A. WEILAND.

CARBURETER.

APPLICATION FILED DEC. 19, 1910.

1,013,708. Patented Jan. 2, 1912.

Fig. 2.

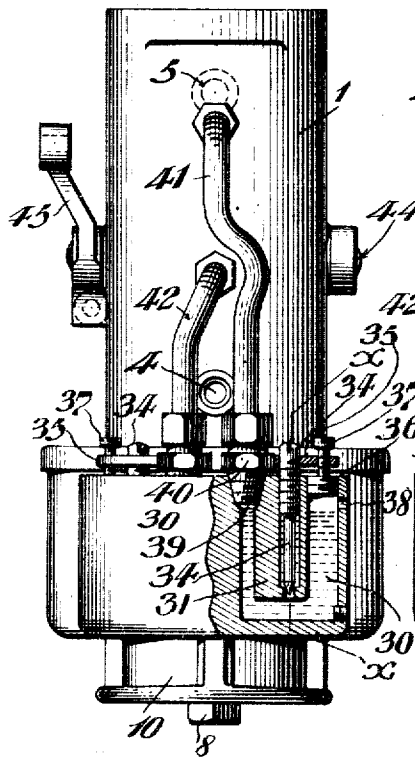


Fig. 1.

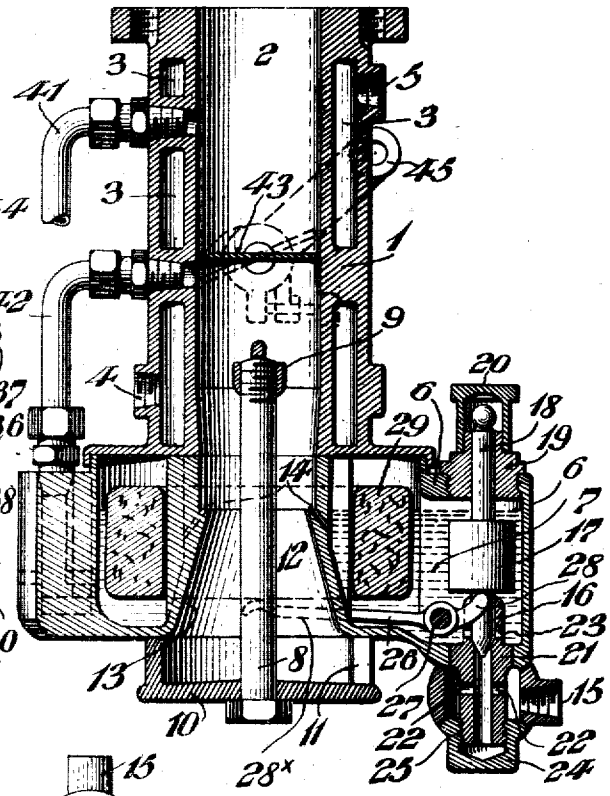


Fig. 3.

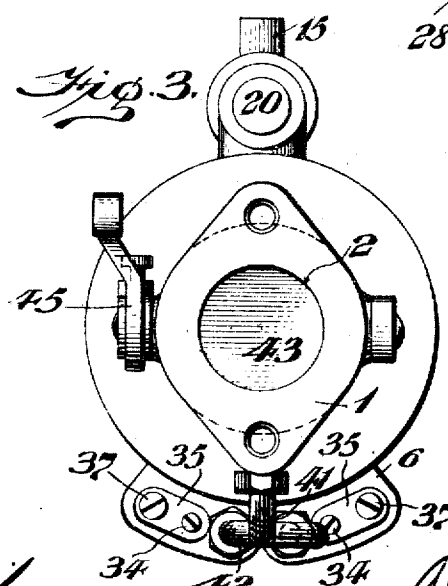
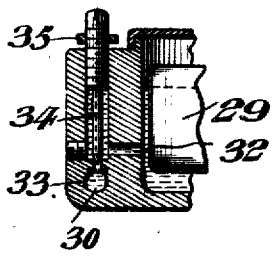


Fig. 4.



WITNESSES

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CARBURETER.

1,013,708. Specification of Letters Patent. Patented Jan. 2, 1912.

Application filed December 19, 1910. Serial No. 597,983.

To all whom it may concern.

Be it known that I, ALFRED WEILAND, a citizen of the United States, residing at Reading, county of Berks, State of Pennsylvania, have invented a new and useful Carbureter, of which the following is a specification.

This invention relates to carbureters or vaporizing devices for use in connection with internal combustion engines and has for an object to provide a carbureter simple in construction, efficient in operation and wherein a definite working mixture is supplied for each speed and in a ratio corresponding to the work done at any particular speed.

In carbureters as heretofore constructed the parts have consisted of complicated weight valves, automatic spring controlled valves, ball valves and like delicate parts which require constant attention for proper adjustment and are susceptible to dirt, wear and atmospheric conditions.

In my present invention I have devised a carbureter comprising few parts and operating to supply a rich mixture at slow speed under load and a weak mixture at high speed and light load, while the starting conditions are greatly simplified through the automatic priming of the motor operable even in cold weather.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating my invention, I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a vertical section of a carbureter embodying my invention. Fig. 2 represents a side elevation of the same partly in section. Fig. 3 represents a plan of the same. Fig. 4 represents a section on line *x*—*x* Fig. 2.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1 designates the casing of a carbureter embodying my invention, the same, in the present instance, being formed substantially tubular by means of the bore 2 passing therethrough and forming a vaporizing chamber, the walls of which are preferably of annular construction 3 for the purpose of providing a jacket through which a suitable medium may be passed to warm the walls and assist in the vaporizing action. A suitable inlet 4 and outlet 5 are provided to permit the circulation of the fluid in the jacket.

6 designates, in the present instance, an annular member, forming a main reservoir chamber 7, which, as here shown, is detachably connected to the casing 1 by means of a bolt 8 secured at one end to a suitable web 9 of the casing 1 and at the opposite end engaging and supporting a cap 10 provided with an opening 11, the latter forming a main air inlet opening communicating with the bore 2 or vaporizing passage. It will be noted that the member 6 is provided with an annular pasage 12 therethrough the walls of which are preferably converging toward the vaporizing passage 2, as will be apparent, the function being to direct the entering air into the passage 2.

14 designates ports formed in the wall 13 and serving as a means of communication between the annular passage 12 and the main reservoir 7. It will be clear that air which is drawn into the vaporizing chamber 2 passes the ports 14 and draws therefrom a supply of the fluid fuel and it will be noted that the ports 14 are preferably inclined so that the inlet thereto from the reservoir 7 is beneath the level of the fluid fuel. This level is of course maintained constant and therefore a quantity of fluid is always in position in the ports 14 for mixing with the air.

15 designates the main fluid fuel inlet leading to the main reservoir 7 and, in the present instance, is controlled by means of a valve 16 preferably having a weight 17 secured thereto to effect the closing of the valve, while a stem 18 slidingly supported in a bushing member 19 serves as a guide holding the valve in proper relation to its seat. It will be noted that the bushing 19 is preferably detachably secured to the member 6 in order that ready access may be had to the valve parts and that a cap 20

is secured thereto over the stem 18 in order to prevent leakage at this point. As here shown, the valve 16 seats upon a sleeve 21 which is located partially within the member 6 and partially exterior thereof and is provided with ports 22 and 23, the former being positioned adjacent the fluid inlet 15 and the latter within the main reservoir 7 and above the seat of the valve 16, as will readily be apparent. A suitable cap 24 is preferably secured by means of screw threads 25 or the like to the sleeve 21 and serves to maintain the fluid inlet 15 properly supported and also provides a means to remove the valve parts if desired.

26 designates a lever, in the present instance, pivotally mounted on the spindle 27 within the member 6, one end 28 of said lever being normally in contact with the weight 17 while its opposite end 28× is in engagement or contact with a float 29 within the main reservoir 7. It will of course be apparent that as both the weight 17 and float 29 rest upon the ends of the lever 26, any movement of the float will cause a corresponding movement of the weight 17 and thereby regulate the opening and closing of the valve 16, it of course being understood that the weight of the parts is properly adjusted to obtain the movement desired.

30 designates, in the present instance, an extension secured to or formed integral with the annular member 6 and has formed therein a plurality of chambers 31 having communication with the main reservoir 7 by way of the passages 32 and 33, the latter being controlled by a needle valve 34 adjustably mounted in the walls of the extension, the said valve stem carrying a plate 35 for a purpose presently to be described. These plates 35 support also a valve member 36 which is mounted for adjustment by means of the threaded bolt 37. These valves 36 are designed to control an air inlet 38 in the walls of each chamber 30 whereby air has access thereto above the fluid level.

39 designates a mixture outlet from each chamber 30 the same having communication by way of the fitting 40 to the respective conduits 41 and 42, the former of which joins the casing 1 preferably at a point above the throttle valve 43 while the latter is secured to the said casing 1 at a point below the throttle valve 43 and in the present instance substantially adjacent thereto for a purpose presently to be described. It will thus be noted that two mixture jets are provided as auxiliary to the main mixture jets 14 and which supply a suitable mixture of gas and air to points in the vaporizing conduit 2, one of which is operated when the throttle is completely closed while the other comes into action as soon as the throttle is slightly opened.

The throttle valve 43, in the present instance, is the ordinary flap type suitably pivoted on a spindle 44 the latter projecting exterior of the casing 1 and having secured to one end thereof the control lever 45 for operating the same, it of course being understood that suitable connections are made with this lever so that it may be operated from a convenient point.

In the operation of the device the motor fluid enters the inlet 15 passing through the sleeve 21 into the main reservoir 7 which it fills to the desired level, this of course being determined by the adjustment and relation of the weight 17, lever 26 and float 29. The fluid fuel of course has free flow by way of the ports 32 and 33 to the chambers 31 and a constant level of fluid is maintained therein whereby these two devices serve as priming, slow speed and intermediate speed vaporizing devices. The motor is started with the throttle valve 43 in closed position and therefore the strong suction is produced in the vaporizing tube or bore 2 and since at this time the only inlet thereto is by way of the conduit 41 a rich mixture of gas and air is drawn from one of the chambers 31 which serves as a slow speed auxiliary carbureter.

The chambers 31 are maintained filled with fluid fuel to a fixed level at all times when the suction in the vaporizing chamber 2 is less than that required to draw mixture from the conduits 41 and 42. These conduits 41 and 42 are only utilized for starting and at slow speeds when the throttle 43 is closed or nearly closed, since at this time the suction in the vaporizing chamber 2 is the strongest. When the throttle is opened the vacuum in the vaporizing chamber 2 is not sufficient to draw mixture from the conduits 41 and 42, since at this time air has a free flow through the passage 12, as will be apparent.

Attention is directed to the fact that the needle valve 34, giving jet action to the port 33, is not subjected to a suction action for the reason that the air passage 38 is much larger in size than the conduits 41 and 42 and the flow of air is therefore so slow through the liquid in the chambers 31 as not to effect the flow of liquid from the port 33. The flow of liquid through the port 33, restricted by the valve 34, is of course also determined by the position of this port with reference to the liquid level in the main reservoir 7 as well as the position of the needle valve. Thus it will be apparent that the chambers 31 are in fact mixing chambers, only, at the time the engine is starting and at slow speed, as at other times the fluid remains at a fixed level above these chambers. As soon as the engine is started the fluid in these chambers 31 is immediately drawn out, thereby emptying the chambers and drawing air through the port 38 past the

jet 34 to produce the necessary carburation for the engine while running at slow speed. However, as soon as the throttle valve 43 is open the main mixture supply of air and fuel from the passage 12 and jets 14 comes into operation so that there is practically no suction through the auxiliary conduits at all and during normal operation the chambers 31 remain filled with fuel and out of commission.

At medium speed of the engine the throttle valve 43 is preferably opened slightly as shown in dotted lines in Fig. 1 and thereupon the jet of conduit 42 is brought into action and as there is at this time a strong suction produced in the vaporizing tube 2 both of the auxiliary chambers 30 are in action and the required mixture for the load and speed supplied. For high speed throttle 43 is opened wide and the main air supply is admitted through the inlet 11 passing upwardly through the vaporizing tube 2 and drawing fluid fuel through the ports 14 and the flow of air is so free that the jets of conduits 41 and 42 cease working and the desired mixture for high speed and light load is supplied in the proper proportions. The supply of fluid from the auxiliary conduit 56 is a constant or fixed quantity for starting purposes and for slow speed only and as soon as the speed of the motor is increased by opening the throttle, the main jets 14 come into operation and there is substantially no suction through the conduit 56 and it ceases to operate to supply any mixture of air and fuel.

It will now be apparent that I have devised a novel and useful construction of a carbureter which embodies the features of advantage enumerated as desirable in the statement of invention and the above description and while I have, in the present instance, shown and described a preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a device of the character stated, a casing having a mixture outlet, a throttle valve controlling said outlet, a mixing chamber in said casing having air and fluid fuel inlets, a fluid fuel supply for said mixing chamber, and means to deliver an auxiliary explosive mixture to said mixing chamber on opposite sides of said throttle valve.

2. In a device of the character stated, a casing having a mixture outlet, a throttle valve controlling said outlet, a mixing chamber in said casing having air and fluid fuel inlets, a reservoir for fluid fuel secured to said casing, a fluid fuel supply, a plurality of auxiliary reservoirs adjacent said main reservoir and communicating therewith, air inlets for said auxiliary reservoirs, and means to convey an auxiliary explosive mixture from each of said auxiliary reservoirs, the respective means of each auxiliary reservoir communicating with said mixing chamber on opposite sides of said throttle valve.

3. In a device of the character stated, a casing having a mixture outlet, a throttle valve controlling said outlet, a mixing chamber in said casing having a main air inlet opening, a fluid reservoir secured to said casing and having ports communicating with said mixing chamber, a fluid fuel supply, means to control a supply of fluid fuel to said reservoir and maintain a constant level therein, a plurality of auxiliary reservoirs adjacent said main reservoir, each having communications therewith, a valve controlling the flow of fluid between said reservoirs, means for conveying an explosive mixture from one of said auxiliary reservoirs to said mixing chamber between said outlet and said throttle valve, and means for conveying an auxiliary supply of explosive mixture from the other auxiliary reservoir to said mixing chamber between said throttle valve and main fluid inlets.

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