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ELECTRICAL RESISTANCE

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Fig. 1.

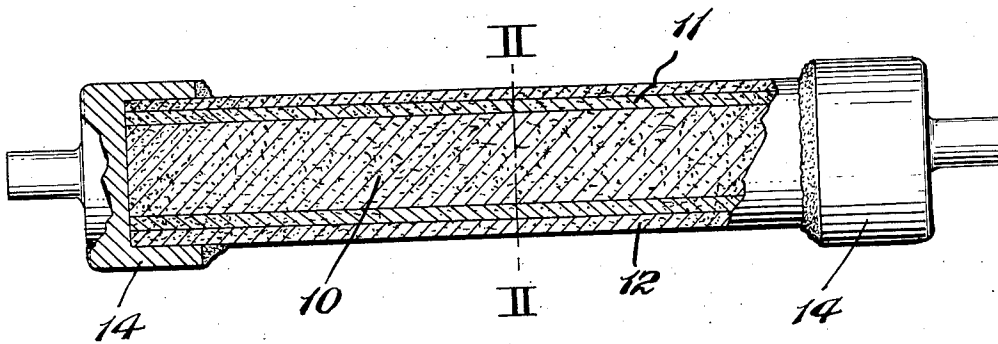
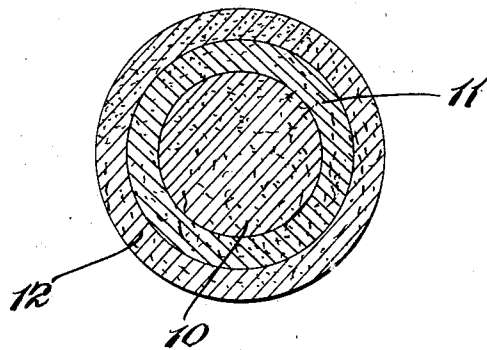


Fig. 2.



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ELECTRICAL RESISTANCE

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8 Claims. (Cl. 201—76)

There are several materials known and used as heating electric resistances which are formed of either wire-drawn alloys of various sections or of silicium carbide rods of homogeneous structure or of amorphous carbon only.

An object of the present invention is to provide electric resistances formed by several layers of different composition with each layer having a special well defined function.

For instance the low heat conductivity and the electrical conductivity of the agglomerated amorphous carbon may be utilized which is protected from the oxidation by heat resisting layers of metallic carbides and metallic oxides.

The outer layers may be formed with carbides and oxides which remain unaltered even in presence of acid or alkaline reactions, according to the particular conditions of use for which the resistances are to be employed.

Further features and objects of the invention will be apparent from a consideration of the following description and the annexed drawing wherein an exemplary embodiment of the invention is disclosed.

In the drawing:

Fig. 1 is a longitudinal sectional view of an electrical resistor embodying the invention.

Fig. 2 is a transverse sectional view taken on the line II—II of Fig. 1.

In carrying out the invention a core 10 formed principally of carbon is heated to a glow temperature in the presence of a mixture containing the metallic oxides and the metals which are to be incorporated on the carbon body. These metallic oxides and metals form the cover which is constituted of a layer 11 of carbides, sub-carbides and a layer 12 of sub-oxides, oxides, within the appropriated limits of temperature.

This operation is carried on in a closed chamber filled with amorphous carbon or graphite avoiding with the greatest care every possibility of communication with the atmosphere.

The mixture is prearranged in such a way that the carbon core 10 is first in touch with the metallic vapours and successively, at a higher temperature, with the metallic oxide vapours partially reduced from carbides already in the making.

In case the treatment is conducted with metals having a boiling point higher than the one of the respective oxides and also in the cases in which the outside surface contains parts of carbon, a further oxidation is brought about in the last phase of the operation by adding oxygen or carbon dioxide.

The resistor thus obtained, which at the beginning of the process was entirely or in part carbon, has been transformed in several layers of various compositions, whose carbon content is decreasing from the internal zone to the external one, until it is covered with oxide only.

This body may be used either with the internal core of carbon or the internal core drilled or burned so as to remove the carbon and a mixture having the required resistance may be substituted for the original core.

The resistor is provided at the ends thereof with metallic terminals 14. These terminals are preferably soldered or welded to the resistor so as to prevent air or other gases from permeating into the core.

What I claim and desire to secure by United States Letters Patent is:

1. An electrical resistance comprising a core member consisting principally of carbon and a plurality of layers superposed upon said core, said layers comprising metal, metal carbides and metal oxides, the percentage of carbon in each of said layers decreasing from the innermost layer to the external layer.

2. An electrical resistance as claimed in claim 1, wherein the metal compounds of the external layer differ from the metal compound contained in the innermost layers.

3. A process for obtaining an electrical resistance comprising the steps of heating a core element consisting principally of carbon to red heat in a closed chamber and in the presence of metals, metal oxides and metallic carbides until a solid formation of metallic carbides has formed on the core member and until additional layers consisting of sub-carbides, oxy-carbides, sub-oxides and oxides are formed on the core member.

4. A process as claimed in claim 3 and further comprising oxidizing the layer of metallic carbides to produce an external layer of metallic oxides.

5. An electrical resistance as claimed in claim 1 and further comprising metallic terminals secured to the core member to prevent gases from permeating into the core member.

6. An electrical resistor comprising, a core consisting principally of carbon, a plurality of layers surrounding said core, said layers consisting of metal carbides and metal oxides, the percentage of carbon in each of said layers decreasing from the innermost layer to the outermost layer, and metallic terminals soldered to the ends of the metal oxide layer sealing the ends of said core.

7. A method of producing an electrical resistor which comprises, arranging the core member consisting principally of carbon in a closed chamber free of air, supplying metal oxides and metal carbides to said chamber, heating the core member until a layer of carbide is formed on the core member and until an additional layer of metallic oxide is formed around the core member.

8. A method of producing an electrical resistor which comprises, arranging the core member 10

consisting principally of carbon in a closed chamber free of air, supplying metal oxides and metal carbides to said chamber, heating the core member until a layer of carbide is formed on the core member and until an additional layer of metallic oxide is formed around the core member, removing the core to provide a tubular casing, and filling the casing with electrically conductive material.

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