Oct. 7, 1930. C. R. NIXON 1,777,932

ROTARY GASOLINE ENGINE

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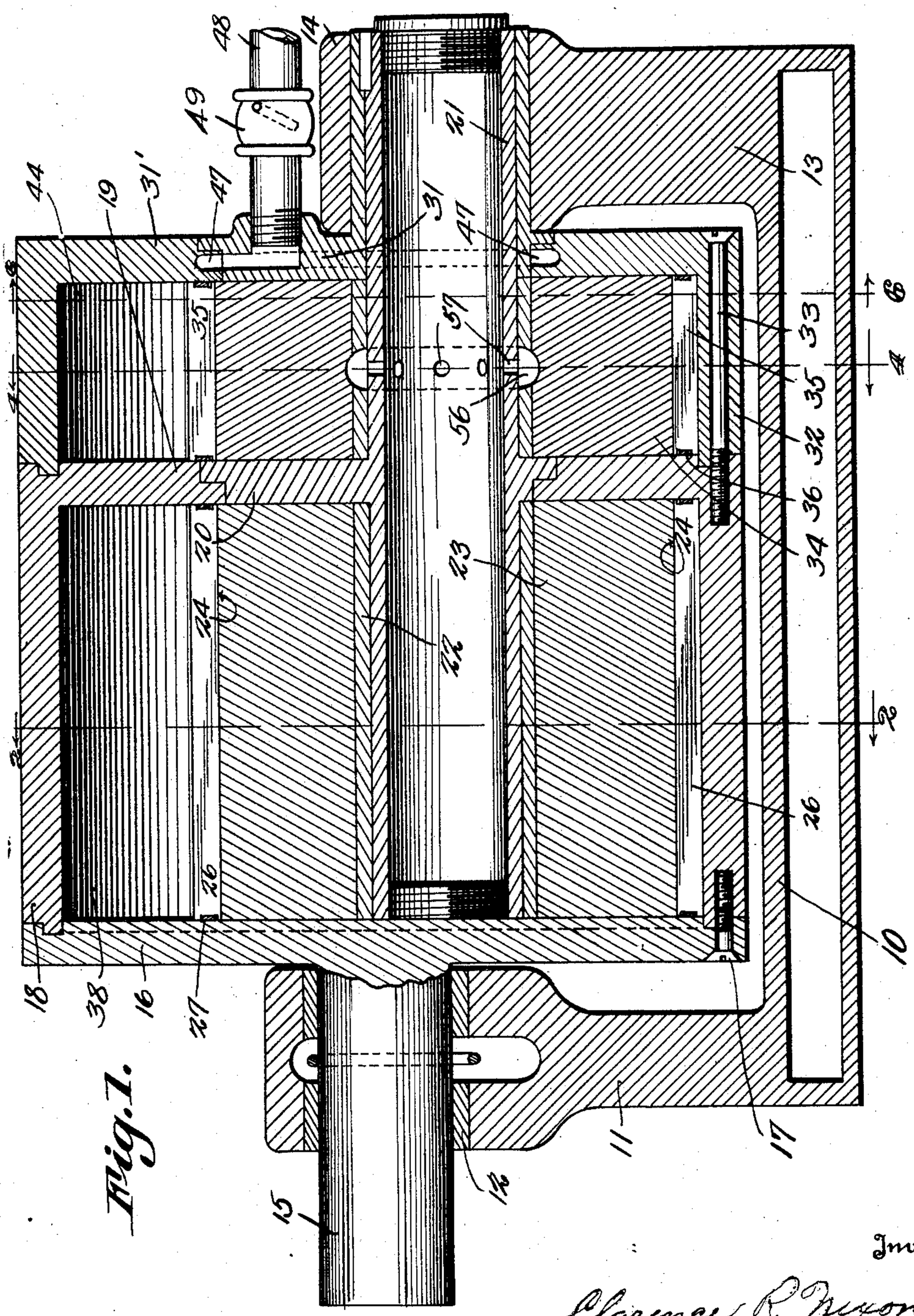

Fig. 1.

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Fig. 2.

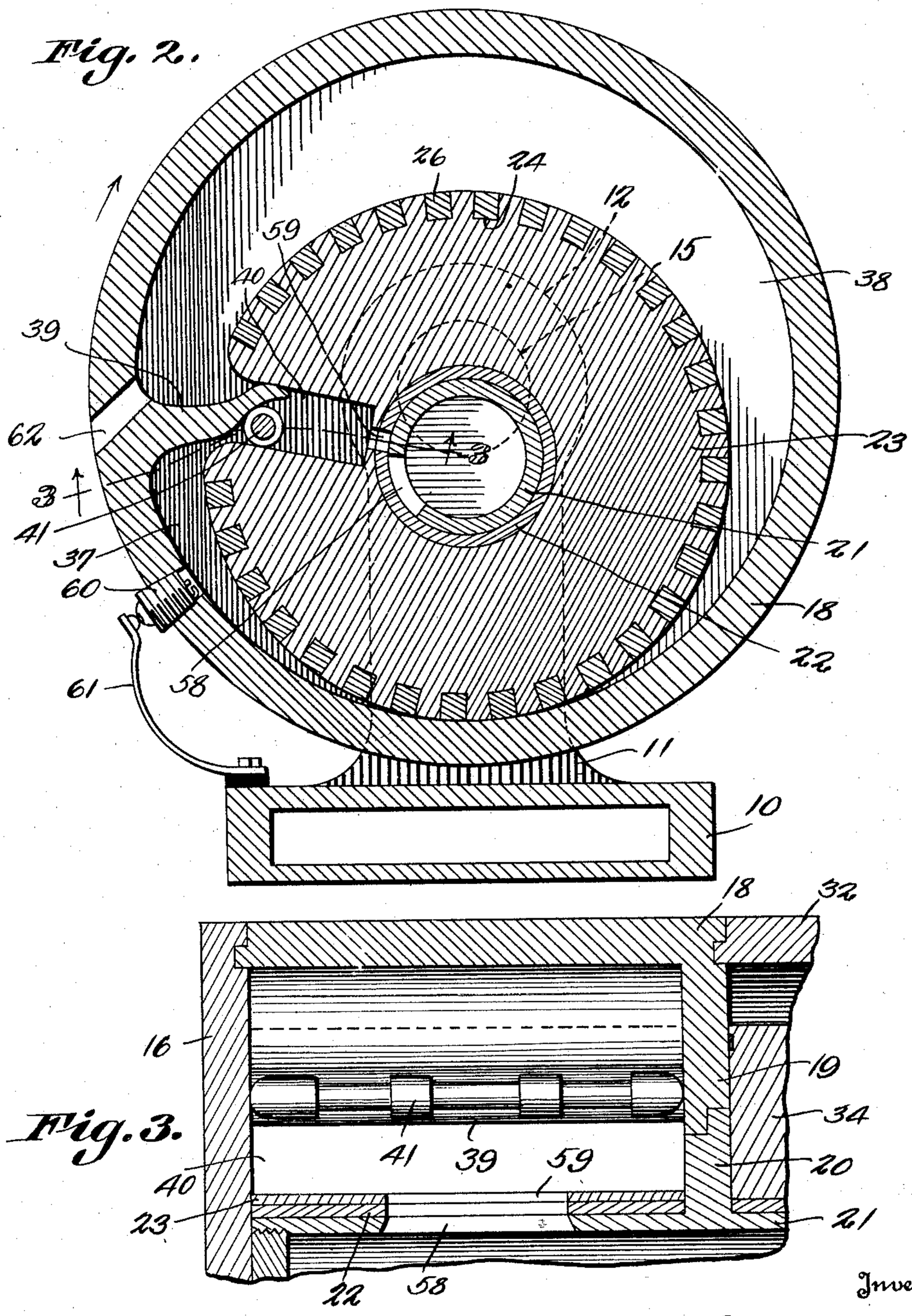

Fig. 3.

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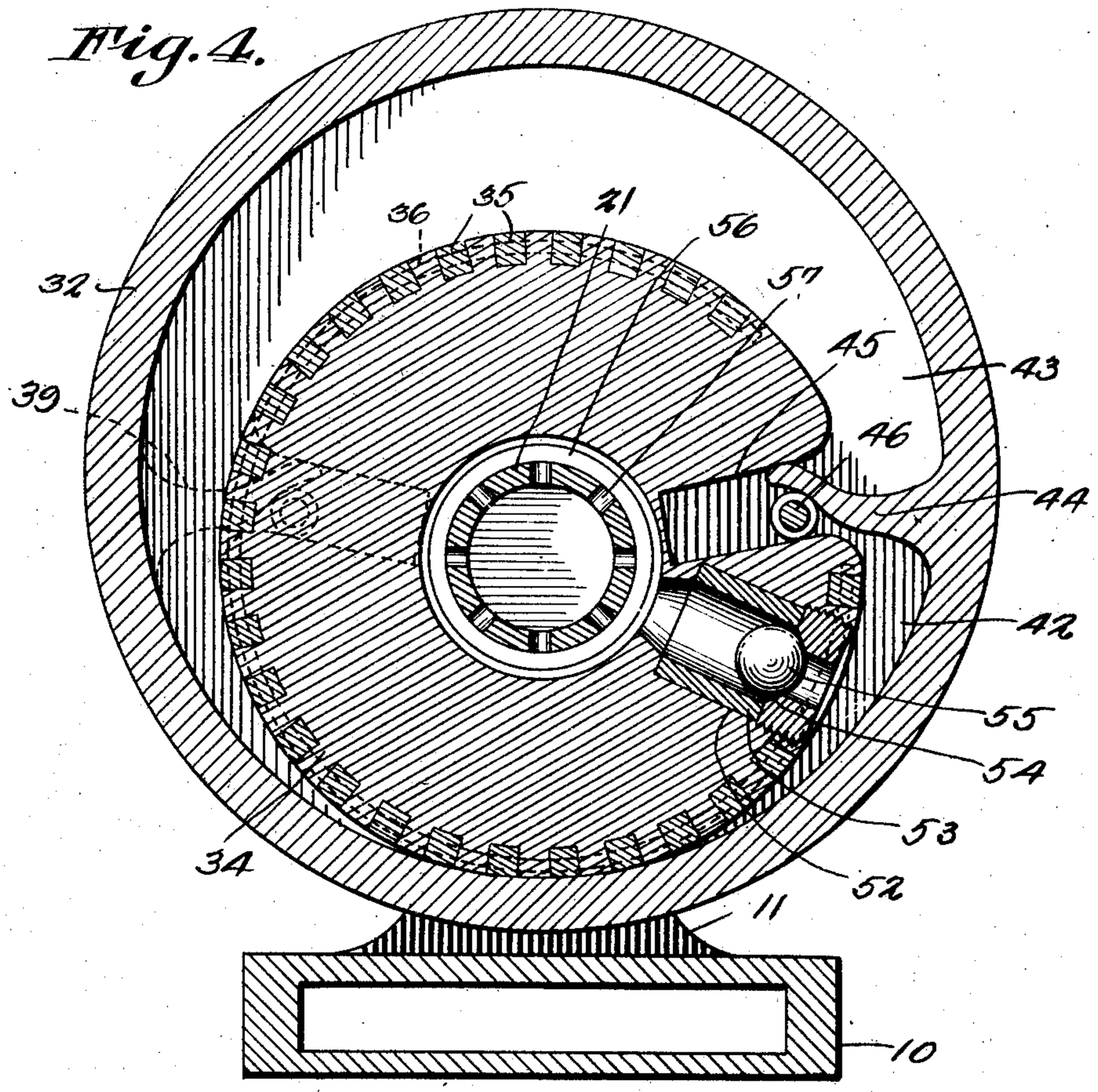
Fig. 4.



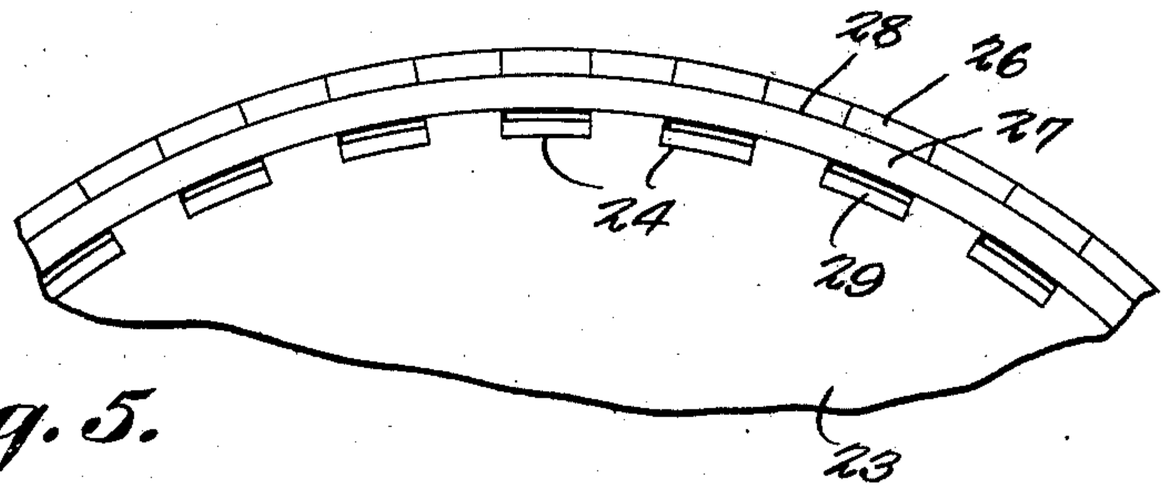


Fig. 5.

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ROTARY GASOLINE ENGINE

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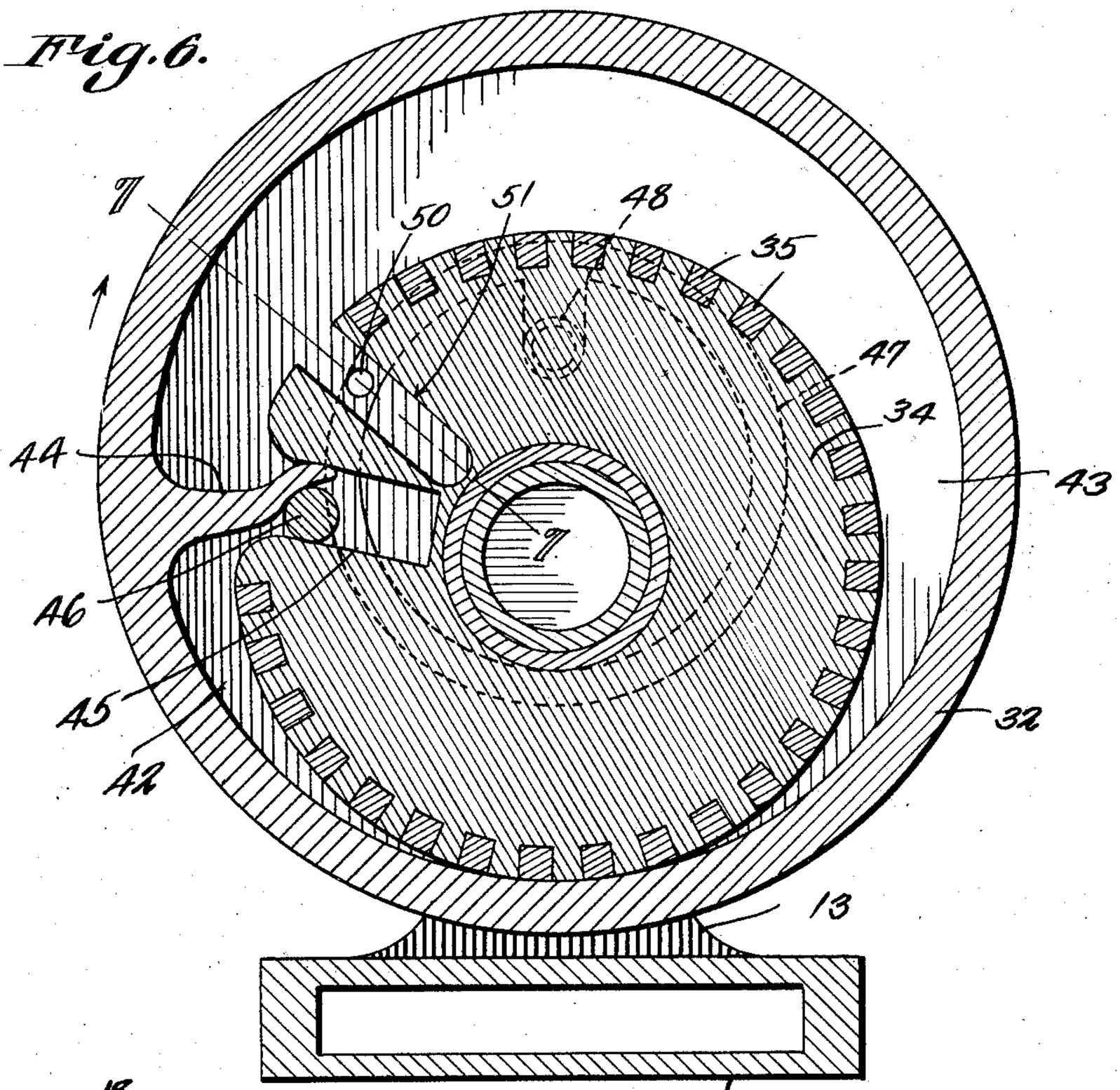
Fig. 6.



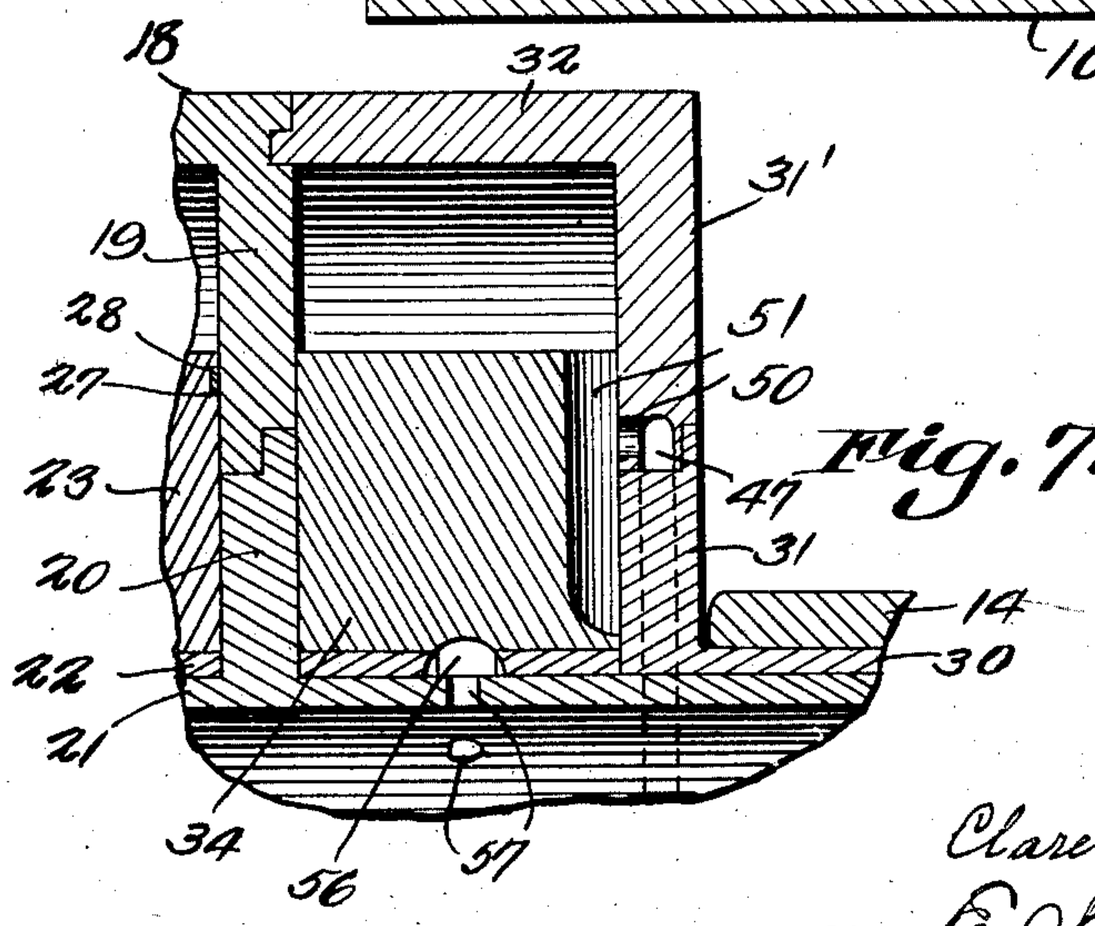


Fig. 7.

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Patented Oct. 7, 1930 1,777,932

UNITED STATES PATENT OFFICE

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ROTARY GASOLINE ENGINE

Application filed December 18, 1928. Serial No. 326,804.

This invention relates to rotary engines and has special reference to a rotary internal combustion engine designed to use gasoline or the like for carburizing explosive charges used in the engine.

One important object of the invention is to improve the general construction of devices of this character.

A second important object of the invention is to provide an improved form of rotary engine including a pair of relatively rotatable rotors both of which move in the same direction.

A third important object of the invention is to provide a novel form of combined engine and compressor or pump wherein the engine is a rotary internal combustion engine.

A fourth important object of the invention is to provide improved valve means for such an engine.

With the above and other objects in view as will be hereinafter apparent, the invention consists in general of certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawings and specifically claimed.

In the accompanying drawings like characters of reference indicate like parts in the several views, and:

Figure 1 is a vertical longitudinal median section through an engine constructed in accordance with this invention.

Figure 2 is a section on the line 2—2 of Figure 1.

Figure 3 is a section on the line 3—3 of Figure 2.

Figure 4 is a section on the line 4—4 of Figure 1.

Figure 5 is a detail view showing the manner in which certain packing strips are held in position.

Figure 6 is a section on the line 6—6 of Figure 1.

Figure 7 is a section on the line 7—7 of Figure 6.

In the present embodiment of the invention as here shown there is provided a base 10 having at one end a standard 11 supporting a bearing 12. At the other end is a second standard 13 having at its upper end a bearing 14. In the bearing 12 is journaled a shaft 15 carrying on the end toward the bearing 14 a disk 16 forming one end of the major or outer rotor. Secured to the disk or plate 16 by screws 17 is a rotor shell 18 of hollow cylindrical form and provided at the end adjacent the bearing 14 with an inwardly extending flange 19 which bears on an outwardly projecting flange 20 formed on a fixed journal member 21, the flange 20 being concentric with the shaft 15 while the journal member 21 is eccentric to said shaft as is the bearing 14. Between the disk or plate 16 and the flanges 19 and 20 there is mounted on the member 21 a bushing 22 whereon is rotatably mounted an inner rotor 23 of cylindrical form and provided with spaced peripheral grooves 24 wherein are mounted packing strips 26 held on the rotor 23 by means of securing rings 27 which are seated in recesses 28 in the ends of the rotor 23, the packing strips 26 having projecting tongues 29 over which the rings 27 engage in spaced relation so that the strips may move in and out. Keyed to the member 21 is a hollow hub 30 journaled in the bearing 14 around one end of the member 21 and on the inner end of this hub is an outwardly projecting flange 31. Mounted for rotation on the flange 31 is a head 31′ having an inwardly directed flange 32 extending from its periphery and engaging the rotor shell 18 at its periphery, this part of the device forming a pump or compressor shell and being secured to the rotor shell proper by screws 33. In this outer pump shell is mounted an inner pump rotor 34 of the same general construction as the rotor 23, that is to say being provided with packing strips 35 and retaining rings 36.

By an inspection of Figures 2, 4 and 6 it will be seen that these inner rotors are tangent to the inner sides of the outer rotors so that there is formed a firing chamber 37 and an exhaust chamber 38 in the engine end of the apparatus, these chambers being separated from each other by the rotor 23 and by a projecting tongue 39 which moves in and out of a slot 40 extending longitudinally of the rotor 23, a packing roller 41 being loosely

mounted in said slot so that under the influence of centrifugal action when the engine is running it moves outwardly and forces the tongue 39 against one side of the slot 40. Similarly the pump rotor 34 divides the pump or compressor shell in such manner as to provide a compression chamber 42 and an intake chamber 43 separated by a tongue 44 working in a groove 45 in the rotor 34 and held against one side of said groove by the roller 46.

In the head or disk 31′ is an annular passage 47 which communicates with an intake pipe 48 leading to a suitable source of carbureted air and provided with a check valve 49. The passage 47 opens through a port 50 into a radial slot 51 formed in one face of the inner pump or compressor rotor and leading radially inward from the periphery of this compressor rotor 34 is a passage 52 wherein is mounted a valve cage 53 having a valve seat 54 engageable by a ball check valve 55. The passage 52 opens inwardly into an annular passage 56 which communicates through ports 57 with the interior of the tubular member 21. In this tubular member 21 at the engine end of the device is a port 58 which, as the engine rotates moves into and out of registry with a port 59 in the bottom of the slot 40 so that from time to time the chamber 37 is placed in communication with the interior of the tubular member 21. Screwed into the engine rotor shell is a spark plug 60 which on each revolution of the shell contacts with a wiper 61 thus causing a spark to pass between the terminals of the plug. Leading from the chamber 38 adjacent the tongue 39 is an exhaust port 62.

In operation rotation of the engine draws carbureted air in through the pipe 48 so that it passes into the passage 47 and from thence through the port 50 into the passage 51 and thus into the chamber 43. Now, as the engine continues to rotate the action of the two eccentrically mounted rotors, both traveling in the same direction, as indicated by the arrows, compresses the air in the chamber 42 and thus causes it to flow past the valve 55 into the hollow member 21. From there each time the port 58 registers with the port 59 a charge of compressed gas passes out of this hollow member into the firing chamber 37 and, as contact is made with the spark plug by the wiper 61, a spark passes and the gas explodes thus driving the engine in the direction of the arrows and causing the exploded gas in the chamber 38 to be exhausted through the port 62.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

It is obvious that minor changes may be made in the form and construction of the invention without departing from the material spirit thereof. It is not, therefore, desired to confine the invention to the exact form herein shown and described, but it is desired to include all such as properly come within the scope claimed.

Having thus described the invention, what is claimed as new, is:

1. In a rotary engine, an outer rotor having a cylindrical chamber and mounted for revolution on its axis, a cylindrical inner rotor of less diameter than the chamber and tangentially engaging the cylindrical wall of said chamber, said inner rotor being mounted for revolution on its axis to constantly contact with said cylindrical wall, a tongue carried by one rotor and engaging the other rotor to cause the rotors to revolve in unison and dividing the space between said rotors into explosion and exhaust chambers, said other rotor having a slot to receive said tongue, a packing roller in said slot and engaging the tongue to force it against one side of the slot, means to supply the explosion chamber intermittently with explosive charges, means to fire each charge at predetermined positions of said rotors, and means to exhaust the spent gases from the exhaust chamber.

2. In a rotary engine, an outer rotor having a cylindrical chamber and mounted for revolution on its axis, a cylindrical inner roller of less diameter than the chamber and mounted to revolve with its periphery in constant engagement with the chamber wall, said inner rotor having a radial slot extending inwardly from its periphery and longitudinally from end to end of the inner rotor, a tongue fixed to the outer rotor and extending into said slot to divide the space between the rotors into compression and explosion chambers, said tongue being of less thickness than the width of the slot and having its inner edge reversely curved, a packing roller loose in said slot and movable outwardly in the slot to engage the curved portion of the tongue on the side next the explosion chamber to force the tongue against the opposite side of the slot, means to supply the explosion chamber intermittently with explosive charges, means to fire said charges, and means to exhaust the spent gases from the explosive chamber.

3. In a rotary engine, an outer rotor having a cylindrical chamber and mounted for revolution on its axis, a cylindrical inner roller of less diameter than the chamber and mounted to revolve with its periphery in constant engagement with the chamber wall, said inner rotor having a radial slot extending inwardly from its periphery and longitudinally from end to end of the inner rotor, a tongue fixed to the outer rotor and extending into said slot to divide the space between the rotors into compression and explosion chambers, said tongue being of less thickness than the width of the slot and having its inner edge reversely curved, a packing roller loose in

said slot and movable outwardly in the slot to engage the curved portion of the tongue on the side next the explosion chamber to force the tongue against the opposite side of the slot, means to supply the explosion chamber intermittently with explosive charges, means to fire said charges, a fixed hollow shaft for said inner rotor and having a lateral port, and a sleeve surrounding said shaft and having the inner rotor fixed thereon, said sleeve having a port movable by rotation of the sleeve into and out of registry with the lateral port, said sleeve port opening into said slot, said roller being grooved to allow exhaust gases to flow past the roller and through said ports.

In testimony whereof I affix my signature.

CLARENCE R. NIXON.