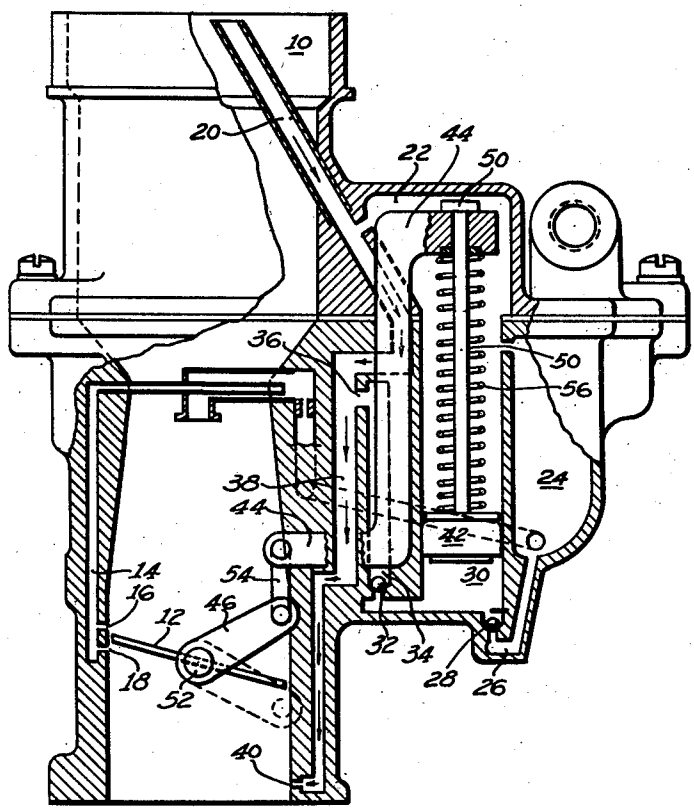
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ACCELERATING PUMP

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ACCELERATING PUMP

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1 Claim. (Cl. 261—34)

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The object of this invention is to improve the acceleration generally and specifically the part throttle acceleration or "off idle" operation of an automotive carburetor.

The figure shows in partial cross-sectional elevation the essential elements of my invention.

In the figure 10 is the air entrance, 12 is the throttle, 14 is the low speed fuel passage delivering a very rich mixture of fuel and air to the mixture outlet. The throttle 12 is shown in its idling position. Low speed fuel and air are discharged through the opening 18 and air enters at opening 16. In addition pure air enters the tube 20, flows through the passage 38 and discharges on the engine side of the throttle 12 through the restricted opening 40. As a result of this very little air is taken in around the lip of the throttle 12.

A lever 46 is shown above the level of the sectional carburetor and is connected to the throttle shaft 52. The lever 46 is connected through the link 54 with the S-shaped element 44 which is shown above the plane of the cross-section of the drawing. This element 44 is guided in the body of the carburetor and is connected by a one-way connection to the pump rod 50. The rod 50 slides in a hole in the end of the element 44. A spring 56 surrounds the rod 50 and engages with the piston 42 and with the underside of the upper portion of the element 44. Piston 42 reciprocates in cylinder 30.

A float chamber 24 is connected through the passage 26 past the check valve 28 so that when the piston is moved up into the position shown fuel flows from the float chamber 24 into the pump cylinder 30. Fuel is discharged from the pump cylinder 30 past the check valve 32 into the passage 34. Passage 34 discharges through the opening 36 into the air passage.

Operation

When the throttle 12 is opened clockwise the S-shaped element 44 descends and compresses the spring 56. The compressed spring 56 expands and pushes the piston 42 downward. This closes the check valve 28 and the check valve 32 thereupon opens. The fuel is discharged through opening 36 and is carried through the opening 40 into the mixture outlet.

When part throttle accelerating occurs the throttle 12 first opens to place the opening 16 on the engine side of the throttle and thereafter

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only opens far enough to admit part of the air that the engine calls for. A considerable suction exists at the orifice 40 even after the throttle 12 has been opened a considerable number of degrees and the fuel for acceleration is properly atomized by engine suction so that a very satisfactory acceleration results.

During normal idle running the air delivered through passages 20—38—40 is pure air, hence, less air is taken in past the lips of the throttle 12. By reducing this air flow around the throttle 12, as pointed out in my Patent No. 2,263,027, less freezing results in icing weather (moderate temperatures and high humidity), especially when operating at normal idle speed with throttle 12 almost closed. Less air down passage 14 means a richer mixture discharges at orifices 16 and 18. This richer mixture is less liable to freeze than are the mixtures in general use today.

The smaller the opening movement of the throttle 12 the greater is the atomization of the acceleration fuel supplied by pumps 44—30—42.

It is "touch throttle" acceleration conditions which have been most difficult to satisfy. The slightest touch of the throttle will lift the small ball check valve 32, which is unloaded and so raises the level in the vertical well 34. This causes fuel to flow out of the opening 36, down passage 38 to the restricted outlet 40.

What I claim is:

Fuel acceleration means for a downdraft carburetor having a constant level fuel supply chamber, a main fuel nozzle fed therefrom, a mixture chamber into which the nozzle discharges, a mixture outlet and butterfly throttle therein, a low speed fuel nozzle connected to the main fuel nozzle and discharging fuel and air into said mixture outlet at a point adjacent to the upstream lip of said throttle when said throttle is in its idling position and in its initial running position comprising, a descending air passage of relatively large size in free communication with the atmosphere at its upper end and a restricted lower outlet therefrom discharging a portion of the air required for low speed running into the mixture outlet on the engine side of and remote from said throttle, an accelerating pump operated by said throttle, a cylinder therefor, an inlet to said cylinder from said constant level fuel supply chamber, an outlet passage from said cylinder, an unloaded non-return valve therein, said passage discharging into the unrestricted

portion of said air passage so that fuel is discharged by said pump uninfluenced by engine suction as the throttle is opened from its engine idling position into its running position.

BERT BEARD.

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