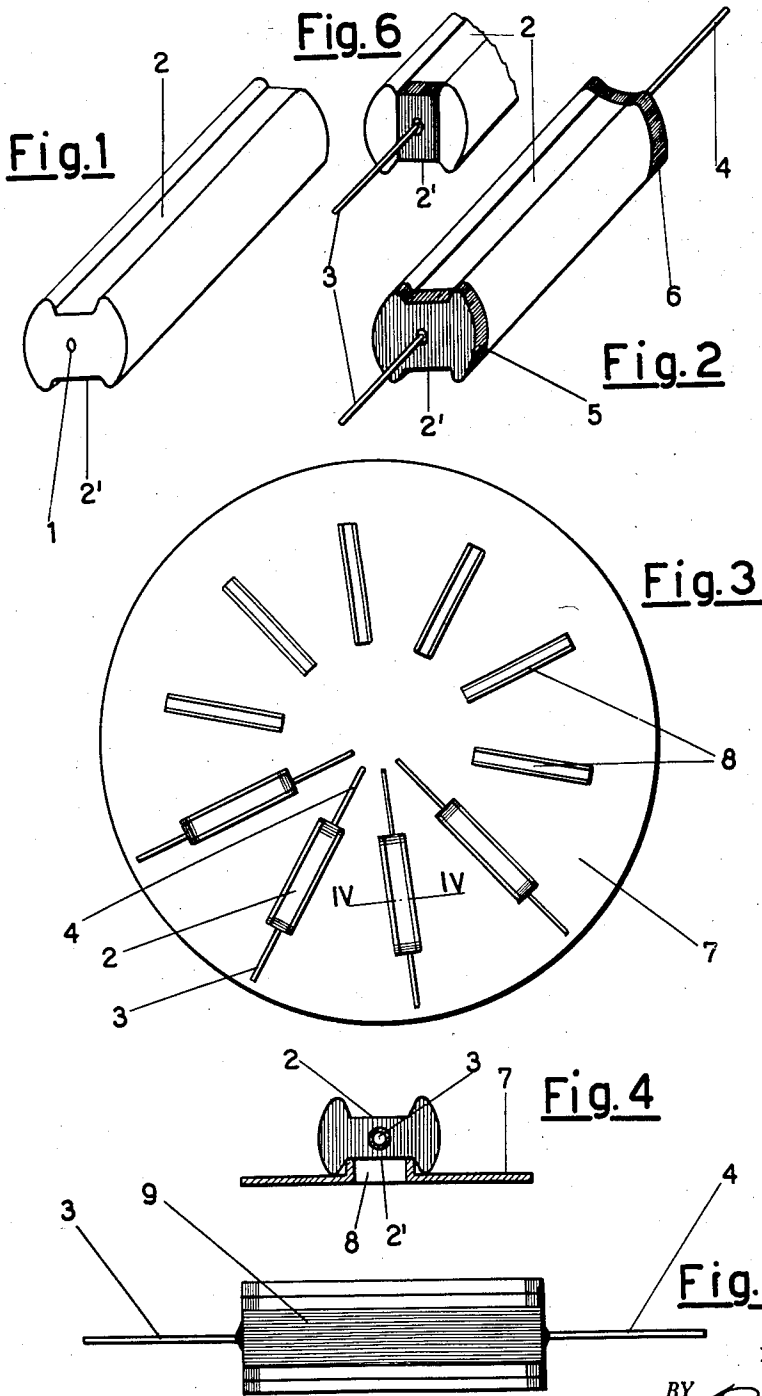


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ELECTRIC RESISTANCE ELEMENT

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ELECTRIC RESISTANCE ELEMENT

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4 Claims. (Cl. 201—63)

The present invention relates to a process for the production of electric resistors by means of deposition of metal by vaporization under vacuo, as well as to resistors so obtained.

The process is characterized in that at first a series of rods of steatite or the like is produced by drawing, which are provided with at least one longitudinal groove, the ends of said rods are covered with a conductive substance to which the terminal conductors are fixed, and then a metallic layer (metallic salts and oxides) is made to deposit by vaporization under vacuo in said longitudinal groove of said rods, while checking at the terminal conductors whether the desired value of electric resistance is attained.

Now a preferred mode of operation will be described by way of example without limitation, to obtain a series of electric resistors according to the invention.

The accompanying drawings illustrate some stages of said process and the resistors obtained therewith. In said drawings:

Fig. 1 is a perspective view of a drawn rod;

Fig. 2 illustrates the same rod after application of the coverings of the ends and of the terminal conductors;

Fig. 3 illustrates the arrangement of a series of small rods according to Fig. 2 on a rotating disc during the deposition of the metal which constitutes the electric resistor proper;

Fig. 4 is a section along the line IV—IV of Fig. 3;

Fig. 5 illustrates the resistor obtained with the process according to the invention; and

Fig. 6 represents the small rod after the application of the coverings at its ends, in a variant.

Procedure is as follows: First a continuous bar is produced of steatite or the like material which is cut to sections of equal length in such a way as to form a number of small rods (one of which is illustrated in Fig. 1) provided with an axial hole 1 and with two longitudinal grooves 2, 2'. Then the ends of said rods are dipped into a bath of silver or other metallic substance, the two metallic terminals 3, 4, are fitted into the ends of the axial hole 1 and said terminals are welded to the coverings 5, 6, obtained by the above-mentioned dipping. The rods thus assume the appearance illustrated in Fig. 2.

Then said small rods are arranged on a rotary disc 7 (Fig. 3 in correspondence with a series of slots 8 in said disc). Fig. 4 illustrates particularly the fact that the groove 2 of the small rods comes to close at top the slots 8 of the disc. The metallic vapours coming from the lower part of the disc deposit on the groove 2 and with their deposition make the electric resistance decrease con-

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tinuously between the terminals 3 and 4. During this stage of vaporization under vacuo it is possible to check the time at which the electric resistance of the deposit layer reaches the desired value. The finished resistor assumes the appearance shown in Fig. 5 (9 designating the metallic layer deposited by vacuum vaporization).

Fig. 6 illustrates a variant and it will be noted therein that the covering at the ends is limited to the ends of the longitudinal grooves 2—2' and to a strip of the heads 10 which connects said ends and which comprises the hole for fastening the terminal conductors.

The advantages of the invention are due to the great simplicity of structure and manufacture, to the considerable mechanical strength and to the perfect gauging of the resistance value.

A further advantage is due to the effective protection of the resistor layer deposited in the groove; this protection is obtained mechanically by the shape of the said groove and chemically by a slight layer of quartz, important for the protection against oxidation as produced by temperature, said quartz layer being deposited under vacuo subsequent to the metal layer.

I claim:

1. An electric resistance element comprising a rod of insulating material having at least one longitudinal groove in the surface thereof, conductive coatings on the opposite end portions of said rod, terminal conductors extending from said conductive coatings, and a layer of metal in said groove extending between said conductive coatings and determining the electric resistance of the element.

2. An electric resistance element comprising a rod of insulating material having at least one longitudinal groove in the surface thereof and a longitudinal hole opening at the opposite ends of said rod, conductive coatings on the opposite end portions of said rods, terminal conductors extending into the opposite ends of said hole and welded to the adjacent conductive coatings, and a layer of metal in said groove extending between said conductive coatings and determining the electric resistance of the element.

3. An electric resistance element as in claim 2; wherein said rod has two longitudinal grooves at diametrically opposed locations, and said conductive coatings at the opposite ends of the rod are confined to the opposite end portions of said two grooves and to stripes on the opposite end faces of the rod connecting the adjacent ends of said grooves.

4. An electric resistance element as in claim 2; wherein said conductive coatings completely cover the opposite end portions of said rod.

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