Oct. 31, 1933. W. E. BENJAMIN ET AL 1,932,764

CARBURETOR

Filed Dec. 20, 1930

FIG. 1

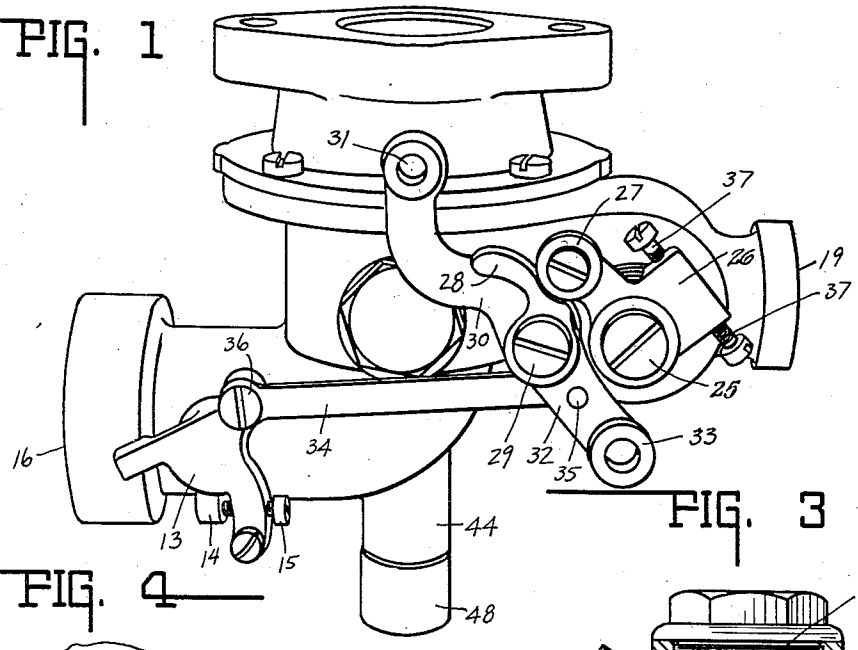


FIG. 3

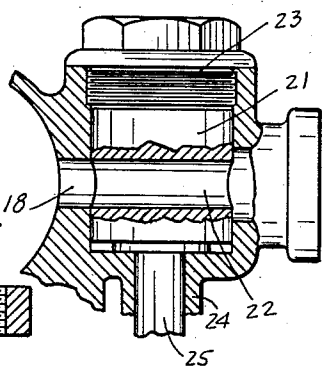


FIG. 4

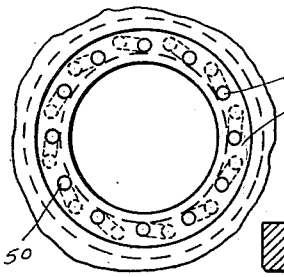
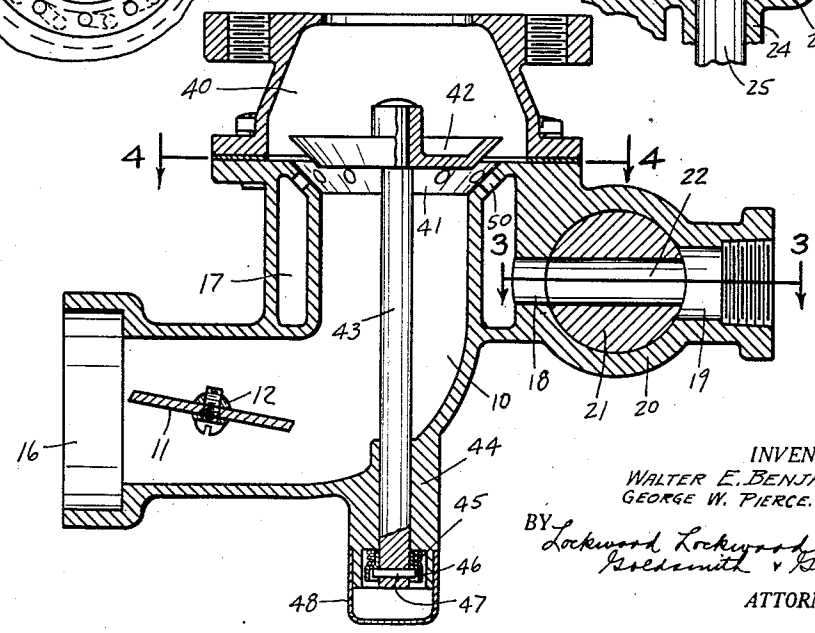


FIG. 2



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CARBURETOR

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Serial No. 503,650

6 Claims. (Cl. 261—50)

This invention relates to a suction type metering carburetor.

The chief object of this invention is to provide a suction type carburetor, wherein the amount of fuel supplied may be readily controlled and wherein substantially uniform vaporization of the fuel is obtained.

One feature of the invention consists in the particular cam control whereby the proportion of the fuel and air may be definitely metered for different velocities of the air.

Another feature of the invention consists in the suction operable valve in association with the swirling directional discharge of the liquid fuel into a swirling or mixing chamber immediately preliminary to discharge into the intake of the internal combustion engine.

The full nature of the invention will be understood from the accompanying drawing and the following description and claims:—

In the drawing, Fig. 1 is a perspective view substantially in side elevation of a carburetor, including the controls therefor.

Fig. 2 is a vertical sectional view through the same at full throttle opening.

Fig. 3 is a transverse sectional view taken on line 3—3 of Fig. 2, and in the direction of the arrows.

Fig. 4 is a top plan view of the valve seat taken in the plane of 4—4 of Fig. 2, and in the direction of the arrows.

In the drawing, 10 indicates an elbow passage constituting the air intake, the same being controlled by the butterfly valve 11 carried by shaft 12, which extends through the passage and mounts upon one exposed end an L-shaped lever 13 which, through the top 14 and adjusting screw 15, regulates the idling adjustment of the carburetor. The air intake end of the elbow passage is indicated by the numeral 16, and it is so arranged that it may receive an air cleaner, air preheater device or the like.

Peripherally enveloping the elbow portion of the passage 10 is a fuel supply chamber 17. Chamber 17 communicates with a supply passage 18 that terminates in an enlargement 19. Between the passage 18 and the enlargement 19 is a circular portion 20 which mounts a cylindrical valve 21, having the passage 22 extending therethrough.

The valve 21, see Fig. 3, is retained in position by the cap 23 and extending through the opening 24 transverse to the passage 18 is the valve stem 25. Stem 25 upon its projecting end, see Fig. 1 supports a bell crank lever 26 and the lever supports a roller 27 that rolls upon cam 28 pivotally supported at 29. Cam 28 and shaft 29 rock with the lever 30 that terminates in a connecting portion 31 by which the usual hand throttle control is associated with the carburetor.

An extension 32 of lever 30 terminates in a similar connection 33, by which a governor may be associated with a carburetor. A link 34 is connected to the extension 32 of lever 30 as at 35 and to the lever 13 of the butterfly or throttle valve 11, as at 36.

The bell crank 26 is adjustably secured upon the stem 25. Thus, when the throttle rod is moved, the butterfly valve 11 or throttle valve is also adjusted and at the same time, the fuel is metered by means of the valve 21 through the passage 22. The mechanism 37 constitutes the mixture adjustment. The shape of the cam 28 is important and varies the mixture for different throttle positions.

The intake passage 10 communicates with the mixing chamber 40 and herein said communication is obtained through a conical enlargement 41. Said conical enlargement of passage 10 forms a conical valve seat for a conical valve 42 carried by stem 43. Stem 43 is slidably mounted in the bearing 44 and is yieldingly retracted or constrained toward closed or seated position by the coil spring 45 concentric with the sleeve 46 carried by the stem 43 through the instrumentality of the key 47. A press fitted cap 48 protects the aforesaid construction from accumulating the oil, grease, dust, dirt and the like, and permits the valve to be opened by the suction of the engine and held open thereby in opposition to spring 45. Whenever suction decreases, the valve closes.

Extending upwardly and inwardly toward the valve stem, are a plurality of passages 50 which communicate at their inner ends with the chamber 17 and discharge into the mixing chamber 40. As shown clearly in Fig. 4, these passages are peripherally arranged about the valve seat and are closed by the valve and are directed at an angle to the several radial planes, including the valve axis and the outlet or opening end of each of the passages 50. Thus, the fuel is discharged at an angle and toward the valve stem and inwardly and upwardly and thus, a swirling action is obtained also. The valve, which is shown in its full open position in Fig. 2, serves as a deflector which directs the incoming fuel stream and also the air outwardly toward the side of the mixing chamber 40. The mixing chamber 40 is flared inwardly so that intimate mixture or substantially

perfect vaporization or carburization is obtained by the aforesaid construction.

The invention claimed is:—

1. A carburetor including a body having an air intake passage, a mixing chamber communicating therewith, and detachably secured to the body, an outwardly flared valve seat forming said communication, and exposed when detached, a fuel supply chamber peripherally enveloping the passage, a plurality of fuel supply passages extending inwardly and upwardly from the supply chamber and angularly of radial planes including the valve axis and terminating at the seat, a suction operable tapered valve arranged to simultaneously seal all the passages, a fuel supply passage to the fuel supply chamber, and valve means controlling the last mentioned fuel supply passage.

2. A carburetor including a body having an air intake passage, a mixing chamber communicating therewith, an outwardly flared valve seat forming said communication, a fuel supply chamber peripherally enveloping the passage, a plurality of fuel supply passages extending inwardly and upwardly from the supply chamber and angularly of radial planes including the valve axis and terminating at the seat, a suction operable tapered valve arranged to simultaneously seal all the passages, a fuel supply passage to the fuel supply chamber, valve means controlling the last mentioned fuel supply passage, a second valve in the air passage, and control means for simultaneously controlling the second valve and valve means, said control means including a cam connection for automatically varying the air and fuel ratio in accordance with the position of said control means.

3. A carburetor including a body having an air intake passage, a mixing chamber communicating therewith, and detachably secured to the body, an outwardly flared valve seat forming said communication, and exposed when detached, a fuel supply chamber peripherally enveloping the passage, a plurality of fuel supply passages extending inwardly and upwardly from the supply chamber and angularly of radial planes including the valve axis and terminating at the seat, a suction operable tapered valve arranged to simultaneously seal all the passages, a fuel supply passage to the fuel supply chamber, valve means controlling the last mentioned fuel supply passage, a second valve in the air passage, and control means for simultaneously controlling the second valve and valve means, said control means including a cam connection for automatically varying the air and fuel ratio in accordance with the position of said control means.

4. In a carburetor, the combination of an air passage, a valve therefor, a fuel passage, a valve therefor, a mixing chamber into which both passages discharge, a suction operable valve controlling the discharge into the chamber, and means operatively connecting both first and second mentioned valves for conjoint operation, said connecting means including a cam and follower connection for automatically varying the fuel to air ratio for different positions of said means and in accordance with the cam.

5. In a carburetor, the combination of an air passage, a valve therefor, a fuel passage, a valve therefor, a lever for each valve, a third lever adapted for manual and governor operation, and independent means connecting each valve operating lever to the third lever for conjoint operation, one of said independent means including an automatically variable connection for automatically varying the fuel to air ratio for different positions of the third lever.

6. In a carburetor, the combination of an air passage, a valve therefor, a fuel passage, a valve therefor, a lever for each valve, a third lever, and independent means connecting each valve operating lever to the third lever for conjoint operation, one of said independent means including an automatically variable connection for automatically varying the fuel to air ratio for different positions of the third lever.

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