United States Patent

Lamore

[15] **3,695,589**

[45] **Oct. 3, 1972**

[54] AIR VALVE CARBURETOR

[72] Inventor: **Herbert T. Lamore**, Detroit, Mich. 48021

[73] Assignee: **Holley Carburetor Company**, Warren, Mich.

[22] Filed: **March 2, 1970**

[21] Appl. No.: **15,427**

[52] **U.S. Cl.** ..... **261/23 A**, 261/50 A

[51] **Int. Cl.** **F02m 11/02**

[58] **Field of Search** ..... 261/23 A, 50 A

[56] **References Cited**

UNITED STATES PATENTS

3,279,767	10/1966	Stoltman	261/50 A
3,263,974	8/1966	Braun et al.	261/50 A
2,099,553	11/1937	Atkins	261/50 A
2,970,822	2/1961	Ernest	261/23 A
3,188,062	6/1965	Reid et al	261/23 A
3,485,482	12/1969	Fuchs	261/23 A

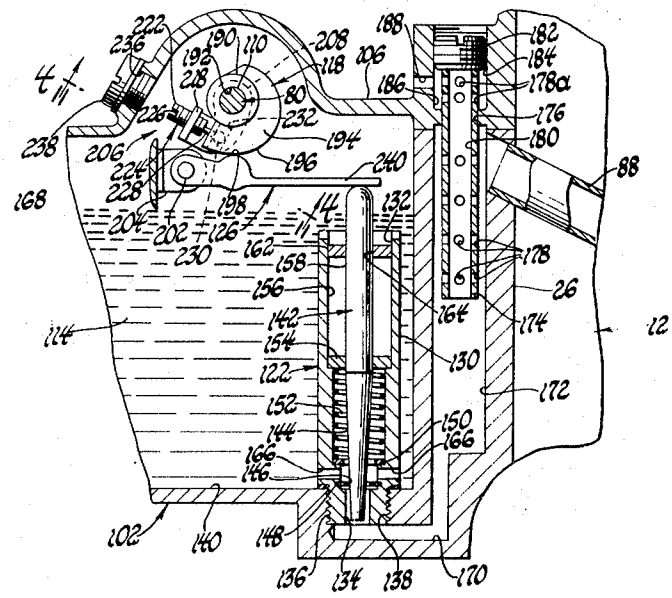
Primary Examiner—Tim R. Miles

Attorney—Walter Potoroka, Sr.

[57] **ABSTRACT**

An air valve carburetor has an air valve secured to an air valve shaft for pivotal rotation therewith; a pair of fuel metering valve assemblies are respectively situated between the carburetor fuel bowl means and the respective fuel nozzles situated within first and second air induction passages formed in the carburetor body; and a pair of cam assemblies carried by the air valve shaft are adjustable with respect to each other and with respect to the air valve and air valve shaft; the cam assemblies are operatively connected to and effective for variably positioning valving members of the fuel metering valve assemblies in accordance with the positions assumed by the air valve during engine operation.

7 Claims, 5 Drawing Figures



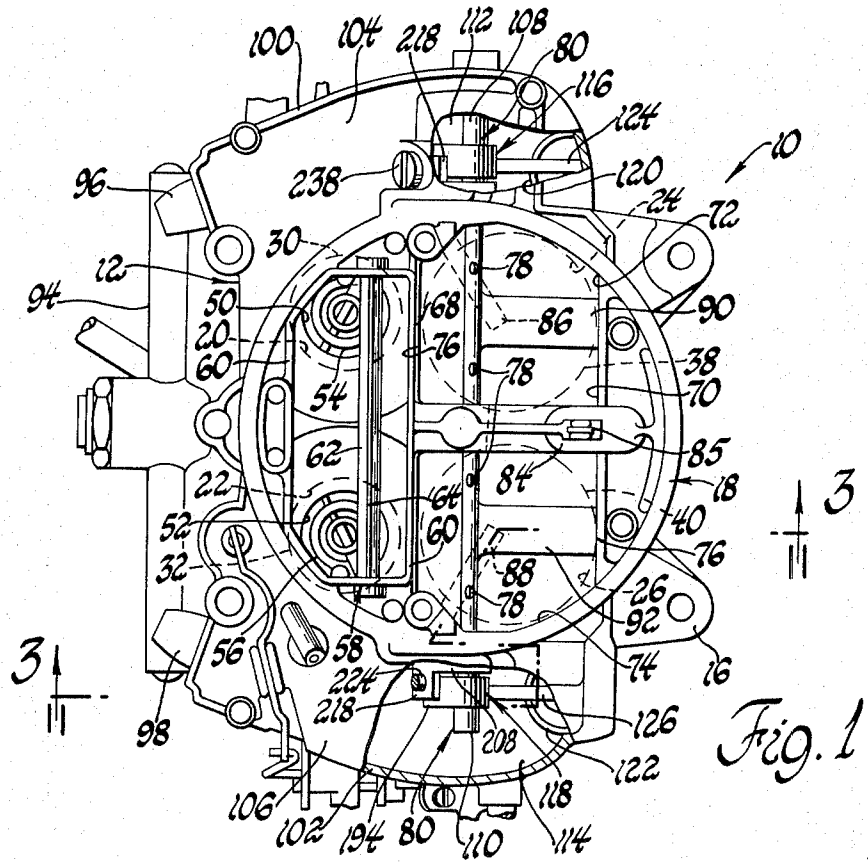


Fig. 1

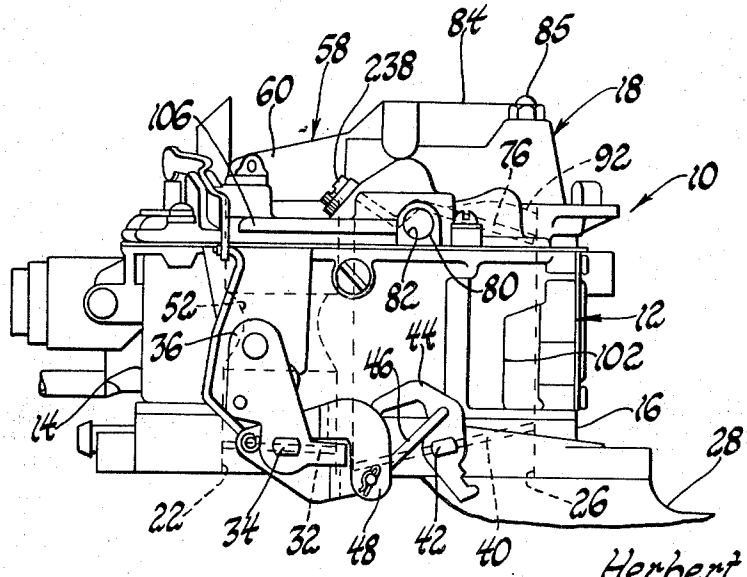


Fig. 2

INVENTOR.
Herbert T. Lamore
BY
Walter Patoroka, Jr.
ATTORNEY

PATENTED OCT 3 1972

3,695,589

SHEET 2 OF 2

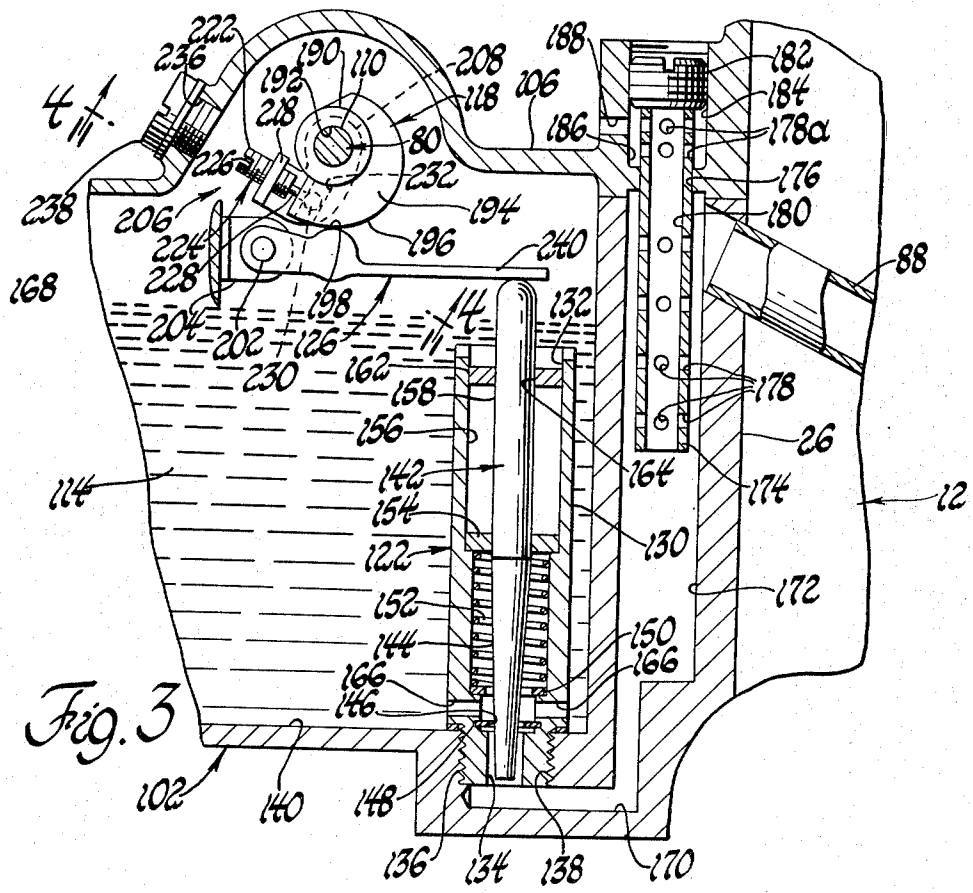


Fig. 3

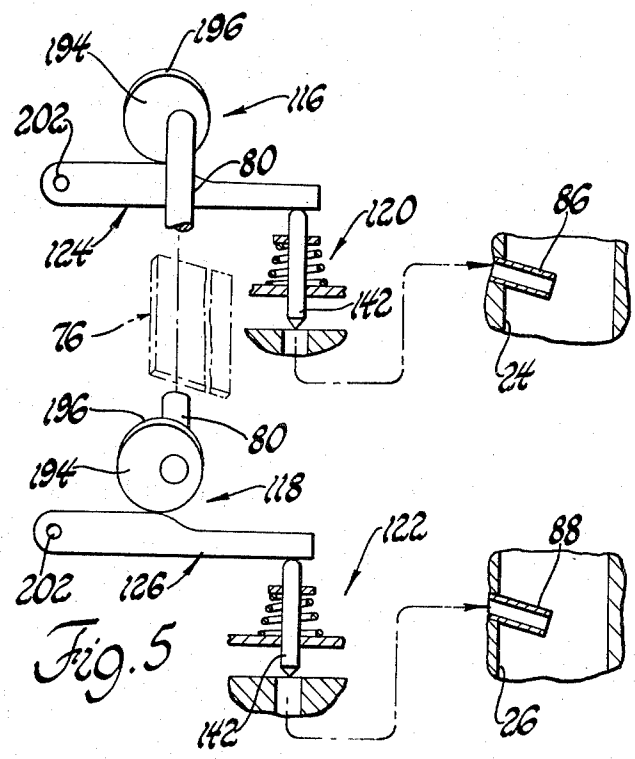


Fig. 5

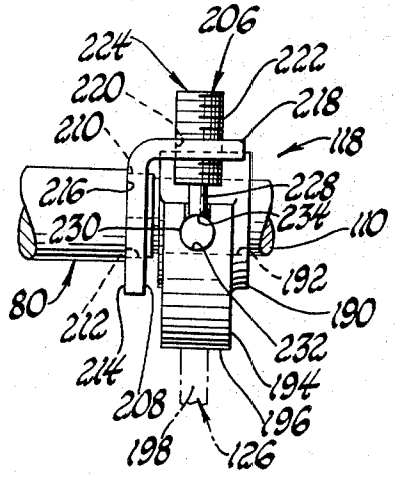


Fig. 4

INVENTOR.
Herbert J. Lamore
BY
Walter Paterson, Jr.
ATTORNEY

AIR VALVE CARBURETOR

BACKGROUND OF THE INVENTION

Air valve carburetors, as generally well known in the art, employ an air valve which is responsive to the volume of air flowing through the air inlet of the engine to in effect measure the volume rate of such air flow. The air valve is usually connected to a fuel metering valve whereby fuel flow to the engine will be regulated in accordance with the air flow and thus a proper mixture of air and fuel may be delivered to the engine.

One of the problems encountered by the prior art air valve carburetors arose in connection with carburetor structures having two or more induction passages which employed a single common air valve but separate fuel discharge nozzles for the respective induction passages. In such structures it was found that employing a single fuel metering valve assembly connected to the air valve for supplying metered fuel to the fuel discharge nozzles collectively resulted in improper fuel-air ratios in at least certain of the induction passages because of the flow dynamics of the fuel and air conduits or passages.

Accordingly, the prior art attempted to solve this by providing a separate fuel metering valve assembly connected to the air valve for each of the induction passages of the carburetor structure. However, problems were again encountered resulting from the dimensional tolerances necessary during machining and assembly. That is because of a stack-up of tolerances, it was often the case that a proper position of the valving or fuel metering rods of the fuel metering valve assemblies could not be achieved for a particular related position of the air valve connected thereto. The prior art sought to solve this problem by providing a single cam-like member carried by the air valve which could be adjustably positioned so as to vary the position of both or all of the fuel metering valve assembly metering rods, collectively, with respect to the air valve.

However, a major problem still exists; that is, it has been discovered that, for example, in a carburetor having first and second induction passages containing an air valve and having first and second fuel metering valve assemblies respectively feeding first and second fuel nozzles in the first and second induction passages, the first of the fuel metering valve assemblies may be providing the desired fuel flow rate to the engine with respect to the position assumed by the air valve while the second fuel metering valve assembly may be providing either an insufficient or an excessive rate of fuel flow. Therefore, in such situations, which often happen, it is impossible to correct the metered rate of fuel flow from the second fuel metering valve, by employing the single cam of the prior art without deleteriously effecting the performance of the first fuel metering valve assembly.

Accordingly, the invention as disclosed and described herein is concerned with the solution of the above as well as other related problems.

SUMMARY OF THE INVENTION

According to the invention, an air valve comprises a carburetor body, a first induction passage formed through said body and including a first variably positionable throttle valve therein, a second induction passage formed through said body and including a first

variably positionable throttle valve therein, a second induction passage formed through said body and including a second variably positionable of fuel, an air valve mounted within an inlet portion of said first and second induction passages so as to be responsive to the total volume of air flow through said induction passages, pivotal air valve shaft means fixedly secured to said air valve for enabling said air valve to pivotally deflect in relation to the total volume rate of air flow through said first and second induction passages, a first fuel discharge nozzle for discharging metered fuel into said first induction passage at a point generally downstream of said air valve but upstream of said first throttle valve, a second fuel discharge nozzle for discharging metered fuel into said second induction passage at a point generally downstream of said air valve but upstream of said second throttle valve, a first variably openable fuel metering valve assembly situated generally between said source of fuel and said first fuel discharge nozzle for providing a metered rate of fuel flow from said source of fuel to said first fuel discharge nozzle, a second variably openable fuel metering valve assembly situated generally between said source of fuel and said second fuel discharge nozzle for providing a metered rate of fuel flow from said source of fuel to said second fuel discharge nozzle, first adjustable cam means operatively connected to said air valve and said first fuel metering valve assembly effective for adjusting the degree of opening of said first fuel metering valve assembly relative to the position of said air valve, and second adjustable cam means operatively connected to said air valve and said second fuel metering valve assembly effective for adjusting the degree of opening of said second fuel metering valve assembly relative to the position of said air valve.

Various general and specific objects and advantages of the invention will become apparent when reference is made to the following detailed description considered in conjunction with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

In the drawings wherein, for purposes of clarity, certain details may be omitted from one or more views:

FIG. 1 is a top plan view of an air valve carburetor, with portions thereof broken away and in cross-section, constructed in accordance with the invention;

FIG. 2 is a side elevational view of the carburetor of FIG. 1;

FIG. 3 is an enlarged fragmentary cross-sectional view taken generally on the plane of line 3–3 of FIG. 1 and looking in the direction of the arrows;

FIG. 4 is an enlarged view, of a portion of the structure shown in FIG. 3, taken generally on the plane of line 4—4 of FIG. 3 and looking in the direction of the arrows; and

FIG. 5 is a somewhat simplified schematic illustration of the fuel metering system and associated regulating and adjusting means shown in FIGS. 1 through 4.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now in greater detail to the drawings FIGS. 1 and 2 illustrate in top plan view and side elevational view, respectively, a multi-induction passage carbure-

tor assembly **10** having a body structure **12** which may be comprised of a main body section **14** with a lower disposed throttle body **16** and an upper air horn or air intake section **18** each of which is detachably secured to the main body section **14** as by any suitable means well known in the art.

The body structure **12**, as shown, has induction passages **20**, **22**, **24** and **26** formed therethrough in a manner so as to form passages distinct from each other discharging into the intake manifold **28** of an associated internal combustion engine. For reference purposes, passages **20** and **22** are identified as being primary induction passages or bores while passages **24** and **26** are identified as being secondary bores. Accordingly, as such terms of reference imply, even through such is not necessary to the practice of the invention, the carburetor assembly **10** would be operated in a generally staged fashion. That is, throttle valves **30** and **32**, each carried by a transversely located pivotal throttle shaft **34**, are respectively located within primary induction passages **20** and **22**. The throttle shaft **34**, in turn, carries at one end thereof a throttle shaft actuating lever **36** which is rotated in responce to operator demands so as to rotate such associated primary throttle vales in accordance therewith. Throttle valve **38** and **40**, each carried by a secondary transversely extending throttle shaft **42**, are respectively located within secondary passages **24** and **26**. Similarly, throttle shaft **42** has an actuating lever **44** connected thereto; however, such lever **44** is operatively connected to the primary throttle shaft **34** through an intermediate linkage **46** which is connected to a third lever **48** fixedly secured to primary throttle shaft **34**. Accordingly, as can best be seen in FIG. **2**, opening rotational movement of the primary throttle shaft **34** causes a rotational throttle opening movement of secondary throttle shaft **42**; however, because of the geometry of levers **44**, **36**, **48** and linkage **46**, the rate of opening movement of the secondary throttle shaft **42**, during the initial stages of opening, will be less than the rate of opening movement of the primary throttle shaft **34**.

The primary induction passages **20** and **22** are provided with main venturi sections **50** and **52** within the throats of which are situated suitable main fuel discharge nozzles **54** and **56** as is well known in the art.

The air horn section **18** may include a primary air inlet section **58** which is defined generally by an upstanding wall **60** arranged in a generally rectangular configuration. A pivotal choke shaft **62** journalled in the wall **60** and carrying a choke valve **64** (shown in the fully opened position) may be operatively connected, as is well known in the art, to any suitable and related choke control mechanism whereby choke valve closure is effected at relatively cold engine and/or ambient temperatures.

In comparison, a second air inlet section, feeding the secondary induction passages **24** and **26**, is defined generally by transversely extending wall surfaces **68** and **70** joined at their ends as by arcuate wall surfaces **72** and; **74** each of which, as shown, may be formed integrally within the air horn section **18**. An air valve **76**, having a top plan profile closely conforming to the configuration of the second air inlet section, is situated generally within the second air inlet and fixedly secured, as by screws **78**, to a transversely extending air valve shaft **80** which is suitable journaled in the wall section of the air horn **18** as at **82** of FIG. **2**.

A suitably bridge-like portion **84**, generally overlying the air valve **76**, may be formed integrally with the air horn section **18**. The bridge portion **84** may, as is well known in the art, contain a suitable spring-biased lever **85** which is operatively connected to either the air valve **76** or the air valve shaft **80** in order to thereby provide a minimal resilient force tending to maintain the air valve **76** in its nominally closed position as illustrated in FIG. **2**.

As shown in FIG. **1**, secondary fuel discharge nozzles **86** and **88** are provided for respectively discharging fuel into secondary induction passages **24** and **26**. Accordingly, since the nozzles **86** and **88** are disposed generally below or beneath the air valve **76**, suitable hood-like raised portions **90** and **92** are formed in the air valve **76** in order to provide sufficient space to accommodate the ends of nozzles **86** and **88** whenever air valve **76** is opened to or approaches its fully opened position.

A conduit **94**, adapted for connection to a suitable source or supply of fuel, has its opposite ends **96** and **98** connected to fuel bowls or reservoirs **100** and **102** which, as shown, may be divorced from each other and formed integrally with the main body **14** so as to be disposed on opposite sides thereof. The cover portions for such fuel reservoirs may be formed integrally with the air horn **18** so as to form general lateral extensions **104** and **106** thereof.

As is generally well known in the art, air flow to the engine may be measured by the deflection of an air valve, such as **76**, which is responsive to the volume rate of air flowing through the particular induction passage or passages containing the air valve. The air valve is then in turn operatively connected to a fuel metering valve whereby fuel flow to the engine will be regulated in accordance with the air flow and thus a proper mixture of air and fuel is delivered to the engine.

Accordingly, as can be seen in FIGS. **1**, **2**, **3** and **5**, the air valve **76** is secured, in an offset manner, to shaft **80** for pivotal rotation therewith so that, as air impinges upon the larger offset area of the air valve **76**, the air valve **76** causes clockwise (as viewed in FIG. **2**) rotation of the shaft **80**. In this connection, it can be further seen that ends **108** and **110** of shaft **80** extend into the chambers **112** and **114** of fuel bowls **100** and **102** and respectively carry cam assemblies **116** and **118** thereon. Also, the fuel bowls **100** and **102** are illustrated as being respectively provided with fuel metering valve assembly **120** and **122** situated generally within the chambers **112** and **114** thereof so as to be respectively operatively connected to the cam assemblies **116** and **118** as by interconnecting lever means **124** and **126**.

FIG. **3**, is fragmentary a cross-sectional view taken on the plane of line—**3** of FIG. **1**; however, all elements shown therein are typical. That is, the disclosure as presented, for example, with reference to cam assembly **118**, lever **126**, metering valve **122**, nozzle **88** and fuel bowl **102** apply equally well to the corresponding elements **116**, **124**, **120** **86** and **102** as well as such structure as is related thereto.

Referring in greater detail to FIG. 3, it can be seen that the fuel metering valve assembly **122** is comprised of an outer generally tubular housing **130** having an open upper end **132** and an open lower end defining a conduit portion **134** which is also provided with an externally threaded portion **136** which threadably engages an internally threaded portion **138** in the lower wall **140** of the fuel bowl **102**. An elongated valve stem **142** situated generally within the housing **130** is provided with a lower tapered or contoured surface **144** which cooperates with an orifice **146** formed in a ring-like member **148** which, being of a relatively thin cross-section, can be snapped into a circumferential groove formed in the wall of conduit portion **134** or, if desired may be initially set onto a circumferential shoulder formed in the wall of conduit **134** and retained thereagainst as by peening over the portion immediately above it.

A second axially spaced shoulder serves to retain an annular spring abutment **150** for abutably engaging the lower end of a compression spring **152** which has its upper end engaging the lower surface of a moveable annular stop-guide **154** which is slidingly received within the cylindrical portion **156** of housing **130** while being press-fitted onto the cylindrical surface portion **158** of stem **142**. A third internally formed annular shoulder **160** may be formed to provide a positive stop or guaging surface against which the lower surface of collar-like guide **154** is at times abutted.

An upper annular member **162**, which may be press-fitted on its outer diameter into the cylindrical surface **156**, has an inner diameter **164** which slidably receives the cylindrical portion **158** of the valve stem therethrough. Suitable conduit means **166** are formed radially through the wall of outer housing **130** so as to be effective for freely converting or supplying fuel **168** from the chamber **114** of the fuel bowl **102** to the upstream side of metering orifice **146**.

In view of the preceding, it should be apparent that as the valve stem **142** is depressed the effective flow or metering area of orifice **146** is decreased thereby reducing the volume rate of flow of fuel from passages **166** to the conduit **170** formed in the body **12** and communicating at its other end with a main fuelwell **172** which is effective for supplying fuel to only one of the secondary nozzles **88**. Likewise, as the valve stem **142** is permitted to rise, from the minimum flow position illustrated, the effective flow area of orifice **146** increased thereby enabling a greater volume rate of fuel flow therethrough and into the main well **172** feeding the nozzle **88**.

The main well **172** may be provided with an elongated main well tube **174** which may be piloted as within an annular portion **176** and may be provided with a plurality of generally radially formed passages **178** communicating between the interior of the well **172** and the axial passageway **180**. The upper end **182** of the main well tube **174** may be threaded so as to be threadably engageably with portion **184** of the air horn structure **18**. A chamber **186**, defined generally about the upper end of tube **174** and between threaded end **182** and annular portion **176**, communicates with both the upwardly disposed radial passages **178***a* as well as a calibrated air vent or restriction **188**. Accordingly, as is well known in the art, the purpose of such a main well tube is to provide a controlled rate of air flow from the restriction **188** to the liquid fuel within main well **172** in order to create a partial mixing of such air and fuel prior to the discharge thereof through the fuel nozzle **88** into the induction passage **26**.

Each of the cam assemblies, as typically shown by cam assembly **118** of FIGS. **3** and **4**, is comprised of a main mounting body **190** have an aperture **192** formed therethrough and of a size so as to slidably and freely accept the end **110** of air valve shaft **80** therethrough thereby permitting the cam mounting body **190** to be freely rotatable with respect to the air valve shaft **80**. A cam body **194**, which may be formed integrally with mounting body portion **190**, extends generally radially outwardly and has a peripheral contoured cam surface **196** which, as illustrated in FIG. **3**, is adapted to be in contact with a follower portion **198** of the lever **126** pivotally secured at one end as at **202** to a suitable support portion **204** within the chamber **114** of the fuel bowl assembly **102**.

As also shown in FIGS. **3** and **4**, each of the cam assemblies, as **118**, is provided with cam adjustment means **206** comprised of a body member **208** fixedly secured to the shaft **80** as by cooperating keying means comprised of, for example, a suitable flatted surface or surfaces **210** formed on shaft **80** and a complementary aperture **212** formed therethrough, the body **208** closely engaging such a flatted surface **210**.

The body portion **208**, which may be held to have its one side **214** against a shoulder **216** of shaft **80**, is provided with a generally laterally extending arm portion **218** which has an internally threaded aperture **220** formed therethrough so as to threadably engage the externally threaded portion **222** of an adjustment member **224** provided with a suitable tool-engaging surface **226**.

The adjustment member **224** is provided with a shank portion **228** carrying, at the lower end thereof, an enlarged ball key-like portion **230** which is closely slideably received within a cylindrical passageway **232** formed in the cam body **194**. An elongated slot **234**, open at its radially outermost end, serves to provide a clearance for the free passage therethrough of the shank or stem **228**. Both fuel bowl cover portions **104** and **106** are provided with an internally threaded access aperture **236** for receiving a threaded cover or closure plug **238**.

Accordingly, in view of the above, it should be apparent that, with the closure plug **238** removed, a suitable tool, such as a screw driver, may be inserted and engaged with surface **226** so as to threadably rotate adjustment member **224**. If the adjustment member **224** is threadably rotated so as to cause ball portion **230** to move downwardly (as viewed in FIG. **4**) cam body **194** and cam mounting portion **190** will rotate counterclockwise relative to and about shaft **80** (as viewed in FIG. **3**). Such rotation of the cam body **194** is reflected in a downward force or movement against follower portion **198** causing lever **126** to rotate generally clockwise about pivot **202** resulting in lever end **240** further depressing fuel metering stem valve **142**. Similarly, as adjustment member **224** is threadably rotated to cause ball **230** to move upwardly (as viewed in FIG. **4**) the cam body **194** is caused to rotate clockwise relative to and about air valve shaft **80**. This,

of course, permits spring **152** of the fuel metering valve assembly **122** to raise stem valve **142** against end **240** of lever **126** thereby maintaining follower portion **198** against the cam contour **196**.

Accordingly, as somewhat schematically shown, in simplified configuration, in FIG. **5**, with each of the cam assemblies **116** and **118** being constructed in accordance with the disclosure of FIGS. **3** and **4** it becomes apparent that each of the cam assemblies **116** and **118** can be independently adjusted relative to air valve shaft **80** and the air valve **76** fixedly carried thereby in order to achieve a very accurate control of the desired rate of flow of fuel through the respective fuel metering valve assemblies **120** and **122** for any particular deflection or operating position of the air valve **76**. Further, not only are such cam bodies **194** of each of the cam assemblies **116** and **118** adjustable but they are also automatically and immediately locked into any adjusted position. This, of course, is achieved by virtue of the generally upper and lower surfaces of the ball **230** being to engage the cylindrical opening or slot **232** thereby precluding any movement of the cam body **194** which is not initiated by the adjustment member **224**.

Even though only one preferred embodiment of the invention has been disclosed and described, it is apparent that other embodiments and modifications of the invention are possible within the scope of the appended claims.

I claim:

1. An air valve carburetor, comprising a carburetor body, a first induction passage formed through said body and including a first variably positionable throttle valve therein, a second induction passage formed through said body and including a second variably positionable throttle valve therein, a source of fuel, an air valve mounted within an inlet portion of said first and second induction passages so as to be responsive to the total volume of air flow through said induction passages, pivotal air valve shaft means fixedly secured to said air valve for enabling said air valve to pivotally deflect in relation to the volume rate of air flow through said induction passages, a first fuel discharge nozzle for discharging metered fuel into said first induction passage at a point generally downstream of said air valve but upstream of said first throttle valve, a second fuel discharge nozzle for discharging metered fuel into said second induction passage at a point generally downstream of said air valve but upstream of said second throttle valve, a first variably openable fuel metering valve assembly situated generally between said source of fuel and said first fuel discharge nozzle for providing a metered rate of fuel flow from said source of fuel to said first fuel discharge nozzle, a second variably openable fuel metering valve assembly situated generally between said source of fuel and said second fuel discharge nozzle for providing a metered rate of fuel flow from said source of fuel to said second fuel discharge nozzle, first adjustable cam means operatively connected to said air valve and said first fuel metering valve assembly effective for adjusting the degree of opening of said first fuel metering valve assembly relative to the position of said air valve, second adjustable cam means operatively connected to said air valve and said second fuel metering valve assembly effective for adjusting the degree of opening of said second fuel metering valve assembly relative to the position of said air valve, at least said first adjustable cam means comprising a cam body freely mounted on said air valve shaft means for rotation thereabout and relative thereto, and an adjustment member fixedly secured to said air valve shaft means for rotation therewith, said adjustment member being operatively connected to said cam body and being effective to cause adjustable rotation of said cam body relative to said air valve shaft means.

2. An air valve carburetor, comprising a carburetor body, a first induction passage formed through said body and including a first variably positionable throttle valve therein, a second induction passage formed through said body and including a second variably positionable throttle valve therein, a source of fuel, an air valve mounted within an inlet portion of said first and second induction passages so as to be responsive to the total volume of air flow through said induction passages, pivotal air valve shaft means fixedly secured to said air valve for enabling said air valve to pivotally deflect in relation to the volume rate of air flow through said induction passages, a first fuel discharge nozzle for discharging metered fuel into said first induction passage at a point generally downstream of said air valve but upstream of said first throttle valve, a second fuel discharge nozzle for discharging metered fuel into said second induction passage at a point generally downstream of said air valve but upstream of said second throttle valve, a first variably openable fuel metering valve assembly situated generally between said source of fuel and said first fuel discharge nozzle for providing a metered rate of fuel flow from said source of fuel to said first fuel discharge nozzle, a second variably openable fuel metering valve assembly situated generally between said source of fuel and said second fuel discharge nozzle for providing a metered rate of fuel flow from said source of fuel to said second fuel discharge nozzle, first adjustable cam means operatively connected to said air valve and said first fuel metering valve assembly effective for adjusting the degree of opening of said first fuel metering valve assembly relative to the position of said air valve, second adjustable cam means operatively connected to said air valve and said second fuel metering valve assembly effective for adjusting the degree of opening of said second fuel metering valve assembly relative to the position of said air valve, each of said first and second adjustable cam means comprising a cam body freely mounted on said air valve shaft means for rotation thereabout and relative thereto, and an adjustment member fixedly secured to said air valve shaft means for rotation therewith, said adjustment member being operatively connected to said cam body and being effective to cause adjustable rotation of said cam body relative to said air valve shaft means and said air valve.

3. An air valve carburetor, comprising a carburetor body, a first induction passage formed through said body and including a first variably positionable throttle valve therein, a second induction passage formed through said body and including a second variably positionable throttle valve therein, a source of fuel, an air valve mounted within an inlet portion of said first and second induction passages so as to be responsive to the total volume of air flow through said induction

passages, pivotal air valve shaft means fixedly secured to said air valve for enabling said air valve to pivotally deflect in relation to the volume rate of air flow through said induction passages, a first fuel discharge nozzle for discharging metered fuel into said first induction passage at a point generally downstream of said air valve but upstream of said first throttle valve, a second fuel discharge nozzle for discharging metered fuel into said second induction passage at a point generally downstream of said air valve but upstream of said second throttle valve, a first variably openable fuel metering valve assembly situated generally between said source of fuel and said first fuel discharge nozzle for providing a metered rate of fuel flow from said source of fuel to said first fuel discharge nozzle, a second variably openable fuel metering valve assembly situated generally between said source of fuel and said second fuel discharge nozzle for providing a metered rate of fuel flow from said source of fuel to said second fuel discharge nozzle, first adjustable cam means operatively connected to said air valve and said first fuel metering valve assembly effective for adjusting the degree of opening of said first fuel metering valve assembly relative to the position of said air valve, second adjustable cam means operatively connected to said air valve and said second fuel metering valve assembly effective for adjusting the degree of opening of said second fuel metering valve assembly relative to the position of said air valve, first and second lever members each including a cam follower portion respectively engaging said first and second adjustable cam means, each of said first and second lever members including valve engaging portions respectively engaging said first and second variably openable fuel metering valve assemblies, said first and second lever members being effective to respectively transmit motion developed by said first and second cam means upon rotation of said air valve in response to air flow through said induction passages to said first and second variably openable fuel metering valve assemblies.

4. An air valve carburetor, comprising a carburetor body, a first induction passage formed through said body and including a first variably positionable throttle valve therein, a second induction passage formed through said body and including a second variably positionable throttle valve therein, a source of fuel, an air valve mounted within an inlet portion of said first and second induction passages so as to be responsive to the total volume of air flow through said induction passages, pivotal air valve shaft means fixedly secured to said air valve for enabling said air valve to pivotally deflect in relation to the volume rate of air flow through said induction passages, a first fuel discharge nozzle for discharging metered fuel into said first induction passage at a point generally downstream of said air valve but upstream of said first throttle valve, a second fuel discharge nozzle for discharging metered fuel into said second induction passage at a point generally downstream of said air valve but upstream of said second throttle valve, a first variably openable fuel metering valve assembly situated generally between said source of fuel and said first fuel discharge nozzle for providing a metered rate of fuel flow from said source of fuel to said first fuel discharge nozzle, a second variably openable fuel metering valve assembly situated generally between said source of fuel and said second fuel discharge nozzle for providing a metered rate of fuel flow from said source of fuel to said second fuel discharge nozzle, first adjustable cam means operatively connected to said air valve and said first fuel metering valve assembly effective for adjusting the degree of opening of said first fuel metering valve assembly relative to the position of said air valve, second adjustable cam means operatively connected to said air valve and said second fuel metering valve assembly effective for adjusting the degree of opening of said second fuel metering valve assembly relative to the position of said air valve, each of said first and second adjustable cam means comprising a cam body freely mounted on said air valve shaft means for rotation thereabout and relative thereto, and an adjustment member fixedly secured to said air valve shaft means for rotation therewith, said adjustment member comprising an adjustment body fixedly carried by said air valve shaft means, a threaded member threadably engaged with and carried by said adjustment body, said threaded member including a pivotal connecting portion operatively connected to said cam body at a point eccentrically disposed with respect to the axis of rotation of said cam body about said air valve shaft means, said pivotal connecting portion being effective to cause adjustable rotation of said cam body about said axis of rotation in response to adjustable threaded rotation of said threaded member in said adjustment body.

5. An air valve carburetor, comprising a carburetor body, a first induction passage formed through said body and including a first variably positionable throttle valve therein, a second induction passage formed through said body and including a second variably positionable throttle valve therein, a source of fuel, an air valve mounted within an inlet portion of said first and second induction passages so as to be responsive to the total volume of air flow through said induction passages, pivotal air valve shaft means fixedly secured to said air valve for enabling said air valve to pivotally deflect in relation to the volume rate of air flow through said induction passages, a first fuel discharge nozzle for discharging metered fuel into said first induction passage at a point generally downstream of said air valve but upstream of said first throttle valve, a second fuel discharge nozzle for discharging metered fuel into said second induction passage at a point generally downstream of said air valve but upstream of said second throttle valve, a first variably openable fuel metering valve assembly situated generally between said source of fuel and said first fuel discharge nozzle for providing a metered rate of fuel flow from said source of fuel to said first fuel discharge nozzle, a second variably openable fuel metering valve assembly situated generally between said source of fuel and said second fuel discharge nozzle for providing a metered rate of fuel flow from said source of fuel to said second fuel discharge nozzle, first adjustable cam means operatively connected to said air valve and said first fuel metering valve assembly effective for adjusting the degree of opening of said first fuel metering valve assembly relative to the position of said air valve, second adjustable cam means operatively connected to said air valve and said second fuel metering valve assembly effective for adjusting the degree of opening of said

second fuel metering valve assembly relative to the position of said air valve, each of said first and second adjustable cam means comprising a cam body freely mounted on said air valve shaft means for rotation thereabout and relative thereto, and an adjustment member fixedly secured to said air valve shaft means for rotation therewith, said adjustment member comprising an adjustment body fixedly carried by said air valve shaft means, a threaded member threadably engaged with and carried by said adjustment body, said threaded member including a ball-like connecting portion, and said cam body including a key-like opening formed therein for closely receiving said ball-like connecting portion being effective to cause adjustable rotation of said cam body about said air valve shaft means in response to adjustable threaded rotation of said threaded member in said adjustment body.

6. An air valve carburetor according to claim 5, including first and second access openings formed in said carburetor body permitting the passage therethrough of suitable tool means for engaging and adjustably threadingly rotating each of said threaded members.

7. An air valve carburetor, comprising a carburetor body, a first induction passage formed through said body and including a first variably positionable throttle valve therein, a second induction passage formed through said body and including a second variably positionable throttle valve therein, a source of fuel, an air valve mounted within an inlet portion of said first and second induction passages so as to be responsive to the total volume of air flow through said induction passages, pivotal air valve shaft means fixedly secured to said air valve for enabling said air valve to pivotally deflect in relation to the volume rate of air flow through said induction passages, a first fuel discharge nozzle for discharging metered fuel into said first induction passage at a point generally downstream of said air valve but upstream of said first throttle valve, a second fuel discharge nozzle for discharging metered fuel into said second induction passage at a point generally downstream of said air valve but upstream of said second throttle valve, a first variably openable fuel metering valve assembly situated generally between said source of fuel and said first fuel discharge nozzle for providing a metered rate of fuel flow from said source of fuel to said first fuel discharge nozzle, a second variably openable fuel metering valve assembly situated generally between said source of fuel and said second fuel discharge nozzle for providing a metered rate of fuel flow from said source of fuel to said second fuel discharge nozzle, first adjustable cam means operatively connected to said air valve and said first fuel metering valve assembly effective for adjusting the degree of opening of said first fuel metering valve assembly relative to the position of said air valve, second adjustable cam means operatively connected to said air valve and said second fuel metering valve assembly effective for adjusting the degree of opening of said second fuel metering valve assembly relative to the position of said air valve, said source of fuel comprising fuel bowl means carried by said carburetor body, each of said first and second variably openable fuel metering valve assemblies being situated within said fuel bowl means, each of said first and second adjustable cam means being situated within said fuel bowl means, and first and second lever means situated within said fuel bowl means, each of said lever means being pivotally connected to a support portion within said fuel bowl means and including a follower portion for respectively engaging said first and second adjustable cam means and a valve actuating portion for operatively respectively engaging said first and second variably openable fuel metering valve assemblies, each of said lever means being respectively effective to transmit motion generated by said first and second cam assemblies as a result of rotation of said air valve to said first and second variably openable fuel metering valve assemblies.

* * * * *