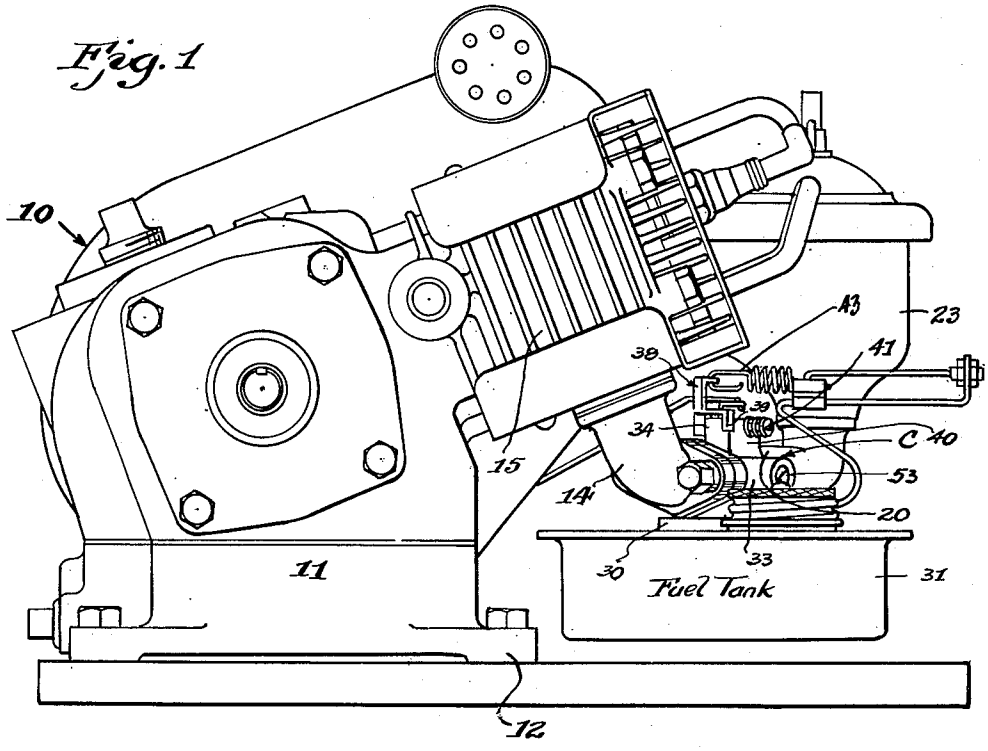
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CARBURETOR

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Fig. 1



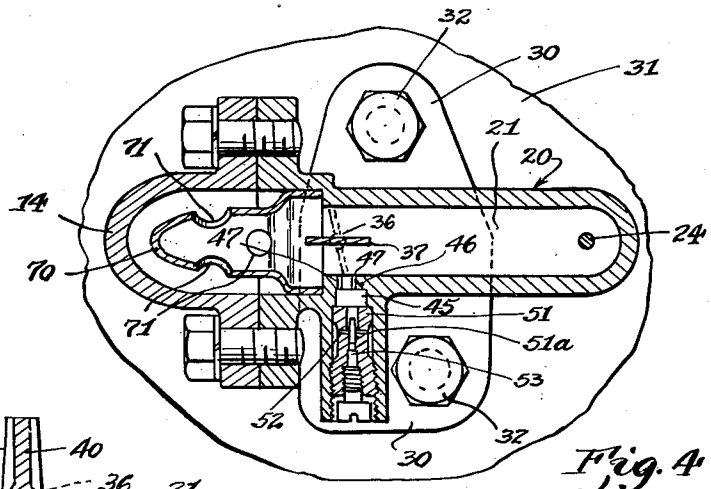
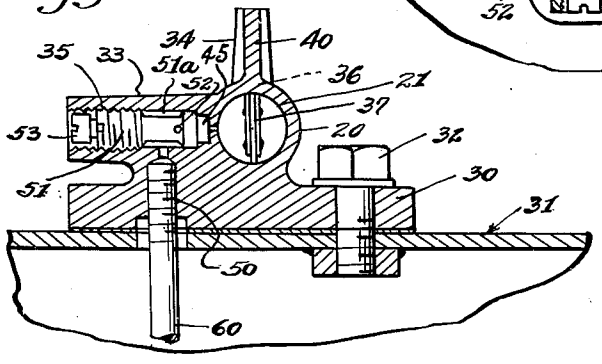


Fig. 4

Fig. 5



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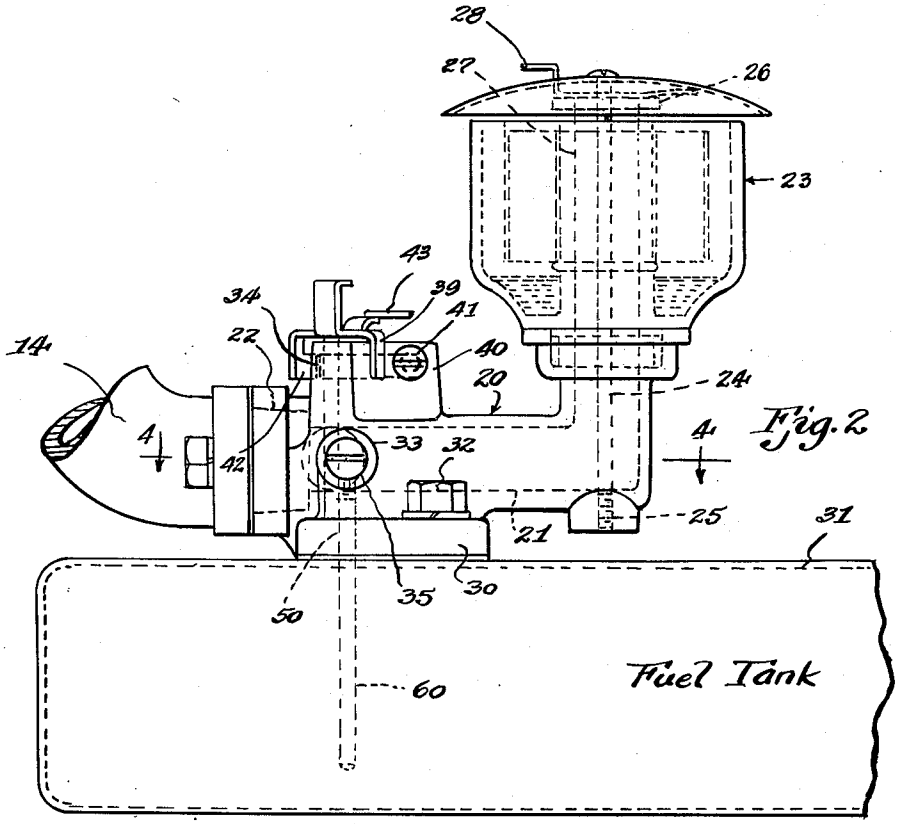


Fig. 2

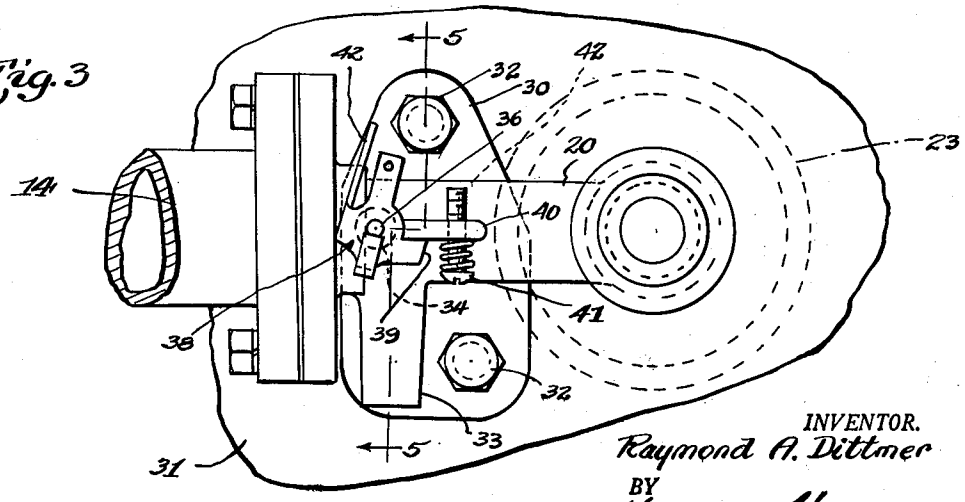


Fig. 3

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2,627,852

CARBURETOR

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Application November 28, 1950, Serial No. 197,931

4 Claims. (Cl. 123—119)

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My invention relates to carburetors and more particularly to that type of carburetor generally referred to as suction type carburetors or mixing valve type, and which are particularly adapted for use with small engines or power plants having only one or two engine cylinders, and most generally used on single cylinder internal combustion engines.

Such engines with which the present type carburetor is generally used are employed as power plants for powered lawn mowers and other similar equipment, the total horse power output of such engines usually being about ¾ to 1½ or 2 H. P. Much effort has been expended in simplifying the design of such engines in order to lessen the manufacturing costs. All features of such engines have been the object of continual research in the past and simplification of carburetor design has been the objective of engineers for many years.

An object of the present invention is to simplify and minimize manufacturing costs of the carburetors employed with these single cylinder internal combustion engines, and with this object in view, the well known suction tube is substituted for the customary float feed so as to lift the fuel directly from the fuel tank for mixture with air and subsequent induction into the engine combustion chamber in response to engine suction.

Other objects of the invention are to simplify the carburetor structure to provide for economy in manufacture and to minimize servicing expense by constructing this carburetor with an elongated mixing chamber overlying the tank and carrying a flanged base to which the fuel tank may be secured and suspended thereby, and to provide for the simple mounting and supporting of a conventional air cleaner.

For a more detailed understanding of my invention, reference may be had to the accompanying drawings illustrating a preferred embodiment of the carburetor structure in which like characters refer to like parts throughout the several views, and in which

Fig. 1 is a side elevational view of a single cylinder internal combustion engine equipped with my improved carburetor.

Fig. 2 is a side elevation view of the carburetor.

Fig. 3 is a top plan view of the carburetor,

Fig. 4 is a detail sectional view of the carburetor taken substantially on the line 4—4 of Fig. 2, and

Fig. 5 is a detail sectional view taken substantially on the line 5—5 of Fig. 3.

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The internal combustion engine is of conventional construction and is designated as a whole by the reference character 10 and is provided with a crankcase 11 having a base 12 by which the engine is supported. An intake elbow 14 is secured to the engine cylinder 15 and the carburetor "C" is secured to the outer end of the elbow 14, thereby placing the carburetor outlet in direct communication with the engine intake port.

The carburetor is provided with an elongated body portion 20 having an axially extending passage 21 having an enlarged outlet end 22 and an upwardly extending air intake end portion remove from the outlet end. A conventional type of air cleaner 23 is mounted on this intake end portion and secured in place by long bolt 24 extending through the cleaner and into the threaded hole 25 in the body portion (see Fig. 2). The air cleaner is provided with a choke valve 26 which is normally held away from the central air intake tube 27 of the air cleaner, but may be depressed by actuation of the button 28 to seat on the open end tube 27 to shut off the supply of air to the carburetor when necessary, usually on starting the engine.

The carburetor body is preferably made of a die casting and carries the base flange 30, and the fuel tank 31 is secured flush against the underside of this flange 30 by bolts 32 or other suitable securing means. This flange 30 is located intermediate the ends of the carburetor elongated body portion 20 and this fuel tank is suspended from the flange 30. A laterally extending boss 33 is carried by the elongated carburetor body portion, as well as an upwardly extending boss 34. The boss 33 is provided with a bore 35 disposed preferably in a horizontal plane intersecting and containing the axis of the fuel-air passage 21, and a fuel metering valve assembly is supported in this bore 35. The boss 34 is bored or drilled to provide a support for rotatably supporting the throttle valve shaft 36 carrying a butterfly valve 37 operable in said passage 21. An arm structure 38 is riveted or otherwise secured to throttle valve shaft 36, which arm structure overlies the carburetor body 20. The arm structure carries a downturned ear 39 which is arranged to engage the side of a vertically disposed integral rib 40 or stop carried by the carburetor body 20 to limit the opening movement of said butterfly valve. An adjusting screw 41 is carried by this rib 40 and another arm or ear 42 carried by said arm structure is arranged to about this adjusting screw to limit the closing movement of said butterfly valve. A link or other

suitable connection 43 is attached to the arm structure whereby to actuate the arm structure to open or close the butterfly throttle valve. Access to the throttle valve is had from above the carburetor.

An adjustable metering valve structure is assembled within the bored out boss 33 (see Fig. 4) and at the base or inner end of this bore, a chamber 45 is formed, which chamber is bounded on one end by the inner end face of the metering valve assembly and on the other end by a wall 46 which separates the chamber from the passage 21. Preferably, a pair of axially spaced holes 47 of relatively small diameter place the chamber 45 into communication with the passage 21.

Under normal operating conditions with the valve 37 partially or fully opened, fuel that has been discharged into the chamber 45 is sucked through these jet openings or holes 47 into the passage 21 where same is mixed with the air for delivery to the engine. When the valve 37 is closed, it will be noted that same contacts the wall of passage 21 at a point between these axially spaced holes 47. This is for idling operation and while the passage 21 is substantially completely closed by valve 37, a predetermined volume of air is thus permitted to bypass the valve 37, it being drawn from the passage 21 behind the valve into chamber 45 where same is mixed with some fuel and drawn through the other hole ahead of the valve as a fuel air mixture for delivery to the engine.

When the throttle valve 37 is completely closed for engine idling operation at the minimum possible speed and then suddenly opened, the air rushes through and momentarily the fuel is only sucked out of one of the holes or restricted orifices 47, resulting in a rather lean mixture being supplied to the engine, and the engine may thus sometimes stall.

The cupped shaped member 70 is pressed into the outlet end of carburetor (see Fig. 4) and same is provided with a plurality of relatively large unrestricted openings 71 in the sides to permit fuel mixture to readily flow into the elbow 14 and thence to the engine. The lean mixture will ram up into the end of this cupped shaped member and the flow is baffled, thus placing a slight restriction to the free induction of the fuel mixture into the engine combustion chamber, so as to not give the engine an excessively lean mixture. As the speed of the engine picks up, the fuel is fed to the mixture passage 21 from both restricted orifices and a fuel-air mixture of the proper proportions to supply the engine requirements is unrestrictedly fed to the engine. This restriction in the outlet side of the induction system is thus operable to prevent stalling of the engine for this short time immediately after suddenly opening the valve 37.

It will be observed that the carburetor body is drilled to provide a vertical hole or bore 50 opening in the lower face of the base flange 31 and into the interior of the bored out boss 33. The fuel metering valve structure is assembled within the boss 33 and comprises a valve casing 51 threaded into the boss 33, the hole 50 communicating with an annular recess 51*a* in said casing 51, thence through holes 52 in the casing to the inner bore of said casing.

A metering pin 53 is adjustably mounted in this valve casing 51 and same is preferably tapered so that it is adjusted "in" or "out" of the valve casing, the clearance between the pin and internal surface of the valve casing is decreased or increased to control the amount of fuel that can flow into chamber 45. A suction tube 60 is fitted into the hole 50 and extends into the fuel tank 31, said suction tube extending to a point relatively close to the bottom of the tank (see Fig. 2). The fuel tank is relatively shallow so as to be fitted into the relatively small space between the engine base and the inclined engine cylinder (see Fig. 1).

It will be apparent to those skilled in the art to which this invention pertains that various changes and modifications may be made without departing from the spirit of my invention or from the scope of the appended claims.

I claim:

1. A carburetor structure comprising a casting providing an elongated body portion having a horizontal longitudinally extending mixture passage, external bosses carried by said body portion and lying in closely adjacent parallel planes extending normal to the axis of the mixture passage and adapted to respectively support a throttle valve structure and a fuel metering valve structure adjustably operable from without the body portion of said carburetor structure, and a horizontally extending flange integral with said body portion and disposed on the underside of said body portion below said bosses and flush against which the top of a fuel tank may be secured, a bore extending down from the boss supporting said fuel metering valve structure to one side of the mixture passage and through the bottom of said flange to receive a suction pipe disposed to extend into the interior of said fuel tank, one end of said elongated carburetor body portion having an air inlet and carrying means for supporting an air cleaner connected with said air inlet, an attaching flange on the other end of said carburetor body portion opposite the air inlet, and an upwardly bent elbow connected with the last mentioned flange and adapted for attachment to an engine cylinder at least partially overlying the carburetor and depending fuel tank structures.

2. A carburetor structure comprising a casting providing an elongated body portion having a horizontal longitudinally extending mixture passage, external bosses carried by said body portion and lying in closely adjacent parallel planes extending normal to the axis of the mixture passage and adapted to respectively support a throttle valve structure and a fuel metering valve structure adjustably operable from without the body portion of said carburetor structure, and a horizontally extending flange integral with said body portion and disposed on the underside of said body portion below said bosses and flush against which the top of a fuel tank may be secured, a bore extending down from the boss supporting said fuel metering valve structure to one side of said mixture passage and through the bottom of said flange to receive a suction pipe disposed to extend into the interior of said fuel tank, one end of said elongated carburetor body portion having an air inlet and carrying means for supporting an air cleaner connected with said air inlet, an attaching flange on the other end of said carburetor body portion opposite the air inlet, and an upwardly bent below connected with the last mentioned flange and adapted for attachment to an engine cylinder at least partially overlying the carburetor and depending fuel tank structures, said engine having a crankcase, a base flange carried by the crankcase and an engine cylinder

inclined at an angle of less than thirty degrees with respect to the horizontal, said carburetor and fuel tank structures disposed in the V-shaped space lying intermediate said base flange and engine cylinder.

3. A carburetor structure comprising a casting providing an elongated body portion having a horizontal longitudinally extending mixture passage; external bosses carried by said body portion and lying in closely adjacent parallel planes extending normal to the axis of the mixture passage and adapted to respectively support a throttle valve structure and a fuel metering valve structure adjustably operable from without the body portion of said carburetor structure, and a flange integral with said body portion and disposed on the underside of said body portion below said bosses and against which the top of a fuel tank may be secured, a bore extending down from the boss supporting said fuel metering valve structure and through the bottom of said flange to receive a suction pipe disposed to extend into the interior of said fuel tank, a pair of axially spaced fuel inlet orifices connecting the interior of last mentioned boss with the mixture passage, said throttle valve structure operable to substantially close said mixture passage intermediate of said orifices when set for engine idling operation whereby to confine the discharge of fuel into said mixture passage from one orifice only, and when open to permit suction of fuel from both orifices, and a fuel mixture flow restricting device disposed in the outlet end of said mixture passage and comprising a cup-shaped element secured to an elongated body portion and projecting beyond the outlet terminus of said mixture passage, said element having a tubular section of reduced diameter and less than the diameter of said passage, said element being closed at its outer terminal end and provided with openings in the tubular wall section of reduced diameter and operable when said throttle valve is suddenly opened to retard flow of fuel and air mixture to the engine until such time as the fuel is being discharged through both said orifices to avoid the tendency of momentarily feeding a lean mixture to said engine.

4. A carburetor structure comprising a casting providing an elongated body portion having a horizontal longitudinally extending mixture passage, external bosses carried by said body portion and lying in closely adjacent parallel planes extending normal to the axis of the mixture passage and adapted to respectively support a throttle valve structure and a fuel metering valve structure adjustably operable from without the body portion of said carburetor structure, and a flange integral with said body portion and disposed on the underside of said body

portion below said bosses and against which the top of a fuel tank may be secured, a bore extending down from the boss supporting said fuel metering valve structure and through the bottom of said flange to receive a suction pipe disposed to extend into the interior of said fuel tank, a pair of axially spaced fuel inlet orifices connecting the interior of last mentioned boss with the mixture passage, said throttle valve structure operable to substantially close said mixture passage intermediate of said orifices when set for engine idling operation whereby to confine the discharge of fuel into said mixture passage from one orifice only, and when open to permit suction of fuel from both orifices, one end of said elongated carburetor body portion having an air inlet and carrying means for supporting an air cleaner connected with said air inlet, an attaching flange on the other end of said carburetor body portion opposite the air inlet, and an upwardly bent elbow connected with the last mentioned flange and adapted for attachment to an engine cylinder at least partially overlying the carburetor and depending fuel tank structures, said bosses lying closely adjacent to the outlet end of said mixture passage, said body portion providing an enlarged passage immediately beyond said throttle valve and extending through said attaching flange to which said elbow is secured, and a fuel mixture flow restricting device secured in the enlarged passage portion and comprising a cupped shaped member having a plurality of unrestricted openings in the side wall and disposed to face the fuel mixture flow and operable when said throttle valve is suddenly opened to retard flow of fuel and air mixture to the engine until such time as the fuel is being discharged through both said orifices to avoid the tendency of momentarily feeding a lean mixture to said engine, said member projected into the elbow and spaced from the walls thereof.

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