Jan. 11, 1938. G. E. ANDRE 2,104,786

ELECTRICAL CONNECTER

Filed March 23, 1936

Fig. 1

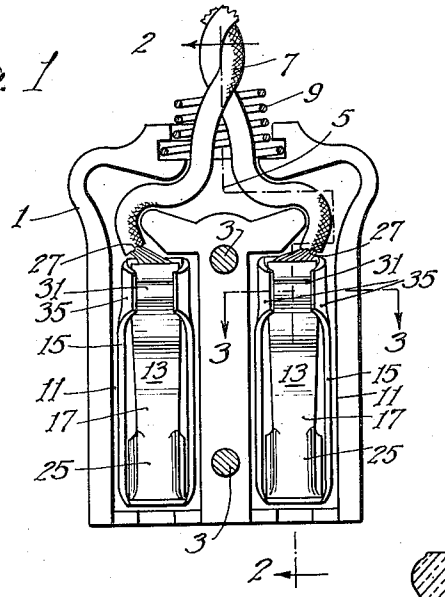


Fig. 2

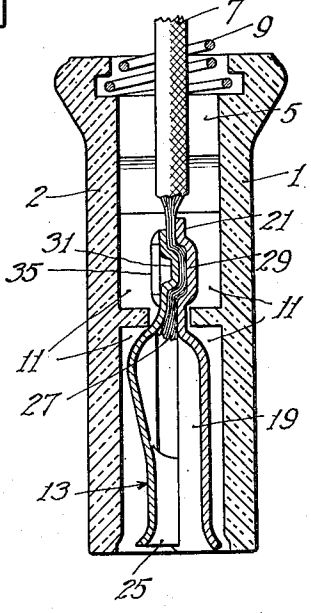


Fig. 3

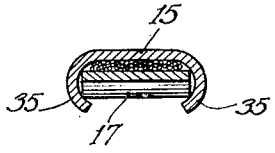
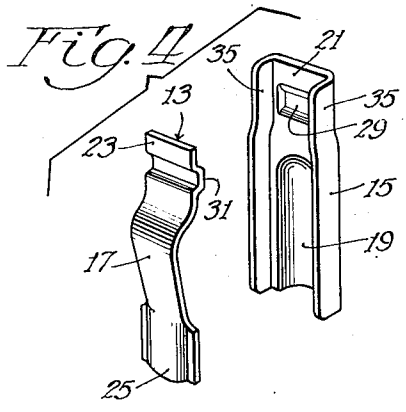


Fig. 4



Inventor:
Gustaf E. Andre

By:
Fisher Clapp, Soans & Pond
Attys.

Patented Jan. 11, 1938 2,104,786

UNITED STATES PATENT OFFICE

2,104,786

ELECTRICAL CONNECTER

Gustaf E. Andre, Richmond, Ind., assignor to Belden Manufacturing Company, Chicago, Ill., a corporation of Illinois

Application March 23, 1936, Serial No. 70,194

4 Claims. (Cl. 173—332)

My invention relates to electrical terminals, and more particularly to plug connecters of the type used for connecting electric conductor cords to electric appliances.

In Patent No. 1,954,859, there is disclosed a connecter of the type herein contemplated, which has been found to be highly effective for maintaining good electrical connections between the contact elements thereof and the cooperating contact pins of an appliance.

The principal objects of the present invention are to provide a connecter of the type referred to which will not only retain the advantages of the construction shown in said patent, but which will have additional advantages of greater simplicity in construction, more secure connection between the conductor cord wires and the contact elements of the connecter; and wherein there is a substantially permanent, low resistance connection between the conductor wires of the associated cord and the contact elements of the connecter; and in general, it is the object of the present invention to provide an improved connecter of the type referred to.

One form of my invention is illustrated in the accompanying drawing wherein—

Fig. 1 is a sectional view, partially in elevation, of a cord terminal having contact elements constructed in accordance with the principles of my invention;

Fig. 2 is a sectional view on line 2—2 of Fig. 1;

Fig. 3 is a fragmentary sectional view on the line 3—3 of Fig. 1; and

Fig. 4 is a perspective view showing the two contact members used in constructing my improved contact elements, prior to the assembling thereof.

Referring particularly to the drawing, the body portion of the terminal comprises a pair of substantially similar, complementary sections 1 and 2 which are formed of molded insulating material. These sections are held together in the assembled terminal by means such as the screws indicated at 3. A passageway 5 for receiving the cord 7 and the cord protecting spring 9 is formed in the upper end of the body portion of the terminal. Within the body portion, two suitably formed recesses 11 are provided for engaging and supporting the two contact elements 13, each of which serves to connect one of the conductors of the cord 7, with which the terminal is used, releasably to one of the contact pins forming a part of an appliance.

Each of the contact elements comprises two elongated contact members 15 and 17 which are joined together at one of their ends in a manner to be subsequently described. One of these contact members (15) is formed from a channel-shaped brass strip and is of relatively rigid construction. It is provided with a transversely arched depression 19 for engaging the sides of a contact pin, which may form a part of the associated appliance, and with a flat portion 21 adjacent its upper end for receiving a similar flat portion 23 forming a part of the other contact member. The other contact member 17 is preferably formed of spring steel, Monel metal or a similar resilient material, which will retain its springiness even after being subjected to the heat normally encountered by connecters of this type. The upper end of the spring contact member 17 is provided, as mentioned above, with a flat portion 23 for engaging the similar flat portion 21 formed in the upper end of the channel-shaped member 15, and the lower end of this member is likewise provided with a transversely arched section 25 for engaging a suitable contact pin.

In order that the bared end 27 of the cord conductor, with which each of the contact elements 13 is associated, may be permanently connected thereto without the use of a screw fastening or other means, the flat portion 21 of the channel-shaped contact member 15 is provided with a transversely extending recess or depression 29, generally rectangular in cross-section, formed therein. A complementary projection or rib 31 is formed in the flat portion 23 of the spring contact member 17.

During the assembling of the contact element, the bared end 27 of one of the cord conductors is positioned on the flat portion 21 of the channel-shaped connecter 15 so as to extend over the recess 29. The spring contact member 17 is then arranged on top of the cord conductor in such position that the rib 31 shall align with the recess 29. The upstanding side portions 35 of the channel-shaped member 15 adjacent the engaging rib and depression are then swedged over as is shown particularly in Figs. 1 and 3. During this swedging operation the rib 31 and its complementary recess 29 are moved into fairly close engagement with each other as is illustrated in Fig. 2, and a clamping force of very substantial magnitude is thereby exerted on the adjacent bared portion 27 of the lead conductor. This clamping action effects a low resistance electrical connection between the bared end 27 of the cord conductor and the two cooperating contact members 15 and 17 which cannot be broken during any ordinary use of the resulting contact element.

In fact, actual tests have shown that this connection is much more rugged and much more permanent than that which can be effected by the use of a screw fastening. The rounding of the opposed surfaces of the rib and the depression, as shown in the drawing, tends to avoid or minimize abrasion and cutting of the cord conductor during the swedging operation, and subsequently when the cord and terminal are in use and the cord subjected to flexing and stretching.

It has been found that breaking-off of the cord conductors adjacent the contact elements or separation of the cord conductors from the contact elements are of extremely rare occurrence during the use of connecters constructed in accordance with the present invention. This desirable characteristic seemingly results from the use of a spring member in each of the contact elements, the resultant resilience imparted to the clamp connection effectively preventing sudden shocks or strains from snapping off the cord conductors or from subjecting the connection thereof to excessive stress. By arranging the swedged over portions **35** so that they do not entirely cover the upper end of the flat portion **23** of the spring contact member **17**, as is shown in Figs. 1 and 2, a further increase in the resiliency of the clamp connection is effected.

From the foregoing, it will be seen that I have provided a novel form of contact element particularly suitable for use in conjunction with appliance cord terminals and the like. My improved contact element uses fewer parts than the prior art structures, and it may be manufactured with one or more less manufacturing operations. It is, therefore, much less expensive to manufacture and to use than the devices heretofore known to the art. At the same time, however, my improved connecter makes possible a much more rugged terminal construction than has heretofore been accomplished. Further, it makes possible a terminal which is capable of providing a permanent, low resistance, releasable connection between the associated cord conductor and the cooperating contact pin throughout its operative life.

The normal stamping operations heretofore necessary to produce the said patent structure are, in view of the present invention, sufficient to not only produce the structure, but also to effect an improved connection between the conductor wires and the respective contact elements. By permanently clamping the conductor wires to the contacts, troublesome loosening of binding post screws is avoided with resulting elimination of loose connections, arcing and incidental burning of the wires.

Various modifications of my invention will be suggested to those skilled in the art, and it is my desire that the accompanying claims shall be construed as broadly as is possible consistent with the state of the art.

I claim the following as my invention:

1. A contact element for an electrical connecter comprising an elongated, channel-shaped contact member, and a second elongated contact member positioned co-extensive therewith, said last mentioned member having a generally flat portion engaging one end of said channel-shaped member and securely affixed thereto by swedging over of the adjacent side portions of said channel-shaped member, said contact members being unconnected at the other end thereof to permit the contact with which said contact element is used to be moved therebetween, one of said engaging portions having a transversely extending rib or projection formed therein and the corresponding section of the other contact member having a similarly shaped, complementary recess or depression formed therein, these complementary portions cooperating during the assembling of said contact element, to securely affix the conductor with which said connecter is used thereto.

2. In an electrical connecter of the class described, the combination of a contact element comprising a pair of elongated members disposed one alongside the other so as to be adapted to receive between them a contact prong of an electrical appliance, one of said members having an edge extension bent around the adjacent portion of the other for clamping the members together, and an electric conductor wire having an end portion interposed between the clamped together portions of said members so as to be electrically connected thereto, the last mentioned portions of said members being provided with interfitting offset formations adapted to form an offset in the wire portion therebetween, thereby to more effectively prevent withdrawal of said wire from between said members.

3. In an electrical connecter of the class described, the combination of a contact element comprising a rigid, elongated, metallic member of generally channel-shaped cross section, a second elongated, metallic member formed of resilient material, an end portion of said second member being seated intermediate the side walls of the channel-shaped member on an end portion of the bottom wall of the latter, portions of said side walls being bent over said end portion of said second member to clamp that member to said first member and an electrical conductor having an end portion interposed between the clamped together portions of said members so as to be electrically and mechanically connected thereto, the clamped together portions of said members being provided with interfitting formations adapted to form an offset in the conductor portion therebetween to more effectively prevent withdrawal of said conductor from between said members, the inherent resilience of the mechanical connection between said conductor and said connecter, resulting from the use of resilient material in one of said contact elements preventing the sudden shocks which may be impressed on said conductor during use from breaking said conductor or from separating said conductor from said clamped together contact elements.

4. A contact element for an electrical connecter comprising a pair of elongated contact members disposed one alongside the other, one of said members being substantially rigid throughout its length and the other member being formed of resilient material, said members being shaped and arranged relative to each other so as to form a socket for receiving a terminal pin or the like, one of said contact members having an edge extension bent around the other for clamping said members together at one end thereof, said members being provided with interfitting offset formations at the portions thereof which are clamped together adapted to engage the conductor with which said contact element is used, during the assembling operation, so as to securely affix that conductor to said contact element.

GUSTAF E. ANDRE.