March 26, 1940. E. T. MARSHALL 2,194,831

SAFETY SWITCH OPERATOR

Filed April 1, 1939

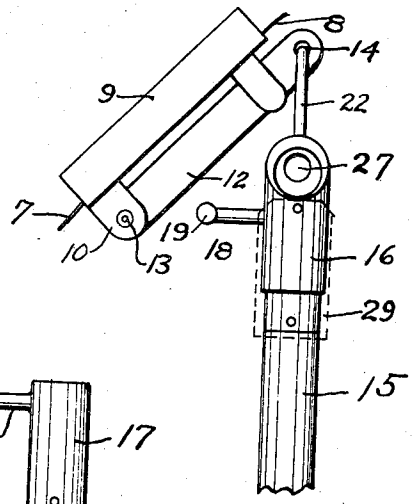


FIG. 1

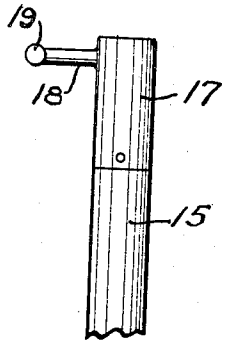


FIG. 3

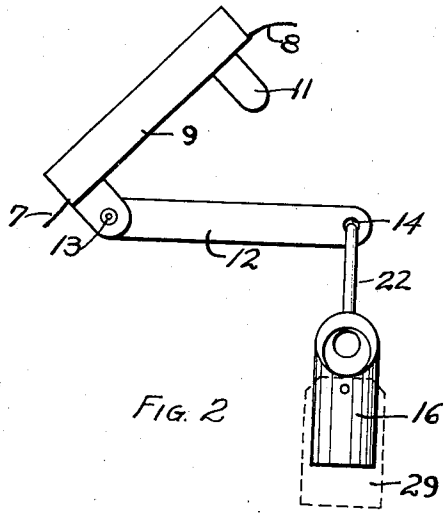


FIG. 2

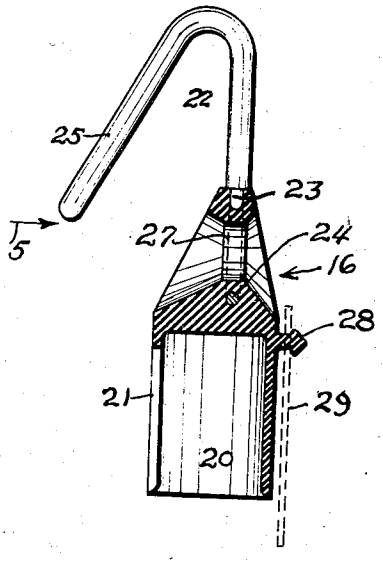


FIG. 4

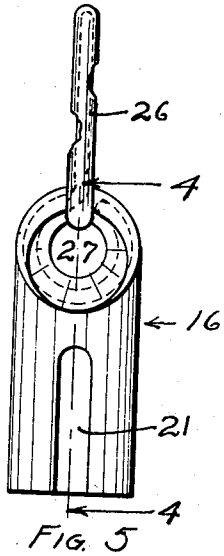


FIG. 5

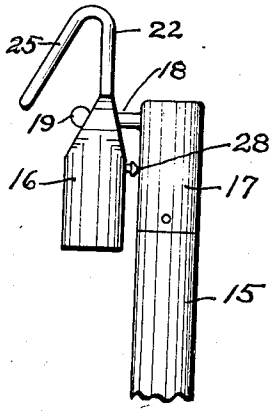


FIG. 6

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SAFETY SWITCH OPERATOR

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2 Claims. (Cl. 81—3)

This invention relates to improvements in high tension switch operators and taggers.

In high tension distribution systems, especially at transformer stations, alternating current circuits of high voltages must be controlled and for this purpose suitable knife switches are employed and these are nearly always so positioned that they cannot be reached without the use of a long pole of insulating material. Such switches must be operated with great care, not only so as to prevent injury to the person operating the switch, but also to prevent injury to workmen and/or others who may be engaged in repair work, or who, for other reasons, may be in contact with portions of the distribution system controlled by the switch or switches under consideration. When such high tension switches are opened, it is quite essential that they shall be tagged in such a way that unauthorized parties can see when and under what conditions they may be closed.

It is the object of this invention to produce a safety device for opening and closing high tension switches that shall afford the operator a maximum amount of safety from shock and which also provides a simple and convenient means for tagging the open switches.

This invention, briefly described, consists of a body member of natural or artificial rubber or of any other high insulating material and which is provided at one end with a socket for the reception of one end of a pole or handle of insulating material. The other end of the insulating body has a hook, one end of which is embedded therein. The pole is preferably provided with a pin projecting laterally therefrom and the wall surrounding the socket has an opening for the reception of the pin. The insulating body is also provided with a transverse opening into which the pin may be inserted for effecting a pull on a switch blade for opening the switch. The insulating body is also provided with a lateral headed projection to which a tag may be attached.

Having thus briefly described the invention, the same will now be described in greater detail and for this purpose reference will be had to the accompanying drawing in which the invention has been illustrated in its preferred form and in which:

Figure 1 is a side elevation of a single pole knife blade switch showing the operator in position as the parts appear just after the switch has been closed or just after the operator has been attached, preparatory to opening the switch;

Figure 2 shows the switch in open position with the tagging device attached;

Figure 3 is a side elevation of the upper end of the operating pole;

Figure 4 is a section taken on line 4—4, Figure 5;

Figure 5 is a side elevation of the insulating body, looking in the direction of arrow 5, in Figure 4; and

Figure 6 is a side elevation showing the position of the parts during the operation of opening the switch.

In the drawing reference numerals 7 and 8 indicate two parts of a high circuit conductor and reference numeral 9 the insulating base of a single pole single throw switch having switch contacts 10 and 11 and a switch blade 12 that is pivoted at 13. The switch blade is provided with an opening 14 in its movable end. The switch is merely illustrative of a switch for this purpose and can be replaced by any switch suitable for the purpose under consideration. It is contemplated, however, that the switch shall have a movable blade with an opening at its free end, as this is quite customary in switches of this type. As above stated, such switches are usually located out of reach of the ordinary operator and sometimes as high as twenty feet above the ground and can be reached only by means of a long pole provided with a hook so that the operator can make connection with the switch blade for opening and closing the same.

The present invention resides in means for opening and closing the switch and for supporting a tag, the function of the tag being to provide means for giving a direction for operating the switch.

In the drawing the insulating pole has been indicated by reference numeral 15 and the body member of insulating material to which the pole is attached has been designated by reference numeral 16. These two parts cooperate to form an operating means for the purposes under consideration. The pole may be made of dry wood or of a tube of vulcanized rubber, or of any other suitable high insulating material and is provided at one end with a furrule 17, from which a finger 18 extends laterally and terminates in an enlarged end portion 19. The body member 16 is formed from moldable rubber, or rubber-like material, preferably from natural rubber, although it may be made from synthetic rubber, or any other suitable insulating material

having the required strength and insulating properties. This insulating body member comprises a cylindrical portion which is provided with a socket 20 that opens from the lower end thereof, and the wall of the socket has an elongated slot or opening 21 for the reception of the finger 18. A hook 22 formed from a steel bar 23 that is provided at one end with a circular loop 24 and has its free end reversibly bent so as to form a downwardly extending hook member 25, has its loop end molded in the material of the insulating body member in the manner shown in Figures 4 and 5. That part of the hook which extends beyond the body member is covered with a layer of rubber, or insulating material, which has been designated by reference numeral 26 and which is shown broken away in Figure 5. The insulating body has an opening 27 that extends entirely through the same and which is concentric with the loop 24. The ends of the opening 27 are outwardly baring at both sides so as to form inwardly tapering surfaces that serve to facilitate the insertion of the finger 18 when the latter is to be so connected to the insulating member for the purpose of opening the switch, as will presently appear.

Referring now more particularly to Figure 6, it will be seen that the finger 18 is positioned in the opening 27 and it is therefore possible to exert a pull on the bar 15 without disconnecting it from the insulating body member. Extending from one side of the insulating body member is a headed projection 28, to which a tag 29, shown dotted in Figures 1, 2 and 4, can be attached. These tags are provided with an opening somewhat smaller than the head of the projection 28 and are forced over the latter and will therefore be securely held in position since the head expands, after it has passed through the tag, and becomes larger than the opening.

Let us now assume that an attendant is provided with a switch operator and tagger constructed in the manner shown on the drawing and described herein, and that he desires to open the switch shown in Figure 1. He will first introduce the end 17 of the insulating handle into the socket 20 in such a position that the finger 18 projects through the slot 21. The insulating body member with its hook 22 is now quite rigidly connected with the pole and the attendant can then introduce the hook into the opening 14. Since the pole is merely connected with the insulating member by friction when in the position shown in Figure 1, it is evident that any pull exerted on the pole will separate the two parts of the operating means and the pole is therefore disconnected from member 16 and the finger 18 is inserted through opening 27 in the manner shown in Figure 6. It is now possible to exert a strong pull on the pole and thus move the switch blade to the open position shown in Figure 2. Before the switch is opened, a tag 29 having the proper instructions written thereon is attached to the projection 28, as shown dotted in Figures 1, 2 and 4. When the switch is to be closed, the attendant introduces the end 17 of the pole into the socket and exerts an upward push on the pole, thereby moving the switch to closed position. The body member 16 can now be removed and employed in connection with another switch, if desired.

It will be apparent from the above that the body member 16, together with the tag, is supposed to remain attached to the switch when the latter is in open position, so that the proper instructions for closing the switch will be attached to each switch when it is in open position.

From the above description, it will be seen that a simple switch operating means has been produced which, when properly constructed, has sufficient insulating value to enable it to be safely used in connection with switches carrying the highest available voltages and that by the two part construction, it is possible to conveniently attach tags to the switch when in open position, thereby enabling other attendants to learn from such tags the reason for maintaining the switch in open position, and thereby preventing them from accidentally closing the same prematurely, which would in many cases, result in damage, and perhaps the death of workmen engaged in repairs or extensions of the electric circuit control by such switch.

Having described the invention what is claimed as new is:

1. A switch opening device comprising in combination, an operating pole having a pin projecting laterally therefrom adjacent one end thereof, a body member of insulating material having one end provided with a socket for the reception of one end of the operating pole, the wall of the socket having a longitudinally extending opening for the reception of the pin, the thickness of the wall being less than the length of the pin, the other end of the body member having embedded therein one end of a metal hook, the end of the hook which is embedded in the body member being bent into a loop, the body member having an opening which passes through the loop, said opening serving to receive the laterally projecting pin, whereby tension can be applied to a movable switch member through the interconnected pole and hook carrying body member.

2. A switch opening device, comprising, in combination, a body member of insulating material having one end provided with a socket, an operating pole having a pin extending laterally therefrom adjacent one end thereof, the wall of the socket having a longitudinally extending opening for the reception of the pin when the end of the pole is inserted into the socket, the other end of the body member having embedded therein one end of a metal hook, the body member having a transverse opening spaced from the bottom of the socket, the embedded end of the hook having a portion positioned between the bottom of the socket and the transverse opening, the transverse opening serving to receive the laterally extending pin whereby tension can be applied to a movable switch member through the interconnected pole and hook carrying body member.

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