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CORE STRUCTURE FOR IMPROVING PERFORMANCE OF THE BLOWN ARC

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Fig. 1.

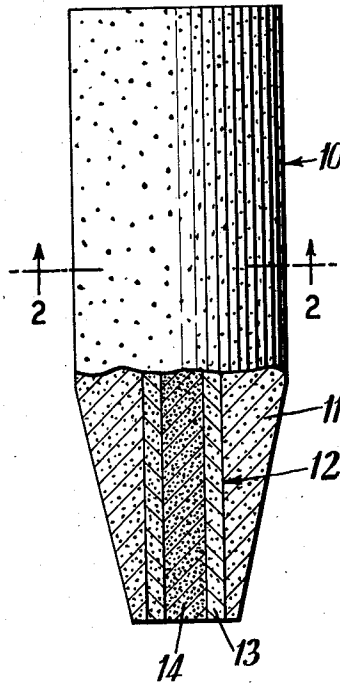
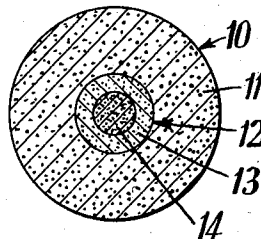


Fig. 2.



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CORE STRUCTURE FOR IMPROVING PERFORMANCE OF THE BLOWN ARC

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4 Claims. (Cl. 313—354)

This invention relates to an arc carbon of the type useful in providing a light source for motion picture and television projection, and more particularly concerns a method and means for suppressing or eliminating the variation in light intensity in the light produced by a carbon electrode in the blown arc.

The conventional arc system comprises a pair of carbon electrodes burning under such conditions as to establish an arc, and thereby provide a brilliant light source. When the arc is operated without an external magnetic field, the brightest area of the arc moves at random from one part of the arc field to another. To overcome this behavior, a magnetic field is applied to the arc in a manner, similar to the Gretener "blown arc" system described in U. S. Patents 2,510,102 and 2,540,256, such as to cause this bright area to rotate or spin on its axis. As a result, the light in a given direction shows a periodic variation in intensity, its frequency being determined by the speed of rotation.

The Gretener "blown arc" as normally operated, shows a variation in light intensity of such high frequency that it is not visible to the naked eye. However, it does cause disturbing effects in television projection.

It is, therefore, an important object of the present invention to provide an improved means for suppressing or eliminating the light variation characteristics normally found in conventional arc carbons or electrodes.

Another object of the present invention is to provide an improved arc carbon having a multiple core construction and exhibiting freedom from disturbing light fluctuations when burned in the arc of the blown arc system, as well as in more conventional systems.

In the drawings:

Fig. 1 is an isometric view of the carbon electrode illustrating the features of the present invention, with parts broken away to show underlying parts; and

Fig. 2 is a cross sectional view of the carbon electrode shown in Fig. 1.

The above objects are accomplished in the present invention by replacing the conventional core of an arc carbon with a composite core structure. Accordingly, an arc carbon or electrode 10 embodying the principles of the invention may comprise a conventional carbonaceous shell 11 and a multiple core construction 12. The shell 11 of the electrode consists normally of a baked composition of substantially pure carbon containing no additive material.

According to the present invention, the multiple core construction 12 may comprise two or more concentrically disposed cores, the double cored construction being preferred and illustrated in the present instance. Referring to Fig. 1, this double cored construction comprises a principal or outer core 13, and a secondary or inner rod-shaped core 14 disposed concentrically adjacent and within the outer core 13. The core construction 12 includes by weight about 30 percent to 50 percent rare earth compounds in order to provide a high intensity of

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light, the proportion or concentration of rare earths in the outer core 13 being greater than that in the inner core 14. Preferably all of the rare earth compounds present in the core structure 12 should be in the outer core 13, and the inner core 14 should comprise essentially pure carbon. However, satisfactory results may be obtained if the inner core contains some rare earth material in proportions up to one-half that found in the remaining core structure. Optimum results are obtained when the cross sectional area of the inner core is between 10 percent and 30 percent of the total core cross sectional area.

The electrode of the invention is manufactured according to conventional methods. A typical composition of the composite core for the arc carbon of the invention contains about 50 percent carbon flour and 40 percent rare earth material bonded by conventional tar or pitch.

Tests of the arc carbon of the invention have shown it to be substantially free of disturbing variations in light intensity when used in the Gretener blown arc referred to hereinabove. Furthermore, the present arc carbon performs equally as well as, or better than the arc carbons that are presently used in conventional arc systems.

From the above description it will be seen that suppression of changes in the intensity of light emitted from a carbon arc may be effectively accomplished by replacing the conventional core of the arc carbon with a composite core having a greater concentration of the rare earth material present in the outer core ring than in the inner core. Through the combination of limiting the percentage composition of rare earth material in the inner core in an amount up to approximately one-half of that in the outer core, and proportioning the cross sectional area of the inner core to between 10 percent and 30 percent of that of the outer core, optimum lighting effects may be obtained with little or no variations in light intensity when used in the blown arc or other conventional arcing systems.

Modifications and variations may be effected without departing from the novel concepts and scope of the present invention.

What is claimed is:

1. A carbon electrode comprising, a core structure for reducing substantially the variation in light intensity of said electrode during arcing, said core structure comprising a pair of adjacently and concentrically disposed cores, the outer core of said core structure comprising essentially carbon and rare earth flame material, the inner core of said core structure comprising carbon and rare earth flame material in concentrations up to about one-half of that in said outer core.

2. A carbon electrode comprising, a core structure for reducing substantially the variation in light intensity of said electrode during arcing, said core structure comprising a pair of adjacently and concentrically disposed cores, the outer core of said core structure comprising essentially carbon and rare earth flame material, the inner core of said core structure comprising carbon and rare earth flame material in concentrations up to about one-half of that in said outer core, said inner core constituting between 10 percent and 30 percent of the total cross sectional area of said core structure.

3. A composite core structure for an arc carbon exhibiting a minimum variation in light intensity when burned in an arcing system, said structure comprising a principal core and a secondary core disposed in concentricity therewith, said structure having as essential ingredients therein, carbon flour and rare earth metal compounds, the concentration of said rare earth metal com-

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pounds in the principal core being greater than that in the secondary core.

4. A composite core structure for an arc carbon for substantially eliminating the variation in light intensity when burning said arc carbon in an arcing system, said structure comprising a principal core and a secondary core, said secondary core having a cross section constituting between 10 percent and 30 percent of the total cross sectional area of said core structure.

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