PUBLISHED
APRIL 27, 1943.
BY A. P. C.

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INSULATED CARBON BODY

Filed July 8, 1940

Serial No.
344,455

Fig. 1

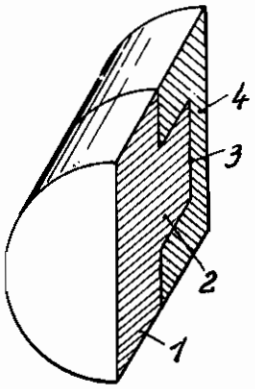


Fig. 2

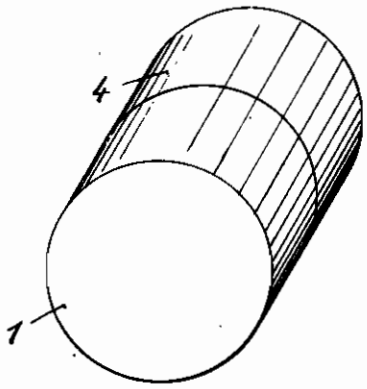


Fig. 3

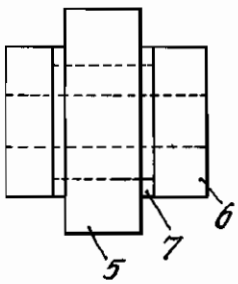


Fig. 4

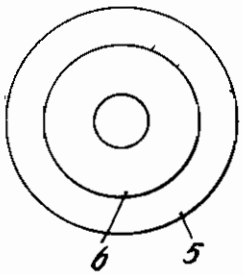
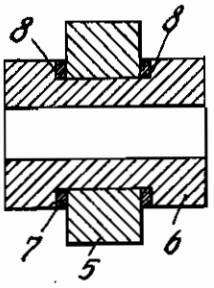


Fig. 5



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Published Apr. 27, 1943 Serial No. 344,455

ALIEN PROPERTY CUSTODIAN

INSULATED CARBON BODY

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Application filed July 8, 1940

This invention relates to artificial carbon bodies including an insulating support for mounting, and to a process of making such articles.

In various branches of the electrotechnical industry, carbon bodies are required which either have to be insulated from each other or from another part of a machine or apparatus, such articles being, for example, carbon collectors and carbon slip rings as well as other carbon contacts operating under high electrical load and reaching high working temperature. The conventional insulating materials, such as, cement, are destroyed and decomposed at the high temperatures in question, more particularly by function of electric sparks, and converted into electric conductors, whereby they become useless as electric insulators and mechanical supports for the carbon bodies.

It is an important object of the present invention to provide a carbon body and insulator unit the insulation of which is capable of resisting extreme electric and heat stresses.

With this and further objects in view, as may become apparent from the within disclosures, the invention consists not only in the structures herein pointed out and illustrated by the drawings, but includes further structures coming within the scope of what hereinafter may be claimed.

The character of the invention, however, may be best understood by reference to certain of its structural forms, as illustrated by the accompanying drawings in which:—

Fig. 1 is a perspective sectional view of a carbon and insulator unit, having the invention applied thereto.

Fig. 2 is an outside perspective view of the same unit.

Fig. 3 is a side elevation of another carbon and insulator unit having the invention applied thereto.

Fig. 4 is an end view of Fig. 3.

Fig. 5 is an axial section of Fig. 3.

Similar reference numerals denote similar parts in the different Figures.

Referring now to the drawings in greater detail, and first to Figs. 1 and 2, a carbon body 1 is formed with a cylindrical projection 2 fitting into a central recess 3 in an insulating body 4. The manner in which the insulating body may be applied to the carbon body will hereinafter more fully appear.

In Figs. 3 to 5, an annular carbon body 5 is mounted on a tubular insulating body 6. Buffer materials 7, consisting, for instance, of asbestos or slag wool, may be provided between the carbon body and the collars 8 of the insulating body adjacent thereto, in order that mechanical shrinking tensions caused by the cooling down of the insulating body may not be transferred upon the carbon material.

The manufacturing process will now be described.

I apply the insulating material on the carbon body under action of heat, in a burning, baking or casting operation. I have found that an insulating material which can be subjected to a treatment of this kind will resist also to the stresses occurring in working order by sparking and heat.

Various insulating materials may be used which can be applied by heat. Depending on the kind of insulating material the same is applied on the carbon before the same has been burnt, or after the preliminary annealing or after the hardening or final annealing.

It is then hardened and solidified by heat. Where the insulating material is applied on the carbon before the burning or before the hardening-on, the carbon will be hardened-on during the heat treatment of the insulating material. On the other hand, where the carbon has been fully annealed already, it will undergo a second annealing process with the insulating material applied thereon. This is by no means objectionable, but on the contrary the properties of the carbon may be modified by the second annealing process in any desired manner.

In the practice of my invention, I may for instance produce a carbon body in known manner by compression, then I press a ceramic insulating material, for instance, steatite, around the carbon body, using a suitable mold and finally the composite body obtained by pressing together the two parts is subjected to a common burning or baking process. It will be appreciated that the shrinking characteristics of the two substances which are being used have to be matched with each other in a suitable manner. Where large differences are existing in the shrinkage of the two materials, namely, carbon and insulator, the compressed carbon may be pre-annealed to such a degree, that in the common final annealing process (hardening-on) it does not shrink more than the insulating material pressed around it after the pre-annealing or first annealing. Again, the ceramic insulating body may be first shaped and pre-annealed, then united with the hardened-on carbon and then the whole unit may be annealed once more up to the temperature

causing maximum shrinkage of the insulating body.

According to a further feature of the invention, the insulating body may consist of vitreous substances, more particularly, glass, which is cast or die-cast upon or around the suitably formed carbon body in a molten and liquid condition. In the same manner, any smelting flux of the glass or enamel type or smeltable blast furnace slag may be applied.

According to another feature of the invention, I may use a ceramic material which contains suitable flux or frit admixtures and therefore does not require a real burning process but is pressed around the carbon body in powdered form and then subjected merely to a sintering process which may consist in the simultaneous application of pressure and heat. Substances which may be sintered in this manner, are, for instance, glass dust, and slag meal. The solidification of the insulating material by a sintering operation without pressure or with simultaneous application of pressure offers the advantage that the differences of expansion or shrinkage of the two materials are less than with a conventional ceramic process. In most instances, it will be advantageous to provide bolsters, as at 7 in Fig. 5, between the carbon and insulating material, to compensate the considerable pressures due to shrinkage of the insulating material.

The method and apparatus of the present invention have been described in detail with reference to specific embodiments. It is to be understood, however, that the invention is not limited by such specific reference but is broader in scope and capable of other embodiments than those specifically described and illustrated in the drawings.

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