(No Model.)

# W. F. SMITH.

## CARBON FOR ELECTRIC LAMPS.

No. 422,456. Patented Mar. 4, 1890.

Fig. 1.

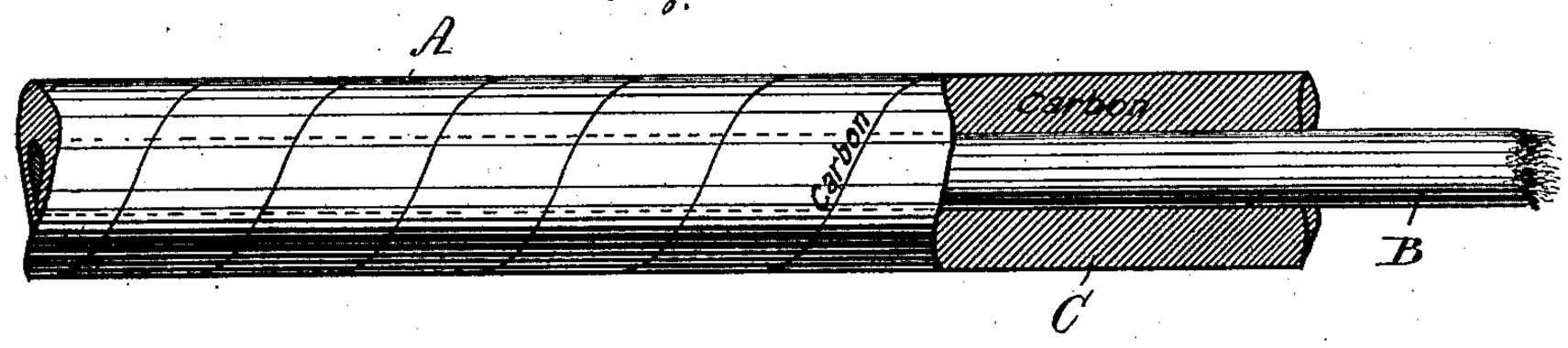
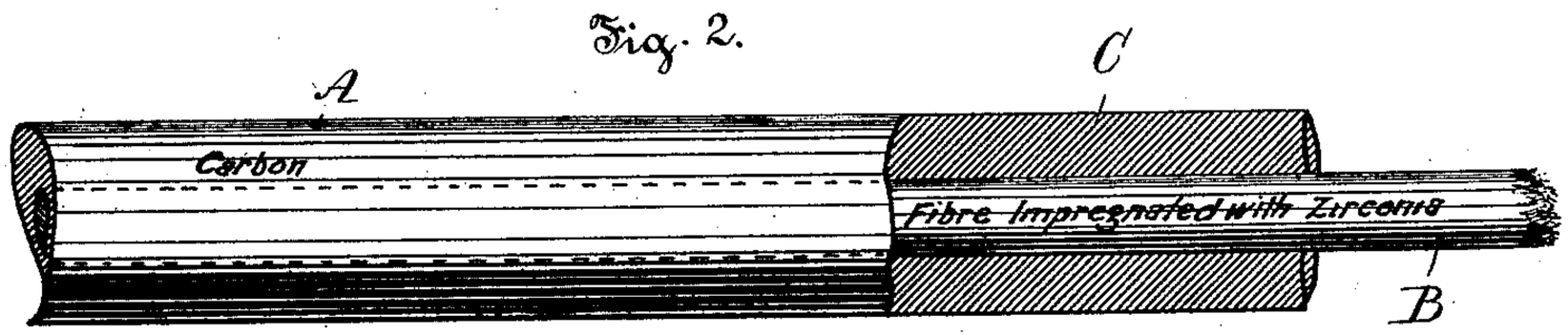



Fig. 2.

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# UNITED STATES PATENT OFFICE.

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## CARBON FOR ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 422,456, dated March 4, 1890.

Application filed November 29, 1889. Serial No. 332,030. (No model.)

*To all whom it may concern:*

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

My invention relates to a composition for and to the construction of what I have designated "compound filaments and pencils for electric lamps or lights;" and this invention is applicable to both the so-called "arc" lights as well as "incandescent" lamps.

The principal objects of my invention are, first, to provide a strong and durable compound filament or pencil capable of becoming intensely incandescent and luminous when included in circuit, and, second, to provide a filamentary body or pencil having the inner section thereof displaced by a core composed of a material or substance capable of withstanding a high degree of incandescence, and yet at the same time a non-conductor of electricity and of the type capable of serving the twofold purpose of not only protecting the filament or pencil proper from disintegration or rupture due to a sudden rise in the temperature through imperfect regulation or other attending causes in the generator, but also of increasing the radiating-surface of the filament or pencil without materially increasing the electrical resistance thereof, and, moreover, prolonging the life and increasing the utility of the same to a greater degree than has heretofore been possible.

My invention consists of a carbon filament or pencil having a core; and my invention further consists of the construction of the compound filament or pencil and of the composition for the core or support thereof, as hereinafter more particularly described.

The nature of my invention will be understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is an elevation of a portion of a compound filament or pencil embodying the characteristic features of my invention, and showing the braided or wound covering thereof partially removed to expose to view the core, and Fig. 2 is a similar view of a portion of a compound filament or pencil embodying a modified form of my invention, and showing a portion of the cast or molded covering removed to expose to view the core.

In the drawings, A represents a portion of the filament or pencil.

B is the core thereof, and C is the envelope or covering surrounding said core.

In order to carry my invention into effect I prepare a wick or strand of fibrous or other preferred material and saturate the same with a solution of nitrate or other compound of zirconium in any preferred manner, and then dry the saturated substance or materials to form a core or support B for the filament or pencil. After the wick or strand is dried I braid, wind, or mold a suitable carbon product or cover C thereon, or mold or cast, Fig. 2, in any preferred manner the carbon or other material or materials which form the cover around the core B. I then submit the entire structure to the ordinary 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.

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

1. A filament or pencil for an electric lamp or light having a core of fibrous material saturated with zirconium, and a carbonized covering thereon, substantially as described.

2. A compound filament or pencil for an electric lamp or light having a dried core of fibrous material saturated with zirconium, and a molded carbonized material thereon, substantially as described.

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

WALTER F. SMITH.

Witnesses:
GEO. W. REED,
HERMANN BORMANN.