the chamber 14 is a rotor 16. It will thus be seen that a substantially crescent-shaped fuel intake and compression compartment 17 is formed in the casing 13.

A chain, sprocket and gear drive 18 in the case 2 connects the shaft 15 to the shaft 3 for actuation thereby. The rotor 6 rotates in a clockwise direction and the rotation of the rotor 16 is counter-clockwise.

Slidably mounted in the rotor 16 is a pair of vanes 19. The vanes 19 comprise overlapping, slidably engaged side legs 20 on their inner ends. Coil springs 21 are provided between the vanes 19 for yieldingly urging said vanes outwardly against the casing 13.

The front portion of the casing 13 is formed to provide a valve chamber 22 which communicates, at an intermediate point, with the fuel chamber 17 through a passage 23. A gate valve 24 is slidably mounted in the chamber 22 and rides on the periphery of the rotor 6 in the channel 8 and the combustion chambers 7. Coil springs 25 yieldingly urge the valve 24 inwardly against the rotor 6. The coil springs 25 are of sufficient strength to cause the valve 24 to force the vanes 9' inwardly against the tension of the springs 11. A block 26 is secured in the outer portion of the chamber 22 by set screws 27. Threadedly

mounted for adjustment in the block 26 is a plurality of screws 28. The screws 28 regulate the tension of the springs 25. A bar 29 is provided between the coil springs 25 and the screws 28 in the chamber 22.

The valve 24 has formed therein a port 30. When the valve 24 is in lowered position the port 30 is in communication with the adjacent combustion chamber 7 and when said valve 24 is in raised position, the port 30 is in communication with the passage 23. A spark plug 31 is provided adjacent the valve 24 for firing the charge in the combustion chambers 7. The shaft 15 drives a suitable timer or distributor 32 which controls the flow of current to the spark plug 31.

A sealing vane 33 is provided in the casing 13 in back of the passage 23 and rides on the periphery of the rotor 16. A fuel intake pipe 35 is connected to the casing 13 and communicates with the chamber 17. An exhaust pipe 34 communicates with the housing 1 adjacent the side of the pump 12 which is remote from the valve 24.

It is thought that the operation of the engine will be readily apparent from a consideration of the foregoing. Briefly, fuel is drawn into the chamber 17 by one of the vanes 19 and compressed by the following vane. With the valve 24 in raised position, the compressed fuel enters the port 30 through the passage 23. When the valve 24 is forced downwardly into one of the combustion chambers 7, when said one combustion chamber reaches this point, the passage 23 is closed by said valve and the port 30 is in communication with the aforementioned chamber 7 for the flow of the compressed fuel thereinto. The charge is then fired by the spark plug 31 and the expanding fuel drives the rotor 6, the valve 24 now functioning as a sliding abutment. When this chamber reaches the pipe 34 the spent charge is exhausted therethrough. Of course, the foregoing operation is repeated each time that one of the combustion chambers 7 reaches the valve 24. If desired, the housing 1 may be provided with cooling fins. Also, the engine may be provided with any suitable lubricating system.

It is believed that the many advantages of a rotary internal combustion engine constructed in accordance with the present invention will be readily understood, and although a preferred embodiment of the engine is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:

A rotary engine comprising a housing, a shaft journaled in said housing, a rotor fixed on said shaft and operable in the housing, said rotor having a plurality of circumferentially spaced combustion chambers in its periphery, a fuel pump on the housing, said pump including a casing having a circular chamber therein, a shaft mounted off center in the chamber, a rotor fixed on the second-named shaft, means connecting said second-named shaft to the first-named shaft for actuation thereby, a valve chamber in the casing, said casing having a passage therein establishing communication between the valve chamber and the pump chamber, a valve slidable in the valve chamber and riding on the periphery of the first-named rotor, a removable closure block in the valve chamber, set screws in said valve chamber securing said block in position, coil springs in the valve chamber yieldingly engaging the valve with the first-named rotor, a bar in the valve chamber engaged with said coil springs, screws adjustably mounted in the block and engaged with the bar for adjusting the coil springs, said valve having a port extending therethrough communicating, at one end, with the passage when the valve is in raised position and, at its other end, with the combustion chambers when said valve is in lowered position, said valve constituting means for conveying compressed fuel from the pump chamber to the combustion chambers, and a spark plug mounted on the housing for firing the charge in the combustion chambers.

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