

Aug. 12, 1941.

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2,252,489

SIGNAL SWITCH

Filed March 8, 1940

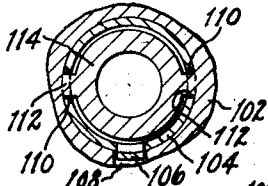


Fig. 6

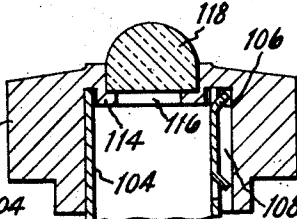


Fig. 7

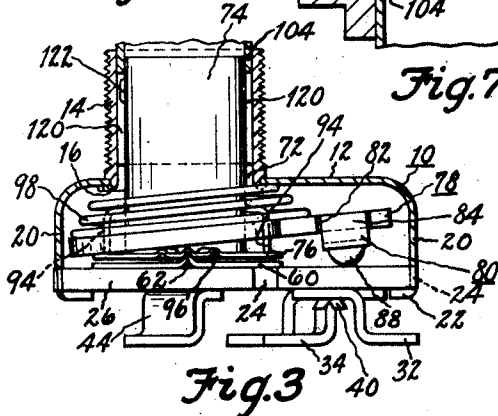


Fig.3

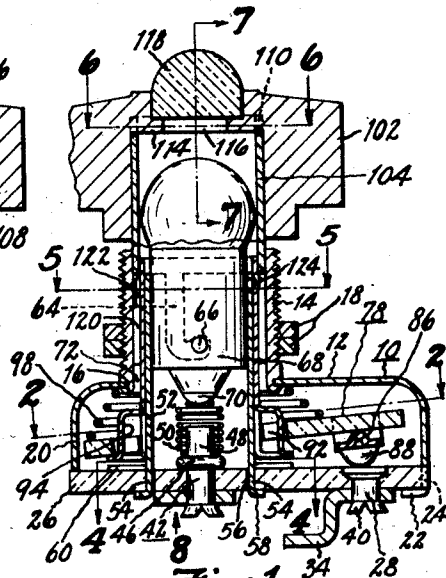


Fig.1

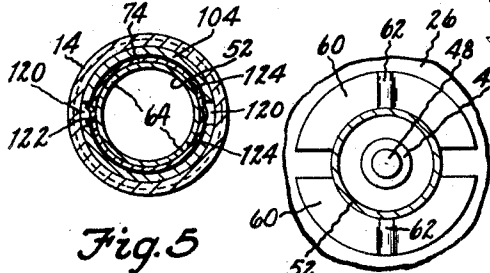


Fig. 5

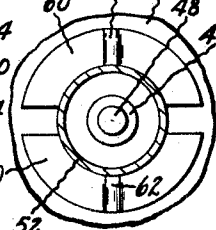


Fig. 4

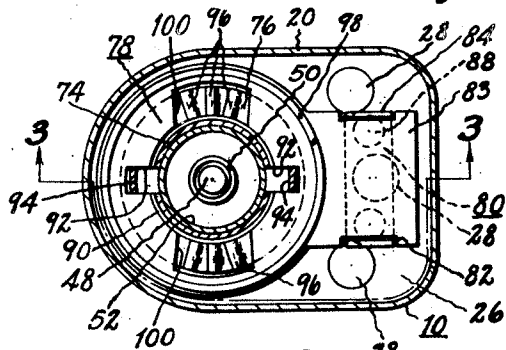


Fig. 2

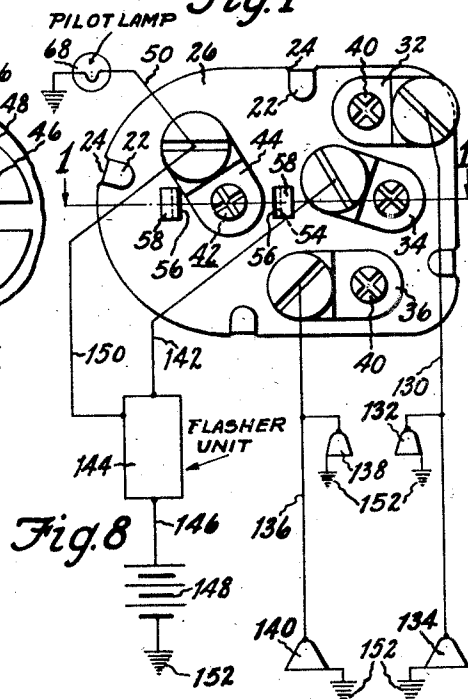


Fig. 8

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2,252,489

SIGNAL SWITCH

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Application March 8, 1940, Serial No. 322,958

9 Claims. (Cl. 200—167)

This invention relates to electric switches, and particularly those of the indicator signal type, wherein an indicator lamp is enclosed within the switch housing structure and such as is adaptable for direction signalling switches.

It is an object of the invention to provide a small compact switch of the type referred to in which a lamp socket provides a pilot, about which the contact mechanism is oscillatable.

A further object of the invention is to rigidly support a lamp socket from a switch back and within a mounting sleeve for an enclosing housing, with coaxial means for actuating a movable contact.

A further object of the invention is to provide a coaxially mounted indicator lamp and switch structure, with means independent of the lamp support for actuating the switch structure.

A further object of the invention is to provide actuating means for a small switch of the type referred to which actuating means will have a large diameter of journalled rotation.

A still further object of the invention is to provide a compact arrangement of the lamp and switch with means coaxial of the lamp for actuating the switch structure without causing any relative movement of the lamp.

The foregoing objects are accomplished by making use of the lamp socket as a fixed pivot or journal for the contact actuator assembly so that the lamp socket, a driving sleeve and an actuating member may be telescopically or coaxially arranged within a tubular mounting sleeve, by which the switch structure is mounted on a support.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred embodiment of the present invention is clearly shown.

In the drawing:

Fig. 1 is a vertical sectional view thru the indicator switch and illustrating the instant invention, it being a section substantially as indicated by the line and arrows 1—1 of Fig. 8.

Fig. 2 is a transverse sectional view thru the switch housing illustrating the contact actuator assembly in plan, it being a view substantially as indicated by the line and arrows 2—2 of Fig. 1.

Fig. 3 is a vertical sectional view thru the switch housing showing the contact actuator assembly and related parts in elevation substantially as indicated by the line and arrows 3—3 of Fig. 2.

Fig. 4 is a view in plan showing details of the ratchet or detent mechanism with certain parts

in section substantially as indicated by the line and arrows 4—4 of Fig. 1.

Fig. 5 is a transverse sectional view substantially as indicated by the line and arrows 5—5 of Fig. 1.

Fig. 6 is a transverse sectional view illustrating a detail of the actuator mechanism substantially as indicated by the line and arrow 6—6 of Fig. 1.

Fig. 7 is a vertical section substantially as indicated by the line and arrow 7—7 of Fig. 1.

Fig. 8 is a bottom plan view of the switch construction substantially as indicated by the arrow 8 of Fig. 1, with a schematic indication of circuit connections thereto as adopted for a signal indication circuit.

With specific reference to the drawing, 10 indicates a switch housing of elongated form fashioned from sheet metal whose bottom wall 12 is apertured at one end to receive a mounting sleeve 14 secured thereto by turning over a flange as at 16.

The sleeve 14 is exteriorly threaded to receive a pair of clamping nuts 18 by which the housing may be mounted upon a support such as an instrument panel or bracket. The housing 10 has depending continuous side walls 20 ending in tongues 22, adapted to be received by peripherally arranged notches 24 of a switch back and terminal board 26 against which they are bent over for retaining the housing and terminal board in assembled relation.

The terminal board 26 has arranged at one end an arcuate row of terminal rivets 28 countersunk into the inner face of the board as indicated in Fig. 1. The outer ends of the rivets pass through terminal lugs 32, 34 and 36 where they are expanded as at 40. At the geometric center of the row of contacts 28, there is another terminal stud 42 which is located coaxially of the mounting sleeve 14 and operates to secure a terminal lug 44 rigidly against the outside of the terminal board 26. The inner end of the terminal stud 42 provides a shoulder 46 abutting the inside surface of the terminal board and ending in an extension 48 providing a seat for a helical spring 50, frictionally retained thereon.

Centralized about the terminal stud 42 there is a tubular pivot post 52 that is rigidly and securely mounted on the terminal board 26 by means of tongues 54 passing thru apertures 56 and bent over as at 58. The end of the tubular member between the tongues 54 is flared outwardly to provide flange portions 60 that are pressed in abutting relation against the inside

of the terminal board 26. At diametric points, such as 62, the flange portions 60 are provided with radially extending ribs that are upstanding away from the terminal board 26 and contribute to detent and ratcheting of the construction, as will presently be explained. The remote end of the sleeve 52 is provided with bayonet slots 64 adapted to receive a pin 66 of a lamp base 68, the lamp having a central contact 70 adapted when the lamp is in position to engage the free end of the spring 50, hereinbefore referred to. The free end of the pivot post 52 extends coaxially of and concentric with the mounting sleeve 14, but is of sufficiently smaller diameter to leave an annular space 72 therebetween.

Disposed in the annular space 72 there are means provided for controlling the switch contacts, which comprise a tubular driving member 74 having a flange 76, and a contact carrier 78 having driving connection therewith. The driving sleeve 74 closely embraces the lamp socket 52 as a journal bearing so as to be capable of oscillating the bridging contact 80, carried by the contact carrier, into bridging relation with respect to adjacent pairs of the contacts 28. The contact carrier 78 is preferably fashioned from a sheet of insulation material to include an arm 83 with oppositely disposed notches 82 receiving end flanges 84 bent up from the contact member 80, the contact member having also a pressure pad 86 engaging the underneath side of the arm 83 so that the contact may rock upon the carrier as its contact points 88 slide over the switch back and engage the contacts 28. The main portion of the contact carrier 78 is apertured at 90 for reception of the driving sleeve 74, and has a pair of radially extending notches 92 leading outwardly from the periphery of the aperture 90 for reception of loops or shoulders 94 struck outwardly from the juncture of the flange 76 with the sleeve 74, the details of which are clearly shown in Figs. 1, 2 and 3.

The flange 76 of the driving sleeve 74 is formed at portions midway between the driving elements 94 with a series of depressed or notched portions 96 facing downwardly as viewed in Fig. 3, so as to cooperate with the radially extending rib 62 of the flange 60, thereby providing ratcheting or detent provisions to hold the contact mechanism in the selected position. A spring 98 disposed against the bottom wall 12 of the housing and the contact carrier 78 maintains the contact member and its carrier along with the driving sleeve 74 yieldingly urged against the back wall or terminal board 26 of the housing. So that there will be no interference with the ratcheting provisions, and so that the contact assembly will always be urged against the terminal board, the contact carrier 78 has laterally extending notches 100 extending radially from the opening 90 and so disposed as to be laid over the bank of detent members 96. By that construction the contact structure thence has a three point suspension against the switch back, in that one end thereof is supported by the two contact elements 88 engaging the inner surface of the terminal board 26 while the opposite end rests against the flange 76 at the region of the driving member 94 on the diametrically opposite side of the driving sleeve 74.

For driving the sleeve 74 there is a manual member including a hub 102 within which is anchored a sleeve member 104 which may be accomplished by providing the outwardly extending lugs 106 forming a keyed relation with the hub

by means of a key way 108. Other driving relations may be incorporated, substituted or added which will include notches 110 in the end of the tube 104 that engage about integrally formed webs 112 connecting the main portion of the hub 102 with an axial extension 114. At any rate, the axial extension 114 is provided with a counter-sunk bore 116 within which is securely fitted a transparent or translucent member 118 adapted to pass illumination from a lamp secured in the socket member 52. The sleeve member 104 is of such length and of that dimension to extend from the hub 102 well into the mounting sleeve 14 and be capable of turning therein freely, and is provided with a driving connection for the member 74 which it closely and firmly engages thru the facility of longitudinally extending slots 120 adapted to receive one or more feather portions 122 struck outwardly from the body of the metal forming the driving sleeve 74. To insure a tight connection between the member 74 and 104 the driving sleeve is provided with a plurality of outwardly directed pressure pads 124 adapted to engage the inside surface of the sleeve 104, and one of these may act as a key to seat in the aforementioned slot 120, substantially as indicated in Fig. 5.

With the parts thus constituted and assembled the switch construction is adapted for mounting upon a support which is accomplished by pulling the manual member with its attached sleeve 104 from the coaxial nested relation between the mounting sleeve 14 and the driving member 74. That is permissible because of the fact that the key portions 122 and 124 will slide out of the open end of the slots 120. Removal of one of the nuts 18 permits passing the threaded portion of the sleeve 14 thru a hole in the instrument panel or other mounting means, after which the clamping nut 18 may be replaced and properly adjusted so as to hold the switch construction firmly on the support in a desired relation.

Fig. 8 illustrates one system of including the switch construction in a signal indicating circuit, in that the terminal member 32 is connected by line wire 130 with signal indicating lamps 132 and 134 on one side of the vehicle, while the terminal member 36 is connected by a line wire 136 to the lamps 138 and 140 on the other side of the vehicle. A line 142 connects the terminal member 34 with one output terminal of a flasher unit 144, to which a lead 146 conveys current from a battery 148, and from which flasher unit 144 another line wire 150 communicates with the terminal member 44 and from which circuit indications to the pilot lamp are indicated by the reference numerals 50 and 68 comparable with the parts illustrated and so designated in Fig. 1. All of the ground connections are indicated by the reference numeral 152. From the foregoing it will be observed that whenever the manual member 102 is oscillated, the oscillatable movement will be conveyed to the contact carrier 78 thru the sleeve portion 104, driving sleeve 74, and loop and notch provisions 94 and 92, which will cause the bridging contact member 80 to move from the neutral position shown in Fig. 2, to either side thereof, whereupon the contact elements 88 will engage two of the contact members 28 and thence bridge them in the circuit so that energy from the battery 148 will pass thru the flasher 144, and then through the two branches 142 and 150. From the flasher 144 the branch 142 will conduct current thru the lamps on one side of the vehicle to ground at 152, and the branch thru wire 150 will cause current

to traverse the pilot light and back to ground, as a result of which closing of either circuit will be indicated by the flashing of the pilot lamp observable thru the window element 118. Due to the fact that a large pivot post is provided for the oscillatable contact, even tho the switch operates thru a small arc, the construction can be built and caused to operate within small limits. A firm and position ratchet and detent relation will be established, and completion of either circuit will always be indicated.

While the embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. In a signal switch, the combination comprising, a housing having a tubular mounting sleeve, a switch back closing the housing and providing a plurality of fixed contacts, a tube secured to the switch back and arranged to extend coaxially with the housing sleeve, said tube having flanged portions abutting the surface of the switch back, a contact actuator journaled about the tube and adapted to selectively bridge two of the fixed contacts, and means including a second sleeve coaxial of the tube for driving the contact actuator, said means having a flange engageable with the tube flange.

2. The combination set forth in claim 1, wherein cooperable ratchet and detent means are provided by the flanges of the tube and driving means.

3. In a signal switch, a housing, a terminal board closing the housing, a lamp socket secured to the terminal board, means disposed about the lamp socket for mounting the housing on a support, a contact actuator journaled about the lamp socket, and ratcheting provisions comprising superimposed parts of the lamp socket and contact actuator.

4. In a signal indicator switch, the combination comprising, a terminal board, a lamp socket rigidly secured to the terminal board, a driving sleeve journaled about the lamp socket, a contact carrier driven by said sleeve, a housing having a tubular mounting sleeve extending over the

lamp socket, and an actuating member having a tubular portion coaxial of the lamp socket and disposed between the driving sleeve and mounting sleeve so as to completely enclose a lamp bulb seated in said socket.

5. A switch comprising in combination, a terminal board providing a plurality of fixed contacts, a contact carrier adapted to oscillate for bridging selected ones of the fixed contacts, a large diameter pivot for said contact carrier comprising a flanged tube secured to said terminal board, the flange of said tube abutting the terminal board, a driving sleeve disposed about the tube and having a flange engageable with the tube flange, said driving sleeve having outwardly struck loops adapted to engage notches of said contact carrier, whereby said contact carrier is driven upon actuation of said sleeve.

6. The combination set forth in claim 5, wherein one of said flanges has a single radially extending rib disposed to engage one or another of a plurality of radially extending grooves provided by the other flange.

7. The combination set forth in claim 5, wherein cooperable ratcheting provisions are provided by the flanges of the tube and sleeve.

8. The combination set forth in claim 5, wherein cooperable ratcheting provisions are provided by the flanges of the tube and sleeve, said contact carrier resting upon the flange of said driving sleeve and having cutouts disposed over the said ratcheting provisions.

9. In a signal switch, the combination comprising, a terminal board providing an arcuate row of fixed contacts, a tubular pivot post secured to the terminal board at the center of said arc, said pivot post having an outwardly extending flange engaging the terminal board and having diametrically arranged radially extending detent ribs, a movable contact oscillatable about said pivot post and adapted to ratchet over said rib, a terminal stud carried by the terminal board at the axis of said pivot post and supporting a helical spring, a lamp bulb carried by the pivot post and engageable with said spring, and means enclosing the lamp bulb for actuating the movable contact.

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