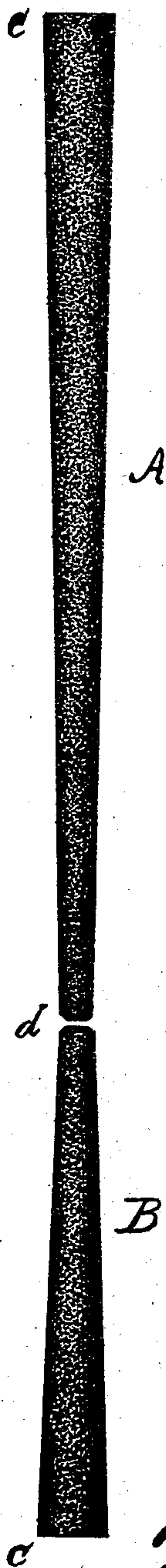


(No Model.)

R. E. BALL.  
CARBON FOR ELECTRIC ARC LAMPS.

No. 506,459.

Patented Oct. 10, 1893.



Witnesses:

M. M. Brown  
Geo. L. Neuhoft

Inventor:

R. E. Ball,  
By Howden & Howden  
Attorneys.

# UNITED STATES PATENT OFFICE.

ROYAL E. BALL, OF NEW YORK, N. Y.

## CARBON FOR ELECTRIC-ARC LAMPS.

SPECIFICATION forming part of Letters Patent No. 506,459, dated October 10, 1893.

Application filed April 28, 1892. Serial No. 430,944. (No model.)

*To all whom it may concern:*

Be it known that I, ROYAL E. BALL, a citizen of the United States, residing at New York city, county and State of New York, have invented certain new and useful Improvements in Carbons for Electric-Arc Lamps, of which the following is such a full, clear, and exact description as will enable anyone skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to carbons for electric arc lamps and the object of the invention is to increase the life or burning capacity of the lamp.

There is at present a demand for some device, simple and, if possible, without mechanism, that can be attached to ordinary single arc lamps now in use and which will burn for twelve or sixteen hours. Carbons of larger than ordinary diameter will do this, but the great drawbacks to them are that they consume much time in pointing themselves and heating up and that during such time which is the time when the best light is needed, the light is not good or at its best.

I overcome these objections by my invention which consists in a carbon of gradually diminishing thickness or diameter from its butt end to its arc-forming end.

I have illustrated a type of my invention in the accompanying drawings, wherein two tapered or conically-shaped carbons, A and B, respectively, are shown as detached and arranged in axial alignment in the usual manner, to form the arcing space. The longer carbon, A, constitutes the movable or upper carbon which is fed to the arc as the carbons waste away and B is the lower carbon. Both of these carbons are coned or tapered from their butt ends *c*, to their arc-forming ends *d*, thus gradually diminishing in diameter or thickness throughout their length.

Of course the taper of the carbon need not extend the entire length thereof, if preferred,

but the carbon should be tapered almost its entire length or at least throughout the length that is to be burned. Though the type of the carbon shown is conical in form, this form need not necessarily be adhered to, for other forms differing in cross-sectional shape may be used—the gradually diminishing thickness or diameter is, however, to be preserved.

I find that good practical results can be obtained by the use of a carbon about twelve inches long, seven-sixteenths of an inch in diameter at the point or arc-forming end and seven-eighths of an inch at the butt end.

By making the carbons of a gradually diminishing diameter or thickness, the light is started with carbon points of the size of most advantage and these points burn as fast nearly as ordinary carbons. In the latter hours of the life of the carbons—the hours of least importance in night service—the slow-burning or larger part of the carbons, which have, however, become properly pointed and heated up during the earlier part of the run or life of the carbons are then consumed.

Having thus described my improvements in carbons for electric-arc lamps, what I claim as my invention, and desire to secure by Letters Patent, is—

1. In an arc-lamp, the combination of a pair of carbon pencils arranged end to end in axial alignment and one or both of the same gradually diminishing in diameter or thickness from or near the butt end to the arc-forming end thereof.

2. A cone-shaped carbon for arc-lamps.

3. A conically-shaped carbon for an electric arc lamp.

In testimony whereof I have hereunto set my hand this 18th day of April, 1892, in the presence of the two subscribing witnesses.

ROYAL E. BALL.

Witnesses:

G. D. SOWERS,

E. E. FRENCH.