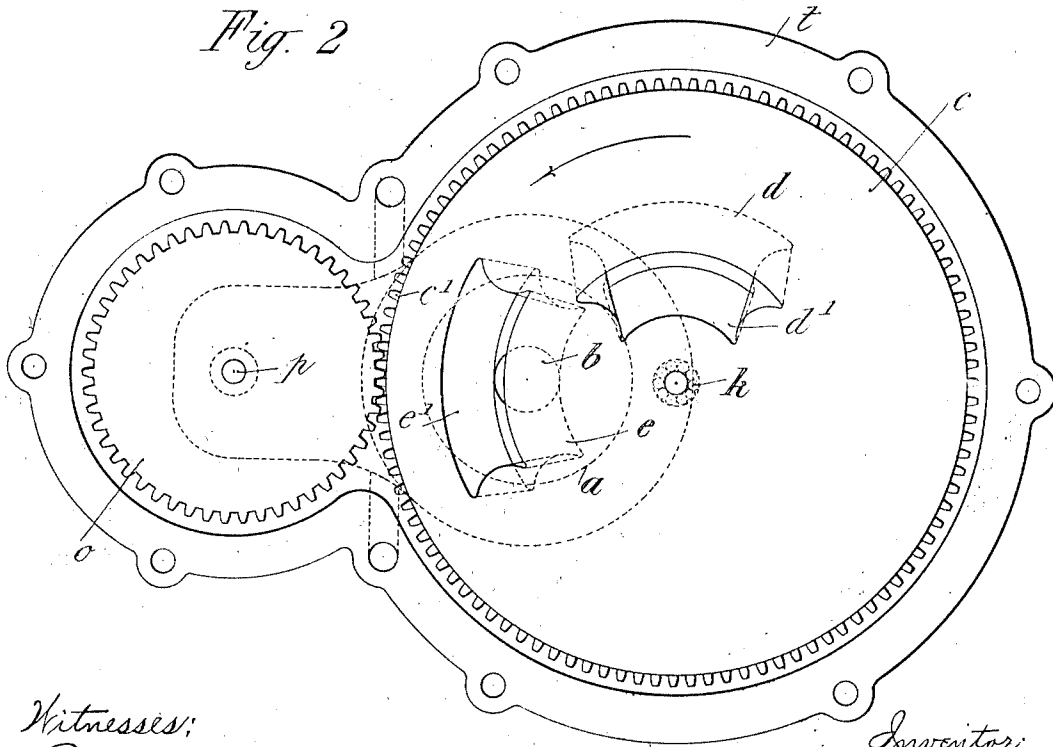
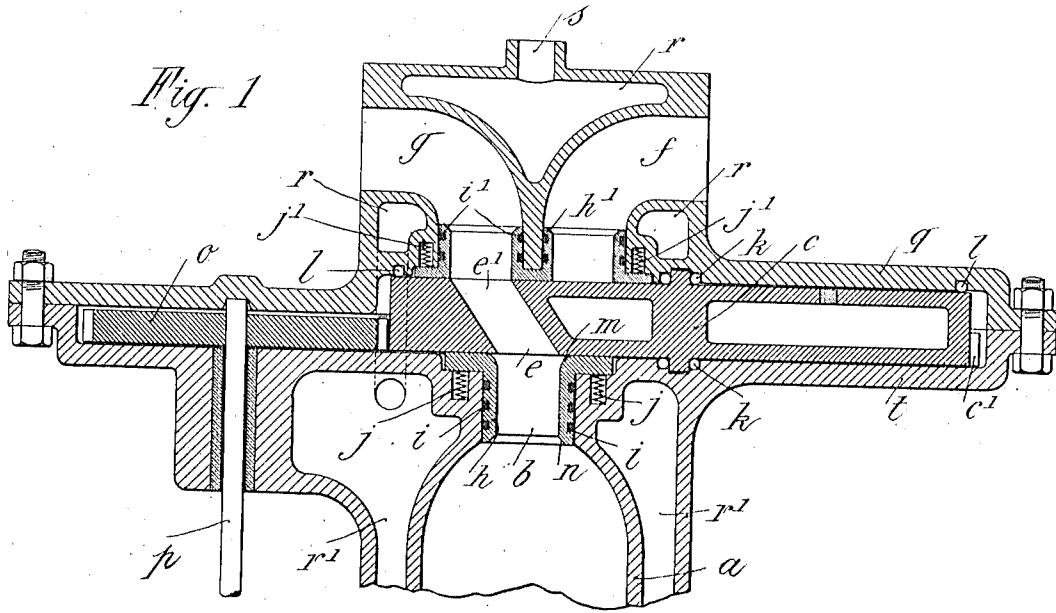


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DISTRIBUTER FOR INTERNAL COMBUSTION ENGINES.
APPLICATION FILED JUNE 13, 1912.

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UNITED STATES PATENT OFFICE.

EUGÈNE LOUIS LÉON MÉNAGÉ, OF PARIS, FRANCE.

DISTRIBUTER FOR INTERNAL-COMBUSTION ENGINES.

1,063,820.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EUGÈNE LOUIS LÉON MÉNAGÉ, citizen of the Republic of France, and resident of 88 Boulevard de Port-Royal, Paris, in the said Republic, engineer, have invented certain new and useful Improvements in Distributers for Internal-Combustion Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

The invention relates to internal combustion engines in which the valves are replaced by a rotary disk provided with suitable ports, rotating on a plane surface formed on one end of the cylinder, in such a manner that the required distribution is obtained by the passage of the port or ports past a fixed port in the end of the cylinder. Distributers with rotary disks of this type have been used for internal combustion engines, but in these previously known arrangements two fixed ports in the end of the cylinder were required with the result that the dimensions of these ports were considerably restricted, and it was generally necessary to form the upper wall of the explosion chamber of the cylinder with a plane surface.

According to the present invention only a single port is required in the end of the cylinder which port serves at the same time for the admission and exhaust of the gas, and in the rotary disk there are two inclined passages alternately placing this port in communication with the admission and with the exhaust pipes. Since the single port can be placed in the center of the end of the cylinder, this construction permits the use of hemispherical ends, and of ports of relatively very large area, which improves the working of the engines. Leakage is prevented between the distributing disk and its two contact surfaces by sliding sockets provided with packing rings like a piston and suitably pressed against the disk by means of springs. The system can be very conveniently applied to engines with two, four,

six or more cylinders, by using the same disk to control two adjacent cylinders.

In the accompanying drawings, Figure 1 is a vertical section of the upper part of a single cylinder engine provided with a rotary disk distributor, according to the invention. Fig. 2 is a plan view of the same, with the covering of the upper casing of the disk removed.

The cylinder *a*, preferably formed with a hemispherical end, has a port *b* of large section at the center of the upper end, which port serves at the same time for the admission of the gaseous mixture and for the escape of the burnt gases. The distributing disk *c*, of relatively large depth, rotates above this port on the upper face of the cylinder about an axis, which is eccentric to the axis of the cylinder.

The disk *c* has on its lower face two ports *d* and *e* at the same distance from the center, one for the admission of the explosive mixture and the other for the escape of the burnt gases. The two ports, which are suitably placed in relation to each other, are continued by inclined passages traversing the disk and leading into corresponding ports *d'* and *e'* on its upper surface at different distances from the center, the port *d'* being nearer the center than the port *d*, and the port *e'* being nearer the periphery than the port *e*. The upper ports *d'* and *e'* of the disk at each revolution communicate respectively with the admission and exhaust tubules *f* and *g* and effect the required distribution in the cylinder.

Leakage between the lower face of the disk *c* and the cylinder is prevented by means of a flanged socket *h* placed in the cylinder port *b* having segmental packing pieces *i* on its outer surface and springs *j* pressing the flange of this socket against the lower face of the disk *c*. In the same way leakage is prevented at the upper surface of the disk by a double socket *h'* with packing pieces *i'* and flanges which press by means of the springs *j'* on the upper face of the disk *c*.

The disk is pivoted in ball bearings *k* and the upper face of the disk rests against an annular ball race *l* to reduce the friction and to take the thrust on the disk due to the explosion. In order to lessen the pressure

and consequently the friction between the socket *h* and the disk *c* at the moment of ignition, the upper angle of this socket may preferably be rounded off or beveled, as shown at *m* in Fig. 1, so that the pressure between the socket and the disk may have any required value, the pressure at ignition being partly exerted on the upper ball bearings *k* and *l*. Similarly the lower edge of the socket *h* may also be beveled at *n* to facilitate the passage of the gas.

The distributing disk is driven by a toothed wheel *o* gearing with teeth *c'* on the disk and fixed on a vertical spindle *p* driven by the distributing shaft of the engine. The diameter of the toothed wheel *o* may advantageously be half that of the disk, so that to obtain the required distribution, the openings *d* and *e* of the disk should be 90° apart and separated by a plain portion equal to the diameter of the port *b* of the cylinder, as shown in Fig. 2. Also the ports should be preferably in the form of sectors, with curved edges, so as to obtain at the same time an abrupt closing and the greatest duration of opening. In an engine with 2, 4 or more cylinders, the same disk can control the distribution of two adjacent cylinders and these disks can be geared together and actuated by a single pinion, either at the center or at one end of the engine. Since the upper ports *d'* and *e'* of the disk *c* are not at the same distance from the axis, as the lower ports *d* and *e* and are on different diameters of the upper face of the disk, they will have different peripheral velocities; so that to avoid resistance to the flow of the gas, the cross section of the port, in which the velocity is greater, in this case the exhaust port *e'*, should be correspondingly increased as shown in Fig. 2.

The admission and exhaust tubulures *f* and *g* should preferably be formed, as shown in Fig. 1, in a projecting part of the cover *o* of the casing, in which the distributing disk and its driving gear *o* are placed. This projection of the cover can also be advantageously used to form a water chamber *r* around the tubulures *f* and *g*, which keeps the disk cool and is in communication by means of suitable passages with the cylinder water jacket *r'*; cooling water can be admitted through a tubulure *s* at the top of this chamber. Since the disk must necessarily have considerable depth, on account of the inclination of the passages traversing it, it should preferably be hollow, and this also will help to prevent its being over heated.

Having now described the nature of my said invention and the best means I know of carrying the same into practical effect, I claim:—

1. An internal combustion engine comprising, a cylinder; a single central port

at one end of the cylinder; a plane disk mounted on this end; an admission port and an exhaust port formed in this disk; means for rotating the disk at a speed proportional to that of the engine and to cause the two ports in the disk to communicate with the central port of the cylinder; and admission and exhaust pipes opening above the disk and with which the two ports in the latter respectively communicate during its rotation.

2. An internal combustion engine comprising; a cylinder; a single central port at one end of the cylinder; a plane disk mounted on this end; an admission port and an exhaust port formed in this disk; means for rotating the disk at a speed proportional to that of the engine and to cause the two ports in the disk to communicate with the central port of the cylinder; admission and exhaust pipes opening above the disk and with which the two ports in the latter respectively communicate during its rotation; a movable flanged socket mounted in the central port of the cylinder; segmental rings inserted in the external surface of the said socket; and springs pressing the flanges of the socket against the lower face of the disk.

3. An internal combustion engine comprising; a cylinder, a single central port at one end of the cylinder; a plane disk mounted on this end; an admission port and an exhaust port formed in this disk, means for rotating the disk at a speed proportional to that of the engine and to cause the two ports in the disk to communicate with the central port of the cylinder; admission and exhaust pipes opening above the disk and with which the two ports in the latter respectively communicate during its rotation; a movable flanged socket mounted in the central port of the cylinder; segmental rings inserted in the external surface of the said socket, and springs pressing the flanges of the socket against the lower face of the disk, a similar double flanged socket, provided with segmental rings and situated in the openings of the admission and exhaust pipes; and springs pressing the flange of the said double socket against the upper face of the disk.

4. An internal combustion engine comprising; a cylinder, a single central port at one end of the cylinder; a plane disk mounted on this end; an admission port and an exhaust port formed in this disk; means for rotating the disk at a speed proportional to that of the engine and to cause the two ports in the disk to communicate with the central port of the cylinder; admission and exhaust pipes opening above the disk and with which the two ports in the latter respectively communicate during its rotation; a movable flanged socket mounted in the central port

of the cylinder; segmental rings inserted
in the external surface of the said socket;
and springs pressing the flanges of the socket
against the lower face of the disk, and a
5 beveled edge at the inner part of the flange
to reduce the pressure of the gas on the dis-
tributing disk.

In testimony that I claim the foregoing as
my invention, I have signed my name in
presence of two subscribing witnesses.

EUGÈNE LOUIS LÉON MÉNAGÉ.

Witnesses:

H. C. COXE,
HENRY THIESSE.