

(No Model.)

T. M. FOOTE.
ARC LAMP CARBON.

No. 584,867.

Patented June 22, 1897.

Figs

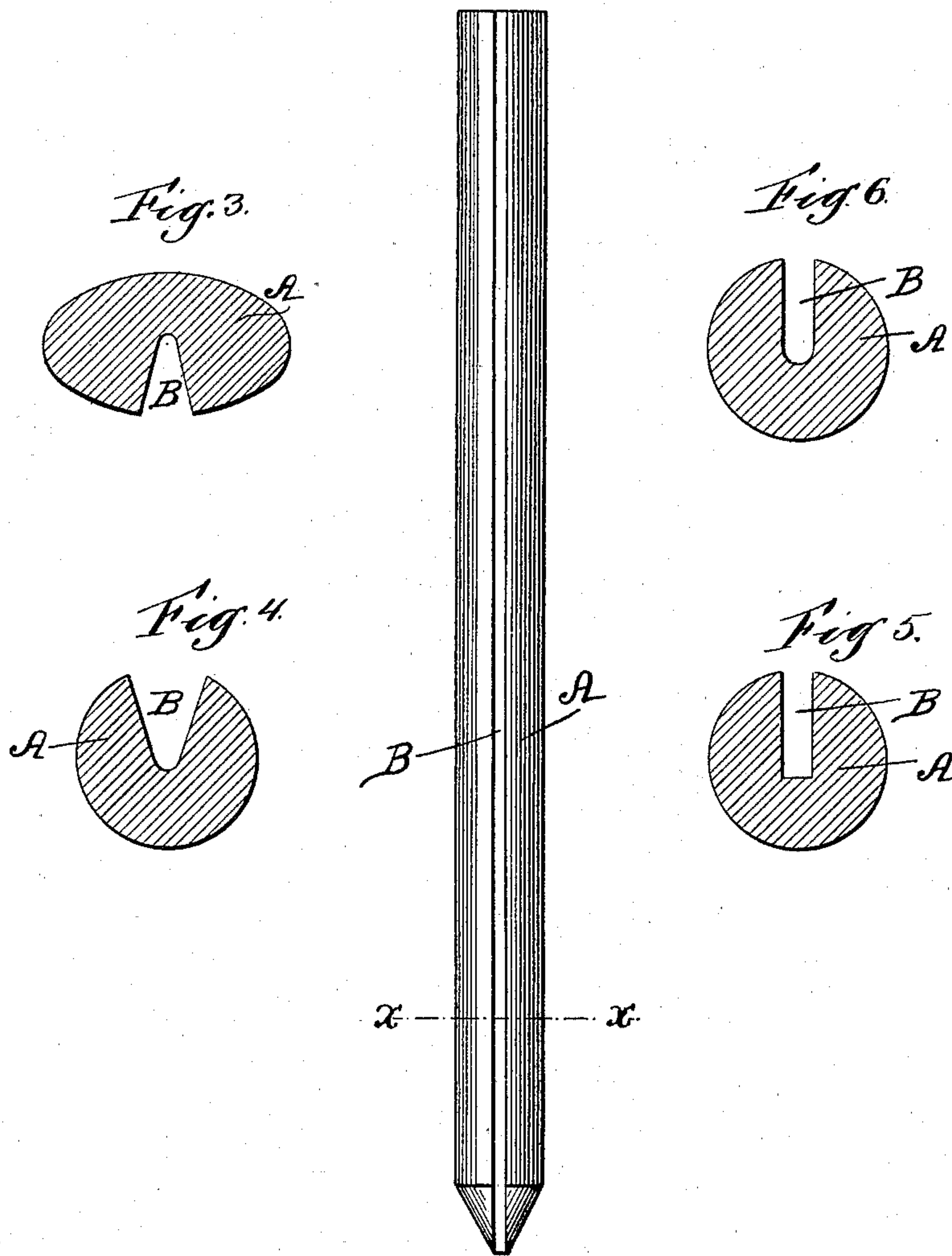


Fig. 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

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ARC-LAMP CARBON.

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To all whom it may concern:

Be it known that I, THEODORE M. FOOTE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electric-Arc-Lamp Carbons, of which the following is a specification.

My invention relates to certain improvements in the manner of forming or making carbon pencils for arc-lamps.

In the operation of the arc-lamp it is well known that the consumption and manner of burning off of the carbon particles under the action of the electric current causes a crater to form at the end of the positive carbon and a pointed end on the negative carbon.

Owing to the well-known evident fact that the current selects the shortest path of travel between the carbons in the practical use of the arc-lamp, it has been ascertained that the formed arc interval across which the current passes is constantly shifting, traveling circularly about the edge of the crater of the positive carbon and causing shadows, unsteadiness, and other objectionable results. The arc interval shifts and travels thus about the crater of the positive carbons by reason of the irregularity of the edge about the crater. For instance, the current disintegrates a portion of the carbon at one point on the edge of the crater, thus forming a notch in said edge, and the current then immediately shifts to the shorter path across the arc offered by that higher portion of the edge of the crater beyond the notch until that portion is disintegrated and carried off and the width of the notch increased, this action taking place successively, the current seeking constantly the shortest arc and shifting about the whole of the circle formed by the edge of the carbon about the crater. It is evident that as the circular edge of the crater is comparatively small the current at the arc will consume quite a considerable portion of its circumference at one time, and that in burning out and carrying away a large portion of the carbon on one side the raised portion of the carbon of the pencil on the opposite side obstructs the rays of light, and preventing its diffusion radially in all directions thus forms shadows which shift and change position as the arc travels about the circle or edge of the crater.

The object of my invention is to overcome these disadvantages and to provide a carbon which shall radiate and diffuse the light in all directions, which shall provide a steadier, clearer light of greater luminosity, which carbon may be made and formed with less difficulty, and which shall present such a construction as to cause more perfect consumption of the carbon particles.

My invention has certain other objects in view; and it consists in certain features to be particularly described, reference being now had to the accompanying drawings, in which—

Figure 1 is a side view of one of my improved carbons. Fig. 2 is a cross-section on the line xx of Fig. 1. Fig. 3 is a cross-section of an elliptical carbon embodying my improvement. Fig. 4 is a like view showing the groove somewhat more flaring. Fig. 5 is a like view showing the groove made straight-sided and having a square end. Fig. 6 is a like view showing the groove made straight-sided and having a circular-formed end.

In carrying out my invention I provide a carbon A of the ordinary character, either straight or semicircular, and form a groove B therein for the whole length thereof, as shown. It is obvious, however, that if desired the groove may terminate at a point below the upper end of the carbon in order to provide a solid end, which is inserted in the carbon-holder.

It will be particularly noted that the longitudinal groove B in the carbon A extends into the carbon for a certain and a determined depth of the curved or circularly-formed carbon, and the importance of this feature will be particularly pointed out.

As previously stated, the arc interval forming across the shortest path between the carbons causes the formation of a relatively higher and lower portion upon each side of the crater of the carbon, the arc interval constantly shifting in a circular path about said edge. As the current at the arc consumes quite a considerable portion of the circumference of the circular edge about the crater, it is evident that if a considerable portion of said edge be notched or cut away prior to the application of the current and this cut-out or notched portion maintained present constantly at said edge during consumption the

are interval cannot travel in shifting continuously about the circular edge around the crater. It is ascertained in the practical use of these carbons that the arc interval shifts
5 or moves within a very materially circumscribed path of travel, owing to the ever-present cut-out or notched portion maintained by the groove B in the circular edge of the crater, and instead of moving continuously about the
10 circular path of the edge of the crater the said arc interval simply shifts or moves alternately back and forth between the two sides of the groove B about the edge of the crater. With this limitation of the shifting movement of
15 the arc interval it is demonstrated in practice that the shadows cannot and do not form, since the one side does not, under these conditions, become of such a relative height as to obscure or cut off the luminous rays.
20 It is of importance that the groove B extend for such a depth into the carbon A as that the groove shall penetrate into the crater formed on the end of said carbon and thus avoid the formation of projections of the material of the carbon at the two sides of the
25 groove on the edge of the crater. So, also, if the said material be not cut out into said crater the radiation and diffusion of the light are obstructed.
30 By this construction I am enabled to produce a light of greater purity and steadiness and also consume the carbon particles more completely and also provide a construction

which is capable of being molded and formed more readily. 35

In the use of this form of carbon I have observed the character of light produced and find it to be purer and much clearer, which I attribute to the more complete circulation
40 of air. The provision of a like groove extended into that carbon on which the apex or cone-shaped end is formed also serves a useful purpose in that the formation of a clinker or slender end at the apex is avoided, which end or clinker breaking off and be-
45 coming separated causes a flashing of the arc, sometimes disestablishes the arc, and often occasions injury to person and property.

It is necessary that the groove shall extend for such a depth as to penetrate into or reach
50 to the said apex in order to overcome the formation of this clinker or slender end.

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

As a new article of manufacture a carbon for electric-arc lamps having a longitudinal groove therein including the center or core of the carbon so as to penetrate into the crater
60 and apex formed at the end of said carbon.

In testimony whereof I affix my signature in presence of two witnesses.

THEODORE M. FOOTE.

Witnesses:

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L. W. BULKLEY.