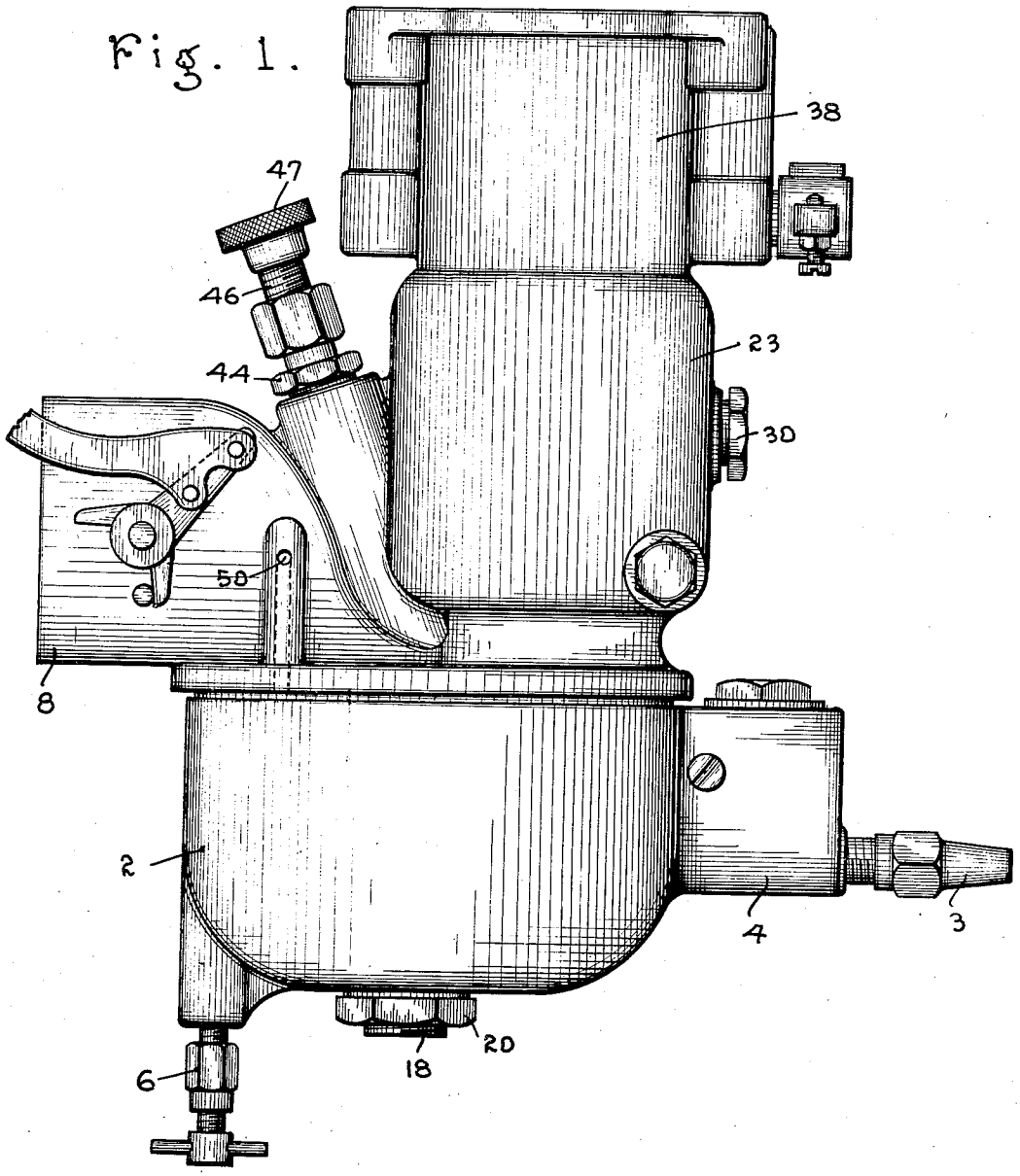
Aug. 4, 1931. G. WAHNISH 1,817,861

CARBURETOR

Filed June 12, 1928 3 Sheets-Sheet 1

Fig. 1.



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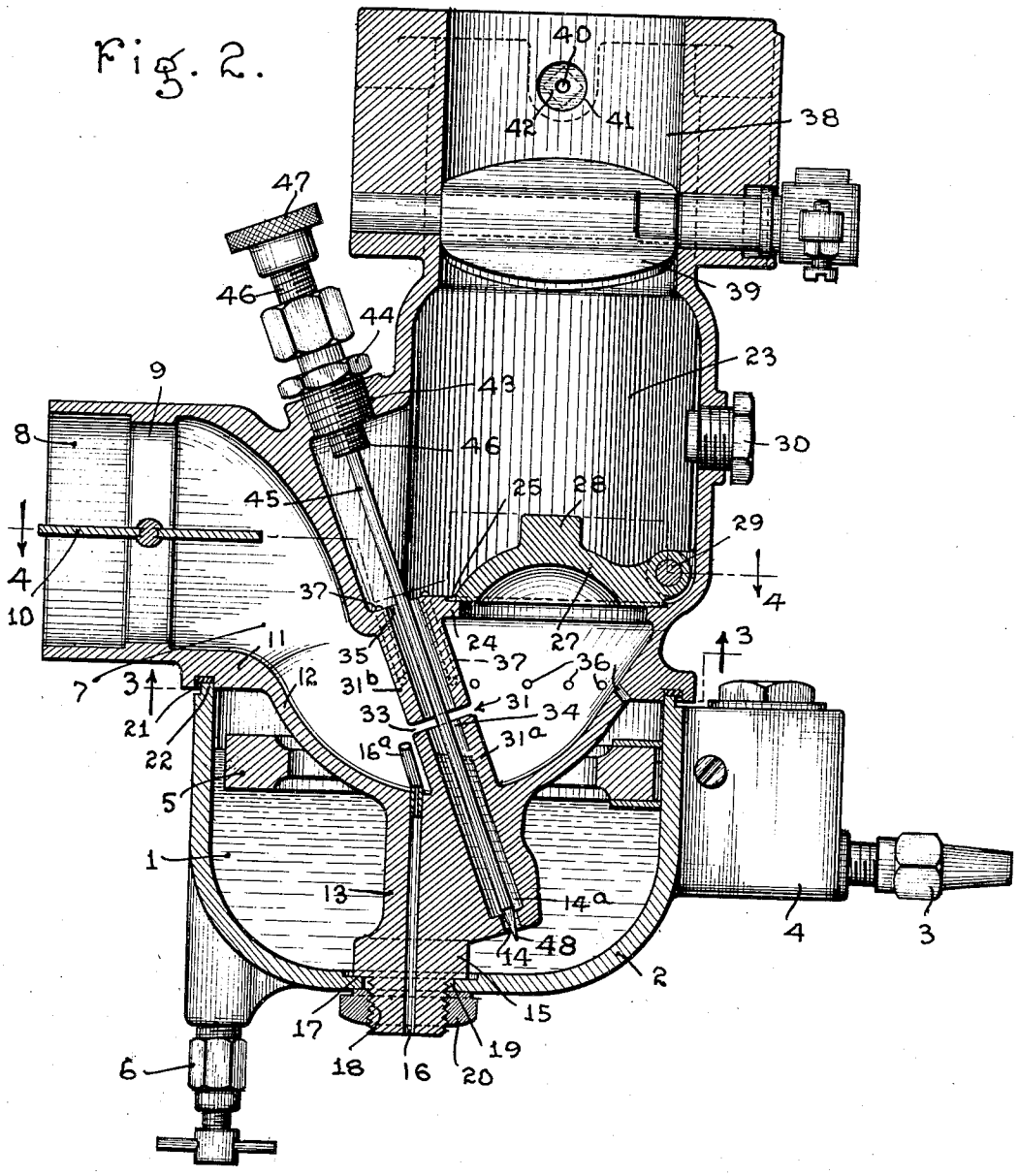
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CARBURETOR

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Fig. 2.



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CARBURETOR

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Fig. 3.

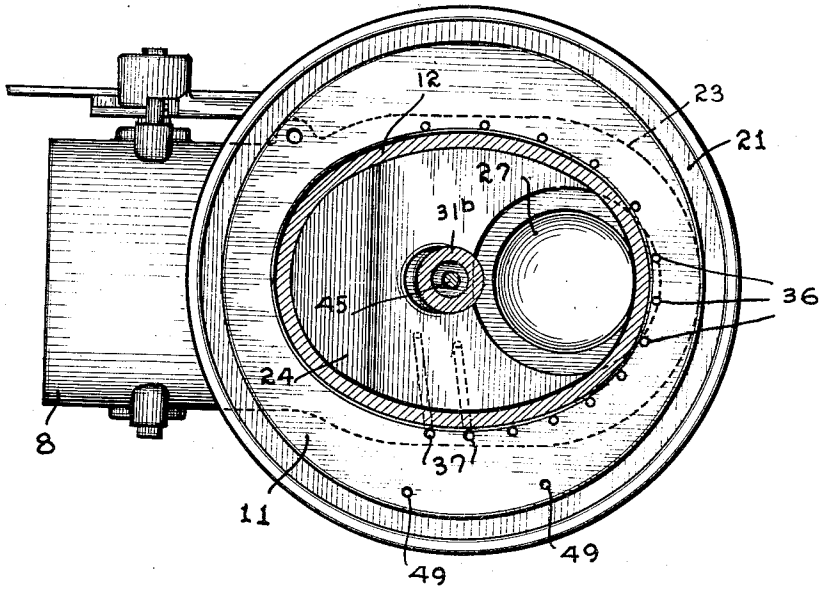
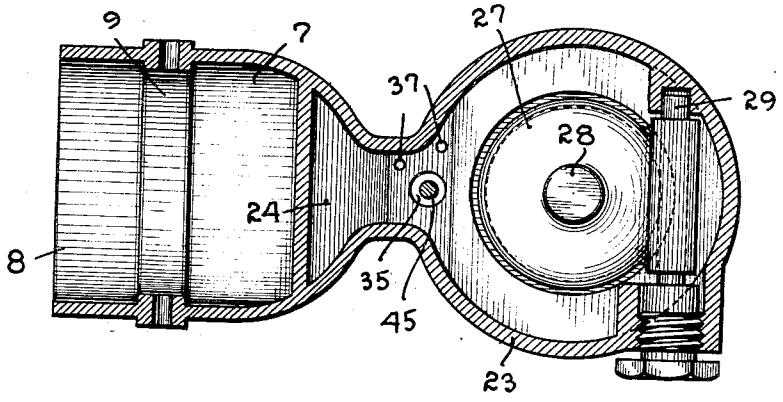


Fig. 4.



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UNITED STATES PATENT OFFICE

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CARBURETOR

Application filed June 12, 1928. Serial No. 284,777.

This invention relates to carburetors and more particularly to carburetors designed for use in automobiles.

The carburetor art has of course reached an exceedingly high state of development accompanying the like development in motor vehicles using internal combustion engines. However as actually used at the present time such carburetors are unnecessarily complicated in structure entailing a variety of adjustments for proper operation, an excessive number of working parts frequently entailing misoperation and waste, and an inordinate cost of manufacture and operating expense. For example, the carburetors in actual use require at least two sets of aspirating tubes, one for normal operation and the other for idling operation of the engine. Further, the mixing chambers where the fuel and air are admixed are generally Venturi shaped or communicate with Venturi passages to obtain the required speed and mixture of fuel and air. These and other features lead to the factors of excessive cost in manufacture, operation, and upkeep, referred to above.

The invention set forth in the instant application is designed to eliminate the factors referred to above so that economy of manufacture, operation and upkeep are obtained.

Accordingly among the objects and advantages of the present invention are the elimination of idling jets and accompanying adjustments, the elimination of Venturi chambers, etc.

Other and further objects and advantages will appear from the more detailed description of the invention specifically set forth below, taken in connection with the drawings illustrating a desirable form of the invention.

It will be understood however that this more detailed description is given by way of illustration and not as limiting, since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the invention specifically disclosed and claimed herein.

Referring to the drawings illustrating one form of the invention that may be desirably used, there is shown in

Figure 1, an elevation of a carburetor embodying the invention herein set forth; in

Figure 2, a vertical sectional view through the carburetor of Figure 1; in

Figure 3, a detailed view partly in section, on the line 3—3 of Figure 2, looking in the direction of the arrows; and in

Figure 4 a detailed view partly in section, on line 4—4 of Figure 2.

In the form of device desirably illustrated in the drawings there is shown a carburetor having a fuel chamber 1 formed by the cup-shaped wall 2. The fuel chamber 1 is supplied with fuel from the fuel inlet pipe 3 controlled by the usual fuel inlet valve (not shown) in the valve housing 4. In accordance with well known construction, the fuel inlet valve is operated by a float 5 within the fuel chamber 1 so that when the float 5 drops with a decrease of fuel in the fuel chamber, the fuel inlet valve is opened to allow ingress of fuel into the fuel chamber, while when the fuel in the fuel chamber reaches a predetermined level causing rising of the float 5, the fuel inlet valve is closed cutting off the ingress of fuel. A cock 6 is connected to the lower portion of the fuel chamber 1 serves to drain the latter if, and when desired.

An air inlet chamber 7 is located adjacent the fuel chamber 1, the air inlet chamber being open at one end 8 to the air inlet manifold (not shown). The open end 8 of the air inlet chamber is desirably provided with a seat 9 for the choke valve 10 as is generally the case for the purpose of closing the air inlet chamber 7. The lower wall or floor 11 of the air inlet chamber is desirably depressed as shown at 12 for purposes hereinafter set forth.

The depressed floor 12 of the lower wall

of the air inlet chamber is continued as a downwardly projecting member 13. A passage or opening 16 in the member 13 is continued upwardly by a tube 16*a* and ends slightly below the level of the break in the aspirating tube 31. Passage 16 and tube 16*a* serve to drain the air inlet chamber. A second, desirably tubular passage 14*a*, in the depending member 13 serves as a continuation of the aspirating tube 31 and this passage 14*a* connects by passage 14 with the fuel chamber. The depending member 13 ends in a reduced portion 15 which serves as a seat 17 against which the fuel chamber wall 2 seats. For this purpose, the portion 15 is threaded as shown at 18 and the threaded end received the wall 2 by virtue of opening 19 in the latter. A nut 20 holds the wall 2 and the shoulder of the seal 17 so that the opening between the several parts is closed securely.

In order to seal the fuel chamber at its upper edge, the lower face of the lower wall 11 of the fuel inlet chamber is desirably provided with a groove 21 adapted to serve as a seat against which the upper edge of the wall 2 of the fuel chamber 1 is seated, for which purpose the wall 2 may have a reduced end 22. A gasket of course may be used in the groove 22. By means of the nut 20 the wall 2 is forced into close engagement with the walls of the groove 21 and the seat 17.

The inner end of the air inlet chamber 7 opens into the mixing chamber 23, the upper wall 24 of the air inlet chamber serving as a seat 25 for the flap valve 27 desirably weighted as shown at 28, this flap valve 27 serving to close the opening between the air inlet chamber and the mixing chamber. The flap valve may therefore be pivoted at 29 and its movement may be limited and controlled by the bolt 30 threaded through the wall of the mixing chamber.

Within the air inlet chamber 7 is an aspirating tube or nozzle 31 broken into two portions 31*a* and 31*b*, so that the break 33 lies well within the air inlet passage. The portion 31*a* of this aspirating tube is attached to the central portion of the wall 12 of the air inlet chamber 7 and communicates through passages 14*a* and 14 with the fuel chamber 1. The portion 31*b* of the aspirating tube 31 is attached to the upper wall 24 of the air inlet chamber and communicates through an opening 35 with the mixing chamber 23. Desirably the opening 14*a* and the aspirating tube portions 31*a* and 31*b* are aligned to form a continuous passage for reception of the needle valve stem.

A number of passages 36 are cut through the wall 12 of the air inlet chamber so that communication is also made between the upper portion of the fuel chamber 1 and the inner end of the air inlet chamber, these passages 36 opening into the air inlet chamber at a point or series of points contiguous to the flap valve 27. These passages 36 may of course vary considerably in number and may comprise a series extending substantially around and through the depressed wall 12 of the fuel inlet chamber.

Additional passages 37 are provided which communicate with the fuel chamber 1 at one end and with the mixing chamber 23 at the other end. These passages are desirably drilled through the wall 12 without entering or touching the air inlet passage proper, and preferably open into the mixing chamber at points near the opening 35 which it will be recalled serves as a communication between the tube 31*b* and the mixing chamber 23.

The mixing chamber 23 communicates with the fuel-air mixture outlet 38 that leads to the usual engine manifold (not shown), but the passage from the mixing chamber 23 to the outlet 38 is adapted to be regulatably restricted as desired by the usual throttle valve 39 seating against the inner wall of the outlet 38 and pivoted for movement within the passage and operated in the usual manner so that further explanation thereof is unnecessary.

An opening 40 between the fuel-air mixture outlet 38 and the atmosphere is provided. This opening or passage 40 may for example be formed by threading an opening 41 in the wall of the outlet 38 and closing the opening by a threaded plug 42 the plug carrying the opening or passage 40.

The wall of the mixing chamber 23 is provided with a threaded opening 43 adapted to receive a nut 44 provided with an internally threaded opening into which the threaded end 46 of the needle valve 45 is extended. The head 47 is desirably formed as a thumb screw to allow of ready adjustment of the needle valve and so that the pointed end 48 of the needle valve 45, when desired, may be seated against the walls of the opening 14 between the fuel chamber and the passage 14*a*, to close substantially the opening 14 or to regulate the size of this opening.

In order to equalize the pressures in the fuel chamber during operation, passages such as those shown in Figure 3 at 49 may be utilized, and in addition the passage 50 (see Figure 1) may be drilled through the wall of the air inlet chamber 7.

The carburetor constructed and assembled in a manner obvious from the detailed description set forth above, operates simply and economically. For example in starting up the engine, the throttle valve 39 is generally opened somewhat. During the turning over of the crank shaft, a suction is of course produced in the engine manifold which is communicated to the mixing chamber. The flap valve 27 will be opened by such suction so that communication is established between the air inlet chamber 7 and

the mixing chamber 23. Fuel will be aspirated through the tube 31, part of such aspirated fuel being mixed with the air at the break 33 in the aspirating tube 31a, while another portion of fuel will enter the mixing chamber 23 from the upper open end of the portion 31b of the tube 31. In other words, during such operation and in fact during the entire normal operation of the carburetor, the broken tube 31 acts as a pair of jets part of the fuel being aspirated into the air within the air inlet chamber 7 while part of the fuel is aspirated directly into the mixing chamber 23 through the opening 35 at the upper end of the portion 31b of the aspirating tube.

In addition to the fuel which is aspirated through the tube 31, additional very volatile fuel is admixed with the air, part of such additional volatile fuel coming from the passages 36 which as stated above communicate with the upper portion that may be defined as the vapor space of the fuel chamber 1 and lead directly to the air inlet chamber while additional volatile fuel is also carried by the passages 37 directly from the vapor space of the fuel chamber 1 to the mixing chamber 23. The result of the admixture of fuel in this manner with the air of course gives very intimate distribution of fuel within the air current and it is in this condition that the fuel-air mixture is sent to the engine manifold. As is usually the case, the opening of the throttle valve 39 will control the suction produced in the mixing chamber 23 and thus control the amount of opening of the flap valve 27. In this manner the amount of fuel passing through the opening normally closed by the flap valve 27 is regulated.

It should be noted that in the carburetor disclosed as a desirable feature in accordance with the present invention, no idling jet is required and none has proved to be necessary in actual practice. Instead, when the motor is idling the flap valve 27 will normally be closed. Consequently all the fuel which is admitted to the engine for idling purposes is obtained in part from the upper end of tube 31b, where it is aspirated into the mixing chamber 23 and a very volatile portion of fuel is admitted from the passages 37 directly from the vapor space of the fuel chamber 1 into the mixing chamber 23. While during idling, the throttle valve 39 is substantially closed, there is sufficient leakage past this throttle valve for the fuel derived as stated immediately above from passages 37 and 35, to enter the engine manifold. The air for idling purposes is derived through the passage 40. It has been found that the engine will idle satisfactorily without the necessity for any provision of an idling jet and that a carburetor made in accordance with this invention requires no idling jet, sufficient fuel being derived in the manner set forth above for idling purposes.

The float 5 maintains a constant level of fuel in the fuel chamber 1 as will be readily understood, the regulation of the needle valve 45 and of the choke valve 10 being accomplished in the usual way.

It may be noted that while the flap valve 27 is desirably used in the present construction, it has been found that this valve can be omitted although the operation of the carburetor without the flap valve 27 is less efficient than when such flap valve is utilized. It may also be noted in this connection that the flap valve 27 when utilized is believed to eliminate any necessity for Venturi shaped passages, and even when the flap valve 27 is omitted the carburetor can be used without such Venturi passages.

The size of the openings 36, 37, and 40 will vary with different types of motors as will also the number of passages 36 and 37. These may be readily adjusted by one skilled in the art to a particular engine.

It may further be noted that since the passages 36 and 37 lead from the upper or vapor space of the fuel chamber 1, an exceedingly volatile fuel is derived in this manner and very efficient operation is thus obtained.

The broken aspirating tube 31 in normal operation appears to act as a pair of jets and therefore yields increased distribution of the fuel when aspirated into the air inlet chamber and the mixing chamber.

Having thus set forth my invention, I claim:

1. A carburetor comprising a fuel supply chamber, an air inlet chamber adjacent said fuel supply chamber, a mixing chamber communicating with said air inlet chamber, an aspirating tube communicating at one end with said fuel supply chamber and discharging at the other end into said mixing chamber, a flap valve between said air inlet chamber and said mixing chamber, a needle valve controlling the entry of fuel from the fuel supply chamber to the aspirating tube, passages communicating with the upper portion of the fuel supply chamber and the air inlet chamber, additional passages connecting the upper portion of the fuel supply chamber directly with the mixing chamber, a fuel-air mixture outlet communicating with said mixing chamber, a throttle valve closing the passage between the mixing chamber and fuel-air outlet, and a passage in the fuel-air outlet communicating with the atmosphere.

2. A carburetor comprising a fuel supply chamber, an air inlet chamber adjacent said fuel supply chamber, a mixing chamber communicating with said air inlet chamber, an aspirating tube communicating at one end with said fuel supply chamber and discharging at the other end into said mixing chamber, the aspirating tube having an opening

into the air inlet chamber, a flap valve between said air inlet chamber and said mixing chamber, a needle valve controlling the entry of fuel from the fuel supply chamber to the aspirating tube, passages communicating with the upper portion of the fuel supply chamber and the air inlet chamber, additional passages connecting the upper portion of the fuel supply chamber directly with the mixing chamber, a fuel-air mixture outlet communicating with said mixing chamber, a throttle valve closing the passage between the mixing chamber and fuel-air outlet, and a passage in the fuel-air outlet communicating with the atmosphere.

3. In a carburetor including a fuel chamber, an air inlet chamber adjacent to said fuel chamber, a mixing chamber communicating with said air inlet chamber, and an aspirating tube connecting the fuel chamber and mixing chamber and opening into the air inlet chamber, passages providing communication between the upper portion of the fuel chamber and air inlet chamber, and additional passages providing communication directly between the upper portion of the fuel chamber and the mixing chamber.

4. In a carburetor including a fuel chamber, an air inlet chamber adjacent to said fuel chamber, a mixing chamber communicating with said air inlet chamber, an aspirating tube connecting the fuel chamber and the mixing chamber, means providing communication between the upper portion of the fuel chamber and air inlet chamber, and additional means providing communication directly between the upper portion of the fuel chamber and the mixing chamber.

5. A carburetor comprising a fuel supply chamber, an air inlet chamber adjacent said fuel supply chamber, a mixing chamber communicating with said air inlet chamber, an aspirating tube communicating at one end with said fuel supply chamber and discharging at the other end into said mixing chamber, a flap valve between said air inlet chamber and said mixing chamber, a needle valve controlling the entry of fuel from the fuel supply chamber to the aspirating tube, passages communicating with the upper portion of the fuel supply chamber and the air inlet chamber, additional passages connecting the upper portion of the fuel supply chamber directly with the mixing chamber, and a fuel-air mixture outlet communicating with said mixing chamber.

6. A carburetor comprising a fuel supply chamber, an air inlet chamber adjacent said fuel supply chamber, a mixing chamber communicating with said air inlet chamber, an aspirating tube communicating at one end with said fuel supply chamber and discharging at the other end into said mixing chamber, the aspirating tube having an opening into the air inlet chamber, a flap valve between said air inlet chamber and said mixing chamber, a needle valve controlling the entry of fuel from the fuel supply chamber to the aspirating tube, passages communicating with the upper portion of the fuel supply chamber and the air inlet chamber, additional passages connecting the upper portion of the fuel supply chamber directly with the mixing chamber, and a fuel-air mixture outlet communicating with said mixing chamber.

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