O. ZIMMERMAN.

TERMINAL CONNECTOR FOR ELECTRICAL CONDUCTORS.

APPLICATION FILED JULY 15, 1916.

1,262,155. Patented Apr. 9, 1918.

Fig. 1.

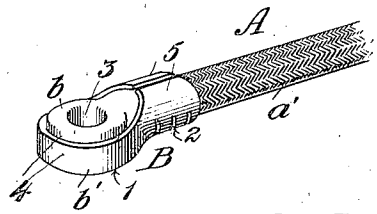


Fig. 6.

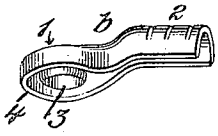


Fig. 2.

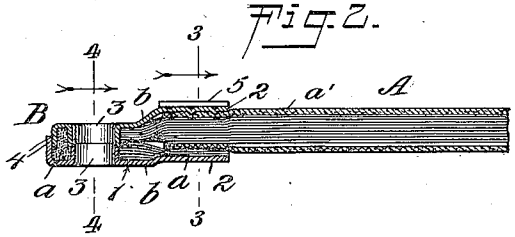


Fig. 7.

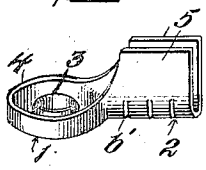


Fig. 3.

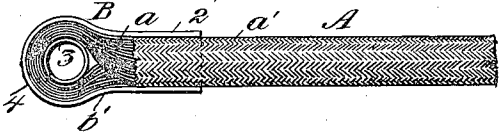


Fig. 4.

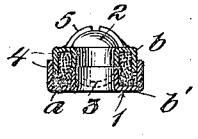


Fig. 5.

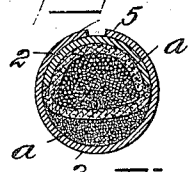


Fig. 8.

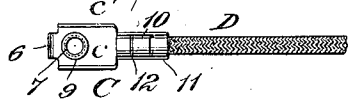


Fig. 9.

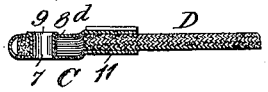


Fig. 10.

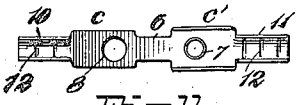
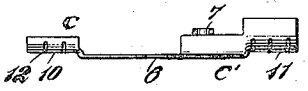


Fig. 11.



WITNESSES

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UNITED STATES PATENT OFFICE.

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TERMINAL CONNECTOR FOR ELECTRICAL CONDUCTORS.

1,262,155. Specification of Letters Patent. Patented Apr. 9, 1918.

Application filed July 15, 1916. Serial No. 109,462.

To all whom it may concern:

Be it known that I, OTTO ZIMMERMAN, a citizen of the United States, and a resident of the city of New York, borough of the Bronx, in the county of Bronx and State of New York, have invented a new and Improved Terminal Connector for Electrical Conductors, of which the following is a full, clear, and exact description.

This invention relates to terminal connectors for electric conductors, especially to terminals for stranded conductors covered with asbestos or other insulation which can be permanently and quickly attached to the end of a conductor by mechanical means and entirely inclosed in a metallic casing.

The invention has for its general objects to provide a terminal of a double eyelet type for flexible electric conductors which can be made of sheet metal easily cut and formed under a punch press and firmly attached to a conductor with specially formed pliers or hand clamps to firmly bind both the naked and insulated ends of a flexible electrical conductor to prevent stripping or unraveling the insulation and holding the stranded wires and the insulation in an entirely inclosed metallic casing allowing a large area of electrical contact and bring the strain of the clamping screw on the top of the double eyelet casing containing the naked conducting wires.

A more specific object of the invention is to produce a terminal which can be attached to electric conductors by mechanical means and not affected by heat, to surround and entirely inclose the naked and insulated ends of a conducting wire in a solid but yielding metal casing in such a manner that the clamping screw brings the strain direct upon the naked end of the conducting wire held within the terminal casing. This construction gives a yielding spring action upon the clamping screw preventing it from working loose. One of the principal uses for this terminal is on a rheostat, heating apparatus, arc lamps and all electrical devices generating heat where a soldered terminal could not be used to advantage although not necessarily limited to this use, but in all cases where a terminal can be applied to conduct electric current.

With such objects in view, and others which will appear as the description proceeds, the invention comprises various novel features of construction and arrangement of parts which will be set forth with particularity in the following description and claims appended hereto.

In the accompanying drawing, which illustrates certain embodiments of the invention and wherein similar characters of reference indicate corresponding parts in all the views,

Figure 1 shows a perspective view of the terminal connector assembled and attached to a flexible electrical conductor;

Fig. 2 is a vertical cross-section through the center of the assembled terminal connector;

Fig. 3 is a plan view with the top or cover section removed, showing the conducting wires in place;

Fig. 4 is a cross-section through 4—4 of Fig. 2, showing the method of inclosing the naked conducting wires within the metal casing;

Fig. 5 is a cross-section through 3—3 of Fig. 2, showing the method of gripping the naked end, also the insulated section of the conducting wires;

Fig. 6 is a perspective view of the cover or top section;

Fig. 7 is a perspective view of the main body section;

Fig. 8 is a plan view of an assembled connector with electrical conductor attached, showing a modified form;

Fig. 9 is a sectional view of the connector as shown in Fig. 8;

Figs. 10 and 11 are a plan and side view, respectively, of the modified form of terminal connector as it is made up ready to be attached to a conductor;

Figs. 1 to 7 inclusive show a terminal connector to take conducting wires of #10 gage and heavier;

Figs. 8 to 11 inclusive are for #12 gage or lighter.

Fig. 6 is made of a soft light gage metal; and Fig. 7 of a heavier gage.

Referring to the drawing, A designates a conductor and B the solderless terminal connector applied thereto. This connector, as shown in Figs. 1 to 5 inclusive, is made in two sections *b* and *b'*. Each section is formed with an eyelet portion 1 and a clip portion 2. The eyelet portions have tubular studs or eyes 3 which are adapted to register and one fits within the other, as

clearly shown in Fig. 2, and around these eyes are coiled or looped the strands *a* of the conductor, it being understood that the conductor has a portion of its insulation *a'* removed from the strands so that the latter will, when clamped between the two sections of the terminal connector, have good electrical connection therewith. The eye portions of the sections *b* and *b'* have peripheral flanges 4, the flange of one section fitting within the flange of the other section, as clearly shown in Figs. 2 and 4.

The tubular studs 3 and the peripheral flanges 4 of the two sections have a sliding engagement on each other, so that when the terminal is applied to a binding post screw and the nut of the binding post is tightened, the two sections will yield toward each other and firmly grip on the strands of the conductor, whereby an effective electrical contact is obtained and the grip on the conductor is increased so that it cannot pull out of the terminal. The clip portions 2 are curved to fit around the insulated portion of the conductor; the clip portion of the section *b* is semi-cylindrical, and the corresponding clip portion of the section *b'* is formed with clip extensions or lugs 5, so that in cross-section the portion 2 is U-shaped. The clip portion of the section *b* fits within the U-shaped clip portion of the section *b'*, and the lugs 5 are bent around the outside of the clip portion 2 of the section *b*. The two sections of the terminal connector are forced together under pressure and the lugs 5 are rolled down tight also under pressure, so that when the terminal connector is once applied it is impossible to pull the conductor out, as the strands are firmly clamped between the eye portions and the insulation and strands are firmly clamped between the clip portions.

The construction shown in Figs. 8 to 11 inclusive is based on the same general idea, except that the two parts *c* and *c'* of the connector C are integrally united by a connecting portion 6 which is doubled so as to bring the section *c* over and in register with the section *c'*. The section *c'* has a hollow stud or eyelet 7 around which the strands *d* of the conductor D are looped, and the section *c* has an opening 8 into which the eyelet 7 extends. The free edge of this eyelet is flanged over or upset as at 9, Fig. 9. The clip portions 10 and 11 coöperate with each other, as do the portions 2 of the sections *b* and *b'* of the first form. These clip portions of the terminal connector may be provided with transverse internal ribs 12 formed by depressions so that the ribs contribute to fasten the terminal connector on the conductor as the ribs 12 bite into the insulation and withstand longitudinal strains.

In use, the terminal connector is applied to the threaded stud of a binding post by the stud passing through the eye of the connector, and when the nut of the binding post is tightened, an additional clamping action of the terminal connector on the wires of the conductor is obtained, so that a good electrical connection is secured, as well as the tightening of the connector on the conductor.

From the foregoing description taken in connection with the accompanying drawing, the advantages of the construction and method of operation will be readily understood by those skilled in the art to which the invention appertains, and while I have described the principle of operation, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative and that such changes may be made when desired as fall within the scope of the appended claims.

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

1. A terminal connector for electrical conductors comprising two members each having a central hollow tubular stud which engage one within the other by a sliding overlapping action, the stud on each member extending short of the outer face of the other member and conducting wires incased between the two members, both members being yieldable toward each other when pressure is applied, whereby the conducting wires are firmly gripped within the terminal.

2. A terminal connector for electrical conductors comprising two members each having an outer peripheral flange which engage one within the other by a sliding overlapping action, the flange on each member extending short of the opposite face of the other member and conducting wires incased within and between the two members and yieldable when pressure is applied, whereby the conducting wires are firmly gripped within the terminal.

3. A terminal connector for electrical conductors consisting of two members, each member having a central hollow tubular stud and an outer peripheral flange, both of which engage one within the other by a sliding overlapping action, the stud and flange on each member extending short of the outer face of the other member, conducting wires incased within the hollow tubular studs and the peripheral flanges and yieldable when pressure is applied, whereby the conducting wires are firmly gripped within the terminal.

4. A terminal connector comprising two members each formed with a clip portion and an eyelet portion, the eyelet portions being provided with a central tubular stud

and a peripheral flange, the stud and flange of one member fitting within the stud and flange of the other member to form a metallic casing, a conductor having a bared portion extending within the casing and out of the same to lie within the clip portions of the members, said clip portions being bent around the end of the insulation of the conductor and around the free extremity of the bared portion of the conductor, the eyelet portions of the members being yieldable toward each other when the terminal is clamped in a binding post.

5. A terminal connector comprising two members each having projecting clips, the clips of one section being disposed within the clips of the other section, and an insulated conductor having a naked extremity clamped between the members and also a portion of the naked extremity and the insulation of the conductor being clamped between the clips, said clips being provided with transverse internal ribs running parallel to each other to grip the naked and insulated portions of the conductor.

6. A terminal connector comprising two sections each formed with an eyelet and a clip portion, each eyelet portion having a tubular stud and a peripheral flange, the peripheral flange continuing into the marginal edges of the clip portion, the eyelet and clip portions of one section fitting into the eyelet and clip portions of the other section, and the stud of one section fitting within the stud of the other section, the clip portions being bendable to grip around the insulation of the conductor, and the eyelet portions coöperating to form a hollow approximately annular casing for receiving a naked portion of the conductor, the stud and flange of each eyelet extending short of the outer face of the other eyelet.

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