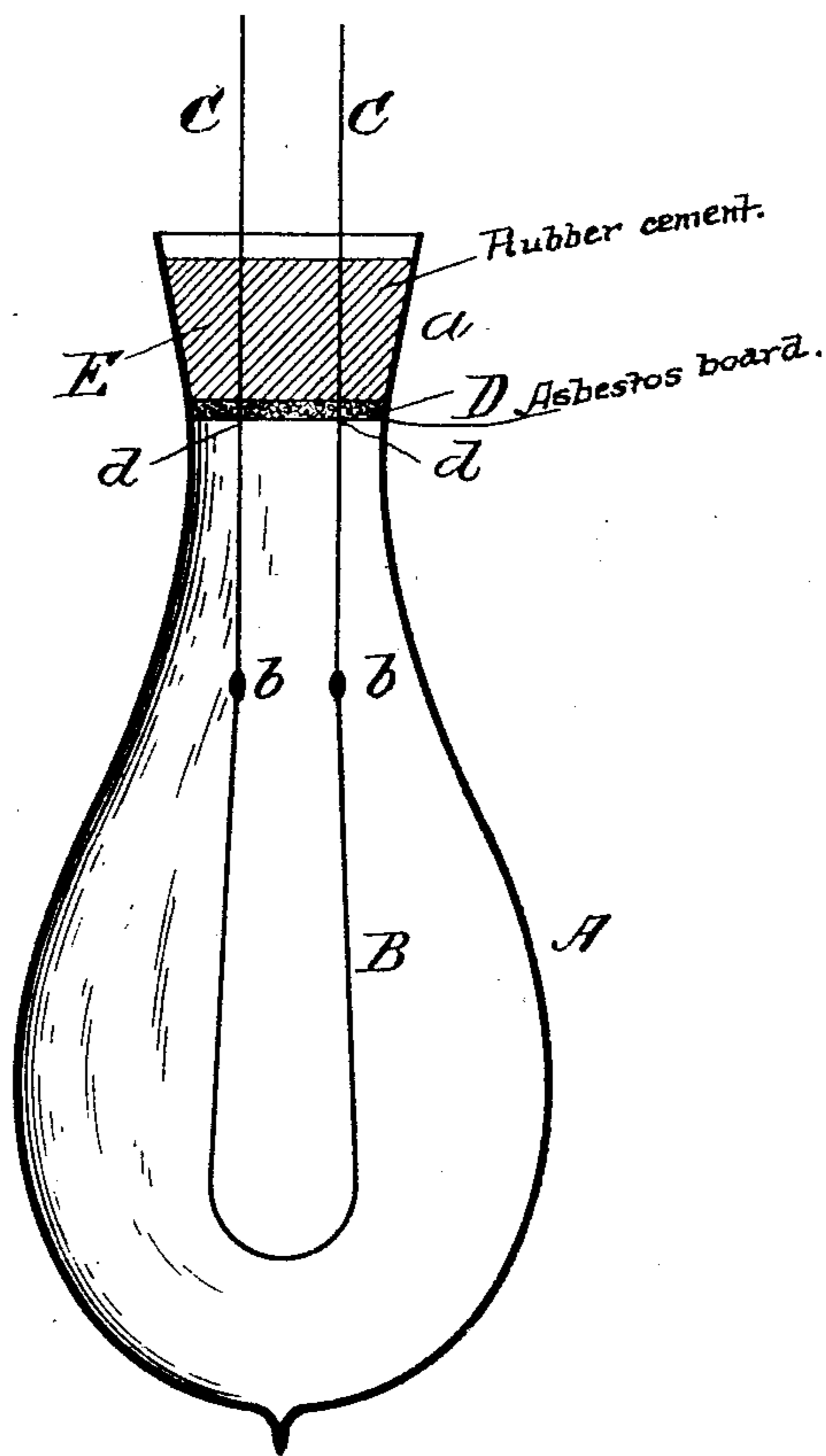


(No Model.)

W. E. NICKERSON & E. E. CARY.
INCANDESCENT ELECTRIC LAMP.

No. 500,670.

Patented July 4, 1893.



WITNESSES.

Frank A. Parker.
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by
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UNITED STATES PATENT OFFICE.

WILLIAM EMERY NICKERSON, OF CAMBRIDGE, AND EDWARD EGBERT CARY,
OF BOSTON, MASSACHUSETTS.

INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 500,670, dated July 4, 1893.

Application filed April 1, 1893. Serial No. 468,737. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM EMERY NICKERSON, of Cambridge, county of Middlesex, and EDWARD EGBERT CARY, of Boston, county of Suffolk, State of Massachusetts, have invented a new and useful Improvement in Incandescent Electric Lamps, of which the following, taken in connection with the accompanying drawings, is a specification.

Our invention relates to incandescent electric lamps and has for its object a cheaper method of connecting the filament with the electric circuit and in such a manner that platinum wire is not required and that lamps may be readily renewed.

Our invention is illustrated in the accompanying drawing, which shows in vertical section our method of sealing the leading-in wires and closing the neck of the lamp globe.

In the drawing, A represents the globe of the lamp and B the filament which is secured at *bb* to the leading-in wires C, C, which may be of iron, copper or other metal.

a is the neck of the lamp globe made conical or tapering with the smallest diameter near the body of the lamp globe.

D is a thin disk, which may be about one-sixteenth of an inch thick and which is preferably made of what is known in the arts as asbestos board.

We do not rely upon the disk to render the globe air tight, but simply to support the cement plug, E which alone performs that important function.

The interior of the neck of the lamp globe is not ground and needs by our method no special preparation, it being not essential that it be exactly round or uniform, or of any particular degree of taper. In fact the vitreous surface belonging to blown glass, is better adapted to our purpose, even though irregular, than any, possible to be made by grinding, since the cement makes a more perfect contact with it than with a ground surface. Stoppered incandescent electric lamps have heretofore been made, by grinding in a tapering glass stopper carrying the leading-in wires, and sometimes supplementing it by cement, relying mainly on the accurate grinding of the glass stopper to make the lamp air-

tight. This, however, is very expensive, as it is costly to grind the tapering glass surfaces to a fit. Our method is exceedingly simple and greatly reduces the cost of the lamp. We simply place the disk loosely in position, with the leading-in wires and filament attached, and pour the melted cement upon the disk to the proper depth. When asbestos board is used, the disks prior to being used, are strongly heated, in order to expel from them gases and organic or volatile matter, arising from size used in the manufacture of the board, or from impurities. Small holes are made in the disk at *d d* by means of a needle, and through which the leading-in wires C C are passed. If the needle used in perforating the disk, is of the proper size relative to the wire, the spongy nature of the asbestos operates to grip the wires sufficiently to maintain them in position, during the subsequent manipulation of the lamp in the process of manufacture.

The disk serves three important purposes. First, to support the leading-in wires during the process of manufacture; second, to serve as a floor upon which to pour the cement, by means of which the lamp is rendered air-tight; and third, owing to its non-conducting properties, to prevent the cement from becoming unduly heated by radiation from the incandescent filament.

In the manufacture of the lamp, the disk D, through which the wires C C carrying the filament B have been passed, is placed in position in the neck of the lamp globe, and a melted cement composed of rubber or other suitable substance, is poured upon it until a layer of sufficient depth to resist the penetrating action of the air, and support the leading-in wires has been formed. A depth of one inch more or less is sufficient. The yielding nature of the asbestos board renders it well adapted for the purpose for which we use it, since it readily supports the leading-in wires until they are permanently held by the cement, and conforms itself to the shape of the neck of the globe, while it is sufficiently impervious to prevent the cement when poured into the lamp neck in a liquid state, from passing through or by it. The neck of the lamp may now be secured, by means of plas-

ter of paris or any other suitable substance, into a brass cap piece, such as is in use for attaching the lamps to a socket or fixture.

Our lamp consists essentially of five parts.

- 5 First, the glass globe A having a conical neck *a*; second, the filament B; third, the leading-in wires C C to which the filament is attached at *b b*; fourth, the asbestos disk; and fifth, the cement E which has been poured into the
10 lamp neck in a melted state.

- When it is desired to renew a lamp in which the filament is unfit for use, or the vacuum vitiated, it is simply necessary to heat the lamp, neck downward, in an oven or other-
15 wise, to the melting point of the cement, whereupon the wires and disk, together with the cement itself, will fall into a receptacle placed to receive them. It is also necessary to admit air into the lamp before the heating
20 is performed, in order that the atmospheric pressure may not prevent the cement and disk from dropping out, on the softening of the former. The lamp globe may then be readily cleaned and used again.

We claim—

1. In an incandescent electric lamp, the combination of a glass globe A, having a conical unground neck *a*, the filament B and leading-in wires C C; with the disk D and fusible cement E, substantially as and for the purpose
25 set forth. 30

2. In an incandescent electric lamp, the combination of a glass globe having a conical neck, leading-in wires, a cement-supporting disk, and a filling of fusible cement adapted
35 to make the lamp air tight and to form a support for the leading-in wires, substantially as and for the purpose set forth.

In testimony whereof we have signed our names to this specification, in the presence of
40 two subscribing witnesses, on this 24th day of March, A. D. 1893.

WILLIAM EMERY NICKERSON.
EDWARD EGBERT CARY.

Witnesses:

FRANK G. PARKER,
FRANK G. HATTIE.