(No Model.)

W. F. SMITH.

MANUFACTURE OF CARBONS FOR ELECTRIC LAMPS.

No. 422,895. Patented Mar. 4, 1890.

Fig. 1.

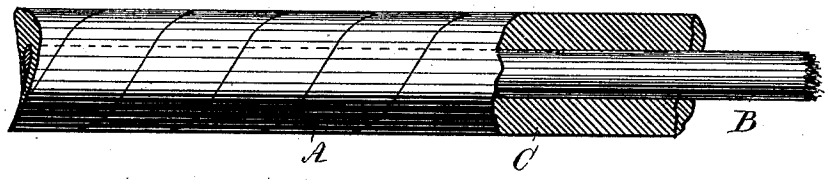
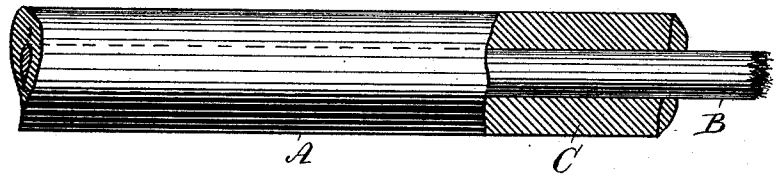


Fig. 2.



Witnesses:
Hermann Bormann.
Thomas M. Smith.

Inventor:
Walter F. Smith,
By J. Walter Douglass.
Att'y.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

WALTER F. SMITH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE UNITED ELECTRIC IMPROVEMENT COMPANY, OF GLOUCESTER CITY, NEW JERSEY.

MANUFACTURE OF CARBONS FOR ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 422,895, dated March 4, 1890.

Application filed January 30, 1890. Serial No. 338,615. (No model.)

To all whom it may concern:

Be it known that I, WALTER F. SMITH, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in the Process of Making Filaments or Pencils for Electric Lamps or Lights, of which the following is a specification.

My invention relates to a process for the manufacture of compound filaments or pencils and applicable to both arc lights as well as incandescent lamps.

The principal objects of my invention are, first, to provide an efficient and comparatively economical method for the manufacture of strong and durable filaments or pencils and of a type capable of becoming intensely incandescent and luminous when included in circuit, and, second, to provide a method by which a filamentary body or pencil may be produced having the inner section thereof displaced by a core composed of a material or substances capable of withstanding a high degree of incandescence, yet at the same time a non-conductor of electricity, and of a type capable of serving the twofold purpose of protecting the filament or pencil proper from disintegration or rupture due to sudden rise in temperature through imperfect regulation or other attending causes in the generator, and of increasing the radiating-surface of the filament or pencil without materially increasing the electrical resistance thereof, and, moreover, with the life prolonged and their utility increased in a greater degree than has heretofore been possible.

My invention consists in coating or saturating a core of fibrous or similar material with a compound of zirconium and then drying the same, when a carbonizable material is braided, wound, or molded thereon, and the treated article then carbonized, whereby the zirconium is converted into zirconia or other oxide thereof, and the filament or pencil thereby rendered suitable for use in an electric lamp or light.

The nature of my present invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is an elevation, on an enlarged scale, of a portion of a compound filament or pencil embodying the particular features of my invention and illustrating the braided or wound covering thereof partially removed to expose to view the core; and Fig. 2 is a similar view, on an enlarged scale, of a filament or pencil embodying a modified form of my invention, and also with a portion of the cast or molded covering removed to expose to view the core thereof.

In the drawings, A is a portion of the filament or pencil. B is the core thereof, and C is the envelope or covering surrounding said core.

The manner of carrying out my improved method for the manufacture of the filaments or pencils of the character hereinbefore mentioned is as follows: A wick or strands of fibrous similar material suitably twisted together are saturated with a solution composed of nitrate or other compound of zirconium. The core or support B is then dried in any preferred manner, when a suitable carbon cover or a conbonizable material C is braided or wound round the same, for instance, in the manner illustrated in Fig. 1, or a carbon cover or other carbonizable material cast or molded around the core B in the manner illustrated, for instance, in Fig. 2. The entire structure, treated in the above manner, is then subjected to a carbonizing process, whereby the nitrate or other compound of zirconium is converted into zirconia or other oxide of zirconium, and the filament or pencil thereby rendered suitable for use in an electric lamp or light.

The particular features of the invention are, first, that a filament or pencil is produced capable in use of becoming intensely incandescent and luminous when included in circuit, and, second, that a filament or pencil is produced with a core capable of not only withstanding a high degree of incandescence, while at the same time being a non-conductor of electricity, but of serving the twofold purpose of protecting the filament or

pencil from disintegration or rupture due to sudden rise in temperature through imperfect regulation or other attending causes in the generator, and of increasing the radiating-surface of the filament or pencil without materially increasing the electrical resistance thereof.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The method of making a filament or pencil for an electric lamp or light, which consists in saturating a core composed of fibrous material with a compound of zirconium, then drying the structure, then mounting on or surrounding said structure with a carbonizable material, and then carbonizing the same, substantially as and for the purposes set forth.

2. The method of making a filament or pencil for an electric lamp or light, which consists in saturating a core composed of fibrous or similar material with a compound of zirconium, then drying and braiding or winding a carbonizable material thereon, and then carbonizing the structure, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

WALTER F. SMITH.

Witnesses:
GEO. W. REED,
RICHARD C. MAXWELL.