Feb. 24, 1942. R. BURTON 2,274,587

CARBURETOR

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Fig. 1.

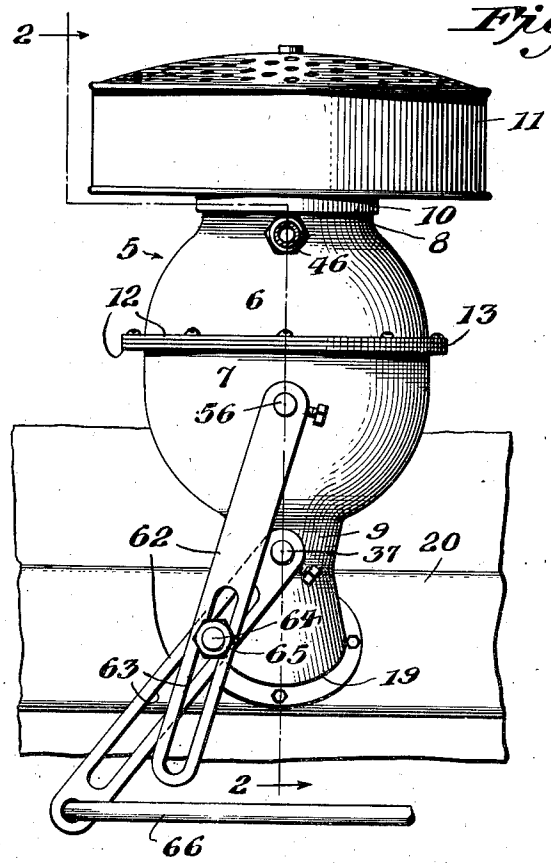
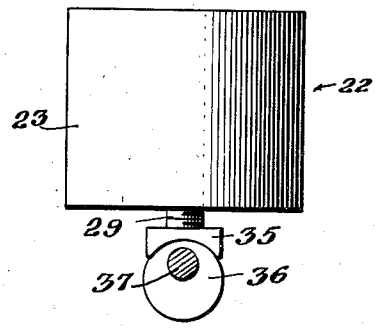


Fig. 3.



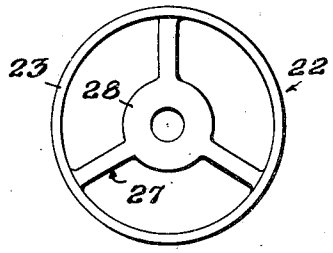


Fig. 4.

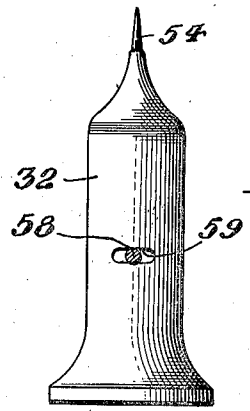


Fig. 5.

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Fig. 2.

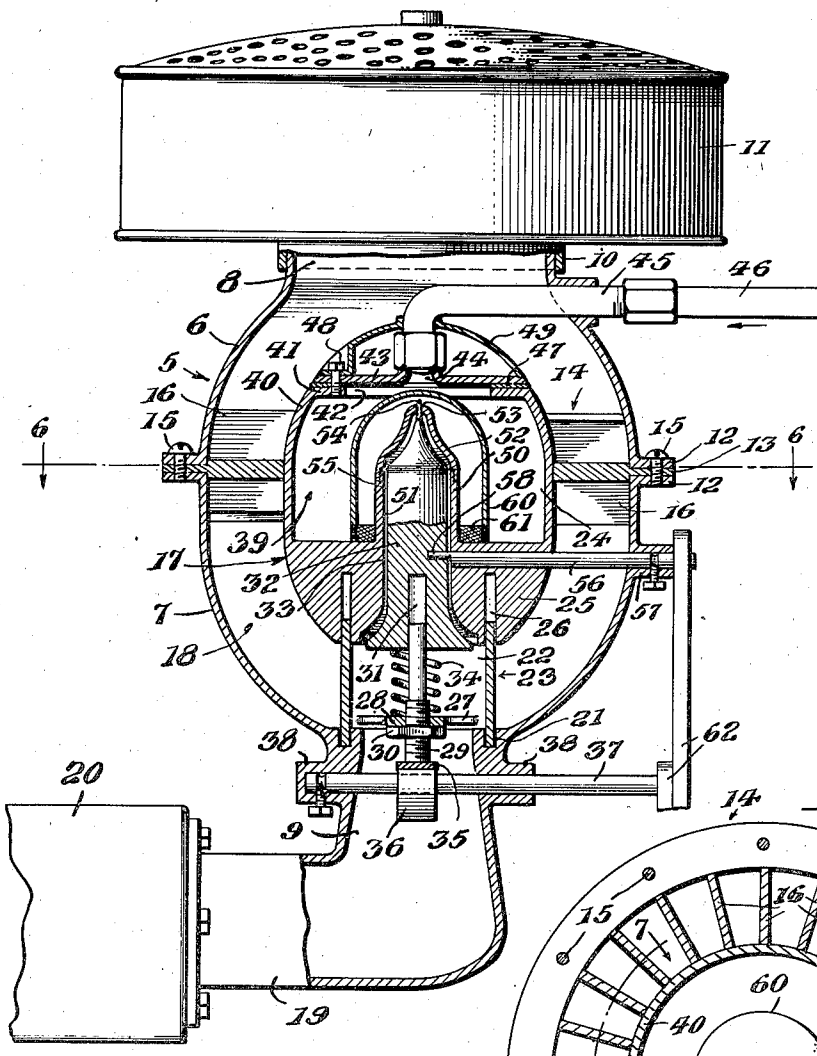


Fig. 6.

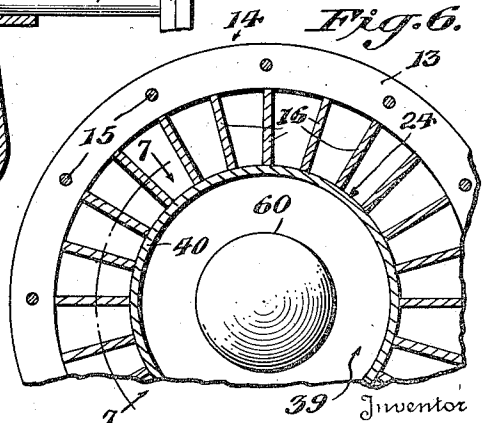
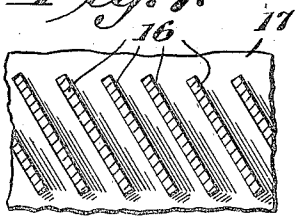


Fig. 7.



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UNITED STATES PATENT OFFICE

2,274,587

CARBURETOR

Roy Burton, Detroit, Mich.

Application December 3, 1940, Serial No. 368,380

1 Claim. (Cl. 261—50)

My invention relates to carburetors and has as one of the principal objects thereof the provision of a carburetor so constructed and arranged whereby the same may be disposed in any position with respect to the vertical and without resultant interference in its operation thereby admirably lending itself to utilization in connection with internal combustion engines of various vehicles, especially aircraft.

Another object of my invention is to provide a carburetor of the above described character which is constructed of a minimum number of parts, equipped with a single intake jet and means for maximizing the mixture of air with liquid fuel to effect increased safety, longer life, and more accurate regulation combined with fuel economy and instant starting of the engine.

A special object of my invention is to provide a carburetor of the above described character wherein the usual choke is eliminated and which is so constructed and arranged whereby the same may be applied to internal combustion engines already in use without modifying said engines.

An important object of my invention is to provide a device of the character described which is simple in construction, durable in use, efficient in operation and economical in manufacture.

Other objects and advantages will be apparent from the following description, appended claim and annexed drawings.

Referring to the drawings wherein like reference characters designate like parts throughout the several views:

Figure 1 is a side elevation of my invention and illustrating the same connected to the intake manifold of an internal combustion engine.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a side elevation of the valve member for controlling the air supply.

Figure 4 is a top plan view of the valve member.

Figure 5 is a side elevation of the plunger for controlling the liquid fuel.

Figure 6 is a sectional view taken on the line 6—6 of Figure 2.

Figure 7 is a detail sectional view taken on the line 7—7 of Figure 6.

In practising my invention, as illustrated in the drawings, I provide a casing 5 having upper and lower sections 6 and 7 respectively. The tubes of the upper and lower sections 6 and 7 constitute sleeves 8 and 9 respectively and with the sleeve 8 connected within a collar 10 communicating with an air filter 11 whereby air is supplied to the casing for a purpose hereinafter set forth. Inasmuch as the filter 11 is of an ordinary construction and forms no part of the present invention per se, a more detailed disclosure of the same is not believed warranted.

The sections 6 and 7 are fashioned at their opposed ends with outwardly disposed circumferential flanges 12 having interposed therebetween the edge 13 of a disk 14 secured between said flanges by bolts 15 with the latter connecting the flanges 12 and portion 13 together in sealed relation against leakage.

Adjacent the edge 13, the disk 14 is fashioned with a plurality of inclined spaced fins 16 having their inner edge faces welded to the outer peripheral face of a housing 17 extending centrally through the disk and supported by the latter in spaced relation with the casing. The housing coacts with the inner face of the casing to define an air chamber 18 surrounding said housing. The inclination of the fins 16 is such as to effect circumrotation of air propelled therebetween and introduced into the lower section of the air chamber from the filter 11 as hereinafter set forth. The lower end of the sleeve 9 is formed with a conduit 19 connecting the sleeve to the intake manifold 20 of an internal combustion engine (not shown). At the jointure of the upper end of the sleeve 9 with the section 7 of the casing 5, the sleeve is fashioned with the circumferential valve seat 21 for receiving therein the lower end of the skirt 22 of a valve member 23 to preclude communication between the chamber 18 and the sleeve 9.

The housing 17 comprises upper and lower sections 24 and 25 respectively and with the lower face of the lower section fashioned with a circumferential groove 26 slidably receiving the upper end of the skirt 22, thus, when said skirt is operated upwardly within the groove 26, as hereinafter set forth, the lower end of the skirt will be disposed above the valve seat 21 and permit communication between the chamber 18 and the sleeve 9 for a purpose hereinafter more fully described. At its lower end, the skirt 22 is interiorly provided with a spider 27 having a hub 28 through which is threaded the lower end of a rod 29, the latter being maintained in adjusted position in respect to the hub 28 by means of a lock nut 30. The upper end of the rod 29 is slidably disposed within a socket 31 formed in the under face of a plunger 32 slidably mounted within a bore 33 formed in the lower section 25 of the housing 17.

Seated on the hub 28 and sleeved about the rod 29 is a coil spring 34, engaging the underface of

the plunger 32 and normally urging the latter upwardly within the bore 33. The lower end of the rod is provided with a shoe 35 engaging the periphery of a cam 36 fixed on a shaft 37 extending transversely through the sleeve 9 and rotatably journaled in bearings 38 formed on the outer face of the sleeve 9. Obviously, rotation of the cam 36, by the shaft 37, serves to raise and lower the rod 29 and as a consequence effects a likewise operation of the skirt 22 whereby the passage of air into the sleeve 9 from the chamber 18 is controlled.

The upper section of the housing constitutes a liquid fuel chamber 39 defined by the lower section 25 and a circumferential side wall 40, the latter terminating, at its upper end, in an inwardly extending circumferential flange 41 defining a fuel opening 42 over which is disposed a closure plate 43. The closure plate 43 is provided with a centrally disposed nipple 44 threadedly connected to one end of a liquid fuel supply pipe 45 having its opposite end extending through one side of the upper section 6 of the casing 5 and connected to a pipe 46 leading to a liquid fuel supply source (not shown). A gasket 47 is interposed between the plate 43 and flange 41 and with the plate and gasket secured to the flange by bolts as at 48. Above the nipple 44, the pipe 45 has sleeved thereon the upper portion of a dome-shaped hood 49, the base of the latter being connected to the plate 43 by means of the bolts 48. The hood 49 serves to evenly direct the air into the chamber 18 from the air filter 11.

The lower section 25 of the housing is provided with a projection 50 extending upwardly into the liquid fuel chamber 39 of the upper section 24 of the housing. The projection 50 is provided with a bore 51 coaxial with the bore 33 and slidably receives the upper end section of the plunger 32. The upper end of the projection 50 has threaded thereon a nozzle 52 formed with a fuel intake opening 53 in its tip and which opening is controlled by a needle valve 54 fixed to the upper end of the plunger 32 slidably disposed within the nozzle 52. The diameter of the plunger is somewhat less than the diameters of the bores 33 and 51 and the inside diameter of the nozzle 52 whereby to provide a fuel passage 55 about said plunger and with said passage extending from the tip of the nozzle to the lower face of the lower section of the housing for communication with the interior of the skirt 22.

Rotatably mounted in one side of the lower section 25 of the housing is the inner end section of a transverse shaft 56, the outer end section of the latter extending through the adjacent side of the casing 5 and journaled in a bearing 57 formed on said casing. The inner end of the shaft 56 is provided with an eccentric pin 58 rotatably and slidably mounted in a transverse slot 59 formed in the side face of the plunger 32 as clearly illustrated in Figure 5 of the drawings. Obviously, rotation of the shaft 56 serves to raise and lower the plunger with respect to the nozzle and thus controls the fuel intake opening 53 as heretofore set forth.

Disposed over and about the nozzle is a substantially dome shaped shell 60 having its lower end supported above the upper face of the lower section 25 by means of a screen 61 for filtering liquid fuel passing into the shell 60 for introduction into the intake opening 53 in said nozzle.

The outer ends of the shafts 37 and 56 have fixed thereto the upper ends of a pair of relatively adjustable operating arms 62, said arms being provided with slots 63 receiving therethrough a bolt 64 provided with a nut 65 to maintain said arms in adjusted position with respect to each other. One of the arms has pivotally connected to its lower end an operating rod 66 for effecting operation of the shafts 37 and 56. Obviously, by adjusting the arms 62 in respect to each other the degree of rotation of one shaft may be varied with respect to the other.

In operation, the parts being in the positions illustrated in Figure 2, the rod 66 is actuated to effect operation of the shafts 37 and 56 through the medium of the arms 62. Operation of the shaft 56 serves to lower the plunger 32 with respect to the nozzle and as a consequence effects opening of the intake opening in the nozzle to permit liquid fuel, for instance, gasoline to be drawn therethrough into the passage 55 from the liquid fuel chamber 18, it being understood that the gasoline is introduced into the chamber 39 through the pipes 45 and 46. When the gasoline is thus introduced into the passage 55 the same is discharged within the upper section of the sleeve 9 through the skirt 22.

Simultaneously with the lowering of the plunger 32, the skirt 22 is raised out of the valve seat 21 through the medium of the cam 36 thereby permitting air from the chamber 18 to be introduced into the upper section of the sleeve 9 for mixture with the gasoline and said mixture drawn into the intake manifold 20 through the conduit 19. By rotatably adjusting the shafts 37 and 56 through the medium of the rods 62 the speed of the engine may be governed to meet the requirements of the operator.

From the foregoing, it will be apparent that I have provided a simple and efficient form of carburetor capable of being operated in various positions with respect to the vertical and which admirably lends itself to utilization in connection with internal combustion engines of various vehicles, especially aircraft.

Without further elaboration the foregoing will so fully explain the invention that others may, by applying current knowledge, readily adapt the same for use under various conditions of service. Moreover, it is not indispensable that all the features of the invention be used conjointly since they may be employed advantageously in various combinations and sub-combinations.

It is obvious that the invention is not confined to the herein described use therefor as it may be utilized for any purpose to which it is adaptable. It is therefore to be understood that the invention is not limited to the specific construction as illustrated and described as the same is only illustrative of the principles of operation, which are capable of extended application in various forms, and that the invention comprehends all construction within the scope of the appended claim.

What I claim is:

In a device of the character described, a casing formed at one end with a sleeve constituting a fuel mixing chamber adapted to be connected to the intake manifold of an engine and formed with a circumferential recess constituting a valve seat, a housing disposed within said casing in spaced relation with the inner face of said casing and coacting with said face to define an air chamber surrounding said housing and with said air chamber communicable with said mixing chamber, said housing provided at one end with liquid fuel supply means extending through said casing, a plurality of spaced inclined fins mounted

within said casing and fixed to said housing for supporting the latter within said casing and for rotating air propelled through said fins for introduction into said mixing chamber, said housing provided with a liquid fuel filtering chamber and a liquid fuel passage for effecting communication between said filtering chamber and said mixing chamber, a valve disposed in said passage for controlling the introduction of liquid fuel from said passage into said mixing chamber, filtering means disposed within said filtering chamber and interposed between said valve and liquid fuel supply means, said housing provided at the opposite end with a circumferential groove disposed in alignment with said valve seat, a valve assembly for controlling communication between said air chamber and said mixing chamber and comprising a cylindrical skirt having one end slidably mounted in said groove and the opposite end operable into and out of said valve seat, spring means connecting said skirt to said valve for urging said skirt and valve away from each other, and means connected between said valve and assembly for effecting unitary operation of said assembly and valve.

ROY BURTON.