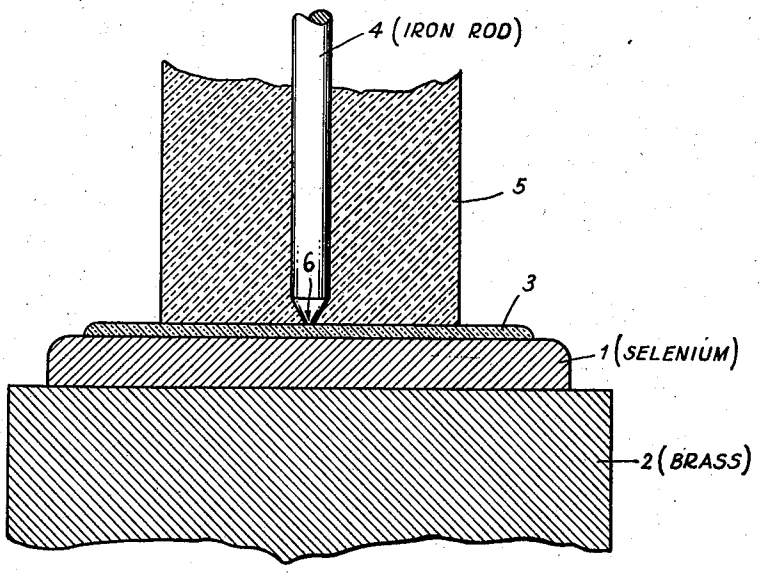
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ELECTRODE SYSTEM

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ELECTRODE SYSTEM

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This invention relates to an electrode system for rectifying or controlling high or intermediate frequency electrical oscillations, in which the positive and negative electrodes consist of materials having a very different emitting capacity with respect to one another and being separated by a solid insulating layer.

It has already been proposed to provide a conical lead contact on a graphite layer which is used as a supply conductor in a cuprous oxide detector. In this case the capacity is determined by the surface of the graphite layer bearing the lead contact. However, it is very difficult to obtain a small surface capable of being reproduced with the aid of such a layer.

Furthermore it is known that the detector may consist of a crystal. However, a crystal detector has a rectifying effect only at one or a few points of the crystal surface and more particularly where the surface bears an insulating coating having such a thickness that its resistance does not have an excessive value and corresponds to the applied voltage to be rectified. Thus, in order that a crystal can be used as a detector the surface of the crystal must be scanned with the aid of a pointed metal contact till a point having a rectifying effect will have been found. In this case there is consequently a small contact surface, viz. of the good conductive electrode on the insulating coating, it is true, but the thickness of the insulating coating cannot be fixed in an exact and reproducible manner, so that the capacity of such a detector cannot be controlled at all.

The object of the invention is to provide an electrode system having a small and reproducible self-capacity which is of paramount importance with electrode systems used as a detector or as a control member for high or intermediate frequency oscillations.

Indeed, the self-capacity of such a system exerts a certain influence on a circuit comprising the cell. In order to ensure the maximum effect in such a circuit definite measures should be taken in designing it. If the various cells would have a different self-capacity with respect to each other then in spite of certain measures being taken the latter would be of no avail when the initial cell adapted to the circuit would be replaced by another one.

The capacity depends, among other things, on the thickness of the insulating coating provided between the electrodes. In the systems referred to above the thickness has a perfectly fixed value since the insulating coating is arranged separately and is not formed together with the semiconductor by oxidation of the copper base, as it is the case with cupro-oxide detectors.

However, there are still other factors affecting the capacity in an electrode system, viz. the surface of the highly emitting electrode, and the surface of the supply conductor for the semiconductor.

For this purpose it has already been proposed with such systems, similarly as with crystal detectors, to give the contact end of one of the conductive parts affecting the capacity a small cross-section, viz, a point. However, this form entails various difficulties, more particularly while the point may readily penetrate into the substratum or damage it. Furthermore a correct arrangement of the point is difficult.

According to the invention these drawbacks are avoided by surrounding the tapering end with insulating material which in the plane of the contact end has a cross-section whose surface is many times larger than that of the contact end.

In a suitable form of construction the end of the conductor is given a conical shape, the top being flattened so that a flat surface is obtained which is used as a contact. By means of a self-capacity to be indicated for such an electrode system said surface can be determined beforehand.

It will be clear that in this manner a perfect electrical connection is ensured, whereas there is no risk of the top of the conductor, which may be conical and has preferably a small surface not exceeding 0.25 mm.^{2}, being pressed through the thin semi-conductive layer or even through the insulating coating which would cause a short-circuit in the system.

The difficulty that a cone having such a small surface cannot be kept upright without additional means on the surface of the semi-conductor, is further disposed of by the large base formed by the surrounding insulating material. In a suitable form of construction this material consists of a compound.

However, it is advantageous to surround not only the contact, but also the whole electrode system with casting material owing to which the whole acquires a higher mechanical solidity.

In the following form of construction of an electrode system according to the invention the semi-conductor 1 consists of selenium, which is applied in the liquid state on a metal support 2 consisting, for instance, of brass and being used at the same time as a supply conductor for the selenium, which is smoothly painted up to a

thickness of about 0.03 mm. The carrier, together with the selenium, is heated in a furnace for about 2 to 24 hours at about 200° in order to convert the selenium into the conductive crystalline modification. An insulating coating 3 consisting, for instance of polystyrene and having a thickness of 5μ is applied on to the selenium.

The good conductive electrode which may consist of an iron rod 4 having a contact surface of 0.25 mm.^{2} at the bottom side, is embedded in a cubical or cylindrical body 5 of polystyrene or compound, at any rate of insulating material, whose bottom surface is at a level with the contact surface 6. The whole is provided on the insulating coating 3, the insulating envelope 5 being secured to the insulating coating 3 by means of an adhesive.

Also other forms of construction fall under the scope of the invention such as those comprising more than two electrodes, for instance, three-electrode systems.

As an alternative the whole system represented in the drawing may, moreover, be surrounded with an insulating layer, so that it is free from external mechanical and atmospherical influences and owing to which, moreover, the supply wires experience much lower mechanical efforts at the welds of the electrodes.

What I claim is:

1. An electrode-system for rectifying or controlling high or intermediate frequency electrical oscillations, comprising positive and negative electrodes composed of iron and selenium, respectively, said electrodes being separated by a solid insulating coating of polystyrene, and wherein at least one of the electrodes influencing the capacity has a small cross-section at the contact end, this end being surrounded with insulating material whose cross-section in the plane of the contact end has a surface which is many times larger than that of the contact end.

2. An electrode system as claimed in claim 1 in which the end of the conducting part influencing the capacity has a conical shape.

3. An electrode system as claimed in claim 1 in which the end of the conducting part influencing the capacity has a conical shape and in which the surface of the contact end does not exceed 0.25 mm.^{2}.

4. An electrode system as claimed in claim 1 in which the selenium layer is applied on to a brass plate, said layer being furnished with an insulating coating of polystyrene which is provided at its free surface and on to which an iron counter electrode having a small contact surface (0.25 mm.^{2}) and being laterally surrounded by polystyrene is applied, the polystyrene envelope being mechanically secured to the insulating coating by means of an adhesive.

5. A contact rectifier electrode system comprising an electrode of selenium having a relatively large plane surface, a thin layer of polystyrene pervious to the flow of electrons applied to said electrode surface, and a positive electrode of iron having a surface many times smaller than the first electrode surface contacting with said insulating layer.

6. A contact rectifier electrode system comprising an electrode of selenium having a relatively large plane surface, a thin layer of polystyrene pervious to the flow of electrons applied to said electrode surface, an insulating block having a plane surface substantially coextensive with the insulating layer and contacting therewith, a positive electrode of iron in the form of a rod embedded within said insulating block, one end of the rod extending to the contacting surface of the block and having its surface of small area lying in the same plane as said contacting surface.

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