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FUEL FEEDING SYSTEM FOR MOTOR VEHICLES

Filed Oct. 31, 1923

FIG. 1.

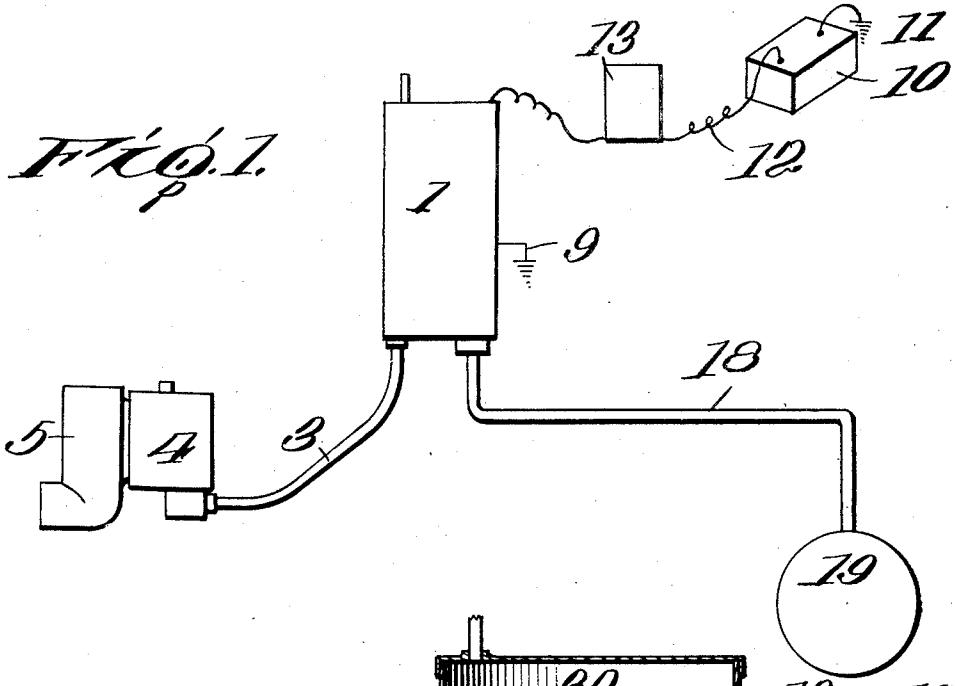
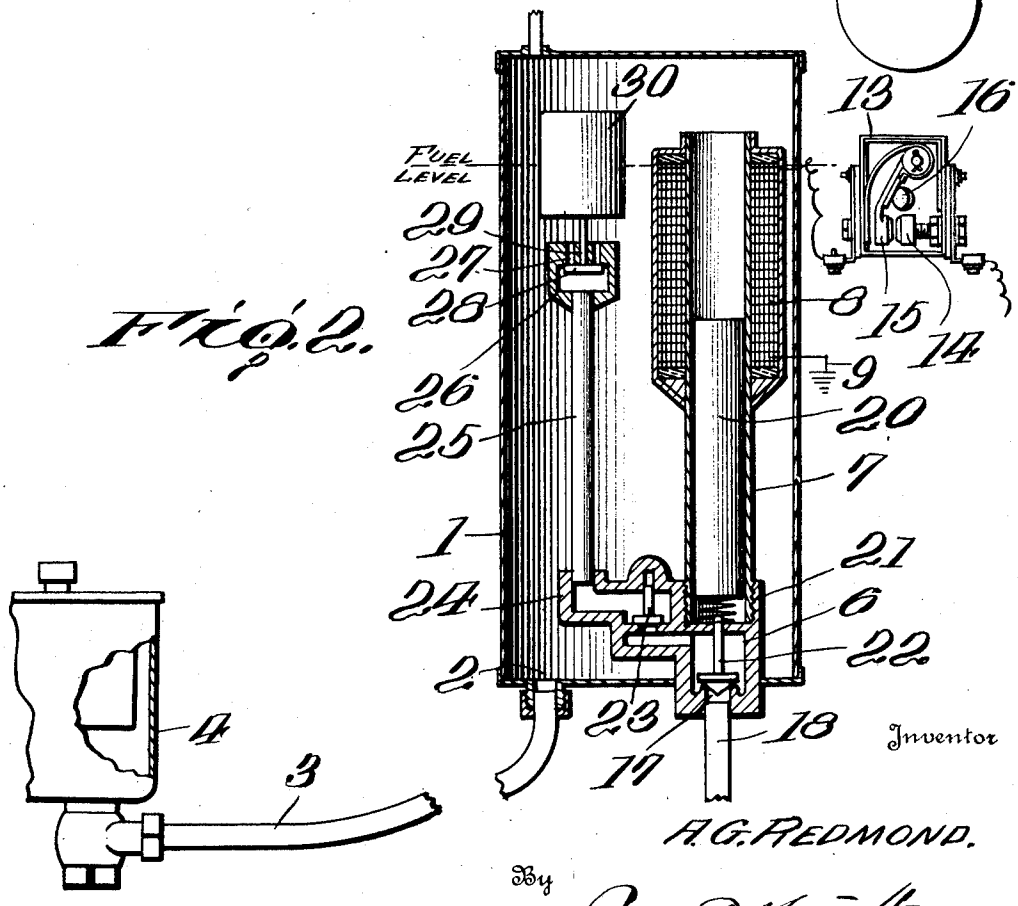


FIG. 2.



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UNITED STATES PATENT OFFICE.

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FUEL-FEEDING SYSTEM FOR MOTOR VEHICLES.

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This invention relates to fuel feeding systems for motor vehicles, the object being to provide means in the form of an electric pump for pumping fuel from a low level fuel tank to a supplemental reservoir from which the fuel is fed to the charge forming device by gravity.

Another and further object of the invention is to provide an electric pump with a valve controlled outlet actuated by a float within the supplemental reservoir so that when the fuel rises to a predetermined level within the supplemental reservoir, the outlet will be closed so as to stop the operation of the pump in order to maintain a predetermined level of fuel within the supplemental reservoir at all times.

A still further object of the invention is to provide a fuel feeding system in which an electric pump is employed having a movably mounted piston which is raised by a solenoid and allowed to drop by gravity so that fuel will be displaced from the cylinder of the pump.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claims.

In the drawings,

Figure 1 is a diagrammatic view showing the wiring and arrangement of the fuel feeding system; and

Figure 2 is a vertical section through the supplemental tank and pump showing the interrupter in elevation and the charge forming device partly in section.

In carrying out my invention I employ a supplemental reservoir 1 which can be arranged in any desired position on the motor vehicle in a plane above the carbureter and I preferably arrange the reservoir under the hood of the motor vehicle to which the system is applied.

The reservoir 1 is provided with an outlet 2 having a feed pipe 3 connected thereto extending to the inlet bowl 4 of the carbureter 5 so that fuel within the supplemental reservoir 1 will flow by gravity to the carbureter.

Arranged within the reservoir 1 is an electric pump comprising a base 6 having a cylinder 7 surrounded at its upper end by a solenoid 8 which is grounded as shown at 9 and is arranged within an electric circuit having a source of electrical energy in the form of a battery 10 which is grounded as shown at 11.

Extending from the battery to the upper end of the solenoid is a feed wire 12 having an interrupter 13 provided with a fixed contact 14 and a movable contact 15 for making and breaking the circuit for energizing and de-energizing the solenoid. The movable contact is actuated by a cam 16 driven by any of the movable parts of the motor to which the system is applied so that the solenoid will be energized and de-energized as the motor operates and while I have not shown any connection with the motor, the form of interrupter as herein shown and its connection to the motor is illustrated in an application filed even date herewith.

The base 6 of the pump extends through the bottom of the supplemental reservoir 1 and is provided with an inlet 17 to which is connected a pipe 18 extending from the main fuel supply tank 19 arranged in a plane below the carbureter and from which fuel is adapted to be drawn by the pump into the supplemental reservoir.

Arranged within the pump cylinder is a piston 20 forming the core of the solenoid and which is adapted to be raised when the solenoid is energized and allowed to drop by gravity when the solenoid is de-energized. The down stroke of the piston is arrested by a spring 21 as clearly shown.

The base is provided with an inlet check valve 22 and an outlet check valve 23 which are herein shown of the sliding type of valve now in use in connection with pumps. The base is also provided with an outlet nipple 24 having a vertical pipe secured therein which extends upwardly into the supplemental reservoir 1 and has a head 26 secured on its upper end provided with outlets 27 which are adapted to be closed by a valve 28 having a stem 29 carrying a float 30.

As the fuel is pumped from the low level reservoir into the supplemental reservoir, it passes out from the outlets 27 and the capacity of the pump is such that the supply from the main reservoir to the supplemental reservoir is in excess of the consumption of

fuel by the charge forming device so that fuel always remains within the supplemental reservoir and when the level of the fuel therein rises above a predetermined point, the float 30 rises and cuts off the outlet of the pump to the receptacle 1. This stops the movement of the piston of the pump until the level drops so as to open the outlet as the particular construction of pump herein shown is such that the stroke of the piston is such that when the piston is raised by the solenoid being energized it rides on the fuel in the cylinder of the pump and if the fuel is held therein the piston is not allowed to drop. If it drops slightly when the solenoid is again energized, it will move slightly, but I have found in practice that after the outlet of the pump has been cut off by the rising of the fuel in the supplemental reservoir and the solenoid has been energized and de-energized once or twice, the piston will remain inactive until the fuel level in the supplemental reservoir drops to such an extent that the outlet valve is opened.

The supplemental reservoir is provided with a cover having a vent, which cover is preferably made removable so that the pump can be inserted and while I have shown certain details of construction, I do not wish to limit myself to these details, as the object of my invention is to provide an auxiliary reservoir arranged in a plane above a carbureter having a pump disposed therein provided with a valve controlled outlet actuated by a float so that when the fuel within the auxiliary reservoir reaches a predetermined level, the outlet valve will be closed and by the use of a particular construction of pump as herein shown and manner of operating the same, the pump will cease to operate until the fuel drops below the predetermined level.

While in the drawings I have shown the outlet of the pump having a stand pipe connected thereto, it is, of course, understood that I am aware that the outlet could be provided with a check valve to which is connected a float so as to accomplish the desired result.

From the foregoing description it will be seen that I have provided a fuel feeding system for motor vehicles in which fuel is pumped from a low level tank to a high level tank having a float for cutting off the supply of fuel to the high level tank when the fuel therein reaches a predetermined level whereby I am able to maintain a reservoir of fuel for the charge forming device within the supplemental tank at all times so that an ample supply of fuel will be supplied to the charge forming device at all times and under all conditions.

While in the drawing I have shown the pump arranged within the receptacle to form a single unit, it is, of course, understood that the receptacle can be separate and distinct from the pump as by arranging the pump outside of the receptacle and having the inlet extending into the receptacle and providing the top of the pump with an overflow for the leakage, the device will operate in the same way. Therefore, I do not wish to limit myself in a fuel feeding system to the use of a pump within the receptacle.

I am also aware that various other changes in the details of construction can be made without departing from the spirit of my invention.

What I claim is:—

1. In a fuel feeding system for motor vehicles, the combination with a low level fuel tank, an auxiliary tank arranged in a plane above said auxiliary reservoir, a carbureter supplied with fuel from said auxiliary reservoir by gravity, a pump arranged in said auxiliary reservoir having inlet and outlet check valves and an outlet port, a valve controlling said outlet port, a float mounted in said reservoir connected to said valve, said pump consisting of a pump barrel, a solenoid and piston in the form of a core and means for energizing and de-energizing said solenoid.

2. In a fuel feeding system for motor vehicles, the combination with a main fuel supply tank, of a carbureter located in a plane above said tank, an auxiliary reservoir feeding fuel to said carbureter by gravity, a pump arranged within said auxiliary reservoir for pumping fuel from said tank to said reservoir, said pump comprising a pump chamber and a piston movably mounted therein, a source of curernt and an electric circuit including a solenoid for actuating said piston, means timed by the engine for energizing and de-energizing said solenoid and a float actuated valve for controlling the outlet of said pump.

3. In a fuel feeding system for motor vehicles, the combination with a main fuel supply tank, of a carbureter arranged in a plane above said tank, an auxiliary reservoir arranged in a plane above said carbureter, a pump for pumping fuel from said main tank to said auxiliary reservoir, said pump having a valve controlled outlet, a float mounted in said auxiliary reservoir for actuating said valve, said pump comprising a pump chamber and a piston movably mounted therein, a source of current, an electric circuit including a solenoid for raising said piston and means timed by the engine for energizing and de-energizing said solenoid.

4. A fuel feeding system for motor vehicles comprising a main fuel supply tank, an auxiliary tank and a carbureter fed by gravity from said auxiliary tank, a pump arranged in said auxiliary tank having a slidably mounted piston, said pump being

provided with a valve controlled outlet, a float mounted in said tank connected to said valve, a source of electrical energy, an electric circuit including a solenoid for actuating the piston of said pump, an interrupter arranged in said circuit, and means actuated by the engine for operating said interrupter.

5. A fuel feeding system for motor vehicles comprising a main fuel supply tank and an auxiliary tank for supplying fuel to the carbureter by gravity, a pump arranged in said auxiliary tank having a slidably mounted piston, a pipe connected to the outlet of said pump carrying a valve casing, a valve mounted in said casing for closing the outlet thereof, a float connected to the stem of said valve and adapted to raise said valve when the fuel within said auxiliary tank reaches a predetermined level, a source of electrical energy, an electric circuit including a solenoid for actuating the piston of said pump and means timed by the engine for energizing and de-energizing said solenoid.

6. In a fuel feeding system for motor vehicles, the combination with a carbureter, of a main fuel supply tank arranged below said carbureter, an auxiliary tank arranged above said carbureter and adapted to feed fuel thereto by gravity, a pump arranged within said auxiliary reservoir having a slidably mounted piston, a solenoid for raising said piston, a source of current, an electric circuit including a solenoid, means for making and breaking said electric circuit for energizing and de-energizing said solenoid, a stand pipe connected to the outlet of said pump, a valve for controlling the outlet of said stand pipe and a float for actuating said valve.

In testimony whereof I hereunto affix my signature.

ALBERT G. REDMOND.