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ASYMMETRICAL CONDUCTOR

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FIG. 1

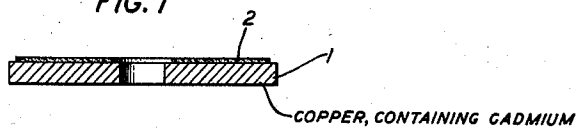
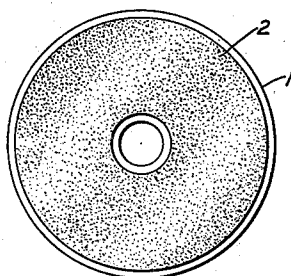


FIG. 2



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ASYMMETRICAL CONDUCTOR

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6 Claims. (Cl. 175-366)

This invention relates to devices that offer a greater resistance to current flow in one direction therethrough than in the opposite direction, and, more particularly, to such devices of the copper-cuprous oxide type.

5 An object of this invention is to increase the resistance in the high resistance direction of copper-cuprous oxide rectifiers.

10 A feature of this invention comprises manufacturing copper-cuprous oxide type rectifiers from copper blanks formed from copper containing a small amount of another metal, more particularly, cadmium.

15 A more complete understanding of the invention will be obtained from the detailed description that follows, taken in conjunction with the appended drawing, wherein:

Fig. 1 is a cross-sectional view of a copper-cuprous oxide rectifier in accordance with this invention; and

20 Fig. 2 is a top plan view of the device of Fig. 1.

Commercial copper having a high degree of copper purity with traces of metallic impurities totalling about .04 per cent, is in general use for the manufacture of copper-cuprous oxide rectifiers. In accordance with this invention, such copper, as received from the supplier, is remelted in a reducing atmosphere, and then a small amount of cadmium is added to the melt. Sheet copper of about .05 inch thickness is formed from the alloy, and copper blanks or washers punched therefrom. Such a copper blank or washer 1 is then heat-treated, for example, by being placed in a first furnace having an oxidizing atmosphere at about 1000° C. for about eight minutes, then placed in a second furnace maintained at about 500° C. for about five minutes, and then quenched in cold water. The copper oxide layer 2 on the

blank is then treated in any well-known manner to provide a good contact surface thereon.

It has been found that the addition of cadmium in an amount up to about .5 per cent by weight results in a rectifier having an improved characteristic over rectifiers made from ordinary commercial copper in that the resistance in the reverse current direction is increased. Rectifiers made from melts to which about .1 per cent, .25 per cent and .5 per cent cadmium were added gave this result.

10 It will be understood that this invention has been disclosed with reference to a preferred form thereof, and is to be considered as limited in scope by the appended claims only.

What is claimed is:

1. A conductive device comprising a copper body containing cadmium having an integral layer of the oxide of said body thereon.

2. A copper-cuprous oxide rectifier formed from a copper body containing cadmium.

20 3. A copper-cuprous oxide rectifier formed from a copper body containing up to about .5 per cent cadmium.

4. A copper-cuprous oxide rectifier formed from a copper body containing up to about .1 per cent cadmium.

5. A copper-cuprous oxide rectifier formed from a copper body containing approximately .1 per cent cadmium.

6. The method of making a conductive device comprising a copper body having a layer of oxide integral therewith, that comprises adding to a copper melt a small amount of cadmium, up to about .5 per cent, forming a copper body from the alloy, and heat-treating said copper body to form the oxide layer thereon.

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