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A. F. MAYHEW
LIQUID TANK SIGNAL DEVICE

Filed May 7, 1921

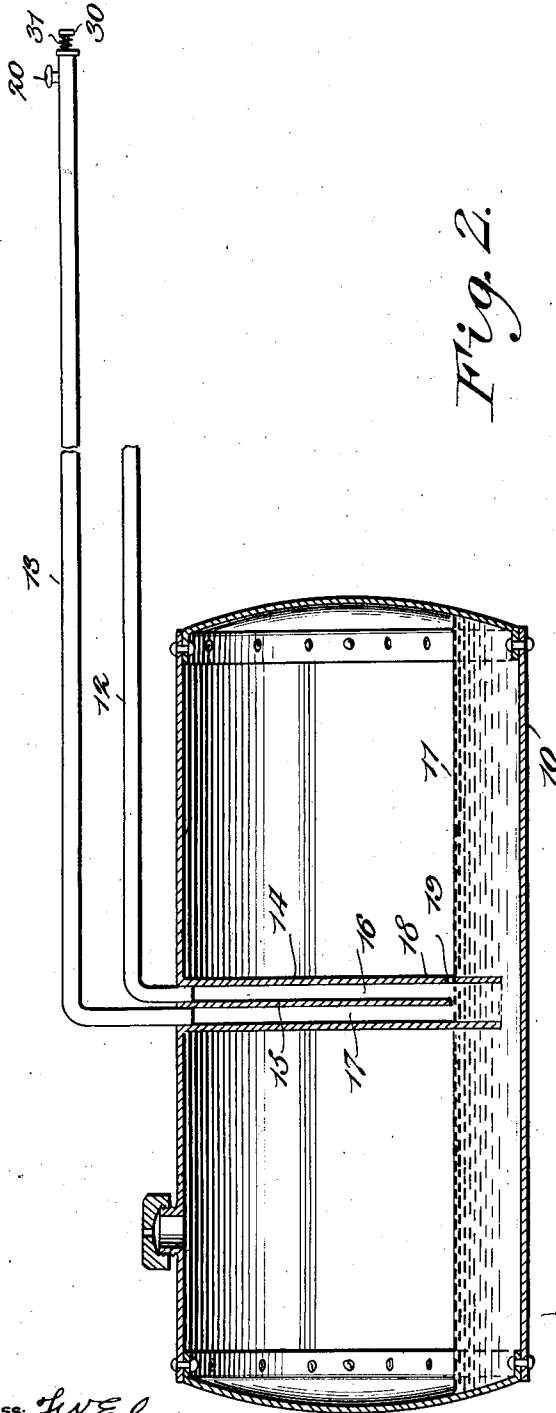


Fig. 2.

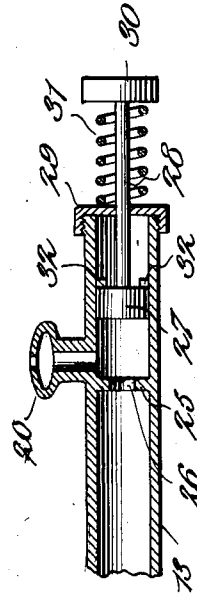


Fig. 1.

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ALFRED F. MAYHEW, OF WHITNEYVILLE, CONNECTICUT, ASSIGNOR OF ONE-TENTH TO JULIA A. MONAHAN, OF WEST HAVEN, CONNECTICUT, AND FOUR-TENTHS TO FREDERICK L. WILLIAMS, OF NEW HAVEN, CONNECTICUT, AND ONE-TENTH TO BERNARD J. McDONNELL, OF NEW HAVEN, CONNECTICUT.

LIQUID-TANK SIGNAL DEVICE.

Application filed May 7, 1921. Serial No. 467,669.

To all whom it may concern:

Be it known that I, ALFRED F. MAYHEW, a citizen of the United States, residing at Whitneyville, in the county of New Haven and State of Connecticut, have invented new and useful Improvements in Liquid-Tank Signal Devices, of which the following is a specification.

This invention relates to emergency signal devices for liquid tanks.

Some of the objects of the present invention are: to employ a signal in conjunction with a tank or the like having a supply of liquid therein, which is rendered active by the pneumatic force which is employed to remove the said liquid from the said tank or the like; to employ in conjunction with a tank or the like having therein a supply of liquid, a signal which is operable by the same force which is employed for withdrawing the liquid from the said tank or the like, and to employ means responsive to the same force for rendering the signal inactive after the level of the liquid in the tank or the like is below a predetermined level; to employ a signal in conjunction with a tank having a supply of liquid therein, which is automatically operable and responsive to the same pneumatic force which is employed for removing the said liquid from the said tank; to employ an audible signal in conjunction with a tank having a supply of liquid therein which is automatically operable and responsive to the same pneumatic force which is employed for removing the said liquid from the tank when the level of the liquid falls below a predetermined point. With these and other objects in view the invention resides in the particular provision, combination, relative disposition and operation of parts hereinafter more fully described and illustrated in the accompanying drawing, in which;

Figure 1 is a sectional view through a liquid tank and showing the application of the signal device of the present invention.

Figure 2 is an enlarged sectional view of the signal means.

As disclosed in the drawing and in this specification the signal device of the present

invention is applied to a liquid tank from which the liquid is removed by a vacuum system employed in conjunction with the tank. Such tanks and systems are in common use on automobiles and it is therefore one of the principal purposes to conjoin the signal device with such liquid tank and vacuum system so that the signal will be rendered active when the supply of liquid (gasoline) in the tank is diminished to a predetermined amount. The signal is preferably an audible one. The signal is rendered active at a time when the supply of gasoline is low, there being enough however to permit the vehicle to proceed a considerable distance. As stated the signal will give warning—and that occurs automatically—when the supply of gasoline has been diminished to a predetermined amount. The signal is designed to remain active constantly from the time the supply of gasoline has diminished to a point to allow the signal to become active unless the signal is rendered inactive by a means which is also provided for accomplishing that. After the signal is first sounded the remainder of the supply of gasoline in the tank may be utilized.

Referring more particularly to the drawing, it will be apparent that, there is a tank 10 which contains a supply of liquid 11, such as gasoline. Pipes 12 and 13 lead to the tank 10. The pipe 12 forms a passage for the flow of gasoline, whereas, the pipe 13 forms what might be termed a signal passage. The tank 10 through the pipe 12 is connected to a vacuum creating device (not shown) for the removal of the gasoline from the tank. These vacuum systems as used in conjunction with gasoline tanks are well known to operate to suck the gasoline from the tank.

In order that the pneumatic force of suction as created in the tank and pipe 12, may be transferred from the pipe 12 to the signal pipe 13 there is employed a preferable tubular member 14 which is connected to the said pipes 12 and 13. The member 14 has a central partition or dividing wall 15 which divides the interior of the member 14 into

two passages 16 and 17 which communicate respectively to the passages formed by the pipes 12 and 13. The wall 15, as will be seen, extends only part of the length of the member 14. The outer wall 18 of the member 14 has an opening 19 therein which lies in a plane coincident with the lowermost edge of the wall 15. It will now be manifest that when the level of the gasoline falls below the said lowermost edge of the wall, the pneumatic force of suction will be transferred to the passage 17 and pipe 13.

In order that advantage may be taken of the transfer of the pneumatic force to the pipe 13, there is provided a preferably audible signal 20 in the said pipe 13. The signal is in the nature of a whistle and operates as the suction action is extended to the pipe 13 due to the lowering of the level of the gasoline. In reality, it happens that the gasoline is shaken and when the level has lowered to a point within proximity to the lowermost edge of the wall 15 the signal will be rendered active. The supply of gasoline to the engine will be gradually lessened as the signal continues to give warning. In time the supply of gasoline to the engine is cut off altogether and of course the signal also becomes inactive.

In order that the signal may be rendered inactive aside from its being rendered inactive by the stopping of the engine; there is provided a diaphragm 25 having an opening 26 therein, in the signal pipe 13. A plug 27 is arranged for movement in the end of the pipe 13. A stem 28 forms a part of the plug 27. The stem 28 extends through a removable cap 29 and has a manipulating head 30 at the end thereof. A spring 31 interposes the cap 29 and the head 30. Small pins 32 limit the movement of the plug 27 away from the diaphragm 25. The plug 27 is held by the spring 31, normally away from the diaphragm and allows the signal or whistle 20 to operate. When it is desired to cut off the suction action through the whistle the plug 27 is moved against the diaphragm 25 to close the opening 26 therein. The force of suction which holds the plug 27 against the diaphragm even overcomes the action of the spring 31. It follows that a warning is given in time to notify the driver of the vehicle that the supply of gasoline is low and that the supply ought to be replenished; that the warning is given at a time when there is still sufficient gasoline in the tank to allow the driver to proceed to the nearest supply station.

While there has been shown and described an audible signal, it should at once be obvious that other types of signals may be employed. It should also be obvious that while the signal shown is operated by the action of suction created by the vacuum system which removes the liquid or gasoline

from the tank, the signal may be operated by the force of compression when the tank is connected to a pressure feed system. No limitations are necessarily made to the precise details herein disclosed. It is to be understood that any and all changes, modifications and alterations which are deemed necessary or desirable and which are within the scope of the claims hereunto appended may be resorted to.

What is claimed is:

1. A device as characterized, including in combination, a liquid-supply-tank, a pneumatic-liquid-passage leading to the interior of said tank, a signal-passage leading to the interior of said tank, both of said passages leading to the tank, an audible signal in said signal-passage, means allowing a pneumatic force to be extended from the pneumatic-liquid-passage to the signal-passage for the signal operation, and means responsive to the pneumatic force for maintaining the signal inoperative.

2. A device as characterized, including in combination, a liquid-tank having a vent, a plurality of passages leading to the interior of said tank, a liquid in the tank being removed therefrom by a pneumatic force compelled through one of said passages while the liquid in the tank remains above a predetermined level in said tank, an audible signal connected in the other of said passages, a tubular member having a plurality of passages therein which communicate with the first mentioned passages, means in the said member with which the liquid in the tank coacts to establish and to disestablish communication between the passages in said member, the said member having an opening in the wall thereof.

3. A device as characterized, including in combination, a liquid-tank having a vent, a plurality of passages leading to the interior of said tank, a liquid in the tank being removed therefrom by a pneumatic force compelled through one of said passages while the liquid in the tank remains above a predetermined level in the tank, a signal connected in the other of said passages, a tubular member arranged within the tank said member having a dividing wall defining a plurality of passages which communicate with the first mentioned passages, and an opening in horizontal alinement with the lower extremity of the said dividing wall of said member.

4. A device as characterized including a liquid-tank having a vent, a plurality of passages leading to the interior of said tank, a liquid in said tank being removable therefrom by a pneumatic force compelled in said tank through one of said passages while the liquid in the tank remains above a predetermined level in the tank, a signal connected in one of said passages, a tubular

member arranged in the tank, said member having a dividing wall defining a plurality of passages which communicate with the first mentioned passages, the said member having an opening therein adjacent the lower extremity of the dividing wall, and means for rendering and for maintaining the signal inoperative.

5 5. The combination of a tank, a supply pipe through which fluid may be drawn by suction, said pipe having an inlet opening communicating with the interior of the tank near the bottom thereof, a supplemental pipe leading from the supply pipe and communicating therewith above the inlet opening therein, and a signal device adapted to be actuated by the drawing of air from the supplemental pipe by suction within the supply pipe.

20 6. A liquid fuel feed system for internal combustion engines, comprising a fuel storage reservoir, a suction pipe terminating inside of said reservoir through which fuel is conducted out of the reservoir, and a signal that becomes operative whenever the supply of fuel in said reservoir becomes diminished to such an extent as to partially or completely uncover the inlet of said suction pipe.

30 7. A fuel feed system for internal combustion engines, comprising a fuel storage reservoir, a suction pipe through which fuel

is conducted out of said reservoir, and a signal arranged so that it will be operated intermittently by the increased suction that is produced in said reservoir by the intermittent uncovering of the inlet of the suction pipe and will operate continuously after fuel ceases to flow out of said reservoir through said pipe so long as the suction is maintained in said pipe. 35 40

8. The combination with a liquid storage reservoir of a suction pipe communicating with said reservoir below the normal liquid level therein, and a signal operable by suction arranged to be placed in communication with said suction pipe when the surface of the liquid falls below a predetermined level. 45

9. The combination with a liquid storage reservoir of pneumatically operated means for withdrawing liquid from said reservoir including a pipe having an inlet in the reservoir below the normal liquid level therein, and a signal operable by the same pneumatic force employed for withdrawing the liquid from the reservoir and which becomes operative when the supply of liquid in said reservoir becomes diminished to such an extent as to partially uncover said inlet. 50 55 60

In testimony whereof I hereby affix my signature.

ALFRED F. MAYHEW.