

April 8, 1930.

R. A. DUFF

1,753,235

CARBURETOR

Filed May 10, 1924

2 Sheets-Sheet 1

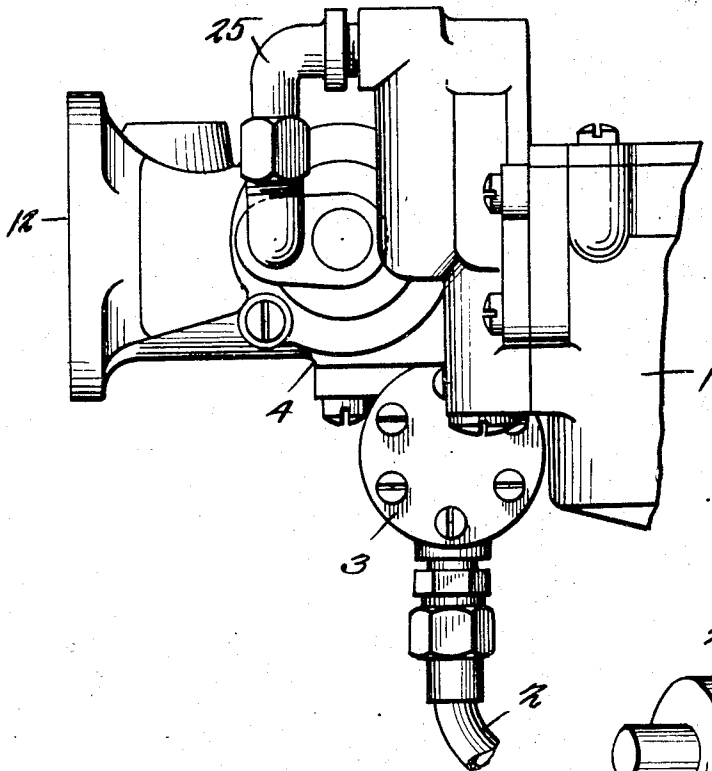


Fig. 1.

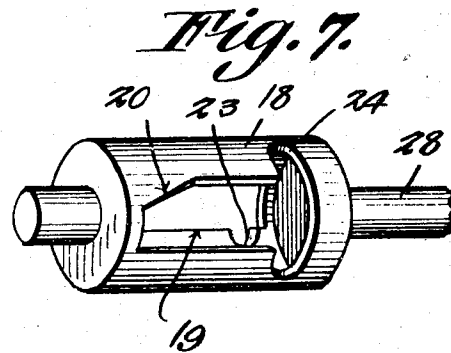


Fig. 7.

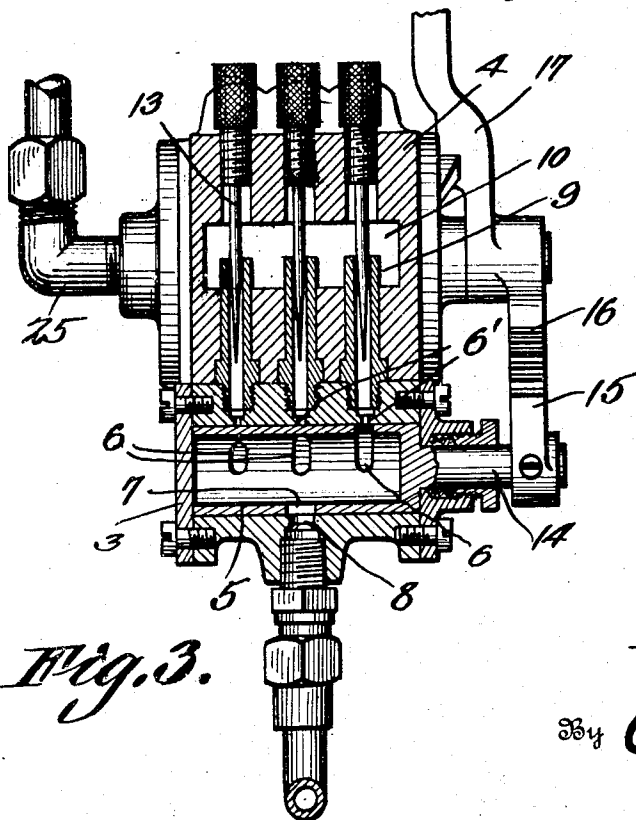


Fig. 3.

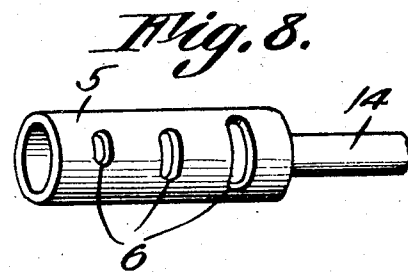


Fig. 8.

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2 Sheets-Sheet 2

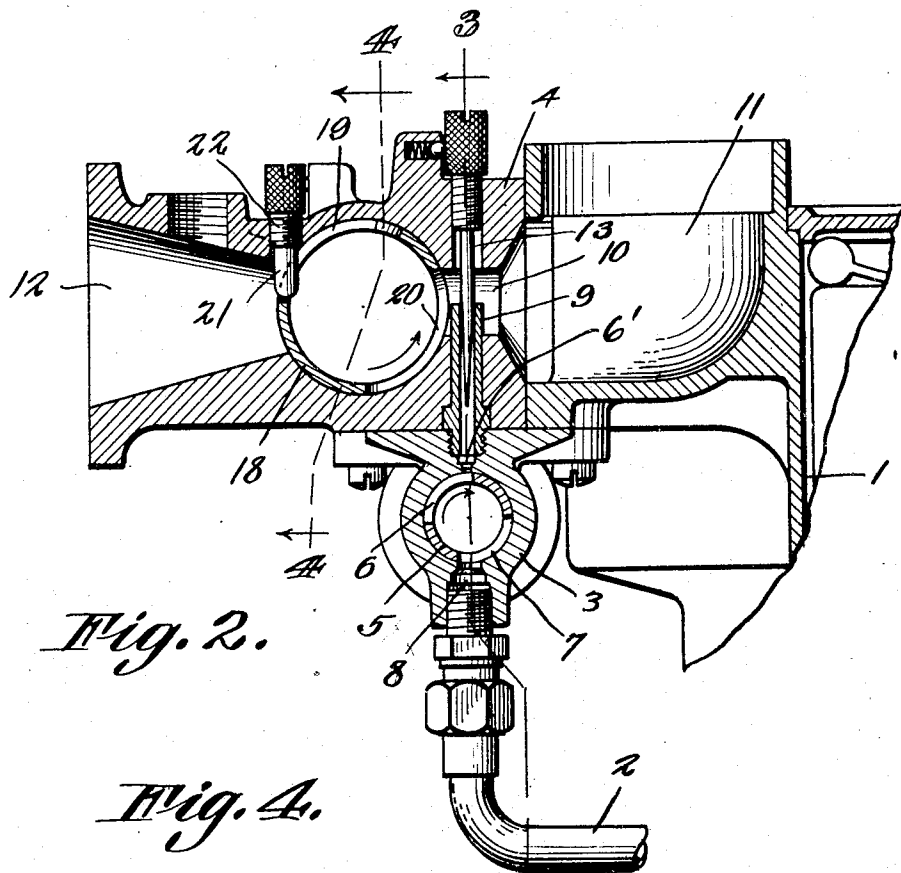
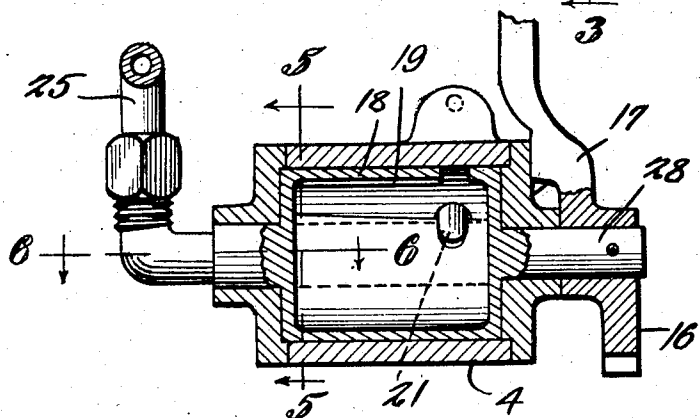


Fig. 5.

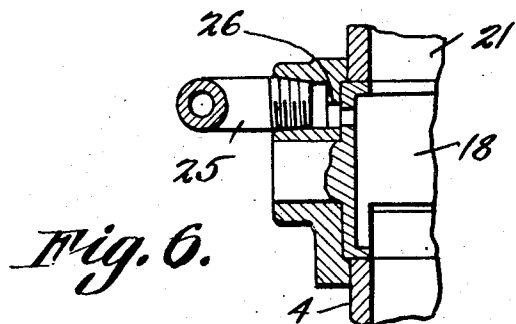


Fig. 6.

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UNITED STATES PATENT OFFICE

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CARBURETOR

Application filed May 10, 1924. Serial No. 712,387.

This invention relates to carburetors and is designed more especially as an improvement, for example, upon the structure shown in Patent No. 1,285,648, issued to me on November 26, 1918.

One of the objects of the invention is to utilize a sleeve valve instead of the usual butterfly valve, this sleeve valve being located between the carburetor and the intake manifold and preventing the condensation of fuel such as occurs when butterfly valves are used.

A further object is to provide means for supplying water to the sleeve valve, the rotation of the valve for controlling the flow of fuel to the intake manifold also serving to control the flow of water to the intake manifold.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings the preferred form of the invention has been shown.

In said drawings:—

Figure 1 is a side elevation of a portion of the carburetor.

Fig. 2 is a vertical longitudinal section therethrough.

Fig. 3 is a section on line 3—3, Fig. 2.

Fig. 4 is a section on line 4—4, Fig. 2.

Fig. 5 is a section on line 5—5, Fig. 4.

Fig. 6 is a section on line 6—6, Fig. 4.

Fig. 7 is a perspective view of the main sleeve valve.

Fig. 8 is a perspective view of the jet controlling valve.

Referring to the figures by characters of reference 1 designates a portion of the usual float chamber and 2 designates a portion of the pipe employed for conducting fuel from said chamber to valve casing 3. This casing is located directly under the body 4 of the carburetor and houses a sleeve valve 5 in the periphery of which are formed separate out-

let ports 6 of different lengths. An inlet port 7 is also provided in the sleeve valve and is adapted to communicate with a port 8 in the casing 3 to which fuel is conducted by the pipe 2. When the sleeve valve is inclosed position, the port 7 is removed from the port 8 and all of the ports 6 are removed from vents 6' that are provided for the respective ports 6 within the upper portion of the casing 3. Nozzles 9 extend from the vents and open into a restricted angular passage 10 formed within the body 4 between an air intake chamber 11 and a flared fuel outlet 12. Needle valves 13 are adjustably mounted in the body 4, one of these being provided for each of the nozzles 9. It is to be understood that the valve 5 can be operated by any suitable means provided for that purpose. For example, and as shown in Fig. 3, a stem 14 can be extended from one end of the valve and be actuated by a segmental gear 15 secured to said stem and receiving motion from the toothed end 16 of a lever 17. This mechanism is common in devices of this character and detailed illustration or description thereof is not deemed necessary. A structure similar thereto has been shown in Figs. 1 and 3 of my patent hereinbefore mentioned and includes cooperating stop devices for limiting the rotation of the valves when brought to full open or closed positions.

That portion of the body 4 between the nozzle 9 and the outlet 12 constitutes a casing for a sleeve valve 18. This valve fits snugly within the body and is provided with opposed slots 19 and 20. Slot 19 has a pin 21 projecting thereinto, this pin being adjustably mounted at 22 in the wall of body 4. When the valve 18 is in full open or full closed position it is held against further movement by the usual stop devices outside of the structure and heretofore explained. When in full closed position a portion of fuel is free to flow through the valve because a notch 23 is provided in one wall of the slot 19 and this notch is never covered when the valve 18 is moved to closed position. For the purpose of controlling the flow of fuel through the notch 23 the pin 21 has been provided, this pin extending into the notch. By

adjusting the pin relative to the bottom of the notch 23 while the valve is closed, a desired amount of fuel will be allowed to flow through the valve to the outlet 12, thereby allowing the engine to idle. Obviously by rotating the sleeve valve 18 in the direction indicated by the arrow in Fig. 2, the slot 19 will be moved to full open position.

As shown in Fig. 7, slot 20 is of variable width, one end portion of the slot being narrower than the other end portion. Slot 20 extends throughout the width of the passage 10 and when in normal or closed position, one of the extensions 24 of the slot is in communication with passage 10 while all the other portions of the slot are shut. Thus while the engine is idling a small amount of fuel is permitted to flow through passage 10 and the open extension 24 into the sleeve valve 18 and thence through the small exposed notch 23 of the slot 19 to outlet 12. By rotating the sleeve valve 18 in the direction indicated by the arrow in Fig. 2, not only will the slot 19 be opened to a greater extent, but the slot 20 will be moved to allow a gradually increasing flow of fuel from passage 10 to the valve 18. The fuel is drawn in through the nozzles 9 and mixes with air admitted from the chamber 11, it being understood of course, that the amount of fuel delivered to the nozzles is controlled by the rotation of the valve 5. Under normal conditions only one of the nozzles 10 is in communication with the pipe 2 through the valve 5, there being enough fuel admitted through the nozzle to allow the engine to idle.

For the purpose of supplying the proper amount of moisture to the explosive mixture, a water pipe 25 opens into one side of the body 4 and terminates in a port 26. See Figs. 5 and 6. That end of the valve 18 nearest to this port has an arcuate slot 27 normally out of communication with the port 26. When the valve 18 is moved away from its normal position, slot 27 will be brought into communication with port 26, thereby admitting an amount of water to the valve where it will mix with the fuel prior to its delivery into the outlet 12. As shown in Fig. 4, the arm or lever 17 is secured to a stem 28 projecting from one end of the valve 18. Thus simultaneous actuation of the two valves 5 and 18 is assured when the arm or lever 17 is moved.

It has been found in practice that by providing a sleeve valve instead of the usual butterfly valve, the fuel will not condense before entering the intake manifold.

It will be noted that the parts can be so adjusted that one nozzle will always be in communication with the source of fuel supply and with the intake manifold for idling purposes.

While the carburetor herein described can be used in connection with all kinds of hydro-

carbon fuel, it is designed primarily for vaporizing kerosene.

What is claimed is:—

A carburetor including a body having a fuel intake port, an air inlet, and an outlet for communication with an intake manifold, there being a restricted passage between the air intake and the outlet, valved means for spraying fuel across the current of air flowing through the passage, a sleeve valve mounted for rotation between said passage and the outlet, there being opposed slots in the valve movable into and out of register with the passage and outlet respectively thereby to control the flow of fuel to the outlet, means outside of the carburetor body for limiting the rotation of the valve to full closed or open position, there being a notch in one wall of the outlet slot in the valve adapted to be positioned to permit flow of mixture through the valve when the valve is in full closed position, thereby to allow idling of an engine supplied by the carburetor, and a pin adjustable into and out of the notch when the valve is in full closed position, thereby to control the flow of mixture through the notch to the outlet when the valve is in full closed position, the inlet slot of the valve having a reduced extension for maintaining communication between the restricted passage and the interior of the valve when the valve is in full closed position.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

RALPH A. DUFF.