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SIGNAL FOR FUEL SUPPLY SYSTEMS

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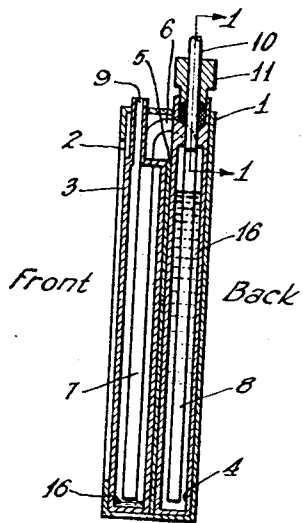


Fig. 2

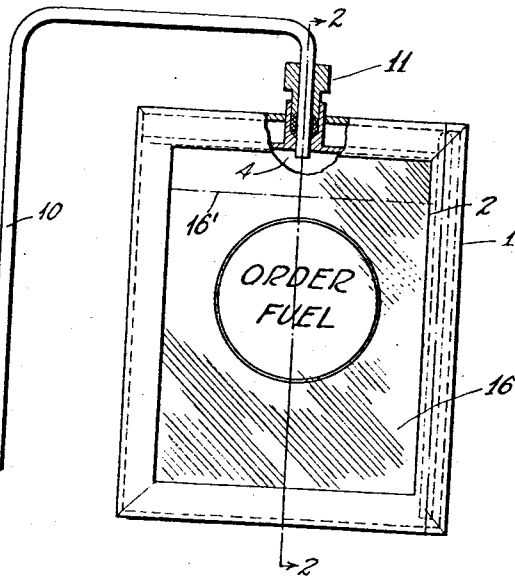
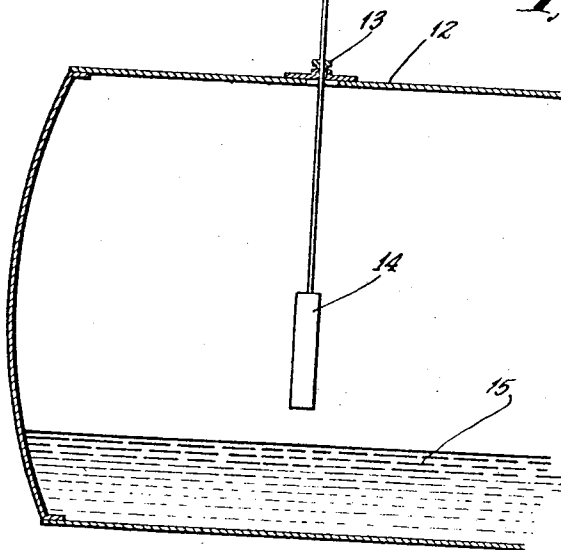


Fig. 1



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SIGNAL FOR FUEL-SUPPLY SYSTEMS.

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This invention is a signaling device adapted to be associated with the liquid supply systems generally, but intended more particularly for use in conjunction with the fuel supply systems of apartment and dwelling houses.

Oil burners are now in common use in dwellings, apartment houses and the like, for heating purposes and when used in this environment, the fuel is supplied from storage tanks, which, because of their environment are necessarily of a limited capacity. It therefore frequently happens that the supply of oil is found to be so low as to require immediate replenishing and a hurried telephone call is sent in to the supply station for this purpose. This ordering on short notice from supply stations is a source of continual annoyance and inconvenience which it is the object of the present invention to overcome by provision of means which will insure the ordering of fuel sufficiently far ahead, in point of time, to permit of seasonable deliveries without rush or inconvenience on the part of any of the parties involved.

In carrying out the invention in one of its practical forms, the system embodies a signaling device which, in practice, is preferably positioned in some convenient place where it will be noted from time to time. This signaling device comprises two containers, viz., a compartment and a reservoir. The compartment preferably has transparent walls and is positioned forwardly of the reservoir and between the compartment and reservoir is positioned a card containing suitable indicia, such, for example, as the statement "Order fuel". The compartment and reservoir collectively contain a body of liquid which is adapted to be transferred from the compartment to the reservoir, or vice versa, depending upon the condition of supply of fuel in the supply tank of the heating system. This liquid is such that when the compartment is filled with the liquid, it will cover and conceal the order card, while passage of such liquid into the reservoir will expose the order card to view.

With the compartment and reservoir is associated an inverted U tube, the legs of which extend into both containers. The compartment is vented and the reservoir is closed, but is connected by means of a tube

to a pressure chamber depending into the fuel supply tank and provided with an open bottom spaced a predetermined distance from the bottom of the tank.

With such an arrangement, it will be apparent that when the tank is filled with fuel, the fuel level will rise in the tank and in the pressure chamber and will compress the air in said chamber so that said air will communicate pressure into the reservoir. When pressure is thus admitted into the reservoir, above the liquid level therein, the liquid will be forced through the U tube into the compartment and will rise therein to a level sufficiently high to conceal the order card.

The order card will remain covered until the fuel level in the supply tank recedes sufficiently to communicate suction to the reservoir and this suction, as the fuel level recedes, will draw the liquid from the compartment through the U tube into the reservoir, thereby uncovering the order card, which will function as a signal or notification that fuel should be ordered, as the supply in the tank is getting low.

When the present invention is employed in conjunction with a fuel supply system, the householder need not go to the cellar to examine the fuel level in the tank, but can see by a glance at the signaling device, which is located in some convenient portion of the house, whether or not the tank requires replenishing. Experience has shown that the system of this invention is highly efficient for the performance of its intended functions and gives thoroughly satisfactory results from every standpoint. The broad inventive concept underlying this invention may partake of other practical forms than the one specifically referred to and this invention is therefore not limited to this illustrative form.

Features of the invention, other than those referred to, will be apparent from the hereinafter detailed description and claims, when read in conjunction with the accompanying drawings.

The accompanying drawings illustrate one practical embodiment of the invention, but the construction therein shown is to be understood as illustrative, only, and not as defining the limits of the invention.

Figure 1 shows the present invention associated with a fuel supply tank, a portion

of this figure being shown in section on the line 1—1 of Figure 2; and,

Figure 2 is a section on the line 2—2 of Figure 1.

Referring to the drawings, 1 designates a suitable casing provided with a sight opening 2 in the front thereof and in which is housed two containers 3 and 4. Between these two containers is positioned a card 5 on which is printed or otherwise delineated a suitable notice such as "Order fuel". To this phrase may be added the name of the dealer and his telephone number, so as to render communication with the dealer convenient.

Of the containers 3 and 4, 3 is shown as a transparent compartment, preferably made of glass, celluloid or some other similar material, so that normally the order card may be seen through the sight opening 2 and through said compartment. The container 4, however, constitutes a reservoir which may have, if desired, metal or other opaque walls.

6 designates an inverted U tube, one arm 7 of which extends into the compartment 3 and the other arm 8 of which extends into the reservoir 4, both of these arms preferably terminating adjacent the base of the respective containers. The compartment 3 is vented, as shown at 9, while the reservoir 4 is hermetically sealed, except for a pipe 10 which extends thereinto through a gland 11. The pipe 10 leads to the fuel supply tank 12 of the heating system with which the present invention is associated and, passing through a stuffing box 13 into the interior of the tank, terminates in a pressure chamber 14 positioned within the tank. The pressure chamber 14 has closed sides, but an open bottom, which is spaced an appreciable distance from the bottom of the tank, as clearly shown in Figure 1, so that, after the fuel level 15 has receded beyond a predetermined level, it will unseal the pressure chamber.

A quantity of liquid 16 is placed within the containers 3 and 4 and, when the level of the fuel 15 is below the open end of the pressure chamber, the greater portion of this liquid is contained within the reservoir 4 up to the level of about the line 16' in Figure 1. The level of the liquid in the chamber 3 will then be relatively low and will expose the printing upon the order card, so that one observing this printing will immediately see that the tank needs replenishing. When the tank is replenished, the fuel level will rise in such tank until it seals the open bottom of the pressure chamber, whereupon further rise of fuel level will place air within the pressure chamber and tube 10 under pressure. This pressure will be communicated to the reservoir 4 above the level of the liquid 16 and the liquid will be forced

through the U tube into the compartment 3, whereby its level will be caused to rise to about the line 16' in Figure 1 and thereby cover and conceal the order card.

This condition will be maintained until the fuel in the tank has been used to such extent as to lower the level therein to a point where it is desirable to order more fuel. By this time, the liquid level will have receded in the tank sufficiently to produce a suction in the pressure chamber 14 and this suction will be communicated to the reservoir 4 to produce therein a lower pressure than in the compartment 3. As a result, the liquid 16 will flow from the compartment 3 through the U tube 6 into the reservoir 4, thereby uncovering the order card and indicating that the fuel should be replenished.

During these operations, it will be noted that as the level of the fuel 15 rises, it will commence to place the reservoir 4 under pressure as soon as the bottom of the chamber 14 is sealed and said chamber will thereafter act as a pressure bell in which the pressure will be built up as the level of the fuel 15 rises. It will of course be understood that considerably before the tank 12 is filled, all of the fluid 15 will be forced from the reservoir 4 into the compartment 3, so as to leave said reservoir substantially empty. As the level continues to rise in the tank 15, the pressure will escape through the tube 6 and bubble up through the liquid in the compartment 3 to finally escape through the vent 9. This operation will continue until the tank is full.

When the level of the fluid 15 recedes, this operation will take place slowly and such level will drop appreciably and in practice almost to the top of the bell 14 before the further drop of such liquid level will produce a rarified condition within the bell. However, as the level continues to descend, suction will be set up within the bell and this suction will be communicated to the reservoir 4 to draw the fluid 16 into said reservoir in the manner described. It is very probable that the fluid 16 will all be moved into the compartment 4 before the level of the fuel 15 recedes below the bottom of the bell, but such fluid 16 will never be drawn into the tube 10 because there is not enough fluid 15 to reach to the inlet end of the tube and if suction continues after all of the fluid has been drawn into the reservoir 4, air will be drawn from the compartment 3 and will bubble up through the liquid into the tube 10.

In practice, the casing 1 is positioned in some convenient location, where it will be frequently observed and the tube 10 leads to the cellar or other location where the storage tank is positioned. This arrangement obviates the necessity of going to the

tank to see the condition of the fuel therein and a sufficiently accurate indication is secured for all practical purposes.

It is of importance to note that changes in atmospheric conditions, and more particularly changes in temperature will not seriously interfere with the functioning of the system, since exact liquid levels are not measured.

The device is unusually simple, but thoroughly efficient in the carrying out of its intended functions. The casing 1 may be ornamental and the liquid 16, which is, in practice, preferably colored or opaque, does not detract from the appearance of the device.

Having thus fully described the invention, what I claim as new and desire to secure by Letters Patent is:

1. In an assembly of the character described, a pair of containers, one of which is closed and the other of which is vented and is provided with a transparent portion through which the contents thereof may be observed, an inverted U tube, the legs of which extend into both containers to substantially the bottoms thereof, a visible liquid in said containers in a sufficient amount to substantially fill one of them, variable pressure means adapted to be positioned within a tank, and a conduit connecting the variable pressure means with the closed container.

2. In an assembly of the character described, a vented compartment having a transparent portion through which the contents of the compartment may be observed, a reservoir containing a visible liquid, a duct extending from adjacent the base of the reservoir to adjacent the base of the compartment, and rising intermediate its ends to a point above the maximum liquid level in both the compartment and reservoir, a fuel supply tank, and variable pressure means within the tank, said means being connected to the reservoir and adapted, when the fuel level rises in the tank, to force the liquid from the reservoir into the compartment, and when the level descends in the tank below a predetermined minimum to draw the liquid from the compartment back into the reservoir.

3. In an assembly of the character described, a pair of containers, one of which has a transparent portion and is vented and the other of which is closed, a visible liquid in said containers in a quantity to substantially fill one of them, a duct leading from substantially the bottom of one container to substantially the bottom of the other and rising intermediate its ends, to an elevation above the maximum liquid level of both containers, a pressure chamber adapted to be positioned in a tank, and a conduit connecting the pressure chamber with the closed container at a point above the maximum liquid

level therein, whereby pressure in the pressure chamber, due to rise of liquid level in the tank, will force the liquid from the closed container into the vented container whereas suction in the pressure chamber, due to fall of liquid level in the tank will draw the liquid from the vented container into the closed container.

4. In an assembly of the character described, a pair of containers, one of which is vented and the other of which is closed, a visible liquid in said containers in a quantity to substantially fill one of them, a duct leading from substantially the bottom of one container to substantially the bottom of the other and rising intermediate its ends, to an elevation above the maximum liquid level of both containers, a pressure chamber adapted to be positioned in a tank, and a conduit connecting the pressure chamber with the closed container at a point above the maximum liquid level therein, whereby pressure in the pressure chamber, due to rise of liquid level in the tank, will force the liquid from the closed container into the vented container whereas suction in the pressure chamber, due to fall of liquid level in the tank, will draw the liquid from the vented container into the closed container, at least a portion of one of said containers being transparent to permit the fluid therein to be seen.

5. In an assembly of the character described, a pair of containers, one of which is vented and the other of which is closed, liquid in said containers in a quantity to substantially fill one of them, a duct leading from substantially the bottom of one container to substantially the bottom of the other and rising intermediate its ends, to an elevation above the maximum liquid level of both containers, a pressure chamber adapted to be positioned in a tank, and a conduit connecting the pressure chamber with the closed container at a point above the maximum liquid level therein, whereby pressure in the pressure chamber will force the liquid from the closed container into the vented container whereas suction in the pressure chamber will draw the liquid from the vented container into the closed container, at least a portion of one of said containers being transparent, and indicating means positioned to be viewed through said transparent portion when the liquid level in said container recedes.

6. An assembly of the character described embodying a visual signal, a vented transparent compartment positioned in front of the signal, a liquid reservoir containing a liquid, a duct extending from adjacent the base of the reservoir to adjacent the base of the compartment and rising intermediate its ends to a point above the maximum liquid level in both the compartment and reservoir,

4

a fuel supply tank, and variable pressure means within the tank, said means being connected to the reservoir and adapted when the fuel level rises in the tank to force the liquid from the reservoir into the compartment to conceal the signal and when the level descends in the tank below a predetermined minimum to draw the liquid from the compartment to render the signal visible.

7. An assembly of the character described embodying a visual signal, a vented transparent compartment positioned in front of the signal and a liquid reservoir positioned in the rear of the signal with means to maintain the compartment and reservoir in assembled relation, in combination with means connecting the interior of the reservoir with the interior of the compartment, and variable pressure means adapted to be positioned within the fuel supply tank and communicating with the reservoir, said means being adapted when the fuel level rises in the tank to force the liquid from the reservoir into the compartment to conceal the visual signal and, when the level recedes in the tank, to withdraw the liquid from the compartment in the reservoir to expose the signal to view.

8. An assembly of the character described embodying a vented compartment and a reservoir positioned with the former in front of the latter, and a visual order signal positioned between the compartment and reservoir, the walls of the compartment being transparent and the interior of the compartment and reservoir being connected by a passage extending downwardly into both the compartment and reservoir, and means to maintain said parts in assembled relation in combination with a variable pressure bell provided with an open bottom and adapted to be positioned within a fuel supply tank, and a tube connecting the pressure bell to the reservoir, whereby when the fuel level rises in the tank, air within the bell will be compressed to force liquid normally contained in the reservoir into the compartment, the

lowering of the fuel level serving to suck the liquid from the compartment back into the reservoir.

9. In an assembly of the character described, a compartment having transparent walls and vented, a closed reservoir positioned at the rear of the compartment and containing a liquid, a visual signal positioned between the compartment and reservoir, an inverted U tube, the arms of which extend downwardly into both the reservoir and compartment, and means to secure said parts together, in combination with a pressure bell having an open bottom and connected by a tube to the interior of the reservoir, said pressure bell being adapted to be positioned within a fuel tank, whereby the rise in level of the fuel in the tank will seal the open bottom of the bell and place the air in the bell under pressure for the purpose of forcing the liquid from the reservoir through the U tube into the compartment to conceal the visual signal, the fall of fuel level in the tank below a predetermined minimum serving to suck said liquid back through the U tube into the reservoir to expose the visual signal.

10. In an assembly of the character described, a visual signal, a transparent compartment positioned at the front of the signal, and a second compartment positioned at the back of the signal, liquid in at least one of said compartments, an inverted U tube, the arms of which extend downwardly into the respective compartments, the forward compartment being vented and the other compartment having a tube leading therefrom, and a casing for securing the parts together in combination with means for communicating suction or pressure through the tube to force the liquid into or suck the liquid from the transparent compartment for the purpose of concealing or exposing the visual signal.

In testimony whereof I have signed the foregoing specification.

JACK D. SARTAKOFF.