

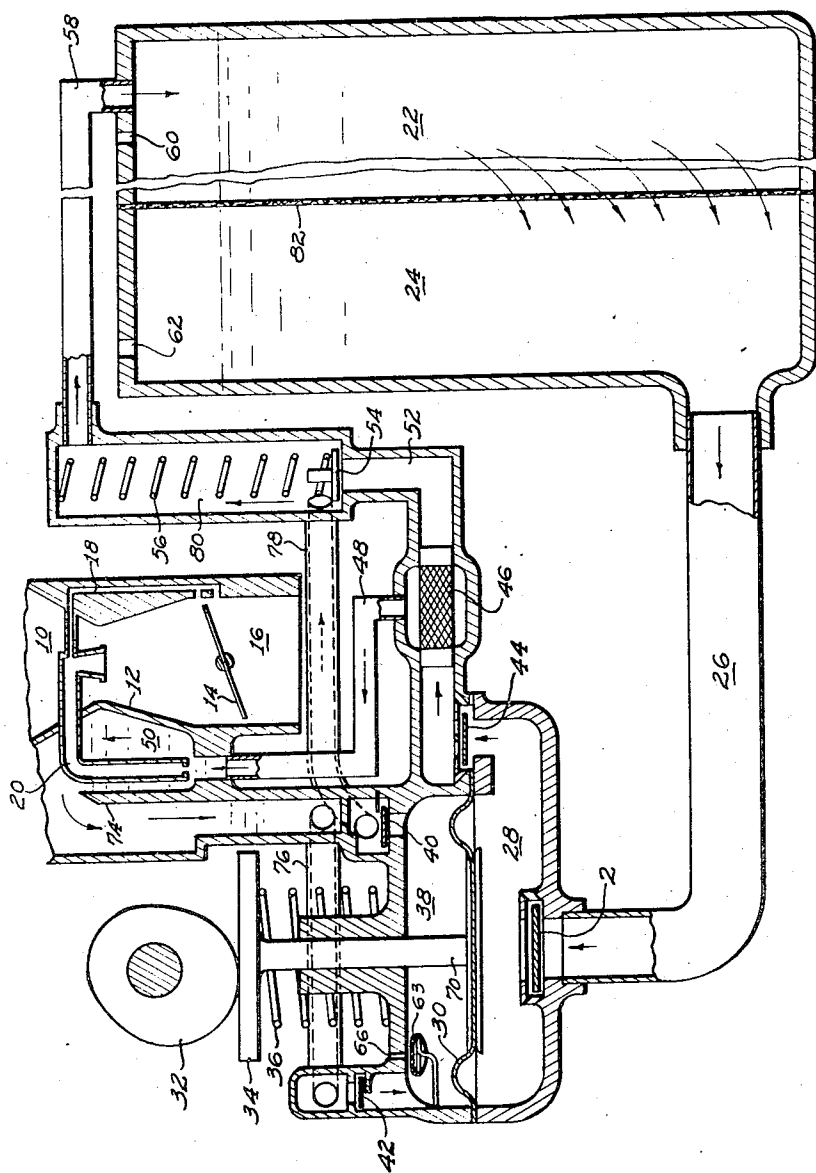
June 15, 1948.

S. M. UDALE

2,443,570

FUEL PUMP

Filed Aug. 24, 1946



Stanley M. Udale,
INVENTOR.

UNITED STATES PATENT OFFICE

2,443,570

FUEL PUMP

Stanley M. Udale, Detroit, Mich., assignor to
George M. Holley and Earl Holley

Application August 24, 1946, Serial No. 692,809

2 Claims. (Cl. 103-11)

1

The object of this invention is to make a floatless carburetor for an automotive vehicle, particularly a truck or bus.

Specifically, if vapor accumulates and a truck or bus stops, great inconveniences result. It would be a simple matter to pump fuel to an overflow tank and let the overflow run back into the tank. Unfortunately, this is an impossible solution as the gravity head available varies and is not always sufficient.

If the excess fuel is returned to the fuel tank it must be pumped back and the existing types of pumps must be modified so they can be utilized for obvious financial reasons.

The figure shows diagrammatically the preferred form of my invention.

In the figure 10 is the air entrance, 12 is the venturi, 14 is the throttle in the mixture outlet 16 adjacent to the low speed fuel outlets from the low speed fuel passage 18. This low speed fuel passage draws fuel from the main fuel nozzle 20 which draws the fuel from the constant level fuel supply chamber 50.

The chamber 50 derives its fuel supply from the pipe 48, which obtains its fuel supply through the fuel filter 46, which gets its fuel supply from the chamber 28, past the non-return valve 44.

The fuel supply to the chamber 28 is derived from the tank 24 through the pipe 26 past the non-return valve 2.

The fuel which overflows a dam 74, in the chamber 50, descends through the passage 76, past the non-return valve 42, into the chamber 38 and out of the chamber 38 past the non-return valve 40, along the passage 78, into the chamber 80, along the passage 58 into the tank 22, and through the screen 82 back to the tank 24.

The tank 22 is vented through opening 60 and tank 24 is vented through opening 62.

Meanwhile a diaphragm 30 is drawing fuel into the chamber 28 from the tank 24 and returning fuel from the chamber 38 back into the tank 22.

The screen 82, being of large area, may be made of small mesh, or might even be non-metallic.

A spring 36 holds the cam follower 34 in engagement with the cam 32. The rod 70 drives the diaphragm 30 and is driven by the cam follower 34, the cam 32 is driven by the engine. The fuel that leaks past the rod 70 may be drawn into the chamber 38, past the small hole 66 and check valve 63.

The fuel that is discharged past the screen 46 is maintained at sufficient head to keep the fuel flowing at the necessary rate to the constant level chamber 50 by means of the spring 56 and valve 54.

2

Operation

In hot weather the flow of excess fuel through the chamber 50 keeps the temperature in the fuel nozzle 20 low enough so that "vapor lock" does not develop.

In cold, damp, freezing weather (from 32° F.-42° F.) the fuel in the tank is usually above 32° F. so that the excess fuel flow through chamber 50 helps thaw the ice that forms on the lip of the throttle 14. The constant circulation of the fuel through the screen 82 tends to hold water in suspension in the tank 22 which is many times the volume of tank 24, although for convenience of illustration 22 and 24 appear of the same size.

The pressure drop across the screen 46 is large enough so that the screen 46 may be of comparatively fine mesh so only the finest particles can pass the mesh 46.

The fuel is shown entering the chamber in the figure directly in line with the nozzle 20, actually, of course, this would not be so but for convenience it is so shown.

What I claim is:

1. A double acting fuel pump for an internal combustion engine having a fuel supply tank, comprising, a chamber, a moving wall in said chamber dividing it into an inlet chamber and a chamber for the return of excess fuel pumped through the inlet chamber, engine operated means for reciprocating said moving wall in said two chambers to enlarge one while diminishing the other, a constant level fuel supply chamber, a passage connecting the outlet from said inlet chamber to the fuel supply tank, a check valve in said passage, a second outlet passage connected to first outlet passage located downstream from said check valve and leading into said constant level fuel supply chamber, a dam in said constant level fuel supply chamber, a passage adapted to conduct the excess fuel flowing over the top of said dam into the excess fuel chamber, a check valve in said passage admitting the fuel to said excess fuel chamber, a passage leading from said excess fuel chamber to the fuel tank, a check valve therein whereby a constant level is maintained and fuel is constantly circulated through said constant level fuel supply chamber.

2. A device as set forth in claim 1 in which there is an additional passage leading from the inlet chamber to said fuel tank and an additional check valve therein, yieldable means for closing said check valve to maintain a minimum flow of fuel over said dam.

STANLEY M. UDALÉ.