Sept. 6, 1960 W. C. EBERLINE 2,951,690

CARBURETOR STRUCTURE

Original Filed May 18, 1955 2 Sheets-Sheet 1

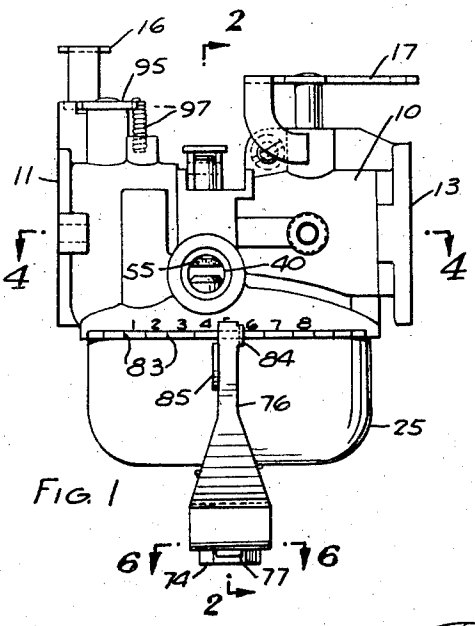


FIG. 1

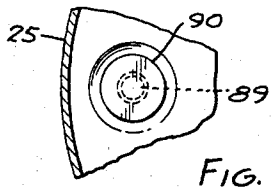


FIG. 3

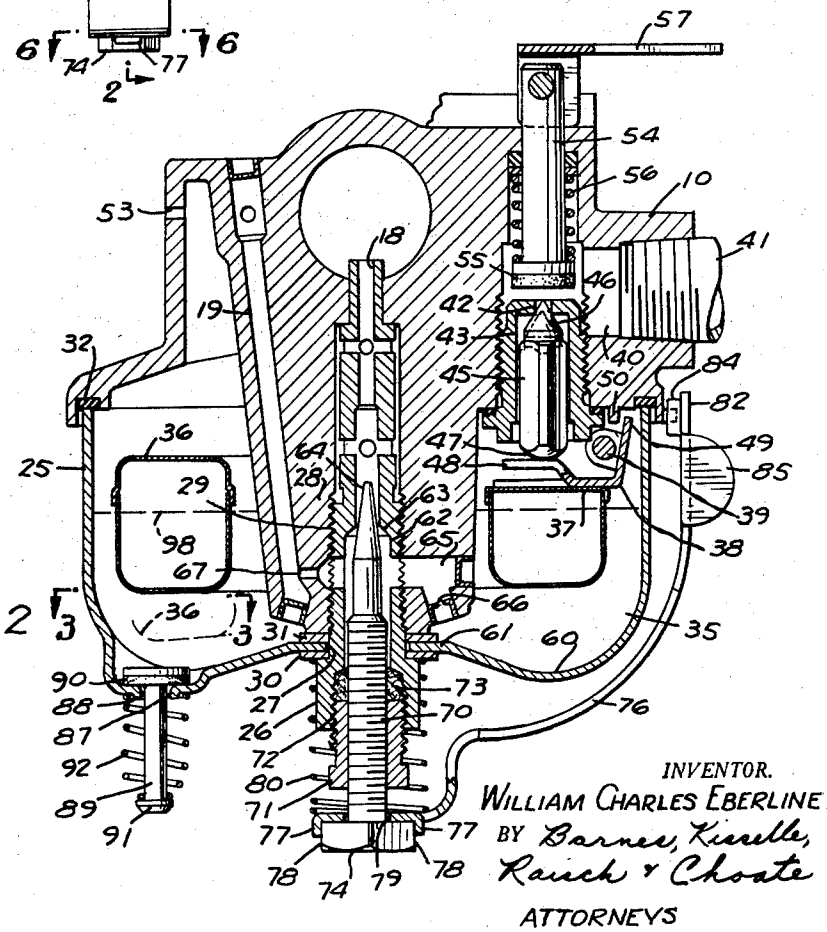


FIG. 2

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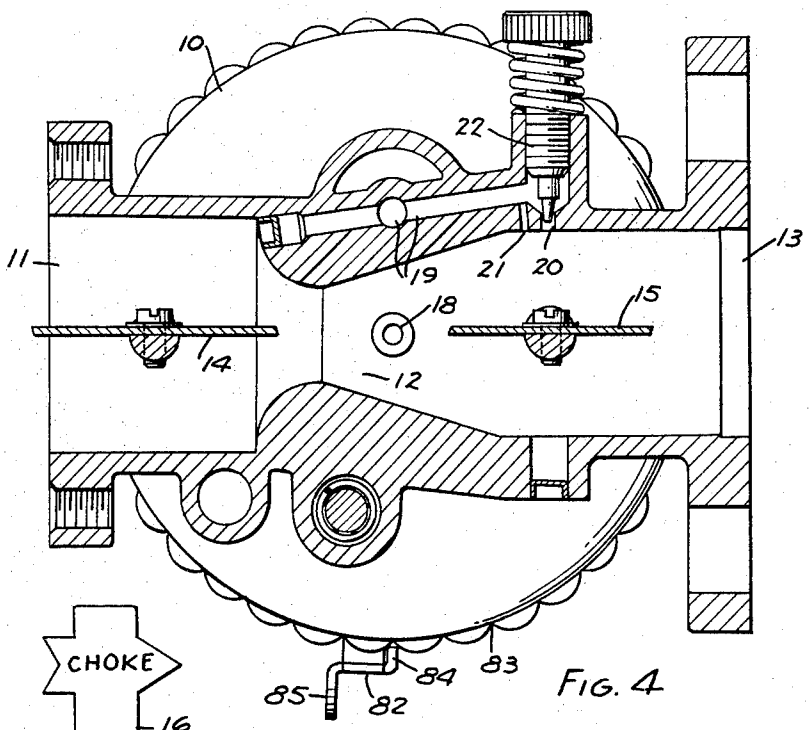


FIG. 4

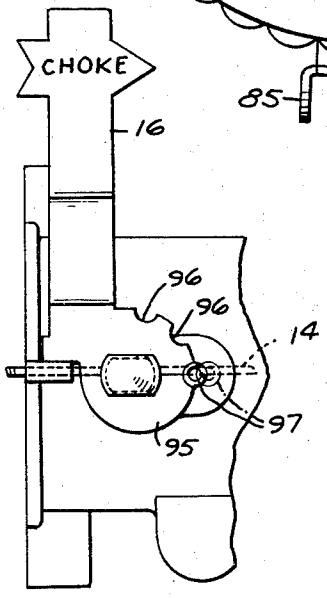


FIG. 5

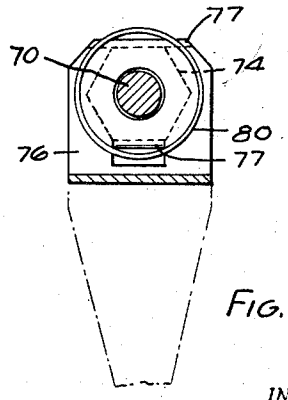


FIG. 6

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2,951,690

CARBURETOR STRUCTURE

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Original application May 18, 1955, Ser. No. 509,154. Divided and this application July 16, 1958, Ser. No. 748,940

3 Claims. (Cl. 261—71)

This invention relates to a carburetor for use on internal combustion engines.

This application is a division of my co-pending application, Serial No. 509,154, filed May 18, 1955.

The invention may be applied to various types of carburetors and is especially adapted to carburetors for relatively small utility engines such as those used on lawn mowers, small farm and gardening equipment, pumps and the like.

An object of the invention is to provide a generally improved, simple, inexpensive bowl structure and an improved structure for controlling the flow of fuel from the bowl for mixing with air.

Generally the invention contemplates a bowl having spaced apart deep and shallow regions with an improved drain cock in the deep region and the fuel outlet positioned at the shallow region for improved separation of foreign matter from the fuel. A float controlling the fuel inlet valve is provided with stop means, preventing it from striking against adjacent parts of the carburetor in order to prolong the life of the float. The mixture control valve is provided with exterior operating means selectively operable to make fine and general mixture adjustments. One form of the invention is shown in the accompanying drawings:

Figure 1, is a side elevational view of a carburetor according to this invention.

Figure 2, is an enlarged sectional view on line 2—2 of Figure 1.

Figure 3 is a sectional view on line 3—3 of Figure 2 illustrating the drain cock structure.

Figure 4 is an enlarged generally sectional view on line 4—4 of Figure 1.

Figure 5 is an enlarged, fragmentary, top elevational view illustrating a detent structure for controlling the choke.

Figure 6 is an enlarged generally sectional view on line 6—6 of Figure 1, illustrating the mixture control means with some parts shown in phantom.

The carburetor shown in the drawings has a body 10 with an air inlet 11, a venturi 12, and a mixture outlet 13 adapted to be secured to the fuel inlet of an internal combustion engine (not shown). A valve member 14 in inlet 11 provides a choke and another valve member 15 adajacent the mixture outlet provides a throttle. The choke and throttle are controlled respectively by exterior levers 16 and 17. A passageway 18 for raw fuel opens into venturi 12 and another passageway 19 supplies raw fuel to idling jets 20 and 21, one of which is controlled by a valve 22.

A bowl 25 is secured on body 10 preferably by a hollow bolt 26 projecting through a central opening 27 in the bowl and threaded to an interior portion 28 of the body as at 29. Washers 30 and 31 may be provided adjacent opening 27 and a seal element 32 is preferably interposed between body 10 and top of bowl 25 (Figure 1).

Bowl 25 defines a chamber 35 containing a torus shaped float 36 having one side portion 37 connected to a hinge 38 rotatably secured to body 10 through a pivot 39. Float 36 preferably comprises a hollow shell formed of thin corrosion resisting metal of the order of .004 to .007 inch thick. Body 10 has a fuel inlet passageway 40 adapted to receive a fuel line 41 and communicating into chamber 35 through an orifice 42 and a passageway 43. A valve member 45 slidable in passageway 43 has a seal element 46 for opening and closing orifice 42 and has a lower end portion 47 supported by an element 48 on hinge 38.

Hinge 38 has a projection 49 which engages a projection 50 on the body when float 36 is in a downward position for a purpose to be described. Chamber 35 is vented as by a port 53 in body 10 and a manually operable valve 54 is provided for cutting off the fuel supply to orifice 42. Valve 54 has a seal member 55 biased downwardly as Figure 1 is viewed by spring 56 and has an operating handle 57.

Bowl 25 is fashioned so that its deepest portion 60 is generally adjacent its periphery and so that its central region 61 is relatively shallow (Figure 1). Mixture control means for the carburetor includes a passageway 62 constricted as at 63 to form an orifice opening into passageway 18 and a taper valve member 64 projecting through the orifice. Passageway 62 has an intake branch 65 communicating into the shallow central portion of bowl 25 through a port 66. Another branch 67 of passageway 62 communicates into the idling jet passageway 19.

Valve member 64 has an elongate shank 70 projecting through hollow bolt 26 and outwardly of bowl 25. Shank 70 has a threaded connection to a packing gland 71 which is in turn threaded to the interior of bolt 26 as at 72 and which secures packing 73 in place. The outer end of shank 70 is enlarged to form a head 74 which may be turned for advancing and retracting taper valve element 64 for adjusting the size of orifice 63.

A wrench member or lever member 76 is operably connected to head 74 and is detachable therefrom. For this purpose head 74 preferably has a non-circular shape such as the hexagonal shape shown and lever 76 has lugs or projections 77 positioned to engage the sides 78 of the head. Shank 70 projects through an opening 79 in the lever member so that the lever is shiftable axially of the shank for selectively engaging and disengaging the lugs and the side faces of head 74. A compressed coil spring 80 seating on the lever member and on bowl 25 or washer 30 adjacent thereto biases lugs 77 into engaged relation with head 74.

Wrench 76 extends upwardly adjacent the side of the carburetor and its upper end portion 82 is disposed adjacent arcuately arranged visible graduations 83 preferably provided on the edge portion of body 10 (Figs. 1 and 4). The graduations may be numbered as shown in Figure 1 and may comprise indentations as shown in Figure 4 for a detent engagement with a projection 84 on lever 76. The lever may be provided with a projection 85 forming a finger hold for convenient operation.

A drain opening 87 is provided in the deepest portion of bowl 25 and the portions of the bowl defining the opening are peened or extruded outwardly to form an annular shoulder 88 (Fig. 1). A valve member 89 projects through opening 87 and has a seal member 90 for closing the opening. Valve member 89 has a head 91 at its outer end and a compressed coil spring 92 seats on the head 91 and around shoulder 88 on bowl 25 to bias the valve toward closed position. Shoulder 88 engages the end convolution of spring 92 as shown in Figure 2 for

securing the spring in a generally axially extending position relatively to valve member **89**.

Choke lever **16** has a generally circular inner portion **95** provided with recesses **96**, and a small coil spring **97** is attached to body **10** and positioned to engage within a recess **96** when in unstressed condition. Spring **97** and recesses **96** cooperate to form a detent for positioning choke lever **16** and valve **14** thereon at predetermined positions.

In handling and shipment of the carburetor prior to its use on an engine, bowl **25** is empty and float **36** is unsupported except by hinge **38**. The float is thus free to swing downwardly as Figure 2 is viewed to the position illustrated in dotted lines. Projection **49** on the hinge engages projection **50** on body **10** to form a stop limiting the downward movement of the float. The float is thus held in a position spaced from the bowl, thereby minimizing damage to the relatively thin metal of the float from contact with adjacent parts during handling and shipment.

As to operation of the carburetor, it may be assumed that mixture outlet **13** is connected to the fuel intake of an internal combustion engine (not shown) and that valve **54** is in the open position shown in Figure 2 with operating handle **57** horizontal and seal member **55** elevated. Drain opening **87** is closed by seal element **90**. Gasoline entering chamber **35** from fuel line **41** through passageway **40**, orifice **42** and passageway **45** has filled the chamber to the level shown in broken lines **98** in Figure 2 and float **36** has swung upwardly on hinge **38** to the solid line position, raising element **48** and valve member **45** to close orifice **42**.

When the engine connected to mixture outlet **13** is in operation, air is drawn in through inlet **11**, passes through venturi **12**, and draws raw fuel from chamber **35** through passageway **18**, orifice **63**, passageway **65** and port **66**. The fuel and air are intermixed and pass into the engine from mixture outlet **13**. The amount of raw fuel entering the air stream through passageway **18** is regulated by turning head **74** to advance or retract valve member **64** for adjusting the size of the orifice at **63**.

To obtain a rough or general adjustment of orifice **63**, lever **76** is shifted upwardly as Figure 2 is viewed against the action of spring **80** to disengage lugs **77** from head **74** so that the head and valve member may be freely manually turned. When the desired adjustment has been made, lever **76** is released and shifts downwardly under the action of spring **80** so that lugs **77** re-engage head **74**. Fine mixture adjustments may then be conveniently made by manually shifting the easily accessible upper portion of lever **76** to selective alignment with the graduations or detents **83** on carburetor body **10**. Lugs **77** engage sides **78** of head **74** in the manner of a wrench for turning the valve member as lever **76** is shifted. Projection **85** provides a finger hold for shifting lever **76**. Subsequent adjustments for leaving or enriching the fuel mixture may be made from time to time by turning lever **76** or by shifting the lever upwardly and turning head **74** directly.

Over a period of time foreign matter separates from the fuel in the relatively large quiescent zone provided by chamber **35** in bowl **25**. The heavier foreign matter such as water and sediment collects in the deeper, generally peripheral region **60** of the bowl. Port **66** of intake branch **65** lies adjacent the shallow central region of chamber **35** and is thus removed from the sediment collecting region **60** of the chamber so that fuel entering branch **65** for ultimate mixture with air at venturi **12** is largely free of foreign matter.

Drain opening **87** is located in the deep peripheral portion of the bowl to insure complete drainage of the cup when opened. Outwardly extruded annular shoulder **88** adjacent the drain opening provides means for positively positioning the contiguous convolution of spring **92** so that the spring is secured in a generally co-axial

position relatively to valve member **89**. The spring thus urges valve member **89** straight downwardly as Figure 2 is viewed to seat seal member **90** evenly and securely over drain opening **87** to provide an effective and reliable seal.

From time to time float chamber **36** may be emptied such as for engine maintenance or draining bowl **25** and float **36** will hinge downwardly to the dotted line position shown in Figure 2. Projection **49** on the hinge then engages projection **50** on body **10** to hold the float in a position spaced from the bowl, thereby minimizing damage to the float as described above.

What is claimed is as follows:

1. A carburetor comprising, a body, said body having fuel inlet means and air inlet means, said body having mixture control means for mixing fuel and air therein and having mixture outlet means adapted to be connected to the fuel intake of an engine, said mixture control means including a passageway for fuel connecting into said air intake means, and means forming a valve member, said valve member having a threaded connection to said body and being operable rotatably to regulate the flow of fuel through said passageway, said valve member having a portion projecting outwardly of said body, said outwardly projecting portion having an enlarged portion positioned for direct manual manipulation, whereby to regulate generally the flow of fuel in said passageway, said enlarged portion having an out of round shape, lever means connected to said outwardly extending portion of said valve member, said lever means having lug means mating with said out of round enlarged portion, means forming arcuately arranged graduations on the exterior of said body, said lever means being shiftable to selective alignment with said graduations, whereby to finely regulate the flow of fuel through said passageway, said lug means being detachable from said out of round enlarged portion to facilitate free rotation of the latter, whereby selectively to regulate such flow of fuel generally and finely, and means to bias said lug means against said enlarged portion and simultaneously to hold said lever means in contact with said serrations.

2. A carburetor comprising, a body, said body having fuel inlet means and air inlet means, said body having mixture control means for mixing fuel and air therein and having mixture outlet means adapted to be connected to the fuel intake of an engine, said mixture control means including a passageway for fuel connecting into said air intake means, and means forming a valve member, said valve member having a threaded connection to said body and being operable rotatably to regulate the flow of fuel through said passageway, said valve member having a portion projecting outwardly of said body, said outwardly projecting portion having an enlarged portion positioned for direct manual manipulation, whereby to regulate generally the flow of fuel in said passageway, said enlarged portion having an out of round shape, lever means connected to said outwardly extending portion of said valve member, said lever means having lug means overlying and encircling said projecting portion and mating with said out of round enlarged portion, means forming arcuately arranged graduations on the exterior of said body, said lever means being shiftable to selective alignment with said graduations, whereby to finely regulate the flow of fuel through said passageway, said lever means being shiftable axially of said outwardly projecting portion of said valve member for detaching said lug means from said enlarged portion, to facilitate free rotation of the latter, whereby selectively to regulate such flow of fuel generally and finely, and spring means seating on said body and on said the lug portion of said lever means, said spring means being stressed to yieldably hold one end of said lever means in operative engagement with said enlarged portion and to hold the other end of said lever means in yieldable contact with said arcuately arranged graduations.

3. In a carburetor of the type having a body with fuel inlet means and air inlet means, said body having mixture control means for mixing fuel and air therein and having mixture outlet means adapted to be connected to the fuel intake of an engine, said mixture control means including a passageway for fuel connecting into said air intake means, and valve means operable to regulate the flow of fuel through said passageway, that improvement which comprises an operating member on said valve means projecting outwardly of said body and being positioned for direct operating manipulation, whereby to regulate generally the flow of fuel in said passageway, an acircular head on the projecting end of said operating member, a manual control lever having a mounting end encircling said projecting portion of said operating member and engaging said acircular head in separable engagement therewith, an extension on said operating lever projecting toward said body shaped to engage spaced

serrations in said body selectively, and spring means to hold said encircling portion on and against said head portion and to bias the extending portion of said lever into engagement with said serrations on said body in various positions of adjustment, said spring permitting relative axial motion of said encircling portion of said lever to permit rotative adjustment between said lever and said operating member and permitting motion of said extending portion of said lever away from said body to permit adjustment of said operating member by said lever to various positions defined by said serrations.

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