

J. BAVEREY.
 ROTARY VALVE MECHANISM FOR INTERNAL COMBUSTION MOTORS.
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1.059,516.

Patented Apr. 22, 1913.

FIG.1.

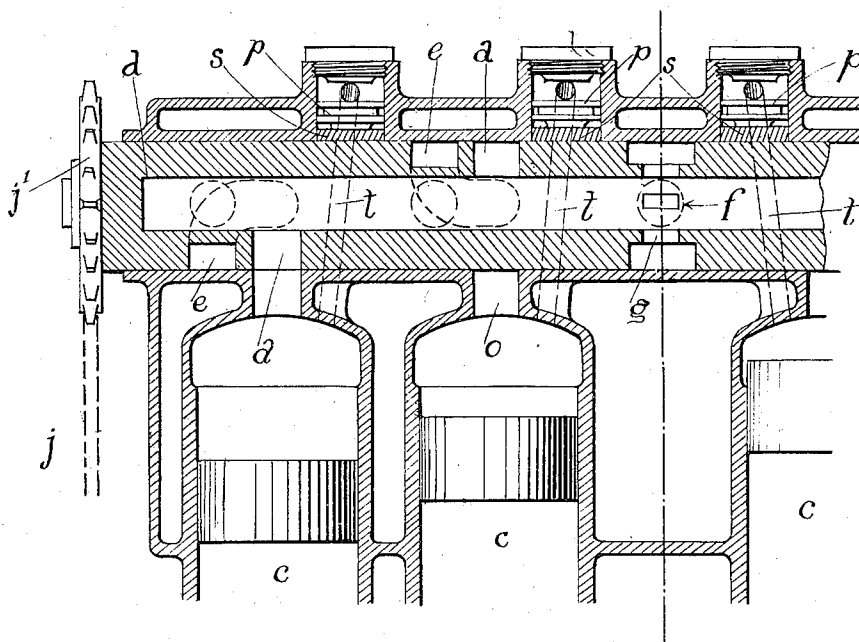
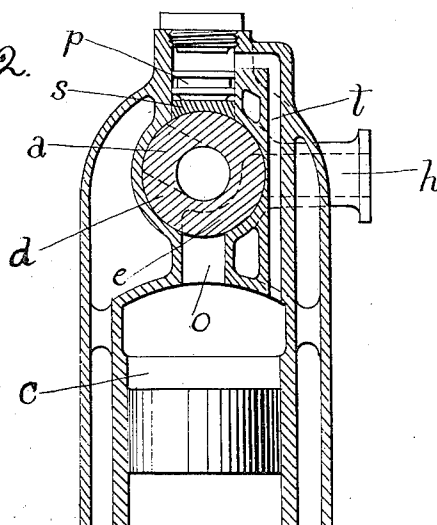


FIG.2.



WITNESSES:

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ROTARY VALVE MECHANISM FOR INTERNAL-COMBUSTION MOTORS.

1,059,516.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed November 29, 1910. Serial No. 594,783.

To all whom it may concern:

Be it known that I, JOSEPH BAVEREY, a citizen of the French Republic, residing at Irigny, Rhône, in France, have invented certain new and useful Improvements in Rotary Valve Mechanism for Internal-Combustion Motors, of which the following is a specification.

This invention relates to a rotary valve mechanism applicable to internal combustion engines provided with one or more cylinders, said mechanism being adapted to regulate both the inlet of fresh gases and the exhaust of burnt gases.

A single valve mechanism can control a motor having any number of cylinders grouped in one series and is applicable to motors of two, three, or four stroke cycle, by suitably regulating the speed of rotation of the mechanism.

An essential feature of the invention is that during operation it is submitted to a temperature which is practically regular and constant, and sufficiently low to prevent distortion due to unequal expansion of its component parts.

A vertical embodiment of the invention applied to a four cylinder motor is represented in the accompanying drawings in which—

Figure 1 is a sectional view through the apex of the cylinders and Fig. 2 is a cross section illustrating the means for balancing the cylinder pressure on the valve.

The type selected as an example is adapted for use with motor road vehicles, in which the axes of the cylinders *c, c*, are in the same vertical plane. The valve mechanism is disposed parallel to the motor shaft and located immediately above the cylinders in order to reduce the length of the orifices or ports. The mechanism comprises a hollow cylinder or valve *d*, adapted for rotation in a casing which is cooled throughout its length, by the water circulation from the motor inclosed within a jacket. The gaseous mixture from the carbureter passes from the inlet port *f* into the valve *d* by means of ports *g* and which enters the cylinders by means of ports *a* formed in the wall of the valve, which ports register at the proper times with the ports *o* in the upper ends of the cylinders.

The exhaust of the burnt gases is effected through channels *e* formed in the wall of the valve, said channels having a curved

form so that one extremity may register with the ports *o* of the cylinders and the other extremity with exhaust pipe *h*.

The valve is rotated from the motor shaft (not shown) by any suitable means, as for example by means of chain *j* passing over a sprocket wheel *j'* secured to the end of the valve at a fixed ratio of transmission according to the cycle of the motor. The valve makes one complete rotation to two revolutions of the shaft in a four stroke cycle motor. The ports *a* and channels *e* are so arranged as to place the cylinders in communication either with the inlet ports for the fresh gases or with the exhaust ports at the desired times, these ports being similar for each cylinder and arranged at angular intervals relatively to one another corresponding to the relative angles of the cranks on the motor shaft.

In the construction illustrated the valve mechanism is interiorly cooled by the introduction of the fresh gases and exteriorly cooled by the contact of the casing with the water in which it is immersed as previously explained. Those portions of the valve and casing which are in contact with the hot gases are small, so that distortion and other faults arising from the action of heat are obviated or reduced to a minimum.

The objectionable effects caused by excessive pressure on the valve through the cylinder ports are also prevented by means of the automatic balancing or equalizing means shown. During the operation of the motor and especially during compression, explosion and expansion of the gases, the pressure within the cylinder tends to lift the valve *d* away from the port *o* which would cause a leakage. This fault is rectified by producing a pressure on the valve diametrically opposite its communication with the cylinder which pressure is equal to or greater than the pressure of the cylinder and proportional thereto. The means for this purpose consists in providing a shoe *s* on the side opposite the cylinder and slightly to one side to prevent coinciding with the port *e*, the pressure from the cylinder acting on said shoe by means of a tightly fitting piston *p*. For this purpose the explosion chamber of the cylinder communicates by means of a channel *t* with the upper surface of said piston. The equilibrating pressure acting on the valve by means of the shoe *s* while remaining proportional to that of the cylinder can

reach the desired comparative value to that acting under the valve through the port *o*. In practice the surface of the piston *p* can be made greater than the cross sectional area of the port *o* so as to always insure contact of the valve with the lower portion of its seat.

It should be remarked that this arrangement and relation of pressures established by the construction described cannot become deranged, and also that the pressure of the shoe *s* being intermittent, only operating at the desired times and being only of the necessary value, the apparatus operates with the minimum of friction and wear.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. A rotary valve mechanism for internal combustion motors comprising a casing, a cylindrical valve therein having a central channel, with a port leading therefrom for inlet of gaseous mixture to the cylinder, and an exhaust channel in the wall of said valve, means for supply of the gaseous mixture to said channel, means for axially rotating the valve whereby the inlet port and exhaust channel are placed in communication with the cylinder in determined sequence, and means for balancing pressure from the cylinder on said valve comprising a shoe dis-

posed for contact with said valve opposite the inlet to the cylinder and means of communication between the interior of said cylinder and the outer surface of said shoe.

2. A rotary valve mechanism for internal combustion motors comprising a casing, a cylindrical valve therein having a central channel with ports leading radially therefrom at different angles for inlet of gaseous mixture to the motor cylinders and exhaust channels in the wall of said valve disposed at different relative angles, means for supply of gaseous mixture to said channel adjacent the longitudinal center thereof, means for axially rotating the valve whereby the inlet ports and exhaust channels are placed in communication with the cylinders in determined sequence, and means for balancing pressure from the cylinders on said valve comprising a shoe disposed for contact with said valve opposite the inlet to the cylinders and means of communication between the interior of the cylinders and the outer surface of said shoe.

In witness whereof I have signed this specification in the presence of two witnesses.

JOSEPH BAVEREY.

Witnesses:

GASTON JEAUNIAUX,
LOUIS DUBART.