

Sept. 12, 1944.

F. SCHAFER ET AL  
FUEL CONTROL APPARATUS

2,358,255

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3 Sheets-Sheet 1

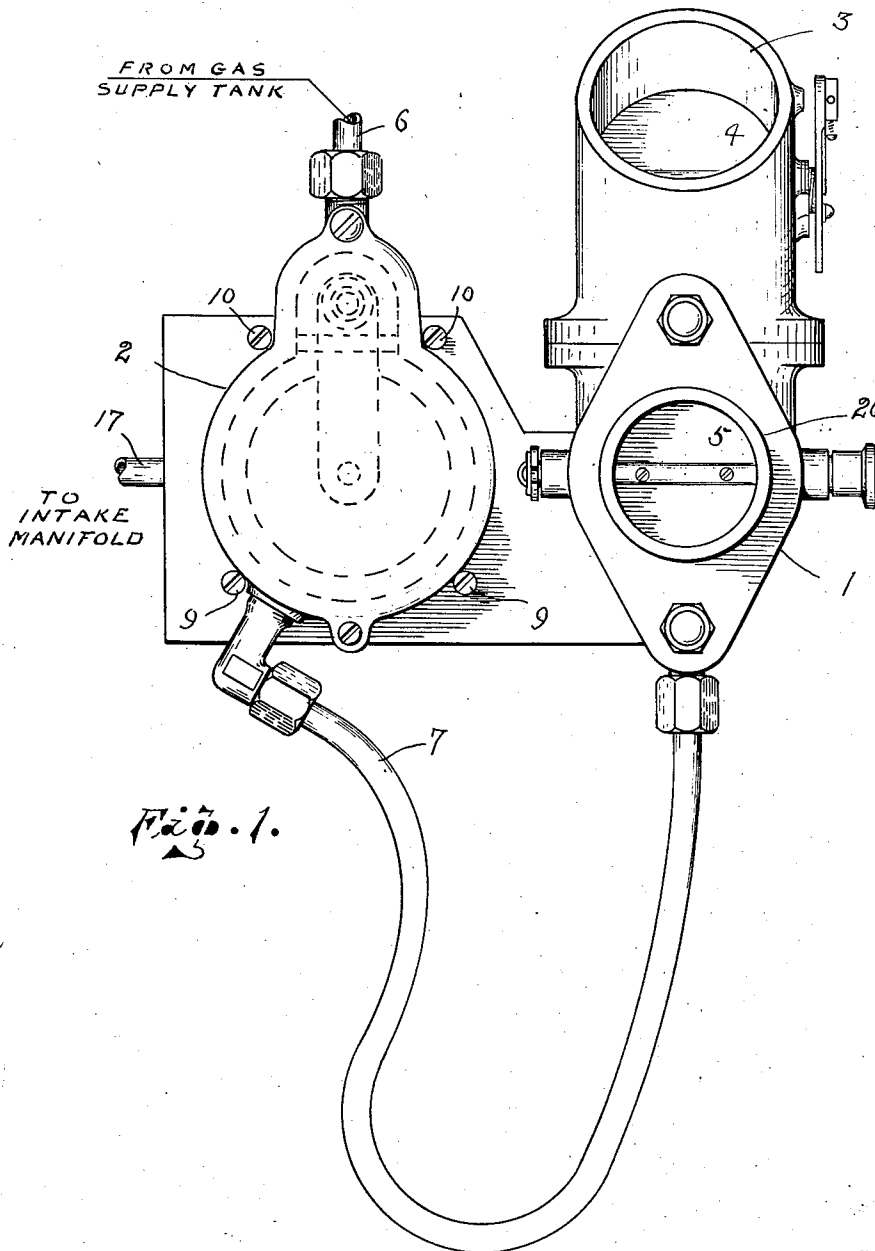


Fig. 1.

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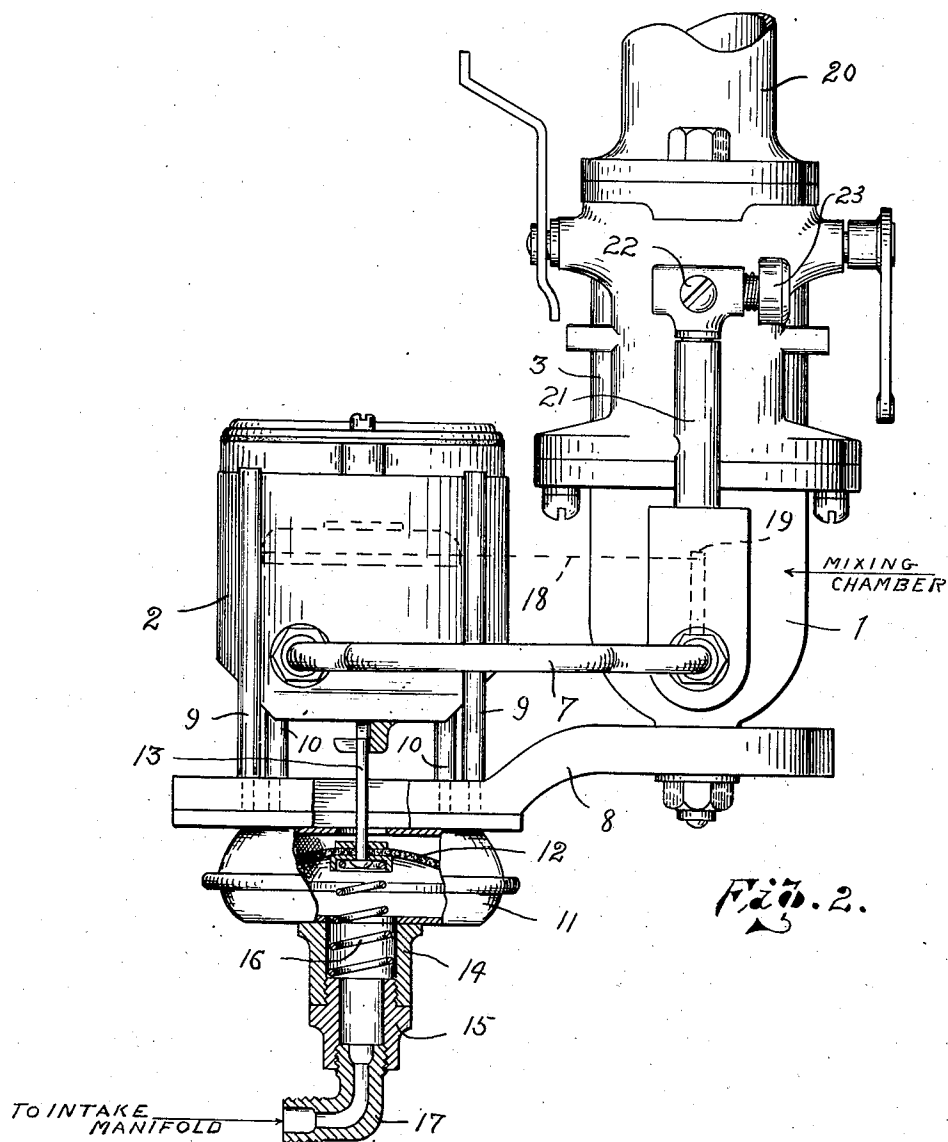
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

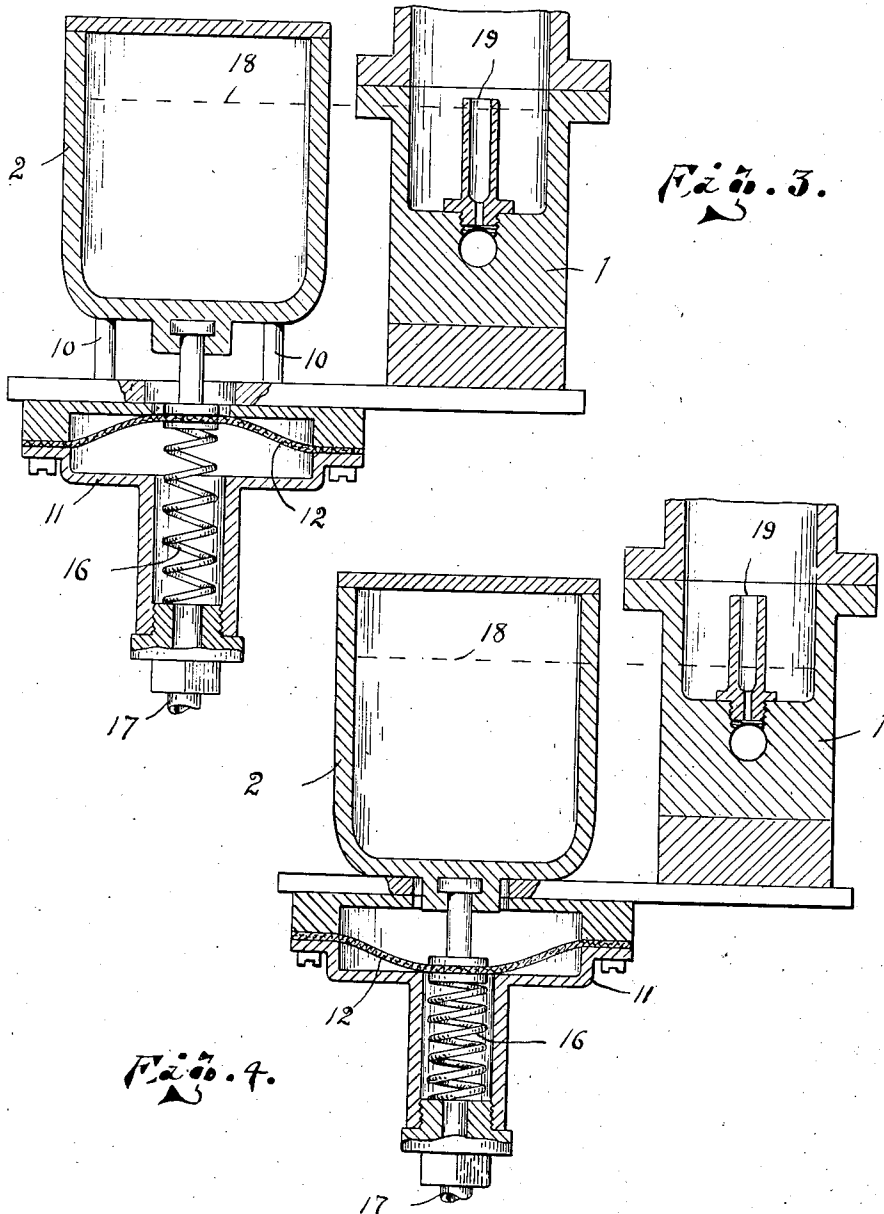


Fig. 3.

Fig. 4.

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# UNITED STATES PATENT OFFICE

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## FUEL CONTROL APPARATUS

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1 Claim. (Cl. 261—72)

This invention relates to apparatus for controlling the fuel supply for internal combustion engines, particularly such as are used in connection with motor vehicles and the like.

It is well known that during periods when such a motor vehicle is moving along a level highway with not so much demand for fuel to maintain the speed desired as to lower the vacuum pressure, or when coasting down grade with the throttle closed and the clutch engaged, harmful fuel wastes occur through both the main and idling jets of the carburetor, with the result that unburned and partially burned fuel is exhausted, giving off disagreeable odors and fouling the cylinders, exhaust line and muffler, as well as materially lessening the mileage obtained by the vehicle per gallon of fuel. This condition occurs with particular frequency in heavy traffic, on hills, and on long trips.

It has been found possible to eliminate for the most part these undesirable conditions by cutting off or lessening the supply of fuel to the engine during such periods, thereby effecting marked improvements in efficiency and economy in operation of the motor vehicle.

Consequently it is the principal object of the present invention to provide such a device for the control of fuel to the engine in a manner that will substantially eliminate all exhaust of unburned or partially unburned gases.

Other objects and advantages of the invention will appear in the following description thereof.

Referring now to the accompanying drawings, forming part of this application, and wherein like reference characters indicate like parts:

Fig. 1 is a top plan view of one embodiment of the invention. Fig. 2 is a side elevation, partly in section, of Fig. 1, and Figs. 3 and 4 are central vertical sections through a slightly modified assembly to illustrate more clearly the extreme relative position of the parts.

The embodiment of the invention here shown and in which the gas receiving bowl of the carburetor is separated from the mixing chamber thereof, the float carrying bowl is illustrated at 2, while the mixing chamber of the carburetor is shown at 1; this latter having attached thereto the air inlet connection 3 having the usual butterfly valve 4 therein, and the throttle control valve 5, within the connection 20 to the intake manifold of the engine.

The gas intake connection to the bowl 2 is illustrated at 6, and the connection between the bowl 2 and the mixing chamber is shown at 7 and in this instance the connection is shown somewhat

extended to provide ample flexibility between the separated members of the carburetor so that the bowl 2 may readily reciprocate vertically, the object of which will be described later.

In this novel construction, the bowl 2 of the carburetor is mounted on one portion of a suitable foundation member or bracket 8 which is common to both portions of the carburetor, and, as guiding means for the bowl, I have illustrated four upright posts 9—9 and 10—10, they being fixed to the bracket 8 as by being screw-threaded thereto, or otherwise as desired.

Directly beneath the bowl 2 and also fixed to the bracket 8 is the diaphragm valve 11, having the ordinary resilient valve member 12 therein to which is centrally fixed the upstanding stem 13, the upper end of which is removably attached in any desired manner to the bottom of the bowl 2. The lower central portion of the valve 11 has fixed thereto the somewhat elongated connection 14, having the removable plug member 15 screw-threadedly mounted within the free end thereof to provide a convenient support for the expansive helical spring 16, which latter is designed to assist in urging the yieldable member 12 at all times to its uppermost position to insure the vertical relation of the two portions of the carburetor 1 and 2 being properly positioned for normal operation of the carburetor.

Within the plug 15 is attached a suitable connection 17 leading to the intake manifold of the engine, not shown, but deemed sufficiently obvious to those versed in the art, to provide the required vacuum for proper operation of the device.

With such connection properly established, it is apparent that when the negative pressure of the vacuum is nil, or substantially so, during operation of the engine, the bowl 2 will remain in its uppermost position, as illustrated, by action of the spring 16, and this position is predetermined in that it maintains the proper level of the fluid within the mixing chamber 1 of the carburetor, as indicated by the dotted line 18; the upper terminus of the main fuel jet being indicated at 19.

When, however, the negative pressure of the vacuum in the intake manifold of the engine increases sufficiently to counteract the expansive action of the spring 16, it will draw downwardly the chamber 2 of the carburetor, thus instantly lowering the level of the fluid supply in relation to the mixing chamber and proportionately decrease the supply of fuel thereto, thereby preventing unburned or partially burned fuel from being exhausted from the engine.

In Fig. 2, at 21 is illustrated the upright conducting chamber of the idling jet which is wholly externally of the mixing chamber 1 and is provided within its connection to the latter with the suitable adjustment and regulating screws 22 and 23. The idling jet is not shown as the relative supply of gas thereto is at all times constant.

Having thus described our invention, what we claim and desire to secure by Letters Patent, is:

In a carburetor for an internal combustion engine including a body member providing a mixing chamber, a fuel nozzle within said mixing chamber, a bracket rigidly secured to said body member, a movable float chamber, upright guiding means on said bracket for said float chamber,

a flexible connection between said float chamber and said nozzle, a diaphragm chamber secured to said bracket beneath the float chamber, a diaphragm within said diaphragm chamber, a stem connecting said diaphragm to said float chamber, resilient means for normally holding said diaphragm and float chamber in their uppermost position, and means connecting said diaphragm chamber to the intake manifold of said engine whereby a predetermined manifold suction will lower the float chamber and consequently lower the fuel level in respect to the nozzle in said mixing chamber.

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