Sept. 20, 1966 G. R. MORTON 3,273,869

CARBURETOR MEANS FOR INTERNAL COMBUSTION ENGINES

Filed Aug. 19, 1963 2 Sheets-Sheet 1

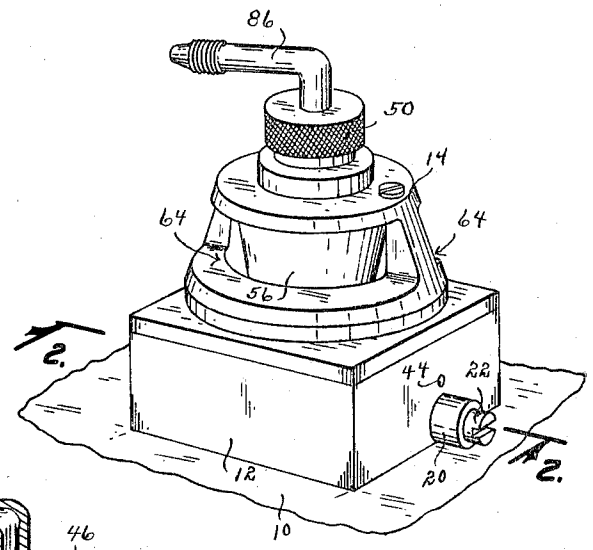


Fig. 1

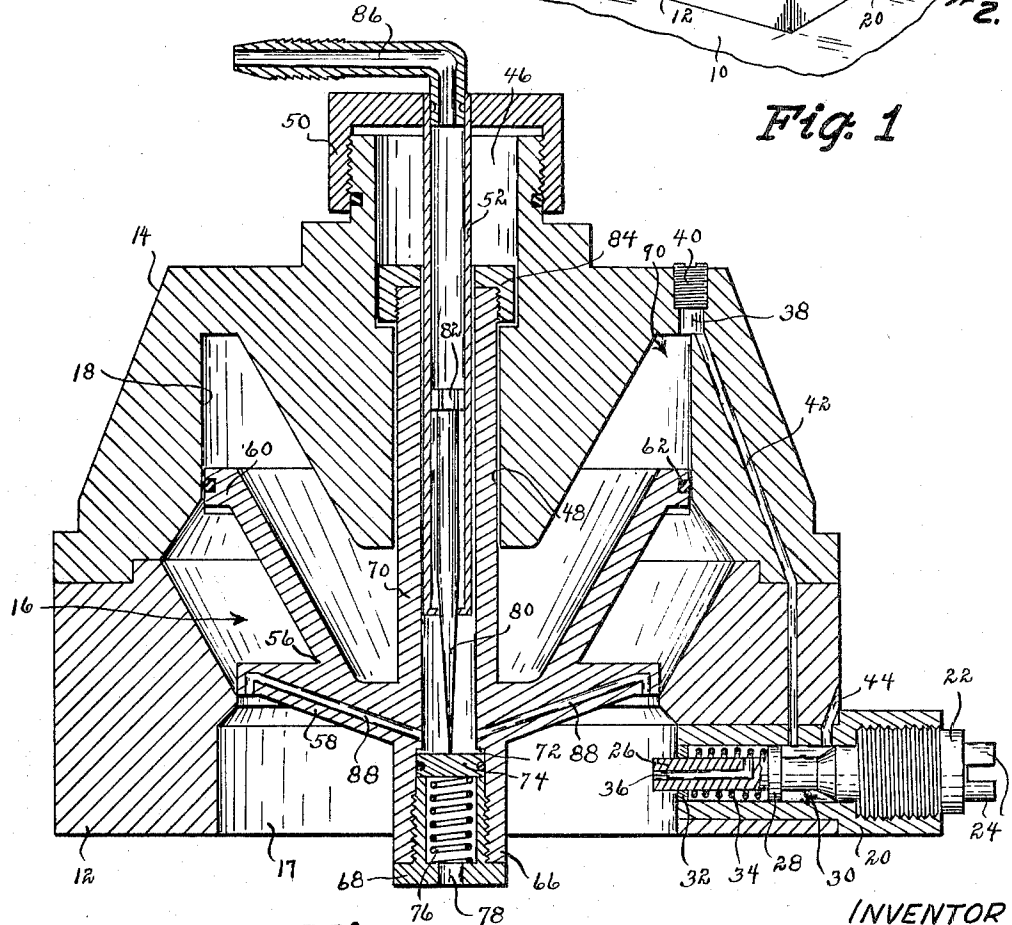


Fig. 2

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CARBURETOR MEANS FOR INTERNAL COMBUSTION ENGINES

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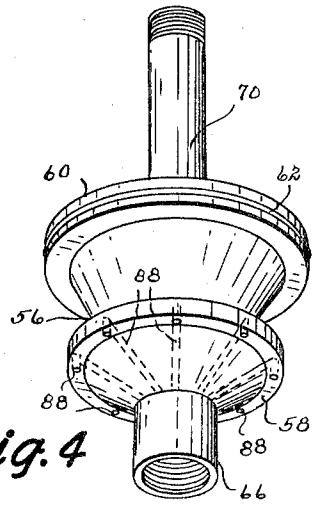


Fig. 4

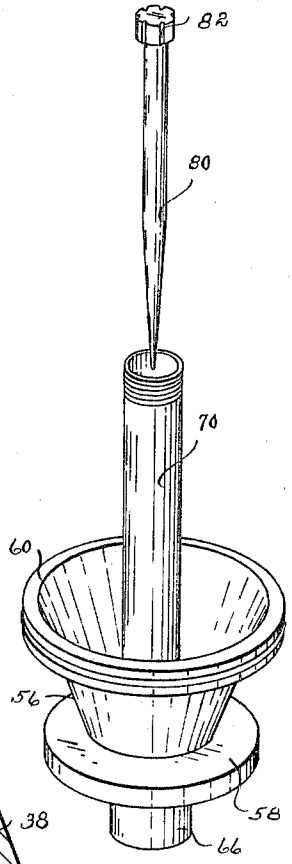


Fig. 5

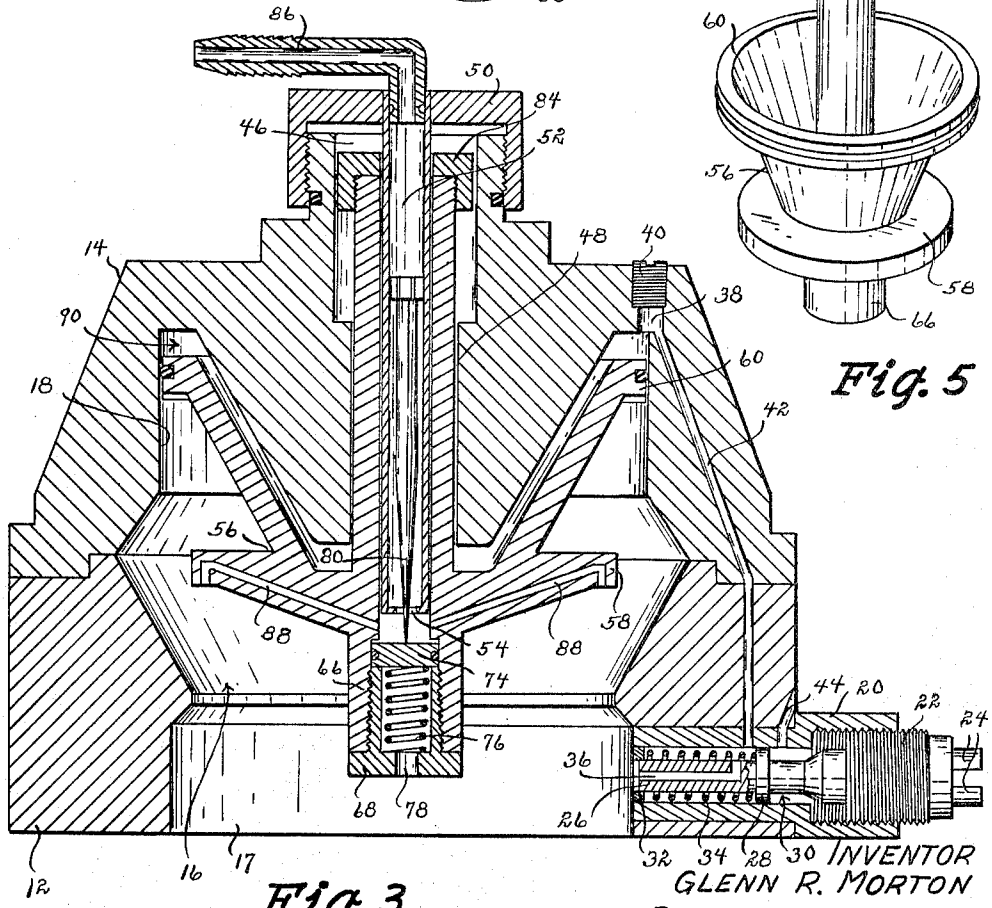


Fig. 3

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3,273,869

CARBURETOR MEANS FOR INTERNAL COMBUSTION ENGINES

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10 Claims. (Cl. 261—40)

This invention relates to carburetors for internal combustion engines and more particularly to a carburetor that will automatically adjust to varying temperatures, atmospheric pressures and engine manifold pressures.

Substantially all internal combuston engines employ a carburetor to mix the liquid fuel, such as gasoline, and air into an ignitable gas. Obviously the efficiency of the engine will depend on the proper mixture of the air and liquid fuel. Most standard carburetors may be adjusted for maximum efficiency for a given engine speed, and/or a given atmospheric pressure. However, most carburetors have only one general use control, i.e. a butterfly throttle valve in the air inlet conduit. This air flow is induced by the engine piston suction and is hereinafter referred to as manifold pressure. The carburetors now in general use have a gasoline float actuated valve in the fuel supply line and a fuel pump to furnish the gasoline to the carburetor bowl. Obviously, such a mechanism is complicated, and does not automatically adjust to changing conditions.

Therefore one of the principal objects of my invention is to provide a carburetor of simplified parts that will automatically compensate for varying conditions of pressures and temperatures.

A further object of this invention is to provide a carburetor that will balance its throttle position with the outside atmosphere as the engine manifold pressure changes.

A still further object of this invention is to provide a carburetor that will automatically enrich the mixture of gasoline at critical engine stages of operation that require such additional fuel.

A still further object of this invention is to provide a carburetor that will successfully operate without a fuel pump or float valve.

A still further object of this invention is to provide a carburetor that provides gasoline without objectionable heat induced air bubbles.

A still further object of this invention is to provide a carburetor that while automatic in general efficient operation, is at all times under the control of the operator.

A still further object of this invention is to provide a carburetor that provides rapid engine acceleration.

A still further object of this invention is to provide a carburetor that idles perfectly.

A still further object of this invention is to provide a carburetor that is so efficient under all conditions that the pollution of the air from the engine's exhaust is greatly reduced.

Still further objects of my invention is to provide a carburetor that is economical in manufacture and durable in use.

These and other objects will be apparent to those skilled in the art.

This invention consists in the construction, arrangements, and combination, of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, specifically pointed out in the claims, and illustrated in the accompanying drawings, in which:

FIG. 1 is a perspective view of my carburetor installed on an internal combustion engine.

FIG. 2 is an enlarged vertical sectional view of my carburetor illustrating the construction of the same.

FIG. 3 is an enlarged vertical sectional view of my carburetor with movable parts in positions different than that shown in FIG. 2.

FIG. 4 is a lower perspective view of the movable throttle of the device, and

FIG. 5 is an upper perspective view of the throttle and needle valve of my carburetor.

In the drawings I have used the numeral 10 to designate the intake manifold of the internal combustion engine and to which my carburetor is associated and into which it communicates.

The main housing of my carburetor consists of a lower housing 12 communicating with an upper housing 14, as shown in FIG. 3. The lower housing 12 has an internal chamber 16 which is adapted to be in communication with the intake manifold of the engine upon which the unit is to be used, such as the opening 17. The upper housing 14 has an internal cylindrical chamber 18 which, except for the throttle to be described hereafter, would be in communication with the chamber 16 in the lower housing 12. The numeral 20 designates a radial horizontal cylinder in the lower portion of the housing 12. This cylinder communicates at its forward end with the opening 17 and at its rear end with the outside of the carburetor. Threaded into this cylinder is a core member 22 having actuatable lugs 24. On the forward inner end of the core 22 is a shaft 26, having a diameter less than that of the diameter inside of the cylinder 20. Between the two ends of the shaft portion 26 is a piston 28. By this structure an area 30 is provided back of the piston 28. The numeral 32 designates a fixed sealing ring in the forward end of the cylinder 20, and through which the piston 26 may reciprocate. The numeral 34 designates a coil spring embracing the shaft 26 and has one end engaging the ring 32 and its other end engaging the forward side of the piston 28. The purpose of this spring is to yieldingly take up any slack experienced in the looseness of the threads of the cylinder 20 and core 22. The numeral 36 designates a passageway in the shaft 26 having its forward end communicating with the opening 17 and its other end in communication with the inside of the cylinder 20 just forward of the piston 28. The numeral 38 designates a well in the top of the housing 14 having its bottom communicating with the inside top of the cylinder bore area 18. The top of this well is closed by a cap screw 40 threaded into its top area. The numeral 42 designates a passageway in the lower and upper housings 12 and 14 and has one end communicating with the inside of the well 38 and its other end communicating with the inside of the cylinder, as shown in FIG. 2 and FIG. 3. The numeral 44 designates an air passageway in the housing 12 and cylinder 20, having one end communicating with the outside atmosphere and its other end communicating with the inside of the cylinder 20 at a point to the rear of the point where the passageway 42 communicates the inside of the cylinder 20. The numeral 46 designates a well in the top central area of the upper housing 14. The numeral 48 designates a vertical centrally located bore passageway through the housing 14 and communicating with the center bottom of the well 46. This bore 48 is of a diameter less than that of the diameter of the well 46. The numeral 50 designates a cap threaded onto the top of the housing 14 and closing the top of the well 46. The numeral 52 designates a vertical pipe having its upper end secured to the center inside of the cap 50. This pipe 52 extends downwardly through the bore 48 and is of a diameter substantially less than that of the inside diameter of the bore 48. In the bottom of the pipe 52 is a valve opening 54. The numeral 56 generally designates the vertically slidable throttle valve which is spool shaped in that it has a downwardly and outwardly extending lower skirt portion 58 and an upwardly and outwardly extending skirt portion 60. The skirt 60 slides within the cylinder bore 18 and a seating ring 62 is imposed between the edge of the skirt 60 and bore 18. The area between the two skirts 58 and 60 com-

municates with the outside atmosphere through the opening or openings 64 that extend through the wall of the upper housing 14. On the bottom center of the throttle 56 is a downwardly extending stub tube 66. The numeral 68 designates a thimble threaded into the stub 66. The numeral 70 designates an upwardly extending tube on the top center of the throttle 56. This tube 70 vertically slides around the pipe tube 52, vertically slides in the bore 48 and extends into the well 46. This tube 70 also has its bottom end communicating with the inside center top of the stub tube 66. The diameter of the inside of the tube 70 is slightly less than that of the inside of the stub tube 66 to provide a shoulder 72. Slidably mounted in the stub tube 66 and above the thimble 68 is a free piston 74. The numeral 76 designates a coil spring in the thimble 68 for yieldingly holding the free piston 74 in an upward position of its sliding movement. The shoulder 72 limits the upper movement of the free piston 74. The numeral 78 designates a passageway through the bottom of the thimble 68. The numeral 80 designates a tapered elongated needle valve, slidably mounted inside the tube 52, having its pointed lower end portion slidable through the valve opening 54, and its lower end riding on the top of the free piston 74. The numeral 82 designates a vertical funnel head on the top of the needle valve 80. The numeral 84 designates a pierced nut, threaded into the upper end of the pipe tube 70, embracing the pipe tube 52, and slidable within the well 46. The numeral 86 designates a pipe communicating with the inside top of the pipe tube 52 and adapted to be in communication with a source of ignitable fuel such as gasoline. The numeral 88 designates a plurality of radially extending spaced apart passageways in the lower skirt 58 of the throttle valve. These passageways 88 each communicate at its inner end with the inside bottom area of the tube portion 70 and at its outer end with the opening 17, at a point on the under side of the skirt 58 near the outer peripheral rim of the skirt 58 and shown in FIG. 2. The numeral 90 designates an area in the bore 18 above the throttle 56.

The practical operation of the device is as follows:

The throttle 56, is vertically floatable, but is controlled by engine suction and atmospheric pressures working in conjunction with or again each other. The area between the two skirts of the throttle 56 is exposed to the outside atmosphere and in some experiments I permitted air to leak around the edge of the upper skirt 60 into the area 90. However if there be any leakage, and with the parts in positions shown in FIG. 3, any such leakage would be pulled into the engine intake manifold. From the foregoing it will be appreciated that if sufficient manifold suction exists in the area 90, relative to that of atmospheric pressure, the throttle 56 will move upwardly, thus raising the needle valve 80 upwardly and permitting a greater amount of gasoline to be drawn from the pipe 86, through the pipe 52 past the needle valve 80, into the tube pipe 70, and out through the passageways 88. If the suction or minus atmospheric pressure in the area is not great or is nonexistent, the throttle 56 will slide downwardly thereby permitting the needle valve 80 to drop and thereby reducing the amount of gasoline passing through the carburetor. Thus, although the throttle does have a floating automatic action due to pressures or lack of pressures above the skirt 60 versus pressures or lack of pressures below the skirt 60, the general manual control of the carburetor will be the regulation of the pressure above the skirt 60. This is accomplished by the rotation of the core 22. In FIG. 1 and FIG. 2, the piston portion 28 is shown at extreme positions merely for purposes of illustration. In actual practice the core 22 may be turned only slightly to move the piston portion 28 to positions when it will permit the passageway 42 to communicate with the passageway 36 or communicate with the passageway 44. When the piston portion 28 is forward of the passageway 42, the area 90 will be of atmospheric pressure because the area 90 will be in communication with the outside atmosphere via the well 38, passageway 42, area 30, and passageway 44. Under such circumstances the throttle 56 will be in a lowered position. If the core 22 is rotated to a position such as shown in FIG. 3, suction minus pressure will exist in the area 90, and the throttle 56 will be in an upward position by virtue of the manifold minus pressure drawing through the passageway 36, passageway 42, well 38 and area 90. The core 22 may be rotated to an adjusted position where the piston 28 will permit adjustable communication between the manifold suction pressure and the passageway 42, thereby, in bounds, controlling the floating position of the throttle. By controlling the general position of the throttle, the speed of the engine will be controlled. The area 16 which is in the lower housing portion 12 and the lower part of the housing 14, should have first an increasing diameter and then a decreasing diameter as shown in FIG. 2, so that when the throttle is in a middle position of its reciprocation, the greater will be the air passing through the carburetor. By the passageways 88 (which are a part of the fuel conduit means) exiting on the underside of the skirt 58 near its periphery, a venturi action will result, pulling the gasoline into and through the device. This phase eliminates the need for a fuel pump. Inasmuch as the gasoline is drawn into the top area of the carburetor, it will be of relatively cool temperature and much of the herebefore objectionable heat induced "bubbling" will be eliminated. The air rushing downwardly around the skirt 58, will successfully join and mix with the exiting gasoline. The floating needle valve 80 is also adjustable, affected by vacuum manifold pressure independently of manifold pressure above the skirt 60. This action is due to the underside of the floating piston 74 being in communication with the manifold pressure through the passageway 78. The piston 74 is only yieldingly held against this suction by the spring 76, and the spring's tension is adjustable by the rotation of the threaded thimble 68. Inasmuch as the needle 80 rides in the piston 74, its position will be automatically adjusted by the piston 74. This phase irons out the action of the carburetor during rapid throttle settings. The needle valve is further operatively adjustable in its function by rotating the cap 50, which raises or lowers the pipe tube 52.

Some changes may be made in the construction and arrangement of my carburetor means for internal combustion engines without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. In a carburetor means for internal combustion engines,

a carburetor housing having an upper bore and a lower compartment area;

said lower compartment area adapted to be in communication with the intake manifold of an internal combustion engine,

throttle valve means slidably mounted in the bore of said housing and adapted to adjustably restrict the entrance to said lower compartment area,

an air inlet port communicating with the inside of said carburetor housing at a point located above the entrance to said lower compartment area,

a passageway means in said carburetor housing having one end communicating with the lower compartment area of said carburetor housing and its other end communicating with the upper bore of said carburetor housing and above said throttle valve means,

a manually adjustable valve means imposed in said passageway means, a conduit means having one end adapted to be in communication with a source of ignitable fluid, and its other end in communication with the lower area of said carburetor housing,

a valve seat imposed in said conduit means,

means mounting a reciprocating needle valve extending into said valve seat,

and a means associated with said throttle valve means for progressively moving said needle valve in a direction away from said valve seat when said throttle progressively moves upwardly;

said manually adjustable valve means being also in communication with the outside atmosphere and capable at one position of its movement of permitting outside air to pass into the passageway in which it is imposed.

2. In a carburetor means for internal combustion engines,

a carburetor housing having an upper bore and a lower compartment area;

said lower compartment area adapted to be in communication with the intake manifold of an internal combustion engine,

throttle valve means slidably mounted in the bore of said housing and adapted to adjustably restrict the entrance to said lower compartment area,

an air inlet port communicating with the inside of said carburetor housing at a point located above the entrance to said lower compartment area,

a passageway means in said carburetor housing having one end communicating with the lower compartment area of said carburetor housing and its other end communicating with the upper bore of said carburetor housing and above said throttle valve means,

a manually adjustable valve means imposed in said passageway means,

a conduit means having one end adapted to be in communication with a source of ignitable fluid, and its other end in communication with the lower area of said carburetor housing,

a valve seat imposed in said conduit means,

means mounting a reciprocating needle valve extending into said valve seat,

and a means associated with said throttle valve means for progressively moving said needle valve in a direction away from said valve seat when said throttle progressively moves upwardly;

said throttle valve means being in the general form of a spool having a lower skirt portion and a spaced apart upper skirt portion, and with said conduit means including passageways exending through said lower skirt portion.

3. In a carburetor means for internal combustion engines,

a carburetor housing having an upper bore and a lower compartment area;

said lower compartment area adapted to be in communication with the intake manifold of an internal combustion engine,

throttle valve means slidably mounted in the bore of said housing and adapted to adjustably restrict the entrance to said lower compartment area,

an air inlet port communicating with the inside of said carburetor housing at a point located above the entrance to said lower compartment area,

a passageway means in said carburetor housing having one end communicating with the lower compartment area of said carburetor housing and its other end communicating with the upper bore of said carburetor housing and above said throttle valve means,

a manually adjustable valve means imposed in said passageway means,

a conduit means having one end adapted to be in communication with a source of ignitable fluid, and its other end in communication with the lower area of said carburetor housing,

a valve seat imposed in said conduit means,

means mounting a reciprocating needle valve extending into said valve seat,

and a means associated with said throttle valve means

for progressively moving said needle valve in a direction away from said valve seat when said throttle progressively moves upwardly;

said throttle valve means being in the general form of a spool having a lower skirt portion and a spaced apart upper skirt portion, and with said conduit means including passageways extending through said lower skirt portion, and exiting at the underside of said lower skirt portion near its periphery.

4. In a carburetor means for internal combustion engines,

a carburetor housing having an upper bore and a lower compartment area;

said lower compartment area adapted to be in communication with the intake manifold of an internal combustion engine,

throttle valve means slidably mounted in the bore of said housing and adapted to adjustably restrict the entrance to said lower compartment area,

an air inlet port communicating with the inside of said carburetor housing at a point located above the entrance to said lower compartment area,

a passageway means in said carburetor housing having one end communicating with the lower compartment area of said carburetor housing and its other end communicating with the upper bore of said carburetor housing and above said throttle valve means,

a manually adjustable valve means imposed in said passageway means,

a conduit means having one end adapted to be in communication with a source of ignitable fluid, and its other end in communication with the lower area of said carburetor housing,

a valve seat imposed in said conduit means,

means mounting a reciprocating needle valve extending into said valve seat,

a means associated with said throttle valve means for progressively moving said needle valve in a direction away from said valve seat when said throttle progressively moves upwardly, and means for adjustably changing the position of said valve seat relative to said throttle valve means.

5. In a carburetor means for internal combustion engines,

a carburetor housing having an upper bore and a lower compartment area;

said lower compartment area adapted to be in communication with the intake manifold of an internal combustion engine,

throttle valve means slidably mounted in the bore of said housing and adapted to adjustably restrict the entrance to said lower compartment area,

an air inlet port communicating with the inside of said carburetor housing at a point located above the entrance to said lower compartment area,

a passageway means in said carburetor housing having one end communicating with the lower compartment area of said carburetor housing and its other end communicating with the upper bore of said carburetor housing and above said throttle valve means,

a manually adjustable valve means imposed in said passageway means,

a conduit means having one end adapted to be in communication with a source of ignitable fluid, and its other end in communication with the lower area of said carburetor housing,

a valve seat imposed in said conduit means,

means mounting a reciprocating needle valve extending into said valve seat,

and a means associated with said throttle valve means for progressively moving said needle valve in a direction away from said valve seat when said throttle progressively moves upwardly;

said conduit means extending into said carburetor hous-

ing from the top of said carburetor housing and downwardly into said throttle valve means.

6. In a carburetor means for internal combustion engines,

a carburetor housing having an upper bore and a lower compartment area;

said lower compartment area adapted to be in communication with the intake manifold of an internal combustion engine,

throttle valve means slidably mounted in the bore of said housing and adapted to adjustably restrict the entrance to said lower compartment area,

an air inlet port communicating with the inside of said carburetor housing at a point located above the entrance to said lower compartment area,

a passageway means in said carburetor housing having one end communicating with the lower compartment area of said carburetor housing and its other end communicating with the upper bore of said carburetor housing and above said throttle valve means,

a manually adjustable valve means imposed in said passageway means,

a conduit means having one end adapted to be in communication with a source of ignitable fluid, and its other end in communication with the lower area of said carburetor housing,

a valve seat imposed in said conduit means,

means mounting a reciprocating needle valve extending into said valve seat,

and a means associated with said throttle valve means for progressively moving said needle valve in a direction away from said valve seat when said throttle progressively moves upwardly;

said last mentioned means including a member carried by said throttle valve means and in contact with the pointed end of said needle valve.

7. In a carburetor means for internal combustion engines,

a carburetor housing having an upper bore and a lower compartment area;

said lower compartment area adapted to be in communication with the intake manifold of an internal combustion engine,

throttle valve means slidably mounted in the bore of said housing and adapted to adjustably restrict the entrance to said lower compartment area,

an air inlet port communicating with the inside of said carburetor housing at a point located above the entrance to said lower compartment area,

a passageway means in said carburetor housing having one end communicating with the lower compartment area of said carburetor housing and its other end communicating with the upper bore of said carburetor housing and above said throttle valve means,

a manually adjustable valve means imposed in said passageway means,

a conduit means having one end adapted to be in communication with a source of ignitable fluid, and its other end in communication with the lower area of said carburetor housing,

a valve seat imposed in said conduit means,

means mounting a reciprocating needle valve extending into said valve seat,

and a means associated with said throttle valve means for progressively moving said needle valve in a direction away from said valve seat when said throttle progressively moves upwardly;

said last mentioned means including a spring loaded member carried by said throttle valve and in contact with the pointed end of said needle valve means.

8. In a carburetor means for internal combustion engines,

a carburetor housing having an upper bore and a lower compartment area;

said lower compartment area adapted to be in communication with the intake manifold of an internal combustion engine,

throttle valve means slidably mounted in the bore of said housing and adapted to adjustably restrict the entrance to said lower compartment area,

an air inlet port communicating with the inside of said carburetor housing at a point located above the entrance to said lower compartment area,

a passageway means in said carburetor housing having one end communicating with the lower compartment area of said carburetor housing and its other end communicating with the upper bore of said carburetor housing and above said throttle valve means,

a manually adjustable valve means enclosed in said passageway means,

a conduit means having one end adapted to be in communication with a source of ignitable fluid, and its other end in communication with the lower area of said carburetor housing,

a valve seat imposed in said conduit means,

means mounting a reciprocating needle valve extending into said valve seat,

and a means associated with said throttle valve means for progressively moving said needle valve in a direction away from said valve seat when said throttle progressively moves upwardly;

said last mentioned means including an adjustable member carried by said throttle valve means and in contact with the pointed end of said needle valve.

9. In a carburetor means for internal combustion engines,

a carburetor housing having an upper bore and a lower compartment area;

said lower compartment area adapted to be in communication with the intake manifold of an internal combustion engine,

throttle valve means slidably mounted in the bore of said housing and adapted to adjustably restrict the entrance to said lower compartment area,

an air inlet port communicating with the inside of said carburetor housing at a point located above the entrance to said lower compartment area,

a passageway means in said carburetor housing having one end communicating with the lower compartment area of said carburetor housing and its other end communicating with the upper bore of said carburetor housing and above said throttle valve means,

a manually adjustable valve means imposed in said passageway means,

a conduit means having one end adapted to be in communication with a source of ignitable fluid, and its other end in communication with the lower area of said carburetor housing,

a valve seat imposed in said conduit means,

means mounting a reciprocating needle valve extending into said valve seat,

and a means associated with said throttle valve means for progressively moving said needle valve in a direction away from said valve seat when said throttle progressively moves upwardly;

said last mentioned means including a spring loaded member carried by said throttle valve means and in contact with the pointed end of said needle valve;

said spring loaded member having an area adapted to be in communication with the intake manifold of an internal combustion engine.

10. In a carburetor means for internal combustion engines,

a carburetor housing having a bore area and a compartment area,

said compartment area adapted to be in communication with the intake manifold of an internal combustion engine,

throttle valve means slidably mounted in said bore area of said housing and adapted to variably restrict the entrance to said compartment area,

at least one fluid exit passageway in said throttle valve means communicating at one of its ends with said compartment area,

said housing having an air inlet means formed therein communicating with said compartment area,

said carburetor housing having a passageway means formed therein having one end communicating with the compartment area of said carburetor housing and its other end communicating with the bore area of said carburetor housing,

a manually adjustable valve means imposed in said passageway means,

a conduit means having one end adapted to be in communication with a source of ignitable fluid and its other end in communication with the other end of said fluid exit passageway,

a valve seat imposed in said conduit means,

means mounting a reciprocating tapered needle valve extending into said valve seat,

and a means associated with said throttle valve means for moving said needle valve in a direction away from said valve seat when said throttle means moves in one direction.

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