

Feb. 4, 1947.

H. A. CARLSON

2,415,336

CARBURETOR DEGASSER

Filed Aug. 7, 1944

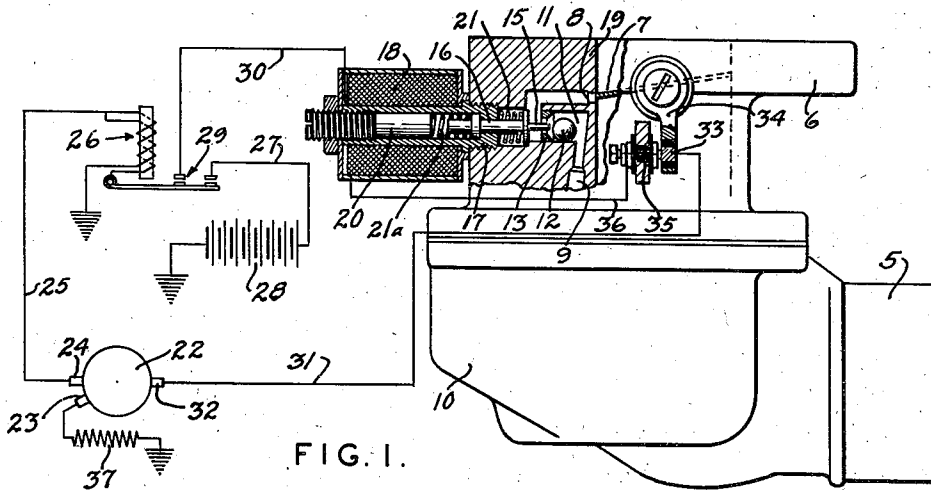


FIG. 1.

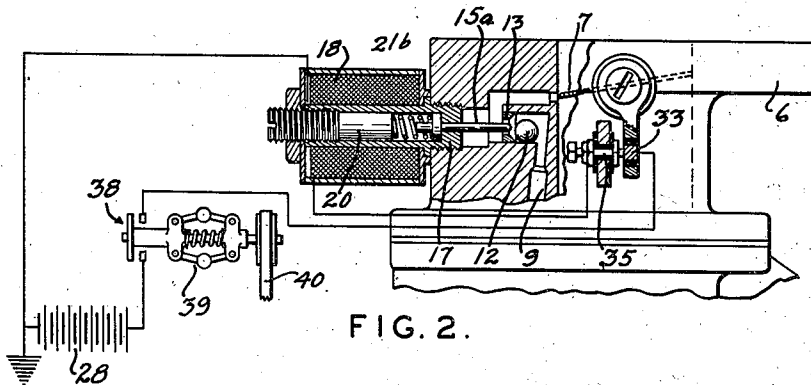


FIG. 2.

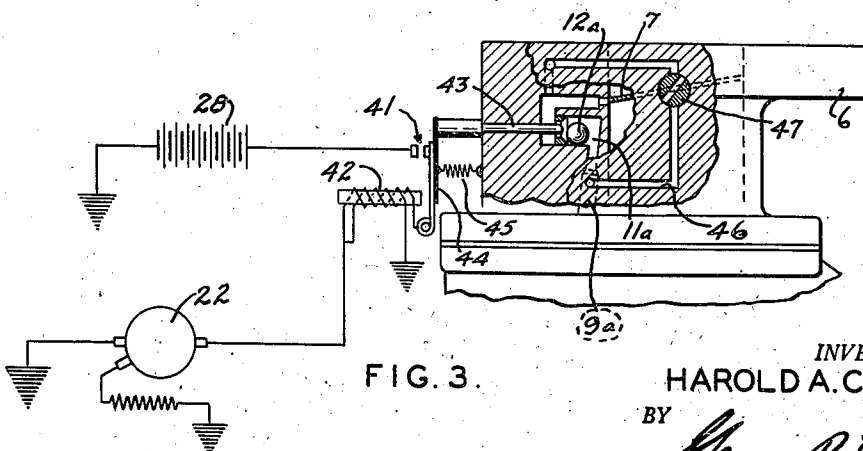


FIG. 3.

INVENTOR.
HAROLD A. CARLSON

BY

George R. Erickson

UNITED STATES PATENT OFFICE

2,415,336

CARBURETOR DEGASSER

Harold A. Carlson, University City, Mo., assignor
to Carter Carburetor Corporation, St. Louis,
Mo., a corporation of Delaware

Application August 7, 1944, Serial No. 548,357

11 Claims. (Cl. 123-119)

1

This invention relates to degasser devices for automotive engines. Such a device must leave the idling system free to operate normally during normal idling periods, while preventing the supply of fuel when the engine is being turned over at higher than idling speed by the momentum of the vehicle and with the carburetor throttle closed. During the latter mentioned times, fuel supplied through the idling passage is wasted and noxious gases may emit from the engine exhaust pipe.

An object of the present invention is to provide a novel degasser device which is adapted to cut off the supply of fuel through the idling passage when the carburetor throttle is closed and the engine is operating at higher than normal idling speed.

A more detailed object is to provide means for positively preventing seating of the degasser valve except when gassing conditions exist.

Another object is to utilize the generator current as a control for the degasser valve.

These objects and other more detailed objects hereafter appearing are attained by the devices illustrated in the accompanying drawing in which

Fig. 1 is a side view, partly sectioned, of an automotive carburetor embodying the invention, certain associated parts being represented diagrammatically.

Fig. 2 is a similar view showing a modification.

Fig. 3 is a similar view showing still another modification.

In Fig. 1, there is shown an updraft carburetor having an air inlet horn 5 at one end and a flange 6 at the other for attachment to the engine intake manifold (not shown). The upper or outlet end of the carburetor is controlled by a butterfly throttle valve 7. Fuel for idling enters the carburetor through an idling port 8 located adjacent and partly posterior to the edge of the throttle when closed. The idle port is supplied by an idling passage 9 leading from the usual fuel bowl 10. Between port 8 and passage 9 there is a right angle chamber 11 receiving a ball valve 12. A valve seat 13 is located just posterior to ball valve 12 so that the normal flow of fuel through passage 9 tends to seat the ball and close the idling passage.

During normal idling operation, the ball 12 is held off its seat, that is, prevented from closing by a stop element 15 which projects through seat 13 and has a shank 16 slidable in a threaded nipple 17 which projects from a solenoid 18. The nipple is screwed into an enlargement 19 formed on the carburetor body for securing the solenoid

2

in position. Shank portion 16 of the stop element extends into the solenoid and functions as the solenoid core or armature. The extent of movement of the stop element, when the solenoid is energized, is limited by an adjustable stop member 20. A pair of coiled springs 21 and 21a normally urge element 15, 16 towards its valve stopping position, as shown.

An engine operated generator is shown at 22 which has a grounded terminal 23 and a terminal 24 having a charging connection by a wire 25, cut out switch 26, and a wire 27 to the storage battery 28 which may supply current for ignition, lighting, etc.

Cut out switch 26 is provided with an extra set of contacts 29, one being connected to the generator through the switch magnet and wire 25. The other contact 29 is connected by a lead 30 to one side of the solenoid. A lead 31 extends from a third contact 32 of the generator to a switch point 33 carried by an arm 34 movable with the throttle valve. A stationary, cooperating switch contact 35 is connected by a lead 36 to the other side of the solenoid. Each of the terminals 23, 24, and 32 is connected to one of the generator brushes. Terminal 23 is connected through field 37 to ground.

This form operates as follows:

When the throttle valve is in closed or idling position and the engine is operating fast enough to produce a charging voltage in the generator-battery set and pick up cut out switch 26, solenoid 18 will be energized to draw stop element 15 leftwardly. Under these conditions, ball valve 12 will be tightly seated by the superior pressure on the anterior side thereof, to prevent the discharge of idling fuel. Immediately upon opening of the throttle, to break switch contacts 33, 35, or upon lowering of the engine speed, to open contacts 29, the solenoid will be de-energized and coil springs 21, 21a will return the stop element to its normal position, as shown, forcing the ball valve from its seat so that normal functioning of the idling passage will be resumed.

The form in Fig. 2 is the same as in Fig. 1 except for the switch device 38 in the solenoid control circuit, which is controlled by a fly ball, speed responsive device 39 instead of the generator. Fly ball device 39 is shown operated by a belt 40 from a moving part of the engine. Ball valve stop element 15a is normally held in its rightward position by a single spring 21b.

In Fig. 3, generator 22 is connected to storage battery 28 through a cut out switch including switch points 41 and an electro-magnet 42. A

3

stop element 43, corresponding to element 15 in Fig. 1, is attached to the movable arm 44 of the cut out switch. Element 43 is normally maintained in its valve stop position, as shown, by a tension spring 45. When the engine is operating at a high enough speed to cause charging of the battery and closing of the cut out switch contacts 41, stop element 43 will be withdrawn from its valve stopping position to permit ball valve 12 to respond to differential fluid pressure thereon.

A by-pass 46 extends from idling passage 9a around valve chamber 11a. The by-pass is controlled by a valve 47 formed on the throttle shaft. This valve is arranged so that when the throttle is in its normal idling position, by-pass 46 is closed and the full differential pressure in the idling passage is effective to urge ball valve 12 toward its seat. However, after the throttle has opened a predetermined degree, by-pass 46 is opened so as to tend to equalize the pressures on the opposite sides of the ball valve. As long as the throttle and valve 47 are open, the ball cannot be seated, regardless of the position of stop element 42.

Each of the forms embodies features necessary to perform the degassing function without affecting normal idling. The invention may be modified in various respects as will occur to those skilled in the art and the exclusive use of all modifications as come within the scope of the appended claims is contemplated.

I claim:

1. A degasser device for an internal combustion engine carburetor having a throttle valve and an idling passage, comprising a normally open check valve in said passage, an abutment element normally located in said passage in position to prevent closing of said valve, and means responsive to operation of the associated engine above a predetermined speed with said throttle closed for withdrawing said element from said position to permit seating of said check valve by differential pressure in said idling passage.

2. In combination with an internal combustion engine having an intake conduit with a throttle valve and an idling passage, a valve operable in the closing direction by flow in said passage, a control for said valve including a solenoid and an engine speed responsive switch therefor for preventing closing of said valve when the engine speed is below a predetermined rate, and a second control for said valve actuated with said throttle valve when said throttle is opened beyond idling position to prevent closing of said valve.

3. In combination with an internal combustion engine having an intake conduit with a throttle valve and an idling passage, a valve operable in the closing direction by flow in said passage, a stop element normally in a position to prevent closing of said valve, an electro-magnet for withdrawing said stop from said position, a control circuit for said solenoid including a pair of switches, an engine speed responsive device for closing one of said switches when the engine speed is above a predetermined rate, and a throttle actuated device for closing the other switch when said throttle is in idling position.

4. The combination specified in claim 5 in which said switches are arranged in series in said control circuit so that both must be closed to withdraw said element and permit closing of said valve.

5. In combination with an internal combustion

4

engine having an engine operated generator and an intake conduit with a throttle and an idling passage, a check valve in said passage, a stop element normally in position to prevent seating of said check valve, a solenoid for actuating said element, and a control circuit for said solenoid including a pair of control switches, one of said switches having a magnetic control connected to said generator so as to close the same when the engine speed is above a predetermined rate and the other switch being throttle operated and being closed when said throttle is in idling position, said solenoid functioning when energized to withdraw said stop element from its valve stopping position to permit closing of said check valve by idling fuel flow.

6. The combination specified in claim 5 further including a storage battery in circuit with said generator so as to be charged thereby, said switch controlling magnet being constructed and arranged to be energized only when said generator is producing sufficient voltage to charge said battery.

7. In combination with an internal combustion engine having an intake conduit with a throttle and an idling passage, a valve in said passage, a solenoid control for said valve, a fly ball device, and a control circuit for said solenoid including a switch which is closed when said throttle is moved to idling position and a second switch closed by said fly ball device when the engine speed is above a predetermined rate.

8. In combination with an internal combustion engine having an intake conduit with a throttle and an idling passage, a flow responsive check valve in said passage, a by-pass from said passage extending around said check valve, a throttle actuated valve in said by-pass adjusted to open the same when said throttle is opened from idling position to balance the pressures on opposite sides of said check valve, a stop element normally in position to prevent closing of said valve, and a device responsive to operation of the engine above a predetermined rate to withdraw said element from said position and permit closing of the same by flow in said idling passage.

9. In combination with an internal combustion engine having an intake conduit with a throttle and an idling passage, a flow responsive check valve in said passage, a solenoid control for said valve, a fly ball device, a control circuit for said solenoid including a switch which is closed by said fly ball device when the engine speed is above a predetermined rate, and a second control for said check valve comprising a by-pass from said passage extending around said check valve and having a throttle actuated valve therein adjusted to close the by-pass when said throttle is moved to idling position to cause closing of said check valve by differential pressure in said idling passage.

10. A degasser device for an internal combustion engine carburetor having a throttle valve and an idling passage, comprising a check valve operable in the closing direction by flow in said passage, a by-pass from said passage extending around said check valve, and a throttle actuated valve in said by-pass adjusted to close the same when said throttle is moved to idling position to permit seating of said check valve by differential pressure in said idling passage.

11. In combination with an internal combustion engine intake conduit, a throttle therein, an idling passage discharging into said conduit, a check valve adapted to close said passage responsive to abnormal fluid flow therein, and a pair of

5

controls for said valve responsive respectively to operation of the associated engine below a predetermined speed and to opening movement of said throttle to independently prevent closing of said check valve, said last named control comprising a by-pass from said passage extending around said check valve and having a throttle actuated valve therein adjusted to open the by-pass when said throttle is opened from idling position to balance the pressures on opposite sides of said check valve.

HAROLD A. CARLSON.

REFERENCES CITED

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

	Number
	2,334,857
5	1,940,712
	2,252,120
	1,961,062
	2,033,019
	1,711,767
10	1,650,482
	1,887,515
	1,970,002

6

UNITED STATES PATENTS

Name	Date
Ball -----	Nov. 23, 1943
Ertz -----	Dec. 26, 1933
Ericson -----	Aug. 12, 1941
Mallory -----	May 29, 1934
Weinmann -----	Mar. 3, 1936
Barden -----	May 7, 1929
Barden -----	Nov. 22, 1927
Pulkinghorn -----	Nov. 15, 1932
Ericsson -----	Aug. 14, 1934

FOREIGN PATENTS

Country	Date
British -----	Oct. 13, 1927

	Number
15	261,022