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F. FIEDLER

FUEL TANK WITH EMERGENCY SUPPLY FOR MOTOR-CARS AND THE LIKE

Filed Sept. 17, 1941

Serial No. 411,178

2 Sheets-Sheet 1

Fig. 1

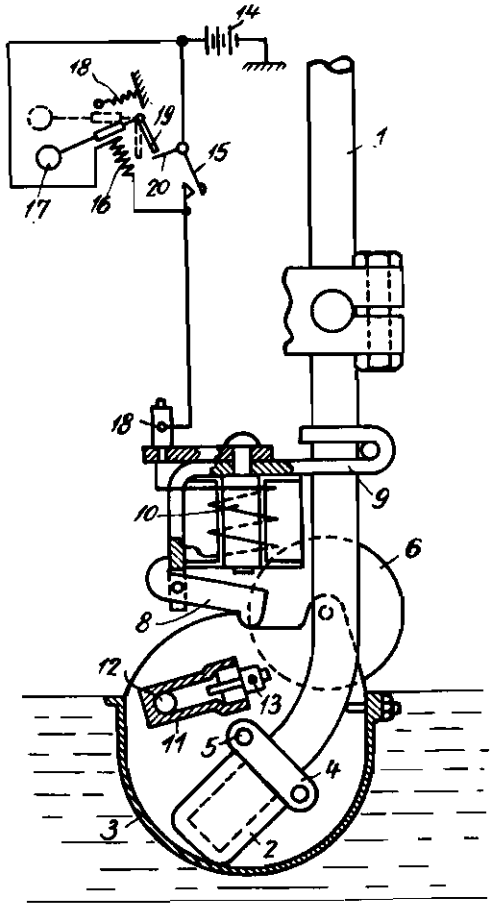
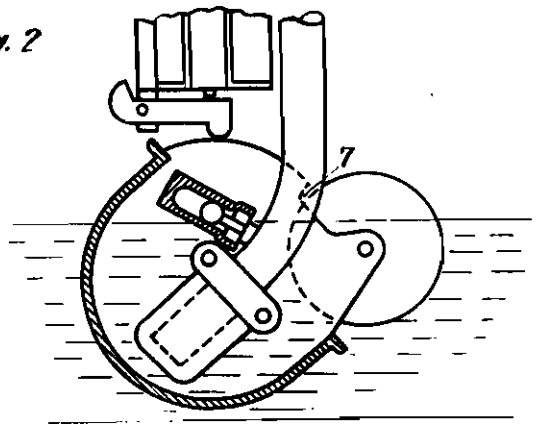


Fig. 2



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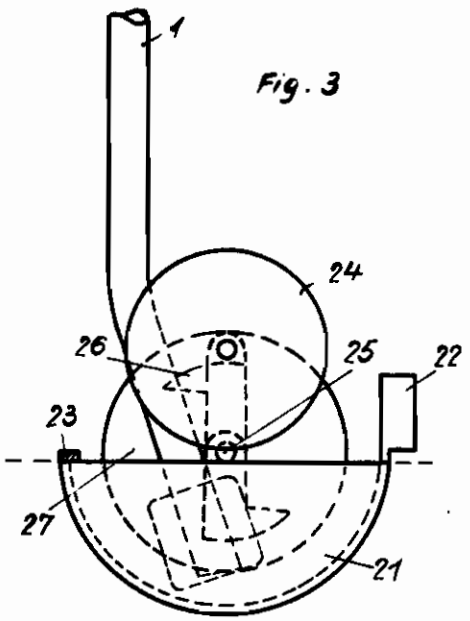

Fig. 3

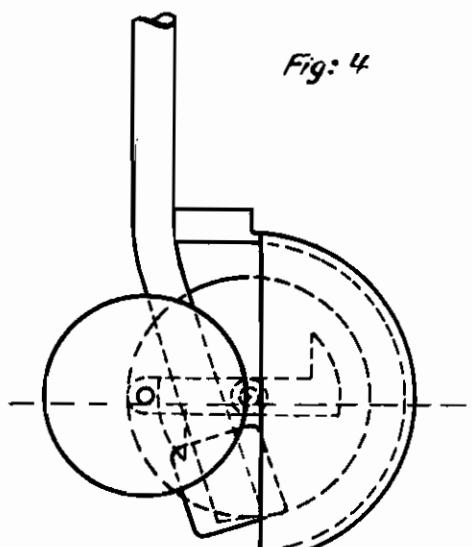

Fig. 4

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ALIEN PROPERTY CUSTODIAN

FUEL TANK WITH EMERGENCY SUPPLY FOR MOTOR-CARS AND THE LIKE

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The invention represents an improvement of devices serving for preventing the fuel tanks of motor cars of being completely emptied, by the drain pipe of the fuel pump not extending directly into the fuel reservoir but into a tipping-cup mounted in this latter so as to be rockable, this tipping-cup excluding for the first, in its horizontal position, the remainder of fuel being below its upper edge from being consumed, thus the engine misfiring after the tipping-cup being emptied. Thereupon, by means of swinging the tipping-cup in a vertical position, the driver may cause the drain pipe to dip into the remaining quantity of fuel, and consequently render possible its being consumed.

The forms of embodiment hitherto realized requiring a relatively great expense of space and stipulating special devices on the fuel tank itself which are rather delicate in its mounting, their improvement became necessary. As far as this the supplementary introduction of the emergency device has not been possible in any tank. Furtheron with the preceding designs it may happen that the float holding the tipping-cup is raised by waves of fuel, thus the cup returning unintentionally into its initial position, by means of which fuel feed will be suspended.

The improvement according to the invention consists in all the single members which belong to the reserve supply device, being combined in a self-dependent structural unit of but low need of space. This will be obtained by attaching to the tipping-cup itself floating members to return the latter, upon refilling the fuel tank, into the horizontal position for maintaining a reserve supply; the floating members being arranged in such a manner as to—when being out of the fuel, in consequence of their net weight, and the tipping-cup being in its position for keeping a fuel reserve—exert a torque on the latter so as to dip it into the remaining quantity of fuel. The tipping-cup is held in its reserve position by a catch and has an electric switch which is sensitive to position and closes, with the cup being tipped downwardly, the circuit of a signalling device. With this the switch may comprise e. g. a rolling ball, or it may be designed as a mercury interrupter. Furtheron the electromagnet for releasing the catch may be traversed, commonly with a further magnet for moving a signal-disc, by a steady feeble current which by means of operating a push button switch can be led either exclusively in the magnet for the catch apart or in that for the signal-disc, so that the magnet in consideration will enter into operation. A lever attached to the signal disc locks with the cup being tipped downwardly the push button switch. Furtheron a weight may be attached to the periphery of the tipping-cup, said weight holding the latter in both its end positions abutting against stops by means of exerting a corresponding torque, the swinging of the tipping-cup being produced, with this, by a rotary magnet mounted on its shaft.

In the drawing two forms of embodiment of the invention have been represented; in which drawing

Fig. 1 shows a section through the new reserve supply device in its initial position with the fuel tank being filled, whereas in

Fig. 2 the tipping-cup is illustrated to be swung;

Fig. 3 shows the form of embodiment of the tipping-cup provided with a weight in its initial position, and

Fig. 4 the same form of embodiment with the cup being tipped upwardly.

The fuel drain pipe is designated by 1, said pipe extending into the fuel tank and the lower end of which may be surrounded by a sieve 2. The drum-shaped tipping-cup 3 is able to swing on the shaft 5 guided in the bearing piece 4 which is attached to the fuel drain pipe, and comprises on its upper side-parts floating-members 6 as well as a recess 7. With the tipping-cup 3 being in its horizontal position a catch 8 will engage with the recess 7, said catch being rockably mounted on an angle member 9 which is attached to the fuel drain pipe 1, and being submitted to the action of an electromagnet 10. To the tipping-cup 3 there may be fixed a switch sensitive to position comprising e. g. a cylindrical guide 11 in which a ball 12 is freely movable and which is closed at its open end by a leading-in contact inserted in insulation material. Likewise an mercury-interrupter may be used.

The connection of the device is as follows:

From battery 14 one pole of which has mass-connection, a line is leading to the push button switch 15 whilst a parallel-line is conducting through electromagnet 16 for the signal-disc 17 to the connecting terminal 18 of the other electromagnet 10 and from there to the leading-in contact 13 of the switch 11, 12. The signal-disc is held in its position of rest by means of a spring 18 and shows an extension 19 which, with the signal put in circuit, is abutting against an extension 20 of the switch 15 thus locking the same.

With a further form of embodiment according to Figs. 3 and 4 a weight 22 is placed on the outer

edge of the semi-circular tipping-up 21, said weight causing the tipping-cup, by exerting a corresponding torque, to bear in the position of rest against a stop 23 and, while being tipped, against the fuel drain pipe which serves as a stop, thus holding the cup in both its end positions. With the cup 21 being tipped and the fuel level descending the mass of weight 22 will be assisted still by the weight of the float 24. In this form of embodiment the tipping-cup 21 may be swung by means of the armature 26 of a rotary magnet 27 which may be excited by a switch, said armature 26 being mounted on the shaft of the cup 21. Instead of the switch 11, 12 sensitive to position provided for according to Figs. 1 and 2, in this case stop 23 may be designed as a simple push-button switch.

The manner of action of the device is as follows:

With the fuel tank being filled and a predetermined supply being kept, the tipping-cup 3 is in the horizontal position as shown in Figs. 1 and 3. If, now, the fuel level descends to the upper edge of the tipping-cup 3, this latter will prevent further fuel from flowing to the drain pipe 1, and the engine will begin misfiring as soon as the quantity of fuel still being in the cup 3 itself has been consumed. By means of depressing the push-button switch 15 which may be placed e. g. in the instrument board of the vehicle, now the driver has the possibility of rendering accessible to consumption the quantity of fuel supply being below the upper edge of the tipping-cup 3. Whereas, to mention this, the steadily flowing feeble current of the battery 14 is insufficient for exciting both the magnets 15 and 16 simultaneously as their total resistance is so great, upon closing the switch 15 the current will be led solely in the magnet 10, this latter thus responding and raising catch 8. Consequently the now released tipping-cup 3 will rock downwardly under the influence of the weight of the float member 6 and dip into the fuel, whereby the supply of fuel towards the drain pipe 1 is established. Owing to the tipping movement of the cup 3 the ball 12 has also changed its position in the guide 11, i. e. it has rolled to the now lowermost place thus establishing mass-connection with the terminal contact 13. The battery-current is now flowing—the push button switch 15 is already open—solely through the magnet 16, which on his part brings the signal-disc 17 into a position attracting the attention of the driver. With this the extension 19 of the signal-disc 17 locks the push button switch 15 against further operation, what would have the consequence of short-circuiting the battery-circuit. If the fuel tank is again refilled the floating-members 6 bring the tipping-cup back again in its horizontal position, until the catch is jumping in. Now the switch 11, 12 is opened by the ball 12 rolling back, and the signal-disc 17 returns under the action of spring 18 into its position of rest. It is quite obvious that any other visible or audible indicating device, e. g. or buzzer, a horn or the like, may replace the signal-disc 17.

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