Feb. 1, 1944. J. T. W. MOSELEY 2,340,820

ACCELERATING PUMP

Filed Nov. 28, 1941

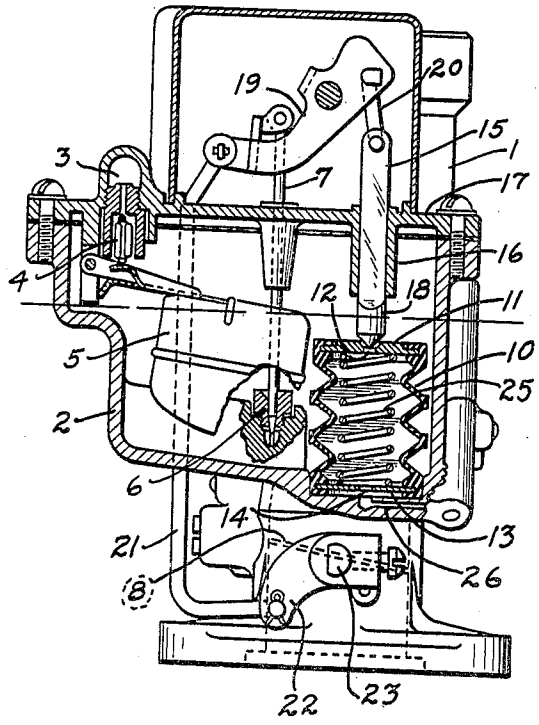


FIG. 1.

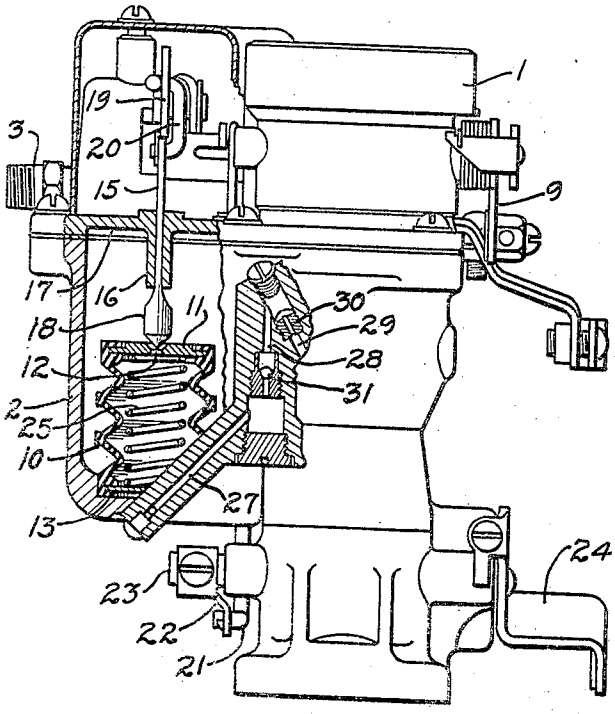


FIG. 2.

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Patented Feb. 1, 1944 2,340,820

UNITED STATES PATENT OFFICE

2,340,820

ACCELERATING PUMP

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Application November 28, 1941, Serial No. 420,745

3 Claims. (Cl. 261—34)

This invention relates to carburetors for internal combustion engines and consists particularly in a novel accelerating pump device.

Automobile carburetors frequently become hot enough, particularly after stopping, to cause boiling of the fuel in restricted parts, such as the accelerating pump, and the increased pressure caused thereby may cause liquid fuel to be forced into the carburetor barrel and the intake manifold. Starting of the engine, thereafter, is delayed until this excess of fuel is removed. Accelerating pump pistons have been provided having holes for relieving this excess pressure, but, obviously, some of the fuel is lost through this hole during the discharge stroke and the initial charge, particularly, is thereby weakened.

It is an object of the present invention to provide means for venting gases which may form in the accelerating pump pressure chamber because of boiling of the fuel, while, at the same time, providing for a maximum initial discharge from the pump during operation thereof.

Another object is to provide a simplified accelerating pump device in which the inlet port is formed and positioned so as to function as vapor releasing vent when the pump is inactive.

These objects and other more detailed objects are attained by the structure shown in the accompanying drawing in which:

Fig. 1 is a side view of a carburetor showing the constant level chamber and some of the contained parts in section.

Fig. 2 is a side view and section taken at 90° to Fig. 1, the section being taken through the accelerating pump.

The carburetor illustrated is of the downdraft type including a barrel 1 and adjacent constant level chamber 2 having an inlet port 3 controlled by the usual needle valve 4 which is operated by the float 5. Located in the lower portion of the constant level chamber is a metering orifice member 6 controlled by a stepped metering rod 7. The fuel supply for normal high and low speed operation is drawn through orifice member 6 and the usual main nozzle and idling passages (not shown). A throttle valve 8 is pivotally mounted in the lower portion of carburetor barrel 1 and a choker (not shown) is mounted in the upper portion of the barrel and controlled by a lever 9.

Also located in the constant level chamber is an accelerating pump including a bellows 10, conveniently formed of synthetic rubber, having a top plate 11 with a port 12 and a lower plate 13, ported at 14. A rod 15 is slidable in a vertical guide 16 formed in cover 17 of the constant level chamber and has an enlarged, pointed lower end 18 disposed to engage pump top plate 11 at port 12 and thereby, coincidentally, close the port and compress bellows 10 for discharging the pump. An internal compression spring 25 constantly tends to expand the bellows, but other self expanding means may be used.

A pump arm 19 is pivotally mounted above the constant level chamber and connected to rod 15 by a link 20 and to the throttle valve by a connector link 21 and an arm 22 rigid on throttle shaft 23. The throttle and pump are operated by a crank 24 opposite arm 22 so that opening of the throttle causes downward movement of rod 15 and compression of bellows 10 for discharging the pump. The pump discharge passes through port 14 and passages 26, 27, 28 and 29, the latter having a metering restriction 30 and discharging directly into the carburetor barrel. An outlet pump check 31 is located in passage 28.

In operation, opening of the throttle valve causes compression of bellows 10 and discharging of the pump, at the same time, port 12 being closed by the valve forming lower extremity of rod 15. As long as the throttle is maintained in an open position and the bellows compressed, either partly or fully, port 12 will be closed because of spring 25. As the throttle is closed, rod 15 is lifted, withdrawing point 18 from port 12 and permitting fuel to enter the interior or bellows 10 through this port. At the same time, spring 25 causes the bellows to expand thus charging the pump. When the throttle is closed and the bellows fully expanded, as shown in the figures, point 18 on rod 15 will be spaced slightly above port 12 so that this port will be available for the egress of gases formed inside the bellows. No air may enter the pump as the bellows is fully submerged in the fuel. This venting of gas bubbles will prevent the formation of a gaseous pocket within the bellows and a consequent increasing of pressure which would otherwise force liquid fuel past the outlet check and into the carburetor barrel. Rod 15 and, particularly, the pointed lower end 18 thereof, cooperates with port 12, to form a valve inlet from the pump and also a pressure relief vent which is always open in the charged position of the pump. The pump provides for a rapid, strong discharge of accelerating fuel as soon as the throttle is opened and during subsequent accelerations.

Various modifications may be made as will occur to those skilled in the art and the exclusive use of all such modifications as come within the scope of the appended claims is contemplated.

I claim:

1. In a carburetor, a fuel chamber, a mixture conduit, and an accelerating pump discharging into said conduit and comprising a self-expanding chamber wholly submerged in the fuel in said chamber under normal operating conditions and having an upper wall provided with a normally open fuel inlet port, and a pump actuating device having a valve part in alignment with said port adapted to forcibly engage said wall and close said inlet port when pressure is applied thereby to contract said chamber.

2. In a carburetor, a constant level fuel chamber, a mixture conduit, and an accelerating pump comprising a resiliently self expanding pressure chamber with a movable upper wall constantly below the normal level in said fuel chamber and provided with a normally open fuel inlet port, and a pump operator in the form of a push rod with its extremity adapted to engage said wall and seal said port during the application thereby of pump discharging force.

3. In a carburetor, a mixture conduit, a throttle in said conduit, a constant level fuel chamber, and an accelerating pump comprising a resiliently self expanding chamber having a movable upper wall with a fuel inlet and gas releasing port therein, and a one-way operating connection between said throttle and said pump including a valve part positioned to engage said wall and forcibly close said port during the application of pump discharging force to said wall thereby, said operating connection being spaced from said port so as to open the same when said throttle is closed.

JAMES T. W. MOSELEY.