C. FOGOLIN.

CARBURETER.

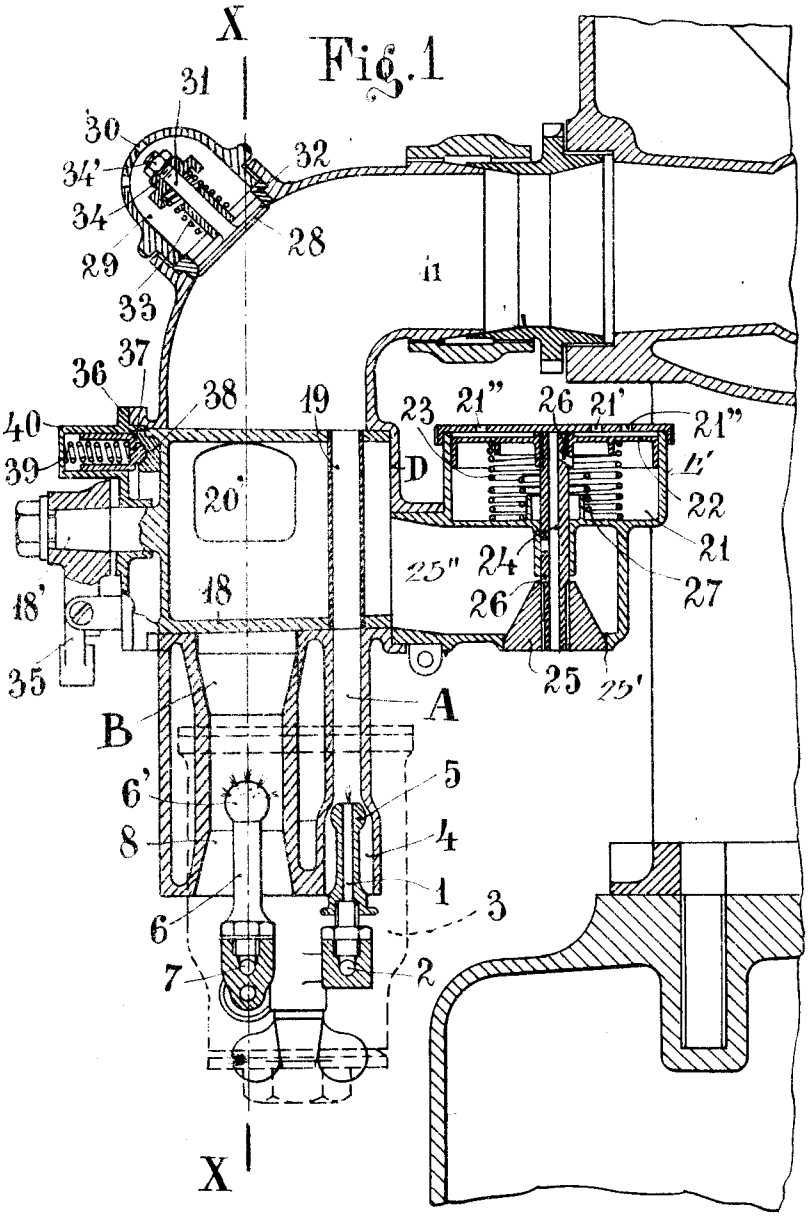
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1,180,483.

Patented Apr. 25, 1916

3 SHEETS—SHEET 1.

Fig. 1



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3 SHEETS—SHEET 2.

Fig. 2

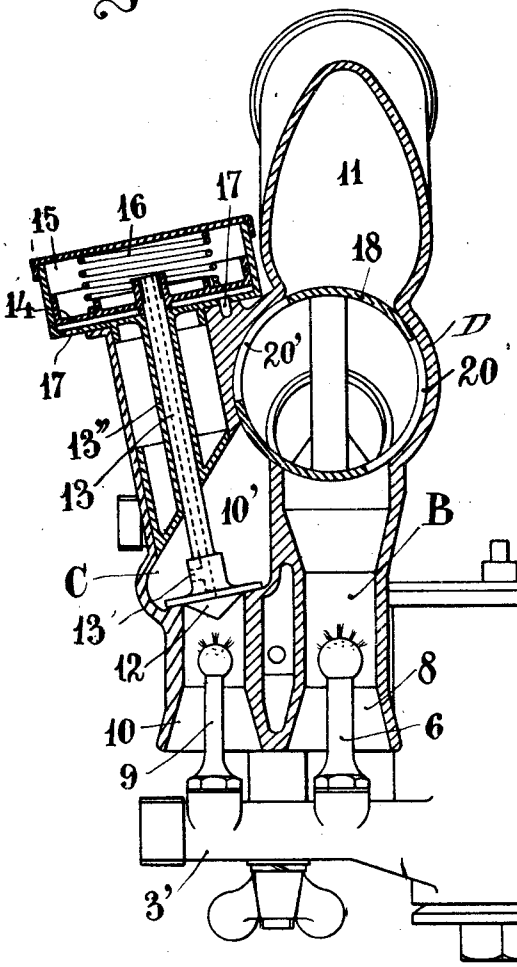
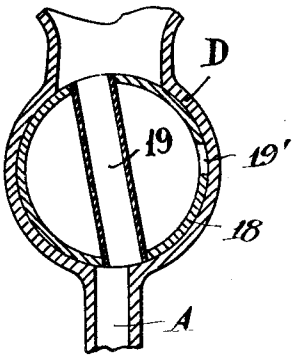


Fig. 3



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3 SHEETS—SHEET 3.

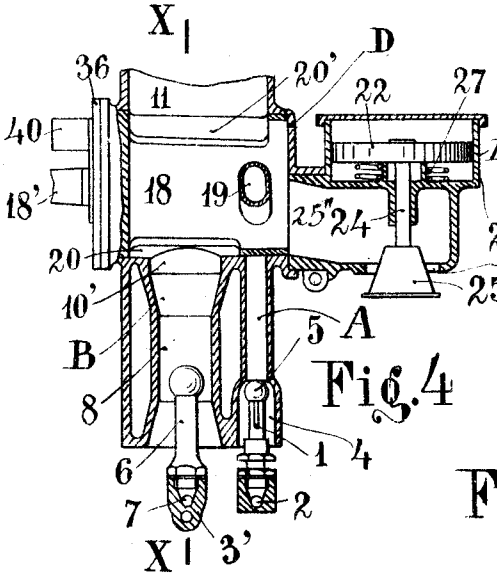


Fig. 4

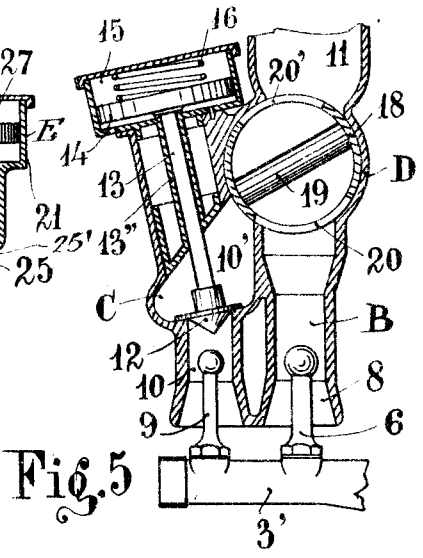


Fig. 5

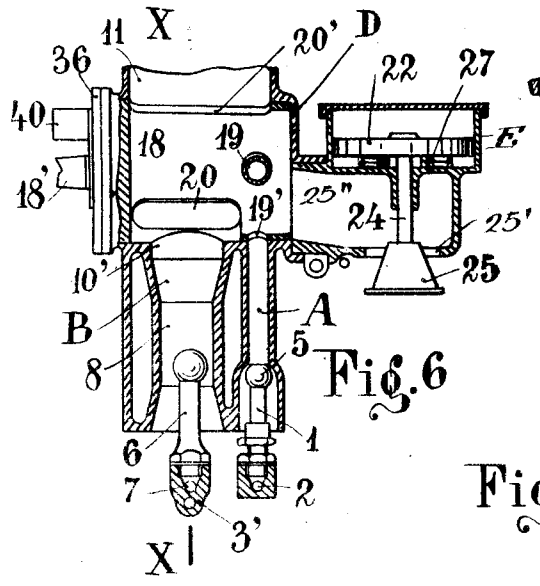


Fig. 6

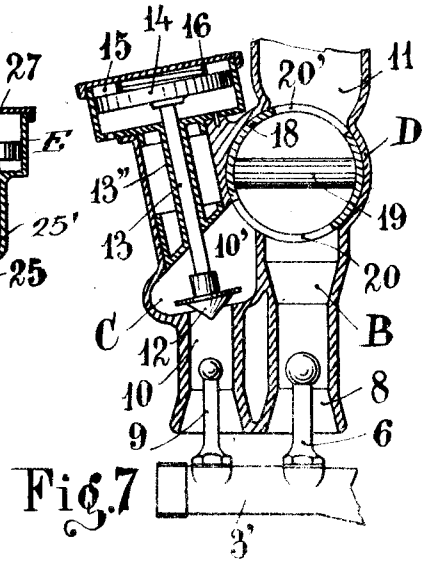


Fig. 7

Witnesses

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UNITED STATES PATENT OFFICE.

CLAUDIO FOGOLIN, OF TURIN, ITALY, ASSIGNOR TO LANCIA & C., OF TURIN, ITALY, A FIRM.

CARBURETER.

1,180,483. Specification of Letters Patent. Patented Apr. 25, 1916.

Application filed February 12, 1915. Serial No. 7,836.

To all whom it may concern:

Be it known that I, CLAUDIO FOGOLIN, residing at Turin, Italy, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to a multiple carbureter comprising three carbureting chambers or sections independent from each other, one of which is intended to supply the mixture to the cylinders of the engine when the engine is running with low speed (by way of example when it is being started), the second one is intended to come in operation when the engine runs with normal speed, said second element being added to the first one if required, and the third section comes in operation automatically when the engine runs with full speed.

A further feature of the carbureter according to this invention is that the supplementary air is supplied by two air inlets independent from each other, the first one corresponding with the two sections of the carbureter working at normal speed and being subject to a double control, while the other one is arranged on the suction duct of the engine and is intended to come in operation when the suction exceeds the maximum corresponding with the normal speed, by way of example in the case of the speed of the engine being suddenly reduced.

A construction of the carbureter according to this invention is shown by way of example in the annexed drawings, and Figure 1 is a vertical section thereof, Fig. 2 is a section on x—x of Fig. 1, Fig. 3 shows the controlling plug in section; Fig. 4 is a partial section of the carbureter the parts being shown in another position; Fig. 5 is the corresponding perpendicular section; Fig. 6 is a partial section the parts being in still another position and Fig. 7 is the corresponding perpendicular section.

As shown in the drawings, the carbureter comprises three sections A, B, and C, each having independent mixing chambers. The section A comprises the nozzle 1, connected with the constant level tank 3 by means of the duct 2 and arranged in a cylindrical chamber 4, an annular passage being left between the wall of said chamber and the head 5 of the nozzle 1.

The second section B comprises the nozzle 6 arranged in the chamber 8 intended to be passed through by the air, said nozzle being mounted on the pipe 3′ projecting from the tank 3 and connected with this tank by the passage 7; a spherical head 6′ is preferably provided at the end of the nozzle.

The third element C (Fig. 2) is provided with a nozzle 9 secured to the pipe 3′ and connected with the tank 3, said nozzle being arranged in the chamber 10 which communicates with chamber 10′. A valve 12 is arranged between the chambers 10 and 10′, this valve being secured to a hollow stem 13 sliding in pipe 13″ solid with the piston 14 arranged in the cylinder 15; a spring 16 acting on piston 14 holds the valve 12 in contact with its seat. The bottom of the cylinder 15 communicates with outside by means of holes 17 and the upper end communicates with the chamber 10′ by the hollow stem 13 and hole 13′. In this way the valve 12 is raised from its seat when there is such a difference between pressures in the lower portion of the cylinder 15 and chamber 10′ (owing to the suction exerted in this latter by the engine) as to overcome the spring and raise the piston 14.

The control of the sections A, B and C is effected by means of a suitable member capable of bringing into operation said sections in the proper succession. In the construction illustrated this controlling member is shown in form of a hollow plug rotatably mounted in a suitable chamber D arranged between sections A, B, C and the suction duct 11 leading to the engine cylinders. Said plug 18 is provided with ports 20 and 20′ opposite to each other, a hole 19′ and a transverse duct 19 by means of which the suction duct 11 is connected with chambers B and A according to requirements as hereinafter described. The plug 18 is provided with a spindle 18′ on which the controlling lever 35 is secured, this lever being actuated by hand or in any suitable way in order to control the operation of the carbureter and the running of the engine. In order to hold the plug 18 in the required position, recesses 38 are provided on the front wall of the plug, which are engaged by the pin 37 acted on by the spring 39 arranged in a chamber 40 provided on the cover 36 closing the chamber D.

The auxiliary air inlet E allows the air to enter the carbureter only when the ports

20, 20′ are uncovered and the section B is in operation, being on the contrary cut out when only the section A is in operation, on account of the chamber 21 communicating with the inner chamber of the hollow plug 18 while the section A communicates directly with the suction duct 11 by means of the duct 19. This air inlet E comprises a cylindrical box 21 provided with the piston 22 which is held by the spring 23 in the position shown in Fig. 1, and is connected with the valve 25 by means of the stem 24, said valve 25 closing the hole 25′ through which the auxiliary air enters the chamber 25″ communicating with the cavity of plug 18. This stem 24 is hollow and provided with holes 26 causing the hollow plug 18 of the cock to communicate with the chamber 21 so that when a sufficient suction is exerted in the plug 18 and chamber 21, the piston 22 is operated by the atmospheric air pressure acting through holes 21″ provided in the cover 21′ of the box 21 and the valve 25 is lowered so that the hole 25′ is opened and the auxiliary air is enabled to reach the chamber 25″ and the cavity of plug 18. The stem 24 is encircled by a second spring which is shorter than spring 23 and is intended to prevent the piston 22 from falling beyond the required position when suction in box 21 corresponds with the operation of the section B. Another supplementary air inlet is provided on the suction duct 11, comprising a valve 28 held in contact with its seat 32 by the spring 33 encircling the stem 31 and capable of being adjusted by the cap 34 and nut 34′ screwed on the stem 31. The valve is inclosed in a chamber 29 provided with holes 30.

The operation is as follows:—When the engine is to be operated with low speed, as when it is being started, the lever 35 is actuated and the plug 18 is carried in the position shown in Fig. 3, the duct 19 causing the section A to communicate with the suction duct 11, and the air inlet 21 is cut out (Figs. 1 and 2). For increasing the speed of the engine the plug 18 is rotated clockwise; then the duct 19 is closed and the section B is caused to communicate with the duct 11 by means of slots 20, 20′ so that the auxiliary air inlet E is put in operation, this inlet being prevented from being fully open by the spring 27 stopping the piston 22 (Figs. 4 and 5). The plug 18 being further rotated clockwise, the chamber 10′ is put in communication with the duct 11. Then the increasing suction of the engine works in chambers 8, 10′ and 15 (through the hole 13′ and the hollow stem 13) so that the piston 14 is raised by the atmospheric pressure overcoming the spring 16, the valve 12 is opened and the section C is put in operation, the area of the air inlet being correspondingly increased as the piston 22 and valve 25 are further moved against the action of spring 23 owing to the increased suction due to the speed of the engine. When the plug 18 is reaching the end of its rotation the section A is again inserted by means of the hole 19′ (Fig. 6) in the plug 18, the duct 19 being on the contrary closed, so that also the mixture supplied by this section is mixed with the supplementary air supplied by the valve 25. When it is desired to reduce the speed of the engine the plug 18 is rotated in the opposite direction, so that the hole 19′ is again closed and then the chamber 10′ is cut out, the further rotation of the plug cutting out also the section B and the section A coming finally in communication with the suction duct 11 by means of the duct 19.

It is known that when it is required to reduce the speed of the engine the cock of the carbureter is suddenly brought into its first position in which only the section A is in operation. In these cases the engine being running with full speed pending some further time owing to inertia of the moving parts, a very strong suction is exerted in the carbureter and a corresponding large amount of fuel is supplied by the nozzle, the supply of air being on the contrary insufficient as the small section A is not provided by itself with automatic means for controlling the supply of supplementary air. In this case and in any other case in which the suction in the duct 11 exceeds a predetermined amount, the valve 28 comes in operation, the spring 33 controlling said valve being properly adjusted in order that the mixture supplied to the duct 11 has always a constant composition.

With a carbureter made according to this invention a mixture of constant composition is obtained in any case, said mixture being supplied by three sections one of which may be put in operation by the suction of the engine while when there is a sudden increase in the suction an automatic air inlet arranged in the suction duct is open.

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

1. In a carbureter, a small chamber, a main chamber and an auxiliary chamber independent from each other and each having a nozzle, an automatic valve closing the auxiliary chamber, a member arranged between the outlets of said chambers and the suction duct of the engine, said member being capable of opening either the outlet of the small chamber; or that of the main chamber, or the outlets of the auxiliary and main chambers at the same time, or finally the outlets of the three chambers at the same time, and means for operating said member.

2. In a carbureter, a small chamber, a main chamber and an auxiliary chamber in-

dependent from each other and each having a nozzle, an automatic valve controlling the auxiliary chamber actuated by the suction in the same chamber, a member arranged between the outlets of said chambers and the suction duct of the engine, said member being capable of opening either the outlet of the small chamber, or that of the main chamber, or the outlets of the auxiliary and main chambers at the same time or finally the outlets of the three chambers at the same time, and means for operating said member.

3. In a carbureter, a small chamber, a main chamber and an auxiliary chamber independent from each other and each having a nozzle, an automatic valve controlling the auxiliary chamber, a hollow plug arranged between the outlets of said chambers and the suction duct of the engine, an opening in the wall of said plug intended to register with the suction duct, openings in the wall of the plug intended to properly register with the outlets of the chambers, means for operating said plug, and means for allowing auxiliary air to enter the hollow plug when the main and auxiliary chambers are in operation.

4. In a carbureter, a small chamber, a main chamber and an auxiliary chamber, independent from each other and each having a nozzle, an automatic valve controlling the auxiliary chamber, a hollow plug arranged between the outlets of said chambers and the suction duct of the engine, a diametrical duct in said plug for causing the small chamber to communicate with the suction duct, openings in the wall of the plug intended to register with the suction duct and the outlets of the chambers, means for controlling said plug and an additional air inlet communicating with the inside of the hollow plug.

5. In a carbureter, a small chamber, a main chamber and an auxiliary chamber independent from each other and each having a nozzle, an automatic valve controlling the auxiliary chamber, means arranged between the suction duct of the engine and the outlets of the chambers for bringing into operation either the small chamber or the main chamber or the main and auxiliary chambers and a valve arranged on the suction duct of the engine for allowing the air to enter said duct when the suction is unduly increased.

In testimony whereof I affix my signature in presence of two witnesses.

CLAUDIO FOGOLIN.

Witnesses:
CARLO TORTUS,
C. S. FEYLES.