

Feb. 17, 1948.

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2,436,319

CARBURETOR

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2 Sheets-Sheet 1

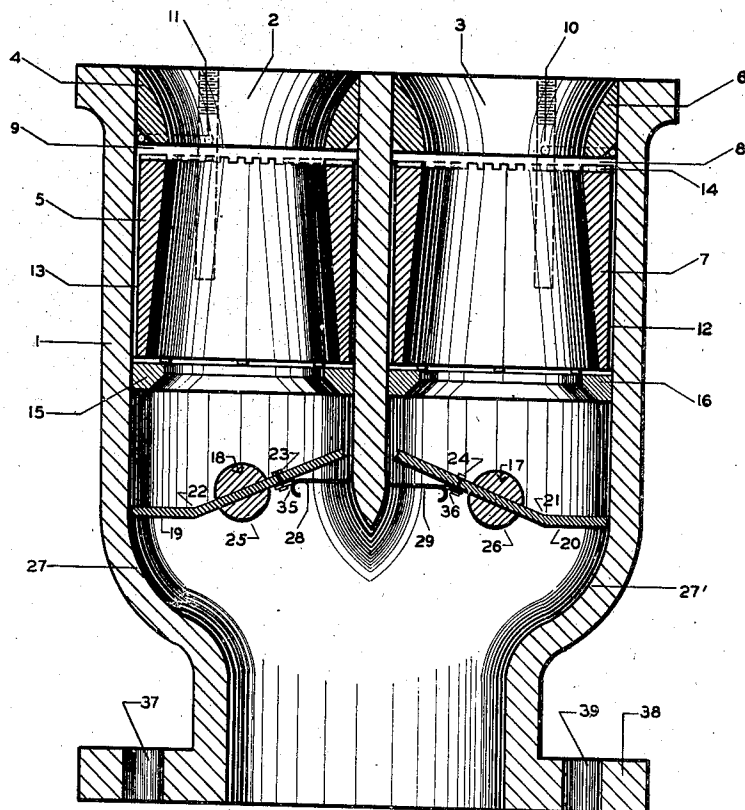


FIG. 1

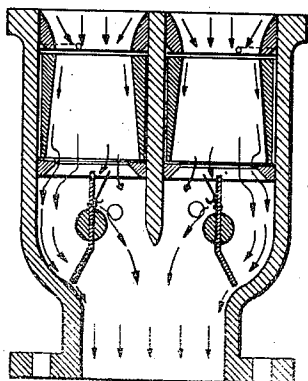


FIG. 2

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2 Sheets-Sheet 2

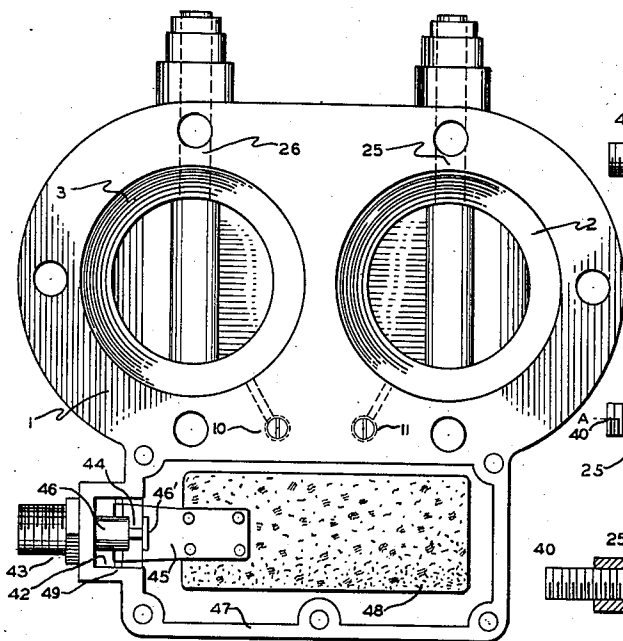


FIG. 3

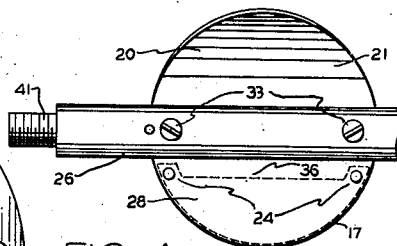


FIG. 4

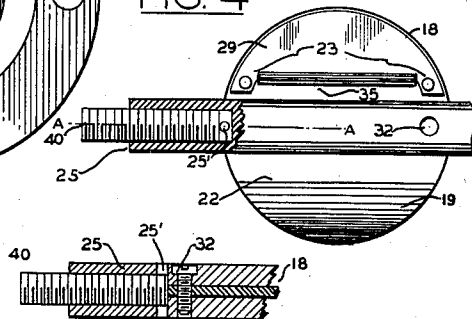


FIG. 5

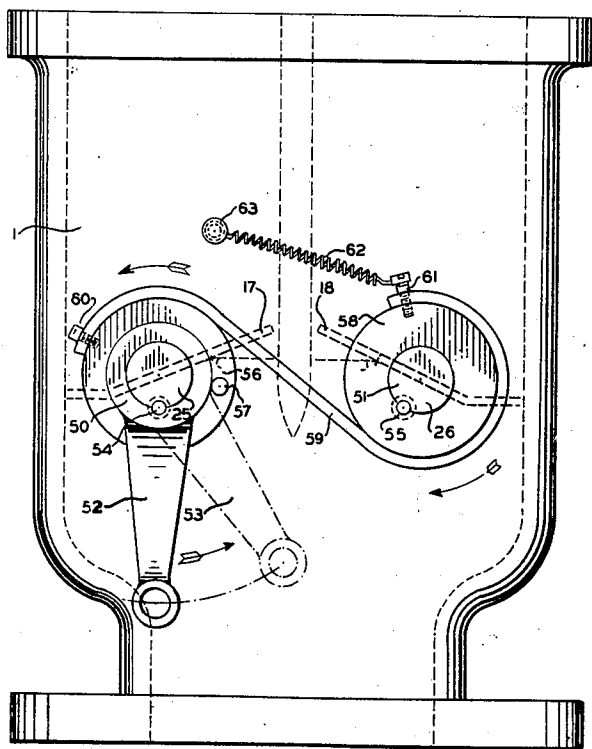


FIG. 7

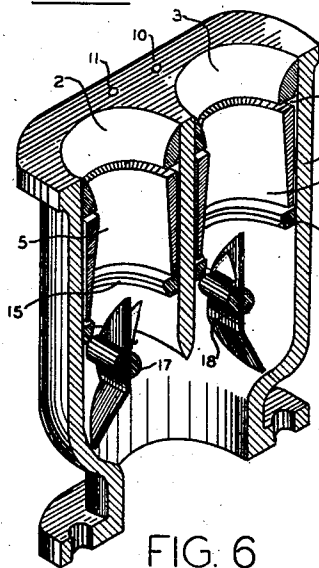


FIG. 6

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CARBURETOR

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6 Claims. (Cl. 261-41)

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This invention relates to carburetors, and to correlated inventions and discoveries appertaining thereto.

An object of the invention is the provision of means to vaporize gasoline more rapidly and more completely than is achieved by existing types of carburetors.

A more specific object of the invention is the provision of means to obtain a fine dry mixture which is comparatively free from wet gasoline, in order to reduce motor vibration.

A further object of the invention is the provision of a carburetor which is simple in construction and certain in operation and one wherein it is possible to obtain the most economical mixture consistent with the required performance.

Another of the more specific objects of the invention is the provision of means for supplying gasoline to the carburetor which will function regardless of the position of the carburetor or motor, so as to assure effective motor performance in an airplane for example.

Other objects of this invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of this invention in practice.

It is to be understood that the invention contemplates a carburetor having an improved arrangement of fuel passages and/or turbulating means whereas the drawings illustrate certain of the more specific aspects thereof.

The preferred embodiment of the carburetor which has been chosen for purposes of illustration and description, forming a part of the specification and in which the same reference characters designate the same or like parts, is disclosed in the accompanying drawings, wherein:

Fig. 1 is a sectional view taken vertically through the carburetor and reveals the throttles in their closed position;

Fig. 2 is also a sectional view on a smaller scale and it discloses the throttles in their full open position with arrows indicating the air and gas flow. Turbulation is also indicated;

Fig. 3 is a plan view of the carburetor in conjunction with a float chamber;

Fig. 4 comprises two views showing the throttle discs in plan, with a portion of one shaft in section;

Fig. 5 is a fragmentary sectional view on the line A-A of Fig. 4;

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Fig. 6 is an isometric sectional view taken vertically through the carburetor;

Fig. 7 is a front elevation of the carburetor in conjunction with a delayed motion mechanism for throttling and acceleration.

In the exemplified carburetor there is provided a carburetor body 1, which may be formed of cast iron, brass, or other suitable material. Securely attached within the carburetor body are the Venturi tubes 2 and 3, preferably of cast aluminum and consisting of upper members 4 and 6 and lower members 5 and 7 spaced within the carburetor body 1 to form grooves or crevices 8 and 9. These grooves are for the express purpose of distributing gasoline at the periphery of the Venturi air stream. Conventional metering jets are provided and are indicated at 10 and 11. These jets are mounted in drilled and tapped holes in the carburetor body casting and are used as conduits to deliver gasoline to grooves 8 and 9.

The upper surface of the lower Venturi members 5 and 7 are serrated to form a series of narrow grooves indicated at 14. These grooves are especially adapted for fast evaporation of the liquid gasoline. The provision of serrations serves to increase the evaporation area. In actual practice the fluid will form a thin film which is exposed to the periphery of the air current. This greatly increases the absorption area and assures better vaporization. Evaporation will thus take place more readily than with the conventional solid jet and needle valve control. It will be readily seen that gasoline spread over a wide surface will evaporate in a fraction of the time taken by a solid drop on a single point. A solid drop of gasoline must first be broken into fine particles, atomized and then be converted into vapor before it becomes an explosive gas.

An additional feature is incorporated in the lower Venturi members 5 and 7 and comprises tubular ducts 12 and 13 formed by spacing the outer carburetor body 1 from the lower Venturi members. Directly below the Venturi members and securely mounted within the carburetor body are beveled cornice rings 15 and 16. These rings, preferably of metal, are especially adapted to vaporize from their upper surfaces unvaporized gasoline flowing down the tubes 12 or 13 or down the inner surfaces of the members 5 and 7. When there is a strong air flow practically all the gasoline will flow thru 8 or 9, and little, if any, thru 12 and 13, but when the flow is weak, gasoline which would otherwise not be vaporized, will flow to the cornice ring and be vaporized there.

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The butterfly throttle valves 17 and 18 are especially adapted to turbulate the flowing air stream and to vaporize any gasoline which is still in a "wet" condition as it comes from the venturi. These valves comprise plates 19 and 20 one side of which is bent as shown at 21 and 22 or otherwise constructed to move as the valves are rotated by their shafts 25 and 26, at a slight distance from the curved surface of the carburetor body wall indicated at 27 and 27' of Fig. 1. The space between the gradually opening throttle discs and the carburetor body wall is utilized to create additional turbulence of the gas flow and also to evaporate any unused portions of liquid fuel reaching this stage of the carburetor.

In addition, the throttle valves carry special deflector members 28 and 29 consisting of relatively thin semi-circular sheets of metal riveted to the throttle discs at 23 and 24. These deflectors form pockets having inlet orifices which serve to catch the air stream and cause it to flow through narrow vents at 35 and 36 when the throttles have reached their open position as illustrated in Fig. 2. This creates additional turbulence for providing a fine mixture and serves to vaporize wet gasoline reaching or condensing on the interior of the shafts. An adjustable opening 25' controlled by a threaded pin or screw 40 is formed through the shaft 25 and likewise on shaft 26 to enable air to pass through the throttle valve when closed to idle position.

The base of the carburetor is provided with a conventional flange 30 drilled as indicated at 37 and 39 for attachment to an intake manifold.

Fuel is delivered to the fuel chamber illustrated in Fig. 3 through a nipple 43 mounted through an opening formed in the end wall of the recess 42 and has its center portion threaded for connecting with a feed tube or pipe leading from a source of supply. The inner portion of the nipple forms a valve housing 46 having a valve seat formed therein for engagement by a needle valve 44. This needle valve extends from the valve housing and is engaged by an abutment plate 46' extending upwardly from the hinge strip 45 of the cork float 48. The hinge strip is pivoted around a hinge pin 49 mounted transversely through the recess and upon movement of the float upwardly the abutment plate forces the needle valve through the valve housing 46 thereby seating into the valve seat and closing the flow of fuel into the chamber. In consequence, an appropriate level of gasoline will be maintained in the fuel chamber at all times.

The fuel chamber may also be used floatless. Gasoline is pumped in one orifice from a conventional fuel pump and unused gasoline is returned from an opposite orifice back to the fuel tank. The gasoline is supplied to the venturi through the metering jets 10 and 11. Gasoline is maintained to a level above the two metering jets thereby supplying the carburetor regardless of its position.

An additional feature illustrated by Fig. 7 comprises a mechanism for delaying the opening of the second throttle valve on shaft 26 at a predetermined interval after the initial opening of the throttle valve on shaft 25. The throttle lever 52 is mounted on shaft 25 and locked in position by set screw 54. Securely mounted on shaft 25 is the collar 56 having a contact pin 57 projecting from its face for engagement by throttle lever 52. Attached to the circumference of collar 56 by set screw 50 is a flexible ribbon 59 of wire mesh or other suitable material. This ribbon is par-

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tially carried around the collar and traverses to collar 58 on shaft 26 where it is rigidly fastened by set screw 61. A set screw 55 is used for fastening collar 58 on its shaft. A spring 62 held by fastening screw 63 maintains a steady tension. This tension is for the express purpose of holding the right hand throttle on shaft 26 normally in closed position until its collar is caused to revolve in a clockwise direction by the flexible ribbon. Such movement will not take place until the throttle lever arm 52 has traversed sufficiently to reach the advanced position as indicated by dotted lines 53 thereby engaging contact pin 57 and causing collar 56 to turn in an anti-clockwise direction. The outstanding advantage of this feature is its provision of a second supply of power and added acceleration when required. Sometimes a motor does not develop sufficient vacuum during the initial starting period to supply both venturis properly. This can be overcome by delaying the opening of the second throttle valve as above described.

It will be appreciated that the invention in various of its aspects is adapted for use in carburetors having air passageways of a variety of cross-sectional configurations; and that while a divided air-flow carburetor is exemplified various of the aspects of the invention may be readily incorporated in a single tube device, and other variations may be made without departing from the spirit and scope of the invention, the extent of which is indicated by the appended claims.

Having thus described the invention, what is claimed is:

1. In a downdraft carburetor, a carburetor body member having a part for direct association with an internal combustion engine, dual, substantially cylindrical upper and lower Venturi elements spaced to form annular crevices for dispersing gasoline within said Venturi members, said lower Venturi elements having their upper wall surface serrated for increased gasoline dispersal, and an orifice discharging into a narrow duct extending lengthwise through said lower Venturi walls, metallic rings securely attached adjacent to the internal wall of said carburetor body directly beneath said lower Venturi members and caused to receive gasoline through said ducts from said annular crevices, a source of suction for producing dual air currents through said Venturi members, two substantially circular throttle discs for controlling said air currents, said throttle discs having a narrow segment and a relatively wide segment angularly disposed to each other and securely attached to a shaft rotatably mounted in said carburetor body wall, curved deflector plates rigidly fastened to but spaced from the undersurface of said throttle discs forming a curved trough for producing turbulence, and the lower extremity of said carburetor body member inwardly curved to produce, in cooperation with said throttle discs, additional turbulence of the air flow.

2. A carburetor comprising a body member having a passageway therethrough a venturi in said passageway, said venturi having an annular fuel feeding crevice surrounding said passageway, a fuel inlet in said body member communicating with said annular crevice, a rotatable throttle disk in said passageway, a shaft therefor, and turbulating means in said passageway, said means including a deflector segment carried by said throttle disk and forming a V-shaped pocket, said pocket having an inlet orifice movable to and from the direction of air flow in said venturi and

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a discharge vent pointed towards said throttle shaft whereby air-fuel mixture entering said inlet orifice will strike said shaft and form an eddy current as the mixture discharges from said V-shaped pocket.

3. A carburetor comprising a body member having a passageway therethrough, a venturi in said passageway, said venturi having an annular fuel feeding crevice surrounding said passageway, a fuel inlet in said body member communicating with said annular crevice, a cornice ring for feeding fuel in said passageway and positioned subjacent to said venturi, said cornice ring spaced from said venturi and forming a lateral passageway for fuel therebetween, a channel within said body member exterior of and surrounding said venturi, said channel communicating from said fuel feeding crevice to said lateral passageway whereby fuel may be conducted from said annular crevice to said cornice ring.

4. A carburetor comprising a body member having a passageway therethrough, a venturi in said passageway, said venturi having an annular fuel feeding crevice surrounding said passageway, said annular fuel feeding crevice on said venturi having its lowermost surface radially serrated to increase its fuel feeding area, a fuel inlet in said body member communicating with said annular crevice, a rotatable throttle disk in said passageway, a shaft therefor, and turbulating means in said passageway, said means including a deflector segment positioned in a plane parallel to the axis of rotation of said throttle disk and forming a V-shaped pocket thereon, said pocket having an inlet orifice movable to and from the direction of air flow in said venturi as the throttle disk is rotated with said shaft and a discharge orifice pointed towards said throttle shaft whereby air-fuel mixture entering said inlet vent will strike said shaft and form an eddy current as the mixture discharges from said V-shaped pocket.

5. A carburetor comprising a body member having a passageway therethrough, a venturi in said passageway, said venturi having an annular fuel feeding crevice surrounding said passageway, said annular fuel feeding crevice on said venturi having its lowermost surface radially serrated to increase its fuel feeding area, a fuel inlet in said body member communicating with said annular crevice, a cornice ring for fuel feeding subjacent to said venturi, said cornice ring spaced from said venturi and forming a lateral passageway for fuel therebetween, a channel exterior of said venturi communicating from said fuel feeding crevice to said lateral passageway whereby fuel may be conducted from said crevice to said cornice ring, a rotatable throttle disk in the passageway subjacent to said cornice ring, a shaft therefor, said rotatable throttle disk hav-

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ing an edge portion at one side of the shaft bent upwardly, turbulating means including a deflector segment carried by said throttle disk and forming a V-shaped pocket thereon, said pocket having an inlet orifice movable to and from the direction of air flow in said venturi as the throttle disk is rotated with said shaft and a discharge vent pointed towards said throttle shaft whereby air-fuel mixture entering said inlet orifice will strike said shaft and form an eddy current as the mixture discharges from said V-shaped pocket, and the entire lower extremity of said body member converging inwardly in a substantially semi-spherical conformation and forming, in cooperation with said throttle disk, additional turbulation of said air-fuel mixture.

6. A carburetor comprising a body member having dual passageways therethrough, a venturi in each passageway, said venturis having annular fuel feeding crevices surrounding said passageways, a fuel inlet in said body member communicating with said annular crevices, a rotatable throttle disk in each passageway, individual throttle shafts therefor, and means to delay the opening of one of said throttle disks a predetermined interval after the other, said means including an arm fixedly secured to one of said shafts, a collar loosely held on the aforesaid shaft, a collar fixedly held on the other of said shafts, a reverse wound flexible ribbon connecting said collars, spring means on said fixedly held collar for yieldingly resisting opening movement of said collar, a lug on said loosely held collar and spaced a predetermined distance from said fixed arm when said arm is in a closed position, said lug permitting the shaft thereof to be rotated said predetermined distance before said arm actuates the other rotatable shaft.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,129,864	Haas	Mar. 2, 1915
1,152,031	Lobdell	Aug. 31, 1915
1,392,473	Ball	Oct. 4, 1921
1,441,992	Meden	Jan. 9, 1923
1,771,530	Edwards	July 29, 1930
1,999,334	Mallory	Apr. 30, 1935
2,063,107	Mack	Dec. 8, 1936
2,103,689	Mullen	Dec. 28, 1937
2,133,757	Smith	Oct. 18, 1938
2,333,030	Meyer	Oct. 26, 1943

FOREIGN PATENTS

Number	Country	Date
508,215	Great Britain	June 28, 1939