July 25, 1939. A. J. SHABACK 2,167,253

PULL SWITCH

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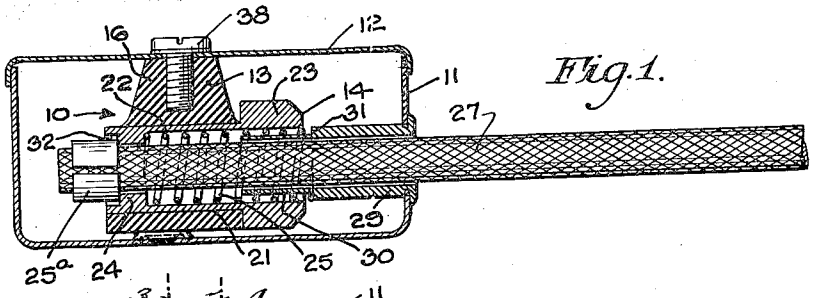


Fig. 1.

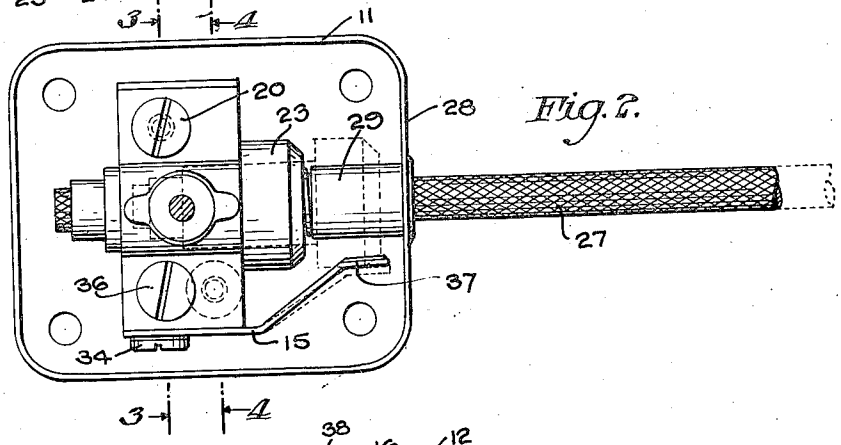


Fig. 2.

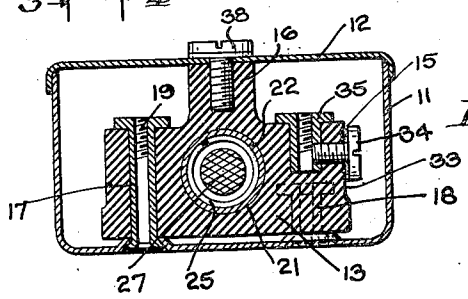


Fig. 3.

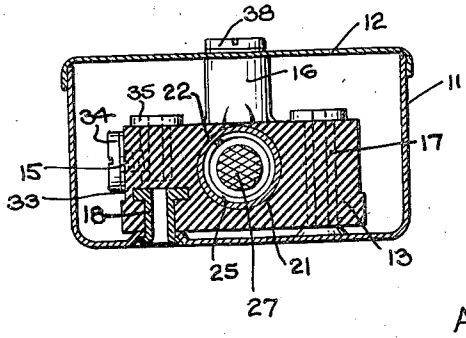


Fig. 4.

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PULL SWITCH

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3 Claims. (Cl. 200—161)

This invention relates to electric switches and more particularly to an improved construction of pull switch of the type employed in railway and automotive vehicles in which a cable running the length of the vehicle is so connected to the switch that the latter is operated by pulling on the cable at any point thereof. The switch, of course, operates to close the circuit leading to a suitable signal device, either of the audible type or the visual type, the signal device being located within the hearing or view of the operator of the vehicle.

It is among the principal objects of the present invention to provide a cable-actuated signal switch which is not only exceedingly compact in design, inexpensive to manufacture and rugged in construction, but which is also designed for such operative association with the actuating cable as to eliminate the necessity of tying knots in the cable and employing relatively expensive devices for securing the cable to the movable element of the switch.

A more specific object of the present invention is to provide a switch of the above described character wherein all of the operating parts thereof are fully enclosed and are reduced to a minimum number and wherein provision is made for securing the cable extremity to the movable element of the switch interiorly of the switch box or casing, the connection between the cable and switch element being of such simple character as to occupy a minimum of space, thus making possible a substantial reduction in the overall size of the switch unit without sacrificing in any respect its ruggedness or durability.

Other objects and advantages of the invention will appear more fully hereinafter, it being understood that the invention consists substantially in the combination, construction, location and relative arrangement of parts, all as will be described hereinafter, as shown in the accompanying drawing and as finally pointed out in the appended claims. In the said accompanying drawing:

Figure 1 is a longitudinal sectional view of the switch unit constructed in accordance with and embodying the principles of the present invention;

Figure 2 is a top plan view thereof with the cover of the switch casing removed;

Figure 3 is a sectional view taken on the line 3—3 of Figure 2; and

Figure 4 is a sectional view taken on the line 4—4 of Figure 2.

Referring now more particularly to the drawing, it will be observed that the switch, as constructed in accordance with the present invention and which is designated generally by the reference numeral 10, is housed within a protective casing or box 11 having a removable cover 12. The switch unit 10 generally comprises a main insulating body 13, a movable switch element 14 and a switch contact member 15. The insulating body 13, which is provided with an upwardly projecting interiorly threaded boss 16, is rigidly secured to the bottom wall of the casing 11 by a pair of laterally spaced tubular rivets 17 and 18. As appears most clearly in Figures 3 and 4, these tubular rivets each have their lower ends upset in countersunk apertures formed in the bottom of the casing 11, the rivet 17 being interiorly threaded at its upper end, as at 19, for reception at a terminal screw 20, the latter being employed to connect a lead (not shown) from one terminal of the signal device (also not shown). It will be observed that the tubular rivet 17 is thus in metallic contact with the casing or box 11. The other tubular rivet 18 does not project entirely through the insulating body but instead is so imbedded therein that while it serves to secure the insulating body to the bottom wall of the box 11, it does not serve as an electrical conducting element.

The insulating body 13 is provided with a bore 21 extending longitudinally therethrough and slidably projected through this bore is the movable switch element 14, the latter being in the form of a metallic sleeve 22, the forward portion 23 of which is of enlarged external diameter. The rear extremity of the slidable metallic sleeve 22 is provided with an internal radial flange 24, opposite surfaces of which respectively constitute abutments for a coiled compression spring 25 and the securing clip 25a of the cable 27.

Rigidly secured to the front wall 28 of the casing 11 is a tubular guide member 29, this member being coaxially alined with the bore 21 of the insulating body and the sleeve 22 slidable therein. As appears most clearly in Figure 1, the guide member 29 is of reduced external diameter in its rear portion 30 to provide an annular shoulder 31 against which abuts the fore end of the compression spring 25. The forward portion of this spring embraces the reduced portion 30 of the tubular guide member 29, the movable sleeve 22 being adapted to telescope over the forward portion of the tubular guide member against the action of the compression spring which normally tends to urge the sleeve 22 rearwardly into the position shown in Figure 1. This rearward move-

ment of the sleeve 22 through the bore of the insulating body is limited by the engagement of the enlarged portion 23 of the sleeve against the front face of the insulating body.

The forward motion of the sleeve 22 through the bore of the insulating body is effected by pulling upon the cable 27 which extends through the axially alined bores of the guide member 29 and the sleeve 22, the rear terminal end of the cable having clampingly secured thereto the clip 25a heretofore referred to. This clip is securely crimped to the cable against removal therefrom and is of a diameter permitting it to be snugly received within the socket 32 formed on the rear side of the internal flange 24 of the slidable sleeve 22.

Secured to the face 33 of the insulating body 13 is the switch contact member 15, this member being secured in position by a screw 34 which threadedly engages and so is in electrical contact with a terminal member 35 embedded in the insulating body. A terminal screw 36 secures a lead from the source of electrical supply (not shown) to the terminal member 35 (see particularly Figures 2 and 3). The free extremity of the contact member 15 projects forwardly of the insulating body and is bent inwardly so that the portion 37 thereof lies in the path of movement of the slidable sleeve 22. Normally, i. e. when there is no pull exerted upon the cable 27, the sleeve 22 is maintained in its retracted position by the compression spring 25, the contact member is electrically insulated from all metallic parts of the switch unit including the movable sleeve 22, as a result of which the electrical circuit through the switch is interrupted. However, upon pulling the cable 27 forwardly, the sleeve 22 engages the extremity 37 of the contact member 15 in consequence of which the circuit through the switch is closed, the current then passing from the terminal screw 36 through the contact member 15 to the sleeve 22, the guide member 29, the casing 11, the rivet 17 and finally to the terminal screw 20. This circuit is immediately broken upon releasing the cable, thus permitting the compression spring to effect the retraction of the sleeve into a position out of contact with the contact member 15.

The lid or cover 12 of the casing is detachably secured in position by means of a screw 38 which threadedly engages the upstanding integral boss 16 of the insulating body 13.

It will be understood, of course, that the invention as hereinbefore described may be changed in its constructional details without departing from the general principles thereof as set forth in the appended claims.

What is claimed as new and useful is:

1. In a switch of the character described, in combination, a casing, an insulating body fixed in said casing, a tubular electrical contact member slidably associated with said insulating body, a relatively fixed electrically conductive tubular guide member extending partially into the bore of said slidable contact member to guide the latter in its movement, a contact finger normally insulated from said contact member, and a cable extended through the axially aligned bores of said guide member and contact member and secured to the latter for axially drawing the same into electrical contact with said contact finger.

2. In a switch of the character described, in combination, a casing, an insulating body fixed in said casing, a tubular electrical contact member slidably associated with said insulating body, a relatively fixed electrically conductive tubular guide member extending partially into the bore of said slidable contact member to guide the latter in its movement, a contact finger normally insulated from said contact member, and a cable extended through the axially aligned bores of said guide member and contact member and secured to the latter for axially drawing the same into electrical contact with said contact finger, said tubular contact member being spring-pressed to normally maintain the same in retracted insulated relation with respect to said contact finger.

3. In a switch of the character described, in combination, a casing, an insulating body fixed in said casing, a tubular electrical contact member slidably associated with said insulating body, a relatively fixed electrically conductive tubular guide member extending partially into the bore of said slidable contact member to guide the latter in its movement, a contact finger normally insulated from said contact member, a cable extended through the axially aligned bores of said guide member and contact member and secured to the latter for axially drawing the same into electrical contact with said contact finger, and a pair of conductor terminals provided in said insulating body and respectively connected electrically to said tubular contact member and said contact finger.

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