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(54) Bimetallic connector.

(57) A bimetallic connector, comprising an aluminium part (4) and a copper part (2) extending in opposite directions from the joint, located in an intermediate portion (8) adapted for attachment to connector installation means ; the aluminium part (4) is provided with a first blade (14) which (a) occupies a substantially axially centered wide area ; (b) has two parallel opposite surfaces (16) forming a thickness smaller than that of the intermediate portion (8) ; and (c) is provided with at least one passage (20) extending between said opposite surfaces (16) ; in turn, the copper part (2) is provided with a second blade (22) having at least one orifice (26).

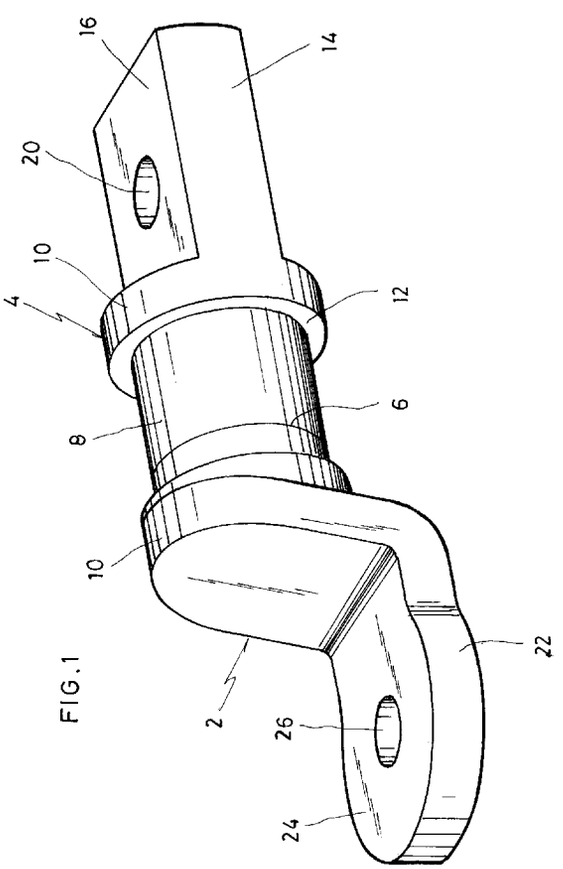

FIG.1

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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.

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 away 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 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 rectangular 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 Fig-

ures 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 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 rectangular to the generating lines of the intermediate portion (8).

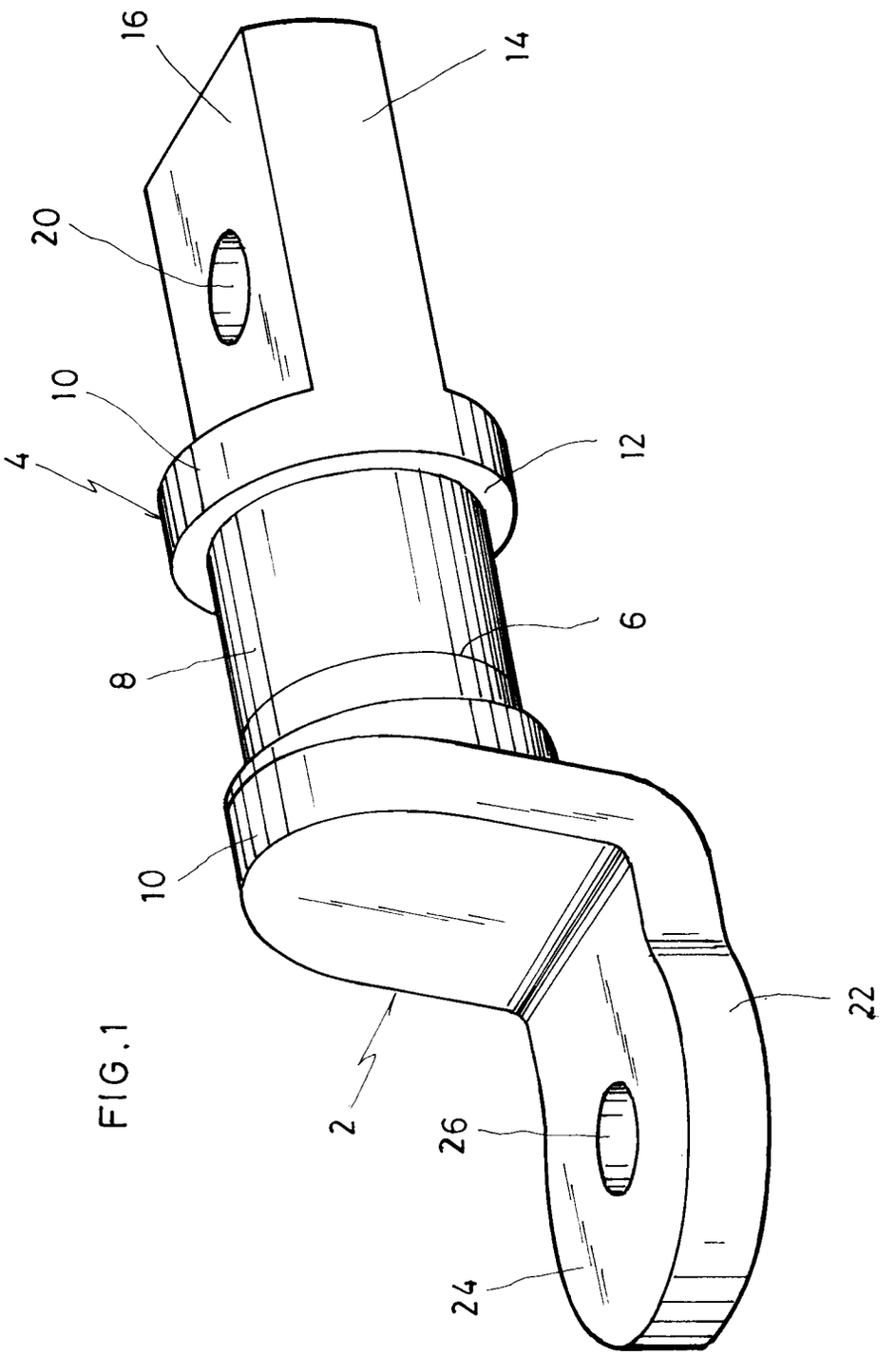

FIG.1

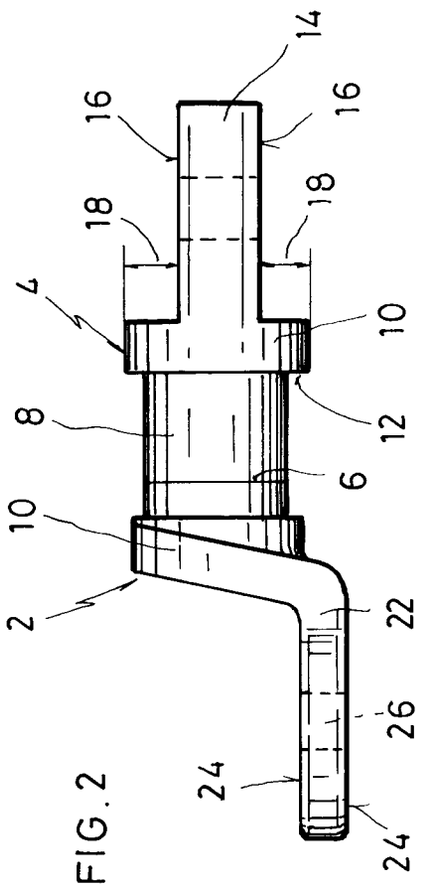
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FIG.2

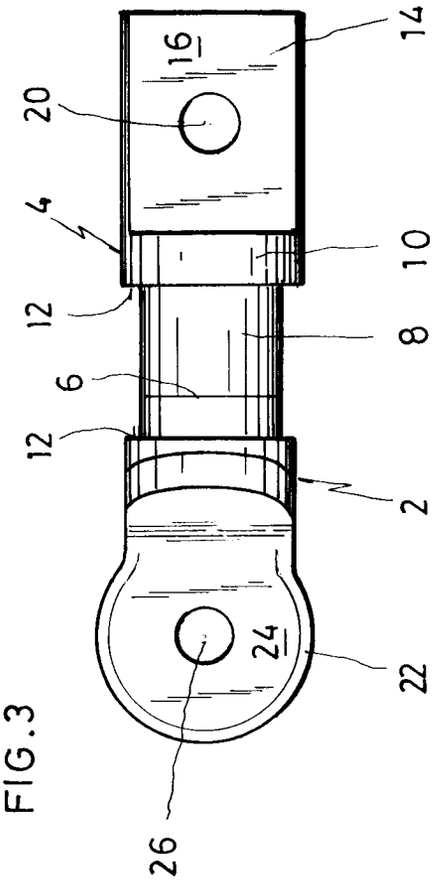
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FIG.3

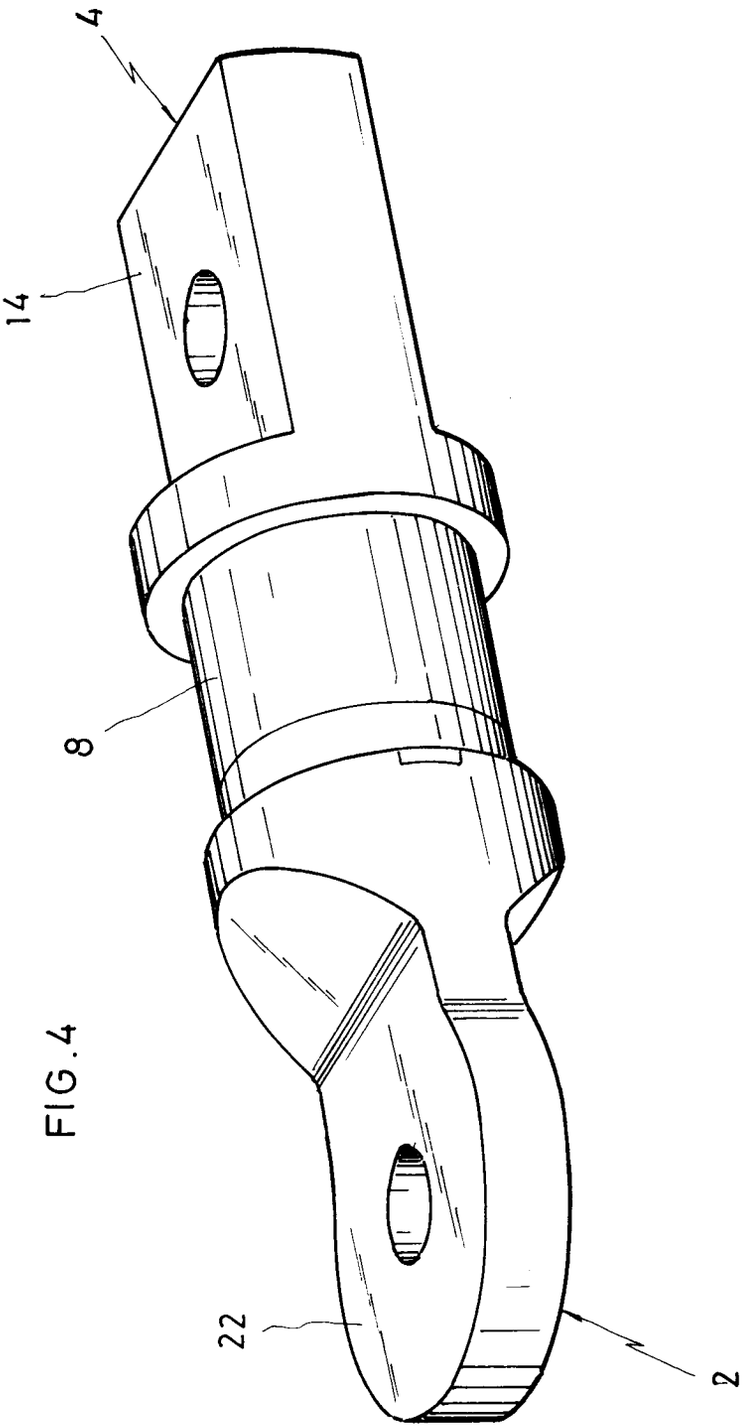

FIG.4

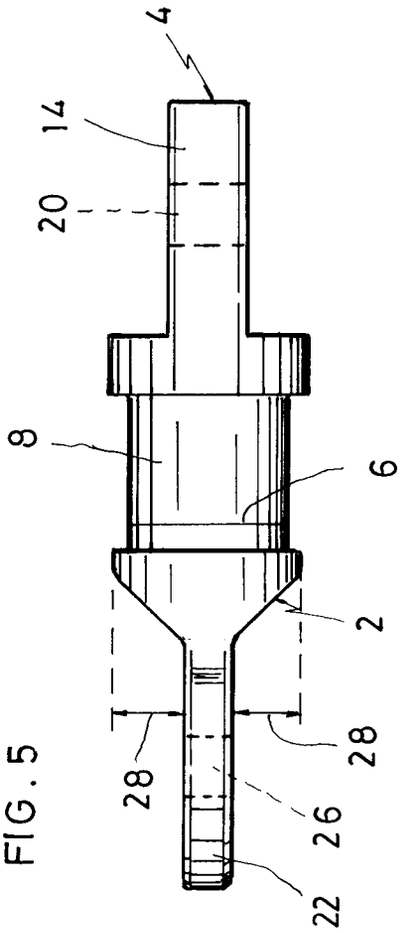

FIG. 5

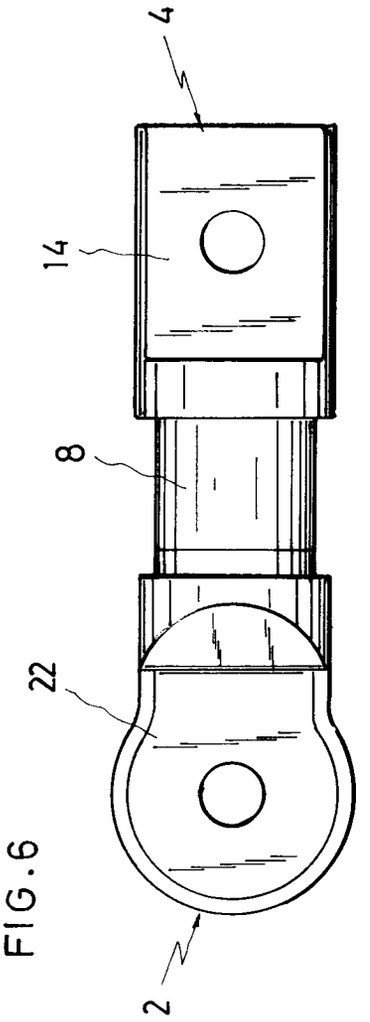

FIG. 6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number EP 95500008.8

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 6)
A	US - A - 4 334 122 (BENNETT) * Abstract; fig. 2e,2f * --	1-4,6	H 01 R 4/62
A	DE - A - 3 539 622 (FELTEN & GUILLEAUME) * Column 1, lines 62-65 * --	2	
A	DE - A - 2 539 338 (SQUARE) * Totality * --	1-6	
A	FR - A - 1 289 476 (SIMEL) * Fig. 1-3 * --	1,6	
A	DE - C - 625 428 (HOFMANN) ----		

TECHNICAL FIELDS SEARCHED (Int. Cl. 6)

H 01 R 4/00
H 01 R 9/00
H 01 R 11/00

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	17-05-1995	SCHMIDT

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
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