UNITED STATES PATENT OFFICE.

SAMUEL B. HUSSELMAN, OF WORCESTER, MASSACHUSETTS.

MANUFACTURE OF FILAMENTS FOR INCANDESCENT ELECTRIC LIGHTS.

SPECIFICATION forming part of Letters Patent No. 650,178, dated May 22, 1900.

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To all whom it may concern:

Be it known that I, SAMUEL B. HUSSELMAN, a citizen of the United States, residing at the city of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in the Manufacture of Filaments for Incandescent Electric Lights, of which the following is a specification.

My invention has relation to a filament for incandescent electric lights and to the method of making the same; and in such connection it relates to the manner in which the filament is made.

The principal object of my invention is to provide a filament for incandescent lamps which may be readily and cheaply manufactured and which is practically indestructible.

To this end my invention consists, first, of a filament comprising a base or thread of asbestos or similar non-destructible material and an outer layer or layers of a semimetallic fused compound of aluminium and iodin, and, second, in the method of manufacturing such a filament which comprises, first, heating iodin, aluminium in divided form, and alcohol in suitable proportions in an air-tight retort to a temperature sufficient to reduce the mixture to a pasty semimetallic mass; second, coating a string or thread of asbestos or similar material with the mass thus formed and permitting the coated thread to dry; third, subjecting the thread thus coated to successive coatings until the thread is thoroughly saturated; fourth, drawing the thread after the last coating operation and while it is still moist between forming rolls or tubes to give the thread its required shape and density, and, finally, heating the thread in an air-tight retort or oven to a temperature sufficiently high to fuse the coating to the thread.

In carrying out my invention the basic material of the filament consists, preferably, of a thread or string of asbestos coated with successive layers of a pasty mixture of iodin and aluminium and which is then heated to a temperature sufficient to fuse the iodin and aluminium to the thread, whereby is provided a filament composed of a base of asbestos or similar material enveloped in a fused coating of iodin and aluminium.

In manufacturing a filament of my invention the following preferred formula and method of making the same are employed: There is first formed a semifluid or pasty mixture of iodin, aluminium shavings, and alcohol, which is heated to a temperature of about 108° Fahrenheit until the mixture is a pasty semimetallic substance of required density or thickness. The proportions of iodin, aluminium, and alcohol in the above mixture which have given good results are as follows: iodin, three grains or parts; aluminium, two grains or parts, and alcohol in preferably a pure state one pound or quart. After the mixture has been formed and heated to provide a bath of required density it is placed in an air-tight bottle or jar, and then a thread or string of asbestos or similar material not susceptible to destruction by heat is drawn through the mixture and so as to become saturated by the same. The thread thus saturated is then dried and again drawn through the mixture until it is again saturated, and these successive operations are continued until the string or thread is thoroughly permeated with the mixture and a coating of the mixture incloses the thread. After the last coating operation and while moist the thread is drawn between forming-rolls or through a forming-tube until it is drawn or formed into the required size and is given the requisite density. The thread is next placed in an air-tight mica retort or oven of the usual type and subjected to a temperature of from 3,500° to 4,000° Fahrenheit and baked until the coating of iodin and aluminium have become fused to the asbestos base. The filament is then formed. After the filament is formed it is advisable to place it in an air-tight receptacle to prevent the absorption thereby of oxygen.

When the filament is to be used, it is cut up into desired lengths and placed in a glass bulb. The ends are cemented to the base of the bulb and brought into electric connection with the current in the usual well-known manner. The air is also exhausted from the bulb in the ordinary way. In testing the filament in the completed lamp some care should

be taken that the current is turned on gradually, so as not to fuse the cemented joints.

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

1. A filament for incandescent electric lights, consisting of a base of asbestos or similar indestructible material to which is fused a coating of iodin and aluminium, substantially as and for the purposes described.

2. The method of making filaments for incandescent electric lights, which consists in first, heating iodin, aluminium in divided form and alcohol in suitable proportions and in an air-tight retort, to a temperature sufficient to reduce the mixture to a pasty, semi-metallic mass; second, coating a string or thread of asbestos or similar material with the mass thus formed and permitting the string or thread to dry; third, subjecting the string thus coated to successive coatings until the string is thoroughly saturated; fourth, giving the thread or string its required shape and density while still moist and after the last coating operation; and finally, heating the thread or string in an air-tight retort, to a temperature sufficiently high to fuse the coating to the thread, substantially as and for the purposes described.

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

SAMUEL B. HUSSELMAN.

Witnesses:
JAMES F. HILL,
HARRISON STOCKMAN.