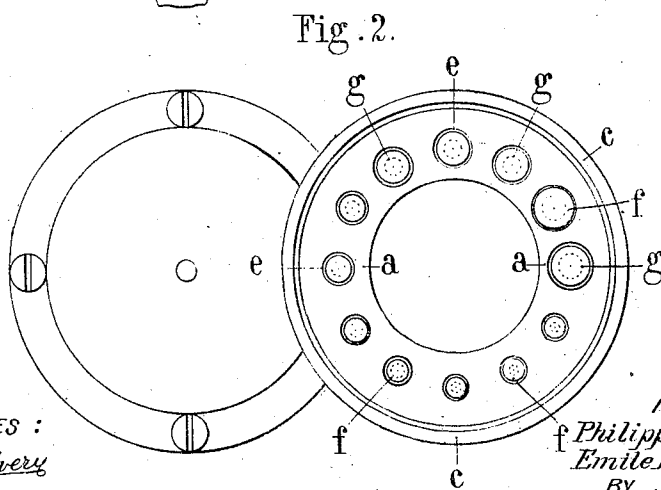
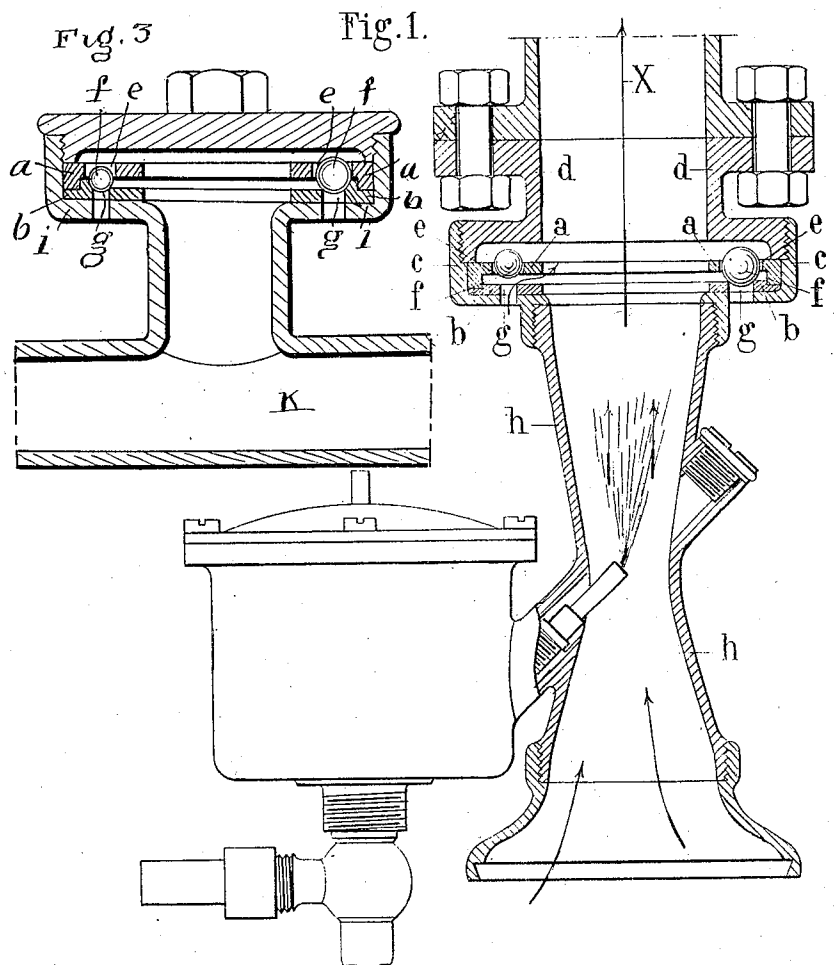


P. J. GROUVELLE & E. H. ARQUEMBOURG.
 CARBURETER FOR INTERNAL COMBUSTION ENGINES.
 APPLICATION FILED JUNE 7, 1906.

932,860.

Patented Aug. 31, 1909.



WITNESSES :

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PHILIPPE JULES GROUVELLE AND EMILE HENRI ARQUEMBOURG, OF PARIS, FRANCE.

CARBURETER FOR INTERNAL-COMBUSTION ENGINES.

932,860.

Specification of Letters Patent.

Patented Aug. 31, 1909.

Application filed June 7, 1906. Serial No. 320,543.

To all whom it may concern:

Be it known that we, PHILIPPE JULES GROUVELLE and EMILE HENRI ARQUEMBOURG, both of 71 Rue du Moulin Vert, in the city of Paris, Republic of France, engineers, have invented Improvements in Carbureters for Internal-Combustion Engines, of which the following is a full, clear, and exact description.

The present invention has for its object to obtain an additional supply of air in a carbureter which is automatically operated by the vacuum which is created in the carbureter by the suction of the motor and to permit of varying the proportions of air and of carbureting fluid according to requirements, by using the vacuum itself.

The invention is illustrated in the accompanying drawings in which:

Figure 1 is a vertical section of a carbureter showing the invention applied thereto; Fig. 2 is a plan of the carbureter with the cover removed showing the seat of the additional air supply valve; and Fig. 3 shows the invention arranged in such manner that the additional air supply constitutes an independent part of the carbureter.

In the various figures, the same letters of reference indicate like parts.

The apparatus consists of two disks *a* and *b* placed horizontally in a box *c*. These two disks are held in position by the cover *d*. The upper disk *a* has holes *e* within which balls *f* of various sizes can move. The lower disk *b* has holes *g* corresponding in position with the holes *e* but of smaller diameter, so that these holes are completely closed by the various balls. The cover *d* serves as a retainer for the balls and at the same time permits them to rise sufficiently to uncover the holes *g*.

The apparatus operates in the following manner: When the motor is working, its suction produces in the carbureter a vacuum corresponding to the power which it develops. When the difference between the atmospheric pressure and the pressure within the carbureter on the area of the hole becomes equal or superior to the weight of the corresponding ball, the latter will rise and there will enter the carbureter a quantity of air according to the size of the hole in question. It will be understood therefore that in suitably choosing; 1st, the diameters of the balls, 2, the nature of the material of which

they are made, 3, the diameter of the air inlet holes which they close, the entry of air can at will be varied according to the vacuum. The power of the motor varying, the vacuum will similarly vary, so that the balls will rise and fall one after the other or several at a time, thus permitting at each instant an entry of air corresponding with the sum total of the areas of the holes uncovered; this entry of air can be determined in advance for a given vacuum because the diameter of the balls, their weight and the area of the opening upon which they rest can be chosen accordingly.

In Fig. 1 the box *c* of the arrangement is a continuation of the body *h* of the carbureter and the arrow *X* represents the direction of suction of the motor.

In Fig. 3, the arrangement is mounted on a piece *i* separate from the carbureter and carrying a junction tube *k* capable of connection on one side with the motor and on the other with the carbureter. In all cases, the section of the passage affording entrance to the air, will always be the section at the entrance to this passage.

The apparatus above described, although very simple, presents the advantage of requiring no spring the power of which latter varies with time and temperature; further no friction is produced and the freedom of motion of its parts is complete and cannot be impeded by dust from the road or by oil projected from the mechanical parts in motion.

Claims.

1. A device for automatically regulating the additional supply of air in a carbureter for internal combustion engines, comprising an apertured box adapted to be connected with the motor and carbureter, two disks arranged in the box, one above the other, each disk having a plurality of apertures of varying sizes, the apertures of the upper disk being larger than the apertures of the lower disk, the apertures of the said disks registering with each other and with the aperture of the box, and a plurality of balls of varying sizes movable in the apertures of the upper disk and closing the apertures of the lower disk.

2. A device for automatically regulating the additional supply of air in a carbureter for an internal combustion engine, comprising an apertured box adapted to be con-

nected with the motor and carbureter, two disks in the box, each disk having a plurality of apertures of varying sizes, the apertures of one disk being larger than those of the other disk, the apertures of said disks registering with each other and with the apertures of the box, and a plurality of balls of varying sizes movable in the apertures of one disk and closing the apertures of the other disk.

3. A device for automatically regulating the additional supply of air in a carbureter for an internal combustion engine, comprising a box adapted to be connected with the motor and carbureter and having a plurality of openings for the admission of air thereto, a plurality of balls of varying sizes for controlling the admission of air to the box, and means for retaining the balls in position in the box.

4. The combination with a carbureter, of a plurality of ball valves actuated by suction to supply auxiliary air to the carbureter, said ball valves being of different sizes and weights, whereby they will be opened under different degrees of suction.

5. The combination with a carbureter having a plurality of openings of varying sizes for the admission of auxiliary air thereto, of a plurality of balls actuated by suction for controlling the said openings, said balls being of varying sizes and weights and having guided movement to and from said openings.

6. In a carbureter for explosive engines, the combination with a primary mixing chamber having an inlet port for a combustible fluid and an outlet port for a combustible mixture, of means for supplying air to said mixing chamber, an auxiliary mixing chamber with which the primary chamber communicates, and a plurality of valves controlling air passages leading to said auxiliary chamber, said valves being arranged to

operate progressively as the pressure within the auxiliary chamber varies.

7. In a carbureter for explosive engines, the combination with a primary mixing chamber having an inlet port for a combustible fluid and an outlet port for a combustible mixture, of means for supplying air to said mixing chamber, an auxiliary mixing chamber with which the primary mixing chamber communicates, a plurality of valves controlling air passages leading to said auxiliary mixing chamber, and means for permitting the successive opening of said valves as the speed of the engine increases.

8. The combination with a mixing chamber having inlets for air and fuel and an outlet for the mixture, of means actuated by suction to supply auxiliary air to the mixture, comprising a plurality of normally-closed valves opening under different degrees of suction respectively.

9. The combination with a carbureter, of a plurality of ball valves actuated by suction to supply auxiliary air to the carbureter, said ball valves being of different weights, whereby they will be opened under different degrees of suction.

10. The combination with a carbureter having a plurality of openings for the admission of auxiliary air thereto, of a plurality of balls actuated by suction for controlling the said openings, said balls being of varying weights and having guided movement, to and from said openings.

The foregoing specification of our improvements in carbureters for internal combustion engines signed by us this 23rd day of May 1906.

PHILIPPE JULES GROUVELLE.
EMILE HENRI ARQUEMBOURG.

Witnesses:

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