

March 5, 1929.

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1,704,236

ENGINE

Original Filed Oct. 13, 1926

2 Sheets-Sheet 1

Fig. 1.

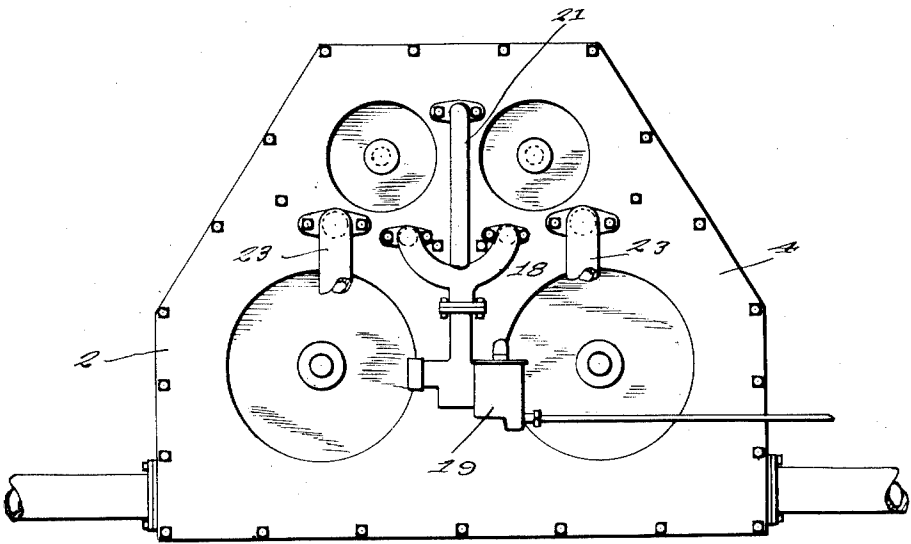
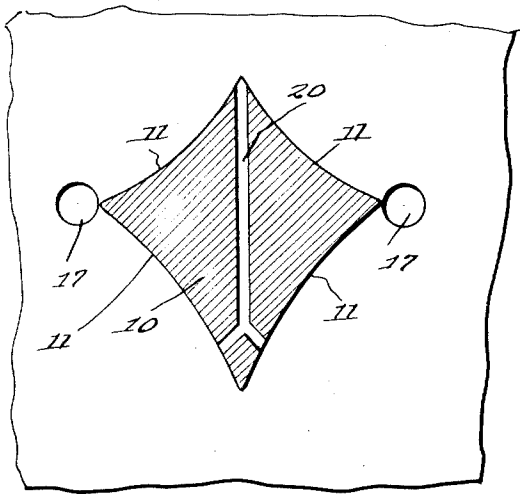


Fig. 4.



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Fig. 2.

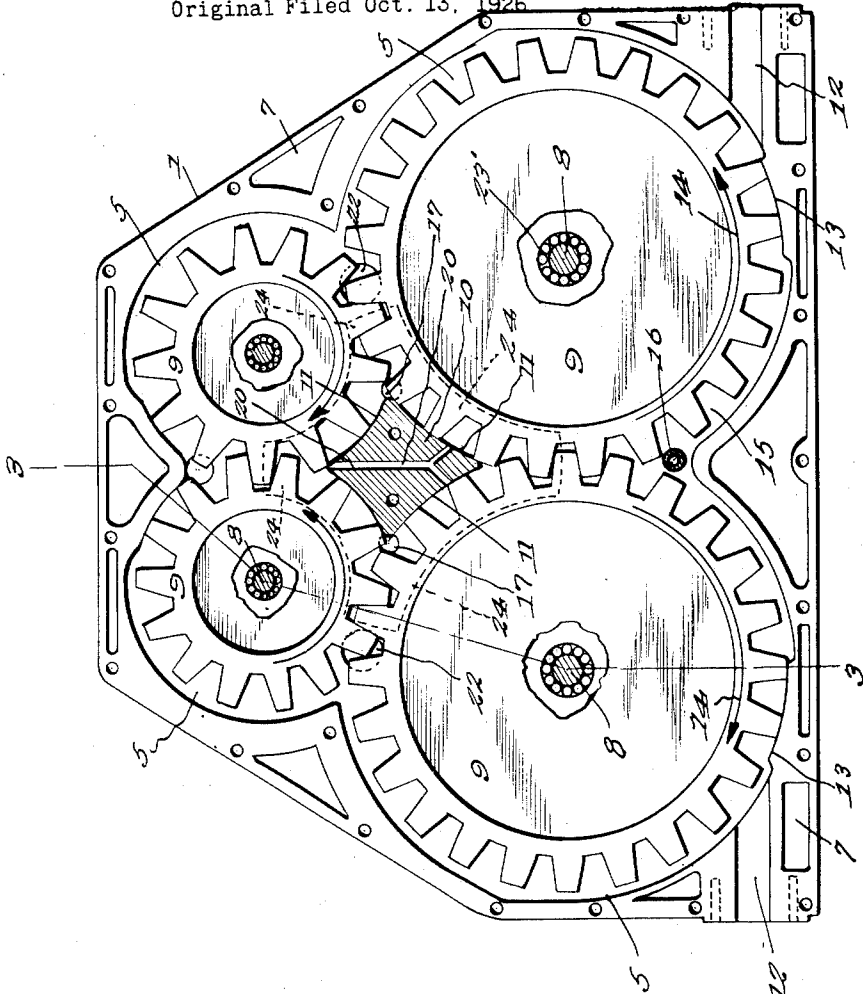
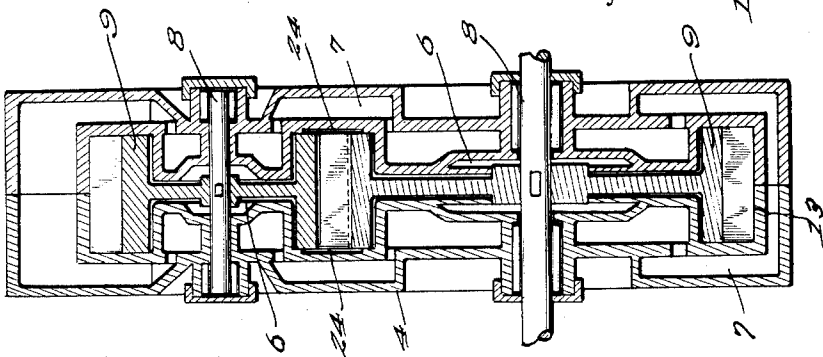


Fig. 3.



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UNITED STATES PATENT OFFICE.

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ENGINE.

Application filed October 13, 1926, Serial No. 141,374. Renewed May 16, 1928.

This invention relates to an internal combustion engine, the general object of the invention being to provide a plurality of rotors having cog-like teeth thereon and which are so arranged in a casing that the intermeshing teeth will create a vacuum or suction to draw an explosive mixture into the casing where it will be compressed by the teeth of the rotors and delivered to an explosion chamber where the gases are exploded, with means for causing the products of combustion to act on the teeth of some of the rotors to rotate the rotors as the gases pass to exhaust.

Another object of the invention is to provide means whereby some of the gases which are carried around by some of the rotors are returned to a point where they will be caused to enter the explosion chamber by the other rotors.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claim.

In describing our invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is a side view of the improved engine.

Figure 2 is a view showing the cover removed and parts in section.

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

Figure 4 is a fragmentary sectional view showing the ported member between the chambers of the casing.

In these views, 1 indicates a casing which is provided with a cover 2 and which is formed with four circular chambers 5, each chamber having a narrow central part and an enlarged outer part. The central part of each chamber is slightly enlarged to form an oil case 6. The casing is also formed with a water jacket or space 7 for cooling the walls of the chambers. A shaft 8 passes through the center of each chamber and is suitably journaled in projections forming part of the casing. A rotor 9 is placed in each chamber and is connected with the shaft which passes through the chamber.

Each rotor is made in the shape of a cog

wheel and the chambers communicate with each other so that each lower rotor will mesh with the other lower rotor and with one of the upper rotors, these upper rotors meshing with each other and the said upper rotors are of less diameter than the lower rotors.

A substantially diamond-shaped part 10 is formed with or connected to a central part of the casing and passes between the four rotors and has its edge walls curved, as at 11, to form a portion of the wall of each chamber. These curved walls 11 are engaged by the teeth of the rotors in a gas-tight manner, suitable packing means being provided if necessary.

A horizontally arranged outlet port 12 is arranged at each end of the casing adjacent the bottom thereof and these ports communicate with the lower parts of the two chambers for the large rotors. Adjacent each outlet port, a portion 13 of the wall of each large chamber extends upwardly to make a gas-tight joint with the teeth of the large rotor, these parts 13 being arranged directly in front of the exhaust ports, the rotors rotating in the direction of the arrows 14. The explosion chamber 15 is formed at the lower portions of the chambers for the large rotors where the chambers communicate with each other, the chamber 15 extending to the walls 13 of the rotor chambers. A spark plug 16 is placed in the chamber 15 to initially ignite the explosive mixture entering the chamber. After this initial ignition, the burning gases in the said chamber will ignite the fresh gases entering the same.

An inlet port 17 is arranged at each side terminal of the member 10 and these ports are connected to the manifold 18 which is connected with the carburetor 19. Thus an explosive mixture will be drawn through each port 17 by the suction created by the teeth of each large rotor leaving the teeth of each small rotor, and this gas filling the spaces between the teeth of each large rotor, will be carried around by the rotation of the rotor into the explosion chamber 15, the gas being compressed by the meshing of the teeth of the two large rotors on its way to the explosion chamber 15. The gas caught in the spaces between the teeth of each small rotor will enter the passage 20 in the member 10, the forked lower end of the said passage delivering this gas into the spaces between the teeth of the large rotors so that this gas will also be carried to the explosion

chamber 15. Any gas which does not enter the passage 20 but is carried to the top part of the space formed at the junction of the two upper chambers will be carried by a pipe 21 back to the manifold 18 so that it will again enter the suction spaces of the chamber. The exploded gases will act on the teeth at the lower portions of the large rotors so as to cause the said rotors to rotate and then the gases will pass through the exhaust ports 12. Any gases that are carried up by the rotors will pass through the exhaust ports 22 formed in the upper portions of the walls of the chambers for the large rotors and will pass into the exhaust pipes 23.

From the foregoing, it will be seen that we have provided a simple form of rotary motor, the cog-like rotors of which act to draw in the explosive mixture and compress the same and carry it to an explosion chamber where the gases are exploded and then the products of combustion, acting on the teeth of some of the large rotors, will rotate the same and permit the products of combustion to pass to exhaust. Thus portions of the combustible mixture which are compressed by the small rotors will be delivered to the large rotors, where they will be compressed again and then delivered to the explosion chamber.

Suitable packing means are placed wherever necessary and the shafts are provided with anti-friction bearings, as shown at 23', and the power can be taken off of one of the shafts of the large rotors.

It will be noticed from the dotted lines in Figure 2 and from Figure 3 that a space 24 is formed in the internal walls of the casing at each side thereof at the combustion chambers so that some of the gases can act on the edges of the toothed portions of the

wheels and the walls of the casing so that the pressure will act against the walls of the casing and thus serve as a counterbalance and prevent the wheels from wobbling.

It is thought from the foregoing description that the advantages and novel features of our invention will be readily apparent.

We desire it to be understood that we may make changes in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claim.

What we claim is:—

An internal combustion engine of the class described comprising a casing having a plurality of circular chambers therein which are in communication with each other, a cog-like rotor in each chamber, said chambers and rotors being arranged in upper and lower pairs, the rotors of each pair meshing with each other and with one of the other pair, inlet means arranged at the point where the teeth of each rotor of one pair leaves the teeth of each rotor of the opposite pair, an explosion chamber formed adjacent the point where the teeth of one rotor of one pair leaves the teeth of the other rotor of said pair, exhaust means separated from the outer ends of the said explosion chamber by an inwardly extending part of the walls of the chambers of the last mentioned or lower pair of rotors and means for causing the gases compressed by the upper pair of rotors to be returned to a point where they will be compressed and carried to the explosion chamber by the lower pair of rotors.

In testimony whereof we affix our signatures.

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