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NON-ELECTROLYZING CONNECTION FOR DISSIMILAR METALS  
AND CONDUCTOR CLAMP EMBODYING THE SAME  
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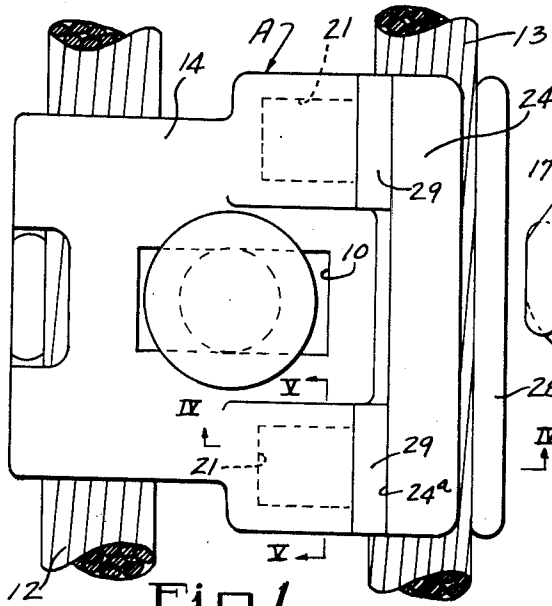


Fig. 1

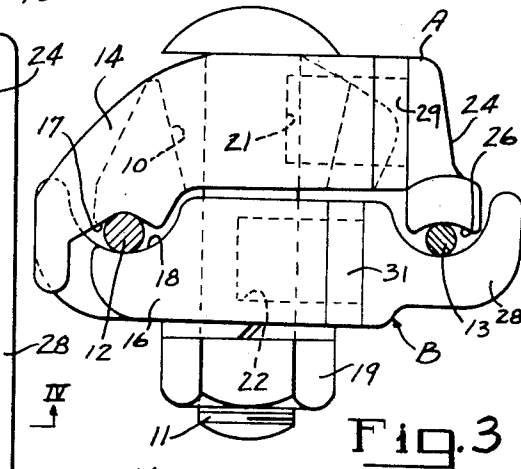


Fig. 3

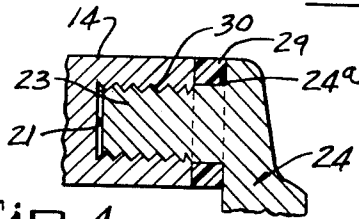


Fig. 4

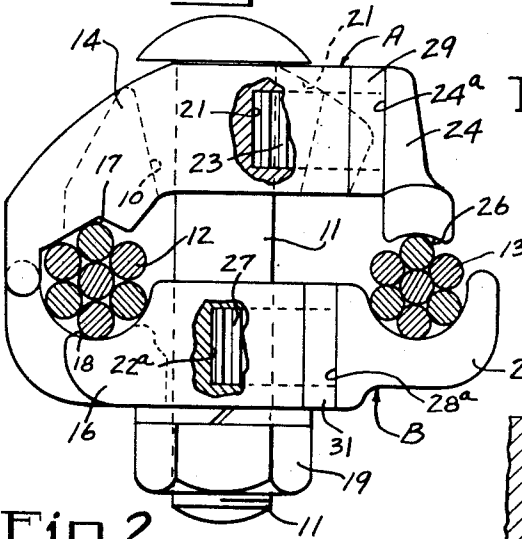


Fig. 2

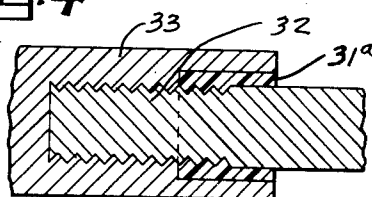


Fig. 6

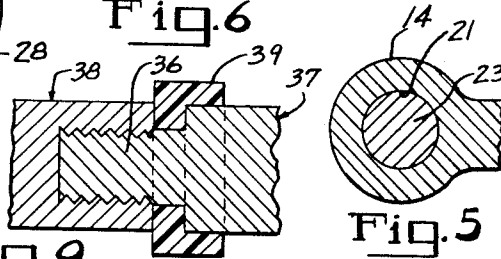


Fig. 5

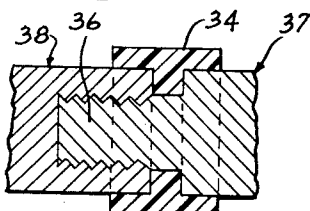


Fig. 8

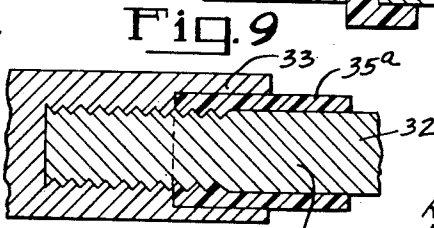


Fig. 7

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**NON-ELECTROLYZING CONNECTION FOR DISSIMILAR METALS AND CONDUCTOR CLAMP EMBODYING THE SAME**

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3 Claims. (Cl. 174—94)

Our invention relates to an improved connection for joining dissimilar metals, and has for an object the elimination of the effect of electrolysis heretofore existing when dissimilar metals such for instance as aluminum and copper are joined together.

Another object is to provide a connection or joint of the character indicated characterized by the provision of means to exclude moisture from the two metals at the place where they are joined, and in that way substantially eliminating the damaging effect of electrolysis at the joint.

Our invention contemplates a clamp for electrical conductors of dissimilar materials such as copper and aluminum in which the portions thereof contacting the respective conductors shall be of the same material as the material of the conductors, and which embodies the improved non-electrolyzing joint or connection as herein disclosed.

Another object is to provide a clamp of the character designated in which the joint between the dissimilar parts thereof is formed by inserting a portion of one member into the other and then compressing the material of said other member about the inserted portion, moisture being excluded from the joint by means of a washer or sleeve of non-conducting material such as rubber or one of a number of well-known plastic materials.

A further object of our invention is to provide a clamp for electrical conductors of different materials which shall be simple and economical of manufacture and which shall have long, trouble-free life.

A clamp for electrical conductors illustrating features of our invention and embodying our improved non-electrolyzing connection is shown in the accompanying drawings forming a part of this application in which:

Fig. 1 is a plan view showing the clamp in place on two conductors of dissimilar metals such as aluminum and copper;

Fig. 2 is a side elevational view of the clamp shown in Fig. 1;

Fig. 3 is a view corresponding to Fig. 2 and showing the clamp applied to conductors of smaller diameter;

Fig. 4 is a detail sectional view taken generally along line IV—IV of Fig. 1;

Fig. 5 is a detail sectional view taken generally along line V—V of Fig. 1;

Fig. 6 is a detail sectional view showing a modified form of our improved joint;

Fig. 7 is a view corresponding to Fig. 6 and showing a still further modified form;

Fig. 8 is a sectional view showing another modified form of our invention; and,

Fig. 9 shows yet another form in which the moisture excluding washer is of different shape from the others.

Referring now to the drawings for a better understanding of our invention and in particular to Figs. 1, 2 and 4, we show our improved non-electrolyzing connection or joint embodied in a clamp for electrical conductors. As shown, the preferred form of clamp embodying our improved joint comprises generally two body portions A

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and B. The portion A is provided with an elongated slot 10 which is adapted to receive the shank of a clamping bolt indicated by the numeral 11.

Let it be assumed that two conductors 12 and 13 are to be clamped and that the conductor 12 is made of aluminum whereas the conductor 13 is made of copper. In the case just mentioned the body portion 14 of the section A is made of aluminum. Likewise, the body portion 16 of the section B is made of aluminum. The sections 14 and 16 have seats 17 and 18, respectively, which coact in clamping the cable 12. It will be apparent that when the nut 19 is run up on the bolt 11, the aluminum cable 12 is clamped between the aluminum portions 14 and 16 of the respective sections A and B of the clamp.

A side of the section A is provided with a pair of openings 21. The corresponding side of the section B is provided with similar openings 22. Disposed to fit in each opening 21 is the extension portion 23 of a jaw member 24 made of copper and having a curved seat 26 thereon adapted to engage the cable 13.

Disposed to fit in the openings 22 of the body portion B are projections 27, similar in all respects to the projections 23, and integral with a copper jaw 28. It will be noted that the extending portions 23 and 27 are provided with serrations indicated in Fig. 4 by the numeral 30.

Prior to assembling the jaws to their respective body members, we place about the portions 23 washers or sleeves of rubber or like material indicated at 29. In like manner, we place about the portions 27 similar washers 31. After inserting the portions 23 and 27 in their respective openings 21 and 22, we compress the metal immediately surrounding the extending portions so as to deform the aluminum and press it against the extending portions. This serves to form an efficient electrical connection between the body portions 14 and 16 and their respective jaws 24 and 28. Further, there is some axial elongation of the aluminum immediately surrounding the respective extending portions which tends to cause the same to flow and compress the washers 29 or 31 against the shoulders 24a and 28a of the respective jaws 24 and 28. Thus, we provide an efficient seal which is effective to exclude moisture from contact with the dissimilar metals and thus eliminate or materially reduce the chance of electrolysis taking place at the point of connection of the copper and aluminum portions of the clamp.

In the remaining detail figures of the drawings we show various other forms of joints embodying the features of our invention. For instance, in Fig. 6 we may use a washer 31a which surrounds the portion 32 inserted in the portion 33 of dissimilar material. Upon compressing the outer portion 33, a good, efficient moisture excluding seal is provided.

In Fig. 7 we show a somewhat similar arrangement in which the washer 35a has a portion extending past the end of the outer metal portion 33. Under some conditions this type of elongated washer or sleeve is preferred over the one shown in Fig. 6.

In Fig. 8 we show a sealing washer or sleeve 34 which is somewhat T-shaped as viewed in transverse section. When the portion 36 of the part 37 is inserted in the portion 38, subsequent distortion of the outer part about the inner part may be effected as before stated. The washer 34 thus assures that moisture does not contact the dissimilar metals at the joint.

Finally, in Fig. 9, we show a seal 39 which is L-shaped as viewed in transverse section. This sealing washer or sleeve functions in the manner already explained.

From the foregoing it will be seen that we have provided an improved means of preventing electrolysis and hence damage to portions of electrical devices or the like

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formed of dissimilar metals. While in the drawings we show the inserted portion as being circular in transverse section, it will be apparent that the same may be laterally elongated or of any other desired shape. With either of the joints made in accordance with our invention, the effect of moisture thereon is materially reduced because no body of moisture can simultaneously contact the two dissimilar metals in the way required to produce or promote electrolytic actions. Under these conditions electrolysis is effectively eliminated thus assuring long, trouble free life for the clamp or other piece of equipment embodying our improved joint.

Our improved clamp is especially effective for its intended purposes and represents a considerable improvement over those forms of clamps in which certain of the parts have been coated with the same metal as the associated conductor. It will also be noted that by serrating the various parts inserted in the other part, a firm, non-slipping grip and a good electrical connection is made when the outer portion is compressed. While we refer herein to a clamp or the like having copper and aluminum parts, we mean to include in those terms the usual alloys of such metals. Similarly, our invention is applicable to various other metals which tend to decompose by electrolysis when brought together.

While we have shown our invention in several forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof, and we desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What we claim is:

1. In a clamp for electrically connecting an aluminum conductor to a copper conductor, a pair of opposed solid aluminum body parts, a pair of opposed jaws of solid copper, there being coating conductor seats on said body parts to receive and clamp said aluminum conductor and similar seats on said copper jaws to receive and clamp the copper conductor, portions on the copper jaws extending outwardly thereof beyond the jaws, said extending portions being inserted into and secured in the associated aluminum body part, and a bolt passing through the aluminum parts and disposed to clamp the conductors in their respective seats.

2. In a clamp for electrically connecting an aluminum conductor to a copper conductor, a pair of solid aluminum body parts, there being coating seats on said body parts located adjacent a side of said parts and disposed to receive between them and clamp the aluminum conductor,

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a pair of solid copper jaws having thereon coating seats disposed to receive between them and clamp the copper conductor, there being openings in the sides of said aluminum body parts opposite the seats thereof, a pair of integrally formed portions on each of the copper jaws extending parallel to each other and inserted in said openings of the body parts, and a single bolt passing through the aluminum body parts between the seats thereon and said jaws, and disposed to draw the seats together about the conductors.

3. In a clamp for electrically connecting an aluminum conductor to a copper conductor, a pair of opposed body parts of solid aluminum, coating seats located on common sides of the body portions and disposed to receive the aluminum conductor, solid copper jaws, cylindrical integrally formed projections on the copper jaws near the ends thereof projecting outwardly of the jaws parallel to each other, there being sets of openings in the sides of the aluminum body parts opposite the side carrying said first named conductor seats for receiving the projections of the respective jaws, means excluding moisture from the exterior surfaces of the aluminum body parts and copper jaws at the points of connection of the same, there being elongated coating seats extending substantially from end to end of the jaws for receiving and clamping the copper conductor, and a single bolt passing through the body parts between the sets of coating seats for drawing the coating seats together, thereby simultaneously to clamp both conductors.

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