

(No Model.)

W. L. VOELKER.

PROCESS OF MANUFACTURING CARBONS FOR ELECTRICAL PURPOSES.

No. 356,020.

Patented Jan. 11, 1887.

Fig. 1

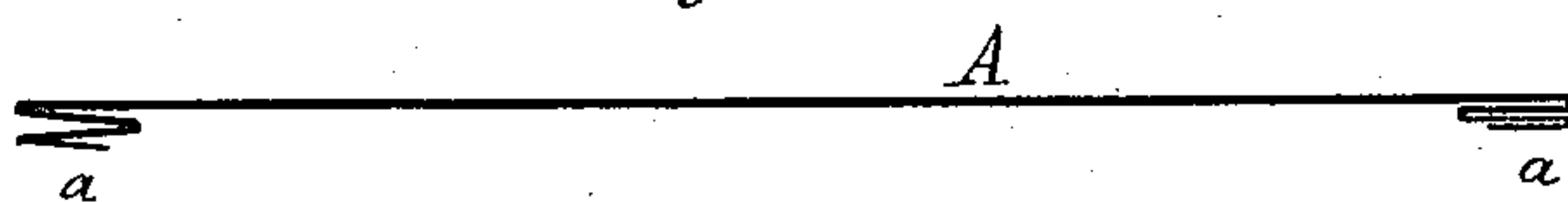


Fig. 2

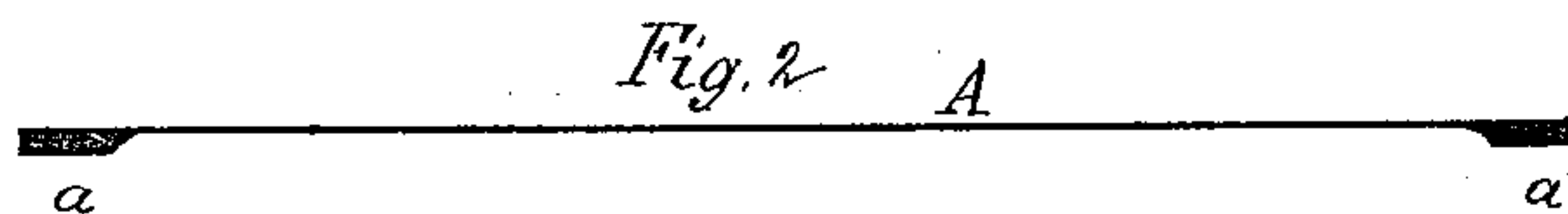
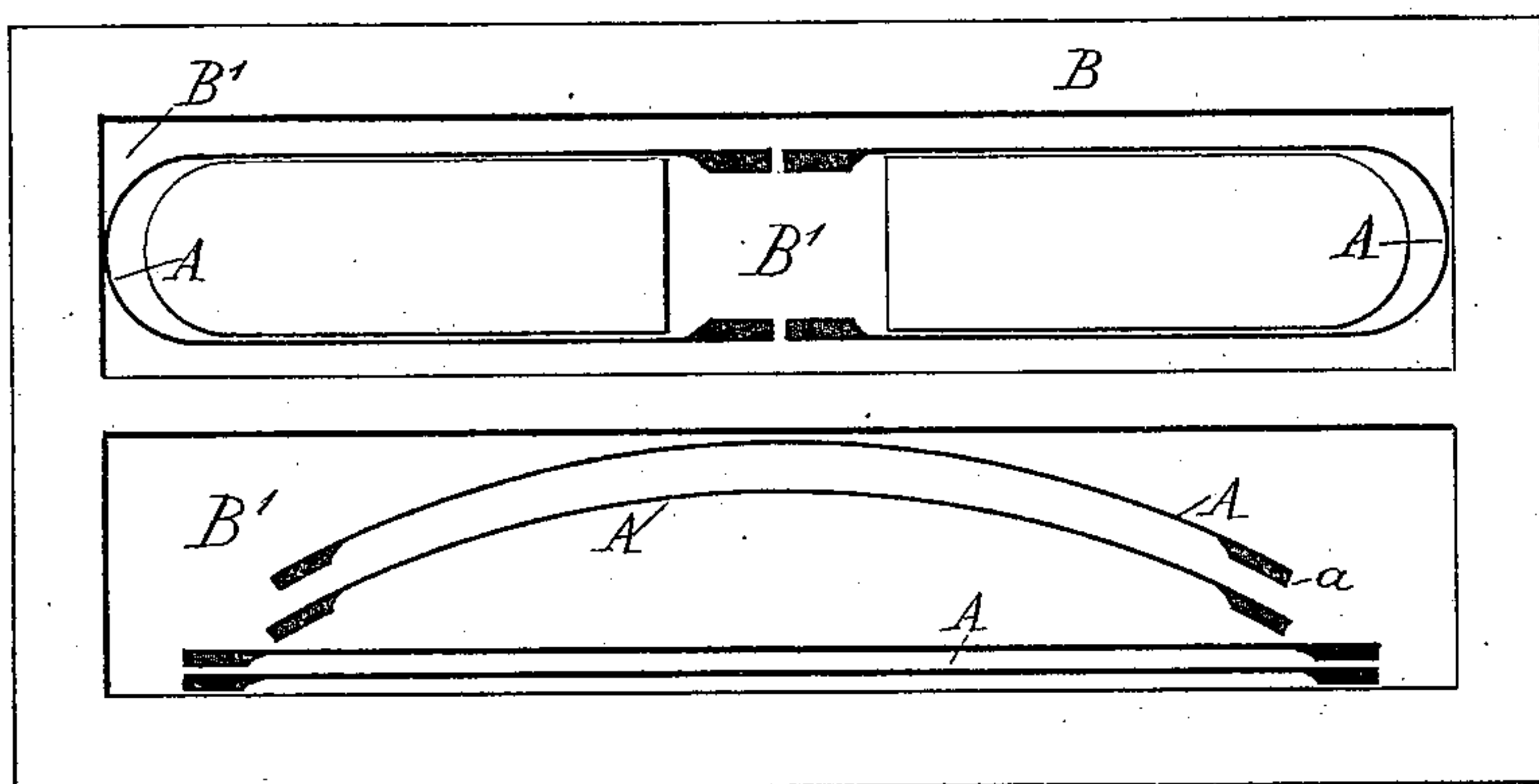


Fig. 3



B² Fig. 4

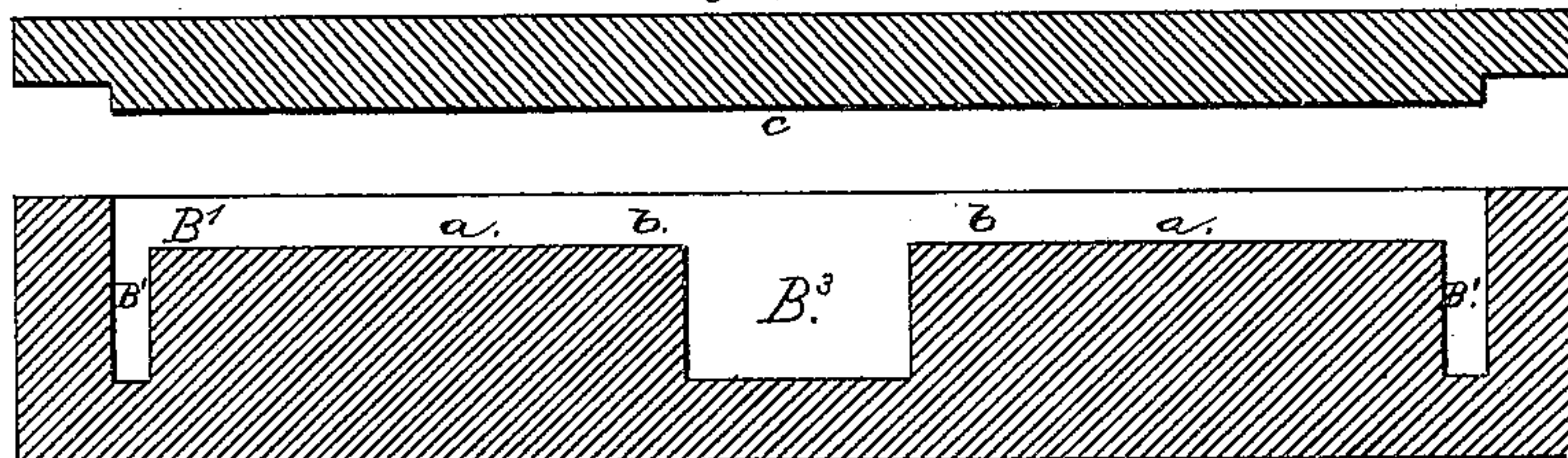
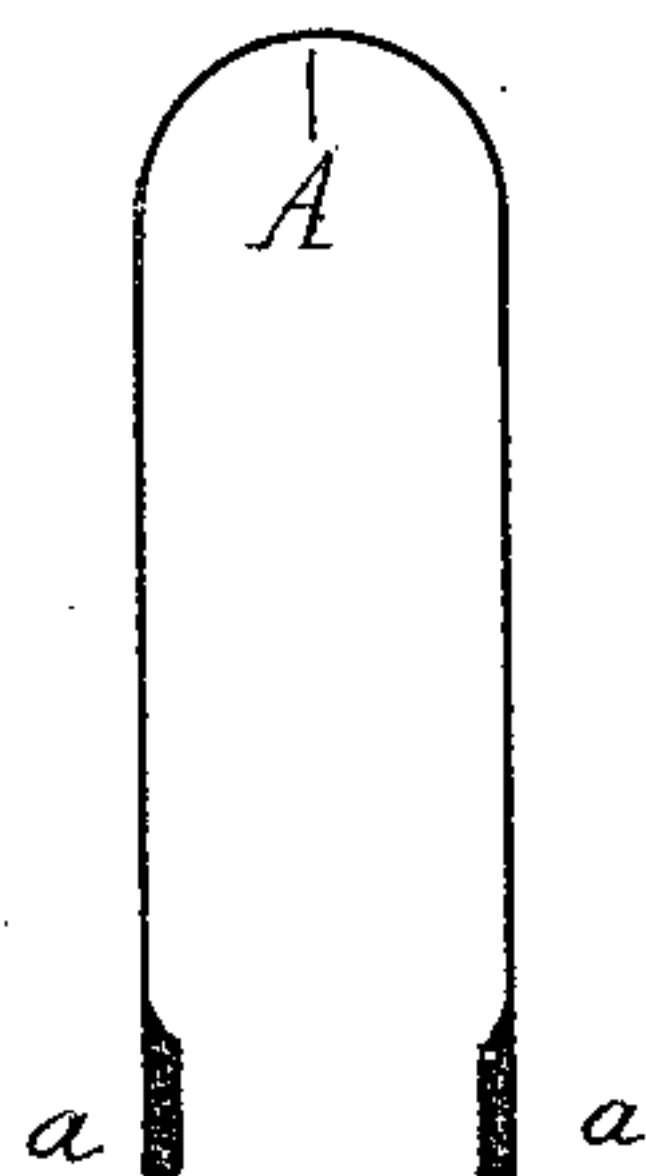


Fig. 5



Witnesses—
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UNITED STATES PATENT OFFICE.

WILLIAM L. VOELKER, OF MORTON, PENNSYLVANIA, ASSIGNOR TO JOHN H. IRWIN, TRUSTEE, OF SAME PLACE.

PROCESS OF MANUFACTURING CARBONS FOR ELECTRICAL PURPOSES.

SPECIFICATION forming part of Letters Patent No. 356,020, dated January 11, 1887.

Application filed February 16, 1882. Serial No. 52,920. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. VOELKER, of Morton, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Process of Manufacturing Carbons for Incandescent Electric Lamps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates especially to the preparation of incandescing filaments of carbon for use in incandescent electric lamps, and has for its object the production of a device whereby filaments are produced which are substantially perfect in structure, and which may be handled freely without danger of breaking them. To accomplish this result I place strips of wood or other vegetable fiber formed in the desired shape in a box or flask constructed of graphite or other suitable material, and after filling the intermediate space between or surrounding the filaments with powdered coke, sealing the flask, and submitting the same, with its contents, to a high degree of temperature, and before removing from the furnace allowing the same to gradually cool or become reduced in temperature before opening the flask and exposing the carbons to the atmosphere; and my invention involves certain novel and useful combinations or arrangements of parts, and peculiarities of construction and manipulation, all of which will be hereinafter first fully described, and then pointed out in the claims.

In the drawings, Figures 1 and 2 are elevations of strips of vegetable fiber, illustrating methods of forming the incandescing filaments. Fig. 3 is a plan view of a flask, and Fig. 4 is a longitudinal vertical section of the same. Fig. 5 is an elevation of a horseshoe-shaped carbon.

Like letters of reference, wherever they occur, indicate corresponding parts in all the figures.

A are strips of wood or other vegetable fiber prepared for carbonizing. In forming said strips great care should be taken to give a uniform size or cross-section to the incandescing portions. When the strip is made the same size throughout its entire length, I form the enlargements *a* by turning or bending the ends

back upon themselves, as shown in Fig. 1, and cement the parts together by means of coal-tar, sugar, or any other substance which will carbonize properly.

If desired, the filament may be formed by shaving the incandescing portion down from a piece of material of the requisite dimensions, leaving the enlargement *a* thereon.

B is a box or flask, preferably of graphite, provided with central upward projections, *a a*, of the general form desired for the completed carbon filament. These projections rise to the same horizontal plane, but not quite so high as the top of the flask, leaving a space, *b*, when the flask is open. Extending around the sides and outer ends of these projections are narrow and deep recesses *B'* of a size to permit all but the ends of the carbon filaments to be packed into them with a small quantity of powdered coke. At the center of the flask and between the inner ends of the projection *a a* is a large cavity, *B³*, of the same depth as the cavities *B'*, which cavity *B³* is adapted to expose the enlarged ends of the carbon filament to a large quantity of powdered coke, so that such enlarged ends may be carbonized uniformly with the thinner parts of such filaments. A cover, *B²*, is cut away upon its bottom at the ends and sides, leaving a central downward projection, *c'*, adapted to fit closely into the interior of the flask and over the upper part of the projections *a a*, while the cut-away ends and sides fit closely over the tops of the upper walls of the flask, thus closing tightly the recesses *B' B³*, and preventing the escape of gases to the atmosphere, while preserving a gas communication between all the recesses.

The filaments A are placed in the receptacle singly, each one being sprinkled with or packed in powdered gas coke, or its equivalent, until the receptacle is filled. The cover *B²* is then placed upon the flask and secured thereto by means of a cement composed of clay and salt, and the receptacle and cover are bound securely together with suitable material. When the receptacle is placed in the furnace, the heat converts the silicious matter in the clay and the soda of the salt into a fused glassy cement, which completely seals the flask. After thoroughly drying, the device is placed in a suitable blast-furnace, and the tempera-

tures slowly raised, in order to render the transition of the fiber of the filaments into carbon gradual. When the temperature has reached an intense white heat, it is so maintained for the requisite length of time, after which the heat is allowed to diminish until the blast is stopped and the fire dies out. After cooling, the receptacle is opened and the carbons are ready for use.

By the above process I am enabled to produce a carbon which is practically free from flaws and imperfections, and is consequently of great durability.

I do not pretend to have been the first to have carbonized incandescent filament-conductors of vegetable fiber for use in incandescent electric lamps, or to have invented all the various steps in the method of carbonization employed by me; but I believe I am the first to employ the various steps in the order of sequence, as claimed below.

Having now fully described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. The method of preparing incandescing filament conductors made of vegetable fiber for incandescent electric lamps previous to the carbonization of such fibers, which consists in shaping a strip of vegetable fiber of uniform size throughout, except its ends, which are made larger, and then bending such ends back

upon themselves and cementing the same in place by means of coal-tar, sugar, or equivalent substances, substantially as described.

2. The method of carbonizing incandescing filament conductors, prepared as described, which consists in packing them into a suitable flask with powdered coke in small quantities where the filament is thin, and in large quantities at the thickened ends, then closing and sealing the cover of the flask with a fusible cement, then placing the flask thus sealed into a furnace, then heating the same gradually to a white heat, then allowing the furnace-fire to go out and the flask to gradually cool in the furnace until it may be opened by hand and the carbonized filament removed complete, substantially as described.

3. A flask for carbonizing incandescing filament conductors made of vegetable fiber for incandescing electric lamps having central projections, *a a*, small end and side cavities, *B'*, a large central cavity, *B³*, and a cover, *B²*, with a central projection, *c*, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

WILLIAM L. VOELKER.

Witnesses:

LEWIS F. BETTS,
A. A. BENKERT.