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CARBURETOR

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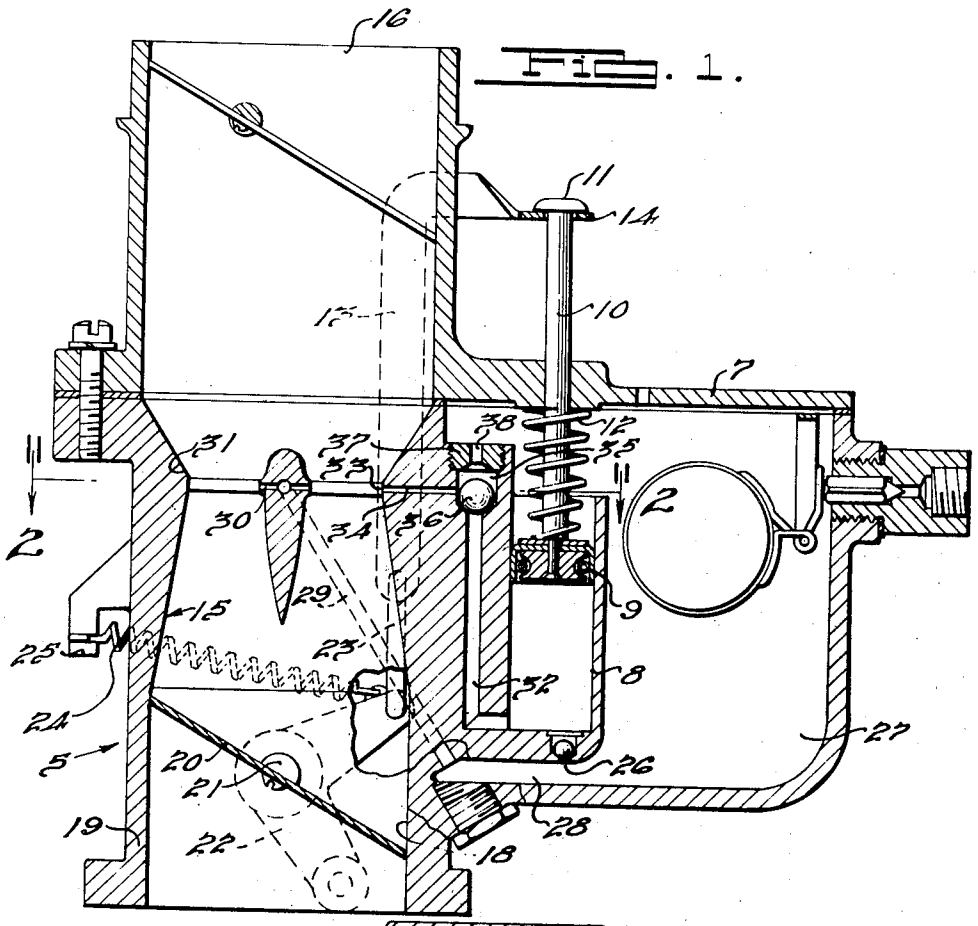



FIG. 1.

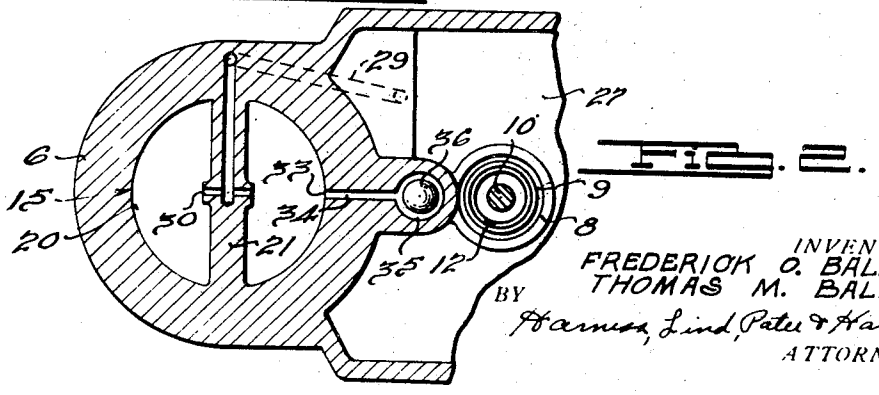



FIG. 2.

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2,182,393

## CARBURETOR

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2 Claims. (Cl. 261—34)

This invention relates to improvements in carburetors.

More particularly, the invention pertains to improved carburetor "pick-up" pump systems.

One of the main objects of this invention is the provision of improved 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.

Another object of the invention resides in the provision of an improved carburetor fuel pull-over discharge preventing means of this character which utilizes the vacuum in the carburetor fuel mixture passage for reducing the effective weight of the pick-up system check valve while this valve is seated to prevent undesirable fuel pull-over.

Further objects of the invention are to provide in a fuel pull-over discharge preventing means of this kind a valve adapted when seated to prevent undesirable fuel pull-over and which is so constructed and arranged with respect to the rest of the carburetor that its effective weight is reduced by carburetor suction so that only a relatively small force is necessary to unseat the valve; to provide in a carburetor in which the pull-over valve lifting force is derived either directly or indirectly from accelerator action, improved fuel pull-over obstructing mechanism which can be moved to an unobstructing position without necessitating a high accelerator pedal pressure requirement; and to provide mechanism of this character by which is facilitated the prompt discharge of fuel from the pick-up system upon initial operation of the accelerator pedal.

Other objects and advantages of the invention will be more apparent from the following description taken in connection with the accompanying drawing, in which:

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

Fig. 2 is a horizontal sectional view taken as indicated by the line 2—2 of Fig. 1.

In the form of the invention shown in the drawing, the improved pick-up pump system is shown as embodied in a carburetor, generally designated by the numeral 5, having a body portion 6 comprising die cast wall structure and a cover portion 7. Formed in the wall structure of the body portion 6 is a cylinder 8 in which a piston 9 is reciprocably mounted. A piston rod 10 is attached at its lower end to the piston 9 and has an enlarged head end portion 11. A spiral spring 12 bearing between the piston 9 and the cover 7, normally urges the piston downwardly, as viewed in Fig. 1, toward the discharge end of its cylinder 8.

Provided in the body portion 6 of the carburetor is pump actuating mechanism comprising a vertically shiftable rod 13 which is slidably mounted in the wall structure of the carburetor. A substantially horizontal slotted plate portion 14 formed on the upper end of the rod 13 extends laterally therefrom into registration with the upper end portion of the piston rod 10, and slidably receives the piston rod 10.

The carburetor 5 has a fuel mixture passage 15 provided with an upper air inlet end 16 and a fuel mixture discharge end 17 which registers with a fuel mixture passage section 18 formed in a throttle body portion 19. A throttle valve 20 mounted on a valve stem 21 which is journaled in apertures in the wall of the throttle body 19, serves to control the flow of fuel mixture from the carburetor. The valve stem 21 has an external end portion on which is mounted a bell crank lever 22. A link 23 operatively connects the lower end portion of the pump actuating member 13 to one arm of the bell crank lever 22. A suitable tension spring 24 of predetermined strength is preferably attached to one arm of the bell crank lever 22 and anchored on a lug 25 of the throttle body for normally urging the throttle valve 20 toward its closed position and for urging the rod 13, piston rod 10 and piston 9 to their uppermost positions against the action of the spring 12. When the throttle valve 20 is opened, the plate 14 is moved downwardly, thereby permitting the spring 12 to urge the piston 9 throughout its full fuel displacing stroke immediately upon opening of the throttle valve.

Fuel is admitted into the interior of the cylinder 8 during upward movement of the piston 9, through a valve controlled port 26 which is supplied with liquid fuel from the interior of a fuel reservoir 27. The normal fuel discharge is fed from the reservoir 27 through passages 28 and 29 to a main discharge nozzle 30 located centrally of the fuel mixture passage 15. This fuel nozzle is located substantially at the maximum restriction provided in the fuel mixture passage 15 by a venturi 31.

Fuel displaced from the cylinder 8 is fed to the fuel mixture passage 15 by a liquid fuel passage 32 leading from the lower end portion of the cylinder 8 through the wall of the body portion of the carburetor and communicating with the fuel mixture passage 15 through an outlet opening 33 substantially at the location of maximum constriction of the venturi 31, and therefore substan-

tially at the region of maximum suction of the fuel mixture passage. The outlet end portion 34 of the liquid fuel discharge passage 32 may be somewhat restricted in size.

Provided at the junction of the restricted outlet branch 34 and the main length of the liquid fuel passage 32 is a valve chamber 35 in which is mounted a ball check valve 36 having a comparatively close fit with the wall of the chamber and adapted to seat in and close the liquid fuel passage 32 as illustrated. In the upper end portion of the chamber 35 is a plug 37 having a restricted passage 38 therethrough which communicates preferably with the fuel reservoir 27 where there are substantially normal atmospheric pressure conditions. The check valve 36 is adapted to close the passage 38 of the plug 37 when the valve 36 is raised to seat upon the inner extremity of the passage 38 by fluid pressure applied on the liquid fuel of the cylinder 8 by the piston 9 in order to prevent the discharge of liquid fuel therethrough. When the valve 36 is closed its diameter is preferably disposed below the location at which the passage 34 opens into the valve chamber 35.

The passages 34 and 38, or their orifices if used, are so predetermined in size that a reduction in air pressure below atmospheric pressure is produced in the chamber 35 and above the ball valve 36, by the vacuum of the fuel mixture passage. The resulting vacuum above the valve tends to lift it off of its seat and thus assists in opening the valve at the initial period of discharge from the fuel system. This action of the carburetor suction reduces the effective weight of the check valve 36 while seated on the passage 32 and the piston operating spring 12 is not called upon to lift the entire weight of the valve in order to discharge the temporary fuel augmenting charge from the cylinder 8. As a result, this spring may be of weaker construction and the throttle valve closing spring which is relied upon to compress the spring 12 may accordingly be of weaker construction, thereby reducing accelerator pedal pressure requirement. Prompt opening action of the valve 36 is thus facilitated without excessive pedal pressure requirement and substantially instantaneous discharge of the pick-up charge is assured during initial throttle movement.

Any liquid fuel which might escape through the air passage 38 is safely returned to the reservoir 27 instead of being lost or being discharged into the fuel mixture passage 15.

While the passage 34 is shown to communicate with the fuel mixture passage of the carburetor at the maximum restriction of the venturi, this passage may be constructed to open into the venturi either above or below the location of maximum restriction as desired to predetermine the pressure characteristics.

Various modifications and changes will be apparent from the teachings of the invention as set forth in the appended claims, and it is not our intention to limit the invention to the particular details of construction and operation shown and described for illustrative purposes.

What we claim is:

1. In a carburetor including a fuel mixture passage having a throttle valve therein and including a resilient member for urging said throttle valve toward its closed position; a pick-up pump system including a fuel cylinder, a fuel displacing element in said cylinder; means including a spring adapted to be loaded by the throttle valve closing action of said resilient member for moving said element through its fuel displacing stroke during opening movement of said throttle valve; means for conducting fuel from said cylinder to said fuel mixture passage including a valve chamber having an air inlet thereto, a passage section leading from said cylinder to said chamber, and a passage section leading from said chamber to said fuel mixture passage; a reciprocable valve in said chamber between said air inlet and the outlet end of said first mentioned passage section having substantially close fitting sliding relationship with respect to the walls of said chamber and normally closing the outlet of the first mentioned passage section, said valve being operable to close said air inlet during fuel discharging operation of said fuel displacing element and said second mentioned passage section communicating with said chamber at a location between said air inlet and the close fitting portion of said valve and said chamber walls in order to apply on said valve a vacuum tending to unseat the valve.

2. In a carburetor having a fuel mixture passage having a throttle valve therein and a resilient member for urging the throttle valve toward its closing position and fuel reservoir; a pick-up pump system including a fuel cylinder; a fuel displacing element in said cylinder; means including a spring adapted to be loaded by the throttle valve closing action of said resilient member for moving said element through its fuel displacing stroke during opening movement of said throttle valve; means for conducting fuel from said cylinder to said fuel mixture passage including a valve chamber having an air inlet, a passage section leading from said cylinder to said chamber having an outlet communicating with the latter at a location spaced from said air inlet, and a passage section leading from said chamber to said fuel mixture passage; valve seats in said chamber adjacent said outlet and said air inlet respectively, a reciprocable valve in said chamber between said valve seats having substantially close fitting sliding relationship with respect to the walls of said chamber and adapted to alternatively close the outlet of the first mentioned passage section and said air inlet respectively, said second mentioned passage section communicating with said chamber at a location between said air inlet and the close fitting portion of said valve and said chamber walls in order to apply on said valve a vacuum tending to unseat the valve from said first mentioned passage section when said throttle valve is substantially closed.

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