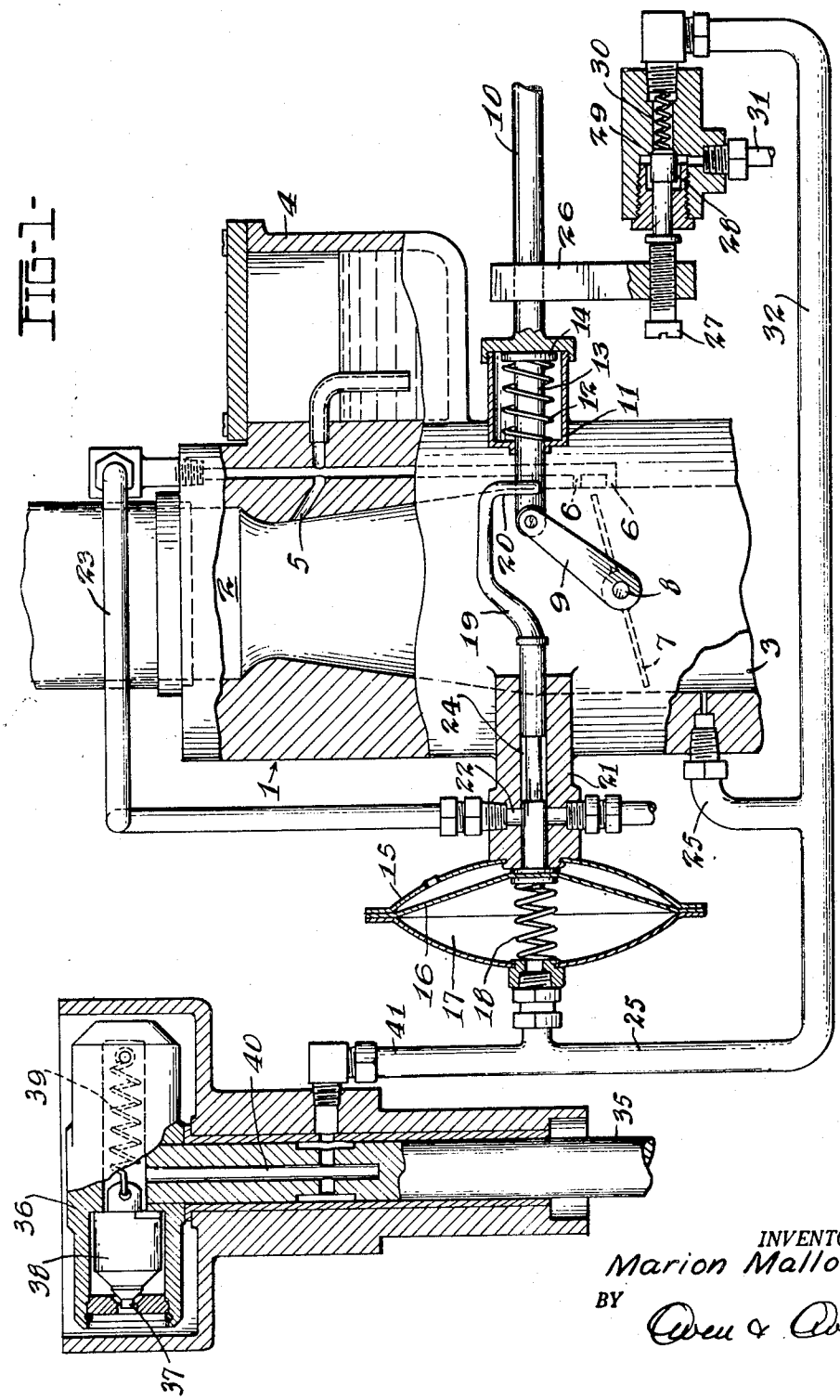
May 2, 1950 M. MALLORY 2,506,511

COMBINED CARBURETOR AND DEGASSER

Filed Aug. 1, 1946 2 Sheets-Sheet 1

FIG-1-



INVENTOR.
Marion Mallory
BY
Owen & Owen

May 2, 1950 M. MALLORY 2,506,511

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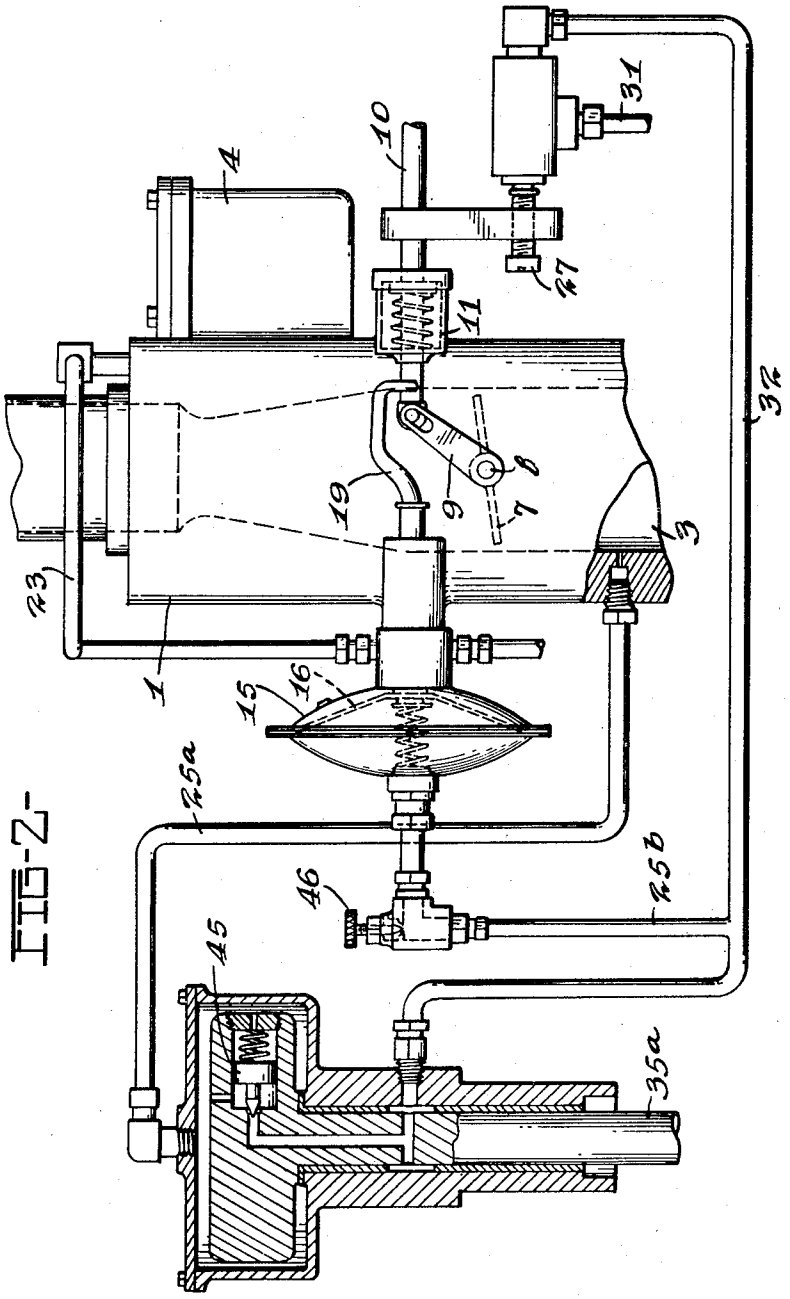


FIG-2-

INVENTOR.
Marion Mallory
BY
Owen & Owen,
Attorneys.

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2,506,511

UNITED STATES PATENT OFFICE

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COMBINED CARBURETOR AND DEGASSER

Marion Mallory, Detroit, Mich., assignor to The Mallory Research Company, Detroit, Mich., a corporation of Michigan

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19 Claims. (Cl. 123—97)

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This invention relates to a combined carburetor and degasser for an internal combustion engine. More particularly, the invention relates to a device where the usual throttle valve of the engine is automatically opened to a regulated degree and at the same time the feed of fuel to the engine is stopped when the usual manually controlled means for operating the throttle valve is in valve closing position and the speed of the engine is above a predetermined idling speed.

The object of the invention is to provide a simple means whereby the flow of fuel to the engine may be stopped and at the same time air free from fuel may be supplied to the engine intake when the engine is running above a predetermined speed and the manually controllable means for operating the throttle is in throttle-closing position. A further object of the invention is to provide means of the character described wherein the initial movement of the manually controlled means for opening the throttle valve renders the degasser inoperative. Another object of the invention is to provide a single means for preventing the flow of fuel to the engine and opening the throttle valve arranged to cut off the flow of fuel before the throttle valve is opened thereby. Other objects and details of the invention will appear as the description proceeds.

In the accompanying drawings, forming a part of this specification, Fig. 1 shows one embodiment of my invention and Fig. 2 shows a modification thereof. In Fig. 1 there is shown a combined carburetor and degasser 1 which is provided with an air intake 2 and an intake 3 for the engine. It is provided with the usual float bowl indicated at 4, and a main fuel jet 5 and an idling fuel jet 6, through which fuel is drawn by vacuum in the intake. In the present instance a jet 6 is provided adjacent to and at each side of a throttle valve 7 when in closed position. The throttle valve 7 is mounted on a shaft 8 having an operating arm 9. A throttle rod 10 may be manually controllable in the usual way or in any suitable way. The end of the rod is provided with a sleeve 11 in which there is a spring 12. A link 13 pivoted to the end of arm 9 is telescoped within the sleeve and is provided with a head 14 against which spring 12 presses. Spring 12 normally maintains the telescoping connection in shortened position, but is weak enough so that it can be compressed to elongate the connection without moving the manually operable end of the rod.

A pressure responsive device 15 is indicated as

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being provided with a diaphragm 16 and a pressure chamber 17. Spring 18 within the chamber normally presses the diaphragm to the right as viewed in the drawings. An operating rod 19 is connected to the diaphragm and is provided on the end with a hook 20 which contacts the end of arm 9 when the diaphragm is moved to the left. Rod 19 works in a guide 21 in the side of the carburetor. The guide is provided with a cross duct 22 connected by a conduit 23 to the fuel jets 5 and 6 of the carburetor. Rod 19 is cut away at 24 so that, when the cut away portion of the rod is in line with the duct, air at atmospheric pressure is admitted to conduit 23. Chamber 17 is connected by a pipe 25 to the engine intake on the engine side of the throttle valve.

Throttle rod 10 is provided with an arm 26 in the end of which there is an adjustable screw 27 in position to contact a valve 28 and seat it against a seat 29 when the throttle rod is in throttle-closing position. The valve seat thus acts as a stop for the throttle-closing movement of the throttle rod, and by adjustment of screw 27 the exact position at which the throttle rod is stopped may be adjusted as desired. A spring 30 opens the valve 28 when the screw 27 is moved away from the valve. This allows atmospheric air to enter through intake 31 and pass through the valve and conduit 32 to chamber 17.

A shaft 35 is driven by suitable means from the engine so that its speed is dependent upon the speed of the engine. Shaft 35 is provided with a head 36 having therein a port 37 controlled by a valve 38 normally held open by a tension spring 39. It will be seen that the valve is closed when shaft 35 reaches a speed at which centrifugal force overcomes the spring. The shaft is provided with a central opening 40 communicating with the valve chamber in head 36 and connected by a conduit 41 to chamber 17.

During the normal starting and operation of the engine, the throttle valve is controlled by the throttle rod 10, manually operated in the usual manner, and the carburetor operates in the well known manner. If the throttle rod is moved to closed position so that screw 27 seats valve 28 and the engine is running at such a speed that valve 38 is closed, the vacuum on the engine side of the throttle valve is connected by conduit 25 to chamber 17 and thereupon the diaphragm is moved to the left. The parts are so arranged that there is some lost motion before hook 20 contacts arm 9, and during this lost motion reduced portion 24 admits air through conduit 23 so

that the intake of fuel is stopped. Thereafter, the hook operates the throttle valve, compressing spring 12 and admitting air through the throttle valve. However, there is still maintained sufficient vacuum on the engine side of the throttle valve to operate the pressure responsive device and maintain the diaphragm in its degassing position. If the speed of the engine is below that at which valve 38 closes, or if the speed is reduced below that point, air entering through port 37 and conduits 40 and 41 breaks the vacuum within chamber 17 and allows the throttle valve to close. In this closing movement, the valve is allowed to close before the reduced portion 24 moves out of register with conduit 22 so that the idling jet becomes operative after the throttle valve is closed.

If, at any time when the degasser is operative, the manually controlled throttle rod 10 is started towards throttle-opening position, the screw 27 immediately allows valve 28 to become unseated, thus breaking the vacuum in chamber 17 and allowing the manually operable means to once more take control of the throttle.

In the modification shown in Fig. 2, there is a centrifugal valve 45 operative from the engine by shaft 35*a* and opening when the speed of the engine is above a predetermined amount. This valve is interposed between pipe 25*a*, leading from the engine intake 3 as does pipe 25 in Fig. 1, and pipe 25*b* leading from the valve to pressure responsive device 15. It will be noted that pipe 32 is connected to pipe 25*b*. A small bleed valve 46 is provided in pipe 25*b*.

The operation of the device shown in Fig. 2 is substantially the same as that of the device shown in Fig. 1. When the manually controlled rod 10 is in throttle opening position, chamber 17 is vented through valve 28, so that degasser will not operate. When rod 10 is in throttle valve-closing position and the speed of the engine is sufficient to open valve 45, chamber 17 is connected to intake 3 and so operates in the same manner as described in connection with Fig. 1 when valve 38 is closed. When the engine speed drops to idling and valve 45 closes, there is no further evacuation from pipe 25*b*, and bleed valve 46 restores pressure in chamber 17 and the degasser becomes inoperative.

It will be seen that, by the construction described, the usual throttle valve is utilized to relieve the vacuum in the engine when it is running above a predetermined speed with the manual means for operating the throttle in throttle-closing position. At the same time, and operated by the same means, the flow of gas to the engine is stopped. The operation of the carburetor is returned to normal automatically upon the speed of the engine dropping to idling speed or upon any movement of the throttle rod to open the throttle valve and apply power to the engine.

An important feature of the invention is the cutting off of the fuel supply by the degasser before additional air is admitted to the engine intake, and cutting off that additional intake before the fuel supply is restored. This prevents an influx of fuel laden air causing the engine to surge at either the start or conclusion of the degasser action.

While one simple and practical arrangement of parts embodying the invention has been shown in some detail, and one variation has been disclosed, it will be recognized that various other changes may be made in the construction and arrangement within the scope of the

appended claims and while retaining at least some of the advantages of the invention.

What I claim is:

1. In an internal combustion engine, means providing an intake for the engine, a throttle valve in the intake, manually operable means for opening and closing the valve, a pressure responsive device, and connections from said device to the intake on the engine side of the valve to automatically open the valve by means of partial vacuum in said intake while the manual means is in valve-closing position.

2. In an internal combustion engine, means providing an intake for the engine, a throttle valve in the intake, manually operable means for opening and closing the valve, a pressure responsive device, and connections from said device to the intake on the engine side of the valve to automatically open the valve by means of partial vacuum in said intake while the manual means is in valve-closing position, and means rendering said pressure responsive means inoperative when the manually operable means is in valve-opening position.

3. In an internal combustion engine, means providing an intake for the engine, a throttle valve in the intake, manually operable means for opening and closing the valve, a pressure responsive device, and connections from said device to the intake on the engine side of the valve to automatically open the valve by means of partial vacuum in said intake while the manual means is in valve-closing position, means providing a vent opening for rendering the pressure responsive means inoperative and means operated by said manually operable means closing the vent when the last said means is in throttle-closing position and opening the vent when the last said means is in throttle-opening position.

4. In an internal combustion engine, means providing an intake for the engine, a throttle valve in the intake, manually operable means for opening and closing the valve, a pressure responsive device, and connections from said device to the intake on the engine side of the valve to automatically open the valve by means of partial vacuum in said intake while the manual means is in valve-closing position, means providing a vent opening for rendering the pressure responsive means inoperative, and a valve controlling said opening and, when seated, acting as a stop for the valve-closing movement of said manually operable means.

5. In an internal combustion engine, means providing an intake for the engine, a throttle valve in the intake, manually operable means for opening and closing the valve, a pressure responsive device, and connections from said device to the intake on the engine side of the valve to automatically open the valve by means of partial vacuum in said intake while the manual means is in valve-closing position, means providing a vent opening for rendering the pressure responsive means inoperative, a valve controlling said opening, and an adjustable contact means carried by said manually operable means, said contact means closing the vent valve and stopping the movement of the manually operable means in throttle-closing direction.

6. In an internal combustion engine, means providing an intake for the engine, a fuel feed to the intake, a throttle valve in the intake, manually operable means for opening and closing the valve connected to the valve by yielding means, a pressure responsive device, connections

from said device to the intake on the engine side of the valve and means actuated by said pressure responsive device to automatically open the valve against the pressure of said yielding means by means of partial vacuum in said intake while the manual means is in valve-closing position, and means operated by the valve-opening movement of the pressure responsive device to stop the feed of fuel in advance of its opening of the throttle.

7. In an internal combustion engine, means providing an intake for the engine, a fuel feed to the intake a throttle valve in the intake, manually operable means for opening and closing the valve connected to the valve by yielding means, a pressure responsive device, connections from said device to the intake on the engine side of the valve and means actuated by said pressure responsive device to automatically open the valve against the pressure of said yielding means by means of partial vacuum in said intake while the manual means is in valve-closing position, and means rendering said pressure responsive means inoperative when the manually operable means is in valve-opening position, and means operated by the valve-opening movement of the pressure responsive device to stop the feed of fuel in advance of its opening of the throttle.

8. In an internal combustion engine, means providing an intake for the engine, a fuel feed to the intake, a throttle valve in the intake, manually operable means for opening and closing the valve connected to the valves by yielding means, a pressure responsive device, connections from said device to the intake on the engine side of the valve and means actuated by said pressure responsive device to automatically open the valve against the pressure of said yielding means by means of partial vacuum in said intake while the manual means is in valve-closing position, means providing a vent opening for rendering the pressure responsive means inoperative and means operated by said manually operable means closing the vent when the last said means is in throttle-closing position and opening the vent when the last said means is in throttle-opening position, and means operated by the valve-opening movement of the pressure responsive device to stop the feed of fuel in advance of its opening of the throttle.

9. In an internal combustion engine, means providing an intake for the engine, a fuel feed to the intake, a throttle valve in the intake, manually operable means for opening and closing the valve connected to the valve by yielding means, a pressure responsive device, connections from said device to the intake on the engine side of the valve and means actuated by said pressure responsive device to automatically open the valve against the pressure of said yielding means by means of partial vacuum in said intake while the manual means is in valve-closing position, means providing a vent opening for rendering the pressure responsive means inoperative, and a valve controlling said opening and, when seated, acting as a stop for the valve-closing movement of said manually operable means, and means operated by the valve-opening movement of the pressure responsive device to stop the feed of fuel in advance of its opening of the throttle.

10. In an internal combustion engine, means providing an intake for the engine, a fuel feed to the intake, a throttle valve in the intake, manually operable means for opening and closing the valve connected to the valve by yielding

means, a pressure responsive device, connections from said device to the intake on the engine side of the valve and means actuated by said pressure responsive device to automatically open the valve against the pressure of said yielding means by means of partial vacuum in said intake while the manual means is in valve-closing position, means providing a vent opening for rendering the pressure responsive means inoperative, a valve controlling said opening, and an adjustable contact means carried by said manually operable means, said contact means closing the vent valve and stopping the movement of the manually operable means in throttle-closing direction, and means operated by the valve-opening movement of the pressure responsive device to stop the feed of fuel in advance of its opening of the throttle.

11. In an internal combustion engine, means providing an intake for the engine, a throttle valve in the intake, manually operable means for opening and closing the valve, a pressure responsive device, and connections from said device to the intake on the engine side of the valve to automatically open the valve by means of partial vacuum in said intake while the manual means is in valve-closing position, and means to render the pressure responsive device inoperative when the engine is running below a predetermined speed.

12. In an internal combustion engine, means providing an intake for the engine, a throttle valve in the intake, manually operable means for opening and closing the valve, a pressure responsive device, and connections from said device to the intake on the engine side of the valve to automatically open the valve by means of partial vacuum in said intake while the manual means is in valve-closing position, and means rendering said pressure responsive means inoperative when the manually operable means is in valve-opening position, and means to render the pressure responsive device inoperative when the engine is running below a predetermined speed.

13. In an internal combustion engine, means providing an intake for the engine, a throttle valve in the intake, manually operable means for opening and closing the valve, a pressure responsive device, and connections from said device to the intake on the engine side of the valve to automatically open the valve by means of partial vacuum in said intake while the manual means is in valve-closing position, means providing a vent opening for rendering the pressure responsive means inoperative and means operated by said manually operable means closing the vent when the last said means is in throttle-closing position and opening the vent when the last said means is in throttle-opening position, and means to render the pressure responsive device inoperative when the engine is running below a predetermined speed.

14. In an internal combustion engine, means providing an intake for the engine, a throttle valve in the intake, manually operable means for opening and closing the valve, a pressure responsive device, and connections from said device to the intake on the engine side of the valve to automatically open the valve by means of partial vacuum in said intake while the manual means is in valve-closing position, means providing a vent opening for rendering the pressure responsive means inoperative, and a valve controlling said opening and, when seated, acting as a stop for the valve-closing movement of said manually operable means, and means to render the pres-

sure responsive device inoperative when the engine is running below a predetermined speed.

15. In an internal combustion engine, means providing an intake for the engine, a throttle valve in the intake, manually operable means for opening and closing the valve, a pressure responsive device, and connections from said device to the intake on the engine side of the valve to automatically open the valve by means of partial vacuum in said intake while the manual means is in valve-closing position, means providing a vent opening for rendering the pressure responsive means inoperative, a valve controlling said opening, and an adjustable contact means carried by said manually operable means, said contact means closing the vent valve and stopping the movement of the manually operable means in throttle-closing direction, and means to render the pressure responsive device inoperative when the engine is running below a predetermined speed.

16. A combined carburetor and degasser for an internal combustion engine comprising means providing an intake for the engine, fuel supply means for the intake, a throttle valve for the intake, manually operable means for opening and closing the throttle valve, a pressure responsive device connected to the intake on the engine side of the throttle valve and operative by vacuum in the intake to first stop the supply of fuel and then open the throttle valve, means rendering said device inoperative when the engine runs below a predetermined speed, and means to render said device inoperative when the manually operable means is actuated to open the throttle valve.

17. A combined carburetor and degasser for an internal combustion engine comprising means providing an intake for the engine and vacuum-actuated means to supply fuel to the intake, a throttle valve in the intake, an operating rod for the throttle valve comprising a telescoping section normally spring-extended, a vacuum operable device connected to the intake on the engine side of the throttle valve, connections from said device to the throttle-end of said telescoping connection to compress the spring therein and open the throttle when vacuum is applied to the device, means to break the vacuum to the fuel supply when said device is actuated, means to break the vacuum to said device when the engine runs below a predetermined speed, a valve normally closed by, and acting as a stop for, the throttle valve-

closing movement of the outer part of said telescoping connection and opening to break the vacuum to said device when said section is moved in throttle-opening direction.

18. In an internal combustion engine, a combined carburetor and degasser comprising means providing an intake for the engine, means to supply fuel to the intake, means to supply air to the intake, a manually operable throttle valve, and means operable by vacuum in the intake on the engine side of the throttle valve, when the manually operable means is in throttle-closing position and the engine is running above a predetermined speed, to first cut off the fuel supply and then open an air supply to said intake, and to first cut off the said air supply and then restore the fuel supply when the engine falls below a predetermined speed.

19. In an internal combustion engine, a combined carburetor and degasser comprising means providing an intake for the engine, means to supply fuel to the intake, means to supply air to the intake, a manually operable throttle valve, and means operable by vacuum in the intake on the engine side of the throttle valve, when the manually operable means is in throttle-closing position and the engine is running above a predetermined speed, to first cut off the fuel supply and then open an air supply to said intake, and to restore the fuel supply upon the movement of the manually operable means to open the throttle.

MARION MALLORY.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,956,657	Scheel	May 1, 1934
1,979,834	Jenks	Nov. 6, 1934
2,023,647	Schmid	Dec. 10, 1935
2,212,936	Hoof	Aug. 27, 1940
2,214,964	Leibing	Sept. 17, 1940
2,269,496	Vanderpool	Jan. 13, 1942
2,293,842	Mallory	Aug. 25, 1942
2,395,748	Mallory	Feb. 26, 1946
2,415,491	Hieger	Feb. 11, 1947

FOREIGN PATENTS

Number	Country	Date
405,346	Great Britain	Feb. 8, 1934