March 4, 1969 L. MOUTTET 3,431,533

ELECTRICAL CONNECTING DEVICE FOR HIGH TENSION WIRE

Filed Jan. 30, 1967 Sheet 1 of 2

FIG.1a

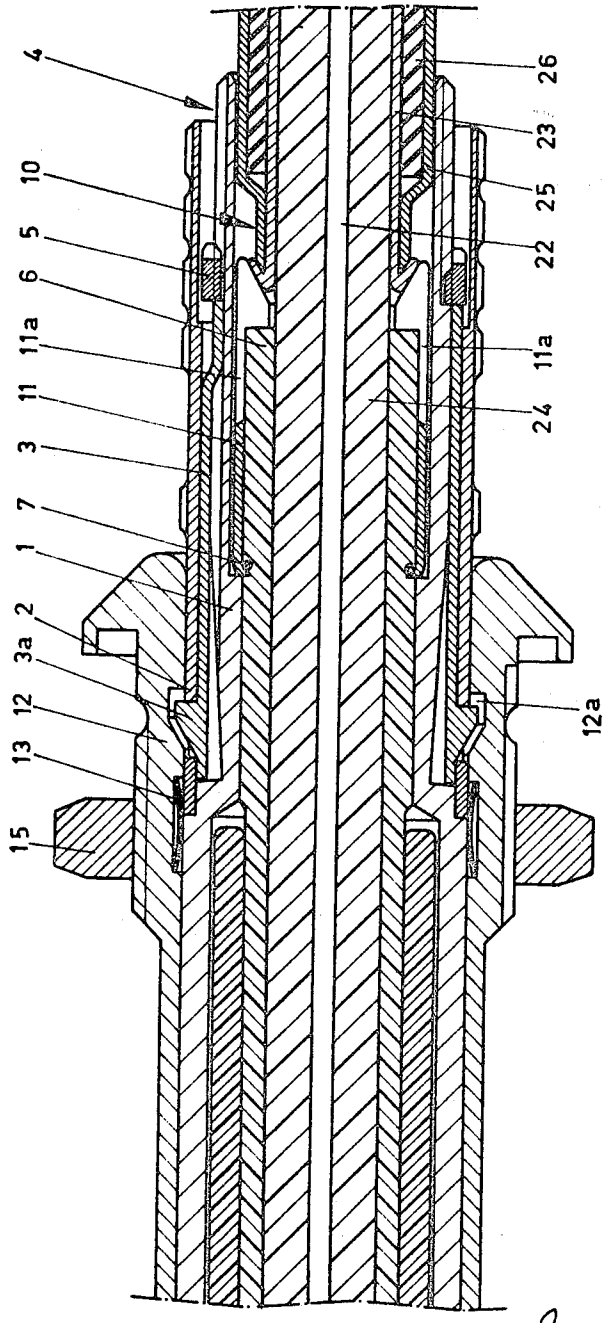

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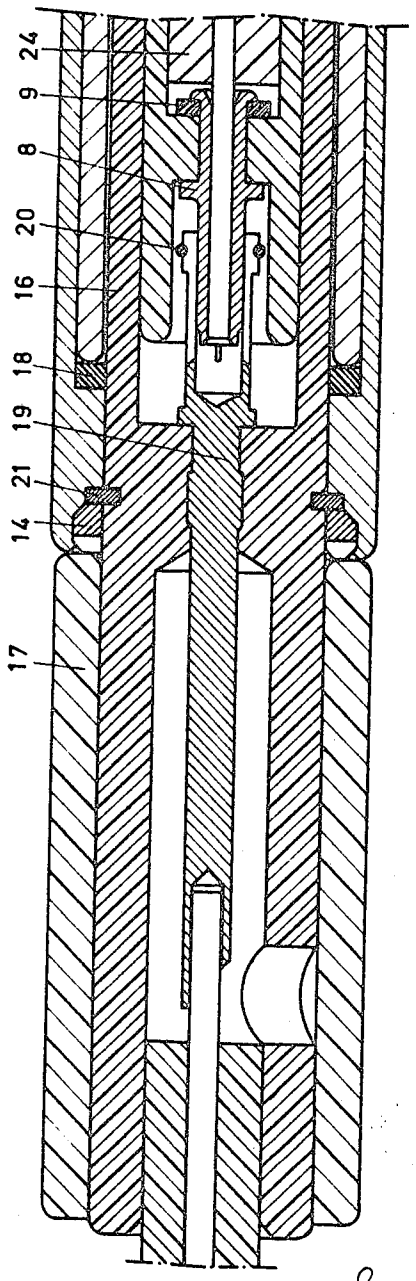
FIG. 1b



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ELECTRICAL CONNECTING DEVICE FOR HIGH TENSION WIRE

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U.S. Cl. 339—14 3 Claims
Int. Cl. H01r 3/06, 13/52, 17/18

ABSTRACT OF THE DISCLOSURE

Electrical connecting device for high tension wire wherein the outer conductive parts and the insulating parts and one of the members of the device extend beyond the inner conductive parts of the same section of the device and the external conductive and insulating parts of each section of the device have about the same length so that when the male and female parts are united, contact is established between the outer conductive parts while the inner conductive parts are still spaced one from the other, the distance at this moment between the inner conductive parts being determined in proportion to the nominal voltage of the central conductor to be linked.

Already known are various coaxial connecting devices for low voltage. The plugs of these devices comprise generally an outer conductive part in the shape of a socket and an inner part consisting of a cylindrical rod engaging in a corresponding spindle. These inner and outer parts of the plug have approximately the same length. Such a plug is described for example in Swiss Patent No. 340,537. Such plugs are however unsuited for use in a high voltage installation for the arc appearing between the central conductors during the plugging or the removal of the plug extends to the outer part from the plug thus endangering the user.

The present invention comprises an electrical connection device for high tension cable comprising at least one male and at least one female part comprising in each an inner conductive part for connecting the central conductor under tension and an external conductive part able to slide one in the other, the exteral part of the female part being adapted for linkage to the ground, each of the insulating parts being slidable one in the other, these insulating parts being located between the inner and outer conductive parts and having approximately the same length as the outer conductive parts, the device being characterised by the fact that the outer conductive parts and the insulating part of one of the parts of the device extends beyond the conductive inner part of the same part of the device and the outer conductive and insulating parts of each part of the device have approximately the same length, the whole so that when the male and female parts are connected, contact is established between the outer conductive parts while the inner conductive parts are still spaced one from the other, the distance at this moment between the inner conductive parts being determined in proportion to the nominal voltage of the central conductor to be connected.

The accompanying drawings represents by way of example one embodiment of the invention, wherein:

FIGURE 1*a* shows the right hand side portion of the device and FIGURE 1*b* its left hand side.

The connecting device shown is intended for linking a coaxial cable **10** constituted by a central conductor **22** of twisted wire and a braided peripheral conductor **23** insulated by an insulated sheath **24**, to an installation operating under high voltage.

The male part of the device is shown on the right in the drawing, while the female part is on the left. The male part comprises essentially a metallic conducting sleeve **1**, a central hollow metallic rod **8**, an insulated sleeve **6** made of the trademark material "Teflon," mounted inside sleeve **1** itself prolonged by a part **4** carrying a locking device consisting of a knurled cylinder **2** slidable on tongue shaped spring **3** the free end of which **3***a* forms a lock traversing an opening made in cylinder **2** to engage in a groove **12***a* of a sleeve **12** integral with the female part. Such a locking device is described in detail in Swiss Patent No. 340,537. When the two parts of the device are coupled, lock **3***a* engages in groove **12***a* to lock the device. The axial position of the openings is determined in such a way that in the absence of all external strain, tongues **3** automatically urge cylinder **2** towards the centre of the device. When cylinder **2** is pulled back, the same compresses resilient tongues **3**, the extremities of which **3***a* disengage from groove **12***a*.

Cable **10** is secured by welding to the male part by its central conductor **22** to hollow rod **8**. The insulating sheath **24** fits in the "Teflon" sleeve **6**. The outer conductor **23** taken off along a certain length, then folded and clamped between a metal collet **11** anchored in insulated sleeve **6** and a band **25** mounted on the external insulating sheath **26** of cable **10** and conductor **23**. The collet has a conical bore provided with elastic grooves **11***a*. The band is clamped axially by means of a nut (not shown).

A space is left between sleeves **1** and **6** between which is inserted a "Teflon" sleeve **16** of the female part of the device. This part comprises furthermore an outer sleeve extending sleeve **12** and in which slides the sleeve **1** of the male part.

The female part of the device which is intended to be mounted on an installation panel by means of a nut **15** comprises a conductive broach **19** forming the female member of the contact and which is embedded in the bottom of the "Teflon" sleeve **16** and is surrounded at one end by an insulating ring **20**. Sleeve **16** is removably secured in the threaded sleeve **12** by means of a ring **21** seated in sleeve **16** and a nut **14**. The coupling of the two parts of the device is made by introducing the front part of sleeve **1** in sleeve **12**. During this operation the extremity of rod **8** penetrates in broach **19**.

An annular spring **13** lodged in a groove of sleeve **12** assures a good contact between the outer parts as well as the necessary rubbing between these parts.

The characteristic of this device permitting its use in high voltage installations consists essentially in the fact that the insulating sleeve **16** of the female part extends well beyond the broach **19** and that the insulated sleeve **6** and the conductive sleeve **1** of the male part have approximately the same length as sleeve **16** of the female part, these external insulated and conductive parts of the male and female parts of the device sliding one in the other for a distance in excess of 70 mm. Thus, during the assembly or the separation of the two parts, while the installation is under tension, the external metallic part of the device remains in contact with the ground until the moment when the broach **19** and the rod **8** are at a sufficient distance one from the other that no arc can be struck between these two pieces. Thus this device has all the safety required for its handling. A device of 18 mm. of diameter can be used for a voltage of 30 kilovolts but can withstand substantially higher voltages. It is evident that the male and the female parts can be interchanged, that is to say that the broach **19** can be on the right on the drawing while the rod **8** would be on the left.

What is claimed is:

1. An electrical connector for connecting to a high voltage installation a coaxial cable comprising a central con-

ductor and an outer peripheral conductor insulated therefrom by an insulated sheath comprising:

(A) a female part including a conductive member having front and rear ends and a middle section;

(B) an insulated inner sleeve surrounding said member and substantially longer than said member, said sleeve having an inwardly projecting flange member therein surrounding said middle section for fixedly securing said conductive member;

(C) a grounded outer sleeve fixed at one end thereof around said inner sleeve in the area adjacent said flange member and having a major part spaced from said inner sleeve beyond said area; a male member comprising

(D) an outer male conducting sleeve having a length approximately equal to said inner sleeve of said female member and having one end fitting between the inner and outer sleeve of said female member;

(E) means on said outer sleeve for locking said outer sleeve with said outer sleeve of said female part;

(F) an insulated inner sleeve having a length approximately equal to that of said outer male sleeve having a portion fitting tightly in said outer sleeve and a portion spaced therefrom forming a space slidably receiving said inner insulated sleeve of said female part, said sleeve receiving therein said insulating sheath of said cable;

(G) an open rod fixed in said inner sleeve and having one end fitting in said conductive member and receiving said central conductor of said cable; and means for clamping the foldded end of said outer conductor of said cable against the insulated sheath thereof,

(H) said inner sleeve of said female part, said outer male sleeve and said inner male sleeve being in mutually slidable engagement for a distance of over 70 mm. whereby contact is established between said outer conductive parts while said inner conductive parts are still separated.

2. Electrical connector according to claim **1**, wherein said outer sleeve of said female part has an inner peripheral groove containing an annular spring in contact with said outer male sleeve.

3. Electrical connector according to claim **1**, wherein said means for clamping the folded end of the outer conductor of said cable include a conductive collet secured around said inner sleeve of the male part and a band mounted on said conductor and having one end wedging said folded end against said collet.

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U.S. Cl. X.R.

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