May 3, 1955

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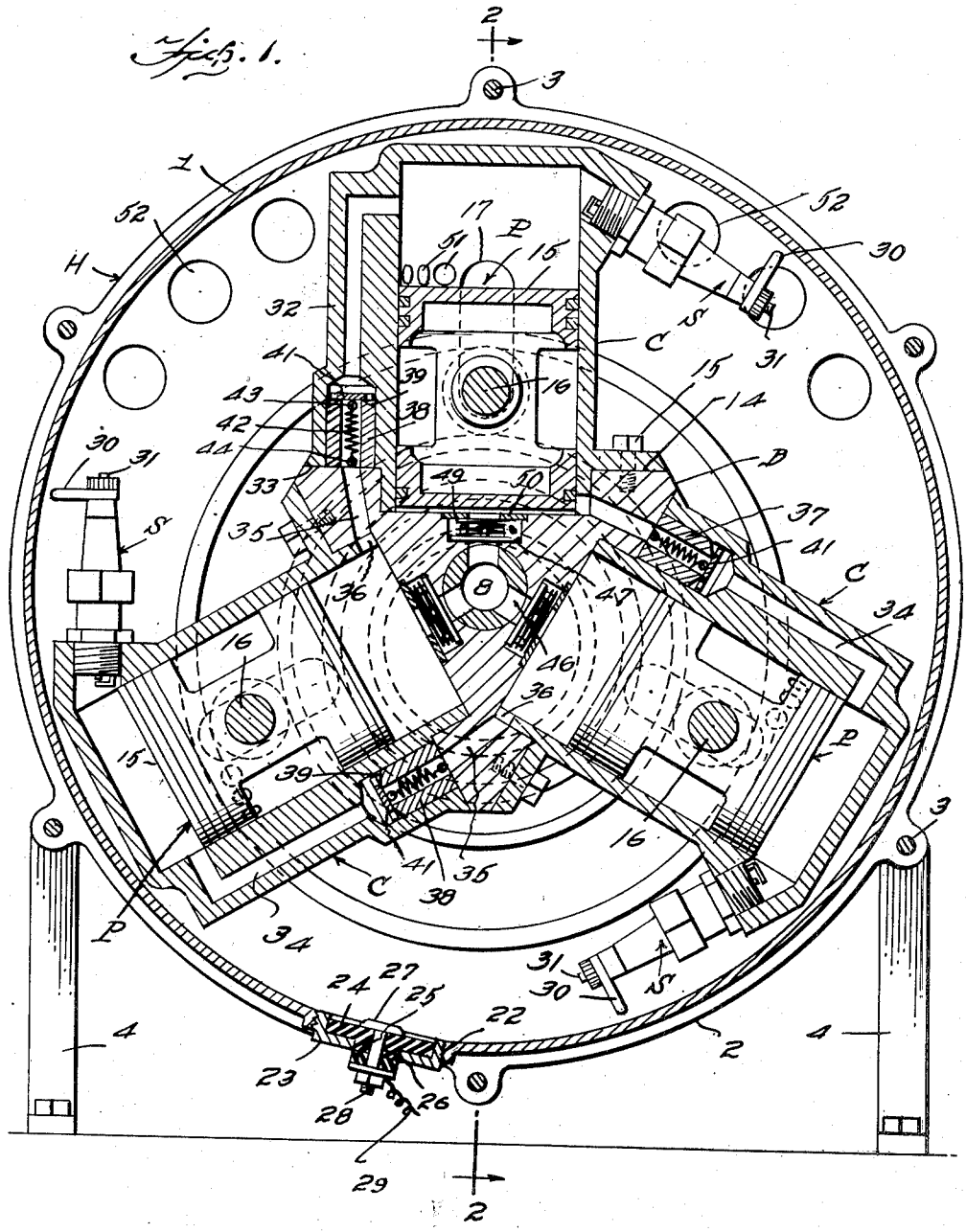
ROTARY ENGINE

2,707,461

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2 Sheets-Sheet 1

Fig. 1.



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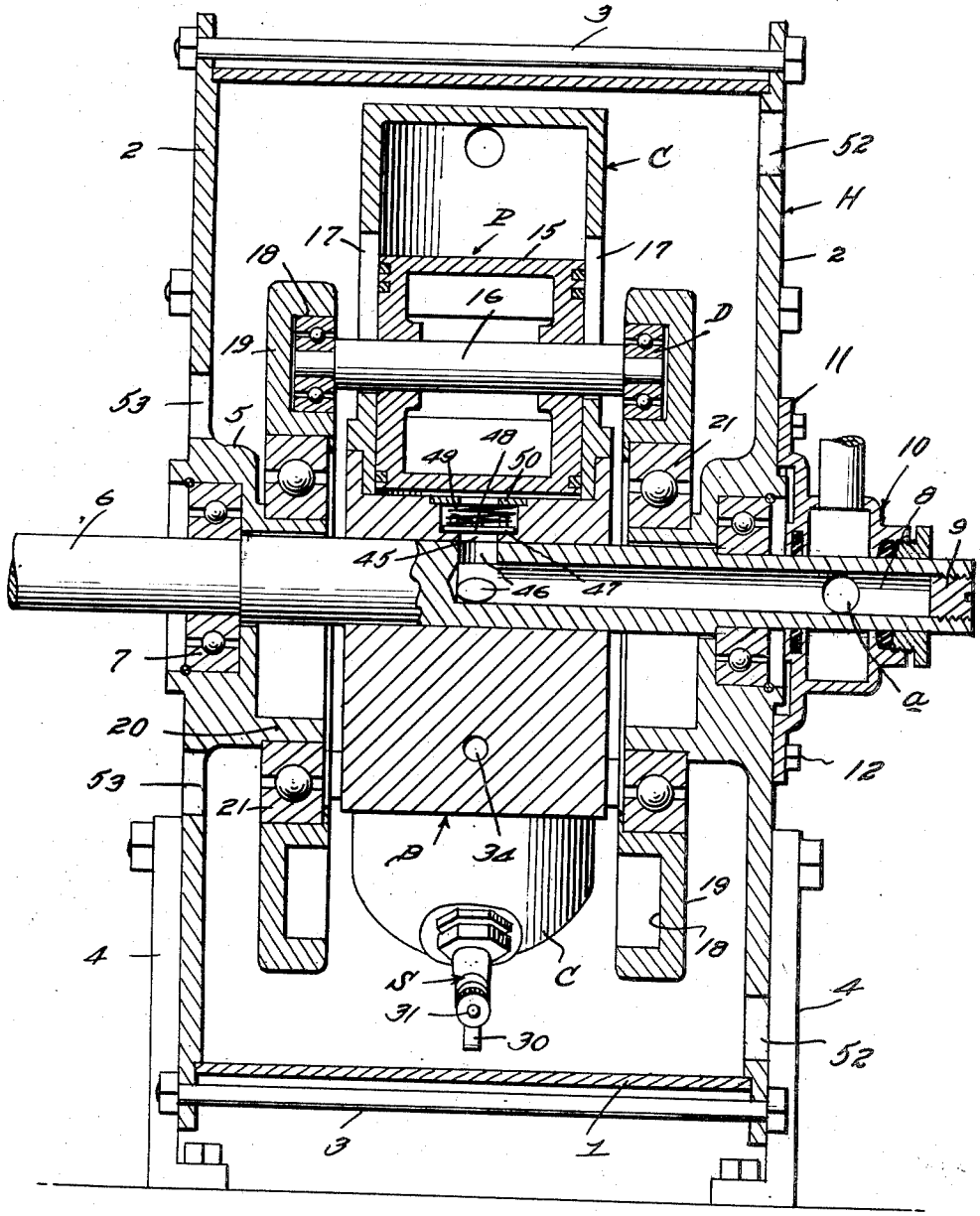
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Fig. 2.



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ROTARY ENGINE

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3 Claims. (Cl. 123—44)

This invention relates to a rotary engine of an internal combustion type and it is primarily an object of the invention to provide an engine which is light in weight in accordance with the horse power.

It is also an object of the invention to provide a rotary engine which is in complete balance when in operation.

Furthermore, it is an object of the invention to provide a motor of this kind wherein the parts are so assembled to eliminate the necessity of using a fly wheel and wherein the assembly is such to assure effective cooling of the engine.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved rotary engine, whereby certain advantages are attained, as will be hereinafter more fully set forth.

In order that my invention may be better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a view partly in side elevation and partly in section of an engine constructed in accordance with an embodiment of the invention; and

Figure 2 is a sectional view taken substantially on the line 2—2 of Figure 1.

As illustrated in the accompanying drawings, H denotes a housing of desired dimensions and which includes a cylindrical peripheral wall 1 held between the side plates 2 by the tie members 3 arranged outwardly of the wall 1. The housing H may be rigidly supported in any desired manner but as herein embodied the lower portions of the plates 2 are secured by certain of the tie members 3 to the supporting columns 4.

The side plates 2 at the axial center thereof are provided with the inwardly disposed bearings 5 for the shaft 6, of a length to extend outwardly beyond the side plates 2. Snugly fitting in each of the bearings 5 and coacting with the shaft 6 is an anti-friction assembly 7 herein disclosed as a ball type.

The shaft 6 is provided with a bore 8 open at one end of the shaft and extending inwardly of the shaft substantially to a point midway of the side plates 2. The outer end of the bore 8 is closed by a removable plug 9 or otherwise as may be preferred.

The portion of the bore 8 exteriorly of the housing H has in communication therewith a port *a* disposed through the wall of the shaft 6 and which port is also in communication with a fuel box or carburetor 10. This box or carburetor 10 is herein disclosed as integral with a plate 11 bolted, as at 12, to a side plate 2 and through which the shaft 6 snugly passes.

The outer portion of the box or carburetor 10 constitutes an outboard bearing for the shaft 6.

Fixed to the shaft 6 for rotation thereof is a triangular block B, said block being substantially midway of the side plates 2 of the housing H. The three peripheral facets 14 of the block B have bolted or otherwise rigidly secured thereto, as at 15, the outwardly disposed

cylinders C equi-distantly spaced around the shaft 6 and radial with respect thereto.

Working in each of the cylinders C is a piston P provided at its opposite end portions with the heads 15.

Disposed transversely and radially through each of the pistons P and at substantially the longitudinal center thereof is a pin 16 which extends out beyond opposite sides of the associated cylinder C through the diametrically opposed slots 17, provided in the wall of the cylinder C and disposed lengthwise thereof. The extended portions of the pin 16 are received in the annular grooves 18 provided in the opposed faces of the rings 19 positioned at opposite sides of the block B. The extremities of the pin 16 within the grooves 18 have associated therewith the anti-friction bearing assemblies D.

The rings 19 are rotatably mounted on the annular hubs 20 concentric to a common axis and which extend inwardly from the side plates 2 in predetermined offset or eccentric relation with respect to the shaft 6. Associated with each of the rings 19 and hubs 20 is an anti-friction assembly 21.

The peripheral wall 1 at a desired location thereon and preferably in its lower portion, is provided with an opening 22 in which is threaded or otherwise removably held a cap plug 23 having its open face inwardly disposed when the plug 23 is applied. Snugly fitted with the plug 23 is a plate 24 of desired insulated material with its central portion provided with an outstanding part 25 snugly fitting within a central opening 26 in the cap plug 23.

Overlying the outer or exposed face of the plate 24 and in close engagement therewith is an electrical contact member 27 of a thickness to extend slightly beyond the inner face of the peripheral wall 1 of the housing H. This member 27 is integral with a conductor shank or post 28 which extends outwardly through the plate 24 and part 25 thereof for electrical connection, as at 29 with a desired source of electrical energy.

The contact member 27 is engaged by the outwardly and laterally disposed contact member 30, when the motor is in operation, carried by the outer extended end portion of the central electrode 31 of a spark plug S operatively engaged with the outer end portion of each of the cylinders C, as is clearly shown in Figure 1 of the drawings.

The side wall of each of the cylinders C has a portion 32 outwardly thickened from substantially one end to the other, with the inner end provided with a shoulder 33 having close contact with a facet 14 of the block B. Disposed through this portion 32 is a fuel feed port 34 in communication at its inner end with the outer portion of the cylinder C. The opposite or outer end of the port 34 registers with a port 35 extending into the block B and registering with the port 36 of an adjacent cylinder C.

The receiving end portion of the port 34 is enlarged, as at 37, and said enlarged portion 37 snugly receives a sleeve 38 the inner or inserted end 39 of which constituting a seat for the inwardly opening valve plate 41 to prevent retrograde flow through the port 34. The valve plate 41, as herein embodied is normally maintained in closed position by a retractile member 42, herein disclosed as a coil spring of required tension, extending through the sleeve 38 with one extremity secured, as at 43, to the central portion of the valve plate 41 and its opposite extremity secured to a pin 44 carried by the sleeve 38 and intersecting the outer portion of the bore thereof.

Each of the cylinders C has its inner or applied end open and in communication with each of said cylinders C through its inner or applied open end is a port 45 in register with a port 46 of the shaft 6 communicating with the inner portion of the bore 8 of said shaft 6.

The port 45 is provided with an outwardly facing in-

ternal valve seal **47** with which coacts a flat non-return valve **48** constantly urged toward its seat **47** by an expansible member **49**, herein disclosed as a coil spring, interposed between the valve **48** and a washer **50** held within the outer portion of the port **45**.

The side wall of each of the cylinders C outwardly of the piston **15** when at the limit of its inward movement is provided with the exhaust openings **51** disposed circumferentially therearound and the upper portions of a side plate **2** is provided with the large openings **52** which allow for exhaust.

The opposite side plate **2** at its inner portion is provided with a series of circumferentially arranged spaced openings **53** to permit the entry of air to cool the motor. When the motor is in operation, the cylinders C serve as fans to draw the air for cooling and also serve as a fly wheel.

In the operation of the motor, the explosion successively occurs in the cylinders C and it is to be particularly noted that the piston **15** of each cylinder operates to deliver under compression the charge into cylinder C in advance thereof.

It is also to be noted that the motor fires at every one third revolution thus assuring effective rotation.

When the motor is in operation, the rings **19** rotate around hubs **20** and the end portion of the pins travel in the grooves or tracks **18**. The rings **19** maintain at all times a fixed relation one with respect to the other.

From the foregoing description it is thought to be obvious that a rotary engine constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated.

I claim:

1. An internal combustion rotary engine comprising a rotatably supported shaft, a block fixed to the shaft for rotation therewith, cylinders radiating from and carried by the block, the shaft having a bore disposed lengthwise thereof and in communication at its outer end with a source of fuel supply, the blocks having ports in communication with the inner portions of the cylinders, rings supported at opposite sides of the block and cylinder and rotating about a common axis eccentric to the axis of the shaft, the opposed faces of the rings having annular grooves of the same radius and concentric to the axes of the rings, the block and walls of the pistons having ports each leading from the inner end portion of one cylinder to the outer end portion of the adjacent cylinder in advance thereof, non-return valves in said last named ports, pistons within the cylinders for reciprocation therein, parts carried by each of the pistons and extended outwardly and laterally from the piston to engage for travel within the annular grooves of the rings, the walls of the cylinders having slots disposed lengthwise of the cylinder and being of a length to allow unobstructed reciprocation of the pistons, said block and the shaft having aligned ports opening into each of said cylinders, outwardly opening valves normally closing said ports, and means for successively exploding the charges in the cylinders as each cylinder completes a revolution with the shaft, the side walls of the cylinders having exhaust openings.

2. An internal combustion engine as set forth in claim 1, wherein the block and cylinders carried thereby operate within a closed housing having end walls, said end walls providing supports for the shaft and for the rings.

3. An internal combustion engine as set forth in claim 1, wherein the block and cylinders carried thereby operate within a cylindrical housing having end walls, said end walls providing supports for the shaft and for the rings, the said walls having inwardly disposed hubs on the inner sides of the same upon which the rings are rotatably mounted.

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