

Sept. 1, 1925.

1,552,154

J. HATFIELD

ELECTRICAL CONNECTER

Filed April 13, 1921

Fig. 1,

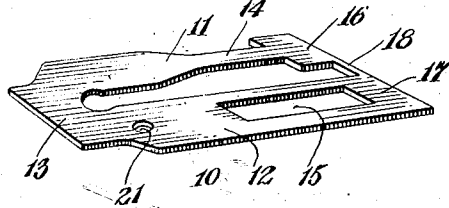


Fig. 3,

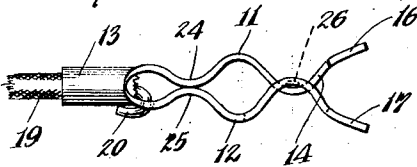


Fig. 2,

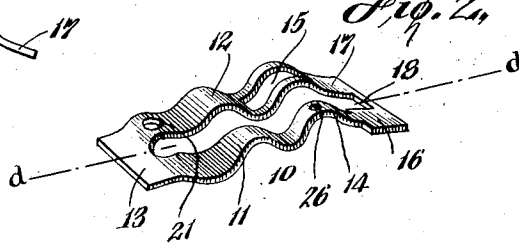


Fig. 4,

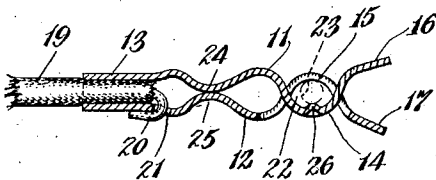
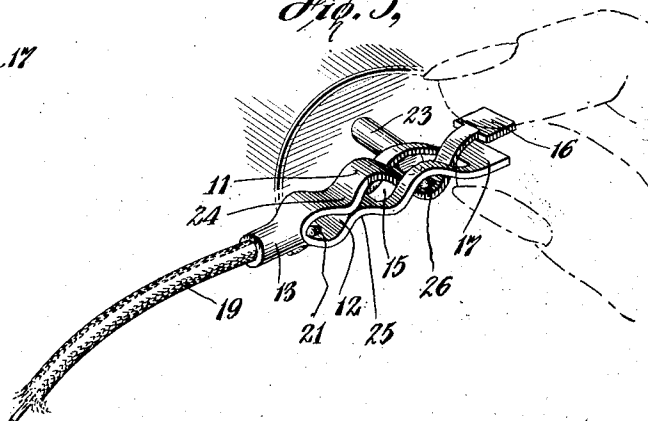


Fig. 5,



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UNITED STATES PATENT OFFICE.

JOHN HATFIELD, OF BROOKLYN, NEW YORK.

ELECTRICAL CONNECTER.

Application filed April 13, 1921. Serial No. 460,984.

To all whom it may concern:

Be it known that I, JOHN HATFIELD, a citizen of the United States, and resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electrical Connecters, of which the following is a specification.

This invention relates to a connector for electrical conductors and more particularly to a connector adapted to be affixed to a terminal such as a cord or battery terminal, and has special reference to the provision of a connector of this character adapted to be manipulated with rapidity and facility to resiliently engage and firmly clamp a conductor connected thereto.

The principal object of my present invention is the provision of a connector of the type referred to in which oppositely disposed members are adapted to be grasped by the fingers of an operator to place the same under tension, the members being provided with means brought into registration when the members are placed under tension to form a conductor receiving channel, the members being adapted to resiliently clasp therebetween a conductor inserted in the channel. Connecters of this type usually embody means forming part of the connector, such means being adapted to be affixed to a terminal such as a cord or battery terminal, for example, such means being affixed to the terminal as by being soldered or otherwise connected thereto to provide an effective mechanical and electrical connection between the parts. A prime desideratum of my present invention includes the provision of a resilient or spring connector of this nature so constructed that the tension operative on the oppositely disposed members is made independent of the means connected to the cord or other terminal. I have found that by constructing a connector in this manner a greater tension effect operative on the members is obtained, the tension being, moreover, removed from that portion of the connector which is soldered or otherwise connected to a terminal, this making for an efficient and durable resilient connecting device.

Another object of my invention involves the provision of a resilient or spring connector which may be made from a blank of sheet material, such blank being sub-

jected to a minimum of operative steps to provide the finished connector at low cost.

To the accomplishment of the foregoing and such other objects as may hereinafter appear, my invention consists in the elements and their relation one to the other, as hereinafter particularly described and sought to be defined in the claims, reference being had to the accompanying drawings which show preferred embodiments of my invention and in which:

Figure 1 is a perspective view of a cut out blank used in the making of my connector,

Figure 2 is a perspective view of the blank after a forming step,

Figures 3 and 4 are views of the finished connector showing its manner of attachment to a cord terminal; Figure 3 showing the connector in inoperative position and Figure 4 showing the same in operative position engaging a conductor,

Figure 5 is a perspective view showing the manner of attaching the connector to a conductor.

Referring to Figures 1 and 2 of the drawings, which show a preferred manner in which my connector is made, I first provide sheet material from which a blank 10 is stamped or cut out to provide two parallel members 11 and 12 connected at one end by an integral web 13. The member 11 is preferably provided with a reduced tongue portion 14, the member 12 being provided with a preferably elongated slot 15 of a width slightly greater than the width of tongue 14 for a purpose that will appear hereinafter. The member 11 is provided at its end opposite to the web 13 with an enlarged head 16, the member 12 being provided with a head 17 of similar configuration, the heads 16 and 17 being adapted to form finger grips in the set up connector, as will further appear hereinafter. These heads 16 and 17 are connected by an integral strip 18, the said strip being cut away before the finished connector is obtained.

After the blank shown in Figure 1 has been stamped the blank is formed by suitable forming dies into the configuration shown in Figure 2 of the drawings, such configuration being preferably sinuous or of wave contour or formation, each member being similar in contour to provide wave formations in opposite phase when member 11 is bent over along line $d-d$ to form the

set up connecter as shown in Figures 3 and 4 of the drawings. By providing a blank such as 10 which is subjected to a single forming operation to effect the configuration shown in Figure 2, the finished article being provided by bending the said formed blank along the longitudinal line $d-d$, I am enabled to produce a connecter at a very low cost.

10 The finished connecter as shown in Figures 3 to 5 of the drawings comprises the now oppositely disposed members 11 and 12 connected by the web 13, which forms a sleeve or shank adapted for connection, for
15 example, to a cord terminal 19, lead 20 being inserted through an aperture 21 provided in the blank 10, the said lead being preferably bent into hooked formation against an outer wall of the connecter, as
20 shown in the figures, these parts being preferably soldered together as is usual, to provide an efficient electrical contact as well as a secure mechanical connection. Members 11 and 12 of the set up connecter form
25 opposed resilient arms with the tongue 14 of member 11 registering with recess 15 in member 12, the tongue being adapted to be received by the recess, as clearly shown in Figures 3 to 5 of the drawings. Members
30 11 and 12 are so curved during the forming step hereinbefore described as to provide opposed curved portions at the tongue 14 and recess 15 respectively, so that when the finger grips 16 and 17 are grasped between
35 the fingers of an operator and placed under tension, as shown in Figure 5, a channel 22 will be effected adapted for the reception of a conductor such as 23. Looked at from
40 another aspect, a crest portion of the wave member 11 as provided by tongue 14 co-operates with a crest portion of the wave member 12 as provided by recessed portion 15 to form a conductor receiving channel 22.

I have found that the tension operative on
45 members 11 and 12 may be considerably increased and the device made more durable by providing a spring or tension seat for members 11 and 12 closer to the channel 22 and removed from the shank portion 13.
50 I have further found that by providing such a tension seat between the shank and channel I remove the tension stresses from the shank portion 13, this minimizing liability of loosening the connection between terminal 19 and the connecter walls, this minimizing the breaking of the solder joints
55 when such parts are soldered. I have found that repeated manipulation of members 11 and 12 when no such displaced spring seat is provided results in a loosening of the connection and a breaking of the solder joints between the terminal and connecter, movement of members 11 and 12 being transmitted to the point of connection between
60 the connecter and terminal with the result-

ing liability of loosening or breaking of these parts. To the end of eliminating this defect and to provide a more efficient resilient connecter, I so form members 11 and 12 into a sinuous or wave configuration as
70 to provide a crest portion 24 of member 11 adapted to abut a crest portion 25 of member 12, these abutting portions forming a spring seat or pivot about which members 11 and 12 rotate when finger grips 16 and 17 are manipulated by an operator. The
75 spring seat provided by the portions 24 and 25 being positioned between shank 13 and channel 22 provides a small radius of swing for members 11 and 12; this resulting in
80 a greater tension or resiliency being imparted to the opposed members 11 and 12. This effect is enhanced for the reason that the tension seat is on a center line of contact between members 11 and 12 instead of being
85 laterally disposed if the tension seat were provided at opposite sides of the shank 13. Furthermore, movement of members 11 and 12 takes place about such tension seat, the strains and stresses incident to movement
90 of members 11 and 12 being transmitted and taken up at such tension seat, this relieving the shank 13 and the connection between the shank and cord terminal from substantially all movement and strain, minimizing
95 the liability of breakage at these parts. Moreover, by providing a bowed portion between the tension seat and the channel 22 I am enabled to provide a channel adapted
100 for large diameter conductors.

For the purpose of effectively receiving a threaded conductor as is usually provided on battery terminals, I provide terminal 14 with an inwardly directed depressed portion or seat 26, the said seat 26 being intended to
105 seat in a trough provided by the conductor threads, this construction firmly holding the connecter on the conductor.

The manner of making, constructing and using my connecter will, in the main, be
110 apparent from the above description thereof. It will be apparent that I have provided a connecter which may be formed from a suitable blank with a minimum of manufacturing operations, the said connecter being adapted to be affixed to a cord,
115 battery or other terminal. The connecter is adapted to be manipulated by the fingers, such as the forefinger and thumb of an operator, to place the same under tension to receive a conductor, the conductor being
120 firmly grasped and resiliently held in position in the connecter when the fingers of the operator are released from the grips 16 and 17. By providing a connecter having
125 opposed members of wave or sinuous configuration, the wave formation being arranged in opposite phase, and by providing in such a connecter of wave configuration abutting portions to form a spring seat with the said
130

abutting portions located between the shank portion of the connector and the conductor receiving channel thereof, I secure a device in which increased tension is effective on the
5 opposed members and the strains are so localized as to increase the efficiency and life of the connector. It will further be apparent that although I prefer to provide a connector in which the members have a curved
10 configuration of sinuous formation, that this may be modified in many ways as, for example, by having opposed members with angularly shaped cooperating portions accomplishing the same functions. In using the
15 term "wave" or "curve" or "sinuous" in the claims, I desire it to be understood that these are used in the broad sense as including angular or other shaped formations.

20 While I have shown my device in the preferred form, it will be obvious that many changes and modifications may be made in the structure disclosed without departing from the spirit of the invention, defined in the following claims.

25 I claim:

30 1. A terminal connector, comprising opposed members connected at one end by an integral sleeve having its axis substantially parallel with the length of the members, and through which an insulated conductor is adapted to extend, one of the members having a perforation adjacent the sleeve for engagement by the bared conductor, one

member slotted and the other shaped for a portion thereof to pass through the slot
35 when the members are pressed together at their free ends, thereby to form a grip between the members actuated to gripping position by the separation of the members, said members bent in opposite directions
40 between the grip and their connection to form opposed cooperating abutments for the purpose specified.

2. A terminal connector comprising opposed members connected at one end by an
45 integral sleeve having its axis substantially parallel with the length of the members, and through which an insulated conductor is adapted to extend, one of the members having a perforation adjacent the sleeve for
50 engagement by the bared conductor, one member slotted and the other shaped for a portion thereof to pass through the slot
55 when the members are pressed together at their free ends, thereby to form a grip between the members actuated to gripping position by the separation of the members, said members bent in opposite directions between the grip and their connection to form
60 opposed cooperating abutments for the purpose specified, the free ends of the members provided with integral finger grips.

Signed at New York, in the county of New York and State of New York, this 12 day of April A. D. 1921.

JOHN HATFIELD.