Oct. 23, 1934. S. W. WHITEHURST 1,977,661

CARBURETOR

Filed June 7, 1932

Fig. 2.

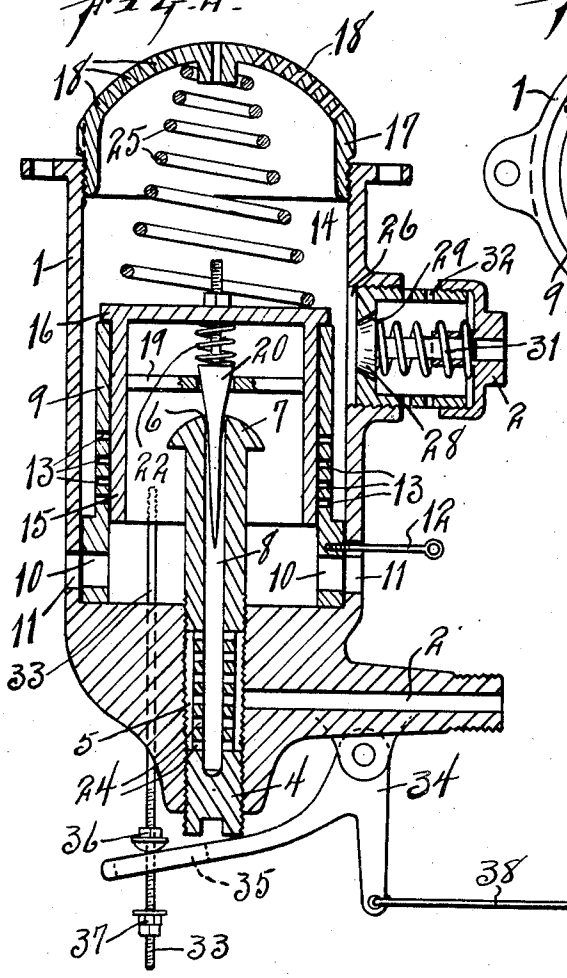


Fig. 3.

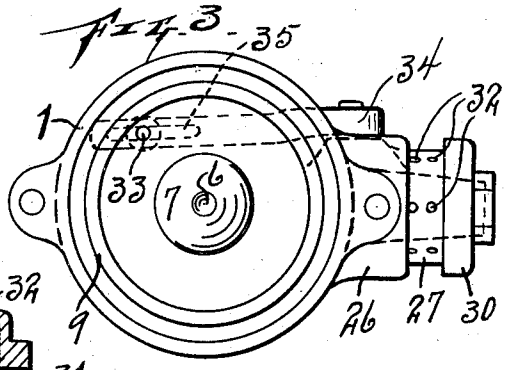


Fig. 4.

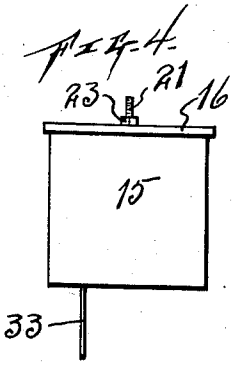


Fig. 5.

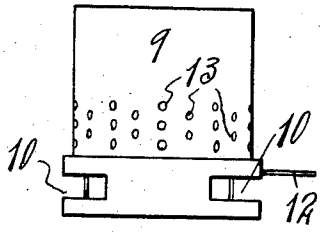
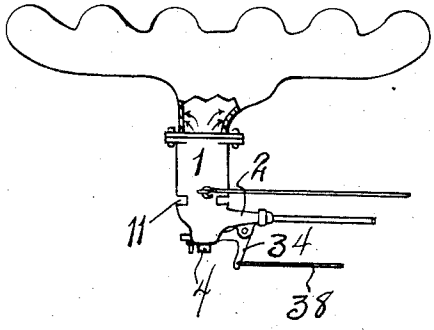


Fig. 1.



INVENTOR

S. W. WHITEHURST.

BY

ATTORNEY

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CARBURETOR

Shepard W. Whitehurst, Fort Worth, Tex.

Application June 7, 1932, Serial No. 615,873

7 Claims. (Cl. 261—49)

My invention relates to carburetors; and more particularly to carburetors which have no float valves or chokes, and the object is to provide carburetors which are highly efficient and which will operate in any position in which they may be placed. Another object is to provide carburetors which are provided with all adjustments external, so that they may be readily adjusted.

An advantage of this invention is that the carburetor is provided with fuel ports that will feed at all speeds of the engine in proportion to the air intake. Another advantage is that the needle valve rises in proportion to the amount of air passing through the air intake, and throws the fuel against the inner walls of the valve casing causing a perfect mixture of the air and fuel as it is passed to the manifold, first being atomized as it passes into the casing 1. Another advantage is that the exhaust of the fuel from the carburetor to the intake manifold is forced against the inner walls of the manifold, which assists in the atomization of the fuel. Other objects and advantages will be more particularly pointed out in the claims.

Reference is had to the accompanying drawing which forms a part of this application.

Fig. 1 is a side elevation of the carburetor connected to the intake manifold of the engine.

Fig. 2 is a vertical section of the carburetor parts on an enlarged scale and the control mechanism therefor.

Fig. 3 is a plan view of the same with the lid and the cup valve removed.

Fig. 4 is a side elevation of the cup valve on a smaller scale.

Fig. 5 is a similar view of the sleeve valve.

Similar characters of reference are used for the same parts throughout the several views.

The carburetor is provided with a casing 1 having a fuel intake passage 2 integral therewith, and a nipple 3 adapted to receive a plug 4. The nipple 3 is integral with the casing 1 and projects downwardly from the base of the casing 1, and is provided with a centrally located opening drilled therethrough and longitudinally within the casing 1. The intake passage 2 registers with a shrunk portion or orifice 5 of the plug 4. The opening through the nipple 3 is interiorly threaded to receive the plug 4 which is threaded and screwed into the nipple 3 and forms the adjuster for the needle valve 20 and seat 6. The end of the plug, within the casing 1, is provided with an enlarged head 7, and the plug is provided with a tubular passage 8 therethrough for directing the fuel from the intake passage 2 into the sleeve valve 9 of the carburetor. The intake passage 2 registers with the openings 8 by means of perforations or ports 24 in the shrunk portion 5 of the plug 4.

The sleeve valve 9 of the carburetor is rotatably mounted in the casing 1 and provided with elongated annular slots 10 near the bottom thereof which register with similar slots 11 in the wall of the casing 1 for receiving air in the sleeve valve 9. The valve 9 consists of a hollow cylinder or barrel, the lower portion of which is of greater diameter than the upper portion. The larger diameter of lower end of the valve 9 is adapted to rotatably fit within the inner periphery of the casing 1 and be rotated therein by means of an arm 12 integral therewith and adapted to act as a throttle connection for controlling the amount of air intake through the passages 11 and 10. This control 12 acts as the accelerator for the carburetor. The valve 9 is provided with perforations 13 in the side walls above the enlarged bottom of the valve, for permitting the fuel mixture to pass into the opening or chamber 14 of the casing 1, as the cup valve 15 is raised by the suction of the engine.

A cup valve 15 is inverted and telescopically inserted into the sleeve valve 9, so that it may reciprocate therein by the suction of the engine, or adjustably positioned therein by a throttle connection. The cup valve 15 is provided with an external annular shoulder 16 on the top thereof, which is adapted to rest upon the top of the valve sleeve 9 and limit the projection of the valve 15 into the sleeve valve 9 of the carburetor. In its lower position, the bottom of the cup valve 15 extends a sufficient distance within the valve 9 to cover all of the perforations 13 of the valve 9.

The casing 1 is provided with a cap 17 which is oval in contour, or of a convex form threaded and screwed into the top of the casing 1. The cap 17 is perforated with perforations or ports 18 angularly drilled in the top of the cap to direct the mixed fuel against the inner side wall of the intake manifold. The top of the casing 1 is provided with bolt connections for securing the carburetor to the intake manifold.

The cup valve 15 is provided with a bar 19 and adapted to guide the needle valve 20. The needle valve 20 projects into the tubular opening 8 in the plug 4 when in normal position. The valve 20 is suspended in the cup valve 15 by means of a rod 21 made integral with the upper end of the valve 20 and adapted to pass through an opening in the top of the cup valve 15. A coil spring 22 is interposed between the top of the valve 15

and the top of the needle valve 20 and adapted to exert pressure against the valve 20 so that it will have resilient connection with valve 15. The bar 19 is tapered. A nut 23 is screwed to the end of the rod 21 above the top of the cup valve 15 to limit the downward movement of the valve 20.

The plug 4 is perforated so that the fuel may pass through the plug 4 into its opening 8, past the needle valve 20 and into the cup valve 15 of the carburetor. The openings or ports 24 in the plug 4 are adapted to effect communication of the opening or orifice 5 of the plug 4, with the passage 8 of the plug 4. The fuel will pass from the intake passage 2, through the orifice 5, into the opening 8, and form a head of fuel in the opening 8 below the needle valve 20.

A coil spring 25 is interposed between the top of the cup valve 15 and the convex cap 17 of the casing 1 so that the carburetor will be held normally closed. A safety device is provided on the carburetor, so that backfire of the engine will not injure the valve and its cooperating parts. The device consists of a threaded opening 26 in the side of the casing 1 above the perforations 13 of the sleeve valve 9 that is adapted to receive a check valve. The check valve housing 27 is threaded and screwed into the opening 26 and provided with a valve 28 and a valve seat 29. The valve housing 27 is provided with a cap 30 threaded and screwed thereto and adapted to normally hold the valve 28 in a closed position by means of a coil spring 31 interposed between the valve 28 and the cap 30 of the valve housing 27. When the engine backfires, the pressure from the engine is released to the atmosphere by pressing against the valve 28 and its spring 31 until the pressure is allowed to pass into the housing 27 and to the atmosphere through perforations 32 in the side walls of the housing 27.

Throttle mechanism is provided to control the extent of the reciprocation of the cup valve 15, thus controlling the amount of mixture to the engine. The mechanism consists of a rod 33 made integral with the cup valve 15 and projected through the base of the carburetor casing 1. A crank 34 is journaled to the base of the carburetor and adapted to be actuated by any of the well known means for throttle connections. One arm of the crank connection 34 is provided with an elongated slot 35 through which the rod 33 projects. A nut 36 is positioned on the rod 33 above the slot 35, and a lock nut 37 is positioned on the rod 33 below the slot 35 of the crank 34. The distance between the nuts 36 and 37 governs the extent of the reciprocation of the cup valve 15 within the carburetor. The other arm of the crank connection 34 is journaled to a control rod 38 which leads to the usual throttle connection for controlling the amount of mixture to the engine. Movement of the rod 38 reciprocates the cup valve 15 in the carburetor, and controls the fuel opening between the needle valve 20 and its seat 6.

The suction of the engine will cause the cup valve 15 to rise, which in turn raises the needle valve 20, allowing the fuel to be drawn into the cup valve and sleeve valve 9 of the carburetor where it is mixed by the air passing into the casing 1 through the ports 10 and 11. The fuel and air are mixed in the cup valve 15 and sucked into the chamber 14 of the carburetors by way of the perforations 13 of the sleeve valve 9. The mixed fuel is then conveyed to the engine from the carburetor by way of the perforations 18 in the cap 17 of the carburetor.

It is apparent that positioning of the throttle rod 38, will be used to attain a drifting speed of the engine, or a pre-determined speed on stationary engines and the like. The minimum and maximum opening of the fuel supply to the carburetor may be governed by the throttle mechanism and the variation of the distance between the nuts 36 and 37 on the rod 33 of the cup valve 15. The rod 38 would only be used to govern the extent of the variation in the engine speeds, but the accelerations of the engine would be controlled by the control arm 12 of the carburetor. The lock nuts 37 may be removed so that the position of the rod 38 would only control the minimum speed of the engine or the minimum amount of fuel to the engine, which is necessary on engines carrying loads intermittently that tend to choke the engine down to stalling speed.

What I claim is:

1. A carburetor having a casing provided with air and fuel intake ports; a sleeve valve rotatably mounted therein and provided with air intake ports adapted to register with said air intake ports of said casing, a cup valve longitudinally movable in said sleeve valve and forming a mixing chamber in said carburetor, said sleeve valve provided with openings at different distances from the bottom of said valve, means for controlling the longitudinal movement of said cup valve, a needle valve operatively connected with said cup valve, a seat for said needle valve provided with a fuel passage therethrough adjustably mounted in said casing and provided with lateral fuel intake ports adapted to register with the fuel intake port of said casing, and means for elevating said cup valve for opening said openings in said sleeve valve.

2. In a carburetor having a casing provided with air and fuel intake ports; a sleeve valve rotatably mounted therein and provided with intake ports adapted to register with said air intake ports, a cup valve longitudinally movable in said sleeve valve and adapted to be actuated by the fuel mixture pressure therein, a needle feed valve operatively connected with said cup valve and provided with an adjustable seat therefor, said seat provided with a longitudinal fuel passage therethrough and lateral fuel intake ports adapted to register with the fuel intake port of said casing, openings in said sleeve valve adapted to be opened by the longitudinal movement of said cup valve, manual means for controlling the movement of said cup valve, and means for rotating said sleeve valve for controlling the air supply to said carburetor.

3. In a carburetor of the class described having a casing provided with fuel and air intake ports, a sleeve valve rotatably mounted in said casing and provided with openings adapted to register with said air intake ports, a cup valve longitudinally movable in said sleeve valve and forming a mixing chamber in said casing, a needle valve operatively connected to said cup valve, a seat for said needle valve provided with a fuel passage therethrough adjustably mounted in said casing and provided with lateral intake ports adapted to register with the fuel intake port of said casing, openings in said sleeve valve adapted to be normally closed by said cup valve, means for rotating said sleeve valve for controlling the amount of air to said mixing chamber, manual means for controlling the longitudinal movement

of said cup valve for permitting the mixture to pass from said mixing chamber through the openings in said sleeve valve into the upper portion of said casing, and means carried in the upper portion of said casing for directing the mixture against the inner periphery of the intake manifold of an engine.

4. A carburetor having a casing provided with a base and a top therefor, air intake ports in the side of said casing and a fuel intake port in the base thereof, a rotatable sleeve valve mounted in said sleeve casing and provided with ports adapted to register with said air intake ports, a cup valve resiliently mounted in said sleeve valve and adapted to reciprocate therein, a needle valve operatively carried by said cup valve, an adjustable seat for said needle valve carried in said base and provided with a longitudinal opening therethrough, lateral ports in said seat adapted to permit the fuel to pass from said fuel intake port to said longitudinal opening in said seat, openings in the side of said sleeve valve adapted to permit the mixture to pass from said cup valve into the upper portion of said casing, perforations in said top adapted to direct the mixture against the inner walls of the manifold to a motor, manual means operatively connected with said sleeve valve for controlling the air supply to said carburetor, and manual means operatively connected to said cup valve for limiting the reciprocation of the same within said sleeve valve.

5. In a carburetor of the class described consisting of a casing having fuel intake ports and air intake ports, a sleeve valve rotatably mounted in said casing and provided with openings adapted to register with said air intake port, a cup valve resiliently mounted in said sleeve valve and adapted to reciprocate therein, said sleeve valve and said cup valve adapted to form a mixing chamber in the lower portion of said casing, openings in the side of said sleeve valve adapted to permit fuel mixture to pass from said mixing chamber into the upper portion of said casing and normally closed by the skirt of said cup valve, said cup valve adapted to be actuated by the pressure of the fuel mixture for permitting the fuel to pass into said mixing chamber from the fuel intake port of said casing, manual means for limiting the reciprocating movement of said cup valve, and manual means for controlling the air supply to said mixing chamber.

6. In a carburetor of the class described consisting of a casing having air intake ports and a fuel intake port, a sleeve valve rotatably mounted in said casing and adapted to be manually rotated for controlling the air supply to said carburetor, a cup valve slidably carried by said sleeve valve and adapted to be reciprocated by the pressure of the fuel mixture therein, a fuel jet adjustably mounted in said casing, a needle valve for said jet resiliently connected to said cup valve and adapted to cooperate therewith to control the fuel supply to said carburetor, manual means for controlling the extent of the reciprocation of said cup valve, and manual means for rotating said sleeve valve.

7. In a carburetor having a casing provided with air and fuel intake ports, a sleeve valve carried in said casing and adapted to control the flow of air through said port, a cup valve resiliently mounted in said sleeve valve, an adjustable valve carried in said casing and adapted to register with said fuel port, said cup valve and said adjustable valve being adapted to cooperate with each other for controlling the fuel supply to said carburetor, and manual means for actuating said cup valve.

SHEPARD W. WHITEHURST.