Feb. 14, 1933. L. M. WITTLINGER 1,897,782

CARBURETOR

Filed June 28, 1928

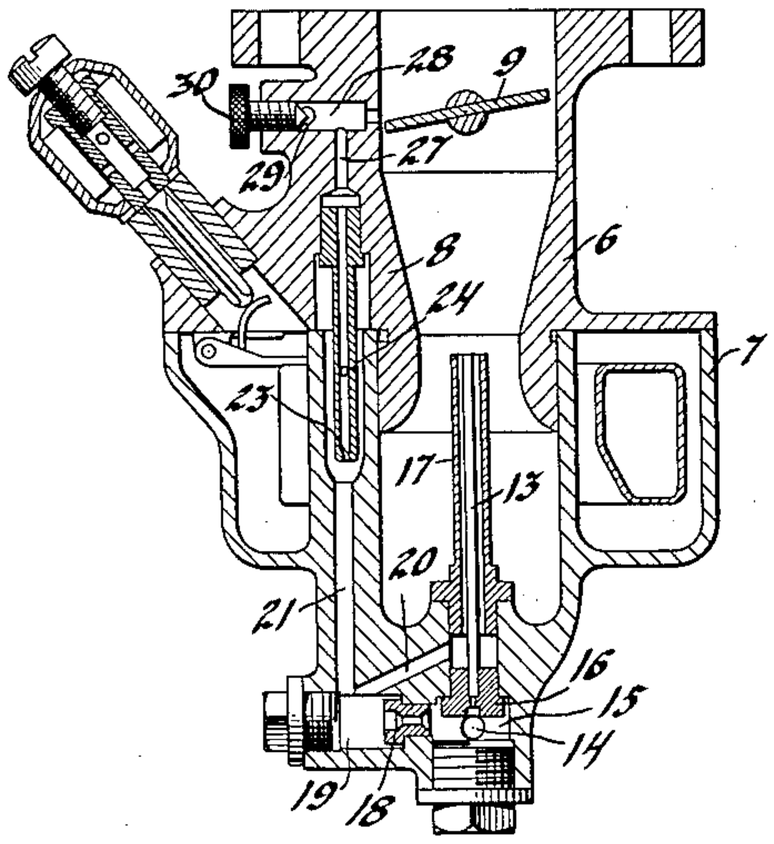

Fig. 2.

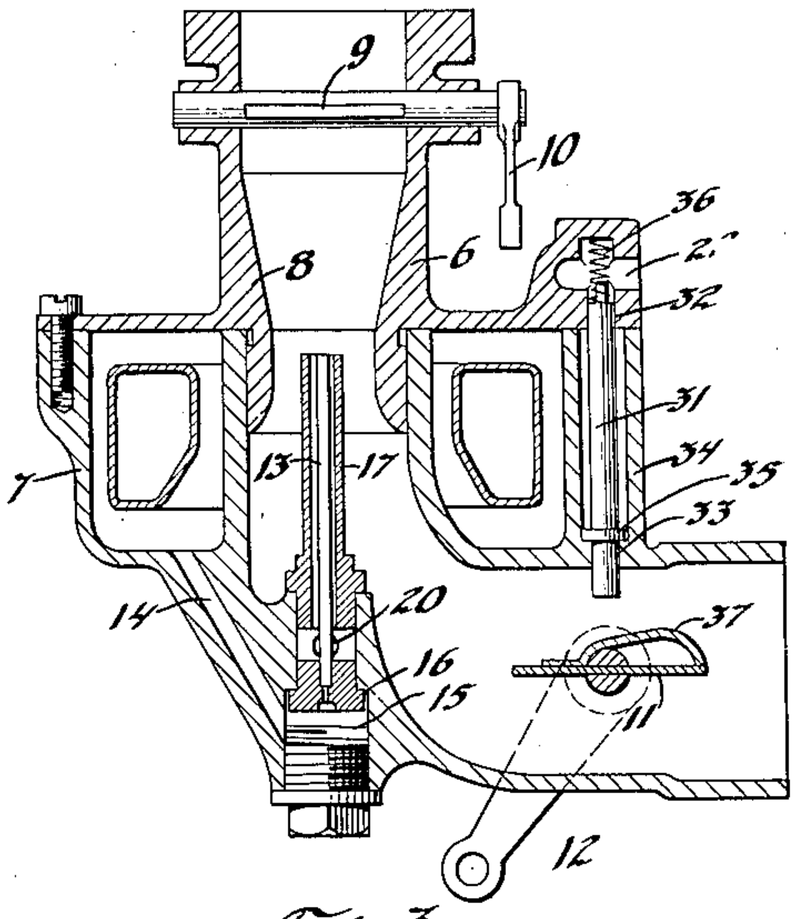

Fig. 3.

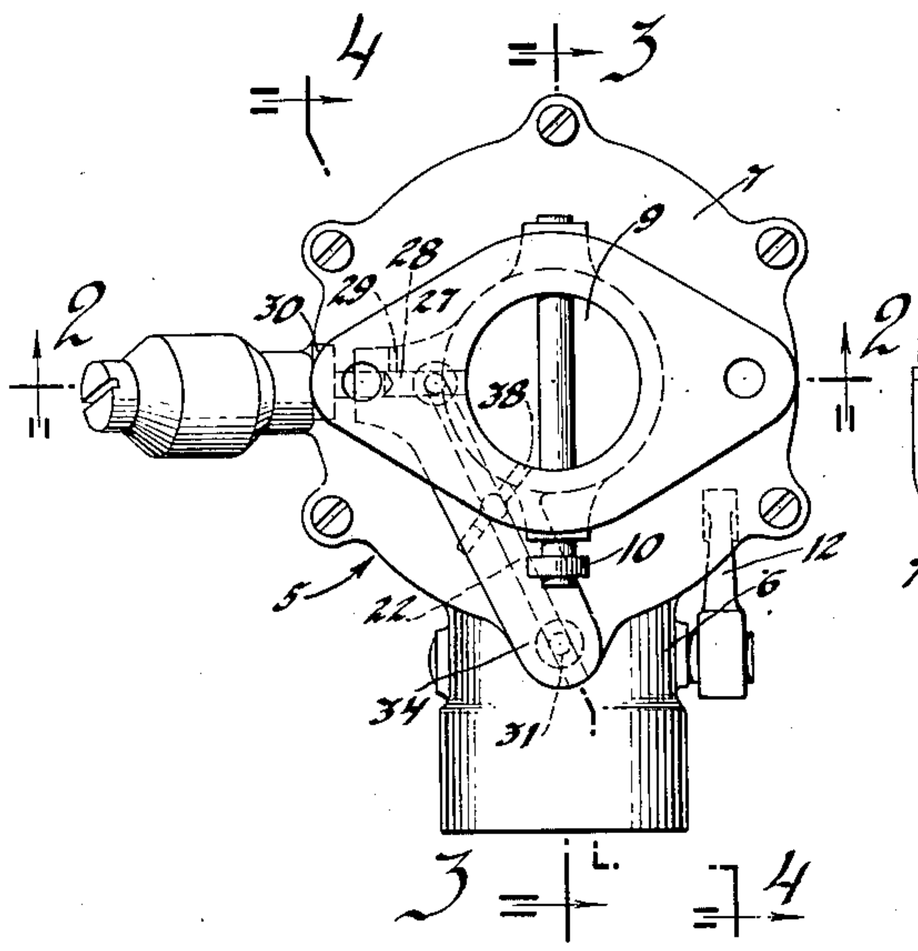

Fig. 1.

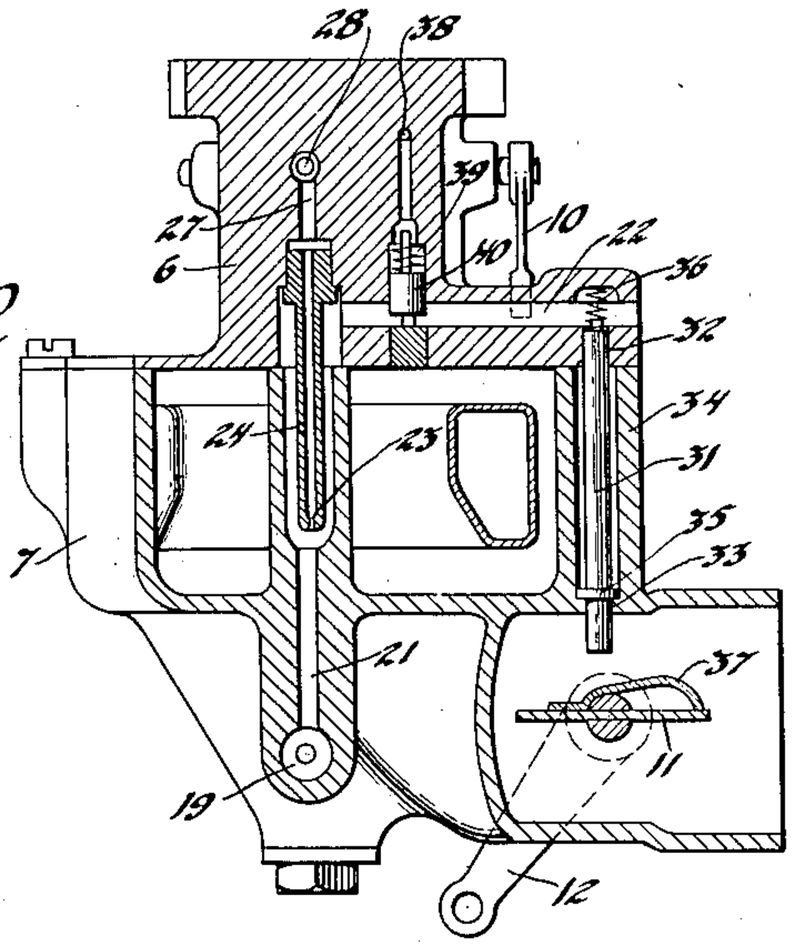

Fig. 4.

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UNITED STATES PATENT OFFICE

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CARBURETOR

Application filed June 28, 1928. Serial No. 289,032.

This invention relates to carburetors and it is an object of the invention to provide certain new and useful improvements in carburetors.

Carburetors of the type to which this invention has particular reference ordinarily include a body having therethrough a main air passage, main and compensating nozzles extending into the main air passage and adapted to discharge fuel thereinto, the latter nozzle drawing its supply of fuel from an atmospheric well, and a choke valve for restricting the main air supply to increase the richness of the combustible mixture when desired. In such a carburetor, even when the choke valve is closed, air flows unrestrained into the main air passage, through the atmospheric well and the compensating jet, thus diluting the combustible mixture therein.

It is an object of this invention to provide, in a carburetor of the type described, means adapted to be operated, upon the operation of the choke valve, to restrict the flow of air to the atmospheric well when the engine is choked in order to decrease the volume of air flowing into the main air passage and to increase the volume of fuel flowing thereinto from the compensating jet so as to further increase the richness of the combustible mixture at this time.

It is another object of the invention to provide, in a carburetor of the type described, means whereby the flow of air to the atmospheric well will be automatically restricted at full throttle in order to increase the richness of the combustible mixture at this time.

Other objects of the invention will be apparent from a perusal of the following description of the embodiment of my invention which is shown in the accompanying drawing, in which:

Figure 1 is a top plan view of my improved carburetor;

Figures 2, 3 and 4 are, respectively, sections on the lines 2—2, 3—3 and 4—4 of Figure 1.

In the drawing, the reference character 5 indicates my improved carburetor which includes a hollow, open-ended, elbow-shaped body 6 and a float bowl 7 surrounding the portion of the vertical branch of the body adjacent the horizontal branch. There is formed between the ends of the vertical branch of the body of the carburetor, which is adapted to be connected at its upper end to the riser of the intake manifold of an internal combustion engine, a venturi 8 and, above the venturi, there is provided a butterfly throttle valve 9 to which is connected an operating arm 10. Adjacent the open end of the horizontal branch of the body, there is provided a butterfly choke valve 11 to which is connected an operating arm 12.

There is provided at 13 a main nozzle which extends into the main or secondary air passage and which is adapted to be supplied with fuel from the float bowl through the passage 14, the well 15, and the jet 16. Surrounding a portion of the main nozzle and circumferentially spaced therefrom is the compensating nozzle 17, which is adapted to be supplied with fuel from the float bowl through the passage 14, the well 15, the jet 18, the well 19, and the passage 20.

Opening at its lower end into and extending upwardly from the well 19 is a passage 21, into whose enlarged upper end opens the inner end of the primary air inlet passage 22 whose outer end opens into the atmosphere at a point above the horizontal branch of the body of the carburetor. The idle jet 23, which has through a wall thereof a small air-leak 24, extends down into the enlarged upper end of the passage 21 and is adapted to withdraw fuel therefrom during the idle operation of the engine. At its upper end, the idle jet opens into a passage 27 which, in turn, opens into a cross-passage 28 which opens at its inner end into the body of the carburetor above the venturi 8. Adjacent the outer end of the passage 28, there is provided an opening 29 which leads to the atmosphere and through which air may be admitted to the passage 28. Admission of air to the passage 28 is controlled by the screw 30.

In starting the engine, I have found, in order to get a maximum supply of very rich

mixture, that, in addition to restricting the main or secondary air entrance by means of the choke valve 11, it is also desirable to restrict the primary air entrance to limit the amount of primary air entering the carburetor and thereby increase the richness of the mixture, and to impose a suction on the compensating jet 18, which ordinarily meters by gravity alone, to increase the volume of fuel supplied to the engine through the compensating nozzle at this time.

In order to restrict the primary air entrance when the choke valve is closed to restrict the main or secondary air entrance, I have provided a pin 31 which is slidable vertically in openings 32 and 33 formed, respectively, in the lower wall of the primary air intake passage 22, and in the upper wall of the horizontal branch of the body of the carburetor at a point directly above the shaft on which the choke valve 11 is mounted, and which extends, intermediate these walls, through a boss 34 formed on the side of the float bowl 7. Under normal operating conditions, the pin 31 is located in the position in which it is shown in the drawing—i. e. with the collar 35 which limits its downward movement seated on the upper wall of the horizontal branch of the body portion, with its lower end projecting down into the horizontal branch of the body portion of the carburetor, and with its upper end entirely within the opening 32—being urged to this position by its own weight and the spring 36. There is provided on the choke valve 11, in such a position that it is adapted to engage the lower end of the pin 31 when the valve is closed to restrict the secondary air supply, a cam 37. It is obvious from the drawing that, as the choke valve is closed, the cam 37 will engage the lower end of the pin 31, moving the whole pin upwardly and thereby projecting the upper end thereof into the primary air passage, thereby restricting the passage and reducing the volume of air supplied to the carburetor therethrough.

It is well known that, generally, when an engine is running with the throttle partly open, economy of fuel consumption is the controlling factor in the operation of the engine whereas, when the throttle is fully open, maximum power regardless of fuel consumption is what is desired. To obtain the metering change necessary to satisfy these requirements, I have provided a passage 38 opening at its enlarged end into the primary air passage 22 and at its opposite end into the body of the carbturetor above the throttle 9. In the enlarged end of the passage 38 and urged into the primary air passage by the spring 39 is slidably mounted a pin 40. The spring 39 is so selected that the pin 40 is withdrawn into the passage 38 by the high manifold vacuum acting through the passage 38 when the engine is operating at part throttle, leaving the passage 22 clear for the entrance of primary air. At full throttle, when the manifold vacuum is reduced, even at high speeds, the spring 39 forces the pin 40 partly into the primary air passage 22, thereby partially restricting the entrance of primary air into the carburetor whereby a suction is imposed on the compensating jet 18 which increases the flow of fuel therefrom. It is thus obvious that by means of the structure described above I have provided means for increasing the fuel supply at full throttle and at the same time reducing the air supply whereby, as is desirable, the engine is supplied with a richer combustible mixture at this time than under part throttle operating conditions.

Though I have shown and described a preferred embodiment of my invention, it is to be understood that this has been done merely by way of example and not with the object of limiting my invention thereto, and that the scope of my invention is defined only by the appended claims.

I claim:

1. In a carburetor, a primary air passage, a secondary air passage, a choke valve in the secondary air passage to restrict the flow of air therethrough, means adapted to restrict the flow of air through the primary air passage upon operation of the valve to restrict the flow of air through the secondary air passage, and means to restrict the flow of air through the primary air passage independently of the first-mentioned means.

2. In a carburetor having therein a main air passage, a throttle valve in the passage, a nozzle projecting into the passage, a well from which the nozzle is adapted to draw fuel, a second nozzle projecting into the passage, means to supply fuel to the well and the second nozzle, a passage connecting the well with the atmosphere, a passage connecting the second-mentioned passage with the main air passage at a point above the throttle, and means in the third passage whereby the maninfold suction applied thereto controls the flow of air through the second mentioned passage.

In testimony whereof I affix my signature.

L. M. WITTLINGER.