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RECTIFIER

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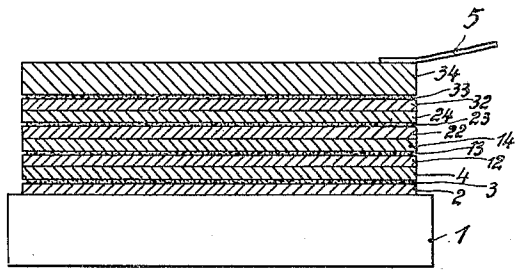

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RECTIFIER

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My invention relates to rectifiers and more particularly to dry rectifiers comprising layers of metals, such as copper, iron, manganese or the like, and metal compounds, such as copper oxide, lead sulfide or the like contacting with each other.

It is an object of my invention to provide a dry rectifier of the kind aforesaid in which the electrical resistance of the contact surfaces of the layers and the resistance of the metal compound layer is very small.

It is a further object of my invention to provide means whereby dry rectifiers with small resistances of the contact surfaces of the metal compound layers and the metal layers and of the metal compound layer may be produced.

It is still another object of my invention to produce layers of metal or of metal compound by depositing the metal or the metal compound from the vapor state in a high vacuum on a base or carrier, such as a metal plate or a metal layer deposited in the same manner. By this method a very thin layer of a metal composition may be deposited on a metal, so that the contact resistance and the resistance of the layer are very small.

In the drawing affixed to this specification and forming part thereof a rectifier embodying my invention is illustrated diagrammatically by way of example at a greatly exaggerated scale.

1 is a support, for instance a metal plate consisting in the preferred form of my invention of copper. 2 is a layer of metal, for instance also copper. 3 is a layer of a metal compound, such as, for instance, copper oxide or lead sulfide or the like, and 4 is a layer of some other metal, such as iron or manganese. The layer 2 is arranged on the copper plate 1 by depositing the metal (copper) from copper vapor in a high vacuum. The layer 3 is arranged on the layer 2 in a similar manner by depositing the metal compound, (copper oxide or lead sulfide) from the vapor state in a high vacuum. The layer 4 consisting of iron, manganese or the like is deposited upon the layer 3 in the same manner. Upon the layer 4 a layer 12 of the same metal as layer 2 is deposited and so on. The layers 13, 14, 22, 23, 24, 32, 33 and 34 are deposited in the same manner. The rate of depositing may be controlled so that the thickness of the layers may be made very small. The thickness of each of the layers 3, 13, 23, and 33 is preferably about 0.001 mms, and the thickness of the metal layers 2, 4, 12, 14, 22, 24 and 32 about 0.01 mms. The metal from which the uppermost layer 34 is made is deposited upon the layer 33 to a thickness of about 0.1 mm, so that a wire 5 or the like may be fixed to it.

In this manner a rectifier column comprising a large number of layers is obtained which is particularly adapted for the rectification of high alternating voltages.

In some cases a single layer of each kind will be sufficient, so that the rectifying device then comprises merely the layers 2, 3, 4.

If the support 1 consists of the same metal as the layers 2, 12, 22, and 32, the layer 3 may be deposited directly on the support 1.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

In the claims affixed to this specification no selection of any particular modification of the invention is intended to the exclusion of other modifications thereof and the right to subsequently make claim to any modification not covered by these claims is expressly reserved.

I claim:—

1. A dry rectifier comprising a plurality of superposed layers, said plurality of layers including two layers, one of said two layers being a layer of a metal compound and the other being a layer of metal, each succeeding layer of said two layers being deposited on the preceding layer in vacuo from the vapor state.

2. A dry rectifier comprising a metal layer, a second metal layer of another metal and a layer consisting of a metal compound arranged between said metal layers, said metal compound layer and said second metal layer being deposited from the vapor state in vacuo.

3. A dry rectifier comprising a copper metal layer, an iron metal layer and a layer of lead sulfide arranged between said copper and iron layers, the lead sulfide layer being deposited on said copper layer and the iron layer on said lead sulfide layer from the vapor state in vacuo.

4. A dry rectifier comprising a copper metal layer, a manganese metal layer, a layer of copper oxide arranged between said copper and manganese layers, the copper oxide layer being deposited on said copper layer and the manganese layer on said copper oxide layer from the vapor state in vacuo.

5. In the method of producing a dry rectifier composed of a layer of a metal compound and a layer of a metal the step of depositing said layer of a metal compound from the vapor state in vacuo and the step of depositing said layer of metal from the vapor state in vacuo.

6. A dry rectifier comprising a copper metal layer, a layer composed of another metal, and a layer composed of a metal compound arranged between said copper metal layer and said layer composed of another metal, said layer composed of a metal compound being deposited on said copper layer and said layer composed of another metal on said layer composed of a metal compound from the vapor state in vacuo.

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