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UNALTERABLE OHMIC RESISTANCE

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UNALTERABLE OHMIC RESISTANCE

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This invention relates to a high ohmic resistance and especially to a method for making a resistance of the coated rod type for use in multiple unit tubes.

Multiple-unit tubes contain a plurality of amplifier systems together with the corresponding coupling means inside one and the same vacuous space, said coupling means consisting usually of what is known as the capacity-resistance arrangement. When such high-ohmic resistances are to be built into the vacuous space of a multiple-unit tube, they must be insensitive to temperature influences. During the manufacture of high-vacuum tubes, it is necessary to apply some prolonged heating to a point in the neighborhood of 400 degrees, for the purposes of removing the last traces of water vapors. During this thermal treatment, the resistance value of built in high-ohmic resistances should not be permanently altered, indeed, after completion of the exhaust and after cooling of the tube, the resistance must be restored to its previous value.

Now tests have shown that high-ohmic resistances which are suited for being built into multiple-unit tubes can be made in a manner to be hereinafter described. Generally these resistances are known as the so-called vacuum resistances which consist of an insulation support or carrier and which are coated with a feebly conducting layer, and are separately enclosed in a vacuous space.

Such a resistance is shown, for example, in the accompanying drawing.

The numeral 1 represents the rod carrier, 2 a deposit thereon and 3 the leads leading thereto.

As a general rule, these resistances are not insensitive to the action of heat up to 400 degrees, but, in case of prolonged heating at these temperatures, they change quite considerably in their resistance value. Vacuum resistances of this kind are made by squirting upon or spraying upon the insulating carrier 1, which is usually made of glass and which at its ends is furnished with sealed supply electrodes 3, a layer in heat, said layer consisting of colloidal carbon including an addition ranging between 3 and 10% of a binder

(protective colloid). The latter usually consists of gum arabic, linseed, grape sugar, or dextrin.

Tests have shown that high-ohmic resistances which are suitable for being built into multiple-unit tubes, may be made by means of the same manufacturing method, if during the manufacture of the resistance, it is heated for some prolonged period of time at a somewhat higher temperature than the one prevailing during the process of exhausting the bulb or tube. Resistances of this kind insensitive to temperature influences are obtained, for example, by spraying a colloid solution containing from 3 to 10% of a protective colloid, upon the resistance carrier or support, whereupon the resistance after having been placed in a small vacuous space, is heated for 15 to 30 minutes at, say, 420 degrees C. During such heating in vacuo, the protective colloid is converted into elementary carbon, with an incidental, almost complete, extraction of water. The connecting resistance film then consists almost completely of elementary carbon.

Tests have shown that resistance so made can be heated any number of times and for any desired periods to lower temperatures, say, around 400 degrees C. without any appreciable alteration in resistance value being occasioned.

I claim as my invention:

1. The method of making a resistance unit for evacuated tubes which includes first coating an insulating carrier with a colloidal solution containing carbon and not more than 10 per cent of a protective binder, and then heating said coated carrier in vacuo to a high temperature.

2. The method of making a high-ohmic resistance which includes first applying a colloidal solution including carbon and a protective binder, to an insulating body, and then heating said body in vacuo up to 420 degrees C., until a coating of substantially elementary carbon free of occluded gases is formed on said body.

3. The method of making a high-ohmic resistance suitable for use in a multiple-unit

tube which consists in coating an insulating carrier with a solution containing colloidal carbon and 3 to 10 per cent of a protective colloid, and then subjecting said coated carrier in vacuo to a temperature in the region of
5 420° C.

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