

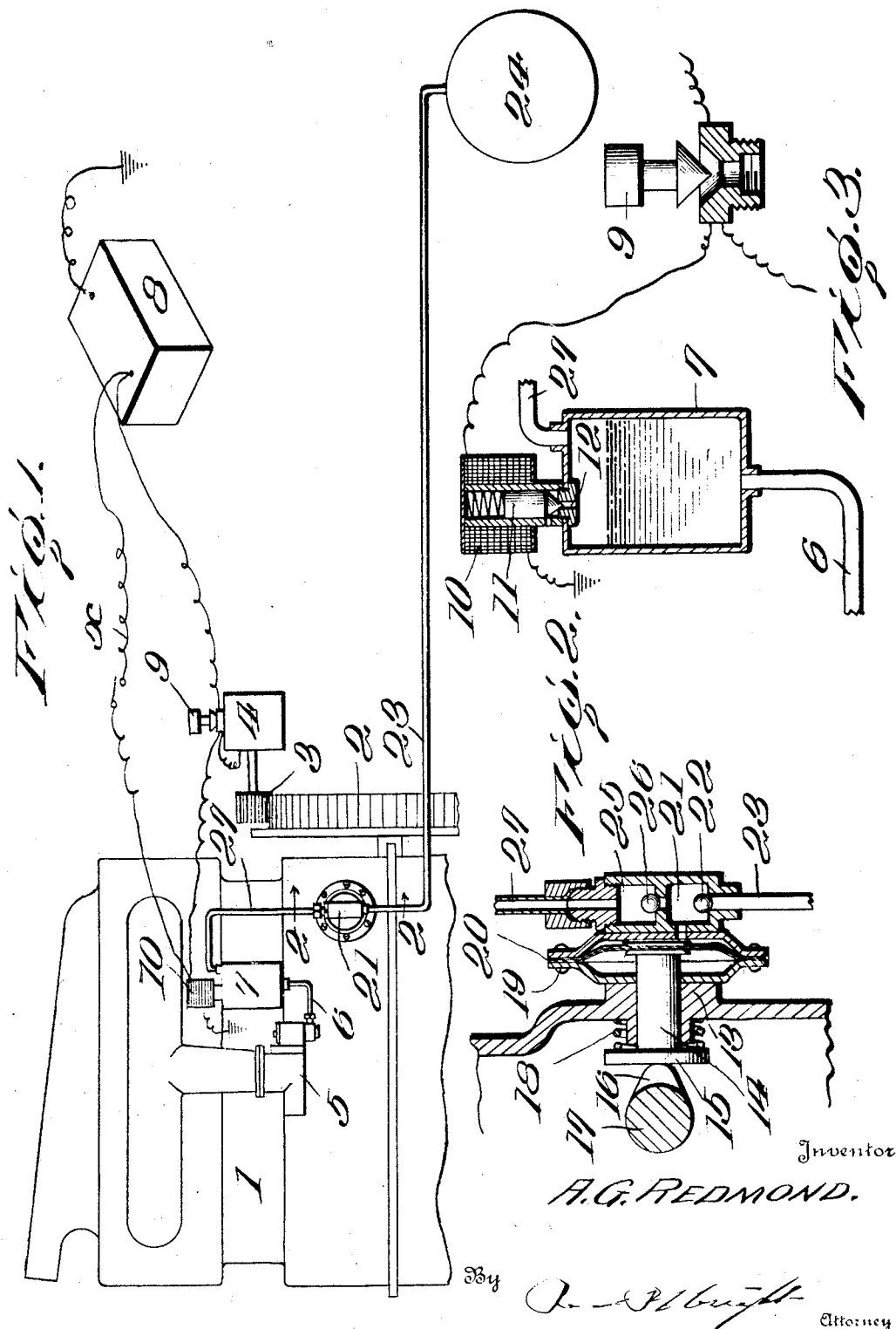
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FUEL FEEDING SYSTEM FOR MOTOR VEHICLES

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FUEL-FEEDING SYSTEM FOR MOTOR VEHICLES.

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This invention relates to certain new and useful improvements in a fuel feeding system for motor vehicles, the object being to provide a fuel feeding system in which a mechanically operated pump is employed for raising the fuel from a low level tank to the charge forming device having a storage receptacle arranged between the pump and the charge forming device in which air and fuel is stored so as to supply fuel at a constant pressure, means being provided for venting the storage chamber in starting the motor so that an ample supply of fuel will be supplied to the charge forming device while the pump is operating to supply fuel thereto.

Another object of my invention is to provide an electric magnet valve for opening the vent in the storage chamber which is in electric circuit with the electric starter of the motor vehicle to which the system is applied so that when the starter button is operated, the electric circuit will be completed so as to raise the valve and open the air inlet in order to allow fuel in the storage chamber to flow to the charge forming device, the construction of valve and electric circuit being such that when the motor is operating, the valve is closed so as to form an air-tight chamber in which the fuel and air are collected.

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 side elevation of an internal combustion engine showing diagrammatically my improved construction of fuel system applied thereto;

Figure 2 is a detail section taken on line 2—2 of Figure 1; and

Figure 3 is a detail vertical section through the storage chamber and starter button for the electric starter.

In the embodiment of my invention herein shown, 1 indicates an internal combustion engine of any of the well known types and for convenience of showing the application of my improved construction of fuel feeding system thereto, I have shown the same provided with a toothed fly wheel 2 which is engaged by a pinion 3 on an electric starter 4; it, of course, being understood, that these parts will be constructed in accordance with

the practice now in use in connection with motor vehicles and they are only shown diagrammatically so as to illustrate the operation of my improved construction of fuel feeding system.

The internal combustion engine is provided with a charge forming device 5 having the usual float controlled fuel chamber which is supplied with fuel by a pipe 6 from a storage chamber 7 arranged in a plane above the charge forming device so that the fuel therein can flow by gravity to the charge forming device.

The electric starter is arranged in electric circuit from the source of current, which is herein shown as a battery 8 and is provided with a starting button 9 which when forced downwardly, completes an electric circuit in the solenoid 10 arranged above the receiving chamber 7, the core 11 of the solenoid forming a valve for opening and closing an air inlet 12. When the solenoid is energized, the valve is raised, compressing the spring disposed above the same so that when the circuit is broken and the solenoid is de-energized, the spring will force the valve seated so as to completely close the air inlet in order to allow the chamber to operate as an air chamber in which fuel accumulates and is forced to the charge forming device under constant pressure.

It will be seen that when the starter button 9 is operated so as to close the electric circuit, the solenoid will be energized in order to raise the valve off its seat and to allow air to enter the chamber 7 so that the fuel therein can flow to the carbureter by gravity and while I have shown certain arrangements of these parts, it is, of course, understood that I do not wish to limit myself to the details of construction or the arrangement of parts as the invention consists in providing a fuel feeding system with a receiving chamber having a valve controlled vent which is automatically opened when the starter of the motor vehicle is operated to start the internal combustion engine.

In the form of mechanically operated pump herein shown, the crank case is provided with a bearing 13 in which is slidably mounted a piston rod 14 provided with a head 15 adapted to be engaged by a cam 16 arranged on a cam shaft 17 operated from the internal combustion engine so as to reciprocate

cate piston 13 and in the construction shown, I arrange a spring 18 under the head 15 so that after the piston has been forced inwardly by the cam and is released, it will be returned so as to be in position to be engaged by the cam.

Arranged on the bearing 13 are a pair of cup-shaped discs 19 and 20 between which are arranged a series of discs of fabric especially treated to make them impervious to gasoline and said discs are carried by the ends of the piston and in connection with the piston form a diaphragm pump.

The outer disc 20 is provided with an opening which is in communication with a valve chamber 21 provided with a check valve 22 and adapted to be connected by a pipe 23 to a low level tank 24, and the valve chamber 21 is in communication with a chamber 25 provided with a check valve 26 from which extends a pipe 27 extending to the receiving chamber 7 so that as the diaphragm pump is operated by the internal combustion engine, fuel will be drawn from the low level tank 24 and forced into the receiving chamber 7 so that the fuel therein will be maintained under pressure and forced to the bowl of the charge forming device.

The details of construction of the pump are not important in carrying out my invention so long as a diaphragm pump is employed and it will be seen that by the construction shown, I have provided a diaphragm pump in connection with a receiving chamber having an electric magnet-operated valve for venting the same when the motor is started so that a supply of fuel will always be on hand to start the motor.

In the operation of a fuel feeding system as herein shown and described, when the engine is running, fuel is pumped from a low level tank to the receiving chamber where fuel and air are stored so as to maintain a constant pressure on the fuel being fed to the charge forming device. This supplies an ample amount of fuel to the charge forming device under all engine speeds and loads.

In connection with this construction it is essential to provide auxiliary means for supplying fuel to the motor when being started, especially in cold weather and by providing means for venting the receiving chamber when the motor is being started, provision is made for allowing the fuel stored in said chamber to flow by gravity to the charge forming device so that the motor can be started without exhausting the fuel.

In order to provide means for venting the chamber 7 when used in connection with a motor vehicle without a starter, I provide an electric circuit X having a switch disposed therein so that the operator of the vehicle by closing the switch can energize the solenoid for opening the valve to vent the chamber.

In the drawings I have shown a diaphragm

pump operated mechanically, but it is, of course, understood that a piston pump could be operated mechanically in substantially the same manner as disclosed so as to raise fuel from the low level tank to the auxiliary tank and therefore I do not wish to limit myself to any particular construction of pump.

What I claim is:—

1. In a fuel feeding system for motor vehicles, the combination with an internal combustion engine having an electric starter, an electric circuit for said starter, a source of current, a receiving chamber, means for forcing fuel from a low level tank to said receiving chamber, an electric magnet valve for venting said receiving chamber, said valve being arranged in said electric circuit and adapted to be opened when the starter is in operation.

2. In a fuel feeding system for motor vehicles, the combination with an internal combustion engine having an electric starter for starting said engine, a source of current, a receiving chamber having a vent, an electric circuit including a solenoid, said starter being arranged in said electric circuit, a pump for pumping fuel from a low level tank to said receiving chamber and a switch controlling the electrical energy to said starter whereby said solenoid will be energized to open said vent when the motor is started.

3. A fuel feeding system for motor vehicles comprising a main fuel supply tank, a carbureter, a receiving chamber arranged in a plane above said carbureter, a pump for pumping fuel from said main fuel supply tank to said receiving chamber, a valve for venting said receiving chamber, an electric circuit including a solenoid for actuating said valve, a source of current, a starter motor arranged within said electric circuit and a starter button for completing said circuit to start said motor.

4. A fuel feeding system for motor vehicles having means for raising fuel from a low level tank to a carbureter and maintaining said fuel under constant pressure, a valve for venting said constant pressure retaining means, an electric circuit including a solenoid for actuating said valve, an electric starter arranged in said electric circuit, a source of current, and means for making said circuit to start said motor and energize said solenoid.

5. A fuel feeding system for internal combustion engines having a mechanically operated pump for raising fuel from a low level tank to a receiving chamber arranged in a plane above the carbureter of said engine, said receiving chamber having a valve controlled inlet, a source of current, an electric circuit including a solenoid for operating said valve and an electric motor for starting said internal combustion engine and means for completing the circuit from said source of current to said starting motor and said sole-

noid for simultaneously operating said motor and opening the vent of said receiving chamber.

6. In a fuel feeding system for internal combustion engines, the combination with an engine having a charge forming device, a receiving chamber arranged above said charge forming device having a valve controlled air inlet, a pump for pumping fuel from a low level tank to said receiving chamber, a source of current, an electric circuit including a solenoid and an electric motor, said motor being adapted to start said internal combustion engine, said solenoid being adapted to open said valve and a circuit closure for said electric circuit adapted to complete said electric circuit to said starting motor and solenoid for venting said receiving chamber when said starting motor is in operation.

7. The combination with an internal combustion engine having a charge forming device connected thereto, of an electric motor for starting said engine, a receiving chamber arranged above said charge forming device having a valve controlled inlet, a main supply reservoir arranged in a plane below said charge forming device, a diaphragm pump for raising fuel from said main reservoir to said receiving chamber, a source of current in electric circuit with said starting motor, an electric circuit including a solenoid

for actuating said valve and a circuit closure for said electric circuit for supplying electrical energy to said starting motor and said solenoid whereby said receiving chamber will be vented when the starting motor is in operation.

8. A fuel feeding system for internal combustion engines having means for raising fuel from a low level tank to a receiving chamber arranged above the charge forming device of the engine, said receiving chamber being provided with a valve controlled air inlet, a source of current, an electric circuit including an electric motor for starting said internal combustion engine, and means operated by said electric circuit for opening said valve to vent said receiving chamber when the electric starter is in operation.

9. A fuel feeding system for motor vehicles having means for raising fuel from a low level tank and storing the same in a high level tank, a source of current, an electric circuit including an electric starter for starting said engine, said high level tank being provided with a valve controlled air inlet and means to open said valve when said electric starter is in operation.

In testimony whereof I hereunto affix my signature.

ALBERT G. REDMOND.