March 31, 1953 R. REISTAD 2,633,341

CARBURETOR

Filed Nov. 28, 1949

Fig. 1.

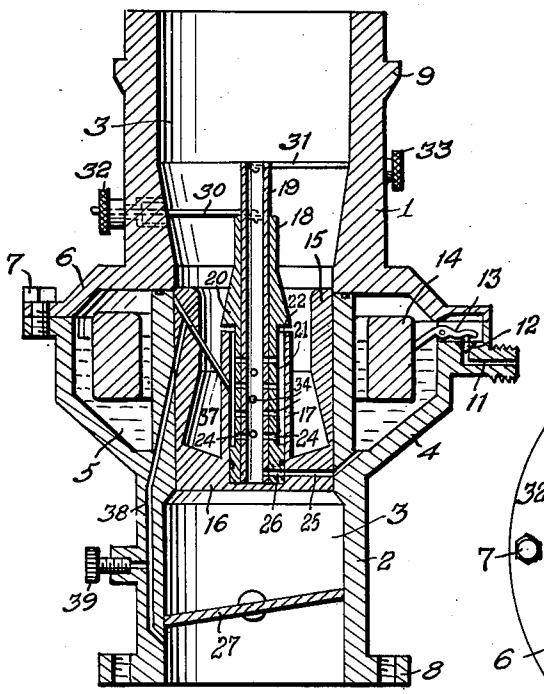


Fig. 2.

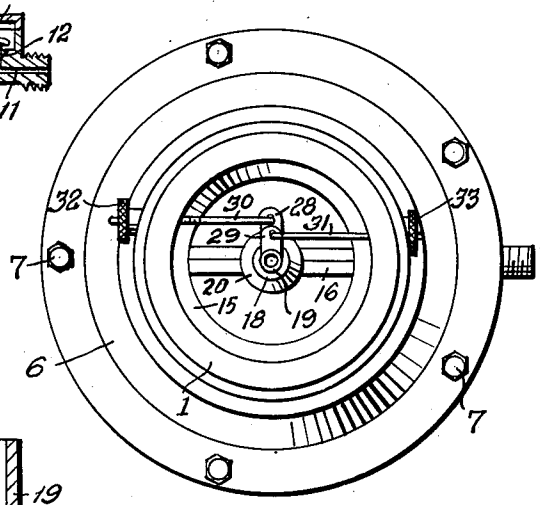
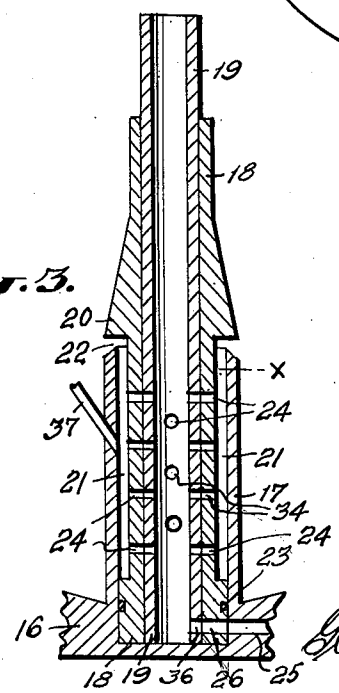


Fig. 3.



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Patented Mar. 31, 1953

2,633,341

UNITED STATES PATENT OFFICE

2,633,341

CARBURETOR

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Application November 28, 1949, Serial No. 129,784
In Norway December 14, 1948

3 Claims. (Cl. 261—40)

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The present invention relates to carburetors for internal combustion engines and the object of the invention is to provide a carburetor which may be quickly and easily adapted to engines of different sizes, that is, engines having different numbers of cylinders and/or horse powers, and which is economical as regards fuel consumption and at the same time ensures the desired acceleration of the engine under all conditions.

The invention is characterized in that the jet system comprises a number of sleeves arranged one within the other, and rotatable relative to each other and to a stationary supporting member, which sleeves are provided with a number of communicating ports leading to a well provided with a discharge opening and a port communicating with a supply bore from a float chamber in such a manner that the supply to the sleeves and the carburetion action thereof may be varied by rotating the sleeves in relation to each other and/or in relation to the stationary member.

In order that the invention may be more clearly understood one particular embodiment of the invention will now be described, by way of example, with reference to the accompanying drawing wherein—

Figure 1 is an axial section of the carburetor,

Figure 2 is a plan view thereof, and;

Figure 3 shows the jet device in axial section and on an enlarged scale.

The carburetor comprises two cylindrical sections 1 and 2 arranged concentrically in alignment and together forming the suction pipe and mixing chamber 3. Surrounding the upper end of the section 2 and integral therewith is an annular flange 4 forming a float chamber 5 which is covered by an annular flange 6 integral with the lower end of section 1 and secured to the flange 4 by means of screws 7. In this manner the annular flanges 4 and 6 serve to connect the sections 1 and 2 tightly together, preferably by an intermediate packing (not shown). At the lower end the section 2 is provided with a flange 8 by means of which the carburetor is secured to the intake manifold of the engine and the section 2 at its upper end is provided with a flange 9 for supporting, in known manner, an air filter.

Fuel is admitted through a supply duct 11 the inner end of which is controlled by an inlet valve 12 carried by a pivoted lever 13 connected with a float 14.

In the mixing chamber 3 is arranged a preferably replaceable venturi 15 and below this, arranged diametrically in the chamber, an integral lower cross piece 16 with a cross section which

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preferably is tapered upwards in order not unduly to interfere with the downward flow of mixture. The cross piece has an integral upwardly extending tube 17 arranged axially in the chamber and which is closed at its lower end to form a well. The tube 17 is provided at its upper end with a bevelled end surface which is inclined outwardly and downwardly and projects somewhat above the maximum level of the fuel in the float chamber 5, as indicated by the line X on Figure 3.

In the tube 17 there is rotatably mounted a sleeve 18 and rotatably mounted in said sleeve is a second sleeve 19 which is open at its upper end. At some distance above the end of the tube 17 the sleeve 18 is provided with an annular enlargement 20 which decreases conically upwards as shown. From the underside of said enlargement 20 at a point some distance from its lower end the sleeve 18 has a smaller outer diameter than the inner diameter of the tube 17 so that an annular fuel well 21 is formed between said members 17 and 18. The lower end of the enlargement 20 has an outer diameter which corresponds to the outer diameter of the tube 17 and thus extends outside the opening of the well 21 and thereby forms an annular slot 22 between its under surface and the upper end of the tube 17. Between the tube 17 and the sleeve 18 there is arranged a packing ring 23 but, as will be understood, the sleeve 18 may be closed at its lower end.

The two sleeves 18, 19 are provided with a plurality of ports 24 and 34, respectively, arranged in vertical rows and spaced in the vertical direction of the well 21. The cross sectional area of said ports may, if desired, increase progressively from the upper series of ports to the lower series as shown. A bore 25, leading from the float chamber 5 and extending through the cross piece 16, communicates with corresponding ports 26 and 36 through the sleeves 18 and 19, respectively.

In the position shown in the drawing, in which the carburetor is regulated for maximum output, the port 26 in the sleeve 18 and the port 36 in the sleeve 19, and the bore 25 are in alignment and all the ports 24 and 34 in the sleeves 18 and 19, respectively, are also in alignment. When in use, with the throttle 27 in open position and the well 21, the ports 24 and the inner sleeve 19 filled with fuel to the level X, the suction from the engine draws air from the air intake downwards through the mixing chamber and causes the fuel to discharge through the annular slot 22. At the same time air flows downwards through the sleeve 19, then through the ports 24 and 34, and up-

wards through the well 21. During this operation the air is mixed with and entrains and comminutes or atomises the fuel in such a manner that the fuel mixture discharges from the annular slot 22 in such a comminuted or atomised state that a most suitable mixture is obtained.

The control of the output of the carburetor in accordance with the number of cylinders or the power of the engine is effected either by controlling the degree of atomisation or comminution or by regulating the supply of fuel to the sleeves or both.

For this purpose the sleeves 18 and 19 are provided at their respective upper ends with radially projecting arms or tongues 28 and 29, respectively, to which are secured the inner ends of screw members 30 and 31, respectively, which pass through the wall of the cylinder 1 and may be displaced in longitudinal direction by means of the adjusting nuts 32 and 33, respectively, whereby the sleeves may be relatively rotated about their longitudinal axis.

In rotating the sleeve 18 by means of the screw 32 the port 26 is displaced in relation to the supply bore 25 and the port 36 in the sleeve 19, and thereby the effective area of the supply bore may be adjusted from maximum to zero. In association with the adjusting nut 32 there is preferably provided an indicating device such as a pointer and a dial (not shown), which indicates the position of the nut for the different adjustments of the sleeves 18 and 19 corresponding to different types of engines.

By rotating the nut 33 the sleeve 19 is rotated so that the ports 24 and 34 in the sleeves 18 and 19, respectively, may be brought into register to a greater or lesser extent, whereby the carburetion action may be adjusted in accordance with the desired conditions. Owing to the fact that the sleeves 18 and 19 are individually rotatable, this adjustment or regulation must be effected at any position of the sleeve 18 within the range of rotation thereof in order to regulate at the same time the supply of fuel from the float chamber.

The annular well 21 is connected by a tube 37 with an idling bore 38 which extends through the venturi 15 and the member 2 into the mixing chamber behind to the throttle 27 when said throttle is in closed or nearly closed position. The discharge from the bore 38 is controlled by an adjusting screw 39.

I claim:

1. In a carburetor, a casing forming a fuel chamber and having a central passageway therethrough, a Venturi element mounted in said passageway and having a bore therein communicating with the fuel chamber, a tube positioned axially of the Venturi element in communication with said bore and forming a mixing chamber, an inner sleeve forming an air conduit rotatably mounted axially of said tube and having rows of holes therein spaced longitudinally along same, and a hole adapted to register with the bore from the float chamber, and an outer sleeve also rotatably mounted axially of said tube surrounding said inner sleeve and spaced inwardly from the inner wall of the tube and having rows of holes therein spaced longitudinally along same and a hole adapted to register with the bore from the float chamber, said rows of holes in the respective sleeves being adapted to register upon relative rotation of said sleeves and said latter holes in the respective sleeves being also adapted to register upon relative rotation of the sleeves to control the flow of fuel from the float chamber to the inner sleeve.

2. In a carburetor, a casing forming a fuel chamber and having a central passageway therethrough, a Venturi element mounted in said passageway and having a bore therein communicating with the fuel chamber, a tube positioned axially of the Venturi element in communication with said bore and forming a mixing chamber, an inner sleeve forming an air conduit rotatably mounted axially of said tube and having rows of holes therein spaced longitudinally along same, and an outer sleeve also rotatably mounted axially of said tube surrounding said inner sleeve and spaced inwardly from the inner wall of the tube, and having rows of holes therein spaced longitudinally along same, said rows of holes in the respective sleeves being adapted to register upon relative rotation of said sleeves, and said outer sleeve having thereon a frusto-conical section the wall of which cooperates with the Venturi element to form the fuel mixture passage through the latter and the bottom of which cooperates with the top of the tube to form a restriction for limiting the flow of the fuel mixture through said passage.

3. In a carburetor, a casing forming a fuel chamber and having a central passageway therethrough, a Venturi element mounted in said passageway and having a bore communicating with the fuel chamber, a tube positioned axially of the Venturi element in comunication with said bore and forming a mixing chamber, an inner sleeve forming an air conduit rotatably mounted axially of said tube and having rows of holes therein spaced longitudinally along same and a hole adapted to register with the bore from the float chamber, and an outer sleeve also rotatably mounted axially of said tube surrounding said inner sleeve and spaced inwardly from the inner wall of the tube and having rows of holes therein spaced longitudinally along same and a hole adapted to register with the bore from the float chamber, said rows of holes in the respective sleeves being adapted to register upon relative rotation of said sleeves and said latter holes in the respective sleeves being also adapted to register upon relative rotation of the sleeves to control the flow of fuel from the float chamber to the inner sleeve, and said outer sleeve having thereon a frusto-conical section the wall of which cooperates with the Venturi element to form the fuel mixture passage through the latter and the bottom of which cooperates with the top of the tube to form a restriction for limiting the flow of the fuel mixture through said passage.

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