Feb. 23, 1965 E. F. STONE ETAL 3,170,480

FLOAT VALVE CONSTRUCTION

Filed Sept. 24, 1963

FIG. 1

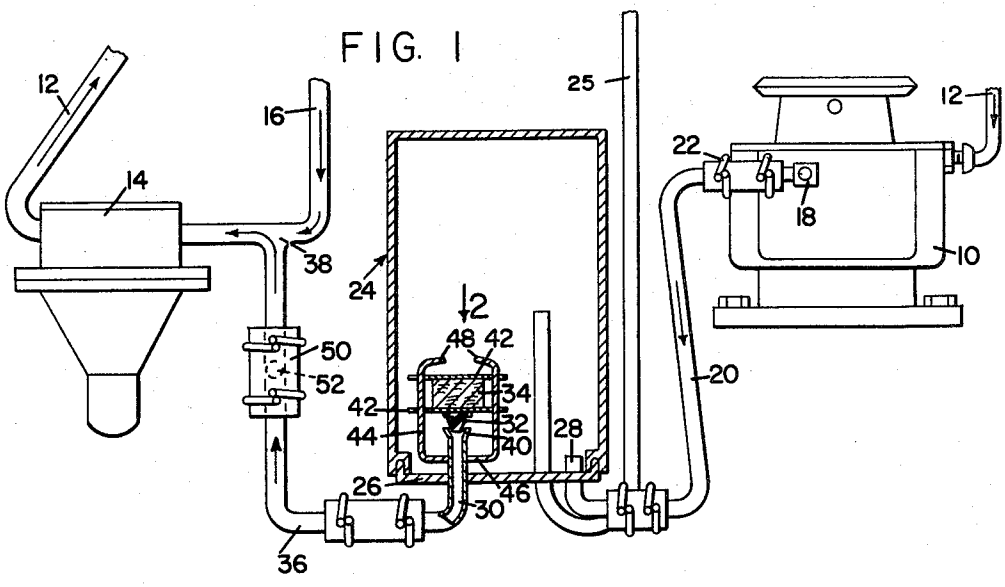
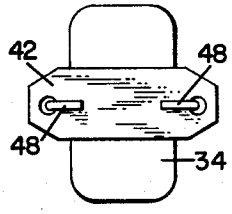


FIG. 2



INVENTORS
ERNEST F. STONE
ARTHUR F. DUMONT

BY Charles R. Fay

ATTORNEY

United States Patent Office 3,170,480 Patented Feb. 23, 1965

3,170,480

FLOAT VALVE CONSTRUCTION

Ernest F. Stone, 167 North St., Grafton, Mass., and Arthur F. Dumont, 214 Brigham Hill Road, North Grafton, Mass.

Filed Sept. 24, 1963, Ser. No. 311,052
1 Claim. (Cl. 137—433)

This invention relates to a new and improved vapor lock chamber which also acts as an overflow preventing reservoir for the carburetor of an internal combustion engine, and the principal object of the invention is to avoid vapor lock, maintain a constant fuel level in the carburetor regardless of poor needle adjustment, rough roads, over-pressure from the fuel pump, etc., and contemplates an up and down valve, avoiding a pivoted valve seat, thus preventing washing of cylinder walls and oil dilution as well as making a considerable savings in gas and preventing flooding of the carburetor.

Another object of the invention resides in the provision of a device of the class described in combination with a conventional carburetor and a conventional fuel pump, the improvement comprising the addition of a closed reservoir chamber with a vertical and rectilinear float in it, there being a gravity line from a certain desired gasoline level of the carburetor directly into the reservoir which contains a float valve, the float valve normally closing a port leading directly to the inflow gas line from the gas tank into the fuel pump and the reservoir being located adjacent to the fuel pump so that the fuel pump tends to suck in the extra gasoline allowed to escape from the gasoline reservoir by reason of actuation of the float valve with greater force than it sucks in the gas from the regular gas line from the gas tank, thus maintaining the device in operative condition at all times without any overflow of the reservoir, flooding therein, etc.

The invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly set forth in the appended claim.

Reference is to be had to the accompanying drawings, in which:

FIG. 1 is a schematic diagram illustrating the invention, and

FIG. 2 is an enlarged plan view, looking in the direction of arrow 2 in FIG. 1.

In this case reference numeral 10 indicates a carburetor. This can be any conventional carburetor, these being old and well known in the art. It operates in the usual manner and may be provided with air filters, etc. It has a feed gas line 12 leading into an upper part thereof and it is supplied with gasoline through line 12 by means of a fuel pump 14 as is completely usual. The fuel pump draws its gasoline from the gasoline tank through line 16. It is emphasized that the carburetor and the fuel pump may be any well known or conventional types presently in use.

At a predetermined desirable gasoline level in the carburetor, there is provided an outlet or fitting 18 and this fitting is connected to a line 20 by any desired or convenient means such as the clamp 22. When the gasoline level in the carburetor coincides with that of fitting 18, gravity alone allows the escape of gasoline down the line 20 which is located with respect to the other parts as shown, i.e., extending vertically downwardly.

A gasoline reservoir is provided, this being indicated generally at 24. This is a closed container having an air vent 26. Its bottom wall through a pipe 25 is provided with an inlet as at 28 for the gasoline which flows by gravity down line 20. The bottom wall 26 of the gasoline reservoir 24 also is provided with an outlet indicated at 30, this outlet being normally closed by a valve member

32 controlled by a float 34 so that when the gasoline level in the reservoir reaches a certain predetermined point, the float 34 will rise, opening the valve 32 and allowing the gasoline in the gasoline reservoir 24 to escape through the outlet 30.

The outlet 30 leads to a line 36 which is cut directly into the gas line 16 at the point 38 just before the gasoline from the gas tank enters the fuel pump and therefore it will be seen that the gasoline escaping from the outlet 30 is drawn out by the fuel pump. Since the distance from the point 38 to the outlet 30 is comparatively short, with respect to the distance of the line 16 extending to the gas tank, the fuel pump operates more strongly to draw out the gasoline in the line 36 than it does to operate to advance the gas in the line 16, and therefore the excess gas in gas reservoir 24 is always quickly disposed of being passed through the fuel pump back into the carburetor feed line 12, where it of course enters the carburetor once more.

Referring now to the valve structure, it will be seen that the outlet 30 comprises essentially a pipe or tubing which extends upwardly through the bottom 26 an appreciable extent as indicated by the reference numeral 40. This tubing is flared at its open end to receive the valve 32 which fits the same and is attached to the under side of the float 34 which can be a cork or other lightweight body secured between a pair of cross plates 42, 42. These cross plates are apertured and slidingly mount the float on a pair of upright wires 44, 44 which are mounted on the pipe above the floor 26 and below the valve seat near the top 40 by being bent inwardly at 46, 46 and soldered or otherwise secured directly to the pipe. These wires 44, 44 have inturned top ends 48, 48 and thus it will be seen that the float is held in position and cannot escape but it can move rectilinearly only in a vertical direction to either seat the valve 32 or to open it.

In the pipe 36 there is provided a fitting 50 in which there is a one-way ball valve 52 so that the gasoline can flow in the direction of the arrows only in pipe 36 and under no circumstances can it be backed up and flooded from pipe 16. This is a safety precaution only.

With this relatively simple device applied as described between the carburetor and the fuel pump, a constant fuel level is always maintained in the carburetor regardless of poor needle setting in the carburetor and also regardless of after boil vapor lock, rough roads, over-pressure from the fuel pump, etc. The result of this is that the carburetor does not flood and therefore the motor will always start easily and a considerable percentage of gasoline formerly wasted is now saved and returned to the fuel pump and to the carburetor. The conventional gas line 16 is not interfered with in any way nor does the gasoline have to pass through any supplemental valve, etc. as has been proposed in the prior art, so that it will be seen that the present invention is extremely simple but also extremely dependable utilizing gravity in the line 20 and the suction force of the fuel pump in the line 34. The respective positioning of the various parts is preferably that as shown in the schematic drawing so that the overflow of gas in the carburetor is taken care of by gravity but when it escapes through the opening of the float valve 32 the powerful suction of the fuel pump is utilized and line 36 kept clear.

The advantage in the particular valve structure disclosed herein is that the valve can move only rectilinearly and is not dependent upon a pivot mounting as is usual in this art. When a pivot mounting is used for the float valve, it has been found that unless the device is exactly level, it tends to malfunction so that it floods and becomes inoperative. When it floods a gasoline fire hazard is present and this is due to the fact that the pivot action

of the prior art floating valves, if not exactly horizontal, do not always operate as expected. The present valve has been found by actual test to be capable of acting perfectly at up to a twenty percent deviation from an exact vertical position. Furthermore the valve itself is mounted by the wires 44 directly on the pipe 40 so that if this pipe becomes distorted in any way, the valve 34 is still held in perfect alignment therewith and therefore another cause of malfunction is done away with because of the fact that the floating valve is mounted in a fixed relationship with respect to its outlet.

Having thus described our invention and the advantages thereof, we do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claim, but what we claim is:

A float valve construction for a fuel level control apparatus for a gasoline engine, said float valve construction comprising a light weight floating body, spaced parallel plates one at each side of the light weight body, two pairs of aligned apertures in the light weight plates,

an aligned pair being at opposite sides of the floating body, a wire extending through each pair of aligned apertures, said wires each having an inturned end at one side of said body, a pipe, a valve seat at an end of the pipe, said wires being fastened to said pipe in position to guide the light weight body moving on the wires to and from the valve seat, and a valve-closing means on one of said plates cooperatively arranged with respect to said valve seat to open or close the valve.

References Cited by the Examiner

UNITED STATES PATENTS

2,695,029	11/54	Bruegger.	
2,901,031	8/58	Powell et al.	158—36.4
2,998,056	8/61	Capehart	158—38 X

JAMES W. WESTHAVER, *Primary Examiner.*

FREDERICK KETTERER, *Examiner.*