United States Patent

Soubis

[15] **3,678,911**

[45] **July 25, 1972**

[54] SWITCHING-OFF DEVICE FOR INTERNAL COMBUSTION ENGINE FED BY A DUAL-BODY CARBURETOR

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[22] Filed: **June 29, 1970**

[21] Appl. No.: **50,626**

[30] **Foreign Application Priority Data**

July 16, 1969 France.....6924230

[52] **U.S. Cl.**.....**123/127,** 123/198 DB, 123/198 DC, 123/DIG. 11

[51] **Int. Cl.**.....**F02m 11/02,** F02b 77/08

[58] **Field of Search**.....123/DIG. 11, 136, 198 D, 198 DB, 123/198 DC, 142, 127

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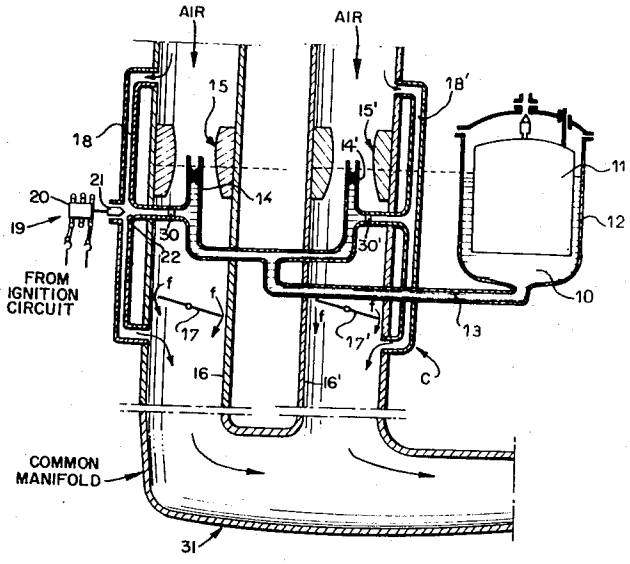
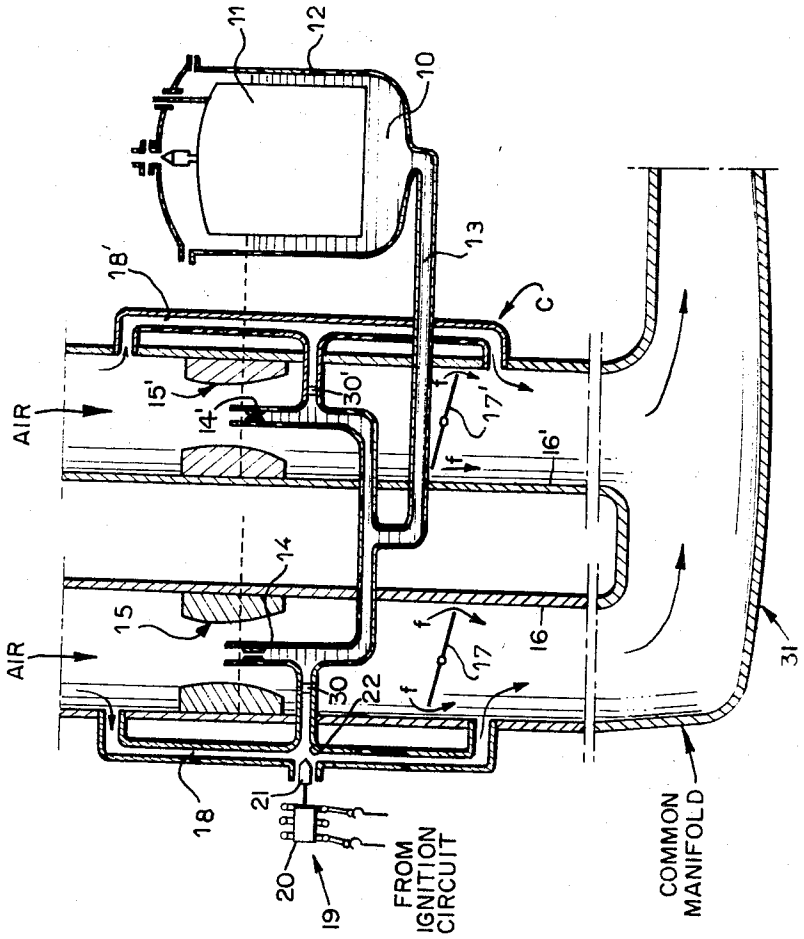
[57] **ABSTRACT**

Modern high-performance combustion engines have the drawback of continuing to run at idling speed during a certain period when switched off. A known method used to avoid this phenomenon consists in shutting off the arrival of gasoline into the idling circuit of the carburetor.

According to the invention when the internal combustion engine is fed by a dual-body carburetor, it is provided with only one member for stopping the feeding with fuel on only one of the two idling tubes of the carburetor and actuated simultaneously with the switching off of the engine ignition circuit.

5 Claims, 1 Drawing Figure





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SWITCHING-OFF DEVICE FOR INTERNAL COMBUSTION ENGINE FED BY A DUAL-BODY CARBURETOR

Modern high-performance and high compression-ratio internal combustion engines have the drawback of continuing to run at idling speed during a certain period when switched off. This may sometimes be a rather long period. This phenomenon which occurs while the ignition circuit is switched off is called self-ignition.

A known method used to avoid this phenomenon consists in shutting off the arrival of gasoline into the idling circuit of the carburettor by using an electro-magnetic valve constituted by a needle mounted in the idling tube of the carburettor, the said needle being controlled by an electro-magnet.

During the operation of the engine, the electro-magnet is fed, the electro-magnetic valve is open and, therefore, the fuel may pass through the idling tube. When the engine is switched off, the current feeding the electro-magnetic valve is also switched off, the latter is closed and, therefore, the fuel can no longer circulate in the idling circuit of the carburettor. The engine, which is no longer fed with fuel, stops.

The invention is concerned more particularly with high-performance internal combustion engines fed by a dual-body carburettor. In a dual-body carburettor, two idling circuits are provided. If the stopping of the engine is to be obtained by the known method just described, it is therefore necessary to provide a duplication of the switching-off devices ; otherwise stated, it is necessary to provide two electro-magnetic valves controlled electrically in parallel and mounted on each of the idling tubes of the carburettor. Indeed, it is known that the normal richness of an idling circuit is usually on the order of 1.30. This richness is defined as being the air/fuel ratio used, taking as a reference a ratio equal to 1 when the relative amounts of air and fuel correspond to a theoretical complete combustion.

Under such conditions, if the known principles are applied and if in a dual-body carburettor there is only provided a single switching-off member in only one of the idling circuits, it may be inferred that with such a device the engine will be fed, after the switching off the ignition, with a richness of the order of 0.65 (i.e. the half of 1.30). Now it is known in the art that such a richness favors the self-ignition phenomenon which it is desired to avoid.

Quite suprisingly, it has however been observed that where use is made of only one member for stopping the feeding with fuel, placed on only one of the two idling tubes of a dual-body carburetor, immediate stopping of the engine was obtained in a manner which has not yet been elucidated.

It may be assumed that such a stopping is due to a transitory phenomenon occuring between the normal running speed of the engine and a weak-feed speed. However that may be, this unexpected phenomenon discovered according to the invention achieves an immediate stopping of the engine, to ensure considerable economy by using a single automatic switching-off device instead of the two normally necessary and to reduce the overall dimensions of the said device. This last consequence is not of the least importance, for dual-body carburettors are already of complex structure and considerable dimensions.

In the single appended drawing, there is diagrammatically illustrated one embodiment of the invention.

The dual-body carburettor C comprises a feeding constant-level or float chamber **12**, the float of which is seen at **11** and which supplies fuel **10** through a tube **13** to two nozzles **14**, **14'** mounted in the Venturi throats **15**, **15'** of the two bodies **16**, **16'** of the carburettor. The flow sections **16**, **16'** forming combustible gaseous mixture inlet tubes are controlled in parallel and simultaneously by two inlet butterfly valves or flaps **17**, **17'** which are controlled from the acceleration pedal (not shown).

When the flaps **17**, **17'** close the flow section of the tubes **16**, **16'** the supply of fuel to the engine rotating at idling speed is ensured by the two by-pass channels **18**, **18'** shunting the flaps **17**, **17'** . As is apparent from the drawing, both barrels **16** and **16'** as well as the idling tubes **18** and **18'** feed into a common manifold **31** for all of the engine cylinders. A fuel path from the bowl's liquid fuel **10** into the idle passages **18** and **18'** is formed by way of the nozzles **30** and **30'** respectively. The air flows in the direction indicated by the arrows in the drawings, with part of the air flowing around the butterfly valves **17**, **17'** even when the latter are closed, as indicated by the arrows *f*. The electro-magnetic valve **19**, referred to below, is activated by the ignition circuit, as indicated.

According to the invention, in order to avoid the self-ignition phenomenon subsequent to the switching off of electric supply to the engine, there is provided only one electro-magnetic valve **19** in the idling channel **18**.

The arrangement is such that when the engine is switched on, the electro-magnetic valve **19** is fed, its plunger **20** is attracted and the valve **21** is displaced away from its seat **22**, thus freeing the channel **18** as shown in the drawing.

When the engine is switched off, the electro-magnetic valve **19** is no longer fed, the valve **21** is applied on its seat **22** and the channel **18** is closed.

The channel **18'** remains open, but it is surprisingly observed that when the switching off is effected, contrary to all expectations, the engine immediately stops, for it is not subjected to the self-ignition phenomenan which should normally persistently occur owing to weak feeding with fuel resulting from the presence of the single idling channel **18'** .

Of course the invention is by no means limited to the form of embodiment described, the means of control of the closing of the switching-off member being, in particular, of any suitable type. The electro-magnet controlling the closing of the needle may in particular be replaced if desired by a mechanical device connected or not with the engine switching control. The invention therefore comprises all technical equivalents to the means described as well as their combinations if the latter are carried out according to its spirit.

Thus, with the dual carburettor of the invention, there are a pair of idling tubes **18** and **18'**. One of these tubes, namely the tube **18'**, is maintained at all times permanently free and unobstructed, so that fluid can flow therethrough at any time. The closure means **19** has a normally closed position and coacts only with the other idling tube **18** for closing the latter automatically when the engine is not operating. This closure means **19** responds to operation of the engine for opening the idling tube **18**. In the example illustrated, this closure means **19** takes the form of the above-described electro-magnetic valve which, when unenergized, assumes its normal position closing the tube **18**. This valve becomes energized when the engine operates to assume the open position opening the idling tube **18**.

What is claimed is:

1. In an internal combustion engine fed by a dual-body carburettor, a switching-off device preventing the operation of the engine fed with fuel through the idling tubes of the carburettor subsequent to the switching off of the electric ignition circuit of the engine, said device comprising only one member for stopping the feeding with fuel, which member is placed on only one of the two idling tubes of the carburettor, means of control of the closing of the said stopping member being provided so as to be actuated simultaneously with the operation of switching off of the engine ignition circuit, said carburettor having two barrels, and both of said barrels as well as both of said idling tubes feeding into a common manifold chamber for all the engine cylinders.

2. Switching-off device according to claim **1**, wherein said stopping member and said control means are constituted by an electro-magnetic valve, the electric supply of which is controlled by the ignition circuit control device.

3. In an internal combustion engine, a dual carburettor having a pair of idling tubes one of which remains permanently open so that fluid can flow therethrough at any time, and closure means coacting only with the other of said tubes for automatically closing the latter when engine operation is terminated and for automatically opening said other tube when

the engine operates, said carburettor having a pair of barrels, and both of said barrels as well as both of said idling tubes feeding into a common manifold for all of the engine cylinders.

4. The combination of claim 3 and wherein said closure means includes a valve which is normally in a closed position closing said other tube.

5 The combination of claim 4 and wherein said closure means is an electro-magnetic valve which when unenergized automatically assumes said closed position, said electro-magnetic valve being energized in response to engine operation for automatically opening said other tube when the engine operates.

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