Nov. 18, 1930. A. BOULADE 1,782,027

CARBURETOR

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Fig. 1.

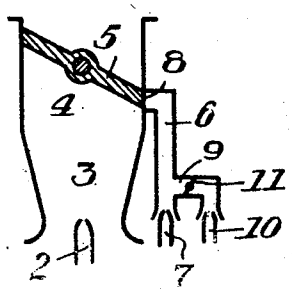


Fig. 2.

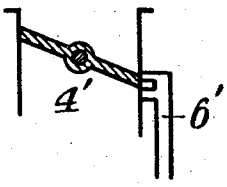


Fig. 3.

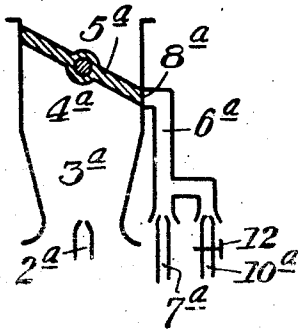


Fig. 4.

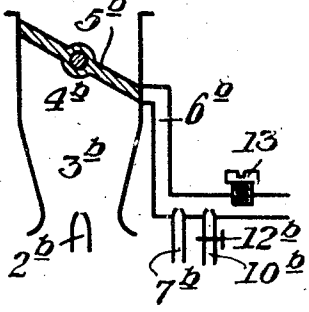


Fig. 5.

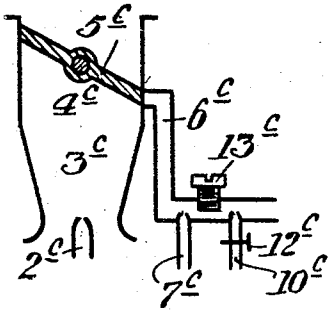


Fig. 6.

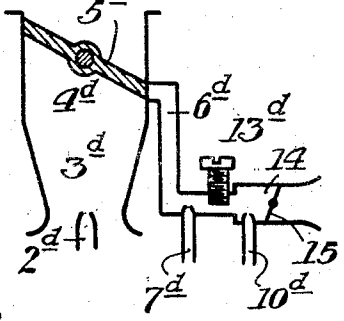


Fig. 7.

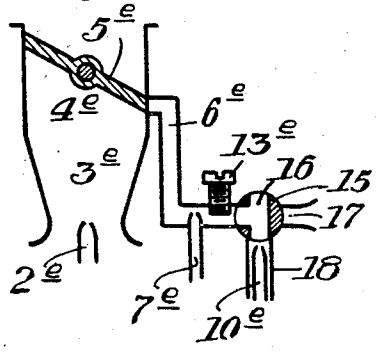
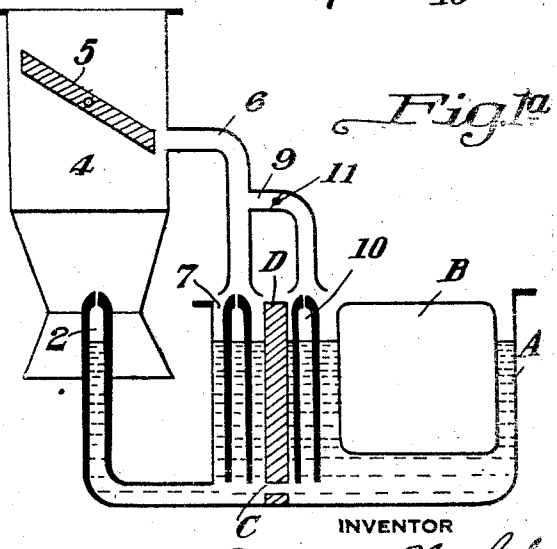


Fig. 1a



INVENTOR

Antonin Boulade

by his attorney

Byron, Stebbins & Lamebee

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CARBURETOR

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Fig. 8.

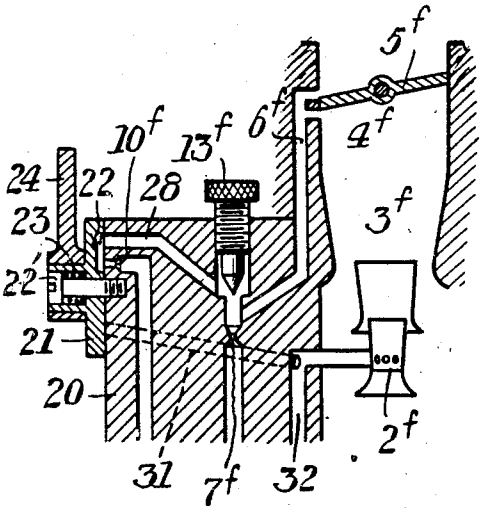


Fig. 9.

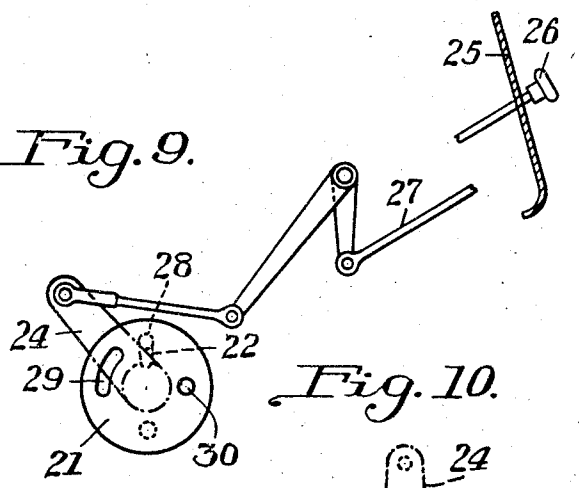


Fig. 10.

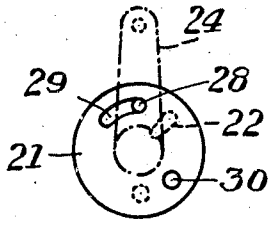


Fig. 11.

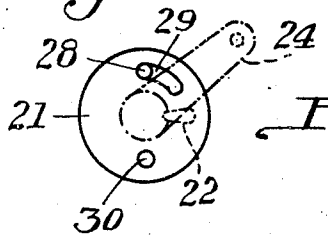


Fig. 12.

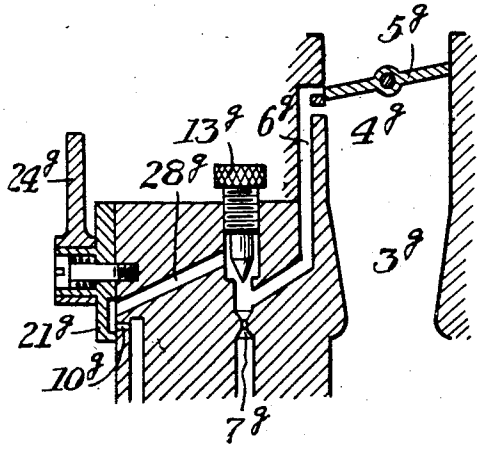


Fig. 13.

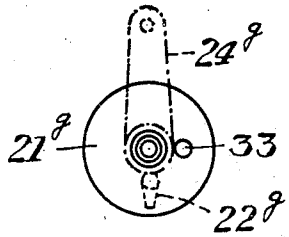
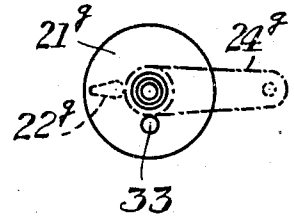


Fig. 14.



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Patented Nov. 18, 1930 1,782,027

UNITED STATES PATENT OFFICE

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CARBURETOR

Application filed August 31, 1926, Serial No. 132,692, and in France September 18, 1925.

This invention relates to carburetors, and particularly to an improved form of starting mechanism therefor.

Carburetors are usually regulated to furnish as perfect a mixture as possible with a low fuel consumption when the motor is running. It is always somewhat difficult to start the motor if the temperatures of the air and of the motor are unfavorable.

To facilitate starting under such unfavorable conditions it is necessary to momentarily enrich the mixture and several schemes have been proposed for this purpose. The common solution has been to be employ a "choke" which partially or wholly closes off the air entrance to the carburetor. The evil effects of running with the choke left closed too long are well known.

In carburetors employing an air bled jet, as for example, those shown in Reissue Patent 14,045 to V. R. Heftler and Patent 1,186,371 to Francois Baverey, it has been proposed to facilitate starting by shutting off the admission of air to the air bleed channel.

I provide a carburetor having a slow speed channel with an auxiliary nozzle therein which can be cut in or out of operation as desired. This nozzle receives its fuel from the usual float chamber.

This system has the advantage of being efficient when the throttle is only slightly open. It is effective for enriching the mixture at all suctions, but enrichment is much greater under conditions when the throttle is only slightly open than when the throttle is open fully. This is due to the fact that the suction in the slow speed channel is much greater for small throttle openings than for large ones. It is therefore impossible to overload the motor with liquid fuel. The auxiliary nozzle may be cut in or out of operation from the dash if desired.

In the accompanying drawings, which illustrate more or less diagrammatically several forms of my invention,—

Figure 1 is a diagrammatic view illustrating the venturi and throttle of a carburetor together with a slow-speed nozzle having my invention applied thereto.

Figure 1A is a diagrammatic sectional view showing the structure of Figure 1 applied to the float chamber of a carburetor.

Figures 2 to 7, inclusive, are diagrammatic views illustrating the venturi and throttle of a carburetor, together with a slow speed nozzle having my invention applied thereto in various ways;

Figure 8 is a vertical section, largely diagrammatic, showing my invention as applied to an actual carburetor;

Figures 9 to 11, inclusive, are views showing various positions of a portion of the apparatus shown in Figure 8;

Figure 12 is a view corresponding to Figure 8 but showing a modified form of apparatus; and

Figures 13 and 14 are views corresponding to Figures 9 to 11 but showing various positions of a portion of the apparatus illustrated in Figure 12.

Referring first to Figure 1, there is shown a carburetor having a main nozzle 2 in a venturi 3 connected to a passage 4 having a throttle 5 therein. The carburetor is provided with a slow speed nozzle 7. A channel 6 terminates in the passage 4 at an opening 8 which, in the closed position of the throttle 5, is covered by said throttle.

When the throttle is only slightly open a large part of the engine suction is exerted on the slow speed channel 6 and fuel is therefore drawn upwardly from the nozzle 7.

An auxiliary channel 9 having a fuel nozzle 10 is connected to the slow speed channel 6, as shown. This channel is provided with a damper 11 which is preferably manually controlled from the automobile dash. When the damper is closed the auxiliary nozzle 10 is out of action. With the damper open the suction in the slow speed channel will act on the nozzle 10 as well as on the nozzle 7, and the mixture will thus be materially enriched to permit easy starting of the motor.

It will be understood that the damper 11 may be replaced by a pet cock, a sliding valve or other device.

Referring to Figure 1A, the nozzle 10 is disposed in a float chamber A of the carburetor, in which chamber the float B is also dis-

posed. A wall D of the carburetor is provided with an opening or sunken jet which controls the flow of fuel to the nozzles 2 and 7. As the slow-speed nozzle 7 is disposed on the lee side of the sunken jet C, the amount of fuel which can be delivered by it for starting is controlled by the sunken jet C. By providing the auxiliary nozzle 10 extending into the float chamber, an additional source of fuel for slow-speeds is attained, which additional source is independent of the sunken jet C. This construction provides two nozzles for supplying fuel to the slow-speed channel. The nozzle 7 is fed from the same well as the nozzle 2 and is used for idling. The nozzle 10 is fed directly from the constant level reservoir A and is used for temporarily enriching the mixture when starting.

Figure 2 shows a slightly modified form of apparatus in which the opening of the slow speed channel 6′ into the main carbureting passage 4′ is divided in two.

In Figure 3 parts corresponding to similar parts in Figure 1 have been given the same reference character with an "a" suffixed thereto.

In this embodiment of the invention the damper 11 is done away with and a pet cock 12 on the auxiliary fuel nozzle 10^a is substituted therefor. It will be seen that by this arrangement the auxiliary nozzle may be cut into or out of operation, as desired, by properly turning the pet cock 12.

In Figure 4 parts corresponding to similar parts in Figure 1 have been given the same reference character with a "b" suffixed thereto. In this form of the invention the idling nozzle 7^b and the auxiliary nozzle 10^b are placed in the same channel 6^b, as shown. A regulating screw 13 is provided for varying the effective size of the channel 6^b. By threading the screw 13 in or out the amount of air supplied through the channel 6^b may be varied as desired. A pet cock 12^b is provided for turning the auxiliary nozzle 10^b as in the embodiment of Figure 3.

Figure 5 is quite similar to Figure 4 and parts corresponding to similar parts in Figure 1 have been given the same reference character with a "c" suffixed thereto. In this form of the invention a regulating screw 13^c is provided between the idling nozzle 7^c and the auxiliary nozzle 10^c. A pet cock 12^c is provided for the auxiliary nozzle.

In Figure 6 parts corresponding to similar parts in the previously described embodiments have been given the same reference character with a "d" suffixed thereto. In this form of the invention the slow speed channel 6^d is provided with an enlarged portion 14 having a damper 15 therein. The regulating screw 13^d permits of adjusting the normal idling mixture to the requirements of the motor, but when the damper 15 is closed full suction is felt on the nozzles 7^d and 10^d. When it is opened the nozzle 10^d will be out of action. This is due to the fact that the passage 14 is of such large size as compared with the passage 10^d that there will be insufficient suction to raise the fuel out of the nozzle.

In Figure 7 parts corresponding to similar parts described in previous embodiments of the invention have been given the same reference character with an "e" suffixed thereto. In this form of the invention there is provided a valve casing 6″ on the end of the slow speed channel 6^e. A three-way valve plug 16 is provided within the valve casing 6″. An air opening 17 and a tube 18 are also connected into the casing 6″, as shown. The tube 18 contains the auxiliary nozzle 10^e.

With the valve 16 in the position shown, the auxiliary nozzle 10^e is in action, as will be apparent. When it is desired to cut the auxiliary nozzle out of action the valve member 16 is given a quarter turn in a clockwise direction which permits of air entering the slow speed channel 6^e through the opening 17. With the valve member 16 in this position the auxiliary nozzle 10^e is of course completely out of action.

Referring, now, to Figure 8, there is shown a schematic disposition of the apparatus illustrated in pure diagram in Figure 7. In this form of the invention parts corresponding to similar parts in the diagram previously described have been given the same reference character with an "f" suffixed thereto. It will be noted that the main nozzle 2^f is supplied with a plurality of venturis within the main venturi 3^f for providing increased suction.

The auxiliary calibrated opening 10^f terminates in a substantially plane face 20 on the carburetor structure and a plate valve 21 is secured to this face by a screw 22′. A spring 23 is provided for pressing the plate firmly against the face, and an arm 24 is secured to the plate for turning the same to its several positions. This plate constitutes the "corrector" some times found on carburetors of this character.

In Figure 9 there is indicated a dashboard 25 of an automobile having a button 26 connected through a rod 27 to the arm 24.

The plate valve 21 has a groove 22 formed in the interior face thereof, and when the valve is in the position of Figure 9 this groove connects the auxiliary calibrated opening 10^f with a channel 28 leading to the slow speed passage 6^f and forming a continuation thereof.

With the plate valve or corrector in the position of Figures 8 and 9, the starting calibrated opening 10^f is operatively connected with the carburetor. When the corrector has been moved to the position of Figure 10 a

slot 29 registers with the end of the passage 28 and permits air to flow therethrough. The auxiliary calibrated opening 10^f is cut completely out of operation by this movement.

The amount of air supplied through the slot 29 and the channel 28 is regulated by the adjusting screw 13^f.

The corrector is shown in its final position in Figure 11. When it is in this position a hole 30 in the corrector is brought into registration with a channel 31 so as to admit supplementary air to the emulsion passage 32 leading to the main nozzle 2^f. It will be noted that when the corrector 21 is moved from the position of Figure 10 to the position of Figure 11 the passage 28 is maintained open.

In Figure 12 the invention is shown applied to a carburetor which is not provided with a passage similar to the passage 31 connected to the corrector. The arrangement is somewhat similar to that described in Figure 8 and similar parts have been given the same reference character with a "g" suffixed thereto. In this form of the invention the slot 29 and the hole 30 in the corrector are done away with and a hole 33 is provided, as shown in Fig. 13.

Figure 13 shows the plate 21^g in starting position with the groove 22^g in registration with the auxiliary nozzle 10^g and passage 28^g.

Figure 14 shows the plate 21^g turned to the running position with the hole 33 in alignment with the passage 28^g and the nozzle 10^g out of action.

My invention provides a simple and advantageous method of enriching the fuel mixture for starting.

I have illustrated and described a perferred embodiment of the invention with several modifications thereof. It will be understood, however, that the invention is not limited to these forms as it may be otherwise embodied and practiced within the scope of the following claim.

I claim:

A carburetor having a slow speed channel with a nozzle therein, an auxiliary channel connected to the slow speed channel, and an independent nozzle adapted to supply fuel to the auxiliary channel, both of said nozzles being above the fluid level in the carburetor.

In testimony whereof I have hereunto set my hand.

ANTONIN BOULADE.