Apr. 10, 1923. 1,451,296

W. J. GIBBONS

CONTACT FOR ELECTRIC KNIFE SWITCHES

Filed Mar. 21, 1921

Fig. 1.

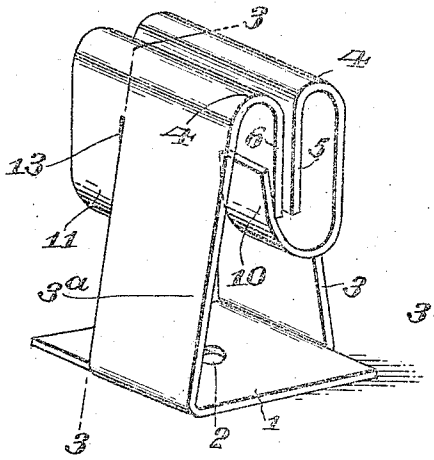


Fig. 2.

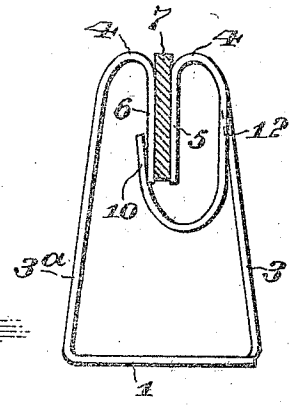


Fig. 3.

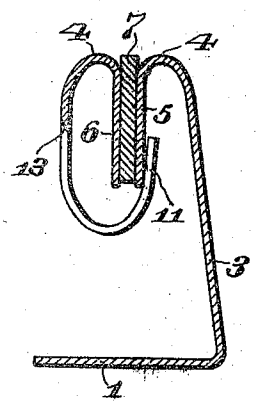


Fig. 4.

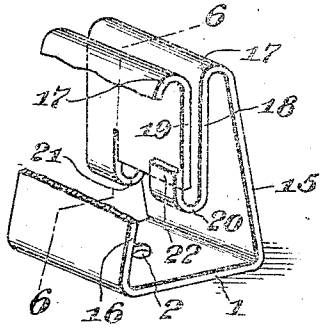


Fig. 5.

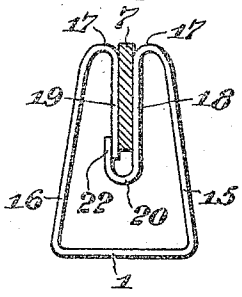


Fig. 6.

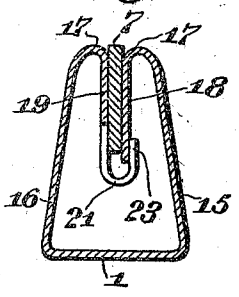


Fig. 7.

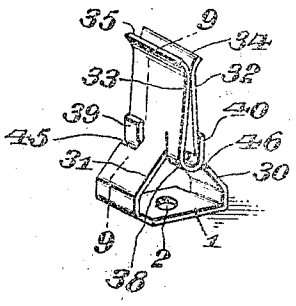


Fig. 8.

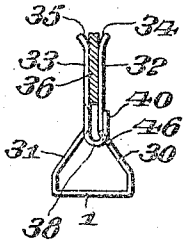
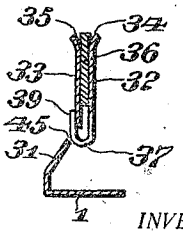


Fig. 9.



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UNITED STATES PATENT OFFICE.

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CONTACT FOR ELECTRIC KNIFE SWITCHES.

Application filed March 21, 1921. Serial No. 453,950.

To all whom it may concern:

Be it known that I, WILLIAM J. GIBBONS, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented an Improvement in Contacts for Electric Knife Switches, of which the following is a specification.

My invention relates to improvements in contacts for electric knife switches, and it has for one of its objects to provide a contact for such switches which, as far as I am aware, will retain its efficiency for a much longer period than contacts of like character as heretofore constructed.

A further object it to provide a contact of the character stated in which the contact portions thereof will not, incident to use, become permanently separated to such an extent that the knife contact member of a knife switch will not make satisfactory contact therewith.

A further object is to provide a contact of the character stated in which the opposite side portions of said contacts are so interlocked or connected together that when the knife contact is inserted between the contact portions each will exert a pull upon the other. The pulling action of the opposite side portions of the contact structure will be exerted in opposite directions with the result that when the knife contact is inserted a more perfect contact is made.

A still further object of my invention is to provide a construction in which the opposite contacting portions of the contact device will make close and intimate contact with the movable knife contact member until the very moment or instant of removal of the latter from between the opposing portions of the said contact device.

Other objects and advantages of my invention will be pointed out in detailed description thereof which follows or will be apparent from such description.

In order that the invention may be more readily understood and its practical advantages fully appreciated reference may be had to the accompanying drawing in which—

Fig. 1 is a perspective view of one type of contact device embodying my invention;

Fig. 2 is an end elevation thereof showing in cross section a knife contact member in position between the contact portions of the said contact device;

Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a perspective view showing a modified construction of contact device of the same type as that shown in the preceding figures, a portion of the said device being broken away;

Fig. 5 is a view in end elevation of the device shown in Fig. 4 and showing also in cross section a knife contact in place between the contacting portions of said device;

Fig. 6 is a transverse sectional view taken on the line 6—6 of Fig. 4;

Fig. 7 is a perspective view showing my invention embodied in another type of electrical contact device;

Fig. 8 is a view in edge elevation of the device shown in Fig. 9 and showing also in cross section the knife contact in place between the contact portions of the said device; and

Fig. 9 is a vertical sectional view taken on the line 9—9 of Fig. 7.

Referring to the drawing: 1 designates the base portion of contact devices by means of which the said devices are connected to supports by screws or other fastening means which pass through openings 2.

Referring now to Figs. 1 to 3 inclusive, 3 and 3^a designate the opposite sides of the spring plate contact devices which sides extend upwardly and converge toward each other as shown. The upper end portions of these sides are bent inwardly, as indicated at 4, and then downwardly to form adjacently situated contact portions 5 and 6. These portions are arranged in substantially parallel relation with respect to each other, and the distance between the same is less than the thickness of the knife contact member 7, shown in Figs. 2 and 3. In the use of these contact devices, the contact portions 5 and 6 and the opposite sides 3 and 3^a are sprung apart upon the insertion between the said parts 5 and 6 of the knife contact members 7. In order to retain the parts 5 and 6 in parallel relation to each other and in order to prevent impairment of the usefulness of the device by reason of the contact portions 5 and 6 assuming permanent positions at too great a distance from each other, I have provided the hook shaped projections 10 and 11 which are formed by slitting the sides 3 and 3^a as indicated at 12 and 13. The portions thus separated from the respective sides at the opposite ends of

the device are then bent so as to form the said hooks 10 and 11. The hook 10 carried by the side 3 of the device extends transversely of the device underneath the lower ends of the contact portions 5 and 6 and upwardly upon the outer side of the contact portion 6, the lower outer edge of the latter contacting with the inner surface of the said hook 10.

The hook 11 carried by the side 3^a extends transversely of the device in a direction opposite to that of the hook 10 and passes underneath the lower ends of the contact portions 5 and 6 and upwardly upon the outer side of the contact portion 5, as shown in Fig. 3, contacting with the lower outer edge portion of the latter.

In the construction shown in Figs. 4 to 6 inclusive, the opposite sides 15 and 16 of the device extend upwardly and converge as shown, and the upper end portions thereof are bent inwardly as indicated at 17 and are then extended downwardly to form the oppositely disposed substantially parallel contact portions 18 and 19. Each of these contact portions is provided with tongue-like projections 20 and 21 which are situated at the opposite ends or edges of the device as shown in Fig. 4. Each of these tongue-like portions is bent to form hooks, as indicated at 22 and 23, which hooks engage the outer sides of the parts 18 and 19, as shown. The hook 22, which projects from and is carried by the contact portion 18, extends underneath the lower end of the contact portion 19 and then upwardly and into contact with the outer side of the lower portion thereof. Likewise the tongue portion 21, connected with and carried by the contact portion 19, extends transversely underneath the lower end of the contact portion 18 and then upwardly, as indicated at 23, and into contact with the outer side of the lower portion of the contact part 18.

The contact device shown in Figs. 1 to 6 inclusive is known as the "roll" type.

In Figs. 7 to 9 inclusive I have shown the invention embodied in another type of contact device in which the upper end portions of the opposite sides thereof are not bent or rolled inwardly as in the case of the previous constructions. In the said Figs. 7 to 9 inclusive, the opposite sides of the device comprise portions 30 and 31 which converge somewhat sharply toward each other and are merged into the less convergent upwardly extending contact portions 32 and 33. The extreme upper ends of the opposite side portions of this type of device are bent outwardly as indicated at 34 and 35 so as to facilitate the entry of the knife contact member 36 between the opposite contact side portions 32 and 33. Each of the sides 32 and 33 is provided with tongue-like portions 37 and 38 which are bent to form hooks 39 and 40. The hook 39 which is connected to and carried by the side 32 extends through a rectangularly shaped notch 45 formed at one edge of the converging side portion 31 adjacent the point of connection between the said portion 31 and the portion 35. The hook 40 extends through a corresponding notch 46 through the opposite edge portion of the converging part 30 of the contact device. It will be observed that the hooks 39 and 40 engage the outer sides of the oppositely disposed contact portions 32 and 33 of the device.

It will be observed that in the several forms of construction the presence of the hooks in contact with the outer sides of the oppositely disposed contacting portions of the contact devices offers opposing resistance to the separation of the contact devices upon the insertion of a knife contact member between the same. Referring for instance to Figs. 1 to 3, it will be observed that upon the insertion of a knife contact member between the opposed contact portions 5 and 6, the latter will be caused to slightly separate. This separation is resisted by the hooks 10 and 11. When the contact portion 6 tends to move toward the left pressure is exerted upon the hook 10 and the force of such pressure is transmitted to the side 3; likewise the contact portion 5 tends to move toward the right, such movement being resisted by the hook 11 and the force resulting from such resistance is transmitted to the side 3^a. In consequence of this arrangement it will be seen that the hooks, which engage the outer sides of the oppositely disposed contact portions, tend to cause closer contact of the said portions with the opposite sides of the knife contact members.

Although the hooks 22 and 23 shown in the construction illustrated in Figs. 4 to 6 inclusive are not carried directly by the opposite sides 15 and 16, yet their presence effects substantially the same result as is effected by the hooks shown in the constructions illustrated in Figs. 1 to 3 inclusive and 7 to 9 inclusive.

A further object of a construction embodying my invention is that the contact portions thereof are prevented from assuming permanent positions a relatively great distance apart, with the result that upon the placing of a knife contact member between the said contact portions it makes complete and close contact therewith from the very moment that it begins its entry between the said parts; also the said close contact is maintained until the very moment the said knife contact member passes from between the said contact portions. If this relationship between the oppositely disposed contact portions of the said device and the knife contact member is not maintained a relatively great amount of sparking takes

place upon removing it from between the said portions, thus causing unnecessary impairment of the said device.

Although I have shown my invention as applied to spring plate contact devices of the character shown for electric knife switches, it will be understood that the principle of my invention is applicable to other constructions where it is desirable that close contact relationship shall be maintained between electrical contact devices; also that the contact devices may consist of other material than spring plate, as for instance, spring wire.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. An electric contact device comprising oppositely disposed side portions and separate means carried by each portion for engaging the other portion, the said means tending to prevent separation of said portions.

2. An electric contact device comprising oppositely disposed side portions and a hook projecting from each side portion of said device and engaging the opposing contact portions of said device.

3. An electric contact device comprising oppositely disposed yielding side portions; and means having integral connection with each side portion and engaging the other side portion, and said means tending to prevent separation of said side portions.

4. An electric contact device comprising oppositely disposed side portions, and two separate means, one carried by one side portion and the other by the other side portion, interlocking and connecting the said portions so that upon the insertion of a contact member between the opposing contact parts of said portion each portion will exert a pulling force upon the other, the said forces tending to pull the said opposite side portions toward each other.

5. An electric contact device comprising a base portion, converging side portions extending upwardly from the opposite ends of said base portion, oppositely disposed contact portions carried by said converging side portions, means carried by each side portion and extending transversely of the said device and beyond the contact portion of the opposing side and being in engagement with the outer side of said contact portion.

6. A contact device for an electric knife switch comprising a spring metal strip having a base portion by means of which the device is secured to its support, oppositely disposed side portions extending upwardly from the opposite ends of said base, the upper end portions of said side portions extending inwardly and downwardly thereby providing depending substantially parallel contact portions intermediate the said side portions, and hooks carried by said side portions and being in engagement with the outer sides of said contact portions and resisting separation of said contact portions when the knife member of such switch is inserted between the same.

7. A contact device for an electric knife switch comprising a base portion, side portions extending upwardly from said base portion, the upper ends of said side portions extending inwardly and downwardly intermediate said side portions, the downwardly extending end portions constituting oppositely disposed contact portions, hooks having integral connection with said side portions, the hook upon one of said side portions being situated at one end of the contact device and the hook upon the other side portions being situated at the other end of said device, and the said hooks extending transversely of the said device and underneath the lower ends of said contact portions and contacting with the outer sides of said portions, substantially as described.

8. A contact device for an electric knife switch comprising a base portion, side portions extending upwardly from said base portion, the upper ends of said side portions extending inwardly and downwardly intermediate parts of the said side portions, the downwardly extending portions constituting oppositely disposed contact portions and each of the said contact portions having hook extensions, the hook upon one of said contact portions engaging the outer side of the other contact portion.

In testimony that I claim the foregoing as my invention I have hereunto subscribed my name this 17 day of March, 1921.

WILLIAM J. GIBBONS.