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(54) **Bimetallic connector**

Bimetall-Verbinder

Connecteur bimétallique

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Description

The invention relates to a bimetallic connector, for electrical and earth connections, comprising an aluminium part and a copper part attached together by a copper-aluminium bimetallic joining system and which extend in opposite directions from the joint, which is located in an intermediate portion adapted for attachment to connector holding means. The aluminium part is provided with a first blade and the copper part is provided with a second blade.

Prior art Bimetallic aluminium-copper connectors having a black provided with a passage an known from FR-A-1 289 476 and US-A-4 334 122.

Particularly for earth connections and more particularly in connections of this type for lightning protection, a bimetallic connector is known in which both the copper part and the aluminium part comprise opposite half round end portions. At the place of use, which usually has a vertical surface such as a wall, this known connector is held by a clamp applied to the intermediate portion thereof, in such a way that the curved surface of each of the end portions is adjacent the vertical surface. It is obvious, therefore, that there is no useful space between the connector and the vertical wall and consequently it is not possible to locate either a nut or the head of a screw. This means that the known connector has to be provided with threaded holes capable of receiving and retaining screws which also pass through the corresponding copper and aluminium bars.

It is an object of the invention to overcome the drawbacks of these known connectors. This object is achieved by a connector of the type described at the beginning which is characterized in that said first blade: (a) occupies a substantially axially centered wide area; (b) has two substantially parallel opposite surfaces forming a thickness smaller than that of the said intermediate portion; and (c) is provided with at least one not threaded passage extending between said opposite surfaces.

Since the first connector blade of the invention is centered and is thinner than the intermediate section, there is of necessity a free space behind the first blade when the connector is installed and this free space allows either the head of screw or a nut to be fitted, whereby the connection with an aluminium bar may also be made without the need for screw threads, with standardized easily obtainable items, such as screws, nuts and, as required, washers. It should be noted that a connection made with screws, nuts and washers is considered to be one of the most reliable.

According to a preferred feature of the invention, said second blade is substantially axially offset; it has two substantially flat opposite flats parallel to said opposite surfaces and is provided with at least one hole extending between said opposite flats.

Owing to this feature, it is possible to use for the connector of the invention known easily obtainable forged copper blades.

According to an alternative feature to the foregoing one, said second blade is substantially axially centered, whereby it allows other copper blades in a similar way to the aluminium blades to be used.

Further advantages and features of the invention will be appreciated from the following description, in which there is given a preferred embodiment of the invention without any limiting nature, with reference to the attached drawings in which:

Figure 1 is a perspective view of one embodiment of the connector of the invention.

Figure 2 is a side elevation view on a smaller scale.

Figure 3 is a plan view from above, also on a smaller scale.

Figure 4 is a perspective view of a second embodiment of the present connector.

Figure 5 is a side elevation view of the latter on a smaller scale.

Figure 6 is a plan view from above of the second connector, also on a smaller scale.

The bimetallic connector comprises a copper part 2 and an aluminium part 4 connected together by friction welding or any other system of forming copper-aluminium bimetallic joints. The joint may be appreciated by the line 6, from which the two parts 2, 4 extend in opposite directions. The joint is located in an intermediate portion 8 which is preferably cylindrical or prismatic, whereby it defines generating lines. The form and thickness of the intermediate portion 8 make it suitable for attachment to holding means, preferably a standardized circular clamp, not shown.

It is also preferred that the intermediate portion 8 be located between two widened portions 10 which facilitate the fitting and permanent location of the said clamp and that the side surface 12 of each widened portion 10 be substantially perpendicular to the generating lines of the intermediate portion.

The aluminium part 4 is provided with a first blade 14 for connection to a flat bar (not shown) which is generally made from aluminium, although it may be made from any other material. The first blade 14 has two opposite parallel surfaces 16 with the distance between them being substantially less than the thickness of the intermediate portion and, therefore, less than the diameter of the widened portions 10. Therefore, between one surface 16 and the most outwardly extending portion of the respective widened portion 10 there is a space to be referred to hereinafter. The first blade 14 is substantially axially centered, i.e. the two heights 18 shown in Figure 2 are substantially the same. The blade 14 is also provided with at least one passage 20 extending between both surfaces 16 and is suitable for receiving a screw, pin, bolt or the like.

The copper part 2 is provided in turn with a second blade 22 for connection to a flat bar which is generally made from copper, although it may be made from any other material. This bar is not shown either. This second

blade is also provided with two opposite substantially plane flats 24 which are substantially parallel to the surfaces 16 of the first blade 14. In Figures 1 to 3 the second blade 22 is seen to be substantially axially offset, like some already known forged blades. In the embodiment described, it is provided with an orifice 26 extending between said opposite flats and which, like the passage 20, is suitable for receiving a screw, pin, bolt or the like.

When the connector is installed with a clamp against a vertical surface, such as that of a wall or a post, the configuration of the first blade 14 and the said space formed from each surface 16 allow a nut or the head of screw to be inserted, which greatly facilitates its use.

In the embodiment of Figures 4 to 6, the aluminium blade 4 and the centre portion 8 have a configuration substantially the same as that of the embodiment already described. On the contrary, the copper blade 22 is substantially centered, in a similar way to the aluminium blade 14. Therefore, in this case, the two heights 28 shown in Figure 5 are also substantially the same. The clarity of Figures 4 to 6 and the similarities with the embodiment of the first three Figures make any further description unnecessary.

It is pointed out that the connector of the invention may also be used as a bimetallic connection between aluminium and copper cables and busbar terminations.

Claims

1. A bimetallic connector, for electrical and earth connections, comprising an aluminium part (4) and a copper part (2) attached together by a copper-aluminium bimetallic joining system and which extend in opposite directions from the joint, which is located in an intermediate portion (8) adapted for attachment to connector holding means; the aluminium part (4) being provided with a first blade (14) and the copper part (2) being provided with a second blade (22), characterized in that said first blade (14): (a) occupies a substantially axially centered wide area; (b) has two substantially parallel opposite surfaces (16) forming a thickness smaller than that of the said intermediate portion (8); and (c) is provided with at least one not threaded passage (20) extending between said opposite surfaces (16).

2. The connector of claim 1, characterized in that said joining system is by friction welding.

3. The connector of claim 1 or 2, characterized in that said second blade (22) is axially offset, is provided with two opposite substantially plane flats (24) parallel to said opposite surfaces (16) and is provided with at least one orifice (26) extending between said opposite flats (24).

4. The connector of claim 1 or 2, characterized in that said second blade (22) is substantially axially centered, is provided with two opposite substantially plane flats (24) parallel to said opposite surfaces (16) and is provided with at least one orifice (26) extending between said opposite flats (24).

5. The connector of any one of claims 1 to 4, characterized in that said intermediate portion (8) is substantially cylindrical or prismatic and is located between two widened portions (10) of the connector.

6. The connector of claim 5, characterized in that the side surface (12) of each of said widened portions (10), adjacent the intermediate portion (8), defines a plane substantially perpendicular to the generating lines of the intermediate portion (8).

Patentansprüche

1. Zweimetallverbinder für elektrische Erdungsanschlüsse mit einem Aluminiumteil (4) und einem Kupferteil (2), die über eine Kupfer-Aluminium-Bimetallverbindungseinheit miteinander verbunden sind und sich von der Verbindungsstelle aus in entgegengesetzte Richtungen erstrecken, wobei die Verbindungsstelle in einem Zwischenbereich (8) angeordnet ist und für das Anbringen von Verbinder-Halteeinrichtungen angepaßt ist, wobei das Aluminiumteil (4) mit einem ersten Blatt (14) und das Kupferteil (2) mit einem zweiten Blatt (22) versehen ist,
   dadurch **gekennzeichnet,** daß
   das erste Blatt (14):

   (a) eine im wesentlichen axial zentrierte große Fläche einnimmt,
   (b) zwei im wesentlichen parallele gegenüberliegende Oberflächen (16) aufweist, wobei deren Dicke kleiner ist als der Zwischenbereich (8), und
   (c) mit mindestens einem kein Gewinde aufweisenden Durch: gang (20) versehen ist, der sich zwischen den gegenüberliegenden Oberflächen (16) erstreckt.

2. Zweimetallverbinder nach Anspruch 1,
   dadurch gekennzeichnet, daß
   die Verbindungseinheit durch Reibschweißen erzeugt wird.

3. Zweimetallverbinder nach Anspruch 1 oder 2,
   dadurch gekennzeichnet, daß
   das zweite Blatt (22) zur Achse versetzt und mit zwei im wesentlichen flachen gegenüberliegenden Flächen (24) versehen ist, die zu den gegenüberliegenden Oberflächen (16) parallel sind und mit

mindestens einer Öffnung (26) versehen sind, die sich zwischen den Ebenen (24) erstreckt.

4. Zweimetallverbinder nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß das zweite Blatt (22) im wesentlichen zur Achse ausgerichtet und mit zwei im wesentlichen flachen gegenüberliegenden Ebenen (24) versehen ist, die zu den gegenüberliegenden Oberflächen (16) parallel sind und mit mindestens einer Öffnung (26) versehen sind, die sich zwischen den gegenüberliegenden Ebenen (24) erstreckt.

5. Zweimetallverbinder nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß der Zwischenbereich (8) im wesentlichen zylindrisch oder prismatisch ist und zwischen zwei geweiteten Teilen (10) des Verbindungsstücks angeordnet ist.

6. Zweimetallverbinder nach Anspruch 5, dadurch gekennzeichnet, daß die Seitenflächen (12) jedes der geweiteten Teile (10) an den Zwischenbereich (8) grenzen und Ebenen beschreiben, die zu den von dem Zwischenbereich (8) erzeugten Linien im wesentlichen senkrecht stehen.

Revendications

1. Connecteur bimétallique pour des connexions électriques et mise à la terre, comprenant une partie d'aluminium (4) et une partie de cuivre (2) fixées ensemble par un système de liaison bimétallique cuivre-aluminium et qui s'étendent dans des directions opposées à partir de la liaison, connecteur qui est situé dans une portion intermédiaire (8) pouvant être fixée sur des moyens de support de connecteur ; la partie aluminium (4) étant munie d'une première lame (14) et la partie de cuivre (2) étant munie d'une seconde lame (22), caractérisé en ce que la première lame (14) : (a) occupe une grande superficie sensiblement centrée axialement ; (b) possède deux surfaces opposées sensiblement parallèles (16) formant une épaisseur inférieure à celle de la portion intermédiaire (8) ; et (c) est munie d'au moins un passage non fileté (20) s'étendant entre les surfaces opposées (16).

2. Connecteur selon la revendication 1, caractérisé en ce que le système de liaison est réalisé par un soudage par friction.

3. Connecteur selon la revendication 1 ou 2, caractérisé en ce que la seconde lame (22) est décalée axialement et elle est munie de deux plats opposés sensiblement plans (25) parallèles aux surfaces opposées (16) et est munie d'au moins un orifice (26) s'étendant entre les plats opposés (24).

4. Connecteur selon la revendication 1 ou 2, caractérisé en ce que la seconde lame (22) est sensiblement centrée axialement et elle est munie de deux plats opposés sensiblement plans (24) parallèles aux surfaces opposées (16) et avec au moins un orifice (26) s'étendant entre les plats opposés (24).

5. Connecteur selon l'une quelconque des revendications 1 à 4, caractérisé en ce que la portion intermédiaire (8) est sensiblement cylindrique ou prismatique et se situe entre deux portions élargies (10) du connecteur.

6. Connecteur selon la revendication 5, caractérisé en ce que la surface latérale (12) de chacune des portions élargies (10) contiguë à la portion intermédiaire (8) définit un plan sensiblement perpendiculaire aux lignes génératrices de la portion intermédiaire (8).

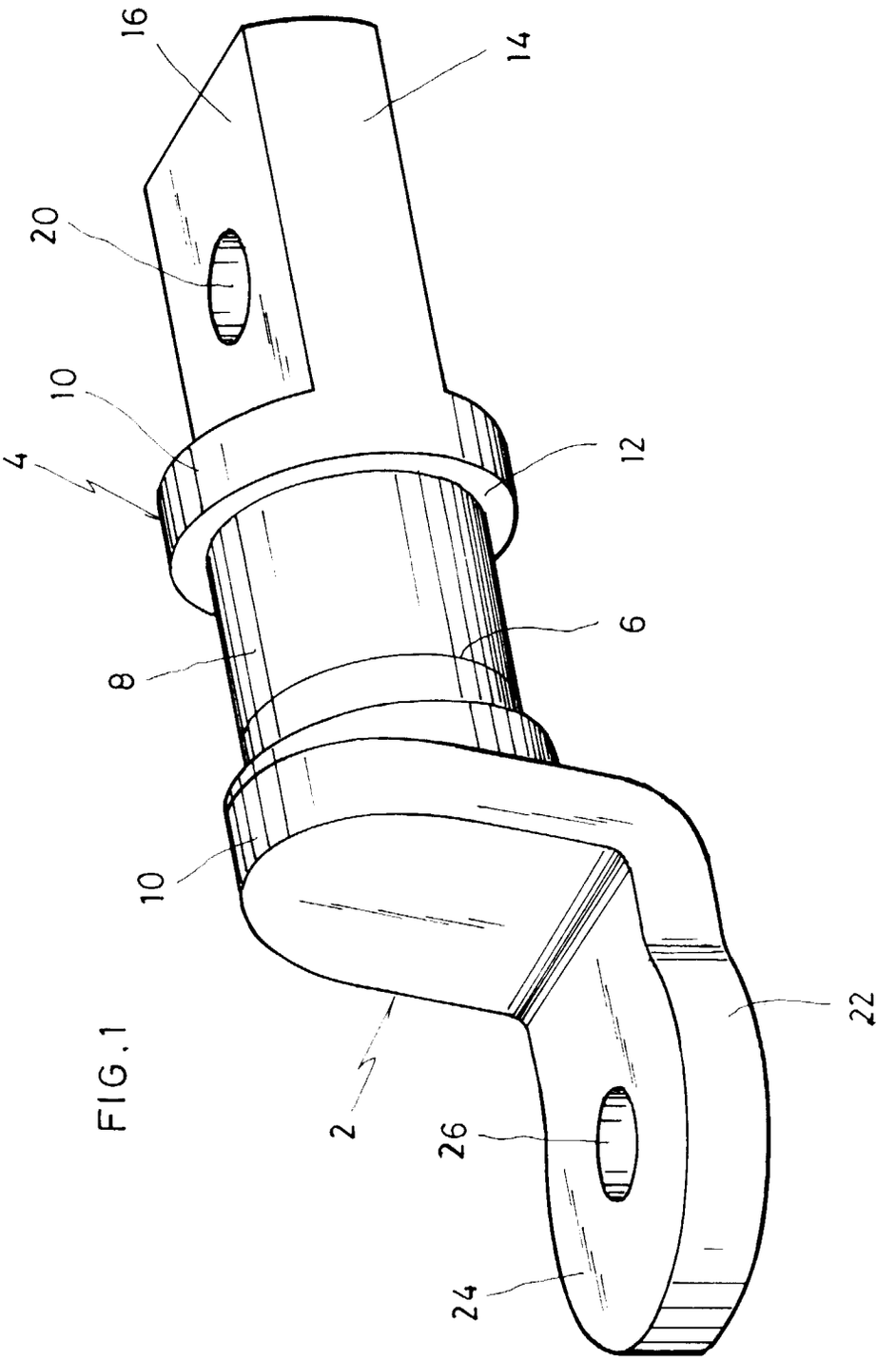

FIG. 1

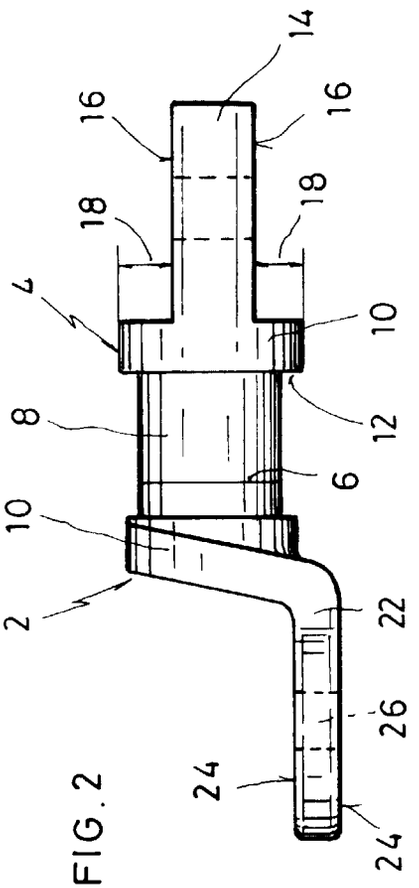
14
16
16
18
18
4
10
8
12
6
10
2
22
26
24
24

FIG. 2

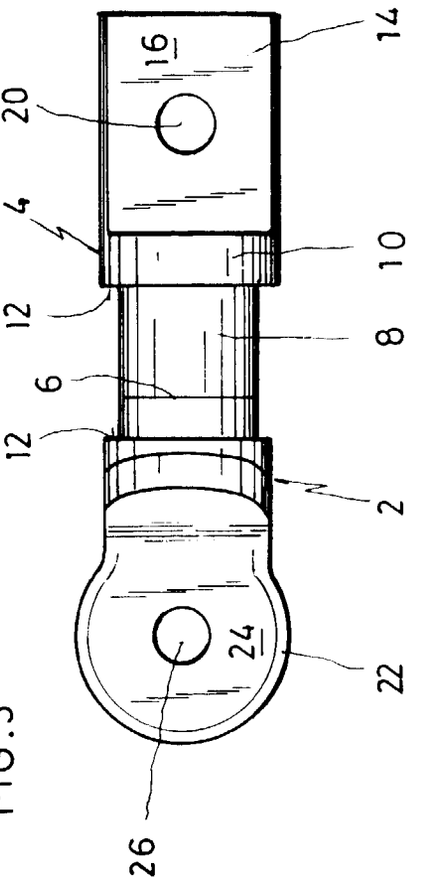
14
16
20
4
10
12
8
6
12
2
24
22
26

FIG. 3

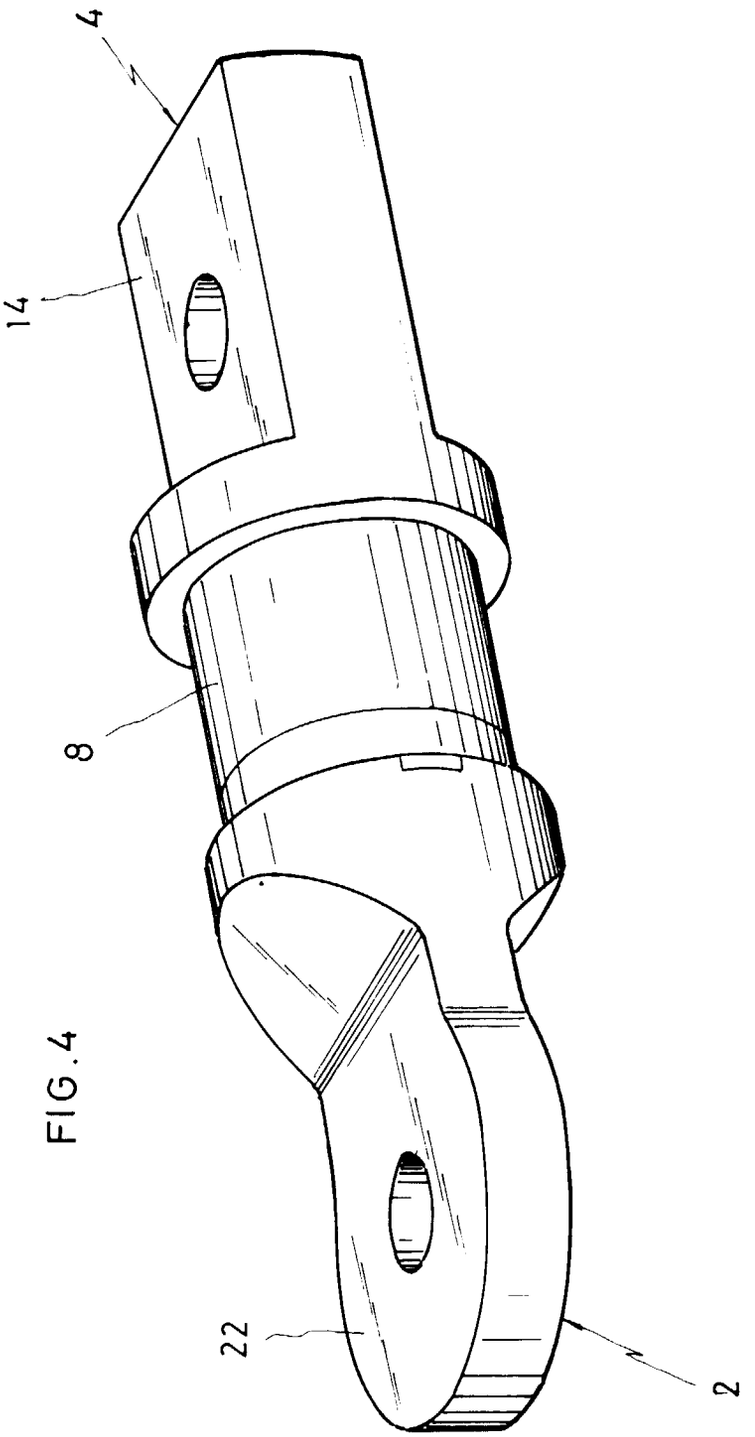

FIG.4

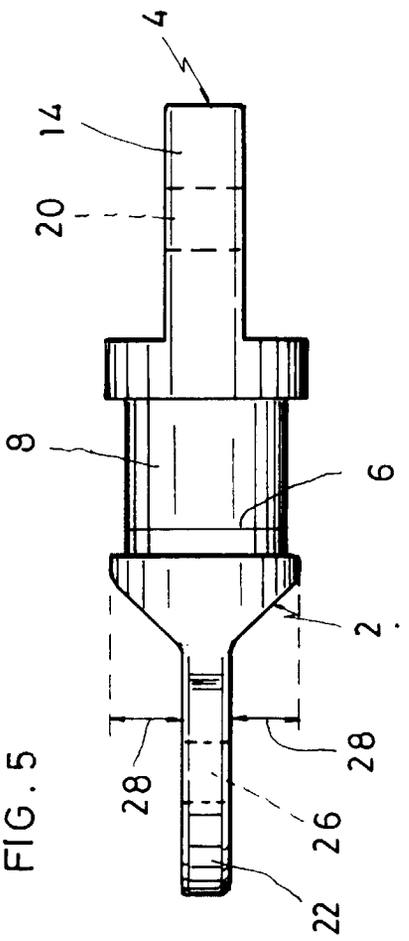

FIG. 5

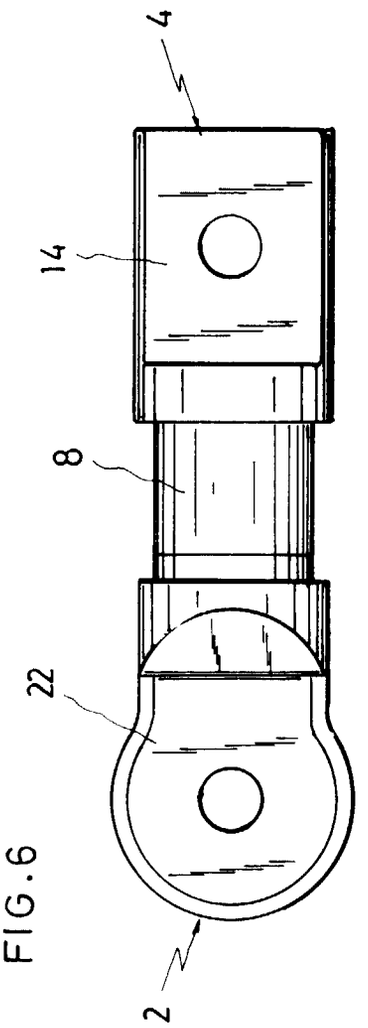

FIG. 6