Oct. 18, 1932. H. W. ASIRE 1,882,725

CARBURETOR

Filed April 23. 1928

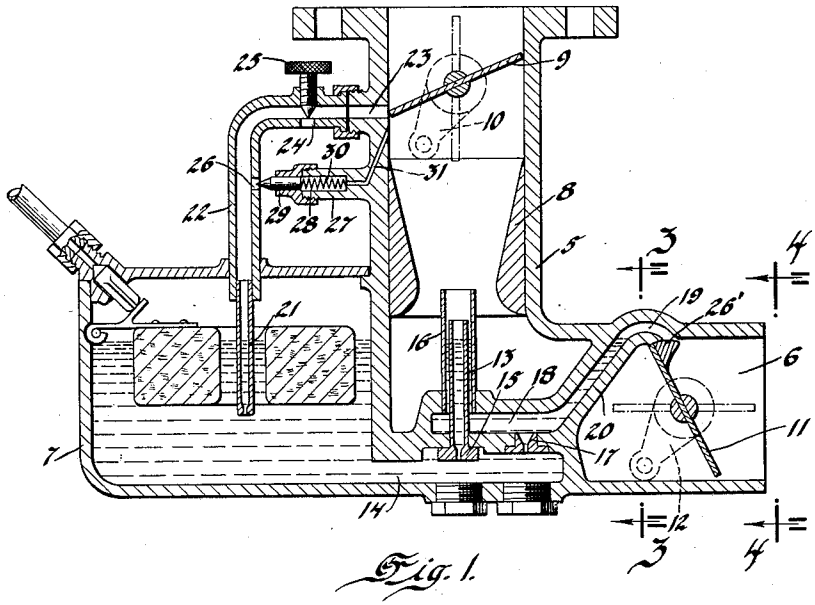


Fig. 1.

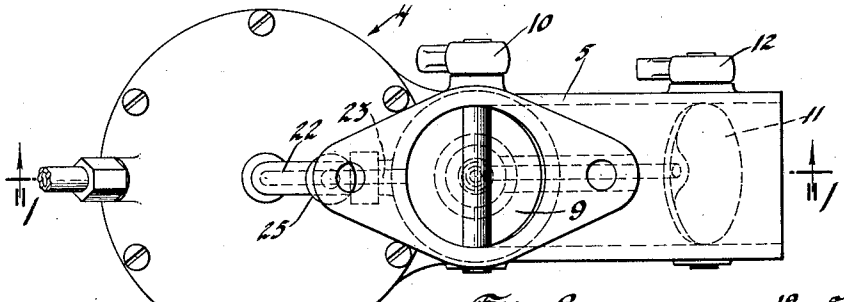


Fig. 2

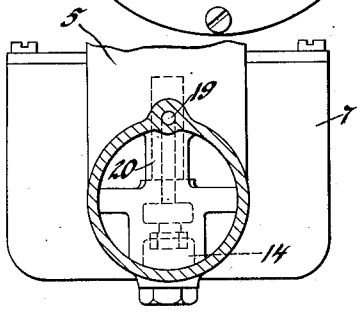


Fig. 3.

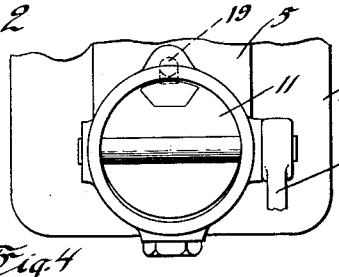


Fig. 4

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UNITED STATES PATENT OFFICE

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CARBURETOR

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Carburetors of the type to which this invention has particular reference ordinarily include a body having therethrough a main air passage, and main and compensating nozzles, the latter of which draws its supply of fuel from an atmospheric well, extending into, and adapted to discharge fuel into, the main air passage. There is also ordinarily provided in such carburetors an idle jet which extends into, and is adapted to withdraw fuel from, the atmospheric well, and through which fuel is adapted to be supplied to the main air passage when the engine is operating under idle conditions, 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 nozzle thus diluting the fuel mixture therein. Furthermore the idle jet has a tendency to drain the atmospheric well and thereby make it impossible for the compensating nozzle to supply the extra fuel needed during acceleration periods.

It is an object of this invention to provide a carburetor of the type described so constructed and arranged that, when the choke valve is closed to restrict the main air supply, the flow of air to the atmospheric well will be simultaneously restricted, whereby the volume of air flowing into the main air passage will be further decreased, and the volume of fuel flowing thereinto from the compensating jet increased, in order to further increase the richness of the combustible mixture when the engine is choked.

It is another object of the invention to provide a carburetor of the type described in which the idle jet is arranged to withdraw fuel directly from the float bowl so as to eliminate its tendency to drain the atmospheric well, and, further, to provide means whereby the idle jet is prevented from functioning when the engine is operating at speeds above idle so as to prevent unduly enriching the mixture during this period.

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

Figure 1 is a longitudinal section, on the line 1—1 of Figure 2, through a carburetor in which is embodied my invention.

Figure 2 is a top plan view of the carburetor shown in Figure 1.

Figure 3 is a section on the line 3—3 of Figure 1.

Figure 4 is a view on the line 4—4 of Figure 1.

Referring to the drawing, the reference character 4 indicates my improved carburetor which includes a hollow, open-ended, elbow-shaped body 5, having therethrough a main air passage 6, and a float bowl or main fuel reservoir 7. There is provided in the main air passage, 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, 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 air passage and which is adapted to be supplied with fuel from the float bowl through the passage 14 and the jet 15. Surrounding a portion of the main nozzle and circumferentially spaced therefrom is the compensating nozzle 16 which is adapted to be supplied with fuel from the float bowl through the passage 14, the jet 17, and the well or auxiliary fuel reservoir 18.

In the upper wall of the horizontal portion of the body of the carburetor, there is provided a curved passage 19 which opens at its forward end into the main air passage at a point slightly inward of the shaft on which the choke valve 11 is mounted and at its rear end into one end of a conduit 20. At its opposite end the conduit 20 opens into the well 18, extending intermediate its ends through the main air passage. The passage

19 and the conduit 20, through which air may be admitted to the well 18, constitute the primary air passage of the carburetor, while the main air passage 6 may be considered as a secondary air passage.

The idle jet 21 is positioned in the float bowl 7 with its lower end positioned below the fuel level thereof and communicates at its upper end with a conduit 22, whose lower end extends through the upper wall of the float bowl. At its upper end, the conduit 22 communicates with a passage 23 which opens into the main air passage at a point above the venturi. In the conduit 22, adjacent the passage 23, there is provided an opening 24 which leads to the atmosphere and through which air may be admitted to the conduit, and a screw 25 for controlling the admission of air to the conduit.

In starting the engine, I have found, in order to get a maximum supply of very rich combustible mixture, that, in addition to restricting the secondary air entrance by means of the choke valve 11, it is 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 16, 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 secondary air entrance, I have provided on the choke valve 11 a projection 26′ which is adapted, when the choke valve is closed to restrict the flow of air through the main air passage, to restrict the primary air entrance to limit the volume of primary air passing therethrough.

When the engine is running under idle conditions, the manifold suction applied to the passage 23 draws fuel directly from the float bowl, through the jet 21, the conduit 22, and the passage 23, into the main air passage where it mixes with the air flowing therethrough and passes therewith into the cylinders of the engine. When the throttle 9 is opened wider, the flow of fuel from the main and compensating jets becomes sufficient to supply the needs of the engine. To prevent the combustible mixture supplied to the cylinders of the engine becoming unduly enriched under these conditions, I provide means whereby the idle jet is put out of action when the throttle has been opened sufficiently that the fuel supplied by the main and compensating nozzles is sufficient for the needs of the engine. This means includes an opening 26, in an intermediate portion of the wall of the conduit 22, and a boss 27 on the body of the carburetor opposite the opening 26. There is provided in the boss 27 a bore 28 in which is located a pin 29 urged, by a spring 30, toward the opening 26 in which it is adapted to seat to close the opening, and a small passage 31 opening at its opposite ends into the bore 28 and into the main air passage at a point above the venturi.

When the throttle has been opened to such an extent that the vacuum applied to the passage 31 becomes sufficiently strong to overcome the pressure of the spring 30, the pin 29 will be withdrawn from its seat in the opening 26 through which air will then be admitted to the conduit 22. When this occurs, the vacuum applied to the idle jet 21 is reduced so much that it becomes insufficient to raise fuel from the float bowl to the level of the passage 23 and the idle jet ceases functioning.

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 limited only by the appended claims.

I claim:

1. In carbureting apparatus, a main fuel reservoir, a main air passage, a fuel nozzle projecting into the main air passage, and adapted to receive fuel from said main reservoir, a second nozzle projecting into the main air passage, an auxiliary fuel reservoir adapted to be supplied with fuel from the main fuel reservoir and from which the second nozzle is adapted to withdraw fuel, a passage through which air may be admitted to the auxiliary fuel reservoir, means to control the admission of air into the main air passage, and means operable upon movement of the first mentioned means to control the admission of air into the auxiliary fuel reservoir.

2. In carbureting apparatus, a main fuel reservoir, a main air passage, a fuel nozzle adapted to receive fuel from said main reservoir and discharge it into said main air passage, second nozzle projecting into said main air passage, an auxiliary fuel reservoir adapted to be supplied with fuel from said main reservoir and from which said second nozzle is adapted to withdraw fuel, a primary passage through which air may be admitted to said auxiliary reservoir, means to control the admission of air into said main air passage, and means operable upon movement of the first mentioned means to control the effective area of said primary passage.

3. In a carburetor, a fuel reservoir, a well adapted to receive fuel from said reservoir, a main air passage, a nozzle adapted to discharge fuel from said well into said main air passage, a primary air passage having its intake end opening in said main air passage and leading to said well, means adapted to restrict the admission of air into said main air passage, and means operable on the re-

stricting movement of the first-mentioned means to restrict the flow of air through said primary air passage.

4. A carburetor comprising a fuel reservoir, a well adapted to receive fuel from said reservoir, a main air passage, a nozzle adapted to discharge fuel from said well into said main air passage, a primary air passage having its intake end opening into said main air passage and leading to said well, and means in said main air passage adapted to restrict the admission of air thereinto, said means being also adapted to restrict the intake opening of said primary air passage.

5. In a carburetor, a fuel reservoir, a well adapted to receive fuel from said reservoir, a main air passage, a nozzle adapted to discharge fuel from said well into said main air passage, a primary air passage connecting said well with the atmosphere, and a single choke valve adapted to control the flow of air through said main and primary air passages.

6. In a carburetor, a main air passage, a primary air passage having its intake end opening into said main air passage, a valve in said main air passage adapted to control the area thereof, and means on said valve adapted to close the intake opening of said primary air passage during the final closing movements of said valve.

7. In a carburetor, a main air passage, an air passage having its intake end opening into said main air passage, a valve adapted to restrict the intake of air through one of said passages, and means on said valve adapted to restrict the area of the other passage during the closing movement of the valve.

8. In a carbureting apparatus, a fuel reservoir, a choke valve, a main air passage, a well, an air passage for said well controlled by the choke valve, a fuel passage leading from said reservoir to said well, a nozzle extending from said fuel passage into said main air passage, a second nozzle extending from said well into said main air passage, and a second fuel passage leading directly from said reservoir to said main air passage.

9. A carburetor comprising a fuel reservoir, a well adapted to receive fuel from said reservoir, a main air passage, a nozzle extending from said well into said main air passage, a primary air passage communicating with said well for admitting air thereto, a valve in said main air passage adapted to restrict the passage of air through both of said air passages, and a passage directly connecting said fuel reservoir and said main air passage for supplying fuel thereto independently of said well.

10. In a carburetor, a fuel reservoir, a main air passage, a well adapted to receive fuel from said reservoir, a nozzle adapted to discharge fuel from said well into said main air passage, a throttle on the engine side of said nozzle, a fuel passage leading directly from said reservoir to said main air passage at the engine side of said throttle, and means controlled by the pressure in said main air passage, at the nozzle side of said throttle, for automatically preventing the flow of fuel through said fuel passage under certain operating conditions.

11. In a carburetor having an air passage, a nozzle adapted to discharge fuel thereinto, a throttle on the engine side of said nozzle, and a fuel passage having an outlet in said air passage near said throttle, means for automatically controlling said fuel passage, said means comprising a vent in said fuel passage, a valve controlling said vent, and means for operating said valve controlled by the pressure in said air passage on the nozzle side of the closed throttle position.

12. In a carburetor having a throttle in an air passage and a fuel passage discharging into the air passage at the engine side of the throttle, means for automatically controlling the discharge of fuel from said fuel passage, said means comprising a vent in said fuel passage, a suction-operated valve controlling said vent, and a passage providing suction communication to said valve from said air passage anteriorly of the closed throttle position.

13. In a carburetor having a throttle in an air passage and a fuel passage discharging into the air passage at the engine side of the throttle, means for automatically controlling the discharge of fuel from said fuel passage, said means comprising a vent in said fuel passage, a suction-operated valve controlling said vent and a passage providing suction communication to said valve from a point in said air passage such that the throttle sweeps thereby in its opening and closing movements.

In testimony whereof I affix my signature.

HORACE W. ASIRE.