No. 679,387. Patented July 30, 1901.

J. C. E. MATHIEU.

CARBURETING APPARATUS FOR EXPLOSION MOTORS.

(Application filed Apr. 17, 1900.)

(No Model.)

FIG. 2.

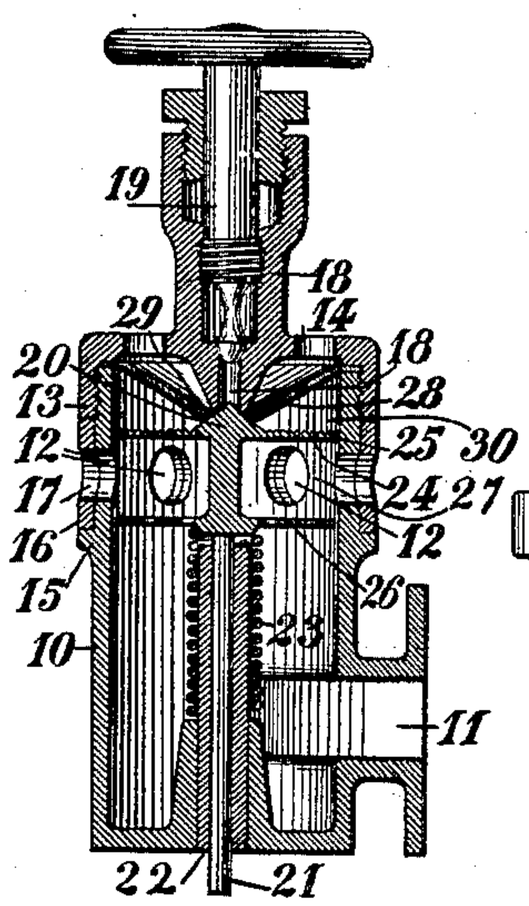


FIG. 1.

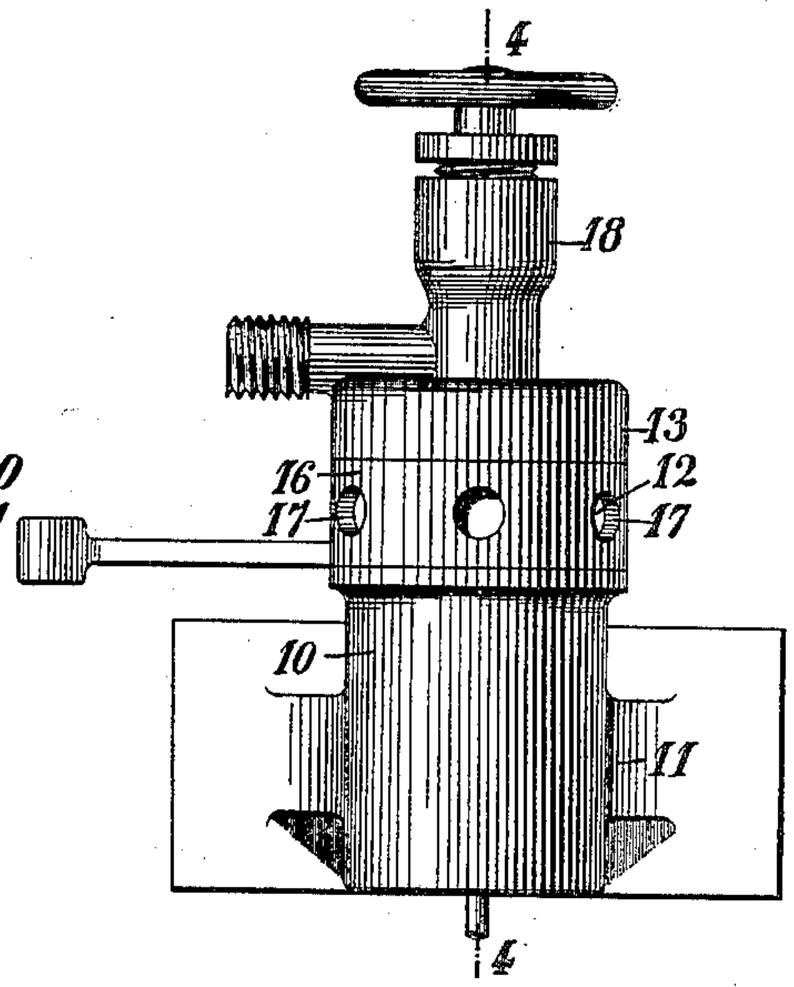
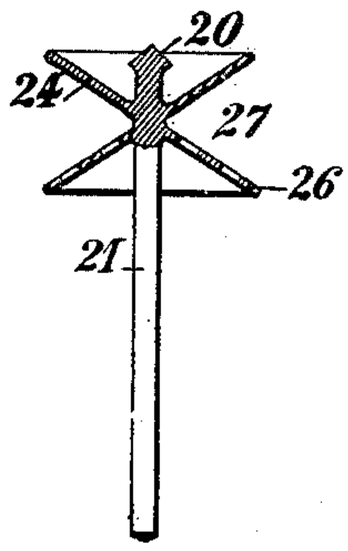


FIG. 3



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JOSEPH CHARLES EUGÈNE MATHIEU, OF NEUILLY, FRANCE.

CARBURETING APPARATUS FOR EXPLOSION-MOTORS.

SPECIFICATION forming part of Letters Patent No. 679,387, dated July 30, 1901.

Application filed April 17, 1900. Serial No. 13,251. (No model.)

To all whom it may concern:

Be it known I, JOSEPH CHARLES EUGÈNE MATHIEU, a citizen of the French Republic, residing at 209ter Avenue de Neuilly, in the city of Neuilly, department of the Seine, France, have invented certain new and useful Improvements in Carbureting Apparatus for Explosion-Motors; 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.

This invention has for its object to construct a carbureting apparatus for explosion-motors, and more particularly an apparatus for motors worked by means of liquid hydrocarbon, which affords many advantages from an industrial point of view. Thus, for example, it allows of, first, feeding the motor with an explosive mixture of hydrocarbons and air of constant quality, which is produced by two successive mixing operations, the first operation consisting in mixing hydrocarbons with a relatively very small quantity of air, while the second mixture is obtained from the primary extra-rich mixture and an additional quantity of air in order to form a more diluted mixture; second, introducing into the cylinder at each suction a certain quantity of pure air before the explosive mixture is admitted, such air forming a sort of cushion or separating and regenerative layer between the residue of the products remaining in the cylinder and the explosive mixture; third, varying the thickness of the said stratum of air from a minimum to a maximum in such a manner that in the latter extreme the charge in the cylinder consists exclusively of pure air and is obtained automatically and in accordance with the working and the requirements of the motor, and, fourth, utilizing the suction of the motor in such a manner that the closing-valve of the hydrocarbon-inlet may be regulated by the motor in an absolutely certain and independent way, as if it were done by a fixed mechanical device. Moreover, as regards the new application of the means for obtaining the results above described the improved apparatus is distinguished by the construction, arrangement, and combinations of means described below with reference to the accompanying drawings. The scale of the latter varies, there being represented as a whole and in detail a modification of the carbureting apparatus embodying my invention.

In the accompanying drawings, Figure 1 is a side elevation of my carbureter. Fig. 2 is a sectional view of Fig. 1, and Fig. 3 shows a modification of the central rod of the carbureter.

Referring to Figs. 1 and 2, it will be seen that the carbureter proper consists of a box 10, provided with a lateral neck (tubulus) 11 for the passage of the charge into the explosion-chamber. The said box is fitted with a series of orifices 12 for the inlet of pure atmospheric air, and it is closed by a cover 13, having apertures 14, through which the air can likewise pass into the interior. Between the edge of cover 13 and a rim 15 of the box, at the height of the apertures 12, is placed a ring 16, which is also provided with a series of holes and is movable in such a manner that the orifices 17 may be made to coincide with the apertures 12 of the box or to close the latter to any degree desired by covering them more or less through the rotation of the ring 16, so that the area of the passage can be definitely regulated.

Through the center of the cover 13 an ajutage 18, which serves to conduct the hydrocarbon, projects into the box or chest. The sectional area of the outlet of the said ajutage may be regulated and closed by means of a plug 19. Against the end of the ajutage rests the conical point 20 of an axial rod 21, forming a valve which is adapted to rise and fall, it being guided in a socket 22 and subjected to the influence of a helical spring 23. The latter always tends to press the cone 20 against its seat, thus closing the ajutage 18.

The cone 20 rests on a corrugated plate 24, the latter leaving a small annular passage 25 between its edge and the inner wall of the chest. This plate 24 is placed above the level of the apertures 12, while another perforated plate 26 is placed below the level of the said apertures 12 and is connected with the rod 21, the two forming with the inner wall of the chest a mixing-chamber 27. Between the upper edge of the chest and its cover is arranged a plate 28, which is provided with a central opening in order to per-

mit the passage of the point of the ajutage 18, thus leaving only a very small annular aperture 29 to admit the air passing through the apertures 14 into the carbureter. The space inclosed between the plates 28 and 24 forms another mixing-chamber 30. In Fig. 2 these two plates 24 and 26 are represented as horizontal and flat; but in order to reduce the weight of the rod they may also be made of a conical shape, as shown in Fig. 3, provided that in such case the peripheral edges of the plates are situated above and below the apertures 12, respectively.

The plate 28 is in the shape of a dome, so that the edge of its central opening is placed in close proximity to the annular aperture serving as the inlet for the hydrocarbon in order that an intimate mixing of the air and hydrocarbon may be effected.

The movements of the rod 21—that is to say, its duration and the moment of opening the ajutage 18—are determined by any suitable regulator for the motor in a manner described below.

The socket 22 forms with its upper part a sort of abutment which limits the extent of the up-and-down movement of the rod in such a manner that the plates 24 and 26 are always above and below the apertures 12, respectively.

The working of the carbureter is as follows: Supposing, in the first place, the motor to work at the normal speed, and consequently the ajutage 18 to open at each suction in spite of the action of the spring 23 without the regulator interfering with this movement, there will be effected an admission of air first through the apertures 12 and then through the apertures 14. Since the first air-current admitted through the apertures 12 does not encounter any obstacles on its way, it will pass in a pure state directly into the cylinder, when it will form a sort of cushion, separating the residue of the consumed products from the explosive charge then introduced into the cylinder. It will thus purify the said charge and have a regenerative effect. The air admitted through the apertures 14, which has to pass obstacles in the narrow passages 29 and 25, thus enters the cylinder after the air introduced through the apertures 12 has arrived, which effects the result described above. The air admitted through 14 and 29 as well as the hydrocarbon introduced through 18, both in the form of very small annular jets, are thrown against the cone 20, whereupon they are, partly owing to the corrugated surface of the upper plate 24, intimately mixed in the chamber 30, and they still continue mixing on passing through the narrow annular aperture 25 until they finally enter the chamber 27, where another mixing operation takes place with the air entering through the apertures 12, this latter operation being completed on the mixture passing through the perforated plate 26. Thus the explosive mixture is obtained first from constant proportions of air and hydrocarbon, the areas of the apertures 29 and 18 remaining invariable and the relative quantity of air admitted to this mixture being very small, which circumstances are very favorable for the production of a good mixture, as demonstrated by experiments. It is only after such a rich and well-proportioned mixture has been obtained that a second mixture diluted by the additional quantity of air, which is also admitted through the apertures 12 in a constant relative quantity, can be produced.

Without limiting myself to the precise details of construction shown and described, I claim, and desire to obtain by Letters Patent, the following:

1. In a gas-engine, a carbureter comprising a chest having an ajutage for hydrocarbon and air inlets, a dome, a valve seated against the ajutage and the dome, mixing-chambers formed by plates connected to the valve, and additional air-inlets for diluting the charge, substantially as described.

2. In a gas-engine, a carbureter comprising a chest having an ajutage for hydrocarbon and air inlets, a dome, an axial rod carrying a spring-pressed cone seated against the ajutage and the dome, mixing-chambers formed by corrugated and perforated plates connected with the cone, annular passages between the plates and the chest, and additional air-inlets for diluting the charge, substantially as described.

3. In a gas-engine, a carbureter comprising a chest having an ajutage for hydrocarbon and air inlets, additional air-inlets for diluting the charge, a dome, an axial rod carrying a spring-pressed cone seated against the ajutage and the dome, mixing-chambers formed by corrugated and perforated plates connected with the cone, annular passages between the plates and the chest, and means for maintaining the additional air-inlets always between the said plates connected with the cone, substantially as described.

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

JOSEPH CHARLES EUGÈNE MATHIEU.

Witnesses:
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