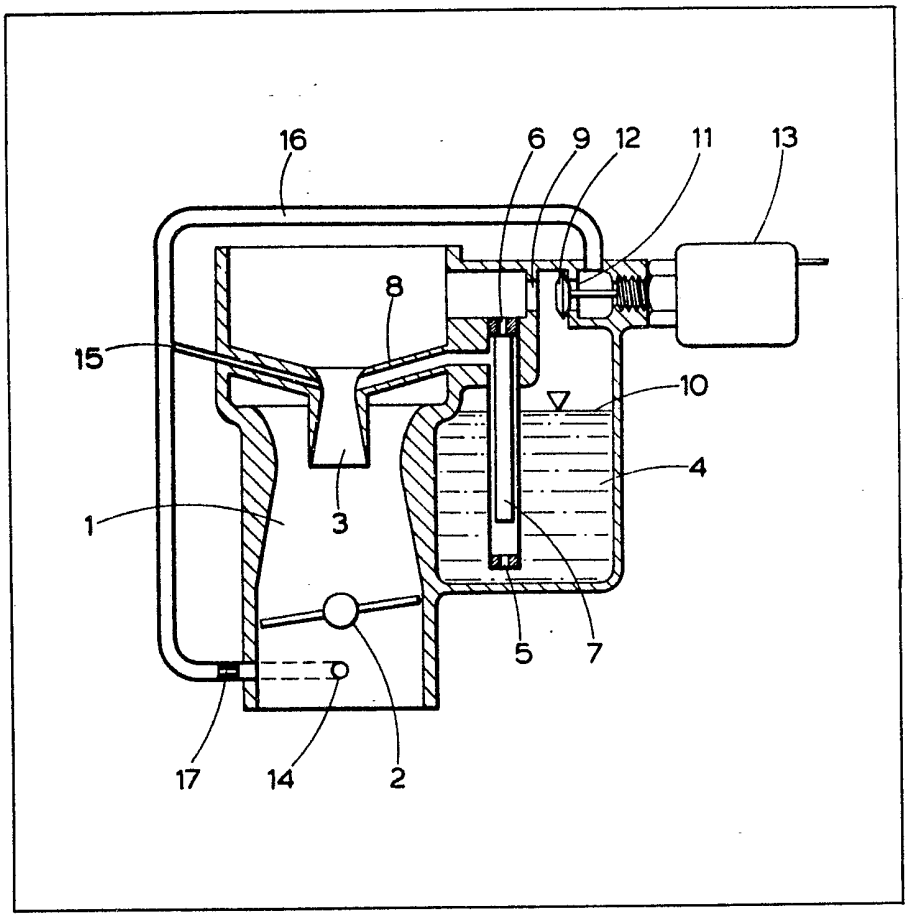
(12) UK Patent Application (19) GB (11) 2 024 950 A

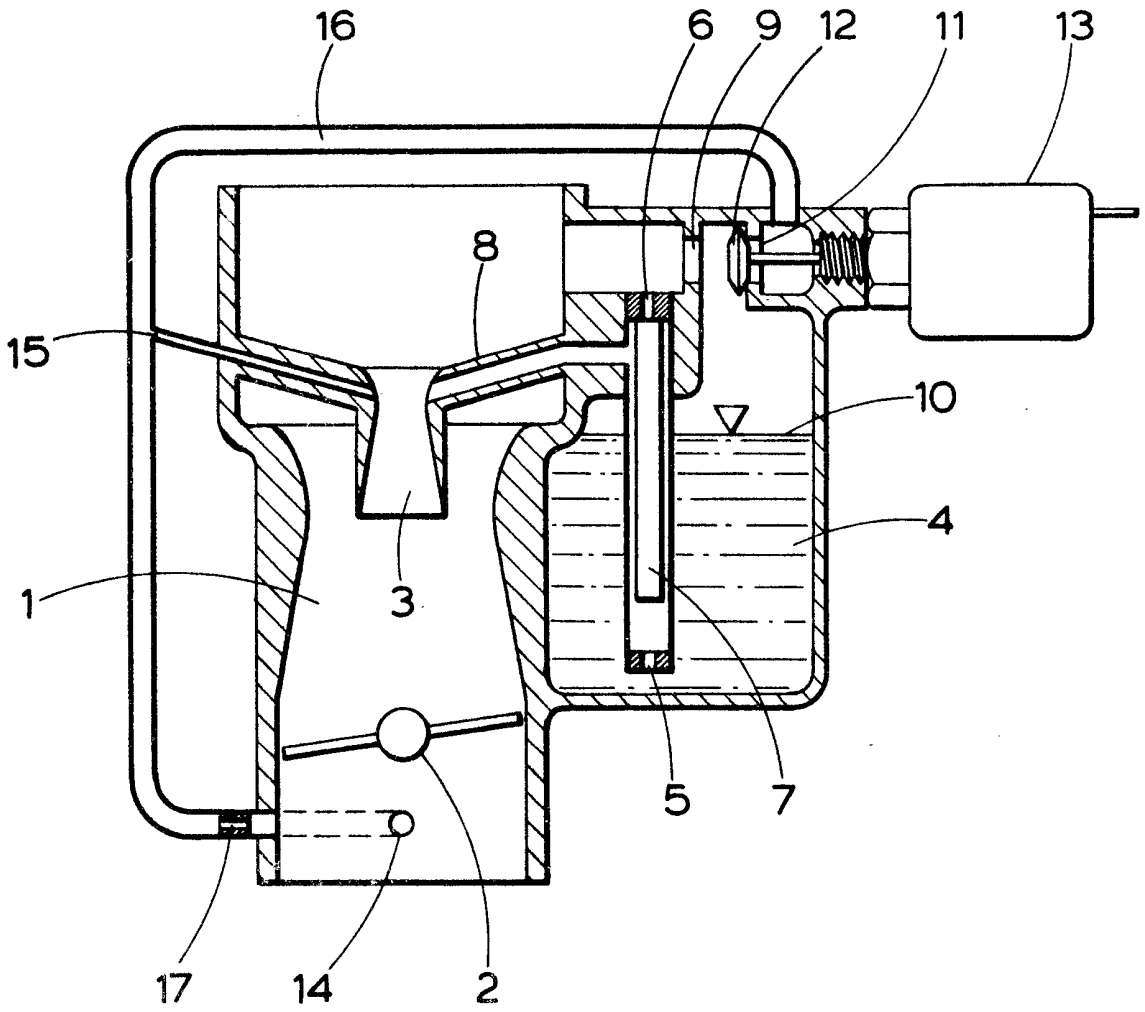
(21) Application No **7921909**
(22) Date of filing **22 Jun 1979**
(23) Claims filed **22 Jun 1979**
(30) Priority data
(31) **2830258**
(32) **10 Jul 1978**
(33) **Fed. Rep. of Germany (DE)**
(43) Application published
16 Jan 1980
(51) **INT CL³**
F02M 7/12
(52) Domestic classification
F1H 1001 1002 1011 105 108 CL
(56) Documents cited
GB 1117268
GB 518164
US 4083344A
(58) Field of search
F1H
(71) Applicants
Pierburg GMBH & Co. KG, Leuschstrasse 1, Postfach 838, 4040 Neuss 13, Federal Republic of Germany.
(72) Inventors
Günter Härtel, Armin Schürfeld, Riedel Röttges
(74) Agents
Hyde, Heide & O'Donnell

(54) **Controlling spray carburettors**

(57) Fuel flow to a venturi 3 is stopped in response to a control signal, by connecting the vapour space of a float chamber 4 to an induction pipe downstream of a butterfly throttle valve 2 by means of a channel 16 containing an electromagnetic valve 12, a branch channel 15 being connected between the channel 16 and the venturi 3.



GB 2 024 950A


16
6
9
12
11
13
8
15
10
4
1
3
5
7
17
14
2

SPECIFICATION
Carburettor

The invention relates to a control device for stopping the flow of fuel through a conventional carburettor equipped with a venturi, a float chamber and the usual system of constricted nozzles, the flow of fuel being stopped, when desired, by connecting the vapour space of the float chamber to the entire inlet pipe downstream of the butterfly throttle valve through a channel containing a controllable valve.

A control device of this kind is known from the German Auslegeschrift 14 26 150, for stopping the flow of fuel during the mode of operation termed "overrunning", that is when the vehicle is driving the engine. Under these circumstances there is a very high suction in the engine inlet pipe. To stop the flow of fuel the suction in the engine inlet pipe is communicated to the vapour space of the float chamber through a channel containing an electromagnetic valve, with the result that the pressure drop is cancelled over each of the constricted nozzles which control the flow of fuel, and this interrupts the flow. A further electromagnetic valve shuts off the flow of fuel through the idling nozzle. This known arrangement has the disadvantage that the flow of fuel is interrupted only when the butterfly throttle valve is shut, whereas in practice it is also necessary to interrupt the flow under certain other circumstances. In particular, this necessity can arise in connection with the purifying system with which many vehicles are nowadays equipped, for removing noxious substances from the effluent exhaust gases. In many cases the exhaust system containing a catalyst which is easily destroyed by overheating. If, for some reason or other, the ignition system of the vehicle fails, for example, because a cable has become disconnected, combustible mixture flows through the engine, as long as it is still turning, into the hot exhaust system and ignites there, destroying the catalyst.

The intention in the present invention is to obviate this danger by providing a control device for stopping the flow of fuel reliably and promptly on receipt of a control signal, for example when ignition fails.

The problem is solved, according to the invention, by giving the control device mentioned at the beginning the characteristics described in the claim.

The drawing shows an example of the invention, and this will now be described in greater detail.

The conventional carburettor represented diagrammatically in the drawing should be thought of as being fully functional and equipped with all the necessary systems. Nevertheless, for the sake of simplicity, only those parts which are necessary for explaining the present invention are shown, that is a main air channel 1 through which air flows downwards, as seen in the drawing, a butterfly throttle valve 2, a pre-atomizing venturi 3, a float chamber 4 and the main mixture-forming system comprising a main nozzle 5, an air-correction nozzle 6, a mixing tube 7 and a main mixture outlet 8. The float chamber 4 communicates through a venting port 9 with the main air channel 1 upstream of the pre-atomizing venturi 3.

For shutting off the flow of fuel through the carburettor, suction is admitted, with the help of a channel 16, into the vapour space of the float chamber 4, above the liquid level 10 of the fuel, through a suction port 11. For this purpose the suction port 11 is opened by movement of a double-action valve head 12 of a two-way electromagnetic valve 13. The valve head 12, travelling across the intervening space, blocks the venting port 9.

The suction is taken from a bore 14 located in the main air channel 1 at a point downstream of the butterfly throttle valve 13, and also from a branch channel 15 which takes suction from approximately the narrowest region of the pre-atomizing venturi 3, the resulting signal being conveyed through a common channel 16 to the suction port 11 of the float chamber 4. A fixed orifice 17 can be interposed in the suction channel near the bore 14. The suction thus applied to the vapour space of the float chamber 4 interrupts the flow of fuel through the carburettor by cancelling, or making negative, the pressure drops across all the nozzles, such as 5, through which fuel flows to the engine. The arrangement ensures that the flow of fuels to the engine through all fuel-conveying systems is stopped, irrespective of the rate of airflow, butterfly valve setting and suction in the engine inlet pipe. In particular, the electromagnetic valve 13 can be arranged so that as long as this valve is receiving current its valve head 12 blocks the suction port 11. On the occurrence of a current failure, the valve head 12 jumps across and, leaving the suction port 11, blocks the venting port 9.

Nevertheless, it should be observed that if, for one reason or another, the supply of electric current to the electromagnetic valve 13 is interrupted, for example if the electric lead becomes inadvertently detached, this could result in an undesired interruption of the flow of fuel to the engine. If this is regarded as a serious risk, the action of the valve 13 can be arranged differently, with the help of a delay device (not shown). In this case, as long as the engine is running normally the valve 13 is without current, the valve holding the suction port 11 closed so that fuel flows through the system. Subsequently, when ignition is switched off, for the purpose of shutting down the engine, or if ignition fails due to a malfunction, a flow of electric current is temporarily applied to the valve 13, for a period determined by the delay device, for example for 30 seconds, the valve responding by shifting the valve head 12 temporarily across to open the suction port 11 and block the venting port 9. This interrupts fuel flow, preventing the enginer from idling diesel-fashion and preventing the dead but still rotating engine from pumping unburnt combustible mixture into

the exhaust system, where it might ignite and destroy the catalyst. For starting the engine again before the delay period has expired, the delay device is bridged over electrically, putting valve 13 without current so that fuel can once more flow normally through the carburettor.

CLAIMS

1. A carburettor assembly equipped with a control device for stopping the flow of fuel through the carburettor, the latter being a conventional carburettor equipped with a pre-atomizing venturi, a float chamber and the usual system of constricted nozzles, the flow being stopped, in dependence upon a control signal, by connecting the vapour space of the float chamber to an induction pipe downstream of a butterfly throttle vavle through a channel containing a controllable valve, and wherein a branch channel is connected between the channel containing the controllable valve, said branch channel leading from the pre-atomizing venturi, the controllable valve being a two-way electro-magnetic valve which, in dependence upon the control signal, opens either a venting port for venting the vapour space of the float chamber to the atmosphere, or a suction port through which suction transmitted through said channel is applied to the vapour space.

2. A carburettor assembly equipped with a control device for interrupting the flow of fuel through a carburettor, substantially as hereinbefore described with reference to the accompanying drawing.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1980. Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.