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J. E. DOWD

1,529,470

LOW LEVEL ALARM SWITCH

Filed Sept. 8, 1923

Fig. 1.

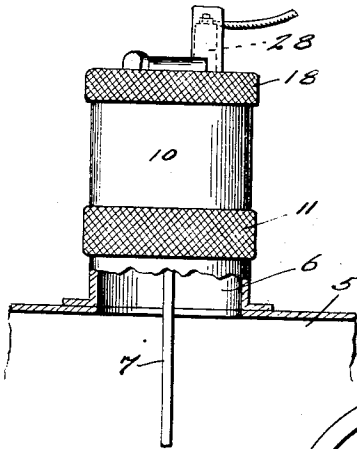


Fig. 2.

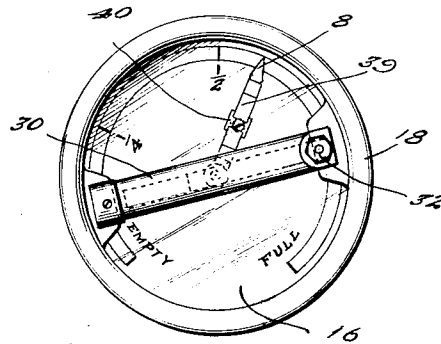


Fig. 5.

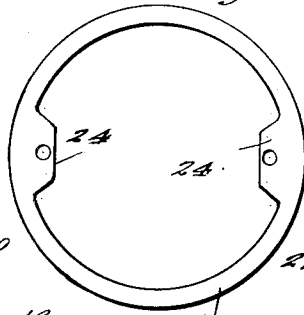


Fig. 7.



Fig. 3.

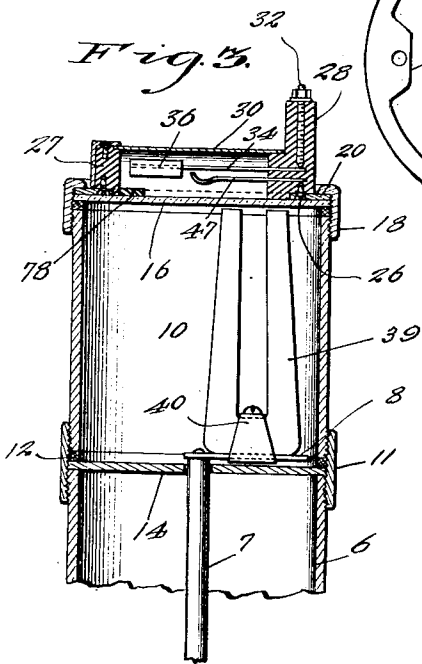


Fig. 4.

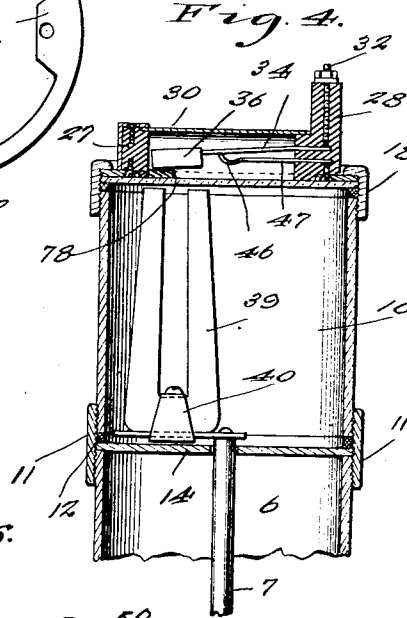
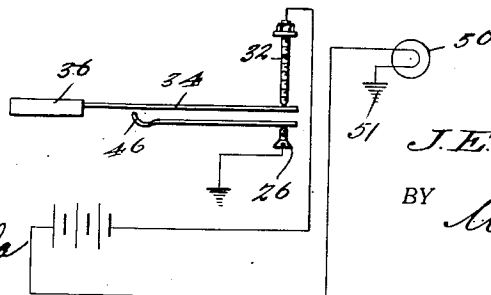


Fig. 6.



WITNESSES

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LOW-LEVEL ALARM SWITCH

Application filed September 8, 1923. Serial No. 661,666.

To all whom it may concern:

Be it known that I, JAMES E. DOWD, a citizen of the United States, and resident of Salt Lake City, in the county of Salt Lake and State of Utah, have invented certain new and useful Improvements in Low-Level Alarm Switches, of which the following is a specification.

This invention relates to low level alarm switches especially adapted for use on fuel tanks of automobiles.

Briefly stated an important object of this invention is to provide a novel form of low level alarm switch adapted to indicate electrically when the fuel in the gasoline tank drops below a predetermined point whereby the complete exhaustion of the fuel in the tank is prevented.

Further the invention forming the subject matter of this application may be conveniently applied to gasoline tanks without elaborately altering the construction of the same and without the exercise of unusual skill.

Also an important object of this invention is to provide a low level alarm switch which remains in its signalling position when operated until the fuel supply is replenished.

A further object of the invention is to provide a low level alarm switch which is safe, of highly simplified construction and cheap to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawing forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of the improved alarm switch applied.

Figure 2 is a plan view of the alarm applied.

Figure 3 is a vertical sectional view through the alarm switch, the alarm switch being in its inoperative position.

Figure 4 is a vertical sectional view through the alarm switch, the same being in its operative position as the result of the depletion of the fuel supply,

Figure 5 is a plan view of a supporting ring embodied in the invention.

Figure 6 is a view of a wiring diagram which may be employed in connection with the invention.

Figure 7 is a detail transverse sectional view through a housing embodied in the invention.

In the drawing wherein for the purpose of illustration is shown a preferred embodiment of the invention, the numeral 5 designates a fuel tank, the upper portion of which is provided with a boss or tubular extension 6 through which the operating rod 7 of the gage is extended. The fuel gage rod 7 is provided with a hand 8 which as illustrated in Figure 2 plays over a dial and thereby indicates the quantity of fuel in the tank.

The invention forming the subject matter of this application resides in providing simple means to indicate when the gage hand 8 approaches or nearly approaches the empty point so that the operator may replenish the fuel supply as early as possible. However, the low level alarm is so adjusted with relation to the gage that the alarm will be actuated before the fuel supply is completely exhausted so that the operator will have ample warning.

In carrying out the invention a tubular housing 10 is mounted upon the upper portion of the boss 6 and is connected thereto by means of a coupling member 11. A gasket 12 is confined between the lower end of the housing 10 and the upper portion of the boss 6 so as to prevent the entrance of foreign matter such as rain and dust. The top 14 and the hand which plays about the same may be viewed through the transparent top 16 on the housing 10.

As shown in Figure 2, indicia such as "Empty, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and full" may be applied to the under side of the top glass 16 so that the magnet may cooperate with this indicia to accurately indicate the quantity of fuel in the tank.

The glass top 16 is held in place upon the housing 10 by means of a ring 18, the upper portion of which is formed with an inwardly extending annular flange 20 which also holds a ring 22 in position, the said ring 22 being of any suitable metal.

The metal ring 22 is provided with a pair of oppositely arranged inwardly directed apertured ears 24 which have connection through the medium of fastening devices 26 with the ends 27 and 28 of a switch container 30.

The ends 27 and 28 of the switch container 30 may be of insulating material

and the end 28 carries a binding post 32 having connection with the leaf spring support 44 of the head or block 36.

The head 36 is responsive to the action of a magnet 39 which as illustrated in Figures 3 and 4 is of U-shaped formation and has its bight portion connected to the hand 8 by means of a fastening device 40. The movement of the hand 8 results in the movement of the magnet 39 so that when the hand turns to a predetermined point the magnet 39 will be immediately beneath the movable head 44 so that the said magnet will draw the head downwardly and consequently cause the spring or contact member 34 to engage the curved end 46 of a second contact 47. Figures 3 and 4 also illustrate that the leaf spring contact 47 is anchored to the end 48 by one of the fastening devices 26. Therefore the fastening device 26 not only serves as a means for attaching the end 28 to the ring 22 but as a contact member for establishing electrical connection between the contact 47 and the housing 10 which of course is of a conducting material and allows the circuit to ground.

The binding post 32 may be connected to a signal light 50 on the dash of the automobile and one side of the light 50 may be grounded as indicated at 51.

In the normal operation of the improved low level alarm the magnet 39 will draw the head 48 downwardly so that the spring 34 is flexed and moved into engagement with the hooked end 46 of the spring contact 47 whereby the circuit is completed and the light is created in the bulb 50 so that the operator of the vehicle is advised that the fuel level has dropped below a predetermined point. It is important to note that the light 50 remains lighted until the fuel supply is replenished so that in case the operator does not happen to be looking at the bulb 50 when it is first energized the purpose of the invention will not be defeated.

The entrance of dust, rain and like into the interior of the mechanism is absolutely prevented by the closure 18 and by the coupling 11 so that there is no possibility of the parts short circuiting.

Furthermore there is no danger of electric sparks igniting the gasoline in the tank. Figures 3 and 4 indicate that a small strip of insulating material 78 may be placed beneath the head 36 so as to prevent the head from contacting with the housing should the vehicle shake the head to any extent. That is to say the vibrational movement of the vehicle is prevented from causing an accidental completion of the circuit and the consequent lighting of the bulb 50. Of course when the head 36 is drawn downwardly by the horse-shoe magnet 39 the rear portion

of the same and the spring contact 34 is also drawn downwardly to engage the curved terminal portion 46 of the leaf spring contact 47.

Of course if the tubular housing 30 is of glass and the head 36 cannot engage any metal part except the part 46, ordinary vibrational movement of the vehicle will not complete the circuit.

In carrying out the invention a tubular housing which is indicated in Figure 7 by the numeral 100 may be made of glass and may be fused with the glass top 115 so as to provide a neat and reliable construction and one in which the possibility of short circuiting or accidental completion of the circuit is reduced to a minimum.

Of course in carrying out the invention the head 36 is located as close to the terminal portion of the magnet 39 as possible so that when the magnet is directly beneath the head 36 the head will be within the magnetic range of the magnet.

Having thus described the invention, what is claimed is:

1. A low level alarm switch comprising a housing, a transparent top for the housing, a metallic ring mounted upon the top, a fastening member screwed upon the housing and engaging the ring whereby to hold the same in position, a switch container connected to said ring and having an insulated end, a head having a leaf spring contact carried by said insulated end, a second leaf spring contact in the path of travel of said first named contact and adapted to be engaged thereby, and a fastening member securing said container to said ring and engaging one of said contacts, whereby to electrically connect the same to the ring.
2. A low level alarm switch comprising a housing, a transparent top for the housing, a metallic ring mounted upon the top, a fastening member screwed upon the housing and engaging the ring whereby to hold the same in position, a ring carried switch container arranged exteriorly of said head and having an insulated end, a head having a leaf spring contact carried by said insulated end, a second leaf spring contact in the path of travel of said first named contact and adapted to be engaged thereby, and a U-shaped magnet arranged within said housing and adapted to be carried by the hand of a gauge, said magnet being adapted to move said head, whereby to engage said first and second named contacts.
3. A low level alarm switch comprising a housing, a transparent top for the housing, a metallic ring mounted upon the top, a fastening member screwed upon the housing and engaging the ring whereby to hold the same in position, a switch container connected to said ring and having an insulated end, a head having a leaf spring contact

carried by said insulated end, a second leaf spring contact in the path of travel of said first named contact and adapted to be engaged thereby, and a U-shaped magnet arranged within said housing and adapted to be carried by the hand of a gauge, said magnet being adapted to move said head, whereby to engage said first and second named contacts, and a fastening device connecting the insulated end of said switch container to said ring and electrically connecting said second named contact to said ring.

4. The combination of a gauge having a hand, a U-shaped magnet connected to said hand, a housing receiving said magnet, a transparent top mounted on said housing, a metal ring mounted on said top and having ears, a switch container having ends of insulating material connected to said ears, a head responsive to the action of said magnet and having a contact connected to one of the ends of said container, a second contact arranged in the path of travel of said first named contact and having electrical connection with said ring, and a binding post connected to said first named contact and being carried by one of the ends of said switch container.

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