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A. COHN ET AL
SWITCH CONTACT FINGER
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Fig. 1.

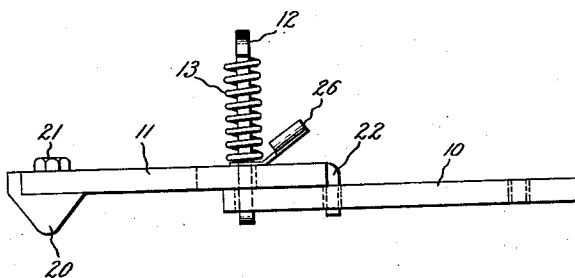


Fig. 2.

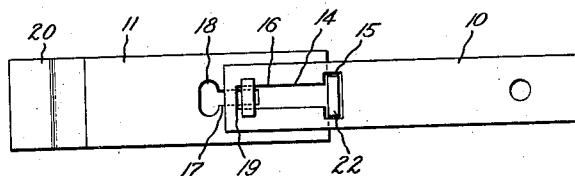


Fig. 3.

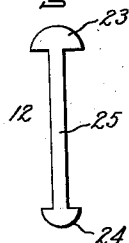
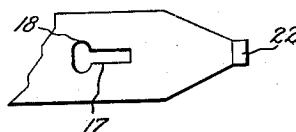


Fig. 4.



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UNITED STATES PATENT OFFICE

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SWITCH CONTACT FINGER

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The invention relates to contact fingers for electric switches, particularly contact fingers constructed to permit the ready and convenient removal and replacement of the contact elements without the use of tools.

With such contact fingers, ordinarily there is considerable chance of accidental displacement or even disengagement of the contact elements during service due to the readily detachable construction that is intended to permit easy removal of the contact elements at will.

The principal object of the present invention is to provide an improved construction of contact finger that not only readily permits removal and replacement of the contact element at will without the use of tools, but also effectively insures against accidental derangement or disengagement of the contact element under service conditions.

In accordance with the preferred form of the present invention, the contact element is secured to its cooperating supporting member by means of a double headed bolt which passes through slots, preferably of keyhole shape, formed in the contact element as well as the support and carries a spring for yieldingly pressing the contact element into engagement with the support. Removal and replacement of the contact element is effected simply by manipulating the headed bolt so that it may be retracted through the slots and thereby release the contact element. The keyhole shape of the slots permits the body of the bolt to be slid into the restricted portions thereof and thereby insure against accidental displacement of the parts. To further insure that the contact and support are maintained in operative engagement, one of these elements preferably is provided with a projecting lug or tongue that fits into the slot in the other element thereby preventing accidental disengagement of the bolt from the restricted portions of the keyhole slots. Also with the body of the bolt of rectangular or other non-circular cross section the bolt as well as the interconnected contact and support are prevented from turning beyond a limited amount.

One form of contact finger construction-em-

bodiment of the present invention is shown in the accompanying drawing in which Fig. 1 is a side view showing the general arrangement of the contact finger; Fig. 2 is a bottom plan view of the finger showing more clearly the arrangement of the bolt in the cooperating slots in the contact element and support; Fig. 3 shows the form of the headed bolt and Fig. 4 shows a modified construction of the shank of the contact element.

As shown in Fig. 1, the improved contact finger comprises the supporting element 10 upon which the contact element 11 is mounted and secured in place by the ready removable bolt 12 and the spring 13. As shown more clearly in Fig. 2, the support 10 is provided with a slot 14 of keyhole shape having an enlarged portion 15 and an elongated restricted portion 16. The contact element 11 likewise is provided with a slot 17 of keyhole shape having an enlarged portion 18 and a restricted portion 19. A suitable contact tip 20 is fixedly secured to one end of the contact element 11 by the bolt 21 as shown, altho, it will be understood that the tip may be secured by other means such as riveting, welding or even may be formed integral with the contact element if desired. The other end of the contact element is provided with a projection, preferably in the form of a bent over tongue 22 as indicated, of a suitable size to fit into the enlarged portion 15 of the slot in the supporting element 10.

The double headed form of the bolt 12 is shown in Fig. 3 and the head 23 is sufficiently enlarged to engage with the convolutions of the spring 13 while the head 24 may be smaller, as indicated in the drawing, to facilitate the assembling of the spring 13 and the bolt. Furthermore, the head 24 of the bolt is proportioned to readily pass through the keyhole slots 14 and 17, respectively, in the support and the contact element, as will be more fully pointed out in connection with the manner of assembling and disassembling the contact element. The body portion 25 of the bolt is of rectangular cross-section and proportioned to fit snugly into the restricted portion 19 of the slot 17, as shown in Fig. 2. If desired, a cable connector terminal 26 may be

provided as shown in Fig. 1 for connecting a current conductor to the contact finger. However, connection may be made directly to the supporting element 10 if desired and the current will be conducted to the contact element 11 through the tongue 22 and the bolt 12 as well as the other engaging portions of the contact element and the support.

In assembling the various parts of the contact finger, the spring 13 is first placed upon the body 25 of the bolt 12 by slipping the spring over the head 24 or in any other suitable manner. The end 24 of the bolt then is passed through the slot 17 in the contact element and with the body portion 25 of the bolt in the enlarged portion 18 of the keyhole slot, the bolt is rotated 90° and the body of the bolt pushed into non-rotatable engagement with the restricted portion 19 of the slot. After this, the headed end 24 of the bolt is passed through the enlarged portion 15 of the slot 14, thereby compressing the spring 13. Then the bolt together with the contact element 11 is slid along to bring the body of the bolt to the end of the restricted portion 16 of the slot 14 and the tongue 22 into the enlarged portion 15 of the slot 14. The various parts of the contact finger are now assembled in their operating relation with the keyhole slots disposed in reversed overlapping relation, as shown in Fig. 2. Due to the compression of the spring 13 during the assembling operation, the contact element 11 is firmly pressed against the supporting element 10, thereby insuring that the tongue 22 remains in engagement with the enlarged portion 15 of the slot in the support. However, the contact element 11 is free to yield readily upon the engagement of the tip 20 with a co-operating contact element such as the segment of a drum controller or the like.

As the body 25 of the bolt 12 is of rectangular section, it engages with the sides of the restricted portion 19 of the slot 17 and thereby effectively prevents any rotation of the bolt in the slot. However, limited lateral displacement of the contact element relative to the supporting element is permitted by the loose engagement of the sides of the body of the bolt with the restricted portion 16 of the slot 14. Furthermore, the contact element 11 is free to tilt about its longitudinal axis to a limited extent so as to readily permit the contact tip 20 to align itself with a cooperating contact.

In order to obtain a greater tilting movement of the contact element 11, the end thereof having the upturned tongue 22 may be tapered, as indicated in Fig. 4. In this case, the tongue 22 acts somewhat as a swivel or ball joint more readily to permit tilting of the contact element 11 about its longitudinal axis.

In removing the contact element 11, the procedure is just reversed from that previ-

ously described in the method of assembling. The tongue 22 first is lifted out of the slot against the compression of spring 13 and the contact element 11, together with the bolt 12, slid to the right to permit the head 24 of the bolt to be retracted first from the slot in the supporting element 10 and then disengaged from the slot in the contact element 11.

From the foregoing, it will be observed that the present invention provides a contact finger construction in which the contact element may be easily removed or replaced upon the supporting element without the necessity of using a rivet, screw, or other fixed connection requiring the use of tools. At the same time, when the various parts of the contact finger are assembled in operative relation there is practically no opportunity for derangement or disengagement of the parts of the finger during service.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A contact finger comprising a supporting element and a contact element, each having a slot therein of substantially keyhole shape and one of said elements having a projection adapted to engage the enlarged end portion of the key-hole shaped slot of the other element when the restricted ends of the key-hole shaped slots in the two elements are disposed in reversed overlapping relation, and a headed bolt proportioned to separately pass through the slot in each element for detachably locking the elements together with the key-hole slots therein disposed in said reversed overlapping relation.

2. A contact finger comprising a supporting element and a contact element, each having a slot therein of substantially keyhole shape, and a double headed bolt proportioned to separately pass through the slot in each element for detachably locking the elements together with the restricted portion of the keyhole slots disposed in reversed overlapping relation, the body of said bolt being of rectangular cross section and arranged to be slid into non-rotatable engagement with the sides of the restricted portion of the keyhole slot in one of said elements after the head of the bolt is passed through the slot therein, and said contact element having a bent up end for engaging with the enlarged portion of the keyhole slot in the supporting element after the bolt is slid into the restricted portion thereof, and a compression spring disposed on said bolt for maintaining the contact element and the bolt in yielding engagement with the supporting element.

In witness whereof, we have hereto set our hands this 5th day of January, 1927.

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