

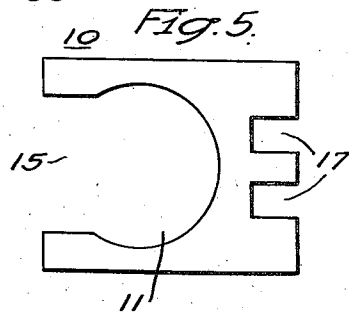
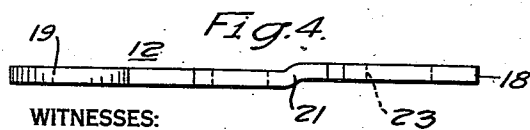
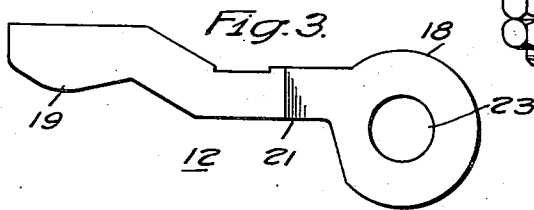
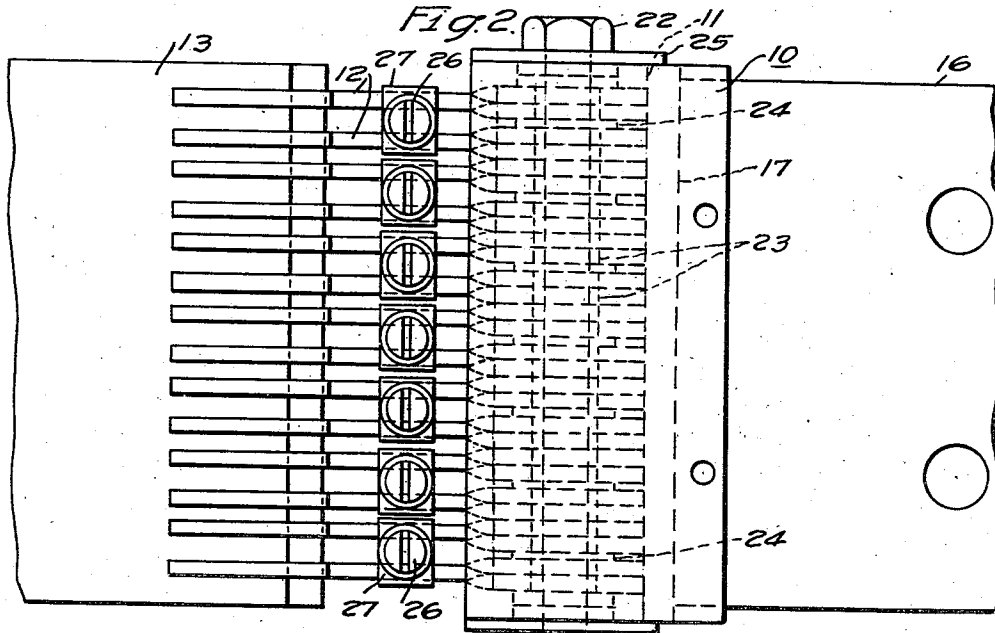
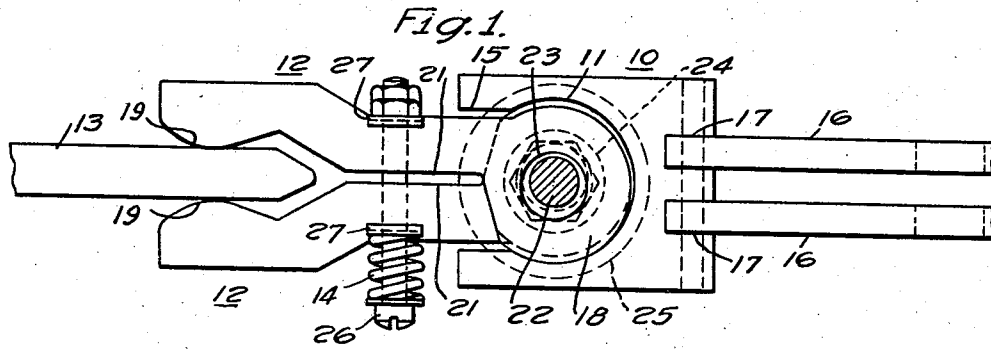
Sept. 2, 1941.

H. H. RUGG

2,254,914

DISCONNECTING CONTACT

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WITNESSES:

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# UNITED STATES PATENT OFFICE

2,254,914

## DISCONNECTING CONTACT

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9 Claims. (Cl. 200-166)

My invention relates, generally, to electric switches and, more particularly, to the contact members of electric switches suitable for separating or disconnecting current carrying members, as, for example, on removable truck-type circuit breakers and in metal-clad switchgear.

An object of my invention, generally stated, is to provide a disconnecting contact which shall be simple and efficient in operation and which may be economically manufactured and installed.

A more specific object of my invention is to provide a disconnecting contact which shall have a high current carrying capacity.

Another object of my invention is to provide a contact suitable for connecting rectangular conductors or bus bars.

A further object of my invention is to avoid the use of flexible shunts in a disconnecting contact having a plurality of movable contact fingers.

Still another object of my invention is to provide a disconnecting contact having sufficient flexibility to permit some misalignment between the connected members.

Other objects of my invention will be explained fully hereinafter or will be apparent to those skilled in the art.

According to one embodiment of my invention, a plurality of pairs of oppositely disposed contact fingers are so mounted in a contact base that one end of each finger is forced into engagement with the base when the opposite end engages a cooperating blade or conducting member. Sufficient clearance is provided between the contact fingers and the base to allow misalignment between the base and the switch blade. High contact pressure between the fingers, which engage the blade on opposite sides, and the blade and also between the fingers and the base-member is maintained by springs provided on bolts which connect the fingers in groups with two pairs of fingers in each group.

For a better understanding of the nature and objects of my invention, reference may be had to the following detailed description, taken in conjunction with the accompanying drawing, in which:

Figure 1 is a plan view of a disconnecting contact constructed according to my invention;

Fig. 2 is a view in elevation of the structure shown in Fig. 1;

Fig. 3 is a plan view of one of the contact fingers utilized in the switch structure;

Fig. 4 is a view in elevation of the contact finger shown in Fig. 3, and

Fig. 5 is a plan view of the base for supporting the contact fingers.

Referring to the drawing, the switch structure shown therein comprises a base member 10 having a cylindrical recess 11 therein, a plurality of contact fingers 12 having one end disposed to engage a rectangular conductor or switch blade 13 and the other end disposed in the recess 11, and a plurality of springs 14 disposed to bias the contact fingers 12 toward each other and into engagement with the conductor 13.

As shown, the base member 10 is of a rectangular shape and may be composed of copper or other suitable conducting material. The groove or recess 11 provided in the base 10 is preferably of a cylindrical shape in order to facilitate machining and is provided with an opening 15 at one side of the base member. A pair of conducting members 16 may be secured in rectangular grooves 17 provided in another side of the base member 10. The conducting members 16 may be connected to bus bars or other suitable current conductors (not shown).

As shown in Fig. 3, each one of the contact fingers 12 is provided with a rounded end or hub portion 18, which is of a smaller diameter than the diameter of the recess 11 in the base 10 in order that the fingers will fit loosely in the base. The opposite end of the contact finger 12 is provided with a rounded surface 19 for engaging the rectangular conductor 13, thereby providing substantially a line contact with the conductor or blade 13.

As shown in Fig. 4, the hub portion of each contact finger is offset slightly from the blade portion in order that the fingers may be assembled in the base member 10 in oppositely disposed pairs, with the blades of the fingers in alignment, as shown in Figs. 1 and 2. In this manner, the fingers are prevented from collapsing when the conductor 13 is withdrawn since the oppositely disposed surfaces 21 of the fingers will engage each other when the fingers are removed from the blade 13.

The contact fingers 12 may be assembled in the base 10 by inserting the rounded portions 18 in the recess 11 through the ends of the base 10. As previously stated, the fingers are assembled in oppositely disposed pairs and they may be held in place by a bolt 22 which is inserted through a cylindrical opening 23 provided in the hub of each finger. The pairs of fingers may be spaced from each other by washers 24 disposed on the bolt 22 and end washers 25 may be utilized to close the

openings at the end of the recess 11 after the fingers are properly assembled.

In order that the rounded portions 18 of the fingers may move outwardly into engagement with the base member 10 when the blade 13 is forced between the contact fingers, the hole 23 is of a larger diameter than the bolt 22. In this manner the outer surface of the hub 18 of each finger is forced into engagement with the rounded surface of the base 10, as shown in Fig. 1, thereby insuring good electrical contact between the contact fingers and the base 10 when the fingers are in engagement with the conductor 13.

As shown in Figs. 1 and 2, the fingers are connected in groups, with two pairs of fingers in each group, and a comparatively heavy contact pressure is applied at the contact points by means of the springs 14 which are mounted on bolts 26. Crimp washers 27 are provided for engaging the upper and the lower contact fingers of the group connected by each one of the bolts 26. As shown in Fig. 2, the springs 14 are disposed between the lower crimp washers 27 and the heads of the bolts 26. In this manner one bolt and one spring serves to compress two pairs of contact fingers.

The opening 15 for the recess 11 in the base 10 through which the fingers project is shaped so that they are held in nearly their normal position where they will properly engage the blade 13. However, some misalignment between the blade 13 and the base 10 is permissible since the opening 15 is slightly larger than the space required for the blades of the contact fingers when assembled in pairs, and the diameter of the recess 11 is also slightly larger than the diameter of the portion 18 of the fingers.

It will be noted that the fingers cannot come out through the opening 15 and that they are not held rigidly in place by the bolt 22. This bolt merely functions to retain the end washers 25 in place to prevent the fingers from coming out through the ends of the base member 10. Furthermore, as explained hereinbefore, the fingers are prevented from collapsing by the engaging surfaces 21 on the blades of the fingers when withdrawn from the blade 13.

From the foregoing description it is apparent that I have provided a disconnecting contact suitable for disconnecting conducting members, which has a relatively high current carrying capacity since the current is conducted directly through the switch members without the use of flexible shunts. Furthermore, the contact pressure between the conducting members may be readily adjusted by varying the compression of the springs 14 and any desired number of contact fingers may be easily provided, thereby increasing or decreasing the capacity of the switch as desired. The present switch is particularly suitable for use with rectangular shaped conductors or bus bars having high current carrying capacity.

I do not desire to be restricted to the particular form or arrangement of parts herein shown and described since it is evident that they may be changed and modified without departing from the spirit and scope of my invention as defined in the appended claims.

I claim as my invention:

1. A disconnecting contact comprising a base member having a cylindrical recess therein, a plurality of contact fingers having a rounded end movably disposed in said recess, the diameter of said end being greater than the width of the

opening to said recess and substantially less than the diameter of the recess, and means for retaining said fingers in said recess.

2. A disconnecting contact comprising a base member having a cylindrical recess therein, a plurality of contact fingers having a rounded hub portion movably disposed in said recess, the diameter of said hub portion being greater than the width of the opening to said recess and substantially less than the diameter of the recess, resilient means for biasing said contact fingers in opposite directions, and means for retaining said fingers in said recess.

3. A disconnecting contact comprising a base member having a cylindrical recess therein, a plurality of oppositely disposed contact fingers having a rounded hub portion movably mounted in said recess, the diameter of said hub portion being greater than the width of the opening to said recess and substantially less than the diameter of the recess, and resilient means for biasing said contact fingers toward each other.

4. A disconnecting contact comprising a base member having a cylindrical recess therein, a plurality of pairs of oppositely disposed contact fingers having a rounded end movably mounted in said recess, the diameter of said end being greater than the width of the opening to said recess and substantially less than the diameter of the recess, resilient means for biasing each pair of fingers toward each other, and means for retaining said fingers in said recess.

5. A disconnecting contact comprising a base member having a cylindrical recess therein, a plurality of pairs of oppositely disposed contact fingers having a rounded end movably mounted in said recess, the diameter of said end being greater than the width of the opening to said recess and substantially less than the diameter of the recess, resilient means for biasing each pair of fingers toward each other, means for retaining said fingers in said recess, and means on said fingers for limiting their travel toward each other.

6. A disconnecting contact comprising a base member having a cylindrical recess therein, a plurality of pairs of oppositely disposed contact fingers, each one of said fingers having a rounded end movably mounted in said recess, the diameter of said end being greater than the width of the opening to said recess and substantially less than the diameter of the recess, means for retaining said fingers in said recess, and resilient means for biasing the fingers of each pair toward each other.

7. A disconnecting contact comprising a base member having a cylindrical recess therein, a plurality of pairs of oppositely disposed contact fingers, each one of said fingers having a rounded end movably mounted in said recess, each finger having a hole through its rounded end, a bolt passing through said holes to retain the fingers in said recess, the diameter of said bolt being less than the diameter of the holes in the fingers to permit the fingers to be moved outwardly into engagement with said base, and resilient means for biasing the fingers of each pair toward each other.

8. A disconnecting contact comprising a base member having a cylindrical recess therein, a plurality of pairs of oppositely disposed contact fingers having one end movably mounted in said recess, said end being rounded and of a greater diameter than the width of the opening to said recess, means for retaining said fingers in said

recess, and resilient means for biasing the ends of said fingers in opposite directions into engagement with said base, the diameter of said rounded ends being substantially less than the diameter of said recess.

9. A disconnecting contact comprising a base member having a cylindrical recess therein, a plurality of pairs of oppositely disposed contact fingers having one end movably mounted in said recess, said end being rounded and of a greater

5 diameter than the width of the opening to said recess, means for retaining said fingers in said recess, resilient means for biasing the ends of said fingers in opposite directions into engagement with said base, and means for adjusting said resilient means to vary the contact pressure between the fingers and the base the diameter of said rounded ends being substantially less than the diameter of said recess.

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