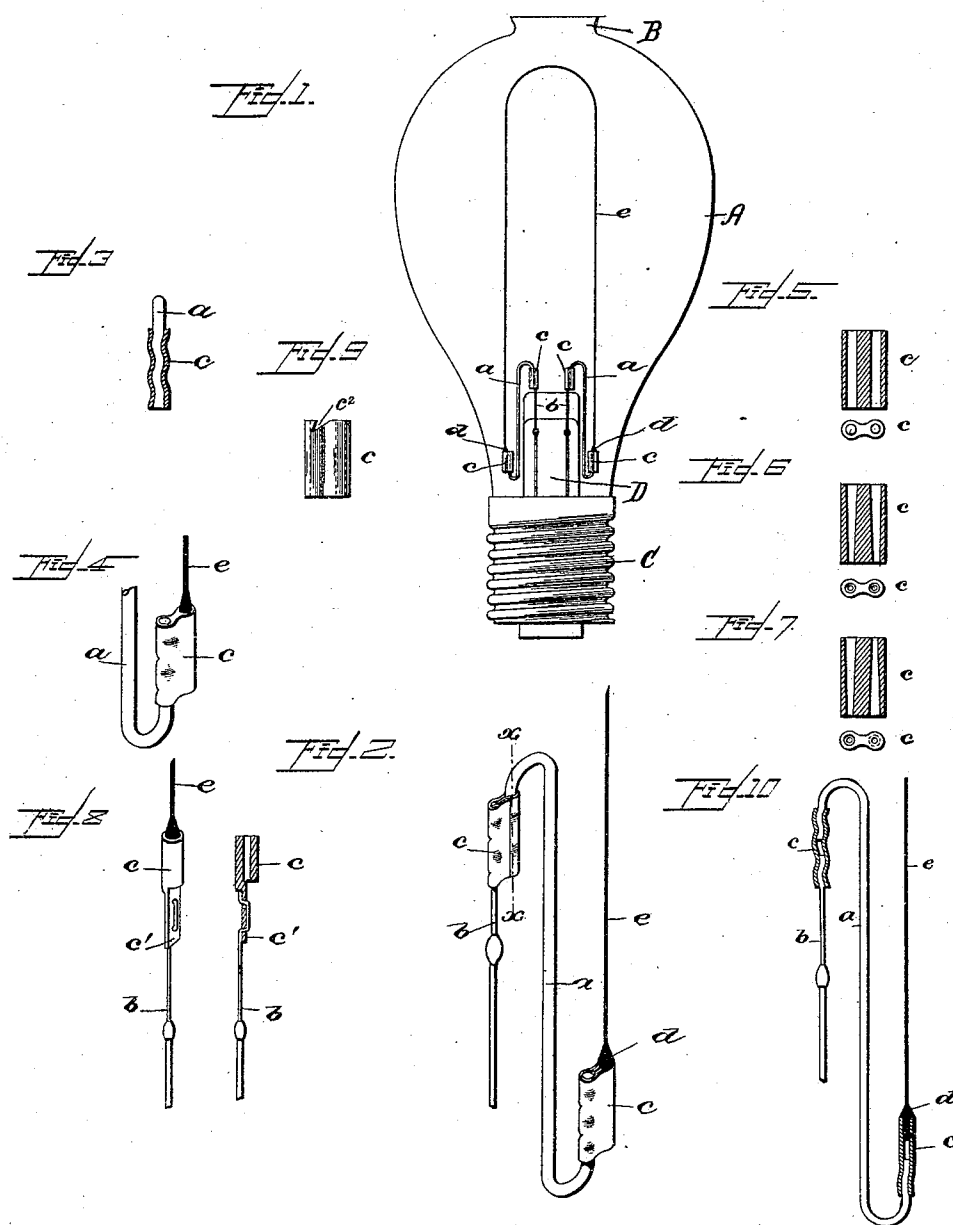


(No Model.)

A. C. CAREY.
INCANDESCENT ELECTRIC LAMP.

No. 473,208.

Patented Apr. 19, 1892.



Witnesses

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UNITED STATES PATENT OFFICE.

AUGUSTUS C. CAREY, OF LAKE PLEASANT, MASSACHUSETTS.

INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 473,208, dated April 19, 1892.

Application filed December 1, 1891. Serial No. 413,712. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS C. CAREY, a citizen of the United States, residing at Lake Pleasant, in the county of Franklin and State

of Massachusetts, have invented a certain new and useful Improvement in Renewing Carbons of Incandescent Electric Lamps, of which the following is a full, clear, and exact description.

In those incandescent electric lamps in which the glass tubes which hold the circuit-wires extend well into the bulb or globe the carbon is short, and in order to renew the carbon it is a matter of difficulty to determine the proper length of carbon to get the right resistance, candle-power, &c.

One object of my invention is to provide means for renewing the carbons of such lamps and obtain the proper resistance, candle-power, &c.

Another object of my invention is to provide means for coupling carbons to circuit or leading-in wires.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is an elevation of an Edison lamp having the bulb or globe opened and my carbon attachment applied. Fig. 2 is a perspective view of my carbon attachment detached. Fig. 3 is a section substantially on line *x x*, Fig. 2. Fig. 4 is a perspective view of a solid coupling. Figs. 5, 6, and 7 show in section and plan various forms of solid couplings. Fig. 8 shows in perspective and longitudinal section still another form of solid coupling. Fig. 9 shows in side elevation a notched coupling, and Fig. 10 shows in sectional side elevation a single tube-coupling.

A may represent a globe opened at B for the insertion of the couplings and carbon. C is the socket or butt, and D the tube holder or standard for the leading-in wires.

I find that a relatively long carbon may be successfully used in the class of lamps first above referred to and preserve the proper resistance, candle-power, &c., by coupling depending conductors *a* to the circuit-wires *b* and coupling the carbon to the lower ends of such conductors. Various forms of couplings may be used for this purpose. In Figs. 1, 2, and 3 the coupling *c* consists of a strip of conduct-

ing material folded upon itself to form two essentially parallel tubular openings. In Figs. 4 and 5 the coupling is shown as made of a piece of wire bored with straight parallel tubes; but tubes tapering in the same direction as in Fig. 6, or tubes tapering in opposite directions, as in Fig. 7, may be employed, and obviously only one tube may be tapering. The tapering tubes assist in guiding the wires or carbon ends into the coupling, and also afford a good anchorage for the cement *d*, used to secure the carbon *e* or wires, or both, in the coupling. As shown in Fig. 8, the coupling may have a single tube to receive the carbon, and there may be a flattened portion *c'*, bored transversely, through which the circuit-wire is bent. The tube to receive the filament may be notched at *c²* in Fig. 9 in order to afford a firm anchorage for the cement. The notch may be applied to any of the forms of couplings. As shown in Fig. 10, the coupling may be made as a single tube into opposite ends of which the circuit and conducting wires or the conducting-wire and filament may be secured.

In order to insure the connection of the couplings with the wires, I bend or crimp them about one another, as shown, using for this purpose as one available instrument pliers whose jaws are made with intermeshing projections, such as will give the result graphically illustrated in Fig. 3; but obviously bending the two in other ways into or through one another will accomplish the object of my invention.

By bending or crimping the couplings and wires together they are not easily separated, but more especially the joint or union is not injuriously affected by contraction and expansion, and it cannot be shaken by vibration whatever the position of the lamp may be; but this feature of the invention I reserve to my application, Serial No. 418,133, filed January 15, 1892.

As shown in Figs. 1 and 2, one of the tubes of each of the upper couplings receives the circuit-wires and the other tube receives the end of the conductors *b*. The lower ends of the conductors *b* are secured in one of the tubes of the lower couplings and the other tubes of such lower couplings are occupied by the ends of the carbon. By using the depend-

ing or hanging conductors along carbon may be adapted to a lamp-globe designed for a short carbon, and thereby such lamps may have their carbons renewed when exhausted or dead. The process of renewing consists in opening the globe, as shown in Fig. 1, taking out the old carbon, cleansing the globe, substituting the new carbon, exhausting the globe of air, and sealing its end, all which steps I follow, as occasion requires, in applying new carbons in accordance with this invention. Obviously, however, my depending conductors and my couplings may be used in making new lamps in the first instance. In order to effect a second renewal, the couplings may be straightened by pressure so as to permit removal.

By the term "depending conductors" I mean conductors that project from the inner ends of the circuit or leading-in wires toward the butt of the lamp, essentially as shown in Fig. 1. These conductors may be of solid or tubular wire, and in the latter case the conductors themselves may be also the couplings, and this form of the invention I mean to include in my claims herein.

What I claim is—

1. In an incandescent electric lamp, a globe, leading-in wires, and the inwardly-projecting holder for the leading-in wires, combined with couplings of flexible material connected with said leading-in wires, conductors also connected with said couplings at one end and depending thence and couplings applied at the other ends of said depending conductors, and the carbon having its ends secured in said last-named couplings, substantially as described.

2. In an incandescent electric lamp having a globe and the holder for the circuit-wires projecting well into the globe, two tube-couplings of flexible material connected by one of their tubes with each of the circuit-wires, conductors secured in the other tubes of said couplings and extending thence toward the butt of the lamp, two tube-couplings applied by one of their tubes to the said conductors, and a carbon secured in the other tubes of said last-named couplings, substantially as described.

3. A coupling for uniting the carbon and the circuit-wires of an incandescent electric lamp, made of a solid piece of metal bored longitudinally and sufficiently flexible to be united with the wires by bending, combined with the globe, circuit-wires, and filament, substantially as described.

4. A coupling for uniting the carbon and the circuit-wires of an incandescent electric lamp, made with a suitable number of tapering holes or tubes, combined with the globe, circuit-wires, and filament, substantially as described.

5. A tubular coupling for uniting the carbon and the circuit-wires of an incandescent electric lamp, constructed with a notch to afford anchorage for the cement used to unite the carbon and the coupling, substantially as described.

In testimony whereof I have hereunto set my hand this 23d day of November, A. D. 1891.

AUGUSTUS C. CAREY.

Witnesses:

W. M. WILLARD,
A. G. BENNETT, Jr.