Dec. 11, 1934. P. FOY 1,984,124

ELECTRIC SWITCH

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Fig. 1

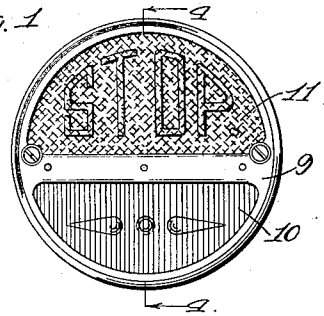


Fig. 2.

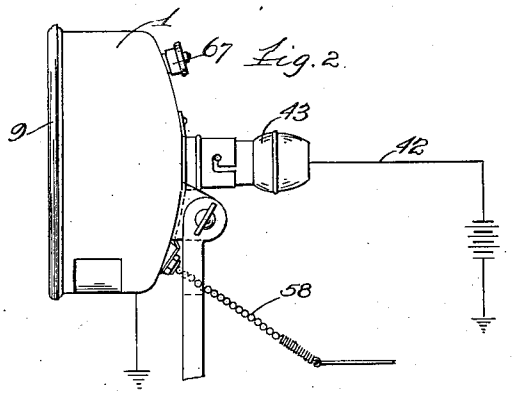


Fig. 3.

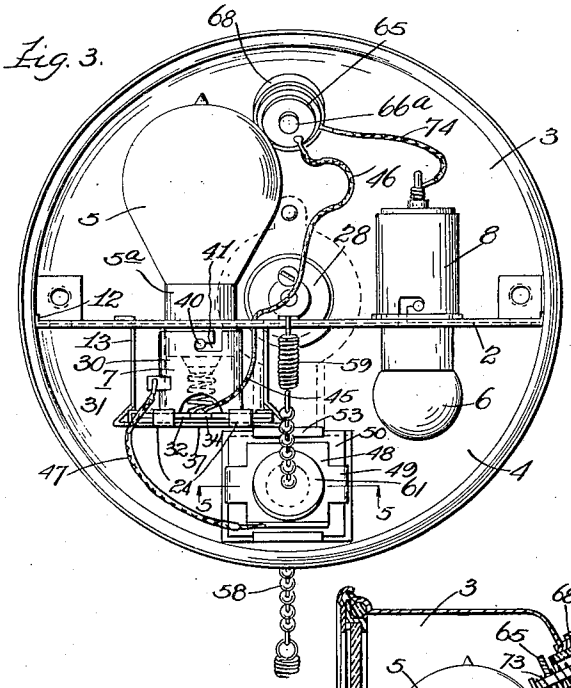


Fig. 5

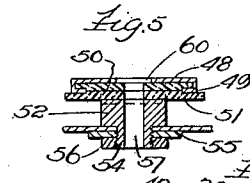


Fig 7.

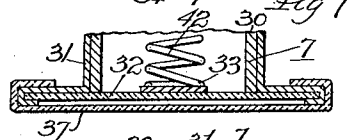


Fig 6.

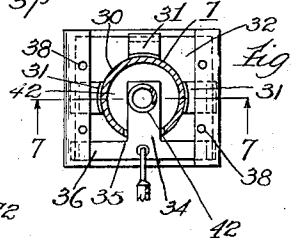


Fig 4.

Witness
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ELECTRIC SWITCH

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Fig. 8.

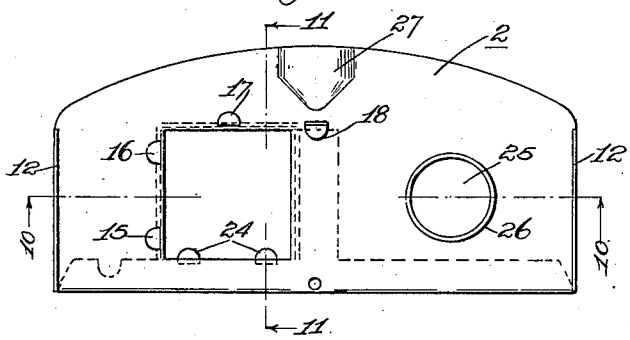


Fig. 11.

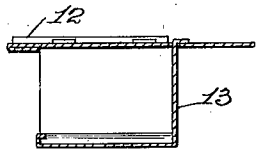


Fig. 9.

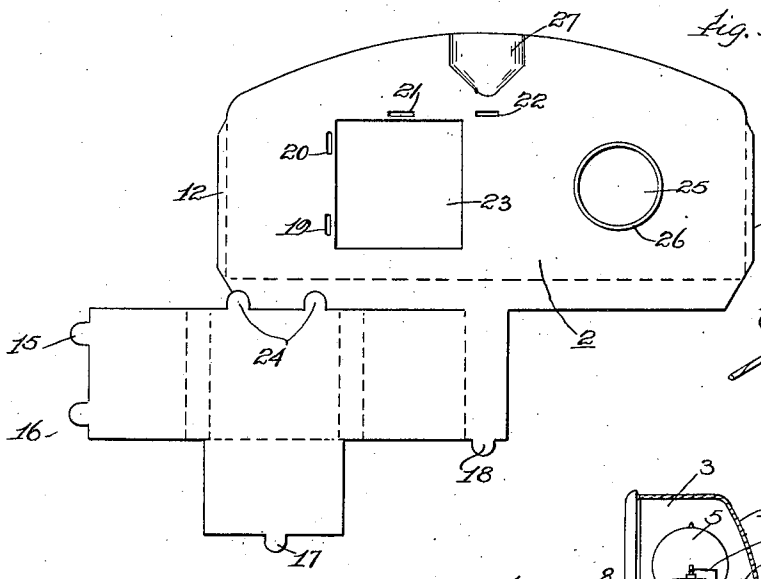


Fig. 14.

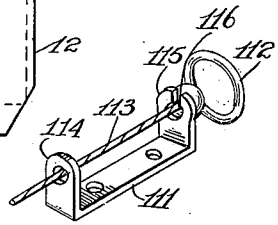


Fig. 10.

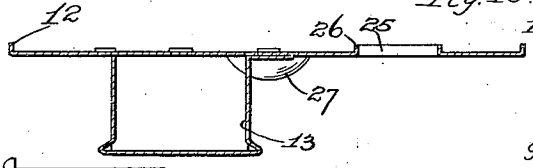


Fig. 12.

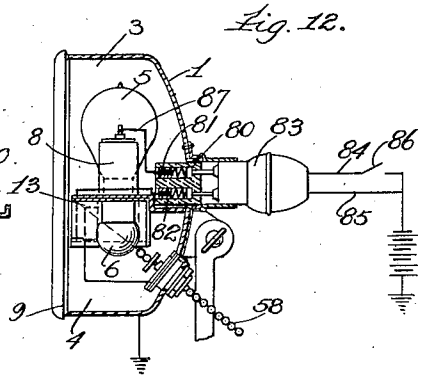
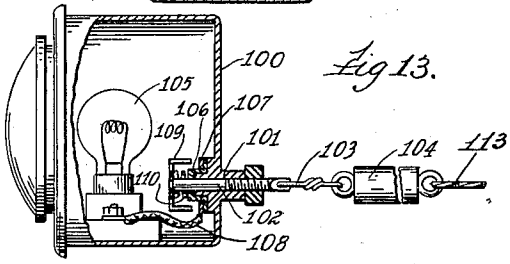


Fig. 13.



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UNITED STATES PATENT OFFICE

1,984,124

ELECTRIC SWITCH

Patrick Foy, Chicago, Ill.

Application December 19, 1928, Serial No. 327,042

4 Claims. (Cl. 200—161)

This invention relates to signal devices and more particularly to devices adapted to be positioned on the rear end of a vehicle for warning or indicating a change of movement to the drivers of following vehicles.

An object of the present invention is to provide an improved mounting for an electric lamp bulb affording a compact arrangement, especially useful when combining in one casing, a signal lamp and tail lamp. Another object is to provide novel switch means in the casing for controlling the signal lamp. A further object is to provide means for manually operating the signal lamp from a remote point, which means may also be operated adjacent the lamp to observe the functioning of the same. It consists in certain features and elements of construction, in combination as herein shown and described and as indicated by the claims.

In the drawings:—

Figure 1 is a face view of a signal device embodying the present invention.

Figure 2 is a side elevation of a device including a signal lamp and tail lamp; the tail lamp being arranged for manual operation by a switch in the casing. This view illustrates diagrammatically the electrical circuit including the lamp device.

Figure 3 is a face view looking into the lamp casing, with the lens removed, illustrating the arrangement of compartments for the signal lamp and the tail lamp, respectively.

Figure 4 is a vertical section taken as indicated at line 4—4 on Figure 1.

Figure 5 is a fragmentary sectional view through the fixed switch contact, taken at line 5—5 on Figure 3.

Figure 6 is a plan view in part section of the improved socket for the signal lamp.

Figure 7 is a transverse section taken as indicated at line 7—7 on Figure 6.

Figure 8 is a plan view of the partition plate and socket support.

Figure 9 is a detail view of a blank for forming the partition plate and socket support.

Figure 10 is a section taken as indicated at line 10—10 on Figure 8.

Figure 11 is a vertical section through the socket support taken at line 11—11 on Figure 8.

Figure 12 is a vertical section through a device embodying the present invention, illustrating the method of operating the tail lamp from a remote point.

Figure 13 is a side elevation partly in section showing a modified construction for a signal lamp alone.

Figure 14 is a perspective view of fastening means for the manual control member shown with the lamp of Figure 13.

This is a continuation in part of my co-pending application, Serial Number 523,119, filed December 17, 1921, the structure shown in Figure 13, being identical with one form of the invention originally shown in said application.

My invention is further illustrated in the drawings in the form of a combination signal and tail lamp of the type usually mounted on the rear end of a vehicle, and it comprises a circular casing or housing, 1, in which is mounted a partition plate, 2, positioned to form an upper compartment, 3, and lower compartment, 4, hereinafter referred to as signal lamp and tail lamp compartments, respectively. These compartments are provided with electric lamp bulbs, 5 and 6, both of the center contact type, spaced transversely of the casing and carried in sockets, 7 and 8, mounted on the partition plate, 2, each on the side opposite the compartment in which its lamp bulb is disposed. It will be apparent that the spaced relation of the lamps together with the positioning of the lamp sockets on opposite sides of the partition plate, affords a compact arrangement and enables the entire device to be made of relatively small size. The face side or open end of the casing is fitted with a bezel, 9, in which is mounted a colored lens, 10, registering with the tail lamp compartment, 4, and a lens, 11, registering with the signal lamp compartment, 3, and on the surface of which lens there may be provided suitable warning information, such as the word "Stop".

The partition plate as shown in Figures 8 to 11, is provided at its ends with upwardly turned lugs, 12, for engaging the inner wall of the housing for seating the partition plate therein. A supporting bracket, 13, for the socket, 7, is connected to the partition plate, 2, and as shown in Figure 9 is blanked out of the same piece of stock and bent along the dotted lines indicated, with the lugs, 15, 16, 17 and 18 registering with slots, 19, 20, 21 and 22 respectively, and turned over in the usual manner to form a four sided support for the socket,—the front side of the socket support being open as seen in Figure 3 for electrical connections, while at the top of the support is a rectangular opening, 23, through which the base, 5^a, of the signal lamp, 5, extends for engagement in the socket, 7. Lugs, 24, on the support, 13, serve to hold the socket, 7, in position as will hereinafter appear. A circular aperture, 25, is formed in

the partition plate, 2, with an upstanding flange, 26, circumscribing it, and on this flange is secured the tail lamp socket, 8, as by soldering. A depression, 27, is formed in the central rear edge of the partition plate to provide clearance for the conductor plug, 28, mounted centrally in the back of the casing, 1, as shown in Figure 4.

The socket, 7, for the signal lamp comprises a cylindrical portion, 30, for receiving the lamp base, 5^a, with three supporting arms, 31, secured to the cylindrical portion and having their lower ends bent outwardly and around the edges of a sheet of insulating material, 32, such as fibre, which serves as a base for the socket.

A metallic contact member, 33, is positioned on the sheet, 32, with its radially extending tongue, 34, lying upon the insulating sheet and projecting through a clearance opening, 35, in the cylinder and having a pair of oppositely extending arms, 36, clinched around the edges of the insulating sheet, 32, in the same manner as the arms, 31. A second sheet of insulating material, 37, is secured beneath the first and has its margins extending laterally beyond the bent portions of the arms and bent up around them, being secured in place by prick-punching as at 38. This second insulating member prevents electrical connection between the socket and contiguous metallic parts of its support when thus assembled. The lugs, 24, of the socket support, 13, are bent upwardly when the socket base is mounted in the support to lock the base in position. The lamps, 5 and 6, being of the center-contact type, the lamp, 5, is provided with a pair of laterally extending pins, 40, on its base, 5^a, engaged in the bayonet slots, 41, formed in the upper end of the socket cylinder, 30, and held yielding in locked position by a contact spring, 42, which engages the center contact of the lamp, 5, and is itself secured to the radial tongue, 34, of the member, 33. It will be seen that the cylinder, 30, and the lamp base, 5^a, are spaced centrally with respect to aperture, 23, and out of contact with the partition plate, 2. In the electrical circuit the casing, 1, is grounded to the vehicle chassis and as indicated in Figure 2, the circuit includes a main lead wire, 42, connecting a source of electrical energy with a plug, 43, detachably engageable with a single conductor, 44, in the conductor plug, 28.

The single conductor, 44, is split into two branches, 45 and 46; the wire, 45 is connected to the tongue, 34, while the wire, 46, is connected to a switch hereinafter described for controlling the tail lamp, 6. A lead wire, 47, connects the cylindrical socket, 30, to a substantially annular fixed contact member, 48, of a switch for operating the signal lamp. This contact member is formed with a pair of tangs, 49, as seen in Figure 5, bent around and under the edges of an insulating plate, 50, on which it is mounted. A second insulating plate, 51, is secured between plate, 50, and a metallic ferrule, 52, by means of tangs, 53, of said ferrule extending around and over the edges of the insulating plate, 50, as shown in Figures 4 and 5. The ferrule is provided with a reduced annular shank, 54, extending outwardly through an aperture, 55, in the lower rear side of the casing, and has a nut, 56, threaded thereon to hold the ferrule with the insulating plates and switch contact, fixed in the casing. The ferrule and insulating plates are formed with a bore, 57, through which a slidable, flexible, metallic chain 58, extends, the end thereof inside the casing being connected to a coil spring, 59, which is anchored to the partition plate, 2. The aperture, 60, in the contact member is made sufficiently large to avoid contact with the metallic chain, 58, but a disk or flange, 61, is carried by said chain and dimensioned to engage the annular contact member, 48, when the chain is pulled outwardly against the reaction of the spring, 59, thus completing the electrical circuit through the grounded casing to operate the signal lamp. A second disk or flange, 62, is carried by the flexible chain outside of the casing and is normally held against the reduced end of the ferrule by the tension of said spring, 59, for sealing the aperture in the ferrule and rendering the casing weatherproof.

It will be understood that this chain may be connected outside the casing to any suitable mechanism for manipulation at will or automatically with some other control managed by the driver of the vehicle.

By positioning the switch for the signal lamp inside the casing it may be maintained in operable condition almost indefinitely, as the contact members of the switch are not subjected directly to the weather or to the mud, dirt, etc. as in prior constructions wherein the switches have usually been mounted beneath the vehicle. Furthermore, the present construction permits manipulation of the signal lamp by grasping the chain adjacent the lamp so that the functioning thereof may be tested conveniently.

In many localities, the law requires that the vehicle tail light be constructed for manipulation only at the lamp, and to this end, I illustrate in Figures 2, 3 and 4, a switch on the casing for operating the tail lamp. The branch lead wire, 46, is connected to a movable contact disk, 65, on a rod, 66, the outer end of which is threaded into a through nut, 67, which is mounted on a cylindrical bushing, 68, secured in an aperture in the upper rear end of the casing. An annular insulating sleeve, 70, is mounted in the bushing, 68, and supports the rod, 66. A stationary contact, 71, is provided on the end of the insulating sleeve, 70, in position to be engaged by the movable contact, 65, which, however, is normally held away by a spring, 72, on the rod, 66, interposed between the head of the insulating sleeve, 70, and the disk, 65.

A cushion spring, 73, is also provided between said contact member and the head, 66^a, of the rod, 66. As the nut, 67, is threaded onto the rod, the disk, 65, is brought into engagement with the contact, 71, which is connected by a lead wire, 74, to the center contact of the tail lamp socket, 8. The socket is grounded by its mounting on the partition, 2, and thus, with the lamp 6, completes the tail light circuit.

In Figure 12, I have shown a modified electrical circuit for controlling the tail light, 6, at a remote point, such as may be convenient to the driver of the vehicle. In this arrangement, a conductor plug, 80, is provided with two conductors, 81 and 82, detachably connected by a plug, 83, having lead wires, 84 and 85, connected to a source of electrical current. A switch, 86, is interposed in the lead wire, 84, at a point convenient for controlling the tail lamp circuit which is completed by a wire, 87, connecting the conductor, 81, to the socket, 8, of the tail lamp; the conductor, 82, is connected for supplying electrical current to the signal lamp, 5, as previously described, and subject to control of the switch in the lamp casing operated by the pull chain, 58.

In Figure 13 I have reproduced a figure of the drawing of my application Serial No. 523,119 filed December 17, 1921, of which the present application is, in part, a continuation, and which

shows a housing, 100, serving with its enclosed lamp, 105, as a stop signal. The housing is provided with a bushing, 101, through which a plunger, 102, is slidably operable by tension in a connecting link, 103, extending outside the housing. It is to be understood that only a single feed wire is required for this lamp, just as for the stop light shown in Fig. 4, though such feed wire is not illustrated in Fig. 13. The other side of the circuit is grounded through the casing, 100, and as a precaution, an insulator, 104, is inserted between the link, 103, and the pull cable, 113, by which the switch device within the housing, 100, is manually operated. The switch structure includes an insulating covering, 106, for the inner end of the bushing, 101, with an annular contact member, 107, supported thereon. Said contact is electrically connected with the lamp socket by an insulated conductor, 108, and the circuit is completed when the movable contact, 109, carried by the plunger, 102, is pulled against the fixed contact, 107, because the metallic plunger or stem, 102, is constantly in touch with the metallic casing, 100, at the bushing, 101, in which it slides. A spring, 110, however, reacting between the insulating material, 107, and the contact member, 109, holds the latter normally out of touch with the fixed contact, 107.

As shown in Figure 14, a convenient finger ring or handle, 112, is attached to the end of the cable, 113, and the latter is guided by the apertured arm, 114, of a bracket, 111, to a position convenient to the driver's compartment of the vehicle. A second arm, 115, is formed with an aperture and a radially-leading slot, 116, through which the cable may be disengaged from this portion of the bracket so as to allow the ring, 112, and the associated bulbous projection to be drawn back against the bracket arm, 114, when the switch device is left in open or released position. Then by pulling the cable, 113, and engaging it through the notch, 116, the switch may be held closed for any desired period and the finger ring, 112, may be released for that period by the operator.

I claim:—

1. In combination with a metallic casing having an aperture in its wall, a switch device comprising a metallic member slidably mounted in the aperture and in electrical contact relation to the casing, an insulating member fixed in the casing and having an aperture registering with that of said casing, a substantially annular metallic contact member mounted upon said insulating member around its aperture and spaced therefrom to avoid contact with the metallic slidable member, and a metallic flange on the slidable member dimensioned to engage said annular contact, together with a spring which normally holds said flange out of such engagement, said slidable member having a portion which extends outside the casing, whereby the member is accessible for actuation to bring its flange into contact with the annular member.

2. In combination with a metallic casing having an aperture in its wall, a switch device comprising a metallic member slidably mounted in the aperture and in electrical contact relation to the casing, an insulating member fixed in the casing and having an aperture registering with that of said casing, a substantially annular metallic contact member mounted upon said insulating member around its aperture and spaced therefrom to avoid contact with the metallic slidable member, and a metallic flange on the slidable member dimensioned to engage said annular contact, together with a spring which normally holds said flange out of such engagement, said slidable member having a portion which extends outside the casing, whereby the member is accessible for actuation to bring its flange into contact with the annular member, and a second flange on the slidable member located outside the casing and normally held against the outer surface of the casing by tension of the spring for sealing the aperture through which the slidable member extends.

3. In combination with a metallic casing having an aperture in its wall, a switch device comprising a metallic member slidably mounted in the aperture and in electrical contact relation to the casing, an insulating member fixed in the casing and having an aperture registering with that of said casing, a substantially annular metallic contact member mounted upon said insulating member around its aperture and spaced therefrom to avoid contact with the metallic slidable member, and a metallic flange on the slidable member dimensioned to engage said annular contact, together with a spring which normally holds said flange out of such engagement, said slidable member being in the form of a flexible chain attached directly to the end of the spring within the casing and extending continuously through the aperture outside the casing.

4. In combination with a metallic casing having an aperture in its wall, a switch device comprising a metallic member slidably mounted in the aperture and in electrical contact relation to the casing, an insulating member fixed in the casing and having an aperture registering with that of said casing, a substantially annular metallic contact member mounted upon said insulating member around its aperture and spaced therefrom to avoid contact with the metallic slidable member, and a metallic flange on the slidable member dimensioned to engage said annular contact, together with a spring which normally holds said flange out of such engagement, said slidable member having a portion which extends outside the casing, said portion being threaded, and a nut on such threaded portion bearing against the casing whereby rotative adjustment of said nut will serve to actuate the slidable member to bring its flange into contact with the annular member.

PATRICK FOY.