

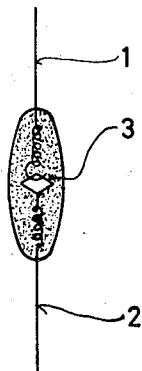
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DIRECTIONAL CONDUCTOR DEVICE AND METHOD OF MAKING IT

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DIRECTIONAL CONDUCTOR DEVICE AND METHOD OF MAKING IT

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12 Claims. (Cl. 317—236)

This invention is concerned with a directional conductor device and a method of making it.

Directional conductors for relatively low loads and high frequencies (detectors) usually comprise two electrodes which are in point contact engagement, the rectifying action taking place at the touching point of the electrodes. A commonly recognized drawback of such a detector is its sensitivity to shocks. It has therefore been attempted to find structural forms in which the sensitivity to shocks is reduced. Care was thereby also exercised to reduce the capacitance between the electrodes in order to adapt the detector for use with shorter waves.

One of the electrodes of the directional conductor device consists usually of a semi conducting combination or of metals such for example as silicon, germanium, selenium, tellurium, Steinmannite, pyrite, and the like, while the counter electrode is usually made of a wire of iron, copper, silver, platinum, tungsten or a suitable crystal. One of the electrodes is usually elastically mounted so as to permit adjustment of the contact pressure. Care is also taken to permit scanning of many points of the counter electrode so as to ascertain a point with high rectification action.

In detectors with high blocking resistance, the contact pressure must be in general very low. This requirement results in increased sensitivity to shocks. Such sensitivity may be lowered by reducing the mass of the adjustable usually wirelike electrode. Such directional conductors fail sometimes, even when mechanically well constructed, for example, when the spacing between the electrodes is for some reason changed, be it due to heat expansion, changes in the longitudinal extent of the structural parts due to shrinking, or the like.

In order to lower the shock sensitivity to a large extent and to improve reliability of operation, the punctiform area of engagement of the electrodes has until now been surrounded by a drop of phenolformaldehyde or else, a casing surrounding the electrodes, was filled with an insulating mass. The corresponding casing was fastened either upon a mounting plate carrying the means for movably adjusting the electrodes; or the casing with the electrodes embedded in the insulating mass projecting therefrom was placed into a further receptacle which served as a carrier for the directional conductor arrangement.

The invention proposes to do away with the special casing and also with a special structure for the fastening of the movable electrode by using a mass in which one of the electrodes is embedded at the point of engagement and vicinity thereof, such mass hardening after electrode adjustment and serving as the sole carrier for the electrodes and for the stabilization thereof.

Masses suitable for the purposes of the invention are masses that will solidify by vaporization of a solvent and also masses that will be converted to solid condition by temperature changes. It is in all cases essential that these masses are chemically inactive. Solidifying masses that may be used are, therefore, for example, commercially

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available cementing masses with a cellulose base. It is however possible to use solutions of celluloid or other substances which are soluble in organic solvents, such as polysterol or the like.

5 An example of the invention will now be described with reference to the accompanying drawing.

As shown, there is provided a wire 1 having a loop formed at one end for holding the directional conductor material 3, for example, a body of germanium, silicon, 10 or a metallic combination such as Steinmannite. The wire 1 may be soldered to the corresponding body. The counter electrode 2 also terminates in a thin wire. Both electrodes are placed in proper mutual position by a suitable clamping device. The contacting area is thereafter 15 enclosed in a pouring or nozzle injecting device and the inside thereof is filled with a suitable liquefied substance. After cooling and solidifying of such substance, the pouring or nozzle injection device may be removed. The ends of the wires disposed within the substance which 20 solidifies may be coiled or otherwise wavelike shaped so as to increase the mechanical strength.

The structure of the directional conductor according to the invention is of particular advantage in case of a body which exhibits a good rectifying action along all or a plurality of points because the searching for particularly sensitive points may then be practically dispensed with. Such 25 bodies may for example be produced from silicon monocrystals having ground surfaces.

Changes may be made within the scope and spirit of the 30 appended claims.

I claim:

1. A directional conductor device comprising a directional conductor body, electrodes in engagement with said body, at least one of said electrodes forming a point 35 contact in engagement with said body, and a mass applied to said body and said electrodes to envelop said body and the corresponding points of contact of said electrodes with said body and part of said electrodes, said mass hardening after application thereof and serving as sole 40 carrier for said electrodes and for stabilizing said electrodes in engagement with said body.

2. A structure and cooperation of parts according to claim 1, wherein said mass is applied in the form of a non-aqueous chemically indifferent solution, especially a 45 cellulose derivative which hardens forming an envelope surrounding the corresponding parts.

3. A structure and cooperation of parts according to claim 1, wherein said mass is an insulating material of low melting point selected from materials of the class 50 including paraffine, wax resin and artificial substance such as polysterol.

4. A structure and cooperation of parts according to claim 1, comprising wirelike members constituting said electrodes, parts of said members adjacent said body 55 being coiled to increase the mechanical strength of the device.

5. A method of producing a directional conductor device comprising taking a directional conductor body, uniting said body with electrodes in adjusted contact engagement with said body, applying about said body and 60 parts of said electrodes extending therefrom a hardenable mass, said mass after hardening serving as the sole carrier for said electrodes and for stabilizing said electrodes in engagement with said body.

6. A method according to claim 5, wherein said mass applied is a non-aqueous chemically indifferent solution.

7. A method according to claim 5, wherein said mass applied is a cellulose derivative.

8. A method according to claim 5, wherein said mass applied is an insulating substance with low melting point.

9. A method according to claim 5, wherein said mass

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applied is an insulating substance with low melting point such as paraffine and the like.

10. A method according to claim 5, wherein said mass applied is an insulating substance with low melting point such as wax and the like.

11. A method according to claim 5, wherein said mass applied is an insulating substance with low melting point such as resin and the like.

12. A method according to claim 5, wherein said mass

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applied is an insulating substance with low melting point such as artificial material of the class of polysterol and the like.

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