

July 1, 1930.

F. J. BRANNEN

1,769,173

LIQUID SUPPLY INDICATING DEVICE SWITCH

Filed April 8, 1925

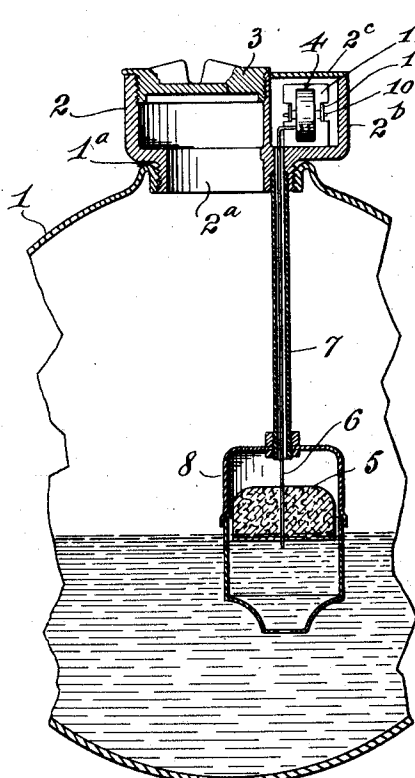


Fig. 1

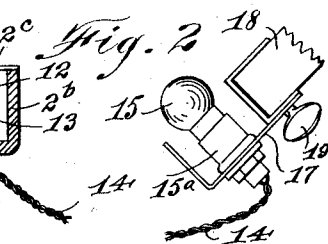
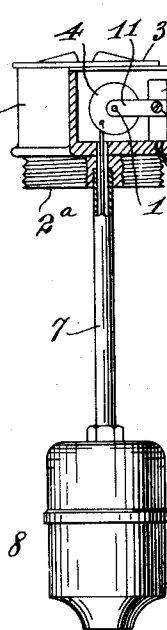


Fig. 3

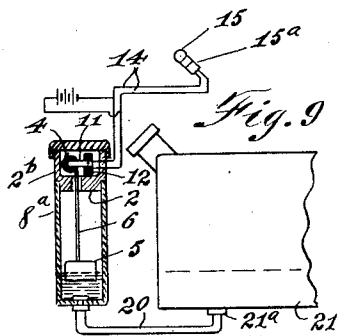


Fig. 4

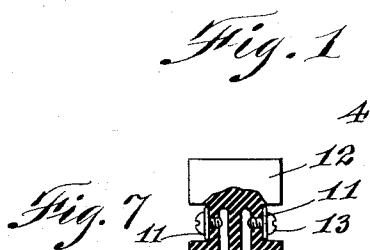


Fig. 5

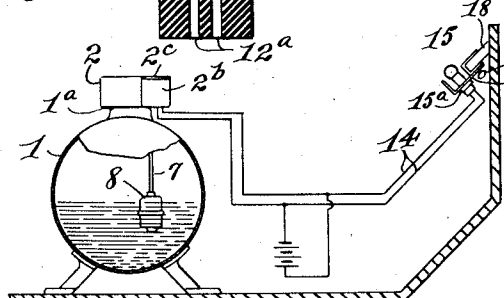
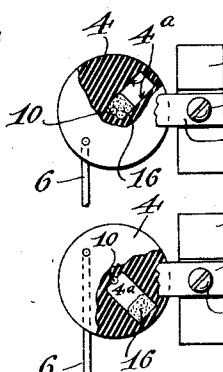


Fig. 6



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LIQUID-SUPPLY-INDICATING-DEVICE SWITCH

Application filed April 8, 1925. Serial No. 21,571.

My invention relates to improvements in liquid supply indicating devices, and more particularly to that type or class which are particularly designed and adapted for use in connection with liquid supply tanks or receptacles in automatically indicating or signaling at some suitable exterior point when the supply in the tank or receptacle reaches a predetermined point therein so that the supply of liquid may be replenished.

The present embodiment of the invention is particularly designed and adapted for use as an automatic oil and gas reserve indicating and signaling device for use in connection with lubricating oil and gasoline tanks or receptacles used in connection with motor vehicles, such as automobiles, trucks, tractors, and the like, as well as in connection with motor boats of various kinds.

The primary object of the invention is to provide a generally improved indicating or signaling device of the type indicated, which will be exceedingly simple in construction, and efficient in operation, and particularly one having a "safety" or protected switch of an improved form and arrangement adapted to energize and de-energize the signal lamp circuit at a predetermined point or level of the liquid in the reserve or supply tank,—the parts being so arranged as to prevent the formation of any spark gaps or contacts, and in which the liability to disarrangement or short circuiting is reduced to a minimum.

A further object is the provision of a signaling or indicating device of the class mentioned which may be readily attached to or detached from any ordinary supply tank or receptacle used in connection with motor vehicles.

With the above mentioned and other ends in view, the invention consists in the novel construction, arrangement and combination of parts, hereinafter described, illustrated in some of its embodiments in the accompanying drawings, and particularly pointed out in the appended claims.

Referring to the drawings, forming a part of this specification, Figure 1 is a fragmentary cross sectional view of a gasoline tank of the Ford type, equipped with a supply

indicating or signaling device, constructed in accordance with this invention, the parts being shown in their lamp energizing or signaling positions.

Fig. 2, a side elevation, partly in section, of the attachment or device removed from the filling opening of the tank and showing the signal lamp and its attachments applied to the instrument board of the automobile.

Fig. 3, a top plan view of the attaching head, the conventional filler cover or cap being removed, as likewise the switch casing or box cover, for the purpose of clearer illustration of the parts.

Fig. 4, a horizontal cross sectional view of the float controlled rotatably mounted switch carrying insulating block and the spaced terminal trunnion members therefor and the insulating terminal binding block, the switch parts being in their open position.

Fig. 5, a fragmentary side elevation of the same, the parts of the rotatably mounted or relatively movable insulating block being in their closed position.

Fig. 6, a side elevation of the same in open position.

Fig. 7, a fragmentary rear elevation, partly in vertical section of the insulating terminal binding block carrying the terminal trunnion members for supporting the rotatably mounted float controlled switch carrying member.

Fig. 8, a diagrammatic view of the electric circuit and its connections.

Fig. 9, a vertical sectional view of a self-contained or adapter form of device designed for application to tanks or receptacles of varying forms and contours.

Similar numerals of reference designate like parts throughout all the figures of the drawings.

The improved device may be used in connection with a liquid supply tank or receptacle of any convenient form or type. For the purpose of illustration I have shown my device used in connection with gasoline tanks such as used in connection with automobiles. In Figs. 1 to 8, inclusive, I have shown a special form of float controlled device adapted to be in-

roduced into the conventional internally threaded filler opening 1^a, of the fuel tank 1, of the Ford type, and having a threaded supporting head 2, adapted to replace the conventional or ordinary threaded cap 3, said head 2 being provided with a reduced opening 2^a, and having an internally threaded opening at the top to receive the cap 3. The head or support 2 is preferably provided with a separate housing or casing 2^b, for the reception of the float controlled relatively movable switch carrying devices 4, said switch housing or casing 2^b being preferably provided with a removable lid or cover 2^c.

The float controlled switch carrying block or device 4 is connected to the float 5 by means of a rod or stem 6, and as a means of properly supporting the float 5 and rod 6 at all times relative to the height of the liquid to be indicated, the head 2 is provided with a tubular body or stem 7, leading downwardly and provided with an open float housing 8.

As a means of providing a switch and switch operating device which will be protected at all times and at the same time be free from spark forming contacts or spark forming gaps in the operation of closing and opening the signal circuit, or energizing and de-energizing the latter as the float reaches predetermined positions with respect to the desired level of the liquid to be signaled, a relatively movable insulating block 4, is mounted within the housing 2^b, said block 4 being preferably in the specific form of an oscillatory disc-block mounted upon or by means of spaced terminal axles or trunnions 10, the latter being mounted on terminal members or arms 11, of conducting material carried on the insulating block 12. The block 12 is provided with binding posts or screws 13, and the movable disc-block 4 is preferably formed of insulating material throughout, as shown.

The terminals of the electric circuit forming wires or conductors 14, leading to the signal lamp 15, may be secured in openings 12^a, of the insulating block 12, by means of the binding screws 13. It will be seen upon reference to Fig. 4 of the drawings that the terminal axle or trunnion members are spaced apart within a radially extending cavity or receptacle 4^a of the oscillatory switch carrying block 4, and as a means of closing the circuit and energizing the lamp when the liquid and float reach predetermined positions, such for example,—as indicated in Figs. 1, 2 and 5 of the drawings, and of opening the circuit and holding the parts in open or de-energized position, a relatively movable contact element or circuit closing and opening element 16 is arranged in the radially extending cavity 4^a, said element being adapted to be moved toward and from said spaced terminal axle members 10 with the movements of the oscillatory block 4, and to bridge the space there-

between when the circuit is closed by the movement of the float and switch carrying block to circuit closing positions. The relatively movable circuit closing and opening element 16 is preferably in the specific form of a suitable supply of mercury, as shown, and the latter is adapted to be moved to the respective positions indicated in accordance with the relative positions of the float and float actuated switch carrying oscillatory insulating block 4.

The signal lamp or source of illumination may be of any suitable and convenient form, such for example,—as the lamp bulb mounted in the socket 15^a and carried in the attaching bracket 17 secured, in the present instance, to the instrument board 18, by means of the binding screw 19.

In the attachment or adapter form of device shown in Fig. 9 of the drawings, the float housing 8^a is in the specific form of a receptacle connected directly to a slightly modified form of switch housing or casing 2^b carrying the rotatably mounted float controlled switch carrying insulating device or block 4, and the head 2 and float housing 8^a are supported by means of a supporting conduit or stem 20 communicating with the bottom of the tank 21 through a suitable connection or bushing 21^a, and it will be obvious that the predetermined position or level of the liquid to be indicated or signaled may be varied by bending or adjusting the supporting stem 20 or the relative position of the float housing 8^a vertically to the tank 21 and its contents.

Having thus described some of the embodiments of my invention, without having attempted to set forth all the forms in which it may be made, or all the modes of its use, what I claim and desire to secure by Letters Patent is,—

1. In a structure of the character described, including a storage tank having a threaded filler opening, a hollow attaching head, a threaded neck threaded in said threaded filler opening of said tank and provided at its top with the threaded cap of said threaded filler opening, said hollow head being provided with a laterally off-set switch housing and carrying a tubular stem provided with a float housing extending into said storage tank, a float provided with a rod extending into said switch housing, an oscillatory disc-block operated by said rod and float and provided with spaced terminal axles, a liquid contact element carried within and protected by said disc-block and opening and closing contact with said axle members as said disc-block is moved to predetermined positions by said float.

2. In a device of the character described, a hollow attaching head provided with a threaded neck adapted to enter the threaded filler opening of a tank and provided at its

top with an internally threaded portion adapted to receive the original threaded cap for closing said threaded filler opening, said hollow head being provided at one side with
5 a switch casing having a tubular stem extending into said tank and carrying a float housing, a float in the latter provided with a rod extending into said switch casing, an oscillatory disc-block connected to said rod
10 and provided with spaced terminal axle members, an internally arranged liquid contact element carried by said disc-block and adapted to open and close contact with said axle members as said disc-block is moved to pre-determined positions.

15 3. In a device of the character described, including a storage tank having a threaded filler opening, an attaching head provided with an externally threaded opening adapted to enter the filler opening of a storage
20 tank and provided with an internally threaded opening adapted to receive the cap of the filler opening, said attaching head being provided with a switch housing, a tubular stem carried by said head and provided with a
25 float housing extending into said tank, a float in said float housing provided with a rod extending through said tubular stem into said switch housing, a rotatably mounted
30 switch carrying insulating block in said switch housing connected to and controlled by said rod and float, spaced terminal axles carrying said rotatably mounted switch carrying insulating block and mounted on said
35 terminal arms, a liquid contact element carried within said rotatably mounted insulating block, and adapted to make and break contact with said terminal axle members as said float controlled switch is moved to pre-determined positions.

40 In testimony whereof I have affixed my signature.

FRANK J. BRANNEN.

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