May 10, 1932. F. H. HEITGER 1,857,543

CARBURETOR

Filed July 28, 1928

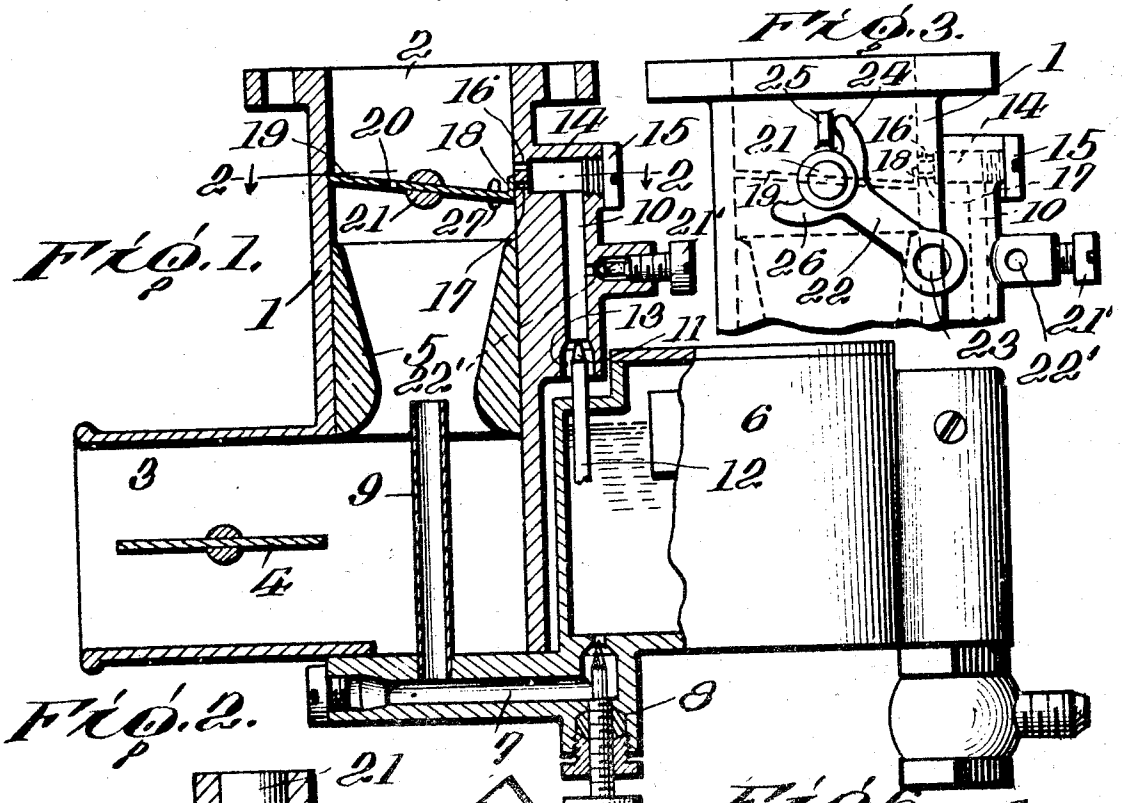

Fig. 1.

Fig. 3.

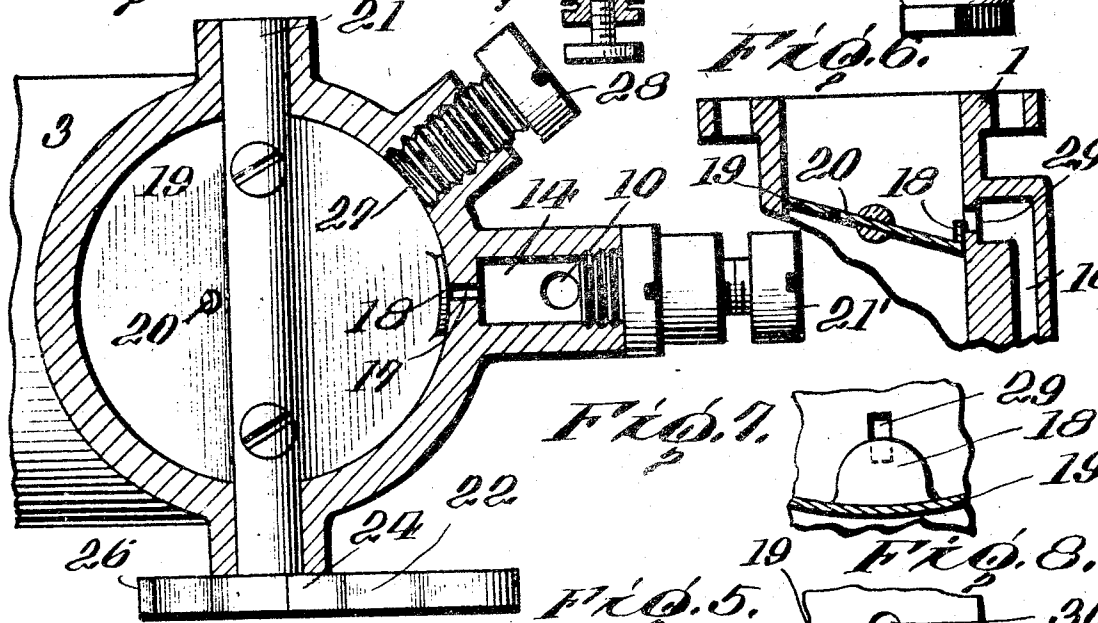

Fig. 2.

Fig. 6.

Fig. 7.

Fig. 8.

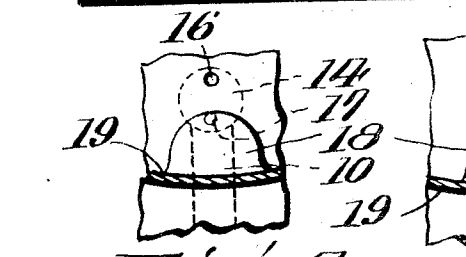

Fig. 5.

Fig. 4.

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Patented May 10, 1932 1,857,543

UNITED STATES PATENT OFFICE

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CARBURETOR

Application filed July 28, 1928. Serial No. 296,004.

This invention relates to certain new and useful improvements in carburetors and particularly to carburetors for internal combustion engines used in connection with motor vehicles where the speed is variable, varying from a minimum speed to a high speed and where it is required to feed fuel to a carburetor posterior of the throttle in the carbureting passage for the minimum or idling speed and to augment the fuel feed posterior of the throttle as the throttle is opened a short distance and before the main feed comes into action fully.

Another object of my invention is to provide a carburetor with a novel construction of idling device wherein the mixture, fed to the carburetor posterior of the throttle, is gradually increased to a point where the throttle starts to open so that there is no so called flat or lean spot before the main fuel feed starts.

Another object of my invention is to provide means whereby the mixture when idling is just rich enough to carry it over the idling period and gradually increasing the richness of the mixture as the throttle starts to open and increasing the same until the main fuel feed starts, whereby there is a smooth transfer during the stage between idling and when the main fuel feed starts.

A further object of my invention is to provide a carburetor with a novel construction of throttle valve wherein I am able to control the mixture to produce proper mixture when idling, and during the entire transfer until the time when the main fuel feed starts.

A still further object of my invention is to provide a carburetor of this character having certain details of structure and combination of parts to accomplish the heretofore mentioned results, as will be hereinafter more fully described and claimed.

In the accompanying drawings:—

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

Figure 2 is a horizontal transverse sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a side elevation of the upper end of the carburetor showing the stop mechanism for the throttle valve operating arm.

Figure 4 is a detail side elevation of the interior wall of the body of the carburetor showing the throttle valve closing the lower transfer hole.

Figure 5 is a view similar to Figure 4 showing the throttle valve moved so that the mixture is passing through the lower transfer hole.

Figure 6 is a vertical sectional view of the upper end of the carburetor similar to Figure 1 showing a different form of transfer opening.

Figure 7 is a detail side elevation of Figure 6 showing the throttle valve partially closing the transfer opening.

Figure 8 is a view similar to Figure 7 showing a still further modified form of transfer opening.

Referring now to the drawings, 1 represents the body part of the carburetor passage, and 2 is the throttle chamber port or carburetor passage outlet, and 3 is the air intake passage having mounted therein the choker valve 4, all of which is well understood and needs no further description. The carbureting passage 1 is provided with the usual Venturi tube member 5, and at one side is provided with the usual fuel or fluid chamber 6 having a passage 7 communicating with the lower end thereof, and the passage of the fuel from the chamber is controlled by the usual needle valve 8. Connected with and communicating with the passage 7 is the Venturi tube 9, which extends upwardly into the member 5 for supplying fuel to the carbureting chamber.

One wall of the carbureting passage 1 is provided with a mixture passage 10 that leads from the fuel jet 11 in the fuel tube 12, and said fuel tube extends down into the fuel or fluid chamber 6, as clearly shown in Figure 1 of the drawings. The tube 12 could be in direct communication with the fuel passage 7, such as shown in my co-pending application Serial No. 258,738, filed March 3, 1928, which matured to Patent 1,838,675 granted Dec. 29, 1931.

Surrounding the fuel jet 11 is an annular air space 13 which is supplied with air through the port 14, whereby the jet gets

some air initially at this point. The upper end of the passage 10 communicates with a chamber 14 and into which is screwed a plug 15, whereby said plug may be removed so that the two holes 16 and 17 may be drilled, and also to enable the proper assembly of the carburetor so that the lip 18, carried by the throttle valve 19, may be properly adjusted to close the lower transfer opening 17. The throttle valve 19 is provided with a small opening 20 which is for the purpose of keeping agitated any liquid fuel that may form in a puddle around the shaft 21 of the throttle valve. The throttle valve 19, as shown in Figure 1 of the drawings, closes on an angle, and the lower opening 17 is in line with the center of the shaft 21 of the throttle valve 19 so that immediately upon any movement of the throttle the lip moves and gradually increases the supply of fuel, and the lip 18 is so arranged that when the throttle valve is completely closed the lower transfer opening 17 is completely closed so that the mixture from the chamber 14 passes posterior of the throttle. The passage 10 is provided with a needle valve 21', having opening 22' for air, whereby the proper mixture of gas and air passes through said passage. The shaft 21 of the throttle valve 19 is provided with the usual operating arm 22 having an eye 23 at its free end for attaching the throttle operating mechanism, and this arm 22 is provided with a lug 24 adapted to engage the stop 25 carried by the outer face of the body of the carburetor, whereby the throttle valve is stopped at a point with the lip 18 closing the lower transfer opening 17. The arm 22 is also provided with a lug 26 adapted to engage the stop 25, and whereby the throttle valve is stopped in a position with the valve running longitudinally of the passage or completely open. One wall of the carbureting passage 2 is provided with a by-pass port 27 which is so positioned that when the throttle valve 19 is in its closed position, as shown in Figure 1 of the drawings, the passage is in communication with the passage 1, both above and below the throttle valve 19, whereby air is allowed to by pass around the throttle valve to supply the proper amount of air to produce the proper combustible mixture, and the depth of the by-pass 27 is controlled by the screw 28, whereby the amount of air may be varied.

In the modification shown in Figure 6, instead of having two transverse openings 16 and 17 I have provided an elongated transfer opening 29, which is in a line with the center of the shaft 21 of the throttle valve 19, and of such a length that when the throttle valve 19 is in its closed position, shown in Figure 1 of the drawings, the opening is about one half open, and thus the supply of fuel is increased immediately upon any movement of the throttle valve.

In the still further modified form of the opening, shown in Figure 8, instead of making the opening elongated I have shown a comparatively large round opening 30 which, when the throttle valve is closed, as shown in Figure 1, the lip closes approximately one half of the opening.

The lower opening 17, communicating with the chamber 14, as shown in Figure 1 of the drawings, has its upper wall in a plane with the center of the shaft 21 of the throttle valve 19, whereby the throttle valve closes the passage 17 when in an inclined or closed position, as clearly shown in Figure 1 of the drawings. It is understood that the throttle valve 19 is oval and therefore must close when at an angle. The lip 18 has a limited spring action and when the throttle valve 19 is moved in the direction of the arrow shown in Figure 1 of the drawings, the lip uncovers the upper end of the transfer opening 17 and allows an additional supply of mixture to pass from the chamber 14. As the throttle valve continues to move downwardly or to an open position the lip gradually uncovers the transfer opening 17, allowing a gradual increase of mixture above the throttle valve until the transfer opening 17 has become wholly uncovered by the lip. When this point has been reached the main fuel supply has been brought into action and the engine runs smoothly from the idling position to the actual working position. By moving the throttle valve downwardly and having the lip 18 spring it will be seen that there is no transfer of air through the transfer passage 17 to the chamber 14, but the mixture passes outwardly through said lower transfer opening.

Having thus fully described my invention what I claim is:—

The combination with a carburetor, of a carbureting passage having an air inlet and a main fuel feed discharging into said passage, an auxiliary fuel passage having a communication with the carbureting passage, a throttle valve mounted in the outlet and having its shaft arranged in substantially the same horizontal plane with the outlet of the auxiliary fuel passage to move into closed position on the communicating side in the direction of travel of the fuel and air passing through said carbureting passage, said throttle valve having flexible means for varying the communication of said auxiliary passage.

In testimony whereof I hereunto affix my signature.

FRANK H. HEITGER.