Dec. 3, 1940. G. STEINLEIN ET AL 2,223,971

CARBURETOR COMBINED WITH A FEEDING PUMP

Filed Feb. 17, 1938

Fig. 1.

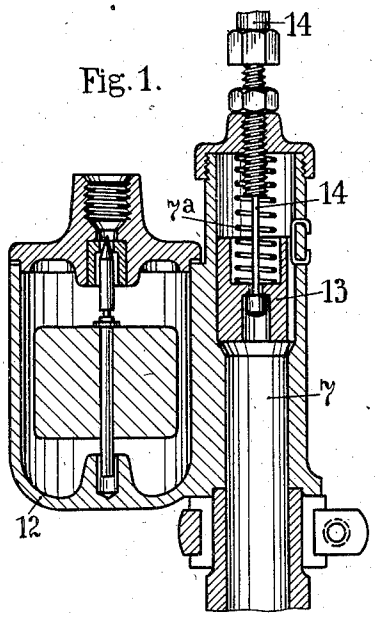


Fig. 2.

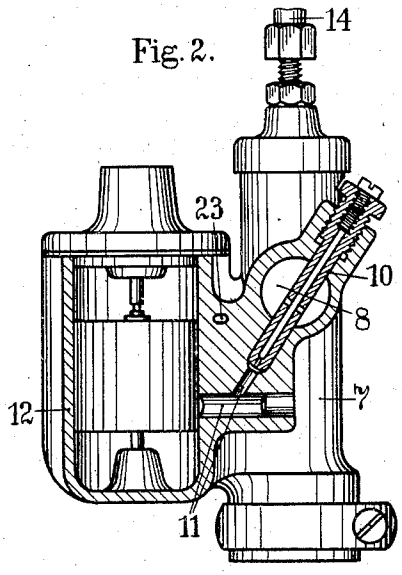


Fig. 3.

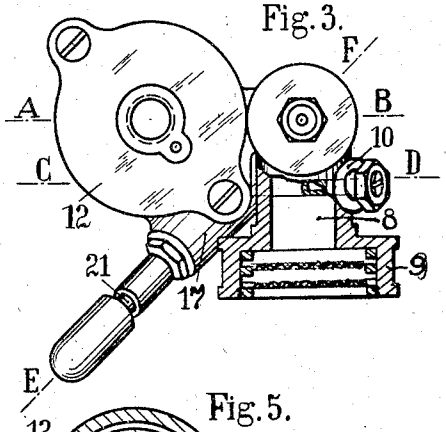


Fig. 4.

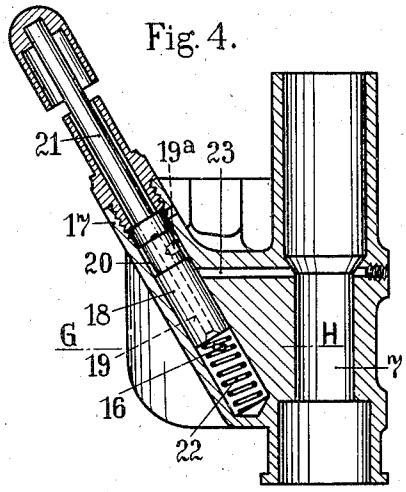
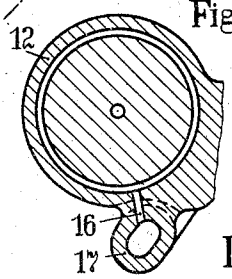


Fig. 5.



Inventors

Gustav Steinlein

and

Ludwig Buchmeier

Dean Finnbank & Hirsch

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CARBURETOR COMBINED WITH A FEEDING PUMP

Gustav Steinlein, Mainberg, near Schweinfurt, and Ludwig Bruckmoser, Schweinfurt, Germany

Application February 17, 1938, Serial No. 191,007
In Germany February 19, 1937

2 Claims. (Cl. 123—187.5)

The invention relates to carburetors and more particularly to carburetors intended for feeding small internal combustion engines.

The object of the invention is to provide means for directly supplying a certain amount of fuel to the mixing chamber with a view to enrich the mixture for starting the engine or other controlling purposes, independently of the position of the gas controlling slide valve which permits partly or completely closing the duct leading from the spray nozzle and the air admission aperture to the engine.

This object is attained by disposing at the side of the float chamber a hand operable pump communicating with the interior thereof, which pump is adapted to supply a definite quantity of fuel to the mixing chamber through an auxiliary passage in order to vary the constituent proportions of the mixture and to enrich the mixture for starting.

The accompanying drawing, which forms a part of this specification, by way of example illustrates an embodiment of the invention and shows in—

Fig. 1 a vertical longitudinal sectional elevation through the mixing and the float chambers on the line A—B of Fig. 3;

Fig. 2 a similar vertical section through the nozzle and the float chamber on the line C—D of Fig. 3;

Fig. 3 a top plan view of the carburetor with the air inlet passage shown in section;

Fig. 4 a vertical section through the mixing chamber and the pump on the line E—F of Fig. 3, the throttle valve being omitted, and

Fig. 5 a horizontal section through the float chamber and the pump cylinder on the line G—H of Fig. 4.

Like numerals designate like parts throughout all figures of the drawing.

The carburetor comprises a vertical mixing chamber 7, into which opens a horizontal air inlet passage 8 provided with a wet air filter 9. Through the said passage 8 extends the spray nozzle 10 the bottom end of which is connected to the interior of the float chamber 12 by bores 11 of the body or casing of the carburetor. The vertical mixing chamber 7 encloses a reciprocal throttle slide valve 13 which is adapted to be raised within the chamber 7 against the action of a spring 7a e. g. by means of a Bowden wire 14. The outlet end of the air passage 8 communicates with the mixing chamber 7 at the section of said chamber above the lowermost position of the slide valve 13 shown in Fig. 1, so that in this lowermost position, said valve closes the mixing chamber against the entrance of the air, so that when the carburetor overflows, no fuel can get into the slide valve passage. The spray nozzle 10 serves both as the main nozzle and as a pilot jet.

By the side of the float chamber there is in an inclined position disposed a pump cylinder 17 communicating with the interior thereof by a bore 16. The plunger 18 of the pump contains axial and radial bores 19, 19a beginning at the lower end of the said plunger and ending into a circumferential groove or recess 20 of the same. The top of the plunger carries a rod 21 projecting outwards and at its free end provided with a push button, a spring 22 disposed in the cylinder tending to move the plunger upwards. When the plunger is pressed down the said circumferential groove 20 thereof will be caused to register with a bore 23 of the casing leading into the mixing chamber.

The carburetor works as follows: For the regular running the piston of the engine will draw in the air through the filter 9, passage 8 and mixing chamber 7 of the carburetor where it mixes with fuel injected by the nozzle 10 into the chamber 7 and then gets into the crank case. The sucking effect of the engine piston will also convey fuel from the float chamber through the passages 11 and nozzle 10 into the chamber 7, when the slide valve 13 is being raised.

In order to obtain a mixture that will be richer for starting, the plunger rod 21 is pressed down so that the plunger 18 at first closes the bore 16 through which the fuel had been supplied from the float chamber to the lower space of the pump cylinder. Thereupon the fuel retained in the cylinder 17 will be forced through the bores 19 and 19a and the circumferential groove 20 into the passage 23 the orifice of which now registers with the said groove 20; from here the fuel flows to the mixing chamber 7. The amount of fuel supplied in this way can be controlled accurately as with each stroke of the plunger a definite quantity only can be brought into the mixing chamber.

After the downward movement of the piston 18 has been completed, and the fuel contained in the cylinder 17 below said piston has been injected through the passages 19, 19a, 20 and 23 into the mixture passage 7, the pressure on the plunger is released and the piston 18 moves upwardly rapidly under the action of the spring 22 to the upper limiting position. The larger section of said piston thus shuts off the passage 23

and the lower end of the piston uncovers the end of the passage 16. The initial portion of the upward movement of the piston 18, while the passages 19, 19a, 20 and 23 are filled with fuel from the previous downward movement of the piston, is sufficiently rapid that there is not time for the liquid in the passages to flow back into the cylinder, and air cannot be drawn through the passage 23 and into the cylinder 17 from the mixture passage 7. After the passage 23 has been closed and the passage 16 uncovered, the continued upward movement of the piston 18 under the action of the spring creates a vacuum in the lower portion of the cylinder 17, and the fuel enters through the passage 16 into the cylinder 17 from the float chamber 12, so that the cylinder is again loaded for the next discharge stroke of the piston.

We claim:

1. In a carburetor for small internal combustion engines, and of the type having a float chamber, an air inlet passage, a mixing chamber into which the said air inlet passage opens, a throttle valve for said mixing chamber, and a spray nozzle in the said air inlet passage discharging into the mixing chamber, and the lower end of which communicates with the float chamber, means for supplying fuel to said mixing chamber for starting while said throttle valve is in its closed position, said means including a cylinder having a passage connected to said float chamber and a passage connected to said mixing chamber posterior to said throttle valve, a manually operable plunger reciprocable in said cylinder independently of said throttle valve, a spring located in the lower end of said cylinder and normally holding said plunger in its upper position, said plunger being provided with a substantially longitudinally extending passageway normally open to said passage which connects said cylinder and float chamber to permit the filling of the space in the cylinder below the plunger with fuel, and said plunger normally closing said passage connecting the cylinder and said mixing chamber, and operating to close said passage to the float chamber and open said passage to said mixing chamber when the plunger is pushed into said cylinder against the tension of said spring, to force a definite quantity of fuel out of said space below the plunger into the mixing chamber each time said plunger is forced down.

2. In a carburetor as claimed in claim 1, having the cylinder arranged at the side of the float chamber in a position inclined to the axes of the float chamber and the mixing chamber, and the plunger having a rod projecting outwardly and provided with a push button at its free end.

GUSTAV STEINLEIN.
LUDWIG BRUCKMOSER.