

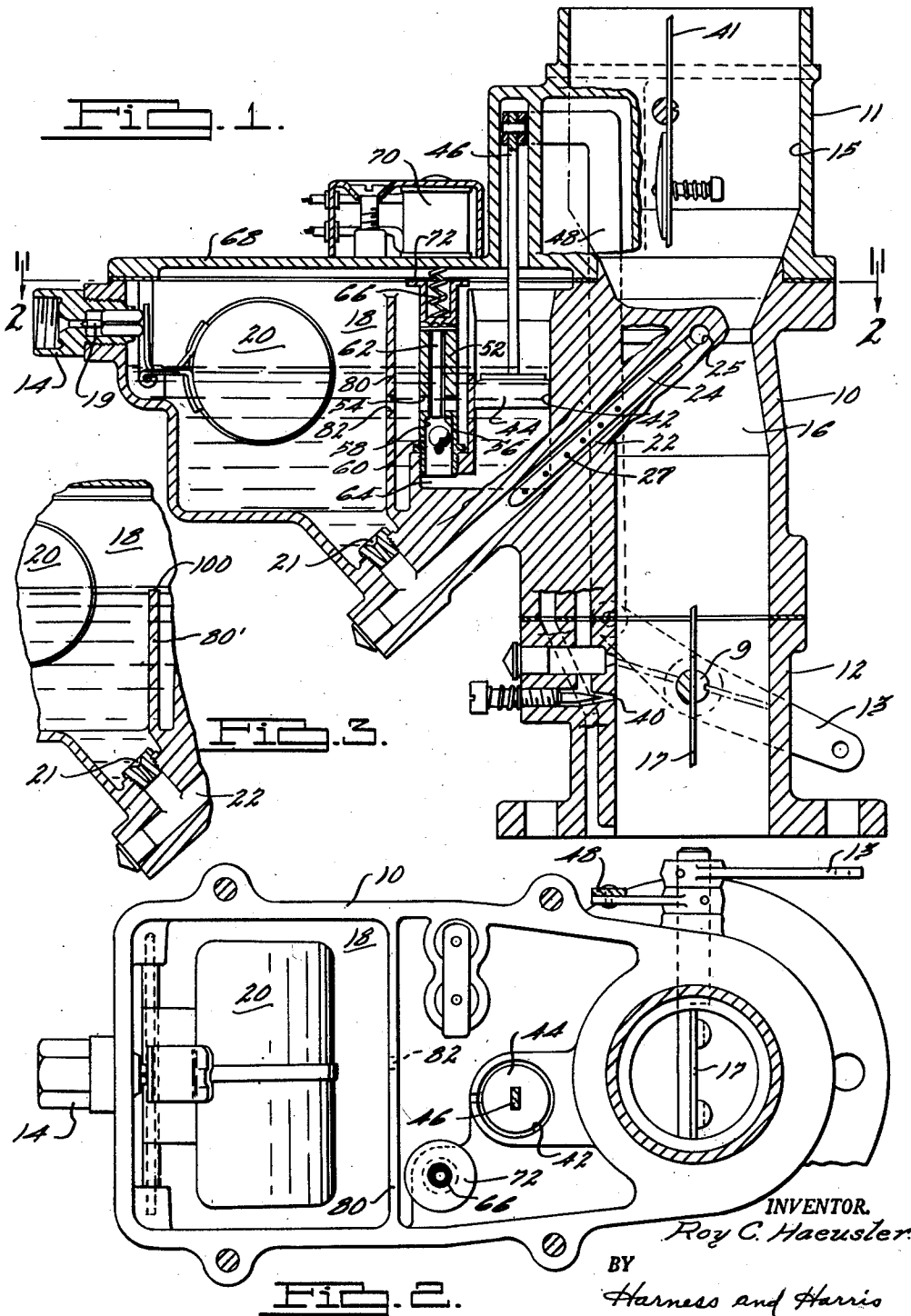
April 8, 1952

R. C. HAEUSLER

2,592,513

THROTTLE DASHPOT MECHANISM

Filed March 3, 1949



UNITED STATES PATENT OFFICE

2,592,513

THROTTLE DASHPOT MECHANISM

Roy C. Haeusler, Detroit, Mich., assignor to
Chrysler Corporation, Highland Park, Mich., a
corporation of Delaware

Application February 3, 1949, Serial No. 74,383

8 Claims. (Cl. 261—65)

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This invention relates to means to stabilize the fuel used in conjunction with a carburetor dashpot mechanism.

Heretofore, it has been customary to provide a dashpot for retarding the final closing movement of the throttle to give the fuel supply system and other factors that are disturbed thereby an opportunity to become balanced or adjusted to the coast conditions and to minimize stalling of the engine. Such dashpot mechanisms are commonly located in the fuel reservoir of the carburetor and utilize the fuel as the fluid medium which effects the dashpot action.

The fuel which passes through the reservoir of a carburetor contains many volatile ingredients, such as the low boiling point hydrocarbons of which propane and butane are examples, and it has been found that under the influence of the heat dissipated by the internal combustion engine that these volatile ingredients vaporize and affect the compressibility of the fuel. This has been found to impair the operation of the throttle dashpots for when the volatile ingredients vaporize they rise and form a compressible bubble of vapor under the dashpot piston.

It is the principal object of my invention to isolate a body of fuel for use in conjunction with a carburetor dashpot so that the volatile components thereof when once driven off by heat no longer impair the operation of the dashpot. It is desirable to isolate this quantity of dashpot fuel from the regular supply of fuel flowing to the engine for the fresh fuel constantly brings in fresh volatile ingredients.

It is a further object of my invention to provide a restricted communication between the isolated quantity of dashpot fuel and the regular supply of engine fuel.

Referring to the drawings:

Fig. 1 is a sectional elevational view of a down-draft carburetor incorporating my invention;

Fig. 2 is a sectional plan view of the carburetor taken on the line 2—2 of Fig. 1; and

Fig. 3 is a partial elevational view of a modified form of the invention.

Referring to the drawings the carburetor comprises an assembly of a body 10, an air horn 11 and a body flange 12. The body flange is adapted for securement to the engine intake manifold (not shown). A nipple 14 is adapted to be connected by a fuel line (not shown) to a source of supply of fuel such as a fuel pump. The air horn 11 is provided with a tube portion 15 which serves as an air inlet to the fuel mixture passage 16. The egress of the fuel mixture to the engine intake

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manifold is controlled by a throttle valve 17 which is keyed to a rotatable shaft 9 controlled by throttle control linkage lever 13. The body portion of the carburetor is provided with a fuel reservoir 18. The intake of fuel from the nipple 14 is controlled by a needle valve 19 which is operated by a conventional float mechanism 20 which predetermines the fuel level in the reservoir.

Fuel is discharged from the reservoir 18 through a metering jet 21 into the main fuel injection means which controls the mixture of fuel with air. A tubular passage 22 connects jet 21 with the mixture chamber 16 through an orifice (not shown). A tubular element 24 is connected by a duct 25 to the atmosphere and is concentrically disposed within the passage 22 and provided with a plurality of holes 27 in its side walls. A mixture of fuel and air is aspirated from passage 22 into chamber 16 by the passage of air therethrough in a manner well known in the art.

A conventional idling jet 40 and choke valve 41 are illustrated.

A dashpot mechanism provided in reservoir 18 includes a cylinder or bore 42 having a piston 44 mounted for reciprocation therein which is adapted to retard the closing of throttle valve 17. The piston 44 carries a vertically extending piston rod 46 which is mechanically connected by a link 48 to the throttle control lever 13. It will thus be seen that a closing of the throttle valve 17 must be accompanied by a downward movement of piston 44 which movement is resisted by the fuel present in cylinder 42.

A tubular member 52 which is located in the reservoir 18 has a pair of outlets 54 located in the side wall and connected with the hollow central portion thereof. A valve seat 56 is associated with the hollow portion of member 52 below outlets 54 and provided with a mating ball 58 which is operable to selectively close the valve seat 56 and openings 54 from the passage of fluid out of cylinder or bore 42. A restricted orifice 60 or bleed hole is provided in the side wall of member 52 below the ball 58 and a plunger 62 is slidably received in member 52 and engageable with the ball 58. When the dashpot is operating the fuel displaced by piston 44 enters a passage 64 interposed between cylinder 42 and valve seat 56. The admission of fuel to passage 64 causes ball 58 to seat on valve seat 56 to prevent the escape of the fuel through outlets 54 thereby requiring the fuel to flow through the restricted orifice 60. At other times a spring 66 acts on plunger 62 to hold ball 58 unseated as in Fig. 1 and at such times the dashpot is inoperative as a retarding device be-

cause piston 44 is then free to move downwardly and the liquid freely flows through the passage 64, around ball 58 and through outlets 54.

An electromagnet 70 is mounted on the top of carburetor cover 68, which is preferably formed of non-ferrous metal, and the plunger 62 has its upper end outwardly flared at 72 and is formed of ferrous metal so as to be attracted upwardly toward the electromagnet when the latter is energized. The energization of an electromagnet is preferably controlled by a governor (not shown) as described in Patent 2,334,857 which issued to T. M. Ball. Preferably when the vehicle speed is below a predetermined value the solenoid 70 is energized and the plunger 62 raised. The dashpot is then operative to retard the closing of throttle valve 17 due to the restricted discharge of fuel through orifice 60 as piston 44 descends in cylinder 42. When the car speed exceeds a predetermined value the solenoid 70 is deenergized, as explained in Patent 2,334,857, and the spring 66 forces plunger 62 downward to unseat ball 58 and render the dashpot mechanism inoperative.

The above described dashpot mechanism is usually located in the fuel reservoir 18 and it has been found that a constantly changing supply of fuel, such as is normally present in the fuel reservoir, possesses certain disadvantages as a medium for use in the dashpot. The presence in the fuel of volatile ingredients, such as low boiling point hydrocarbons, of which propane and butane are examples, renders the operation of piston 44 erratic and I have found it to be desirable to utilize, as the dashpot medium, fuel which does not contain these volatile hydrocarbons. Such fuel may be obtained by isolating a quantity of fuel in the reservoir adjacent the dashpot mechanism. Once the original low boiling point hydrocarbons are vaporized therefrom by engine heat the fuel becomes "weathered" or "pure" and prolonged use thereof in the dashpot mechanism will not be hindered by the presence of volatile ingredients. Previous devices, which did not isolate the dashpot fuel, required the dashpot to operate on fresh fuel constantly supplied to the reservoir and thereby continually provided a fresh supply of volatile ingredients to the dashpot mechanism. To accomplish my purpose of isolating a portion of the fuel I have provided a partition or dam 80, which extends entirely across the fuel reservoir, and extends from the bottom thereof to a height above the normal level of fuel in the reservoir as established by float 20. The partition or dam 80 thus divides the reservoir into two compartments. An opening or bleed hole 82 is provided in the dam to permit a limited amount of fuel to enter the compartment containing the dashpot mechanism to maintain the proper fuel level therein. However, with the exception of the bleed hole 82 the fuel operated upon by the dashpot is substantially isolated from the fuel present in the reservoir 18 which is traveling between the inlet nipple 14 and the jet 21. Vapor which is formed in cylinder 42 below piston 44 gradually escapes past piston 44 through the clearance space between the piston and the cylinder walls so that the vapor which accumulates during the initial "weathering" of the isolated fuel does not remain locked in the system to impair subsequent dashpot action.

Instead of providing a bleed hole 82 in the dam a portion 100 of the upper edge of a dam 80' may be located slightly below the normal level of fuel in the reservoir as illustrated in Fig. 3.

The results accomplished thereby are identical to those accomplished with the Fig. 1 form of the invention.

I claim:

1. A carburetor adapted for use in conjunction with an internal combustion engine and comprising a housing having a fuel reservoir provided with a fuel inlet and a fuel outlet, a throttle valve operable to regulate the flow of fuel and air through said carburetor, a vertically extending partition dividing said fuel reservoir into a first compartment containing said fuel inlet and said fuel outlet and a second compartment, means forming a bleed passage for fuel to enter said second compartment at a restricted rate approximating the rate of loss of fuel from said second compartment by evaporation and a dashpot mechanism operable to retard closing movement of said throttle and comprising wall structure defining a piston receiving bore in a portion of said second compartment, a piston slidably mounted in said bore and operatively connected to said throttle valve for movement toward one end of said bore in response to closing movement of said throttle valve, means forming a fluid flow connection between said bore and that portion of said second compartment exterior of said bore, a one-way valve located in said connection and a means forming a restricted fluid flow passage for bleeding fuel from said bore to that portion of said second compartment exterior of said bore independently of said one-way valve.

2. A carburetor adapted for use in conjunction with an internal combustion engine and comprising a housing having a fuel reservoir provided with a fuel inlet and a fuel outlet, a throttle valve operable to regulate the flow of fuel and air through said carburetor, a vertically extending partition dividing said fuel reservoir into a first compartment containing said fuel inlet and said fuel outlet and a second compartment, means forming a bleed passage for fuel to enter said second compartment at a restricted rate approximating the rate of loss of fuel from said second compartment by evaporation and a dashpot mechanism operable to retard closing movement of said throttle and comprising wall structure dividing said second compartment into a piston receiving bore portion and a second portion, a piston slidably mounted in said bore and operatively connected to said throttle valve for movement in said bore in response to movement of said throttle valve, means including a one-way valve device forming a fluid flow connection to accommodate flow of fuel from said second portion into said bore and means forming a restricted fuel passage for accommodating bleeding of fuel from said bore portion to said second portion of said second compartment to accommodate retarded movement of said piston and said throttle valve.

3. A carburetor adapted for use in conjunction with an internal combustion engine and comprising a housing having a fuel reservoir provided with a fuel inlet and a fuel outlet, a throttle valve operable to regulate the flow of fuel and air through said carburetor, a vertically extending partition dividing said fuel reservoir into a first compartment containing said fuel inlet and said fuel outlet and a second compartment, means forming a bleed passage for fuel to enter said second compartment at a restricted rate approximating the rate of loss of fuel from said second compartment by evaporation and a dashpot mechanism operable to retard closing move-

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ment of said throttle and comprising wall structure dividing said second compartment into a piston receiving vertical bore portion and an outer portion, a piston slidably mounted in said bore portion and operatively connected to said throttle valve for movement in said bore in response to movement of said throttle valve, means forming a fluid flow connection between the lower portion of said bore and said outer portion, a one-way ball check valve adapted to obstruct movement of fuel from said bore to said outer portion through said connection but accommodate unopposed movement of fuel from said outer portion to said bore below said piston and means forming a bleed passage for the retarded passage of fuel from said bore portion to said outer portion.

4. A carburetor adapted for use in conjunction with an internal combustion engine and comprising a housing having a fuel reservoir provided with a fuel inlet and a fuel outlet, a throttle valve operable to regulate the flow of fuel and air through said carburetor, a wall structure dividing said reservoir into a first compartment containing said fuel inlet and fuel outlet and a second compartment substantially isolated from said first compartment by said wall structure, said wall structure having means providing a fluid flow communication adapted to bleed fuel from said first compartment to said second compartment at a restricted rate to replenish fuel lost from said second compartment by evaporation, a dashpot mechanism so located in said second compartment that said mechanism occupies a portion only of the second compartment and a second portion of the second compartment serves as a reservoir for fuel substantially isolated by said wall structure from the fuel moving between said fuel inlet and fuel outlet, said mechanism comprising a movable member operatively connected to said throttle valve, means cooperating with said movable member to define a chamber for fuel the capacity of which is varied by movement of said member, means including a one-way valve device forming a fluid flow connection to accommodate flow of fuel from said second portion of said second compartment to said chamber and means forming a restricted fuel passage for accommodating bleeding of fuel from said chamber to said second compartment to accommodate retarded movement of said member and said throttle valve.

5. A carburetor adapted for use in conjunction with an internal combustion engine and comprising a housing having a fuel reservoir provided with a fuel inlet and a fuel outlet, a throttle valve operable to regulate the flow of fuel and air through said carburetor, a vertically extending partition dividing said fuel reservoir into a first compartment containing said fuel inlet and said fuel outlet and a second compartment, said partition having a bleed hole therein to provide a fluid flow communication adapted to bleed fuel from said first compartment to said second compartment at a restricted rate approximating the rate of loss of fuel from said second compartment by evaporation and a dashpot mechanism operable to retard closing movement of said throttle and comprising wall structure defining a piston receiving bore in a portion of said second compartment, a piston slidably mounted in said bore and operatively connected to said throttle valve for movement toward one end of said bore in response to closing movement of said throttle valve, means forming

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ing a fluid flow connection between said bore and that portion of said second compartment exterior of said bore, a one-way valve located in said connection and a means forming a restricted fluid flow passage for bleeding fuel from said bore to that portion of said second compartment exterior of said bore independently of said one-way valve.

6. A carburetor adapted for use in conjunction with an internal combustion engine and comprising a housing having a fuel reservoir provided with a fuel inlet and a fuel outlet, a throttle valve operable to regulate the flow of fuel and air through said carburetor, a wall structure dividing said reservoir into a first compartment containing said fuel inlet and fuel outlet and a second compartment substantially isolated from said first compartment by said wall structure, said wall structure having a bleed hole therein to provide a fluid flow communication adapted to bleed fuel from said first compartment to said second compartment at a restricted rate to replenish fuel lost from said second compartment by evaporation, a dashpot mechanism so located in said second compartment that said mechanism occupies a portion only of the second compartment and a second portion of the second compartment serves as a reservoir for fuel substantially isolated by said wall structure from the fuel moving between said fuel inlet and fuel outlet, said mechanism comprising a movable member operatively connected to said throttle valve, means cooperating with said movable member to define a chamber for fuel the capacity of which is varied by movement of said member, means including a one-way valve device forming a fluid flow connection to accommodate flow of fuel from said second portion of said second compartment to said chamber and means forming a restricted fuel passage for accommodating bleeding of fuel from said chamber to said second compartment to accommodate retarded movement of said member and said throttle valve.

7. A carburetor adapted for use in conjunction with an internal combustion engine and comprising a housing having a fuel reservoir provided with a fuel inlet and a fuel outlet, a throttle valve operable to regulate the flow of fuel and air through said carburetor, a vertically extending partition dividing said fuel reservoir into a first compartment containing said fuel inlet and said fuel outlet and a second compartment, said partition having an upper surface located slightly below the fuel level in said reservoir to provide for restricted fluid flow communication between said compartments and a dashpot mechanism operable to retard closing movement of said throttle and comprising wall structure defining a piston receiving bore in a portion of said second compartment, a piston slidably mounted in said bore and operatively connected to said throttle valve for movement toward one end of said bore in response to closing movement of said throttle valve, means forming a fluid flow connection between said bore and that portion of said second compartment exterior of said bore, a one-way valve located in said connection and a means forming a restricted fluid flow passage for bleeding fuel from said bore to that portion of said second compartment exterior of said bore, a one-way valve located in said connection and a means forming a restricted fluid flow passage for bleeding fuel from said bore to that portion of said second compartment

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exterior of said bore independently of said one-way valve.

8. A carburetor adapted for use in conjunction with an internal combustion engine and comprising a housing having a fuel reservoir provided with a fuel inlet and a fuel outlet, a throttle valve operable to regulate the flow of fuel and air through said carburetor, a wall structure dividing said reservoir into a first compartment containing said fuel inlet and fuel outlet and a second compartment substantially isolated from said first compartment by said wall structure, said wall structure having an upper surface located slightly below the fuel level in said reservoir to bleed fuel from said first compartment to said second compartment at a restricted rate to replenish fuel lost from said second compartment by evaporation, a dashpot mechanism so located in said second compartment that said mechanism occupies a portion only of the second compartment and a second portion of the second compartment serves as a reservoir for fuel substantially isolated by said wall structure from the fuel moving between said fuel inlet and fuel outlet, said mechanism

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comprising a movable member operatively connected to said throttle valve, means cooperating with said movable member to define a chamber for fuel the capacity of which is varied by movement of said member, means including a one-way valve device forming a fluid flow connection to accommodate flow of fuel from said second portion of said second compartment to said chamber and means forming a restricted fuel passage for accommodating bleeding of fuel from said chamber to said second compartment to accommodate retarded movement of said member and said throttle valve.

ROY C. HAEUSLER.

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