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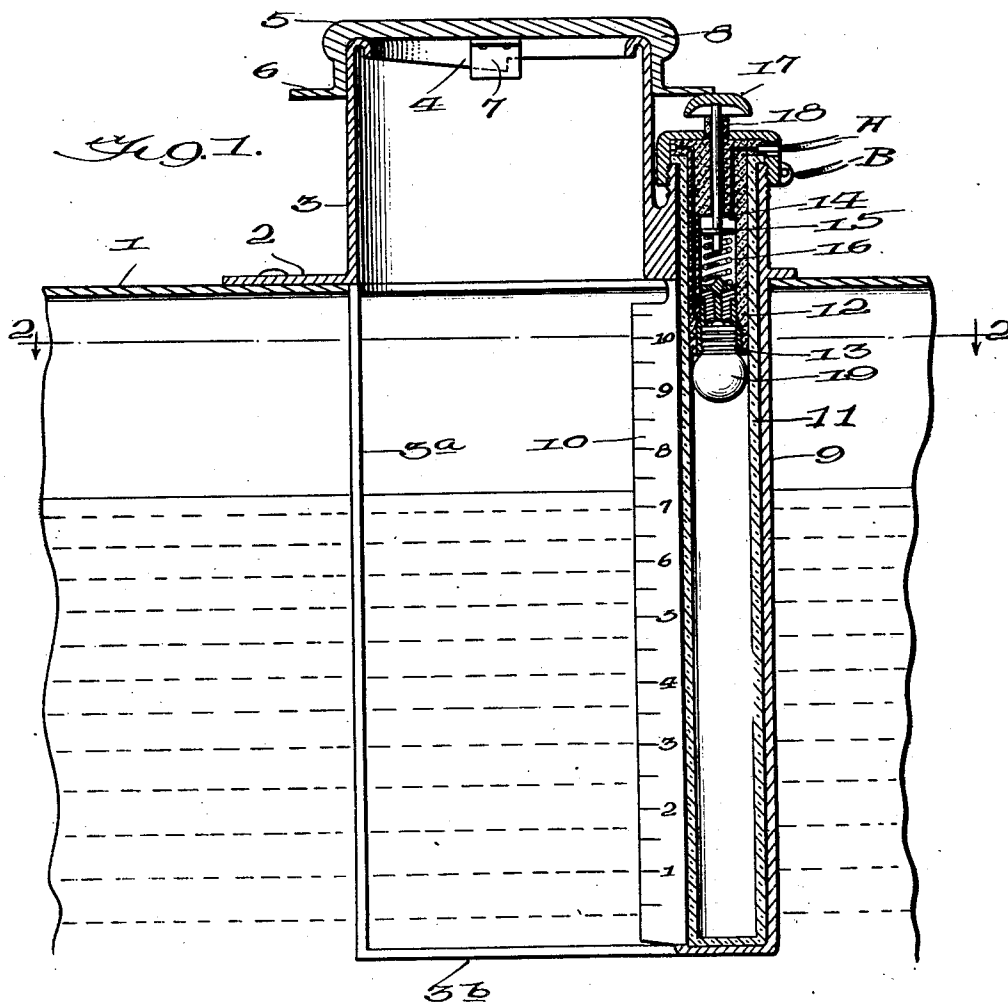
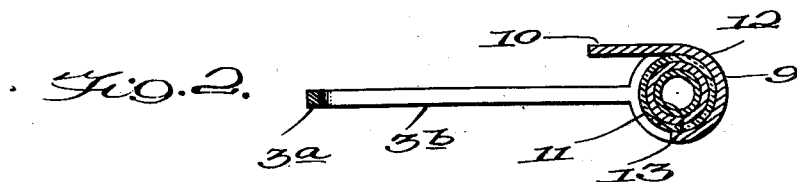
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1,926,945

TANK LIGHT APPARATUS

Filed Aug. 29, 1931

2 Sheets-Sheet 1



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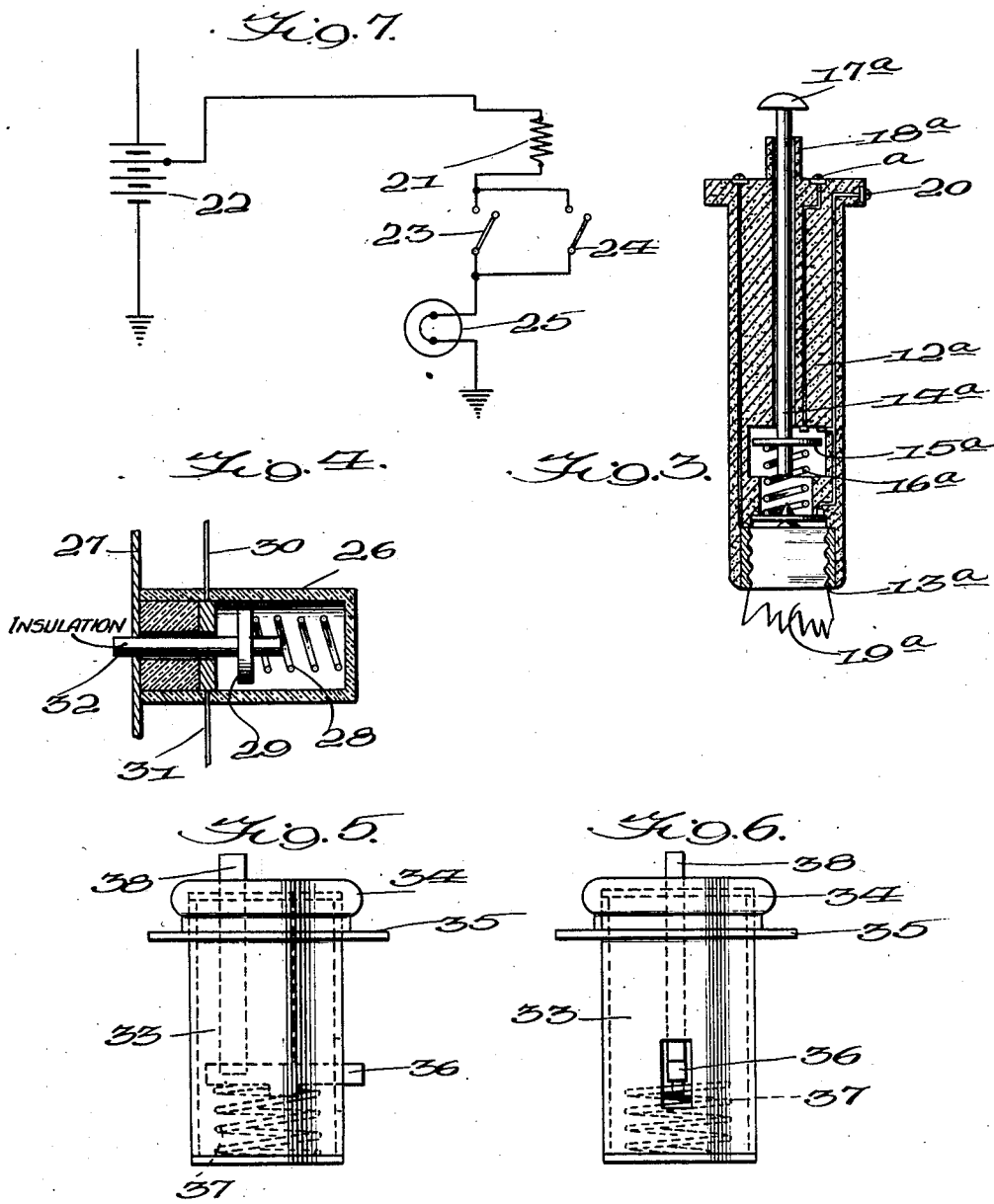
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TANK LIGHT APPARATUS.

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2 Sheets-Sheet 2



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TANK LIGHT APPARATUS

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7 Claims. (Cl. 240—2.15)

This invention relates to attachments for vehicles in general. More particularly this invention relates to apparatus for illuminating the inside of fuel tanks for vehicles, such as automobiles, which are propelled by internal combustion engines.

An object of this invention is to provide an arrangement for illuminating the inside of an internal combustion engine fuel tank, which is connected for use simultaneously as the tank is opened for filling.

Another object of this invention is to provide apparatus for illuminating a scale within the fuel tank of an internal combustion engine which is positioned adjacent to the filling opening of the tank so that the scale may be viewed there-through.

Still another object of this invention is to provide a tube with a scale thereon adapted to be illuminated by a lamp therein, inside of the fuel tank of an internal combustion engine adjacent to the filling opening of the tank, the circuit of the lamp being arranged so that the lamp is energized simultaneously as the tank is opened and de-energized as it is closed.

A further object of this invention is to provide the fuel tank of an internal combustion engine with a tubular member depending from the upper wall of the tank from a surface adjacent to the filling opening, the tubular member having a scale bearing portion thereof extruded outwardly in such a way that this portion may be viewed from the outside of the tank through the filling opening.

Still a further object of this invention is to provide an arrangement inside of the fuel tank of an internal combustion engine for illuminating a scale which indicates the fuel content of the tank, in which the operation of the illumination device is remotely controlled.

Other objects and features of this invention will be apparent from the following specification and the appended claims.

In accordance with this invention a small tube of metal, or other material which does not deteriorate while in contact with gasoline, benzene, alcohol or other chemical compounds used as fuel in internal combustion engines, is positioned inside of the fuel tank of an internal combustion engine, preferably adjacent to the filling opening of the tank. A longitudinal section of this tube is extruded from the tube and a scale, which indicates the fuel content of the tank at different levels, is imprinted into or on the surface of this longitudinal section. A glass

tube is fitted into this metal tube to exclude the fuel from the inside of this latter tube, and an incandescent lamp is mounted inside of the glass tube. In practice, it may be desirable to omit this glass tube and mount the lamp inside of the metal tube, leaving the liquid fuel to come directly in contact with the lamp.

Connections are provided between the lamp and a source of current supply, such as a storage battery, generator and the like. A switch is also provided for either connecting or disconnecting the lamp from circuit. This switch is arranged to be operated to close the lamp circuit simultaneously as the tank closure is opened and to interrupt the lamp circuit as the tank is closed. In this way the scale of the tube positioned inside of the fuel tank is illuminated for view when the tank closure is open or removed. The volume of the contents of the tank may be read direct from the scale through the filling opening.

In a modified form of this invention the lamp circuit is opened or closed by a switch which is operated as a door of the vehicle is opened or closed. An arrangement such as this is more readily adaptable to motor vehicles already in existence which are not provided with a fuel tank having a filling opening cap to which a switch-operating mechanism may be relatively easily attached.

This invention will be more fully and easily understood from the accompanying drawings in which

Fig. 1 is a plan view in fragmentary section of a form of this invention;

Fig. 2 is a horizontal sectional view taken along the line 2—2 of Fig. 1;

Fig. 3 is a modified form of lamp socket and switch embodied in this invention;

Fig. 4 illustrates a door-operated switch;

Figs. 5 and 6 illustrate another form of tank cap retaining mechanism embodied in this invention; and

Fig. 7 is a diagram of connections.

Reference numeral 1 of Fig. 1 is a wall of the fuel tank, such as is carried by internal combustion engine propelled vehicles. A filler stem 3 is attached to the wall 1 of the fuel tank in the filling opening of the tank. Bracing section 3a of stem 3 is provided to extend into the tank. A cap 5, having a flange 6 and a gripper member 7 for engaging the projecting members 4, is provided to the filler stem.

This gripper member 7 is attached to the under surface of the central portion of the cap 5, either by spot welding, a small rivet, or in any

other convenient manner well known in the art. A knurled ring 8 is provided to the cap integral therewith to facilitate the removal of the cap, when desired. A small tubular member 9 having a section 10 thereof extruded therefrom is positioned adjacent to the filler stem 3.

The tubular member 9 is attached to the upper wall of the tank, as is the filler stem 3, and projects upward out of the tank on a side of the filler stem. This member 9 is a casting made integral with the filler stem and braced thereto by the members 3a and 3b, or it may be a small metal tube made of iron, copper, brass or similar material made entirely separately from the filler stem. In case it is made separate from the filler stem, its upper section is provided with a flange and threaded to receive a nut so that it may be inserted into a hole formed into the upper wall of the fuel tank and retained in place by the cooperative action of the flange and nut. This tubular member 9 is also made of phenol condensation or similar products which resist the solvent action of gasoline, alcohol and other internal combustion engine fuels.

A gauge for indicating the volume of the contents of the tank is printed, embossed or engraved upon the extruded section 10 in such a way that when illuminated it may be seen through the filler opening. The tubular member 9 may be positioned at an angle with respect to the tank wall 1, or it may be disposed in a true vertical position. In each case, however, the scale of section 10 is adjusted to give the correct volume indication for the position chosen.

A tube 11, of glass, fused quartz, or borosilicate compounds, is fitted into the tubular member 9. This glass tube is preferably sealed at its lower end to prevent liquid from the tank from entering it. Where it is desired the scale of the extruded section 10 may be placed upon the surface of the glass tube 11 instead of the section 10 in any of the known methods of registering indicia upon glass, such as etching, abrading, grinding or molding while casting or working the glass. It is, of course, understood that the tube 11 may be made solid at the lower end or curved slightly to reflect the light from the lamp 19 to the scale.

A block 12, carrying a lamp socket 13 and switch 14, is positioned into the glass tube 11. The switch 15 is closed by the rod 14, which is held under tension by the spring 16, when the cover 5 is removed from the filler stem, and the pressure exerted by the flange 6 upon the cup-shaped cap 17 is released. A small upright tube 18 is provided to block 12 to prevent gasoline or other liquids spilled over the edge of the filler stem from flowing around the rod 14 into the compartment of the switch 15. The rod 14 and block 12 may be made of phenol condensation products, synthetic porcelain, insulating compositions or similar suitable materials.

The lamp 19 is preferably a small substantially spherical-shaped bulb type used in three to four volt circuit. It may be of the elongated type designed to operate in a six volt circuit. Connection A is provided to the contact positioned adjacent to the movable switch contact 15. The circuit between the contact 15 and the central contact of the lamp socket 13 is completed through the spring 16. A connection is also provided between the return or ground circuit and the threaded contact section of the socket 13.

In Fig. 2 of the drawings, the arrangement of the various parts within the tube 9 is more clearly illustrated.

A modified form of the switch embodied in the invention is illustrated in Fig. 3 of the drawings. This switch is made essentially of a block 12a, of insulating material, a movable contact 15a, a spring 16a, and a socket 13a. This switch differs from the switch illustrated in Fig. 1 in that an additional connection 20 is provided between the central contact of the socket for the purpose of permitting a remotely controlled switch to be connected to the lamp 19a.

In Fig. 4 of the drawings a switch having a casing 26, adapted to be mounted in the sill of an automobile door in such a way that the plate 27 is flush with the outside of the sill, is illustrated. A spring 28 is positioned inside of the housing 26 in engagement with the contact 29, which is carried by the rod 32. The rod 32 and housing 26 are preferably of insulating material. A pair of contacts 30 and 31 are positioned inside of the case 26. The door of the automobile when closed presses the rod inwardly into the case 26 and thus maintains the circuit between contacts 30 and 31 open. When the door is opened the spring 28 presses the contact 29 into engagement with the contacts 30 and 31 and closes the circuit.

The switch illustrated in Fig. 4 of the drawings is preferably connected into circuit as switch 24 (Fig. 7) across the switch 23, which is illustrated in detail in Fig. 3. The lamp 25 which corresponds to the lamp 19 (Fig. 1) and lamp 19a (Fig. 3) is thus adapted to be energized by current from the battery 22, either upon the operation of the switch 23 when the cover of the fuel tank is removed, or upon the operation of the switch 24 when the door of the automobile is opened by the operator. If desired, either one of the switches 23 or 24 may be eliminated. A resistance 21 is also connected into circuit in certain cases where the rated voltage of the lamp 25 is below the voltage of the automobile battery 22.

In Figs. 5 and 6 of the drawings, a modified form of cap for closing the filling opening of the fuel tank is illustrated. This cap is provided with a flange 35 corresponding to the flange 6 (Fig. 1). A catch 36 for engaging the wall of the tank just below the filler stem is positioned substantially within the body 33 of the cap. A spring 37 is provided between the body portion of the catch 36 and the bottom of the cap to maintain the catch in normal position.

In practice, the cap is used in fuel tanks that are normally provided with threaded caps that must be screwed into place. The section 34 and the flange 35 are formed to encircle the outer surface of the filler stem of the fuel tank in such a way that the flange 35 engages the switch cap 17 (Fig. 1) when the tank opening is closed. To remove the cap from the filler stem the pin 38, which is pivotally attached to the body of member 36, is pressed inwardly against the force exerted by the spring 37, until the outer portion of member 36 is caused to be flush with the outer surface of the cap body 33. The cap may then be withdrawn.

From the foregoing specification and the accompanying drawings it will be observed that I have set forth my invention in considerable detail. However, I do not desire that the invention be limited to those exact details except in so far as they are defined by the appended claims.

What I claim and desire to secure by Letters Patent of the United States is:

1. In illumination apparatus the combination of an incandescent lamp positioned inside of a

tank, a tubular member positioned in said tank, means for supporting said lamp upon a wall of said tank for transmitting light through said tubular member, a scale on a section of said tubular member arranged to be illuminated by light from said lamp, a switch for controlling the operation of said lamp and means for operating said switch when said tank is opened.

2. In illumination apparatus the combination of an incandescent lamp positioned within a tank, a closure for said tank, means for supporting said lamp upon a wall of said tank, said means including a tubular member, a scale on said tubular member arranged to be illuminated by said lamp, a switch for controlling the operation of said lamp, and mechanical means cooperating with said closure of said tank for operating said switch when said closure is opened.

3. In illumination apparatus for indicating the volume of the contents of a tank the combination of a transparent member positioned within the tank, a scale supported in said tank parallel to said transparent member, an incandescent lamp arranged to transmit light rays through said transparent member for illuminating said scale, and a switch connected to control the operation of said lamp.

4. In illumination apparatus for indicating the volume of the contents of a tank the combination of an elongated transparent member positioned within the tank, a scale supported in said tank,

an incandescent lamp supported to transmit light rays longitudinally through said transparent member for illuminating said scale inside of said tank and a switch connected to control the operation of said lamp.

5. In illumination apparatus for indicating the volume of the contents of a tank the combination of a metal tube positioned in the tank, said tube having a longitudinally extending section thereof extruded therefrom, said extruded section having a scale thereon, a transparent member positioned within said metal tube, and a lamp supported to transmit light rays through said transparent member to illuminate the scale on said extruded section.

6. In illumination apparatus for indicating the volume of the contents of a tank the combination of a metal tube positioned in the tank, said tube having a section thereof extruded therefrom, said extruded section having a volume indicating scale thereon, a transparent member positioned within said metal tube, and a lamp supported in said transparent member for illuminating said scale.

7. In illuminated tank scales the combination of a metal tube supported in the tank, said tube having a volume indicating scale thereon, a transparent member in said tube, and a lamp for transmitting light rays through said transparent member for illuminating said scale.

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