

UNITED STATES PATENT OFFICE.

HARRY BRESLER, OF CHARLOTTENBURG, GERMANY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

MANUFACTURE OF METALLIC FILAMENTS FOR INCANDESCENT ELECTRIC LAMPS.

1,023,295.

Specification of Letters Patent.

Patented Apr. 16, 1912.

No Drawing.

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To all whom it may concern:

Be it known that I, HARRY BRESLER, a subject of the Emperor of Germany, and resident of Charlottenburg, Germany, have
5 invented certain new and useful Improvements in the Manufacture of Metallic Filaments for Incandescent Electric Lamps, of which the following is a specification.

My invention relates to the manufacture
10 of metallic filaments for incandescent electric lamps, and particularly to the production of a plastic paste or mass from which such filaments may be formed by the well-known squirting process or in any other
15 approved manner.

In carrying out my present invention, I take a fine powder of a suitable metal, such as tungsten or molybdenum, either alone or mixed with oxids of such metal, and by the
20 addition of a small amount of binder consisting of a solution of ammonium viscose, I produce a plastic mass or paste. This mass is then formed by squirting or otherwise into filaments which are subsequently
25 converted into metallic filaments by a suitable treatment, as by drying the filament in the open air and heating it in an atmosphere of hydrogen. This results in a carbonization of the filament, or rather of the
30 binder it contains. This binder is decomposed by the heat, the ammonium sulfid escaping as a gas and the cellulose being burned or carbonized. This carbonizing
35 step may be carried out in a porcelain tube heated externally by Bunsen burners, the air originally contained in such tube being driven out by a current of hydrogen passed therethrough. The quantity of carbon resulting from this treatment should be exactly or approximately sufficient to combine
40 with the oxygen of the oxid, and the pro-

portion of binder used in the mixture or paste should be chosen accordingly. No carbon should therefore remain in the filament, but if there is any excess, it should
45 be of oxid. Any remnant of oxid not decomposed by the carbon, will be reduced by the action of the hydrogen current, so that a pure metallic filament is obtained. In order to give these filaments good electrical conductivity, they are then brought to red heat by an electric current either in a vacuum or in an atmosphere of nitrogen.

Among the advantages of the viscose binder are the smallness of the carbon residue left by it, the small amount of it that
55 suffices for efficient binding action,—the advantage of these two properties being of course, cumulative,—and the relatively low temperature at which it decomposes. Besides the low carbon content, efficient binding action, and low temperature of decomposition characteristic of viscose itself, the ammonium solution has the advantage that
60 the solvent leaves no residue of any sort. 65

I claim as my invention:

1. A squirting mixture for the formation of filaments comprising material held in a binder of ammonium viscose.
2. A plastic paste for filament manufacture comprising finely divided tungsten held in a binder of ammonium viscose. 70
3. A plastic mixture for the production of filaments comprising finely divided material held in a solution of viscose. 75

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HARRY BRESLER.

Witnesses:

JOHN LOTKA,
JOHN A. KEHLENBECK.