

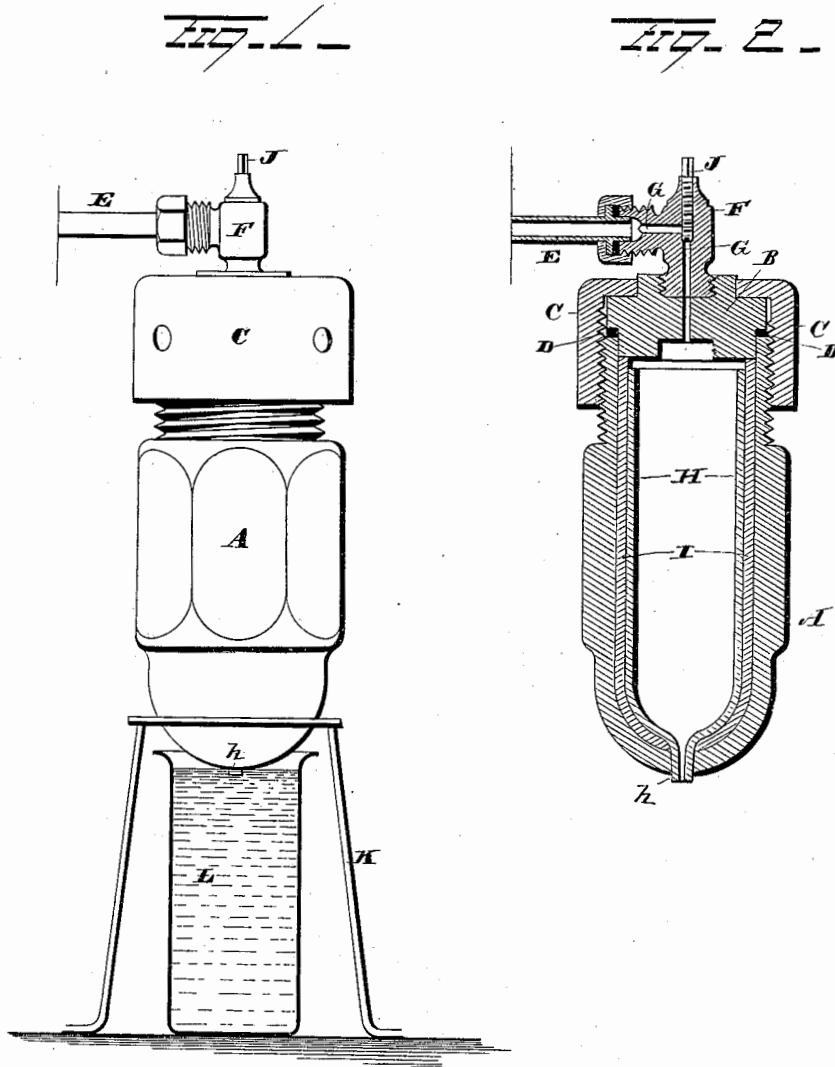
(No Model.)

J. W. SWAN.

MANUFACTURE OF CARBONS FOR INCANDESCENT LAMPS.

No. 322,993.

Patented July 28, 1885.



WITNESSES
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MANUFACTURE OF CARBONS FOR INCANDESCENT LAMPS.

SPECIFICATION forming part of Letters Patent No. 322,993, dated July 28, 1885.

Application filed August 7, 1884. (No model.) Patented in England December 31, 1883, No. 5,978; in France April 28, 1884, No. 161,780, and in Germany May 4, 1884, No. 30,291.

To all whom it may concern:

Be it known that I, JOSEPH WILSON SWAN, chemist, a subject of the Queen of Great Britain and Ireland, and residing at Bromley, in the county of Kent, England, have invented certain Improvements in the Manufacture of Carbons for Incandescent Electric Lamps, (for which I have obtained patents in Great Britain, No. 5,978, dated December 31, 1883, in France, dated April 28, 1884, and in Germany, dated May 4, 1884,) of which the following is a specification.

It is necessary, for obtaining the greatest efficiency in electrical lamps in which light is produced by the incandescence of a carbon filament or thread, that the filament or thread should be of a homogeneous and solid texture, and that its section should be uniform in size.

Hitherto great difficulty has been experienced in producing thin carbon filaments or threads of a perfectly uniform sectional size and at the same time homogeneous and solid in texture.

My invention has for its object the production of carbon filaments or threads possessing these qualities and the removal of the difficulties which have hitherto stood in the way of their manufacture.

According to my said invention I take a carbonizable material, of the nature hereinafter mentioned, in a plastic or semi-liquid state, and I squeeze or press it through a hole or holes or die or dies, so as to form a filament or thread or filaments or threads of any required length and of equal substance throughout its or their length, and also of any required form in transverse section.

The material I employ in carrying out my invention is a solution of nitro-cellulose in acetic acid or other solvent. Other carbonizable material may be combined with the nitro-cellulose, or the nitro-cellulose solution may be used alone; or I employ nitro-glucose rendered plastic by heat. I project the filament or filaments or thread or threads as it or they issues or issue from the die into a liquid, such as alcohol, of from seventy to eighty per cent., or into other liquid which has the effect of setting or giving coherence to the issuing thread.

The accompanying drawings represent an apparatus which may be used in carrying my invention into effect. It is given as an example and as a means of making the invention perfectly understood; but I do not limit myself to the use of this particular form of apparatus.

Figure 1 is an elevation, and Fig. 2 is a vertical section.

A represents a strong metallic cylinder, constituting the body of the apparatus. It is closed by a covering-piece, B, held down by the cap-piece C, which is screwed down so as to compress the packing D firmly to give a tight joint. E is a pipe from the reservoir of an air-compressing pump secured in the nozzle-piece F, through which the passage G leads to the interior of the part A, which is lined with a glass cylinder, H, terminating in a nipple-piece, h, having a fine orifice therethrough and passing through the bottom of the part A.

I is a lining of plaster-of-paris, to keep the glass cylinder H in place. J is a screw closing plug or tap, by which the passage G can be closed while the air is being compressed by the pump attached to the pipe E.

The apparatus may be supported by a stand, as at K, so that the outlet-orifice through the nozzle h is situated over a vessel, L, into which the material is passed as it issues from the said orifice. The carbonizable material, in a plastic or semi-liquid state, is put into the receiver A, which is firmly closed. The tap J is closed, and air is pumped into the reservoir of the pump until it has attained a sufficient pressure, when the top J is opened and the carbonizable material is forced slowly through the orifice in the nozzle h, from which it may pass into the vessel L, containing a liquid for the purpose hereinafter described.

When the threads or filaments have been formed in the manner described, I treat them with a solution of hydrosulphate of ammonia or other equivalent deoxidizing agent until they are no longer in a condition to burn explosively, and I then dry them and shape them into the forms in which they are to be used in the lamps; and I carbonize them in any suitable manner.

I am aware that it has been proposed to

make filaments for incandescent lamps by placing plastic carbonizable substance within a receptacle and forcing it therefrom through a die, forming filaments, which are cut into lengths and carbonized; also, that it has been proposed to make carbons as follows: treating cellulose with a mixture of sulphuric and nitric acids producing pyroxyline, dissolving this by a suitable solvent, and treating the product with ammonium sulphide or equivalent agent; also, by dissolving fibrous cellulose, forming the solution into sheets from which the impurities are removed and the sheets then cut into filaments and carbonized; also, by dissolving cellulose by a suitable solvent and forming the solution into sheets, or subjecting it to heat and pressure and forcing it through dies to form a filament, and hence I make no claim to such process.

20 I claim—

1. In the process of manufacturing carbons for incandescent electric lamps, the following steps: placing a mixture or solution of nitro-cellulose in acetic acid (or other solvent) in a

receiver and forcing said mixture through a contracted opening, thereby producing a filament and conducting said filament into a liquid for hardening the same and subsequently carbonizing the filament, substantially as set forth.

2. Manufacturing carbons for incandescent electric lamps by forcing a mixture or solution of nitro-cellulose in acetic acid (or other solvent) or the equivalent thereof, as hereinbefore stated, through a hole or holes or die or dies and into a liquid for causing the setting, coagulation, or coherence of the issuing filament or filaments, and subsequently treating the said filament or filaments with a deoxidizing agent and then carbonizing the said filament or filaments, substantially as hereinbefore described.

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

JOSEPH WILSON SWAN.

Witnesses:

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