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CARBURETOR

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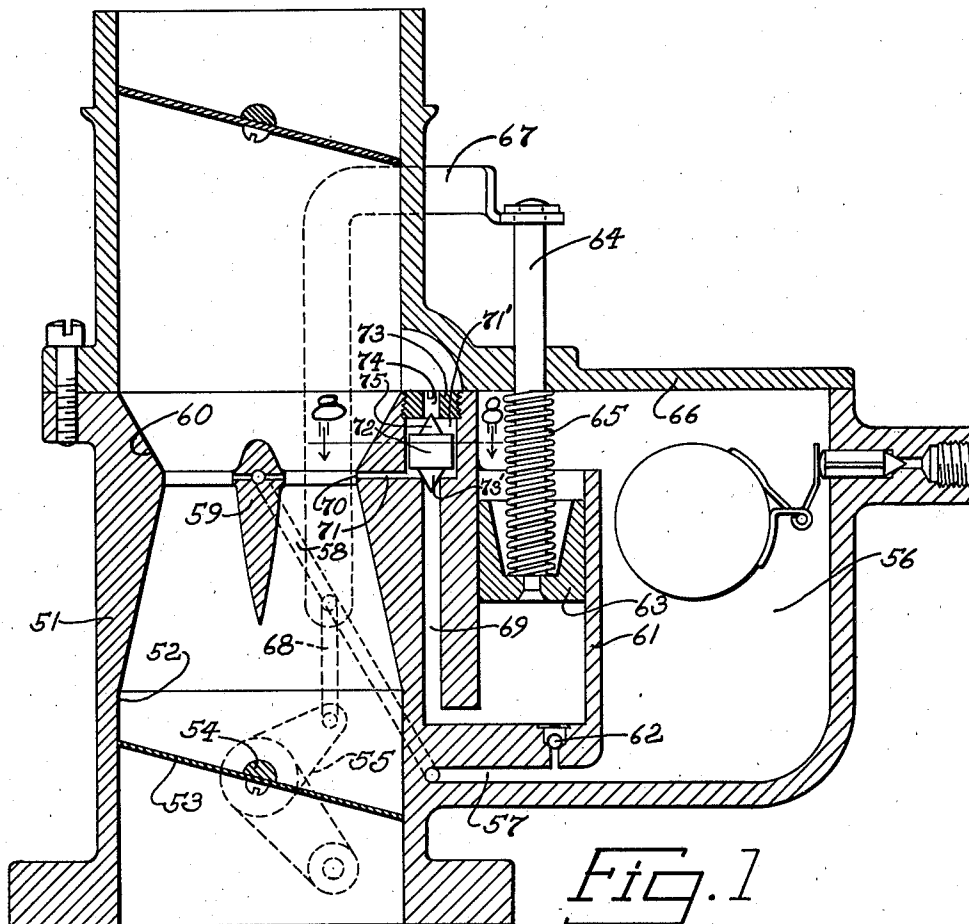


Fig. 1

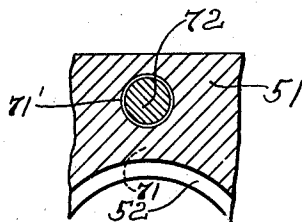


Fig. 2

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CARBURETOR

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2 Claims. (Cl. 261—34)

This invention relates to improvements in carburetors and is a division of our copending application, patented June 25, 1940, No. 2,205,457.

More particularly, the invention pertains to improved carburetor "pick-up" pump systems of the type by which the discharge of fuel from a carburetor of a vehicle engine is temporarily augmented during opening movements of the throttle valve thereof.

The fuel displacing elements of pick-up pump systems of this character are generally actuated by, and in relation to, operation of accelerator mechanism by which the throttle valve of the carburetor is controlled.

The effort required to displace the temporarily augmenting fuel charge increases the pedal pressure required to operate the accelerator mechanism and to open the throttle valve. This pressure requirement is preferably held at a low value so as to guard against tiring of the foot of the operator of the vehicle.

Since the discharge from the pick-up system of a vehicle engine carburetor is desired only during throttle valve opening movements, precaution must be taken to obstruct flow or pull-over of fuel from the pick-up system discharge orifice under the action of the normal carburetor suction applied thereon. The interposing of valve mechanism for this purpose between the pump and the discharge outlet of systems of this kind, which has to be moved to open position against its weight or other closing force to permit the discharge of fuel, imposes further pressure requirements on the accelerator mechanism.

One of the main objects of this invention is the provision of improved fuel displacing mechanism and fuel pull-over discharge preventing means which together enable the accelerator pedal pressure requirements to be held within substantially low limits.

Another object of the invention is to provide an improved light weight valve for the outlet passage of a pick-up pump system of this kind which is normally held in closed position, partly by the carburetor vacuum which is relieved when the valve is initially partly opened and which therefore does not impose excessive pedal pressure requirements upon the accelerator system.

Further objects of the invention are to provide means for relieving the discharge outlet of a pick-up pump system of that effect of the normal carburetor suction which tends to pull over fuel therefrom when additional fuel is not desired; and to provide means of this character which reduces the amount of valve weight, or

otherwise derived valve closing force, required to prevent undesired fuel flow from the outlet of the pick-up system and which therefore reduces the pedal pressure required to open such a valve.

Still further objects of the invention are to provide in a pick-up pump system of this kind resilient means for projecting the fuel displacing member thereof through its fuel displacing stroke; to provide means of this character which are energized during closing movement of the throttle valve of a carburetor and the corresponding movements of the accelerator mechanism associated therewith; and to provide a pull-over preventing valve of the foregoing character which requires so little opening force that an excessive pedal pressure is not necessary in order to accommodate the use of a return spring in the accelerator system that is capable of satisfactorily loading the fuel displacing mechanism during the throttle closing operations.

Illustrative embodiments of the invention are shown in the accompanying drawing in which:

Fig. 1 is a central vertical sectional view of a carburetor embodying the invention.

Fig. 2 is a fragmentary horizontal view taken on the line 2—2 of Fig. 1.

In the drawing is diagrammatically illustrated a carburetor including a body portion 51 having a fuel mixture passage 52 therein in which a throttle valve 53 is provided. The throttle valve 53 is mounted on a valve stem 54 which is journaled in the body portion 51 of the carburetor and which has an external end portion provided with a bell crank lever 55. Formed in the body portion 51 of the carburetor is a fuel reservoir 56 from which liquid fuel is fed through passages 57 and 58 to a discharge nozzle 59 located centrally of the fuel mixture passage 52. The fuel nozzle 59 is also located substantially at the maximum restriction provided in the fuel mixture passage 52 by a venturi 60.

The carburetor shown in Fig. 1 has a pick-up pump system comprising a cylinder 61 located in the fuel reservoir 56 to which liquid fuel is supplied from the latter through a valve controlled port 62. Reciprocably mounted in the cylinder 61 is a piston 63 having a piston rod 64 rigidly attached thereto and extending externally of the fuel reservoir. The piston 63 is normally urged downwardly, as viewed in Fig. 7, toward the discharge end of its fuel displacing stroke by a spring 65 which bears between the piston 63 and the cover 66 of the fuel reservoir 56. The piston rod 64 is operatively connected with the bell crank lever 55 on the throttle valve stem 54 by

an L-shaped lever 67 and connecting link 68. The throttle valve 53 is normally urged toward a closed position by a spring (not shown) which may act directly upon the throttle valve stem 54 or upon any of the parts of the accelerator system by which throttle valves are conventionally controlled. The throttle valve closing spring is predetermined in strength to not only close the valve 53 but to also raise the piston 63 against the action of the coil spring 65 and to thereby energize the latter spring in order that it may move the piston 53 through its full displacing stroke immediately upon opening of the throttle valve.

Fuel displaced from the cylinder 61 is fed to the fuel mixture passage 52 by a liquid fuel passage 69 leading from the lower end portion of the cylinder 61 through the wall of the body portion of the carburetor and communicating with the fuel mixture passage 52 through an outlet opening 70 substantially at the location of maximum constriction of the venturi 60, and therefore substantially at the region of maximum suction of the fuel mixture passage. The outlet end portion 71 of the liquid fuel discharge passage 69 is somewhat restricted in size.

Provided at the junction of the restricted outlet branch 71 and the main length of the liquid fuel passage 69 is a valve chamber 71' in which is mounted a valve 72 having a conical valve element 73' adapted to seat in and close the liquid fuel passage 69, as illustrated in Fig. 7. The main body portion of the valve member 72 is in substantially close-fitting sliding engagement with the wall of the valve chamber 71' and in the upper end portion of the chamber 71' is a plug 73 having a restricted passage 74 there-through which communicates with the fuel mixture passage 52 at a location above the maximum restriction of the venturi 60 and at a region of the carburetor of comparatively low suction. A valve element 75 is provided on the valve member 72 and adapted to close the passage 74 of the plug 73 when the valve element 73' is held in open position by the fluid pressure applied on the liquid fuel of the cylinder 61 by the piston 63 in order to prevent the discharge of liquid fuel therethrough.

When the pick-up pump system is not in operation, the suction applied on the outlet opening 70 acts upon the cylindrical body portion of the valve member 72 normally urging the latter downwardly so as to utilize the force of carburetor suction for the purpose of assisting in holding the valve element 73' in closed position. As soon as the valve element 73' is opened slightly during operation of the pick-up pump, the suction applied on the valve member 72 is relieved and the pick-up pump is no longer required to overcome this valve closing force. This action of the carburetor suction reduces the amount of valve closing force derived from the weight of the valve member 72 or from any other source and in place of requiring valve closing force to overcome the action of normal carburetor suction, such normal carburetor suction is utilized to assist in closing of the valve.

By virtue of this construction, the piston operating spring 65 does not have to lift a heavy valve or overcome a strong valve closing force in order

to discharge the temporary fuel augmenting charge from the cylinder 61. As a result, this spring may be of weaker construction and the throttle valve closing spring may accordingly be of weaker construction, thereby reducing accelerator pedal pressure requirement.

Although but one specific embodiment of the invention is herein shown and described, it will be understood that various changes in the size, shape and arrangement of parts may be made without departing from the spirit of the invention.

We claim:

1. In a carburetor having a fuel mixture passage; a pick-up pump system including a fuel chamber, a passageway leading from said fuel chamber having an outlet branch communicating with the latter at a region thereof of relatively low pressure and having an air vent branch leading from a region of higher pressure, a fuel displacing element in said fuel chamber, and a valve member in said last mentioned branch passage having a body portion provided with a surface exposed to atmospheric pressure at said air vent and an opposite surface and having a valve element for obstructing the flow of fuel to said outlet branch when said fuel displacing element is inoperative, said valve element extending in advance of said last mentioned surface for so positioning the latter as to subject it to the carburetor suction at said outlet branch when said valve element is in closed position for normally urging said valve element to closed position, and a second valve element on said valve body for obstructing the discharge of fuel from said air vent branch when said fuel displacing member is in operation.

2. In a carburetor having a fuel mixture passage; a pick-up pump system including a fuel chamber, a valve chamber in said carburetor having a permanently open fuel outlet port at one end communicating with said fuel mixture passage at a region thereof of relatively high suction and having a fuel inlet opening at the same end of said valve chamber adjacent said outlet port, said valve chamber also having an air inlet opening at its opposite end, a fuel passage leading from said fuel chamber to the fuel inlet opening of said valve chamber, a fuel displacing member in said fuel chamber, and a valve member in said valve chamber having a valve element normally closing the fuel inlet opening of said valve chamber when said fuel displacing member is inoperative for holding fuel of said fuel chamber against withdrawal by carburetor suction and having a body portion terminating between said air inlet opening and said fuel inlet opening and adjacent outlet port and so subjected to said carburetor suction applied thereon through said fuel outlet port when said fuel inlet opening is closed as to urge said valve element toward its closed position, said valve member including a second valve element for closing said air inlet opening of said valve chamber during fuel discharging operations of said system.

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