Sept. 17, 1940. W. E. LEIBING 2,214,964

CARBURETOR

Filed Feb. 21, 1938 2 Sheets-Sheet 1

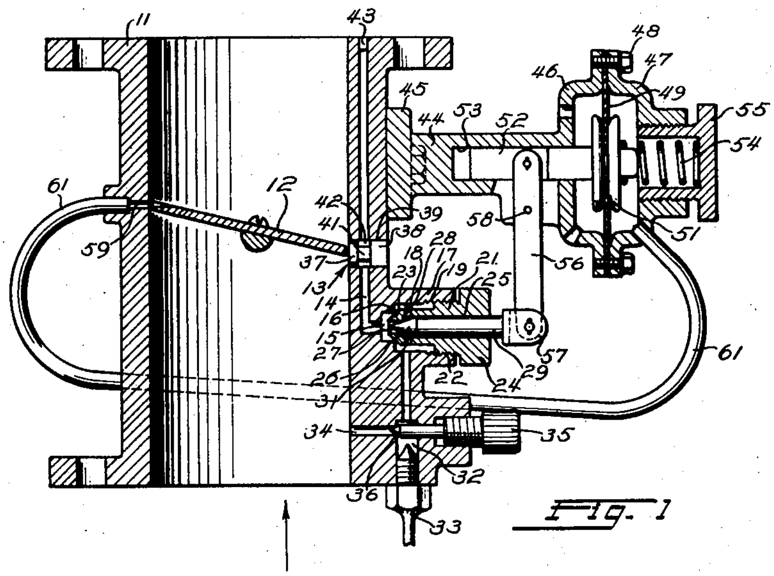


Fig. 1

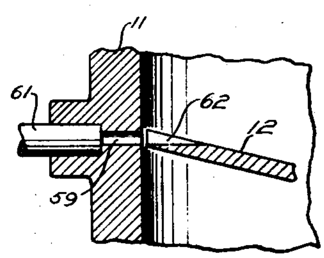


Fig. 2

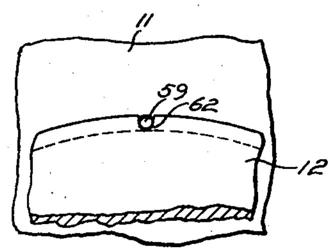


Fig. 3

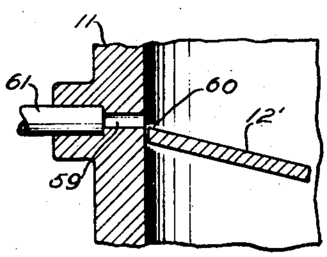


Fig. 4

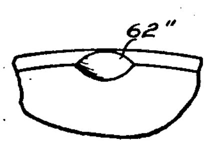


Fig. 5

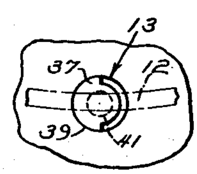


Fig. 6

Inventor

William E. Leibing

By Strauch & Hoffman

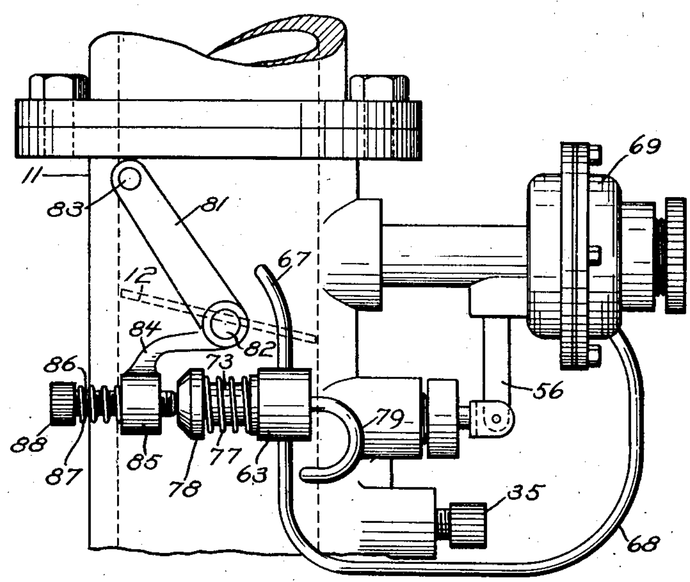
Attorneys

Sept. 17, 1940. W. E. LEIBING 2,214,964

CARBURETOR

Filed Feb. 21, 1938 2 Sheets-Sheet 2

Fig. 7



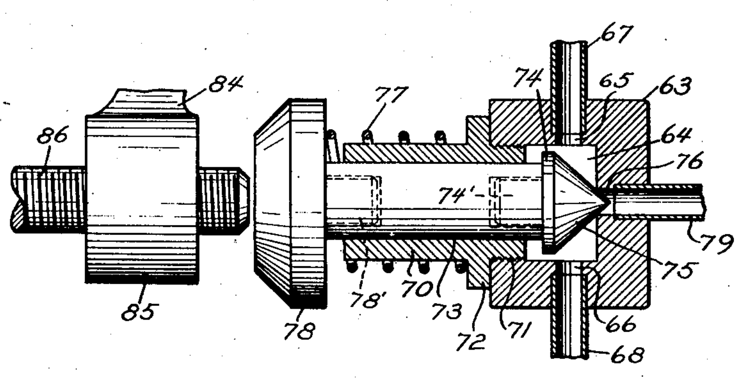


Fig. 8

Inventor

William E. Leibing

By Strauch + Hoffman

Attorneys

Patented Sept. 17, 1940 2,214,964

UNITED STATES PATENT OFFICE

2,214,964

CARBURETOR

William E. Leibing, Detroit, Mich.

Application February 21, 1938, Serial No. 191,783

1 Claim. (Cl. 261—41)

This invention relates to apparatus for supplying fuel to internal combustion engines and more particularly to novel apparatus for carbureting such engines.

This application is a continuation-in-part of my copending application Serial No. 109,607 filed November 6, 1936, patented Oct. 25, 1938, Pat. No. 2,134,667.

In carburetors in general use at present, while the engine is running at idling speed and at light loads, such as where the vehicle is travelling down hill with the engine driven by the wheels, fuel is fed through the idling jets to be mixed with air passing around the periphery of a closed pivoted or otherwise movable valve. This valve may be a throttle valve of suitable form or may be a combined throttle and governor valve.

The amount of fuel fed through the idling jet or jets is a function of the vacuum present in the intake manifold. The amount of fuel which passes through an idling jet is normally regulated by a suitable valve on the carburetor so that the right amount of fuel to keep the engine turning over properly at idling speed is sucked through the jet by the vacuum which exists in the intake manifold at such engine speeds.

When the vehicle operates, however, under such conditions as to create a greater vacuum in the manifold than during idling conditions, the increased vacuum will cause an increased flow of fuel through the idling jets. Such a condition of increased vacuum in the manifold exists when the throttle is in closed or substantially closed position and when the engine is being driven by the vehicle upon which it is mounted, as when decelerating or on a down grade. This condition of increased vacuum may also be created when the engine is running under light load on a slight down grade with the throttle partly open.

Under such conditions, with the throttle closed or substantially closed, a large amount of unburned fuel is discharged through the exhaust causing what is termed "gassing." So-called "degassers" have been designed to shut off the supply of fuel under these conditions. Despite the use of extensive mechanical expedients, pressure responsive device and other means, prior "degassers" have not proved satisfactory in practice because of their failure to respond quickly enough to changes in operating conditions of the engine. During acceleration prior "degassers" have not been sufficiently responsive to permit immediate resumption of fuel flow upon opening of the throttle after complete fuel cut-off. Consequently the engine does not pick up as quickly as it should. Also, during deceleration, prior "degassers" have been so slow or sluggish in action that a large quantity of fuel has been passed to the engine and discharged as unburned fuel before the fuel has been shut off.

Another problem arises when vacuum conditions greater than those existing during idling are present in the manifold during normal operation of the vehicle with the throttle open. Under such open throttle conditions, it is desirable and necessary for efficient engine performance to maintain a steady flow of fuel through the idling jet or jets. Prior art degassers which operate independently of the throttle position and must be set to operate at a critical vacuum which is below those caused during such normal open throttle operation interfere greatly with the operation of the engine.

To illustrate this point, a modern internal combustion engine idling at about 400 R. P. M. maintains a vacuum of 17–18 inches in the manifold. In order for a degasser to be sufficiently sensitive to prevent gassing in such a motor, it should be capable of permitting fuel to pass at 18 inches of vacuum and should operate to effect an entire cut-off of fuel at 19 inches. But when such an engine is running with open throttle under a light load at 900–1000 R. P. M., the manifold vacuum is about 20–21 inches and when the vehicle is on a slight down-grade and the engine is running with open throttle at 1300–1400 R. P. M., the manifold vacuum increases to 21–22 inches. Under these latter conditions, the degasses should not operate to shut off the flow of fuel.

To care for these conditions, prior degassers have been set to operate to shut off the fuel supply at 23–24 inches of vacuum. If such a prior degasser is set to operate at 19 inches in an attempt to gain the desired sensitivity, it will cut off the fuel supply during certain normal running conditions above specified. This is especially disadvantageous when the throttle is only slightly opened. It is thus evident that prior degassers do not distinguish between vacuums created at closed throttle position and vacuums created at open throttle position.

Some attempts have heretofore been made to provide degassers in which provision is made for distinguishing between manifold vacuums caused during deceleration and those caused during normal running operation of the engine. Such devices generally involve electrical controls operated by current from the generator. Besides being relatively expensive, these devices are oftentimes faulty and insensitive in operation because of varying generator voltages and faulty electrical contacts. Furthermore there is danger that sparking from such electrical contacts will ignite adjacent fuel vapors.

In overcoming the problem of gassing, it is a major object of my invention to provide a novel device capable of selecting between the operating vacuums and vacuums at which the fuel should be shut off wherein means is provided to insure instantaneous valving of the fuel to the engine when the engine changes its condition of operation, particularly from decelerating to idling or accelerating. More specifically my invention comprises a novel arrangement of an engine throttle and a connection to a "degasser" whereby the slightest movement of the throttle valve to and from a fully closed position effects operation of the "degasser" in accordance with the condition under which the engine is operating. My invention, through elimination of the sluggish action of prior "degassers," provides the final step between the prior art and a practical degassing operation.

A further major object of my invention is to provide a novel device for eliminating gassing which is operable to control the fuel supply only when the throttle valve is in closed or substantially closed position and is not operable even at higher vacuums than that at which degassing is desired as long as the throttle valve is in an open position. More specifically my invention comprises a novel arrangement of an engine throttle and a pressure responsive device for controlling the fuel supply wherein the pressure responsive device is effected by the vacuum in the engine manifold only when the throttle is in closed or substantially closed position.

A further object of my invention is to provide a novel device for eliminating gassing in an internal combustion engine which is operated by pressures in the intake manifold to control the fuel supply when the throttle valve is in substantially closed or idling position only, but which is rendered entirely inoperative upon the slightest movement of the throttle valve away from idling position regardless of the pressure existing in the intake manifold.

A further object of my invention is to provide a novel device for eliminating gassing which is responsive to engine manifold pressure but whose operation is not affected by changes in the idling speed of the engine.

It is still a further object of my invention to provide novel throttle and degassing means which may be added to existing carburetors with a minimum of alterations.

A further object of my invention is to provide a novel butterfly valve for use in existing carburetors. This valve is similar to a conventional butterfly valve but is modified at its periphery to insure trigger action of the degasser.

A further and important object of my invention is to provide a novel removable valve seat in the fuel supply line to the idling jet of a carburetor wherein the valve seat can be quickly detached for replacement and repair purposes.

Still a further object of my invention is to provide a sensitive degasser which is operated by a pre-determined vacuum in the intake manifold under predetermined throttle conditions and which positively acts to shut off the fuel supply to the idling jet, but yet has no fluid connection which will allow unburned fuel to be sucked into the degasser and thereby cause backfiring.

Further specific and more detailed objects will appear from the following description and the appended claim taken in connection with the accompanying drawings, where:

Figure 1 is a section of an updraft carburetor illustrating the combination of the degasser of my invention with a carburetor employing a throttle valve of the butterfly type.

Figure 2 is an enlarged fragmentary view, partly in section showing how the edge of the throttle valve is modified according to a preferred manner of practicing the invention to gain instantaneous operation of the degasser.

Figure 3 is an elevation of the edge of the valve of Figure 2 immediately adjacent the vacuum outlet leading to the degasser.

Figure 4 is an enlarged fragmentary view illustrating a further preferred form of the invention wherein the upper valve edge is disposed adjacent the lower edge of the degasser connection when the valve is in closed position.

Figure 5 is an elevation of the edge of a valve in which the valve edge is cut away adjacent the vacuum outlet as in Figure 3 but at the bottom surface of the valve according to another manner of practicing my invention.

Figure 6 is an end view of the idling jet outlet illustrating how the valve when in closed position leaves a portion of the idling jet open to atmosphere so that a proper mixture of air and fuel may be obtained.

Figure 7 is a side elevation of an embodiment of my invention wherein the degasser of Figure 1 is provided with a positively acting control for insuring resumption of the fuel flow upon the slightest movement of the throttle away from idling position.

Figure 8 is an enlarged fragmentary view, partly in section, of the positively acting control for the degasser.

In Figure 1 my invention is illustrated by way of example as applied to an updraft carburetor having a conduit 11 defining a passage adapted to be connected to the intake manifold of an internal combustion engine on a vehicle. Throttle valve 12 of the butterfly type is pivotally mounted within the passage and shown in Figure 1 in substantially closed position. This valve is illustrated as of the unbalanced type but may be balanced if desired or furthermore may comprise the valve and governor combination described in my co-pending application Serial No. 171,298 filed October 27, 1937.

An idling jet opening generally indicated at 13 is located in the inner wall of conduit 11 adjacent the edge of the throttle valve when closed, for a purpose to be explained in detail later. Fuel supply line 14 comprises passages formed within the wall of conduit 11 and serves to conduct fuel to opening 13 where it is discharged into the conduit passage. Fuel supply line 14 is provided, intermediate its ends with an enlarged portion 15 having a seating ledge 16. Conduit 11 is provided with an external boss 17 which has an enlarged hollow bore 18 communicating with portion 15 of the supply line. Boss 17 is threaded internally at 19.

A removable seat member 21 is insertible in bore 18 from the outside and has an enlarged threaded portion 22 co-operating with threads 19 of boss 17. Member 21 is provided at its inner end with a conical seating surface 23 co-operating with ledge 16 and at its outer end with an externally accessible head portion 24 which may be knurled or otherwise adapted to be frictionally gripped. It will be obvious that head 24 can be turned to advance member 21 and firmly seat surface 23 on ledge 16 so that a fluid tight joint is there formed.

Member 21 is provided with a smooth axial bore 25 terminating at its inner end in a valve seat 26 and a restricted passage 27. A series of radial apertures 28 disposed near seat 26 place bore 25 in fluid connection with bore 18. It will be seen therefore that when member 21 is firmly seated it forms part of the fuel supply line and the fuel must pass through passage 27. Needle valve 29 having a conical seating surface 31 is slidably mounted in bore 25 and has its inward movement restricted by the coaction of surface 31 and valve seat 26. Thus valve 29 serves to control the amount of fuel passing through supply line 14.

At its lower end supply line 14 is provided with another enlarged portion 32 which is internally threaded to receive the fuel supply nozzle 33. A small passage 34 leads from portion 32 to the upstream or atmospheric side of throttle 12 and the amount of air entering from passage 34 is regulated by the adjustable valve member 35 which is threadedly mounted in the wall of conduit 11 and has a forwardly extending conical seat portion 36 extending into and cooperating with passage 34 to restrict the effective opening thereof. It will be seen that valve 35 constitutes an idling mixture adjustment which is entirely independent of the carburetor throttle.

As shown in Figures 1 and 6, the idling jet opening is substantially arcuate in shape and its contour is defined by the head 37 of plug 38. The plug body has a force fit in aperture 39 in the conduit wall and intermediate the head and the body is provided a shank 41 of reduced diameter which cooperates with the walls of aperture 39 to form a fuel receiving chamber 42 into which opens the fuel supply line 14. It will be noted that passage 14 is continued beyond the chamber 42 to the top of conduit 11 where it is sealed off with a plug 43 but this passage is formed merely for expediency in drilling operations during machining of the casting 11.

The idling system herein described is shown only by way of example and it is to be understood that my novel degasser may be employed in combination with other systems or arrangements.

A diaphragm support 44 is mounted upon the carburetor by means of an integral arcuate flange 45 which is bolted or secured in some such rigid manner to the wall of conduit 11. Support 44 bears a diaphragm housing 46 which may be integral therewith or rigidly secured thereto, in some manner and a diaphragm cover 47 which is preferably clamped to housing 46 by a series of bolts 48 or similar securing means.

A diaphragm 49 of rubber, "Duprene" or any suitable flexible material is clamped between the housing and cover, and the central portion 51 of the diaphragm is provided with an extension 52 which is slidably received in a guide slot 53 in support 44. Cover 47 is provided with a control spring 54 and a recessed nut 55. Rotation of nut 55 regulates the pressure of spring 54 upon the diaphragm. Extension 52 is connected through a pin and slot arrangement to one end of link 56 and the other end of link 56 is pivotally mounted by a suitable pin and slot connection between the jaws of a clevis 57 rigidly secured to needle valve 29. Link 56 as a fixed pivot at 58 on the diaphragm support and provides a leverage ratio of approximately 3 to 1 so that relatively slight displacement of the diaphragm causes an appreciable movement at valve 29.

At the inner wall of conduit 11 is an outlet opening 59 which is located adjacent the edge of valve 12 when in closed position as shown in Figures 1 and 2, for a purpose to be described later. Conduit 61 leads from opening 59 to the diaphragm chamber defined by the diaphragm 49 and housing 47. The other side of the diaphragm is preferably open to atmospheric pressure.

I have found that the sensitivity and quickness of response of my degasser is increased tremendously by modifying the edge of the throttle valve adjacent opening 59 in any one of the ways illustrated in Figures 2–5. A preferred embodiment is that shown in Figures 1–3 where a butterfly valve having a beveled edge is shown with a channel or groove 62 cut therein to provide a thin substantially knife-edged valve section immediately adjacent the opening 59. If desired the whole peripheral edge of valve 12 may be formed as a thin section but it is essential only that the thin edge of valve 11 traverse the outlet 59. Thus only a slight movement of the throttle is sufficient to transfer connection 59 from the effect of vacuum above the throttle to the effect of atmospheric pressure below the throttle and the degasser is correspondingly rendered more sensitive. It will be noted that the opening 59 is at a point where the throttle valve edge has a maximum movement for a predetermined angle of oscillation thereby further contributing to sensitivity in operation.

It is desirable that the openings 59 and 13 in the passage wall cooperate with substantially diametrically opposite edge portions of the valve when in closed position. As shown in Figure 6, throttle valve 12 when closed has its edge extending transversely of the arcuate idling opening 13 in such a manner that the lower portion of opening 13 is exposed to the atmosphere below valve 12.

In operation during periods when the vehicle is driving the engine, a vacuum greater than that existing during normal idling periods of the engine is created in the intake manifold. If throttle valve 12 is in closed or substantially closed position, no fuel is fed to the engine from the main carburetor jet or jets. This high vacuum would tend to draw an increased amount of fuel out of the idling jets in the ordinary carburetor and thus cause "gassing," but my "degasser," the operation of which will be described later, prevents this by shutting off the fuel supply to the idling jet.

By an initial adjustment of nut 55, spring 54 is caused to withstand movement of diaphragm 49 which might be caused by any degree of vacuum communicated to the diaphragm through conduit 61 less than and including the vacuum created at normally idling speeds of the engine.

Whenever the vacuum in the intake exceeds this predetermined amount with the throttle in closed or substantially closed position, the diaphragm moves to the right in Figure 1 against the opposition of spring 54 and, through link

56, causes needle valve 29 to shut off the flow of fuel in line 14 thereby completely eliminating the discharge of unburned fuel and resultant obnoxious and toxic gasses, and at the same time effecting substantial economies in operation of the engine through elimination of fuel waste.

During all normal open throttle running conditions passage 59 is in fluid connection with that portion of conduit 11 which lies upstream of valve 12 and in which the pressure is substantially atmospheric. Therefore no matter what degree of vacuum might be created in the intake manifold during open throttle running conditions, such is inoperative to actuate the pressure responsive device to shut off the fuel supply. In this manner the invention is rendered selectively operable only during the conditions which normally tend to cause gassing.

The speed of operation of this mechanism is dependent, of course, upon the speed with which passage 59 is placed in fluid connection with the vacuum in the manifold. Referring to Figure 2, it will be seen that the vacuum above valve 12 is communicated to passage 59 immediately upon the valve 12 reaching idling position when a knife edged section is provided at the edge of the throttle blade and the resultant trigger action is one of the most startling and unusual advantages of my invention.

Upon acceleration, the slightest movement of throttle 12 from a closed position as when pressing lightly on the accelerator, will immediately place passage 59 in communication with atmospheric pressure so that the vacuum in the diaphragm is released and valve 29 quickly opened so that normal power delivery is immediately available. Here again the trigger action is effected by the thin valve edge which also has a maximum amount of movement for a predetermined angle of oscillation of the valve.

In Figure 4 a further preferred embodiment of my invention is illustrated wherein a valve 12', preferably of conventional butterfly design, is pivotally mounted in conduit 11 in such a manner that the top or engine edge 60 of the valve in closed position is substantially aligned with the bottom or carburetor edge of opening 59.

When valve 12' is in closed position, as shown in Figure 4, opening 59 is in fluid communication with the manifold. However, a very slight movement of valve 12' toward open position will immediately place opening 59 in fluid communication with that part of the conduit below the valve and thus relieve the vacuum in line 61.

The clearance between valve 12' and the conduit edge is slightly exaggerated in Figure 4 but it will be understood that, when the throttle is in closed position, whatever air does escape past the valve edge is insufficient to disturb the operation above explained. Furthermore, the effect of this slight amount of air escaping past the valve edge can be compensated for by the diaphragm spring 54.

When valve 12' is returning to closed position, it will be seen that opening 59 is placed in instant fluid communication with the manifold only when the upper edge 60 of the valve reaches its lowermost position in substantial alignment with the lower edge of opening 59. Edge 60 of valve 12' therefore performs the same function as the knife edge valve portion above described.

In Figure 5, I have illustrated another embodiment of my invention as applied to valve 12. Whereas in Figure 2 the valve is cut away at the top, here valve 12 is provided with a cut away section 62'' at the bottom edge so that the top edge of the valve blade presents a thin section.

In all embodiments of the invention, however, the action of the valve edge, however formed, is substantially the same as described above and gives the desired speedy response of the degasser which has not been possible in prior art devices.

Most internal combustion engines are provided with idling speed adjustments which require frequent manipulation to suit climatic conditions, wear, different grades of fuel and the like. Many of these idling speed adjustments comprise adjustable stops for determining the slight amount of throttle valve opening which exists when the throttle valve is in substantially closed or idling position.

In the embodiment of the invention illustrated in Figure 1, the diaphragm adjustment at 55 is carefully set to cause shut off of the fuel supply when a predetermined manifold vacuum has been attained. This predetermined vacuum is just beyond the range of normally idling vacuum as explained before. The slightest change in the throttle valve opening caused by manipulation of an idling speed adjustment of the type above described causes a corresponding change in the idling vacuum in the intake manifold. This change in the idling vacuum unbalances the existing trigger condition of the degasser and changes the rate of operation of the degasser, and it has been found necessary to readjust the degasser nearly every time the idling speed adjustment is changed.

For remedying this condition the embodiment of my invention illustrated in Figures 7 and 8 has been designed. Conduit 11 is provided with an externally projecting member 63 in which is formed a chamber 64. Member 63 may be formed integrally with conduit 11 or may be separate therefrom and rigidly secured thereto in any desired manner. Oppositely disposed aligned passages 65 and 66 leading to chamber 64 are provided in the walls of member 63. Passage 65 is connected by conduit 67 to the passage within conduit 11 downstream of valve 12 while passage 66 is connected by conduit 68 to the enclosed pressure chamber within diaphragm 69. If desired conduit 67 may be connected directly to the intake manifold.

An annular sleeve 70 is threaded at one end to fit within a cooperating threaded aperture 71 which extends through a side wall of member 63 into chamber 64. Sleeve 70 is provided with an annular flange 72 which abuts against the external surface of member 63 when the sleeve 70 is mounted thereupon. A needle valve rod 73 is slidably supported within chamber 64 where it is provided with an enlarged head 74 having a conical seating face 75. Head 74 is preferably removably mounted upon rod 73 for convenience in assembly and for repair and replacement purposes and is preferably provided with a threaded shank 74' fitting within a threaded bore in rod 73. The chamber wall opposite aperture 71 is provided with an aligned passage 76 whose inner edges serve as a cooperating seating portion for conical face 75.

Outwardly of flange 72, sleeve 70 is surrounded by a coil spring 77 extending between flange 72 and the inner edge of an enlarged butt 78 at the outer end of valve rod 73. Butt 78 is preferably removably mounted upon rod 73, being provided with a threaded shank 78' fitting within a threaded bore in rod 73. Spring 77 constantly urges valve face 75 away from its seat at passage 76. A conduit 79 connects passage 76 with the passage within conduit 11 upstream of valve 12. If desired conduit 76 may be connected to any other portion of the carburetor or the engine where substantially atmospheric pressures exist, or may even be left open to the atmosphere, in which event a small air filter could be provided to prevent dust and dirt from entering chamber 64.

Referring to Figure 7, the carburetor throttle lever 81 is non-rotatably secured to a shaft 82 which supports valve 12 and which is journaled, preferably in anti-friction bearings, in opposite lateral walls of conduit 11. The upper end of lever 81 is formed as at 83 to be connected to suitable linkage leading to the usual manual control members of the ordinary automobile (not shown). At its lower end lever 81 is provided with a depending leg 84 terminating in a hollow threaded boss 85 in which is disposed an idling speed adjustment screw 86. Coil spring 87 extends between boss 85 and the enlarged head 88 of screw 86 to maintain the screw in adjusted position and to compensate for wear in the screw threads.

In operation, throttle lever 81 is constantly urged in a counter-clockwise direction by the usual heavy return springs (not shown) which are provided on the throttle controls of an automobile. When the throttle controls are released, as by the operator taking his foot off the accelerator, those springs rotate lever 81 counter-clockwise to turn valve 12 to idling position. As lever 81 rotates, the end of screw 86 engages butt 78 and pushes valve rod 73 along sleeve 70 until valve face 75 is firmly seated, thus preventing communication between chamber 64 and passage 76.

In this manner a closed fluid path comprising conduit 67, chamber 64 and conduit 68 is established between the manifold side of the passage in conduit 11 and the diaphragm 69 so that the diaphragm will be actuated to cut off the fuel supply in line 14 whenever the pressure in the manifold exceeds a predetermined degree of vacuum. Diaphragm 69 is similar to the diaphragm at 47 in Figure 1 and is connected to needle valve 29 in supply line 14 exactly as shown in Figure 1.

Upon the slightest movement of the throttle valve away from idling position, as when the operator presses on the accelerator or otherwise exerts manual control tending to open the throttle valve, lever 81 rotates in a clockwise direction and screw 86 is moved away from butt 78. This permits spring 77 to slide valve rod 73 outwardly to unseat valve face 75 and allows substantially atmospheric pressure to act through chamber 64 and conduit 68 to cause diaphragm 69 to unseat valve 29 and permit flow of fuel through line 14. The discharge of air or fluid from passage 76 through chamber 64 tends to remove particles of dust and dirt from the chamber and keep the valve seating surface 75 clean.

With lever 81 actuated manually to any open throttle position, chamber 64 will always be in communication with substantially atmospheric pressures and no cut-off of the fuel supply can be effected whatever the vacuum in the intake manifold. With the throttle valve in substantially closed or idling position, diaphragm 69 is subjected to manifold pressures and will cut off the fuel supply at a predetermined vacuum. The slightest movement of the throttle valve from idling position will positively render the fuel supply cut-off means inoperative. This movement of the throttle valve from idling position is manually controlled and hence is entirely independent of the pressures existing in the intake manifold.

Adjustment of screw 86 to rotate lever 81 for regulating the idling speed of the engine does not change the position of needle valve rod 73 and does not alter the relative positions of screw 86 and butt 78 since boss 85 is displaced axially when screw 86 is rotated.

The idling speed of an engine can be adjusted within all practical limits without causing the manifold pressure to depart from the range of 16–18 inches of vacuum. Hence such adjustment will not interfere with the fuel cut-off operation of a degasser which is set to so operate at 19 inches of vacuum. With my arrangement shown in Figures 7 and 8, and above described, the rate at which the degasser is rendered inoperative is independent of the engine speed selected by the idling adjustment. Hence the whole operation of my degasser is independent of the idling speed adjustment.

It will therefore be seen the present invention provides a degasser that is extremely sensitive and responsive to the range of conditions within which it is designed to operate without the aid of mechanical multiplying devices or the like.

Furthermore, although I have illustrated my invention with respect to an updraft carburetor it will be apparent that the inventive principle is clearly applicable to down draft carburetors or any other type employing movable throttle and governor valves. It will also be apparent that the invention is applicable to idling arrangements other than that illustrated.

It will further be apparent to those skilled in the art that the control methods and apparatus described above with reference to Figures 1 and 7 can be used with any type of degasser regardless of the manner by which the obnoxious gasses are eliminated. Some degassers use a system which brings the passage between the carburetor and the engine to substantially atmospheric pressure during periods when degassing is desired. Other degassers cause complete and sometimes simultaneous cut-off of fuel flow through the main and idling fuel jets during periods when degassing is desired. Still other degassers use a system by which excessive amounts of air are introduced into the fuel mixture during periods when degassing is desired.

In any event the various systems for operating degassers of any type, including those outlined above, may be positively and efficiently controlled by the control methods and apparatus of my invention above described and such is contemplated in my invention.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claim rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claim are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

In a carburetor device having a passage adapted to be placed in fluid communication with the intake manifold of an internal combustion engine; a throttle in said passage; a passage for carrying fuel to an idling jet adjacent the edge of said throttle in idling position; a valve in said last named passage; pressure responsive means for operating said valve; a conduit leading from said first named passage at the intake manifold side of said throttle to said pressure responsive means and a valve chamber in said conduit; a valve in said chamber adapted to close an orifice in said chamber leading to a source of substantially atmospheric pressure; resilient means urging said last mentioned valve away from said orifice; means for actuating said throttle and mechanism connected to said last named means for maintaining said last mentioned valve in closed position when said throttle is in idling position only, said last mentioned valve being opened immediately by said resilient means when said throttle is moved even slightly toward open position.

WILLIAM E. LEIBING.