(No Model.)

A. L. REINMANN.

APPARATUS FOR CARBONIZING FIBER.

No. 345,860. Patented July 20, 1886.

Fig. 1.

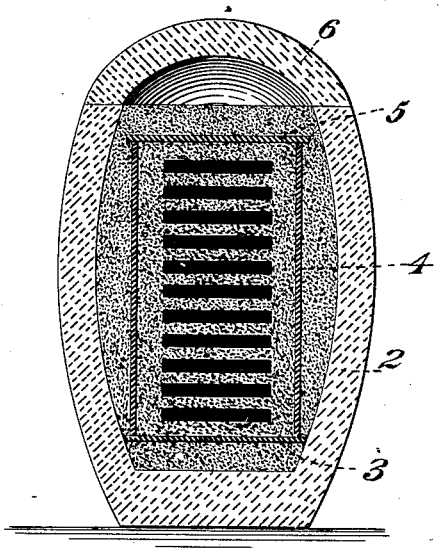
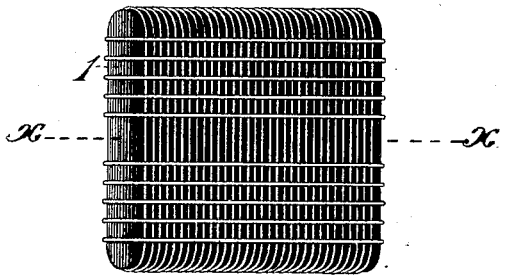


Fig. 2.



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APPARATUS FOR CARBONIZING FIBER.

SPECIFICATION forming part of Letters Patent No. 345,860, dated July 20, 1886.

Application filed October 31, 1885. Serial No. 181,459. (No model.)

To all whom it may concern:

Be it known that I, ALBERT L. REINMANN, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Apparatus for Carbonizing Fibers, of which improvements the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a sectional view showing the manner of packing the carbons, carrying the fibers to be carbonized in a crucible. Fig. 2 is a perspective view showing the manner of winding the fibers on the carbon-holder.

The invention herein relates to certain improvements in apparatus for baking or carbonizing silk or other fibers employed in incandescent electric lights.

The method of carbonizing fibers heretofore in general use consisted in winding the fibers to be treated upon suitably-shaped carbon blocks, and then arranging these blocks in suitable pots or crucibles, carbon dust or graphite being interposed between the blocks, and then subjecting the same to a high heat in any suitable furnace. This method is objectionable on account of the unequal carbonizing of the fibers, it being practically impossible to heat the pot or crucible and its contents uniformly on all sides, and consequently some portions of the fiber will be more highly carbonized than others.

It has been attempted to overcome the above difficulty by interposing metal plates between the carbon blocks, the edges of such plates extending between the edges of the blocks and into close proximity to the walls of the containing pot or crucible, the object of such plates being to conduct the heat to the interior of the pot, and thereby effect an even distribution thereof. This plan, however, is only partially successful, as the heat would pass in between the metal plates, and, consequently, carbonize the portions of the fibers on the edges of the block more highly than the other portions.

The object of the invention herein is to provide for the equal and even distribution and application of the heat on all sides of the carbon blocks to effect the regular and even carbonization of the fibers thereon; and to this end my invention consists in interposing a heat-conducting shell or frame between the carbon blocks and the walls of the containing pot or crucible, said shell or frame completely inclosing said blocks, substantially as hereinafter described and claimed.

In carrying out my invention, the silk or other suitable thread or fiber is wound upon the carbon block 1, and secured thereon in the manner shown in Fig. 2. The threads or fibers are then cut on both sides of the block along the line *x x*. The prepared blocks are then packed into the pot or crucible 2 in the following manner: A layer of powdered carbon dust is placed on the bottom of the pot or crucible 2, and on this layer is placed a plate, 3, of metal or other good heat-conducting material. Within the pot or crucible is arranged the metal shell or frame 4, its lower end resting upon the plate 3, and the space between the wall of the crucible and the shell is filled with carbon dust, as shown. On the plate 3, within the shell 4, is placed a layer of powdered carbon, and on this layer and centrally within the shell is arranged one of the prepared carbon-blocks 1. Then another layer of carbon dust and another block 1 are placed therein. This arrangement or packing of the carbon dust and blocks is continued until the shell is filled, the powdered carbon not only covering the blocks 1, but also surrounding the edges thereof, as shown, the shell being of a diameter greater than the length of the carbon blocks. Over the top of the shell or frame is placed another metal plate, 5, which is also covered with powdered carbon. The crucible or pot 2, having its contents arranged substantially in the manner above stated, is covered by the cap 6, and placed in a suitable heating-furnace.

During the baking of the fibers the heat of the furnace is conducted through the pot to the carbon dust outside of the shell or frame, then to said shell and through the shell to the carbon dust and blocks within the same. It sometimes occurs that the pots are exposed to a greater heat on one portion or side thereof than the other; but by interposing a good heat-conducting shell or frame in the path of the heat it will follow the path of least re-

sistance—*i. e.*, be conducted around the walls of the shell or frame—rather than be transmitted to the adjacent carbon dust, which, as is well known, is a poor conductor of heat, and will offer considerable resistance to the passage thereof. The course or path of the heat will be somewhat as follows: It will be transmitted or radiated from the walls of the pot to the carbon dust between the shell and pot, and from the carbon dust to the metal shell, around which it will pass, raising the same to a practically-uniform temperature throughout, and from thence it will flow inwardly in equal degrees from all sides to the carbon dust and blocks, carrying the fibers contained therein. The equable application of heat will cause the fiber to shrink equally and regularly, thereby avoiding any bending or distortion thereof, and will effect a uniform carbonization of all the filaments and of all parts of each filament. This uniform carbonization is practically impossible in the manner of packing the fiber-carrying blocks, as heretofore practiced, for the reason that if one part of the fibers be heated sooner or more highly than others the resulting filaments will be bent and distorted by this unequal application of heat, and be unequal as regards electrical resistance on account of their different degrees of carbonization.

The shell or frame, and its top and bottom plates may be made of any good heat-conducting material, or of any material having greater heat-conducting properties than the carbon dust in which the fiber-carrying blocks are packed; and I do not wish to limit myself to any particular shape of pot or interposed shell, the main characteristic of the invention being the interposition of a shell or frame having relatively high heat-conducting properties between the pot or crucible and the fiber-carrying blocks; nor do I limit myself to powdered carbon as the packing material to be used, as other suitable refractory materials may be used without departing from the spirit of my invention.

I claim herein as my invention—

1. A pot or crucible having fiber-carrying blocks suitably arranged therein, in combination with a heat-distributing shell or frame, as described, interposed between said blocks and the walls of the pot or crucible, substantially as set forth.

2. A pot or crucible having fiber-carrying blocks, and powdered refractory material arranged therein in alternate layers, in combination with a heat-distributing shell or frame, as described, interposed between said blocks and the walls of the pot or crucible, substantially as set forth.

In testimony whereof I have hereunto set my hand.

ALBERT L. REINMANN.

Witnesses:

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