

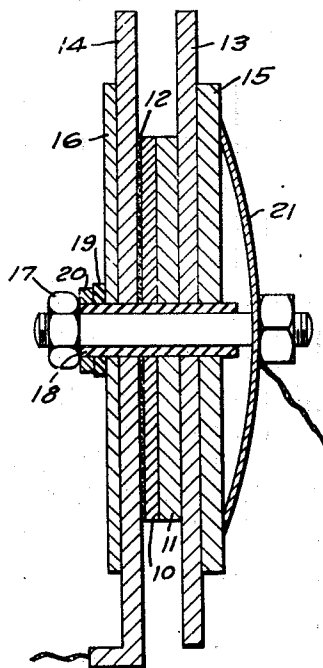
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SELENIUM RECTIFIER

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WITNESSES:

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SELENIUM RECTIFIER

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2 Claims. (Cl. 175—366)

The invention relates to rectifiers and especially to selenium rectifiers.

An object of the invention is to provide a selenium rectifier that is free of materials which will adversely effect the quality of rectification of the selenium.

Other objects and advantages of the invention will be apparent from the following description and drawing, in which the single figure illustrates a cross section through a selenium rectifier to which the invention is applied.

It has been discovered that a selenium rectifier only has good rectifying properties if the selenium layer is completely free of heavy metals, particularly copper and zinc. Accordingly, the invention contemplates freeing the selenium layer of copper and zinc and in addition freeing the metallic layers or members bounding the selenium layer of copper or zinc mixtures as their components or as impurities. Copper and zinc particles from the bounding contact layers penetrate into the selenium in time and adversely effect the rectifier properties of the selenium.

In many cases the selenium is fused onto a base of iron or nickel or an alloy of both and then a further metal layer is sprayed on the selenium to serve as a counter-electrode. On the one or more sprayed layers a further metallic conductor is impressed for the purpose of providing a conductor for the current from the rectifying layers. The invention also contemplates that this metallic conductor which is only mediate in the neighborhood of the selenium layer be carefully freed of copper and zinc because of the possibility that the copper and zinc constituents present therein may diffuse at the temperature existing during the operation of the rectifier, through the counter-electrode and into the selenium layer.

The metallic conductor previously mentioned generally consists of a metal of the iron group and may be iron, cobalt, nickel, tungsten, chromium, molybdenum, manganese or uranium. These metals, however, where they are to be used continuously in the mediate or immediate neighborhood of the selenium layer cannot be applied in their commercial condition without the possibility of damage to the rectifier but are first submitted to a special treatment by which they are substantially freed of the normal content of copper and zinc.

The application of the invention to the situation where the layer between the selenium and the metallic conductor is applied by spraying is of particular significance because the sprayed on layer by reason of its thinness and its characteristic structure makes possible an easy passage of the copper and zinc particles into the selenium.

The drawing illustrates a selenium rectifier to which the invention may be applied. The layer 10 of selenium is preferably welded on a disc 11 of iron, nickel or the other metals previously mentioned. The counter-electrode 12 is preferably sprayed upon the selenium and may be of suitable materials and alloys such as lead and bismuth preferably in 60-40 ratio or bismuth, tin and cadmium in 50-30-20 ratio.

These parts are preferably mounted between large discs 13, 14 of any of the suitable materials of iron, etc., previously mentioned. The large diameter of these discs is for cooling purposes. Heavy end plates 15, 16 bear against the large discs and the assembly is preferably mounted on a bolt 17 which has an insulating sleeve 18 around its shaft. Insulation 19 is also placed between lock washer 20 adjacent one of the bolt's end nuts and the adjacent end plate 16. A spring 21 exerts pressure upon the whole assembly by acting against the other end plate 15 and the spring makes electrical contact with the bolt 17. Connections to the device may be made to the bolt 17 and disc 14 as shown. The device thus described is for purposes of illustration and with no intention of unduly limiting the application of the invention.

The injurious materials, such as copper and zinc, may be removed from the selenium by distilling the selenium as many times as considered necessary or by treating selenium with acid. The other parts of the device, such as disc 11, large discs 13, 14, are treated for the removal of undesirable substances. One convenient method, in many cases, is by applying heat at a high temperature such as 1100° to 1300° C. in a vacuum furnace and distilling out the undesirable substances.

While there has been described a preferred embodiment of the invention as required by the patent statutes, yet it is possible that many other embodiments may be made without departing from the spirit of the invention. Accordingly, the following claims are not to be limited except as is necessitated by the prior art.

I claim as my invention:

1. The method of preparing a rectifier which comprises removing substances injurious to the rectifying function from selenium and metal contact members and then assembling said members in contact with said selenium.

2. The method of preparing a rectifier which comprises removing copper and zinc from selenium and metal contact members and then assembling said members in contact with said selenium.

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