Dec. 16, 1930. W. C. CARTER 1,784,864

CARBURETOR

Filed July 15, 1927

Fig. 1.

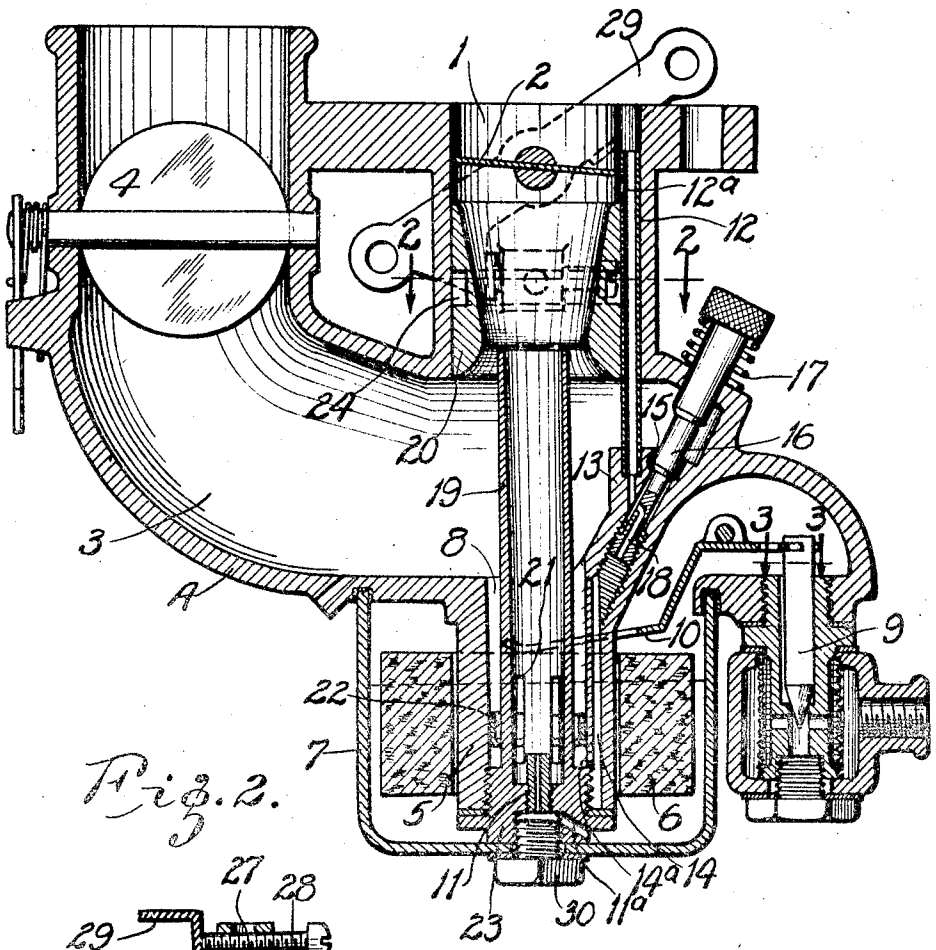
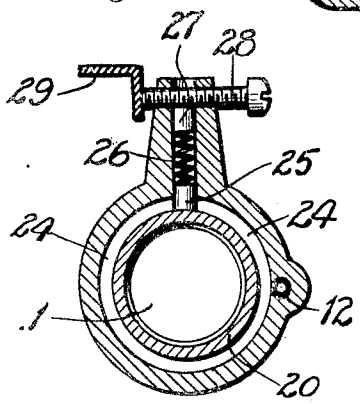


Fig. 2.



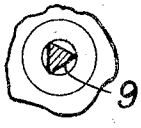


Fig. 3.

INVENTOR:
WILLIAM C. CARTER
By Bakewell & Church
ATTORNEYS

Patented Dec. 16, 1930 1,784,864

UNITED STATES PATENT OFFICE

WILLIAM C. CARTER, OF FLINT, MICHIGAN

CARBURETOR

Application filed July 15, 1927. Serial No. 206,028.

This invention relates to carburetors of the type that are equiped with an accelerating well or reservoir, and a fuel duct or by-pass leading upwardly from the side wall of said well for supplying fuel to the main passageway of the carburetor at a point in proximity to the throttle valve, when said valve is closed or only partly open.

One object of my present invention is to provide a carburetor of the general type referred to which is of such design that the liquid fuel in the accelerating well cannot surge away from the inlet end of the by-pass or fuel duct which terminates in the side wall of said well, and thus prevent said by-pass from functioning properly, in the event the vehicle on which the carburetor is used is stopped suddenly simultaneously with the operation of moving the throttle into its closed position and throwing out the clutch which connects the motor to the propelling mechanism.

Another object of my invention is to simplify and reduce the cost of manufacture of a carburetor of the general design illustrated in my pending application for patent Serial No. 147,010, filed November 8, 1926.

Figure 1 of the drawings is a vertical sectional view of a carburetor embodying my present invention.

Figure 2 is a horizontal sectional view, taken on the line 2—2 of Figure 1, looking in the direction indicated by the arrows, and

Figure 3 is a horizontal sectional view, taken on the line 3—3 of Figure 1, looking in the direction indicated by the arrows.

Referring to the drawings which illustrate the preferred form of my invention. A designates the body casting of the carburetor which is provided with a straight, vertically-disposed bore 1 that constitutes the main passageway of the carburetor through which a mixture of air and fuel travels to the intake of the motor. 2 designates a throttle valve which is arranged in said main passageway adjacent the upper end of same, 3 designates an air chamber which communicates with the lower end of the main passageway, 4 designates a choke valve for the air chamber, 5 designates a depending, cylindrical portion on the body casting that serves as a guide for an annular float 6 in the float bowl 7, and 8 designates an accelerating well or reservoir formed by a straight bore in the depending portion 5 on the body casting.

Liquid fuel is admitted to the float chamber by a needle valve 9 that is controlled by the float 6 through means of a lever 10, and liquid fuel is supplied to the accelerating well, preferably by a nozzle 11 projecting upwardly from the bottom of the accelerating well and arranged with its upper end terminating at a point below the normal level of the fuel in the float chamber.

The carburetor is equipped with a fuel duct or by-pass that leads upwardly from the accelerating well 8, and which is used to supply fuel to the main passageway 1 when the throttle valve is closed or only partly open. Said fuel duct or by-pass can be constructed in various ways, but it is preferably of the construction illustrated and described in my pending application previously referred to and comprises an upper portion formed by a straight, vertically-disposed tube 12 that projects downwardly through the portion of the body casting in which the main passageway 1 is formed and terminates in a lug 13, the lower end of said fuel duct or by-pass being formed by a small, vertically-disposed bore or groove 14 in the depending portion 5 of the body casting, provided adjacent its lower end with an inlet 14^a that leads laterally from the accelerating well and which forms in effect an opening in the side wall of the well through which fuel will pass, from the well into the fuel duct, by-pass or other element which the well supplies with fuel.

The upper end portion of the fuel tube 12 is so constructed, formed or arranged that when the throttle valve is closed or only partly open, fuel will pass from the upper end of said tube into the passageway 1 at a point above the throttle valve and sufficient air will enter said tube from the passageway 1 at a point below the throttle valve to cut down or reduce the suction that is exerted on the upper end of the tube 12 by the high vacuum which then exists in the intake of

the motor. The upper end portion of the tube 12 is also designed so that the movement of the throttle valve forwardly, away from its idle position, cuts off the admission of the air that reduces the suction in said tube, thereby causing the full force of the vacuum which exists in the intake of the motor to become effective for drawing fuel upwardly through the tube 12. The result above described can be accomplished in various ways, but in the carburetor herein illustrated a hole 12^a is formed in the side of the tube 12 at a point far enough below the upper end of said tube to cause the hole 12^a to be located below the throttle valve, as shown in Figure 1, when said throttle valve is in its closed position.

The lug 13 in which the lower end of the tube 12 is seated is provided with an air passageway 15 through which air is admitted to the lower end of the tube 12 from the air chamber 3, and in order that the supply of air through said air passageway 15 may be regulated, an adjustable valve 16 is provided for controlling the admission of air to the air passageway 15. Said air regulating valve 16 is herein illustrated as being provided with a stem having an externally screw-threaded portion that is screwed into a hole in the lug 13 which communicates with the upper end of the fuel duct or groove 14 that leads upwardly from the accelerating well, and the valve 16 is preferably provided with a spring or other suitable device 17 for retaining said valve in adjusted position. As shown in Figure 1, the stem of the air valve 16 is provided with a fuel duct 18 that has a lateral outlet which constitutes a fuel supply orifice for the air passageway 15. When the engine is idling with the throttle valve set in its closed position, liquid fuel, mixed with air, will be drawn upwardly through the tube 12, and discharged from the upper end of said tube into the main passageway 1 at a point above the throttle valve, due, of course, to the fact that the vacuum in the intake of the motor produces a suction in the tube 12 that is exerted on the fuel duct or port 18 in the stem of the air valve 16. Notwithstanding the fact that the tube 12 establishes direct communication between the intake of the motor and the fuel supply duct 18 in the stem of the air valve when the throttle valve 2 is in its idle position, only a relatively slight suction exists in the tube 12, because air is entering the lower end of said tube from the air chamber 3 and air is entering the upper end of said tube 12 through the lateral opening 12^a in said tube, which, at this time, is located below the throttle valve. After the throttle valve has been moved into such a position that the opening 12^a in the upper end portion of the tube 12 will be positioned above the throttle valve, the high vacuum which exists in the intake of the motor when the throttle valve is partly open will become operative for drawing the fuel upwardly through the tube 12, thus increasing the amount of fuel which said tube introduces into the passageway 1.

A tubular member 19 projects upwardly from the bottom of the accelerating well 8 in concentric relation with the fuel nozzle 11, and the upper end of said tubular member terminates within the main passageway 1, preferably in the contracted portion of a Venturi member 20 that is arranged inside of said main passageway below the throttle valve. At the lower end of the tubular member 19 are a plurality of vertically-disposed slots 21 that project upwardly from the bottom of the accelerating well and which are of such length that their upper ends terminate above the normal level of the fuel in the float bowl.

As previously stated, the tube or by-pass 12 supplies fuel to the main passageway 1 when the motor is idling and also when the throttle valve is partly open, the particular period in the cycle of operations of the carburetor when the tube 12 goes out of service, or in other words, when said tube ceases to supply fuel to the passageway 1, varying. Usually, however, the tube 12 will go out of service when approximately 10% of the capacity of the carburetor is reached. From this point on the fuel in the accelerating well 8 and the fuel discharged from the nozzle 11 constitutes the source of supply of fuel for the main passageway 1. After the throttle valve has reached such a position that the tube 12 ceases to supply fuel to the main passageway 1, the air that is drawn upwardly into said passageway through the annular opening between the upper end of the tubular member 19 and the contracted portion the Venturi member 20 creates a suction inside of the tubular member 19 of sufficient intensity to draw air downwardly through the well 8 and into the vertically-disposed slots 21 in the member 19, and thereafter, upwardly through said member 19, thus causing more or less of the fuel in the well 8 to be absorbed by the air and carried upwardly into the main passageway 1. When the throttle valve reaches such a position as to cause sufficient air to travel through the well 8 to keep said well dry, or practically so, the suction inside of the tubular member 19 becomes strong enough to cause fuel to be drawn from the nozzle 11 and carried upwardly into the main passageway 1.

Whenever the throttle valve is moved from its high speed position towards its closed or partly open position, the liquid fuel builds up in the accelerating well 8 so as to form an accelerating charge that is in readiness to be carried into the main passageway 1 by the air that rushes downwardly through said well, and thence upwardly through the tubular member 19, if the throttle valve is opened

suddenly. Frequently, however, the throttle valve is moved suddenly from its wide open position into its closed position simultaneously with the operation of applying the brakes of the vehicle and disengaging the clutch of the motor, and whenever this happens, there is a tendency, in a carburetor of this general design, for the by-pass to fail to supply sufficient fuel to the main passageway 1 to keep the motor in operation. This is due to the fact that the sudden application of the brakes of the vehicle causes the relatively small quantity of fuel which has entered the accelerating well to surge away from the inlet 14^a of the small bore or duct 14 which forms the lower end of the by-pass, thereby producing a momentary interruption of liquid fuel to the tube 12 that constitutes the source of supply of fuel for the main passageway 1 when the throttle valve is closed. In order to prevent this from occurring, I arrange a horizontally-disposed baffle or partition 22 in the accelerating well 8 at a point a slight distance above the bottom of said well, as shown in Figure 1, said baffle being of annular form and arranged between the side wall of the well and the tubular member that projects upwardly through the well. Such a baffle or partition effectively prevents the fuel from surging away from the inlet end of the duct 14 when there is only a small quantity of fuel in the accelerating well. Accordingly, with my improved carburetor it is possible to bring the vehicle to a sudden stop and simultaneously disengage the clutch of the motor and move the throttle valve from its wide open position into its closed position, without causing the motor to cease operating.

Other changes that I have made in the carburetor described in my pending application previously referred to, with a view of simplifying the carburetor and reducing its cost of manufacture, are as follows: forming the venturi 20 from a separate member that is removably mounted in the main passageway 1, and integrally connecting the tubular member 19 to a plug 23 that is screwed into the bore in the depending portion 5 of the body casting, so as to form the bottom of the accelerating well 8. The Venturi member 20 can be retained in operative position in the passageway 1 in various ways without departing from the spirit of my invention, but I prefer to form an annular groove 24 in the exterior of said member, as shown in Figure 1 and mount a retaining device 25 in the side wall of the passageway 1 in such a manner that it projects into said groove, as shown in Figure 2. The retaining device 25 is herein illustrated as a plunger that is acted upon by a spring 26, and if desired, said spring can also be used to exert pressure on a plunger 27 that is used to lock or prevent movement of the adjustable stop 28 that cooperates with the throttle valve lever 29 to determine or control one position of the throttle valve. The plug 23 to which the tubular member 19 is integrally connected carries the fuel nozzle 11, and said plug is provided with an orifice 11^a that extends inwardly to the center of said plug from the exterior of same, so as to establish communication between the inlet end of said nozzle and the interior of the float bowl 7. Said float bowl is retained in position and held with its upper edge pressed tightly against a gasket on the body casting by a cap screw 30 that is screwed into the lower end of the plug 23.

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

1. A carburetor provided with a main mixture passageway, a throttle valve, an accelerating well for holding fuel, a fuel duct leading from the lower end of said well for introducing fuel into said main mixture passageway when the throttle valve is closed or only partly open, the inlet of said fuel duct being formed in the side wall of said well, and a horizontally-disposed partition member arranged parallel to and in closely spaced relation with the bottom of said well, above the inlet end of said duct, for preventing the liquid fuel in said well from surging laterally away from the inlet end of said duct under certain conditions.

2. A carburetor provided with an accelerating well for holding fuel, a fuel duct leading from said well, a fuel nozzle projecting upwardly from the bottom of said well, a tubular member projecting upwardly from the bottom of the well in concentric relation with said nozzle and provided adjacent its lower end with elongated openings, and a horizontally-disposed partition at the lower end of the well positioned between the side wall of same and said tubular member transversely of said elongated openings, for preventing the fuel in the well from surging away from the inlet end of said fuel duct under certain conditions.

3. A carburetor, comprising a body portion provided with a bore that constitutes the main mixture passageway of the carburetor, a Venturi member removably mounted in said bore, a throttle valve arranged above said Venturi member, an adjustable stop for determining one position of said throttle valve, plungers reciprocatingly mounted in the body portion for holding said stop and said Venturi member in position, and a spring for causing both of said plungers to remain in engagement with the parts which they hold.

4. A carburetor, comprising a main mixture passageway, a float chamber provided with a float, a body casting provided with a depending portion that serves as a guide for

said float, said depending portion having a bore that constitutes an accelerating well for holding fuel, means for supplying fuel to said well from said float chamber, a plug screwed into the lower end of said bore so as to form the bottom of said well, a tubular member integrally connected to said plug and projecting upwardly through said well so as to form a passageway through which fuel travels to said main mixture passageway, and means whereby a suction existing inside of said tubular member will cause air to enter said accelerating well, pick up fuel in said well, and then flow upwardly through said tubular member.

5. A carburetor, comprising a main mixture passageway, a float chamber, a float in said chamber, a body casting provided with a depending portion that serves as a guide for said float, said depending portion having a bore that constitutes an accelerating well for holding fuel, a plug screwed into the lower end of said bore so as to form the bottom of said well, a tubular member integrally connected to said plug and projecting upwardly towards said main mixture passageway so as to form a passageway through which fuel travels to said mixture passageway, a fuel nozzle carried by said plug and projecting upwardly into said tubular member, openings in the lower end portion of said tubular member, through which fuel is adapted to pass into said member from said accelerating well, and an orifice in said plug for admitting fuel to said nozzle from the float chamber of the carburetor.

6. In a carburetor, the combination of a well that is adapted to receive liquid fuel, a fuel duct having an inlet that is located in the side wall of said well adjacent the bottom of the well, and a horizontally-disposed partition member in the well arranged parallel to and in closely spaced relationship with the bottom of the well above the inlet of said duct for preventing the liquid in the well from surging laterally away from said inlet under certain conditions.

WILLIAM C. CARTER.