

Oct. 22, 1935.

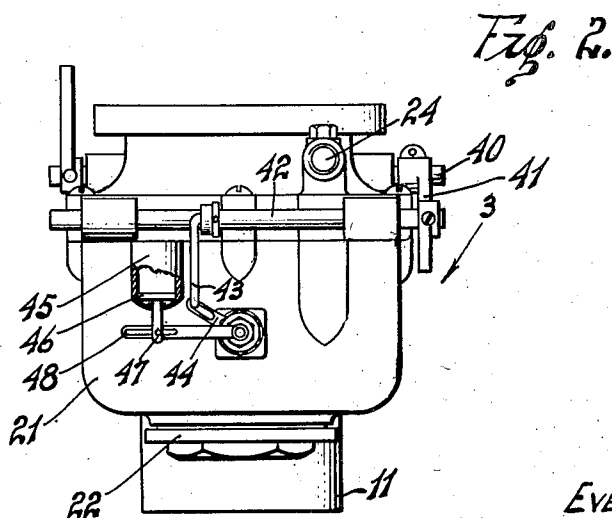
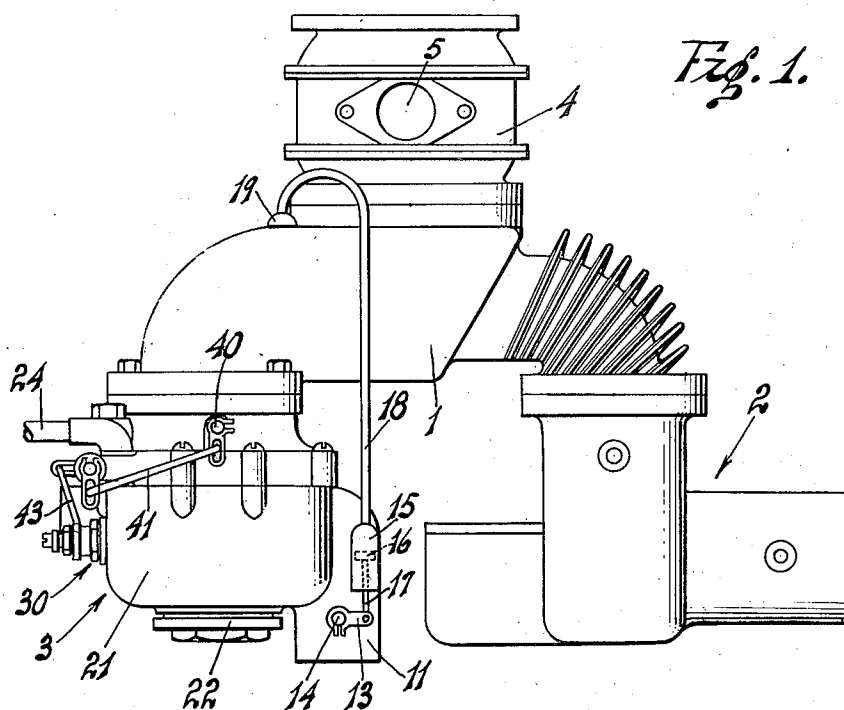
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2,018,168

CARBURETOR

Filed Feb. 17, 1934

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 3.

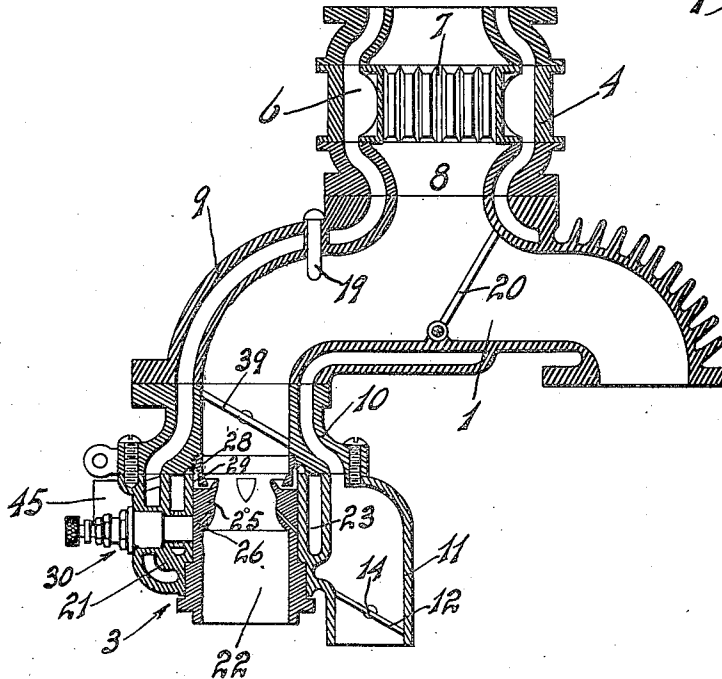
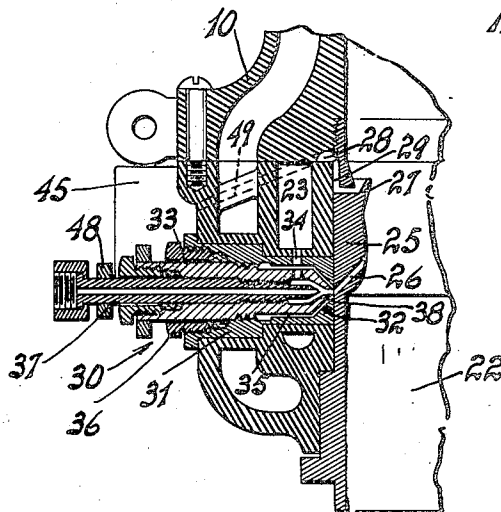


Fig. 4.



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UNITED STATES PATENT OFFICE

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CARBURETOR

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Application February 17, 1934, Serial No. 711,684

7 Claims. (Cl. 261—18)

This invention relates to a carburetor for internal combustion engines of the ignition type, and particularly, to a carburetor utilizing low gravity fuels.

5 An object of my invention is to provide a carburetor in which the quantity of fuel admitted into the carburetor is controlled in a novel manner.

10 Another object is to provide a novel means of controlling the quantity of inert gas which is fed into the carburetor.

15 Still another object is to provide a novel means of controlling the branch manifold so that either gasoline or low gravity fuels are admitted to the engine.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined detailed description and the appended claims.

20 In the drawings

Figure 1 is a side elevation of my carburetor assembly.

Figure 2 is an end view of the low gravity fuel carburetor.

25 Figure 3 is a transverse, sectional view of the low gravity fuel carburetor and the branch manifold.

Figure 4 is an enlarged fragmentary, vertical, sectional view of the fuel nozzle.

30 Referring more particularly to the drawings, the numeral 1 indicates a branch manifold, to one side of which a gasoline carburetor 2—of usual and well known design—is attached, and to the other side a low gravity fuel carburetor 3. The branch manifold 1 is connected to a sleeve 4 which sleeve is, in turn, attached to the intake manifold of the engine (not shown).

35 A port 5 in the sleeve 4 is connected to a pipe extending from the exhaust manifold of the engine so that hot gases are fed into an annular heating chamber 6. A plurality of ribs 7 extend into the central gas passage 8 of the sleeve 4, thereby heating the incoming combustible gases prior to their admission into the engine.

40 A heating jacket 9 surrounds the portion of the branch manifold 1 to which the carburetor 3 is attached, and hot exhaust gases move thru the jacket 9 so as to heat one portion of the branch manifold. The carburetor 3 is provided with an outer heating jacket 10 which jacket extends to an outlet pipe 11. A valve 12 is provided in the pipe 11 and controls the opening thereof. This valve is thermostatically controlled by the following arrangement:

55 An arm 13 is secured to the shaft 14 of the

valve 12. A cylinder 15 is provided with a piston 16, and the rod 17—attached to the piston—is pivotally secured to the arm 13. A pipe 18 extends from the cylinder 15 to a thermostatic bowl 19 in the jacket 9. The bowl 19 and the pipe 18 are filled with expansible fluid and as the temperature of the bowl 19 increases, the fluid will expand, thus moving the piston 16 downwardly and thereby opening the valve 12. When the carburetor is cold, the valve 12 will be closed and the hot gases from the exhaust will circulate around the carburetor 3 and a portion of the branch manifold 1. As soon as the parts have become heated, the valve 12 will open and the temperature of the carburetor 3 and branch manifold 1 will remain substantially constant.

The engine is started with the gasoline carburetor 2. To prevent the gasoline from passing over into the carburetor 3, I provide a swing valve 20 in the branch manifold 1. This valve is preferably pivoted at the bottom, as shown in Fig. 3, and is adapted to swing to either side so as to open or close one side or the other of the branch manifold. The valve 20 will swing to either side, depending on whether the throttle valve of the gasoline carburetor, or the fuel oil carburetor is open.

The fuel oil carburetor 3 comprises a bowl 21, in the center of which an air intake passage 22 is formed. An annular fuel chamber 23 is provided in the bowl 21 and fuel oil is fed into this chamber thru the pipe 24.

35 A venturi 25 is formed in the air passage 22 and fuel jets 26 extend thru the venturi. The venturi 25 is formed with an upwardly extending lip 27. This lip extends upwardly and inwardly for the purpose of creating a partial vacuum immediately back of said lip. An annular vacuum port 28 is formed in the bowl 21 and surrounds the air intake passage 22.

40 A plurality of ducts 29 extend from the vacuum port 28 to the lip 27. Thus, a partial vacuum is created in the vacuum port. A fuel nozzle 30 is fitted in the side of the bowl 21 and comprises a sleeve 31 fixedly mounted in the bowl. This sleeve has a seat 32 at the inner end thereof, the purpose of which will be subsequently described.

45 A valve 33 screws into the sleeve 31, and the end of the valve is tapered so as to fit against the seat 32. By rotating the valve 33, it is moved longitudinally, thereby adjusting the space between the end of the valve and the seat 32. This controls the quantity of fuel fed into the air passage 22.

50 A port 34 extends from the fuel chamber 23

into the annular space 35 around the valve 33. Fuel is thus permitted to pass around the end of the valve and thence into the ducts 26 and on into the central air passage 22. A packing nut 5 36 screws into the sleeve 31 to prevent leakage of fuel around the valve 33.

It is desirable to inject a quantity of inert gas with the low gravity fuel, in order that the engine may operate better. To accomplish this, I provide a tube 37 which screws into the valve 33. A pipe carrying inert gas is attached to the outer end of the tube 37. By rotating the pipe 37, it can be adjusted longitudinally so as to vary the quantity of inert gas which flows therethru. The end of the tube 37 is adjusted relative to the seat 38 on the inside of the valve 33. The valve 33 is adjusted relative to the seat 32 as the throttle valve 39 is opened or closed. The shaft 40 of the throttle valve 39 is connected thru a link 41 to a shaft 42 and from this last shaft, thru a link 20 43 to an arm 44 secured to said valve. It will be evident that as the throttle valve is manually adjusted, the valve 33 will be moved longitudinally and adjusted relative to the seat 32.

The tube 37 is controlled by the quantity of vacuum in the port 28. A vacuum cylinder 45 is mounted on the bowl 21, and this cylinder is provided with a piston 46 and a depending rod 47. The rod 47 is slidably attached to an arm 48 which arm is, in turn, secured to the tube 37. A bore 49 extends from the vacuum port 28 to the cylinder 45. Thus, as the vacuum in the port varies with the flow of gases thru the passage 22, the piston 46 will rise or fall, and thus longitudinally adjust the tube 37.

Having described my invention, I claim:

1. A carburetor for internal combustion engines comprising a branch manifold adapted to be attached to the engine, a low gravity fuel carburetor secured to one end of said branch manifold, a gasoline carburetor attached to the other end of said branch manifold, a freely pivoted and automatic swing valve in said branch manifold, said swing valve being adapted and arranged to close the branch manifold to either the low gravity fuel carburetor or the gasoline carburetor, a heating jacket around said branch manifold above the low gravity fuel carburetor and ribs extending inwardly from the heating jacket into the branch manifold whereby gases passing thru the branch manifold are heated.

2. A carburetor for low gravity fuels comprising a bowl, said bowl having a central air passage extending therethru, a throttle valve in said air passage, a fuel nozzle extending thru the bowl, a sleeve adjustably mounted in the fuel nozzle whereby the quantity of fuel passing therethru is controlled, means connecting said throttle valve and the sleeve whereby the sleeve is adjusted as the throttle valve is opened and closed, an inert gas pipe in the fuel nozzle, said last named pipe being longitudinally adjusted to vary the flow of gas therethru, automatic means connected to said last named pipe whereby the pipe is adjusted, a heating jacket surrounding the bowl, an outlet pipe extending from the heating jacket, a valve in the outlet pipe, and thermostatically controlled means connected to said last named valve whereby the valve is adjusted.

3. A carburetor for low gravity fuels comprising a bowl, said bowl having a central air passage extending therethru, a throttle valve in said air passage, a fuel nozzle extending thru the bowl, a sleeve adjustably mounted in the fuel nozzle whereby the quantity of fuel passing

therethru is controlled, means connecting said throttle valve and the sleeve whereby the sleeve is adjusted as the throttle valve is opened and closed, an inert gas pipe in the fuel nozzle, said inert gas pipe being longitudinally adjustable to control the flow of gas therethru, automatic means connected to said inert gas pipe whereby said pipe is adjusted, a branch manifold, said low gravity fuel carburetor being attached to one end of the branch manifold, and a swing valve in the branch manifold so adapted and arranged as to close one side or the other of the manifold.

4. A carburetor for low gravity fuels comprising a bowl, said bowl having a central air passage extending therethru, a throttle valve in said air passage, a fuel nozzle extending thru the bowl, a sleeve adjustably mounted in the fuel nozzle whereby the quantity of fuel passing therethru is controlled, means connecting said throttle valve and the sleeve whereby the sleeve is adjusted as the throttle valve is opened and closed, an inert gas pipe in the fuel nozzle, said inert gas pipe being longitudinally adjustable to control the flow of gas therethru, and vacuum controlled means connected to said inert gas pipe whereby the pipe is adjusted, a branch manifold, said low gravity fuel carburetor being attached to one end of the branch manifold, and a swing valve in the branch manifold so adapted and arranged as to close one side or the other of the manifold.

5. A carburetor for low gravity fuels comprising a bowl, said bowl having a central air passage extending therethru, a throttle valve in said air passage, a fuel nozzle extending thru the bowl, a sleeve adjustably mounted in the fuel nozzle whereby the quantity of fuel passing therethru is controlled, and means connecting said throttle valve and the sleeve whereby the sleeve is adjusted as the throttle valve is opened and closed, an inert gas pipe in the fuel nozzle, said last named pipe being longitudinally adjusted to vary the flow of gas therethru, automatic means connected to said last named pipe whereby the pipe is adjusted, a branch manifold, said low gravity fuel carburetor being attached to one end of the branch manifold, and a swing valve in the branch manifold so adapted and arranged as to close one side or the other of the manifold.

6. A carburetor for low gravity fuels comprising a bowl, said bowl having a central air passage extending therethru, a throttle valve in said air passage, a fuel nozzle extending thru the bowl, a sleeve adjustably mounted in the fuel nozzle whereby the quantity of fuel passing therethru is controlled, means connecting said throttle valve and the sleeve whereby the sleeve is adjusted as the throttle valve is opened and closed, an inert gas pipe in the fuel nozzle, said last named pipe being longitudinally adjusted to vary the flow of gas therethru, automatic means connected to said last named pipe whereby the pipe is adjusted, a heating jacket surrounding the bowl and an outlet pipe extending from the heating jacket.

7. A carburetor for low gravity fuels comprising a bowl, said bowl having a central air passage extending therethru, a throttle valve in said air passage, a fuel nozzle extending thru the bowl, a sleeve adjustably mounted in the fuel nozzle whereby the quantity of fuel passing therethru is controlled, means connecting said throttle valve and the sleeve whereby the sleeve is adjusted as the throttle valve is opened and

closed, an inert gas pipe in the fuel nozzle, said last named pipe being longitudinally adjusted to vary the flow of gas therethru, automatic means connected to said last named pipe where-
5 by the pipe is adjusted, a heating jacket surrounding the bowl, an outlet pipe extending from the heating jacket, a branch manifold, said low

gravity fuel carburetor being attached to one end of the branch manifold, and a swing valve in the branch manifold so adapted and arranged as to close one side or the other, of the manifold.

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