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RESERVE LIQUID FUEL CONTROLLING DEVICE

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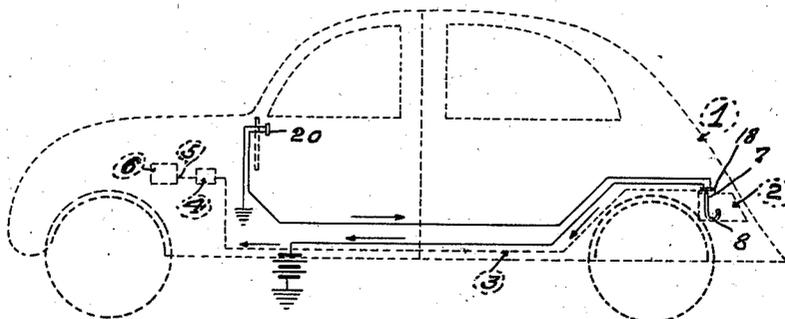


FIG. 1

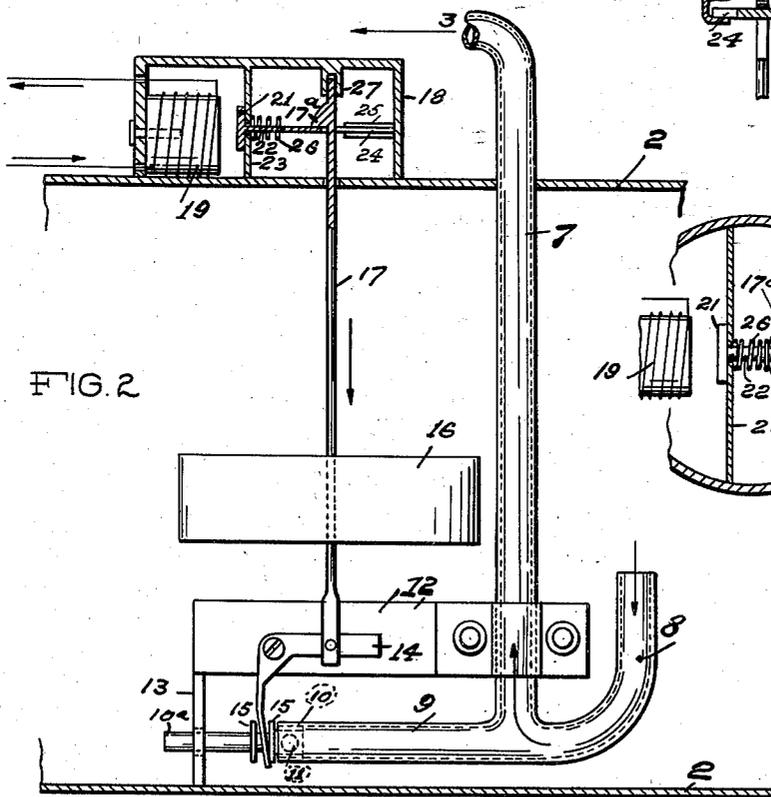


FIG. 2

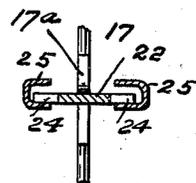


FIG. 5

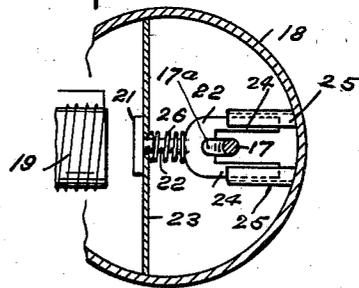


FIG. 4

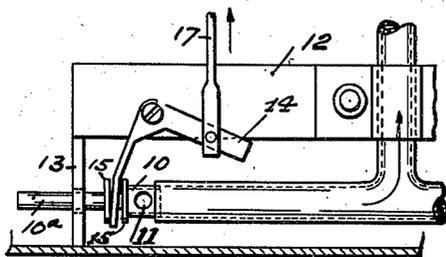


FIG. 3

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# UNITED STATES PATENT OFFICE

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## RESERVE LIQUID FUEL CONTROLLING DEVICE

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### 1 Claim. (Cl. 158—46.5)

My invention relates to an improvement in means to insure the continuous operation of an internal combustion engine, for automobiles or like installations,—whereby a reserve supply of liquid fuel is maintained in the fuel tank subject to withdrawal only through the operation of controlling means actuated by the driver from the dash of the vehicle, or like convenient locations, following a suspension in the operation of the engine through lack of fuel, due to neglect on the part of the driver in determining the quantity of fuel remaining in the tank for the operation of the engine.

One object of the present invention is to provide a discharge port for the reserve supply of fuel in the fuel tank including a valve controlling said port, located below the liquid level of the reserve fuel in the tank,—the valve being opened to release the reserve supply of fuel only when required for the operation of the engine, by means conveniently located near the driver's seat,—the valve being automatically closed through the action of a float when the tank is refilled. A continuous and positive discharge of the reserve supply of fuel to the carbureter of the engine, through the operation of the usual pump or vacuum tank, is thus assured.

The present invention is in contradistinction to devices employing a valve seated above the liquid level of the reserve fuel which are designed to close against the admission of air following the stoppage of the engine, when the level of the liquid fuel drops below the valve seat,—but is above the level of the reserve supply of fuel. Devices of the latter character are subject to the vibration or movement of the vehicle, which causes an intermittent feeding and stoppage of the fuel fed to the carbureter.

In the drawing accompanying this specification:

Figure 1 shows diagrammatically in dotted lines an automobile, its fuel tank, a pipe connection leading to a pump or vacuum tank and thence to the carbureter of the engine;—also an electrical circuit leading from a source of energy to means controlling the operation of a valve releasing a reserve supply of liquid fuel within the tank, following the stoppage of the engine, due to the main supply of fuel being exhausted.

Figure 2 is a fragmentary sectional view of a fuel supply tank, showing means for holding in reserve a portion of the fuel stored in the tank, to be released by the driver of the vehicle when the main supply of fuel is exhausted.

Figure 3 is a fragmentary detail of a portion of

the valve controlling device, showing the valve open for the discharge of the reserve liquid fuel from the tank.

Figure 4 is a fragmentary cross-sectional view through a housing upon the fuel tank inclosing a magnet and means under the control of the magnet for releasing a rod suspended from a forked arm connected with the armature of the magnet, to release a bell-crank lever which in turn opens the discharge valve.

Figure 5 is a detail cross-sectional view, through the forked arm of the armature, for supporting the depending rod until released by manually closing the circuit through the magnet.

Referring now to the reference characters placed upon the drawing:

Numeral 1, denotes an automobile; 2, indicates a fuel supply tank for the engine; 3, designates a pipe-line leading from the fuel tank 2, to a vacuum tank or pump 4; and 5, indicates a connection between the pump or vacuum tank and a carbureter 6,—and thence to the engine (not shown).

Numeral 7, denotes a pipe extending downwardly from pipe 3, to a point near the bottom of fuel tank 2, provided with an upturned nipple 8, open at its upper end, through which the liquid fuel may be drawn by the operation of the pump, or vacuum tank, for delivery to the carbureter. Numeral 9, indicates a horizontal nipple projecting from the depending pipe 7, having an open end—in which is sleeved an annular valve 10 with a transverse port 11, through its skirt, which on being uncovered permits the passage of liquid fuel from the reserve fuel supply,—Figure 3,—out through the horizontal nipple into pipes leading to the pump, or vacuum tank, and carbureter. Numeral 12, indicates a bracket arm, clamped to the depending pipe 7, having a downwardly extending leg 13, resting upon the floor of the tank, with an opening therein to guide and support the valve stem 10<sup>a</sup>. Numeral 14, denotes a bell-crank lever pivoted to the bracket arm. One arm of the lever 14, is forked to receive the valve stem 10<sup>a</sup> of the valve 10,—the tines of the forked arm projecting between spaced flanges 15—15, mounted upon the stem;—so that upon tilting the lever, the valve may be shifted to close or open the port 11 through the skirt of the valve. Numeral 16, indicates a float secured to a depending rod 17, and upon the tank receiving its usual supply of gasoline, the float rises closing the valve 10, against the withdrawal of the reserve supply of fuel until the valve 10, is released following the stoppage of the engine,—

as a result of the consumption of the main body of fuel. Secured within the wall of the housing 18, on the top of the tank is a magnet 19, energized through the closure of an electrical circuit 5 by a push button or switch 20, mounted on an instrument board or other convenient location for the driver of the vehicle. Numeral 21, denotes the armature of the magnet, fitted with a projecting forked slidable member 22, extending 10 through an opening in a partition wall 23, bridging the wall of the housing. The tines 24, of the forked member 22, are guided and supported by channel members 25—25, secured to and projecting inwardly from the wall of the housing. 15 Numeral 26, denotes a spring, sleeved upon the stem of the forked member 22, which bears at one end against the wall of the partition and at its opposite end against the forked portion of the slidable member. The depending rod 17, is pivoted 20 at its lower end to one arm of the bell-crank lever 14, while the upper end of the rod enters a socket formed in a lug 27, extending downwardly from the cap of the housing. Integral with the rod 17, is a lug 17<sup>a</sup>,—see Figure 2,—adapted 25 to overlap the stem of the forked member 22, to maintain the bell-crank lever 14, in the position indicated in Figure 2, in order that the valve 10, may be normally closed against the discharge of the reserve supply of fuel in the tank. When 30 the valve is held in an open position, as shown in Figure 3, the reserve supply of fuel is released to provide for the further operation of the engine.

Having indicated the several parts by reference numerals, the operation of the device will 35 be readily understood.

When the driver discovers that his supply of gasoline has been exhausted through the operation of the engine,—and desiring to continue its 40 further operation—he releases the depending rod connecting the bell-crank lever by closing the circuit through the magnet by the switch or push button provided for that purpose. The armature

is thus drawn toward the magnet and releases the depending rod by the withdrawal of the supporting forked member. The weight of the rod and float in dropping rocks the bell-crank lever which in turn opens the valve controlling the 5 discharge of the reserve supply of fuel, whereupon the pump or vacuum tank delivers the reserve gasoline to the carbureter, thereby continuing the further operation of the engine. 10 When the fuel tank is refilled the float 16 secured to the rod 17, raises the latter and rocks the bell-crank lever 14, thereby closing the valve 10, against withdrawal of the reserve supply of fuel until it is again released. The rod 17, when 15 raised sufficiently to close the valve 10, is held in its elevated position by the forked member 22, of the armature 21, which is projected by the spring 26, beneath the lug 17<sup>a</sup>,—thereby holding the valve closed until again released—as previously described. 20

What I claim is:

The combination of a fuel tank, a fuel supply pipe leading from the bottom of the tank, with an upturned nipple open on a plane with the 25 predetermined level of the reserve fuel to be maintained in said tank, said supply pipe also extending horizontally adjacent the bottom of the tank with an open end adapted to be closed by a valve; a valve submerged in the reserve fuel, 30 adapted to maintain the open end of the supply pipe normally closed; means fitted with a float, adapted to insure a definite opening and closing of said submerged valve, whereby the latter may not chatter and cause intermittent operation of 35 the engine; and a remotely actuated electrical controlling means, adapted when actuated to release the means fitted with a float, and whereby the valve is held open to release the reserve fuel, until automatically closed through the act of re- 40 filling the tank.

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