

Oct. 20, 1953

E. H. FOSTER
CHARGE FORMING DEVICE

2,656,166

Filed July 12, 1949

2 Sheets-Sheet 1

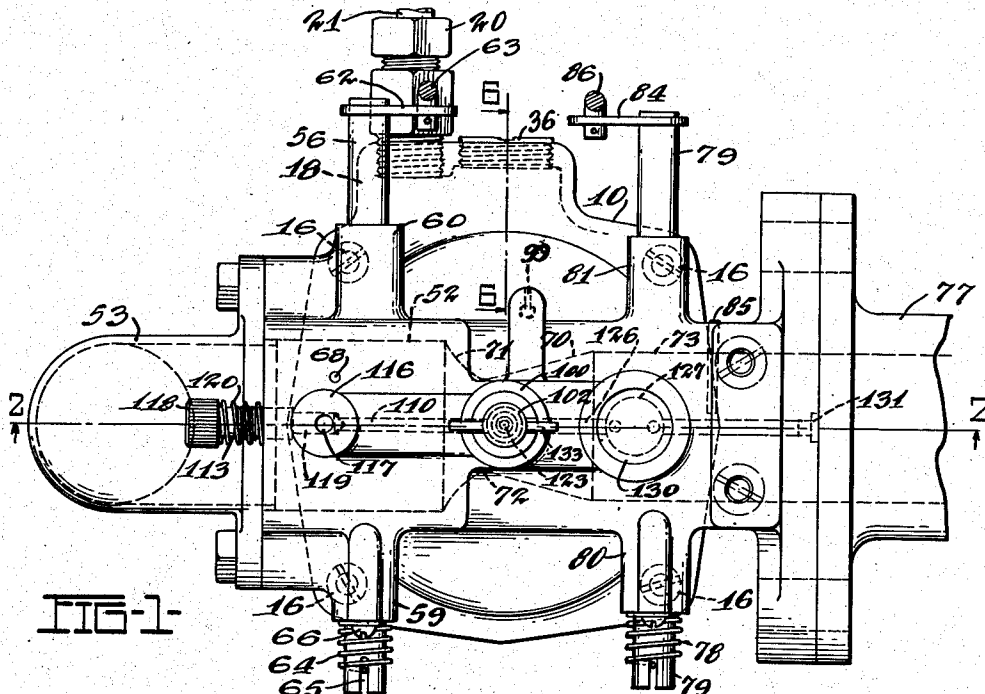


FIG-1-

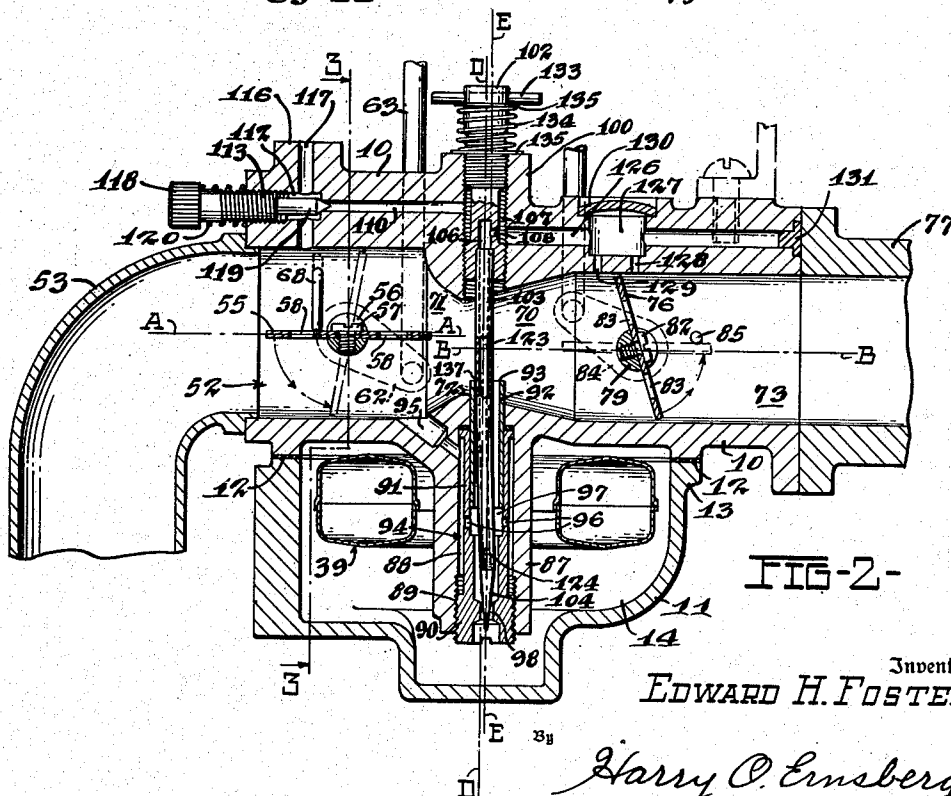


FIG-2-

Inventor:
EDWARD H. FOSTER.

Harry O. Emsberger
Attorney

Oct. 20, 1953

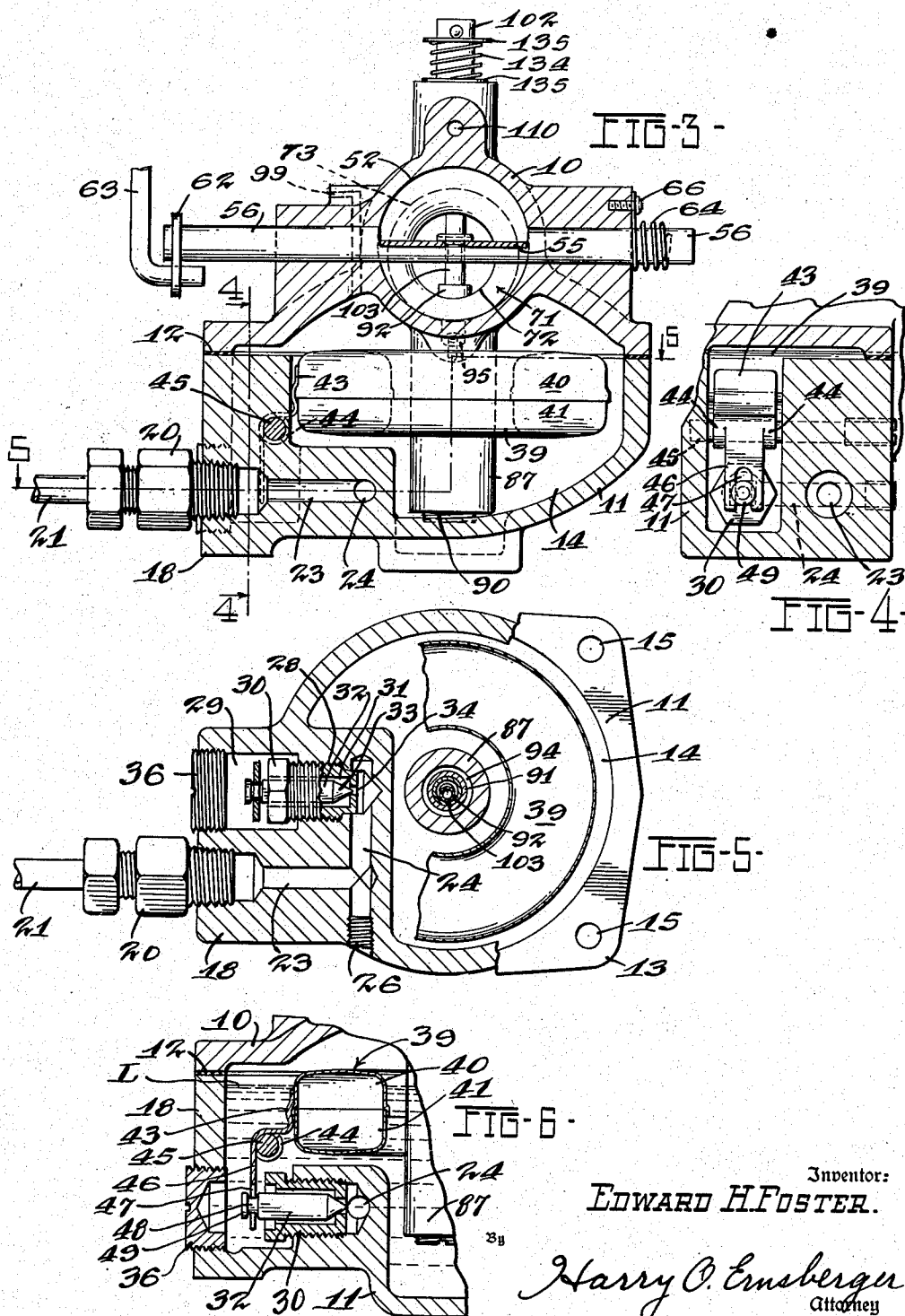
E. H. FOSTER

2,656,166.

CHARGE FORMING DEVICE

Filed July 12, 1949

2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,656,166

CHARGE FORMING DEVICE

Edward H. Foster, Toledo, Ohio, assignor to The
Tillotson Manufacturing Company, Toledo,
Ohio, a corporation of Ohio

Application July 12, 1949, Serial No. 104,225

13 Claims. (Cl. 261—41)

1

This invention relates to charge forming apparatus for use with internal combustion engines and more especially to a carburetor of a character particularly adaptable for use with comparatively small internal combustion engines having relatively small piston displacement of a character particularly adaptable for driving or operating bicycles, motor cycles, lawn mowers, small garden tractors, marine engines, stationary industrial engines and the like.

The invention embraces the provision of a carburetor device wherein the elements thereof are assembled and compacted to occupy a relatively small space so as to render the device readily adaptable for use with engines wherein only a limited space is available for a carburetor device.

The invention further comprehends the provision of a carburetor in which the float chamber adapted to contain fuel supply is disposed directly beneath a mixing passage so as to minimize the distance through which fuel must be elevated for discharge into the mixing passage of the carburetor.

An object of the invention is the provision of an air inlet chamber in a carburetor constructed and arranged out of alignment with the axis of a venturi and the passage conveying the fuel and air mixture to an engine.

Another object of the invention resides in the provision of a bleeding arrangement for introducing air into fuel contained in a fuel well prior to the discharge of the fuel from the main nozzle into the venturi or mixing passage.

Still a further object of the invention is the provision of a tubular member forming a means or passage for conveying fuel to an idle jet and also serving as an adjustment for metering fuel to a fuel supply well in the carburetor.

Still another object of the invention resides in the arrangement and construction of a float chamber, fuel well and mixing passage wherein a minimum amount of lifting force is required to discharge fuel from a main orifice or nozzle into a mixing passage.

Still another object of the invention is the provision of a combined idle fuel supply tube and metering device extending through a high speed fuel discharge orifice, the idle tube and metering device being out of alignment with the axis of the main fuel discharge orifice whereby the major amount of fuel discharged from the high speed jet is emitted into a mixing passage at one side of the idle tube and metering device.

Further objects and advantages are within the scope of this invention such as relate to the arrangement, operation and function of the related elements of the structure, to various details of construction and to combinations of parts, elements per se, and to economies of manufacture

2

and numerous other features as will be apparent from a consideration of the specification and drawing of a form of the invention, which may be preferred, in which:

Figure 1 is a top plan view illustrating one form of carburetor of my invention;

Figure 2 is a vertical sectional view through the carburetor, the section being taken substantially on the line 2—2 of Figure 1;

Figure 3 is a vertical sectional view taken substantially on the line 3—3 of Figure 2;

Figure 4 is a fragmentary detail sectional view taken substantially on the line 4—4 of Figure 3;

Figure 5 is a transverse sectional view taken substantially on the line 5—5 of Figure 3;

Figure 6 is a fragmentary sectional view taken substantially on the line 6—6 of Figure 1.

While I have illustrated my invention as embodied in a carburetor especially adapted for use with comparatively small internal combustion engines, it is to be understood that I contemplate the utilization of the principles of my invention in any device wherein the same may be found to be applicable.

Referring to the drawings in detail, the carburetor is inclusive of a body 10 beneath which is arranged a fuel receptacle or float bowl 11, a gasket 12 being interposed between the float bowl and the body for establishing a fluid tight joint between these elements. The bowl 11 is of hollow configuration forming a chamber 14 adapted to contain fuel to be discharged through suitable jets as hereinafter explained. The bowl member 11 is provided with a flange portion 13 having a plurality of openings 15 adapted to receive screws 16 for securely fastening the bowl member 11 to the carburetor body 10.

The bowl member 11 is formed with a boss portion 18 which is drilled and threaded to accommodate a fitting 20 to which is connected a tube or conduit 21 for conveying fuel or gasoline from a tank or reservoir (not shown) to the carburetor. The boss 18 is formed with a bore 23 which is in communication through the fitting 20 with the fuel conveying tube 21, a second bore 24 being arranged substantially at right angles to the bore 23 and intersecting the same. The passage 24 is drilled into the boss 18 and the entrance portion threaded to receive a plug 26 closing the outer end of the passage 24 as shown in Figure 5. The boss 18 is provided with a pair of axially arranged bores or chambers 28 and 29 as shown in Figure 5, a portion of the inner wall of the smaller bore 28 being threaded to accommodate a valve cage or fitting 30. The fitting 30 is provided with a longitudinal channel or bore 31 which accommodates a valve member 32 having a polygonally-shaped body and a tapered extremity 33, the latter extending into an orifice 34 formed in the fitting 30, the position of the valve 32 determining the rate of flow of fuel through the ori-

3

fice 34 and along the facets of the polygonally-shaped body of the valve into the chamber 29. A portion of the wall 29 is threaded to receive a plug 36 so as to close the chamber 29.

Float means are provided for controlling the position of the valve 32. Disposed within the chamber 14 is an annular or doughnut-shaped float 39 preferably made in two cup like portions 40 and 41 which overlap as shown in Figure 6, the juncture or overlap seam being soldered or otherwise hermetically sealed. The walls of the cup like portions 40 and 41 comprising the float member are comparatively thin and are fabricated of a metal which is noncorrosive and will not be affected by the liquid fuel. Soldered or otherwise secured to the float 39 is an arm 43 having laterally spaced cylindrical portions 44 as shown in Figure 4 through which extends a pivot pin or pintle 45 providing a fulcrum for the float 39. The arm 43 is formed with a depending portion 46 provided with a slot 47 which accommodates a tenon or reduced portion 48 formed on the needle valve 32 as shown in Figure 6. A head portion 49 is formed on the needle valve 32 adjacent the reduced portion 48, the head forming an abutment arranged to be engaged by the depending portion 46 when the fuel level falls or is lowered in the chamber 14 which in turn causes the float to swing downwardly about the fulcrum pin 45 moving the needle valve 32 to open position. Through this connection between the float 39 and the needle valve 32, the position of the float controls the flow of fuel into the chamber 14.

The carburetor body 10 is formed with an air inlet passage 52 which may be connected with a suitable air inlet tube 53 if desired. The latter may be connected to an air cleaner or filter (not shown) to admit clean air into the carburetor body. The air passage or inlet 52 is of cylindrical configuration, and disposed in the passage is an air regulating or choke valve 55 which is of disk-like formation and is secured to a transversely extending shaft 56 by means of a screw 57 or other suitable means. The air controlling valve 55 may be formed with small openings 58 to admit the passage of some air through the carburetor even when the valve is in closed position as indicated in dotted lines in Figure 2. The air valve operating shaft 56 is journaled for rotation in suitable boss portions 59 and 60 formed on the carburetor body. Fixedly secured to one end of the shaft is an arm 62 which is connected to an operating rod 63 for manipulating the air or choke valve 55. A coil spring 64 surrounds the other end of the shaft 56, one end of the spring extending into a slot 65 formed in the shaft, the other end of the spring being secured to the carburetor body by means of a screw 66. The spring 64 is coiled or stressed to exert a rotative tension upon the shaft 56 tending at all times to urge the air valve 55 to open position as shown in full lines in Figure 2. An abutment pin or stop 68 is fixedly secured in an opening in the wall of the air passage, the pin being engaged by the valve disk 55 to determine the full open position of the valve.

A mixing passage 70 is formed in the carburetor body and is inclusive of a venturi 71 having a restricted throat portion 72, the inlet end of the venturi being in direct communication with the air inlet passage 52, the other end of the Venturi configuration being in communication with a cylindrical outlet passage 73 provided in the body and forming part of the mixing pas-

4

sage. As particularly shown in Figures 2 and 3, the axis BB of the venturi and mixture outlet passage 73 is below the axis AA of the air inlet passage 52 of the carburetor. By positioning the axis of the venturi in the manner shown in the drawings, the fuel discharged into the venturi from a discharge orifice or jet hereinafter described does not have to be elevated or lifted but a comparatively small distance above the fuel level in the chamber 14. Disposed in the mixture outlet passage 73 is a circular disk-like valve 76 which functions as a throttle valve for controlling the flow of fuel and air mixture to an engine manifold 77. The valve 76 is mounted upon a transversely extending shaft 79 which is journaled in bosses 80 and 81 formed in the body of the carburetor, the valve disk 76 being secured to a central flattened portion of the shaft 79 by means of a screw 82 or other suitable securing means. The valve disk 76 is provided with two or more small openings 83 to provide for passage of a comparatively small amount of air through the carburetor to be mixed with fuel for engine idling purposes in a manner hereinafter explained. An abutment or stop means in the form of a pin 85 is provided as shown in Figure 2 to determine the full open position of the throttle 76, full open position being illustrated in dotted lines in Figure 2. The pin 85 is securely driven into a suitable opening in the wall of the passage 73. The shaft 79 is urged toward closed position under the influence of a coil spring 78 which is similar in construction to the spring 64. The opposite end of the shaft is equipped with an arm 84 to which a throttle operating link 86 is connected for manipulating or regulating the throttle opening position of the valve disk 76.

The carburetor arrangement of my invention is provided with a fuel well and main nozzle construction contained within the central space formed by the doughnut shaped float 39. The carburetor body 10 is integrally formed with a depending projection or boss 87 which is provided with a central bore 88, a portion of the bore being threaded as at 89 to receive the threaded portion of a fitting 90. The fitting 90 is formed with a sleeve-like extension 91 within the upper portion of which is snugly fitted a tube 92, the upper end 93 thereof being open and forming the main fuel jet or orifice through which fuel for high speed operation of the engine is discharged into the venturi to be mixed with air entering the air inlet 52. The sleeve-like extension 91 of the fitting 90 is provided with a cylindrical recess or chamber 94 which is in communication with the air inlet chamber 52 by means of a passage 95. The sleeve-like wall 91 is provided with two or more minute openings or orifices 96 for establishing communication between the space or chamber 94 and the interior well 97 formed in the fitting 90. The well 97 in the fitting 90 terminates at its lower end in a restricted orifice 98, the latter providing for the admission of fuel from the float chamber 14 into the well 97.

The carburetor body 10 is formed with an upwardly projecting portion 100 provided with a threaded bore adapted to receive a threaded fitting 102. The axis DD of the fitting 102 is out of alignment with the axis EE of the fitting 90 for a purpose to be hereinafter explained. The fitting 102 is bored in its lower portion to snugly receive a tubular member 103, the latter terminating in a tapered solid end portion 104, the lat-

ter forming a needle-like configuration adapted to extend into the orifice 98 for regulating the fuel flow therethrough. The fitting 102 is provided with a bore 106 which in turn is in communication with a chamber 107 by means of a passage 108, the chamber 107 being formed as an annular recess in the fitting 102. The passage or chamber 107 is in communication with a channel 110 which terminates in a chamber 112, a portion of the chamber wall being threaded to accommodate an adjustable valve fitting 113. The carburetor body 10 is formed with a boss portion 116 having a passage 117 drilled therein which establishes communication with chamber 112 for admitting air into the chamber from the air inlet passage 52 or from outside atmosphere. The purpose of passages 110, 117 and chambers 107, 112 is to admit air for admixing with liquid fuel to provide a combustible mixture for engine idling purposes. The valve fitting 113 is provided with a finger piece or knurled portion 118 to facilitate manipulation of the position of the needle valve 119 forming a part of the fitting 113 for controlling the amount of air admitted to the passage 110. A coil spring 120 surrounds a portion of the fitting 113 and serves the purpose of setting up a frictional component between the fitting and the threads in the bore accommodating the fitting so that the needle valve 119 will be frictionally retained in adjusted position.

The fuel supply for the idling mixture is obtained from the fuel well 97. The member 103 is of hollow configuration throughout a portion of its length providing a fuel conveying passage 123. The lower extremity of the member 103 is provided with an orifice 124 for establishing flow of fuel from well 97 into the passage 123 in member 103. The bore 106 and orifice 108 provide means for establishing communication for flow of liquid fuel from passage 123 into the chamber 107 formed in the fitting 102. A passage 126 establishes communication between chamber 107 and a chamber 127, as shown in Figure 2. The chamber 127 is in communication with the mixture outlet 73 by means of orifices 128 and 129 which are arranged respectively on each side of the throttle valve disk 76 when the latter is in closed position, as shown in Figure 2. The passages or orifices 128 and 129 are drilled into the carburetor body after which the chamber 127 is closed through the use of a Welsh plug 130. The passage 126 is drilled horizontally in the carburetor body and the end of the passage closed by means of a friction plug 131.

The fitting 102 is provided with a transversely extending pin 133 forming a handle for rotating the fitting 102 and tube 103 in order to adjust the position of the needle 104. A coil spring 134 is disposed between two disks or washers 135 to set up a friction force against the fitting 102 in order to frictionally retain the fitting 102 in adjusted position.

It should be noted that the axis DD of the threaded bore in the carburetor body accommodating the fitting 102 is disposed slightly rearwardly of the axis EE of the bore in the projection 37 accommodating the fitting 90. Through this arrangement of offset bores, the tube or fuel regulating means 103 is caused to occupy a slightly angular position as shown in Figure 2 so that the surface of the tube is substantially in contact with the upper edge of the high speed fuel jet 93 as indicated at 137. This construction places the major fuel outlet of the jet or orifice

93 to the right hand side of the tube 103 as shown in Figure 2 so that the major amount of fuel flowing from the jet 93 is emitted to the right hand side of the tube 103.

The function and operation of the carburetor of my invention is as follows: Assuming that the carburetor is connected to an engine manifold 77 and the bowl 11 connected to a fuel supply reservoir (not shown) by means of the tube 21, the float member 39, through its lever moment about the fulcrum 45 is at its lowermost position in which it acts upon the valve member 32 to move same from its seat and thus admit liquid fuel into the float chamber 14 through passages 23, 24 orifice 34 past the polygonally-shaped valve member 32 into the chamber 14. As the fuel level rises in the chamber 14, the float 39 is buoyed upward, moving in a counter-clockwise direction about the fulcrum 45 as viewed in Figure 3, and when the fuel reaches a predetermined level as indicated at "L" shown in Figure 6, the valve 32, through pressure of the arm 46, closes the orifice 34 to interrupt the flow of fuel into the chamber 14. The member 103 is adjusted through manipulation of the handle portion 133 so that the tapered needle 104 is moved away from its seat to admit fuel from the chamber 14 into the well or chamber 97 and into the space or well 94 surrounding the fitting 90. The fuel level in the wells or chambers 94 and 97 will be the same as the fuel level in the float chamber 14 in accordance with well known hydrostatic principles. A normal fuel level in the chamber 14 is indicated at "L." Upon the application of a starting force or medium applied to the internal combustion engine with which the carburetor may be used, a sub-atmospheric pressure is set up within the passages 52, 73 and the venturi 70. With the mixture controlling valve 76 moved to open or partially open position and the air valve 58 in closed or partially closed position, the subatmospheric pressure in the mixing passage is effective in the float bowl 14 and well 97 causing fuel to be elevated in the space between the sleeve 92 and the exterior wall of the member 103 and discharged into the venturi or mixing passage from the main orifice or jet 93. When this fuel flow has begun and the engine started, the air valve 55 may be moved to the full open position so as to admit an increased amount of air to be mixed with the fuel discharged into the venturi 70 and the mixture outlet passage 73. The fuel in the wells 94 and 97 is premixed with a small amount of air supplied through the air bleed passage 95 so that the fuel discharged from the jet 93 is partially atomized. Due to the positioning of the main jet 93 at the throat or restriction 72 of the venturi 70, which is at the point of the highest air velocity, it has been found to enhance the operation of the carburetor by providing the major fuel outlet space at the right side of the member 103 at the jet 93. This structural feature decreases the tendency for air pressure to build up on the left hand side of the member 103 as viewed in Figure 2 which may under certain conditions act in a downward direction upon upwardly moving fuel and impair the efficiency of fuel discharge from the main jet 93.

The orifice or passage 128 supplies a mixture of fuel and air for idling purposes of the engine when the valve 76 is in closed position as illustrated in figure 2. The fuel for the idling mixture is obtained from fuel in the well 97 flowing through orifice 124 upwardly through the hollow

interior 123 of member 103 thence through the orifice 103 into the chamber 107 formed in the fitting 102. The fuel introduced into the chamber 107 is therein mixed with air from the supplemental air passage 110 so that a fuel and air mixture is conveyed through passage 126 and chamber 130 for discharge into the passage 73 through the outlet or orifice 131. The position of the fitting 113 may be regulated or adjusted by the manipulating member 118 to vary or control the amount of air to be mixed with the fuel for idling purposes. A fuel and air mixture from the passage 126 is also admitted to the mixture outlet passage 73 through the supplemental orifice 129 which comes into operation immediately upon slight movement of the throttle valve 76 away from closed position. Thus the supplemental orifice 129 together with the idling orifice 128 supplies fuel and air mixture for the engine during increasing speed of the engine and before the high speed jet 93 comes into operation viz. before it begins to discharge fuel into the venturi 70. The amount of fuel admitted to the well 91 may be regulated by adjusting the relative position of the fitting 102 to change the position of the needle valve 104 in the fuel orifice 98. Such rotation of the fitting 102 does not interfere with the mixing of air and fuel in the chamber 107 as the fuel orifice 103 is always in communication with the chamber 107 irrespective of the relative position of adjustment of the needle valve 104 and fitting 102 under all operating conditions. The speed of the engine is controlled by the position of the valve disk 76 the latter serving to control the fuel and air mixture passing through the mixture outlet 73 into the engine.

It should be noted that with my invention an exceedingly compact arrangement of elements is attained wherein the float mechanism is arranged directly below the mixing passage so that the distance that the fuel must be lifted from the fuel level "L" in the bowl 14 to the discharge orifice or jet 93 is reduced to a minimum. Another feature that makes this possible is the arrangement of the axis of the venturi and mixture outlet passage being out of alignment with the axis of the air inlet 52 so that while high efficiency of the venturi is assured, the distance through which the fuel must be elevated for discharge from the main jet 93 is correspondingly reduced whereby the carburetor operates at a very high degree of efficiency. Furthermore another feature of compactness resides in a fuel well being disposed in a depending portion of the carburetor body projecting through the central space formed by the doughnut or annularly shaped float member 39. Furthermore the adjustment of the needle 104 and of the air regulating valve 119 are readily accessible at the upper part of the carburetor so that there is no interference of the adjustable elements of the construction with any other mechanism placed close to the carburetor. The offset arrangement of axes DD and EE of fittings 102 and 90 provides for an angular position of the tubular needle valve member 103 so that the major amount of fuel discharged from the orifice or main jet 93 occurs at the right hand side of member 103 as shown in Figures 2. This substantially eliminates any tendency for air stream entering air inlet 52 from exerting a downwardly acting pressure on the fuel moving upwardly in tube 92 for discharge from the orifice 93. The fuel chamber 14 is vented to

the atmosphere for purpose of pressure equalization by means of a duct 99. Due to the compact arrangement of my invention an effective reduction in weight of the parts and a corresponding saving of metal is effected.

It is apparent that, within the scope of the invention, modifications and different arrangements may be made other than is herein disclosed, and the present disclosure is illustrative merely, the invention comprehending all variations thereof.

What I claim is:

1. In a carburetor, in combination, a body; a fuel receptacle disposed directly beneath the body; a float controlled valve for establishing a predetermined fuel level in said receptacle; a fuel well associated with said body; a mixing passage including a venturi formed in said body; an air inlet passage formed in the body in communication with said mixing passage; the axes of said mixing and air inlet passages being in parallel relationship with the axis of said mixing passage being nearer to the fuel level in said receptacle than the axis of said air inlet passage; a fuel discharge orifice arranged to discharge fuel from said well into the mixing passage; a member extending through said orifice for regulating the flow of fuel from said receptacle to said fuel well; the longitudinal axis of said member being out of alignment with the axis of said fuel discharge orifice.

2. In a carburetor, in combination, a body; a fuel receptacle disposed directly beneath the body; a float controlled valve in said receptacle for establishing a predetermined fuel level in said receptacle; a fuel well associated with said body; a mixing passage including a venturi formed in said body; an air inlet passage formed in the body in communication with said mixing passage; the axes of said mixing and air inlet passages being in parallel relationship with the axis of said mixing passage being nearer to the fuel level in said receptacle than the axis of said air inlet passage; a fuel discharge orifice arranged to discharge fuel from said well into the mixing passage; a member extending through said orifice for regulating the flow of fuel from said receptacle to said fuel well; the longitudinal axis of said member being out of alignment with the axis of said fuel discharge orifice.

3. In a carburetor, in combination, a body; a fuel receptacle associated with said body; a valve; float means associated with said valve for controlling the fuel level in said receptacle; a fuel well formed in said body; a mixing passage including a venturi formed in said body; an air inlet passage formed in the body in communication with said mixing passage; the axis of said mixing passage being nearer to the fuel level in said receptacle than the axis of said air inlet passage; a fuel discharge orifice arranged to discharge fuel from said well into the mixing passage; a member extending through said orifice for regulating the flow of fuel from said receptacle to said fuel well; the longitudinal axis of said member being angularly disposed with respect to the axis of the fuel discharge orifice; a second orifice arranged in the wall of the mixing passage for discharging an idling mixture into said mixing passage; said member having a passage therethrough for conveying fuel from said well to said second mentioned orifice.

4. In a carburetor, in combination, a body; a fuel receptacle disposed beneath the body; a

valve; float means associated with said valve for controlling the fuel level in said receptacle; a fuel well associated with said body; a mixing passage including a venturi formed in said body; an air inlet passage formed in the body in communication with said mixing passage; a main orifice arranged to discharge fuel from said well into the mixing passage; a member extending through said main orifice for regulating the flow of fuel from said receptacle to said fuel well; said member being laterally offset with respect to the center of the main fuel discharge orifice; a second orifice arranged in the wall of the mixing passage for discharging an idling mixture into said mixing passage; said member having a passage therethrough for conveying fuel from said well to said second mentioned orifice; a supplemental air inlet in communication with said second mentioned orifice for admitting air to the fuel prior to its discharge from said second mentioned orifice, and valve means in said supplemental air inlet for regulating the amount of air to be mixed with the fuel discharged from said second mentioned orifice.

5. In a carburetor, in combination, a body; a fuel receptacle disposed directly beneath the body adapted to be connected to a fuel supply tube; a valve; a float in said receptacle associated with said valve for controlling the flow of fuel to said receptacle; said body having a portion extending through said receptacle; a fuel well formed in said portion; a mixing passage including a venturi formed in said body; an air inlet passage formed in the body and in communication with said mixing passage; the axis of said mixing passage being nearer to the fuel level in said receptacle than the axis of said air inlet passage; a fuel discharge orifice arranged to discharge fuel from said well into the mixing passage; a manually adjustable member extending through said orifice for regulating the flow of fuel from said receptacle to said fuel well; the longitudinal axis of said member being angularly disposed with respect to the axis of the fuel discharge orifice; a second orifice arranged in the wall of the mixing passage for discharging an idling mixture into said mixing passage; said manually adjustable member having a passage therethrough for conveying fuel from said well to said second mentioned orifice; a supplemental air inlet in communication with said second mentioned orifice for admitting air to the fuel prior to its discharge from said second mentioned orifice; and valve means associated with said supplemental air inlet for regulating the amount of air to be mixed with the fuel discharged from said second mentioned orifice.

6. In a carburetor, in combination, a body; a float chamber positioned directly beneath the body; an annularly shaped float disposed in said float chamber; valve means associated with said float for controlling the flow of fuel into said float chamber from a fuel supply; a fuel well associated with said body; said body being formed with a mixing passage including a venturi; an air inlet passage formed in said body and in communication with said venturi; the axis of said venturi being parallel to and out of alignment with the axis of said air inlet; a main fuel discharge orifice for discharging fuel from said well into the restricted portion of said venturi; an elongated member extending through said main fuel discharge orifice into said fuel well and having a valve portion for controlling the amount of fuel flowing into said well from the float cham-

ber; the longitudinal axis of said member being angularly disposed with respect to the axis of the main fuel discharge orifice; an idling orifice formed in the wall of said mixture outlet; said elongated member having a passage therein for conveying fuel to said idling orifice; and means including a supplemental air inlet for supplying air to the fuel prior to its discharge through the idling orifice.

7. In a carburetor, in combination, a body; a float chamber associated with the body; an annularly shaped float pivotally supported in said float chamber; valve means connected with said float for controlling the flow of fuel from a fuel supply into said float chamber; a fuel well associated with said body; said body being formed with a mixing passage comprising a cylindrical chamber and a venturi; an air inlet passage of cylindrical shape of greater area in cross-section than the cylindrical chamber formed in said body in communication with said venturi; the axis of said venturi and cylindrical chamber being nearer to the fuel level in said float chamber than the axis of said air inlet; a main fuel discharge orifice for discharging fuel from said well into said mixing passage; a manually adjustable member extending through the main fuel discharge orifice into said fuel well and having a valve portion for controlling the amount of fuel flowing into said well from the float chamber; an idling orifice formed in the wall of said mixing passage; said member having a passage therein for conveying fuel to said idling orifice; means including a supplemental air inlet for supplying air to the fuel prior to its discharge through the idling orifice; means for regulating the amount of air supplied to the fuel discharged from said idling orifice; and an air bleed passage having communication with said fuel well for admitting air to the fuel in said well prior to its discharge from the main orifice.

8. In a carburetor, in combination, a body; a float chamber positioned directly beneath the body; an annularly shaped float pivotally supported in said float chamber; valve means connected with said float for controlling the flow of fuel from a fuel supply into said float chamber; said body having a depending portion extending into the central space formed by said annular float; a fuel well formed in said depending portion; said body being formed with a mixing passage including a cylindrical chamber; an air inlet passage of greater cross-sectional area than the cylindrical chamber formed in said body in communication with said mixing passage the axis of said mixing passage being nearer to the fuel level in said float chamber than the axis of said air inlet passage; a main fuel discharge orifice for discharging fuel from said well into the mixing passage; an elongated member extending through the main fuel discharge orifice into said fuel well and having a valve portion for controlling the amount of fuel flowing into said well from the float chamber; the longitudinal axis of said elongated member being angularly disposed with respect to the axis of the main fuel orifice; an idling orifice formed in the wall of said mixture outlet; said elongated member having a passage therein for conveying fuel to said idling orifice; means including a supplemental air inlet for supplying air to the fuel prior to its discharge through the idling orifice; means for regulating the amount of air supplied to the fuel discharged from said idling orifice; and an air bleed passage having communication with

said fuel well for admitting air to the fuel in said well prior to its discharge from the main discharge orifice into the mixing passage; a throttle valve in said mixing passage; a supplemental orifice in the wall of said mixing passage spaced from said idling orifice; said idling and supplemental orifices being arranged on opposite sides of the throttle valve when the latter is in closed position; said supplemental orifice being supplied with fuel and air from the passage in said elongated member and said supplemental air inlet.

9. In a carburetor, in combination, a carburetor body having a depending portion; a fuel receptacle positioned directly beneath the body; an annular float member surrounding said depending portion and disposed in said receptacle; valve means actuated by said float for controlling the flow of fuel from a fuel supply into said receptacle; a fitting disposed in a bore in the depending portion of the body; a mixing passage including a venturi formed in said body; an air inlet formed in the body in communication with the venturi; the axis of said venturi being spaced from the axis of said air inlet; a fuel well associated with said fitting; a second fitting threaded into an opening in the body and disposed above the venturi; the axis of said second fitting being parallel to but out of alignment with the axis of said first mentioned fitting; a fuel discharge orifice in communication with said fuel well for discharging fuel into said venturi; an elongated valve member carried by the fitting disposed above the venturi and extending into the fuel well; means for adjusting the upper fitting to regulate the position of said elongated member for controlling the flow of fuel from said receptacle into said fuel well; the longitudinal axis of said elongated member being angularly disposed with respect to the axis of said fuel well.

10. In a carburetor, in combination, a carburetor body having a depending portion; a fuel receptacle positioned beneath the body; an annular float member surrounding said depending portion and disposed in said receptacle; valve means actuated by the position of said float for controlling the flow of fuel from a fuel supply into said receptacle; a mixing passage including a venturi formed in said body; an air inlet formed in the body in communication with the venturi; the axis of said venturi being spaced from the axis of said air inlet; a fuel well formed in the depending portion of said body; a fitting threaded into an opening in the body and disposed above the venturi; the axis of said fitting being parallel to but out of alignment with the axis of said fuel well; a fuel discharge orifice in communication with said fuel well for discharging fuel into said mixing passage; an elongated valve member carried by the fitting extending into the fuel well; means for adjusting the fitting to regulate the position of said elongated member for controlling the flow of fuel from said receptacle into said fuel well; the longitudinal axis of said elongated member being angularly disposed with respect to the axis of said fuel well; said elongated member being arranged at one side of the axis of the fuel discharge orifice whereby fuel is discharged by said orifice at one side of said elongated member.

11. In a carburetor, in combination, a body; a fuel receptacle disposed beneath the body; a float controlled valve in said receptacle for establishing a predetermined fuel level in said receptacle; a fuel well formed in said body; a mix-

ing passage comprising a cylindrical chamber and a venturi, the axis of the venturi being coincident with the axis of the cylindrical chamber; a cylindrically shaped air inlet passage of greater cross-sectional area than said cylindrical chamber and having its axis eccentrically arranged with respect to the venturi and cylindrical chamber; the axis of the cylindrical chamber and venturi being nearer to the fuel level in said receptacle than the axis of said air inlet passage; a fuel discharge orifice arranged to discharge fuel from said well into the mixing passage; and a member extending through said fuel discharge orifice for regulating the flow of fuel from said receptacle to said fuel well.

12. In a carburetor, in combination, a body; a fuel receptacle disposed beneath the body; a float controlled valve in said receptacle for establishing a predetermined fuel level in said receptacle; a fuel well formed in said body; a mixing passage comprising a cylindrical chamber and a venturi, the axis of the venturi being substantially coincident with the axis of the cylindrical chamber; a cylindrically shaped air inlet passage of greater cross-sectional area than said cylindrical chamber and having its axis eccentrically arranged with respect to the axis of the venturi and cylindrical chamber; the axis of the cylindrical chamber and venturi being nearer to the fuel level in said receptacle than the axis of said air inlet passage; a tube in communication with said fuel well and terminating in said venturi, the end of the tube in the venturi being open to form a discharge orifice arranged to deliver fuel from said well into the venturi, and means for metering the flow of fuel from the receptacle to the fuel well.

13. In a carburetor, in combination, a body; a fuel receptacle disposed beneath the body; a float controlled valve in said receptacle for establishing a predetermined fuel level in said receptacle; a fuel well formed in said body; a mixing passage comprising a cylindrical chamber and a venturi, the axis of the venturi being substantially coincident with the axis of the cylindrical chamber; a cylindrically shaped air inlet passage of greater cross-sectional area than said cylindrical chamber and having its axis eccentrically arranged with respect to the axis of the venturi and cylindrical chamber; the axis of the cylindrical chamber and venturi being nearer to the fuel level in said receptacle than the axis of said air inlet passage; a tube in communication with said fuel well and terminating in said venturi, the end of the tube in the venturi being open to form a discharge orifice arranged to deliver fuel from said well into the venturi, and adjustable valve means for regulating the admission of fuel into the fuel well from the receptacle.

EDWARD H. FOSTER.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,453,490	Bessom	May 1, 1923
1,523,095	Zarracina	Jan. 13, 1925
1,741,401	Bryan	Dec. 31, 1929
1,758,954	Linn	May 20, 1930
1,823,017	Wolfard	Sept. 15, 1931
1,840,279	Sturm	Jan. 5, 1932
1,849,720	Parkin	Mar. 15, 1932
2,270,369	Danielsen	Jan. 20, 1942
2,419,956	Kuzelka	May 6, 1947