

No. 679,803.

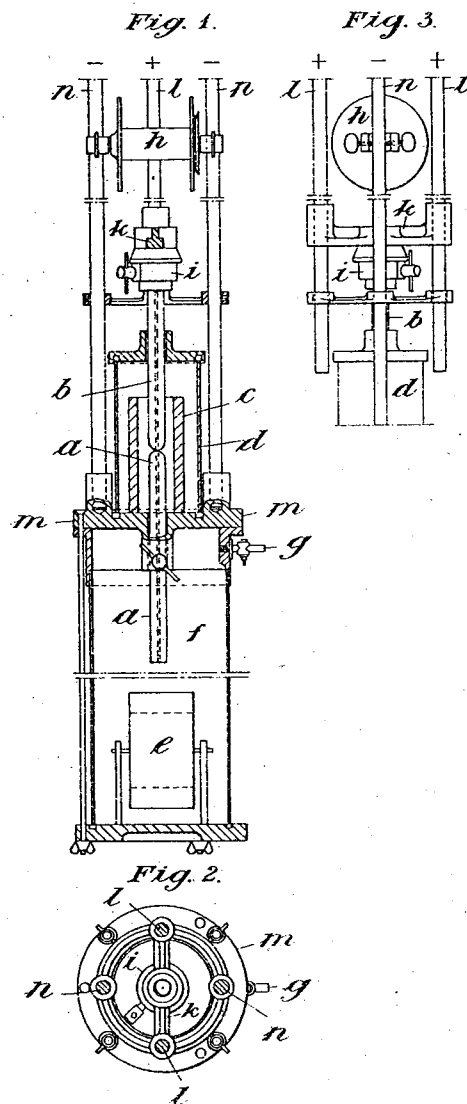
Patented Aug. 6, 1901.

W. L. VOELKER.

MANUFACTURE OF FILAMENTS FOR INCANDESCENT ELECTRIC LAMPS.

(Application filed Nov. 19, 1900.)

(No Model.)



Witnesses:
Edmund S. Shewin
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MANUFACTURE OF FILAMENTS FOR INCANDESCENT ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 879,803, dated August 6, 1901.

Original application filed July 29, 1900. Serial No. 25,337. Divided and this application filed November 19, 1900. Serial No. 37,959. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM LAWRENCE VOELKER, a citizen of the United States of America, residing at 1, Broad street, Russell Square, London, England, have invented new and useful improvements in the Manufacture of Filaments for Incandescing Electric Lamps, (the nature whereof I have applied for a patent in Great Britain to bear date June 22, 1900, No. 11,841,) of which the following is a specification:

This invention (a division of my application for Letters Patent filed July 30, 1900, Serial No. 25,337) relates to the manufacture of carbide filaments from carbonizable material capable of absorbing or chemically taking up the gas of the metal with which it is to be combined with the object of the improvement of the carbide.

In the accompanying drawings, Figure 1 is a vertical section of a device for use in passing the carbon filament through an electric arc. Fig. 2 is a perspective plan, and Fig. 3 a side view, of the upper portion of the said apparatus.

According to my improved method a carbon filament is treated in an electric arc in the presence of vapor of the metal to be combined with the carbon in the manner hereinafter described. Under such conditions the effect is essentially different from that which results where the filament is employed as a conductor and the current transmitted there-through. The carbon filament is thus converted into graphite and then into carbide at a single operation.

In carrying out my improved process I prefer to employ arc-producing apparatus of the character hereinafter described. The end of the carbon filament is passed through two longitudinally-perforated carbon electrodes *a* *b*, mounted axially in line with one another and capable of being moved apart. The space to be occupied by the arc is immediately surrounded by a cylinder composed of the metal intended to form the metallic base of the carbide or composed of the metal itself, this cylinder

being in turn inclosed within a tight-fitting globe or vessel *d*, formed of glass or of the same substance as the cylinder. A small electric arc is struck between the extremities of the carbons *a* *b*, so as to produce a high heating effect without much pressure, the globe or vessel *d* being meanwhile charged with hydrogen or carbureted hydrogen or with vapor of a hydrocarbon or of the metal intended to form the metallic base of the carbide. The spool *e* of carbon filament is preferably mounted in a gas-tight container *f*, to which the hydrocarbon or other gas is admitted by way of a cock *g*, the said gas passing from this container through the perforation in the carbon *a* into the interior of the cylinder *c* and globe or vessel *d*. The extremity of the carbon filament having been passed through the carbon electrode and carried to a drum or reel *h*, the thread or filament is drawn through the electric arc at a speed depending upon the strength of the current. The carbide resulting has a metallic appearance, and although of a highly-crystalline nature may when cut into the required lengths be readily bent into horseshoe form and mounted in incandescing-lamp globes in the ordinary manner. The temperature which should be employed at the final stage of converting the filament into carbide will vary slightly when working with different kinds of metals. The temperature appropriate may, however, be determined by that at which incipient fusion of the metallic oxide or oxides takes place.

The carbons *a* *b* may be mounted in a similar manner to those in an ordinary electric arc lamp and their regulation effected by suitable mechanism or by hand. In the accompanying illustration the carbon *b* is held in a socket *i*, carried by a transverse bar *k*, the latter being supported by rods *l* *l*, while the carbon *a* is carried by the plate *m*, in which the supporting-rods *n* *n* terminate.

The method of manufacture hereinbefore described is well adapted for use in the production of incandescing-lamp filaments where uranium, titanium, zirconium, or beryllium,

either singly, in combination or in combination with other metals, is employed as the metallic base of the carbid.

What I claim as my invention, and desire to secure by Letters Patent, is—

The herein-described method of producing carbid filaments for electric incandescing lamps consisting in treating a carbon filament in an electric arc in the presence of vapor of the metal or metals constituting the metallic base of the carbid to be produced,

the said carbon filament being converted into graphite and then into carbid at a single operation, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM LAWRENCE VOELKER.

Witnesses:

EDMUND S. SNEWIN,
WM. O. BROWN.