

(No Model.)

T. A. EDISON.
INCANDESCING ELECTRIC LAMP.

No. 341,839.

Patented May 11, 1886.

Fig. 1.

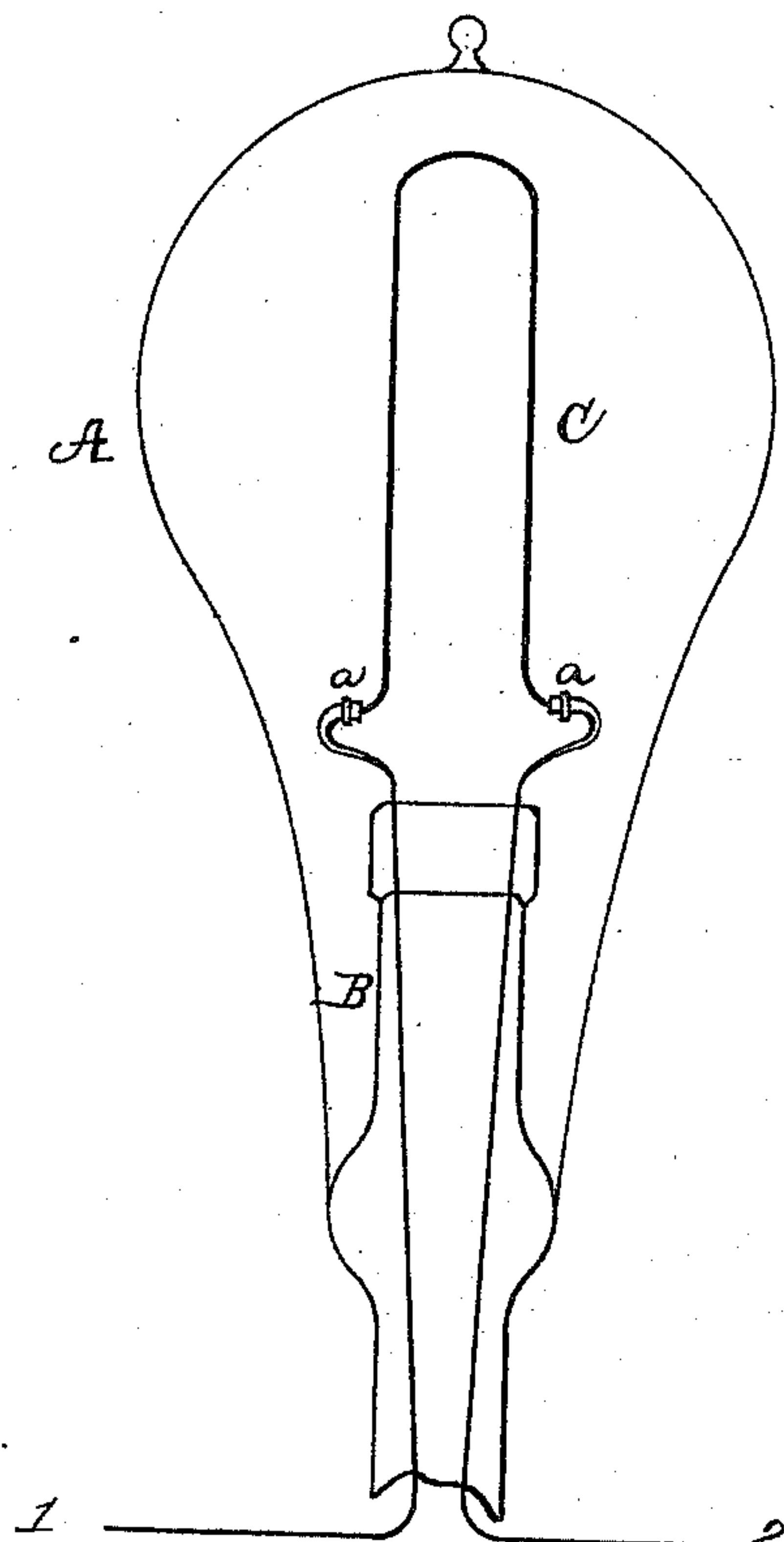
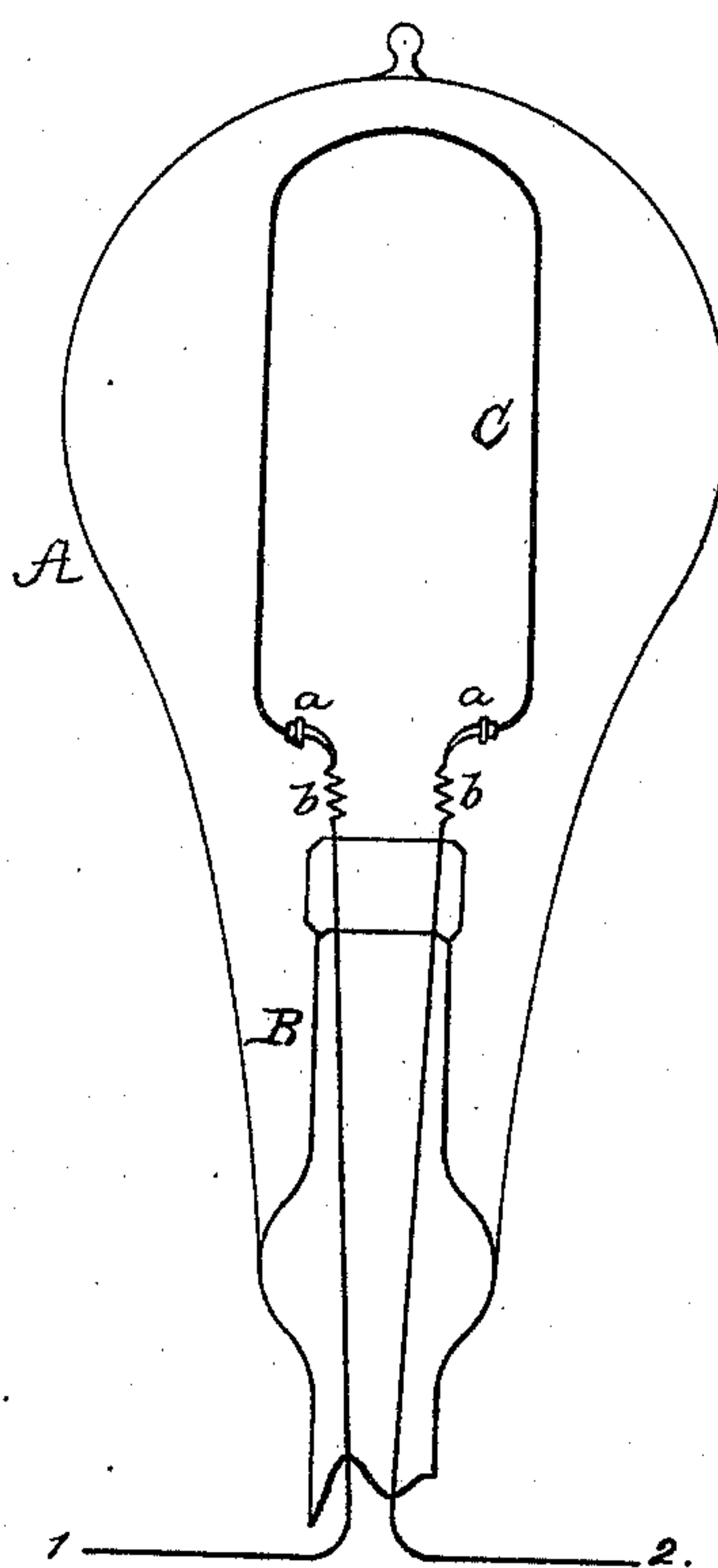


Fig. 2.



ATTEST
W. W. Rowlands
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UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY.

INCANDESCING ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 341,839, dated May 11, 1886.

Application filed May 14, 1883. Serial No. 94,892. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in Incandescing Electric Lamps, (Case No. 563,) of which the following is a specification.

The object of this invention is to increase the durability in use of incandescing electric lamps by allowing the flexible carbon incandescing conductor to expand freely, and by providing a clamp for joining the carbon to the leading-in wires which shall not readily be injuriously affected by the heat of the electrical carrying of the filament. Such electrical carrying or transferring of carbon takes place from the negative side of the carbon to the positive clamp, and such clamp, therefore, becomes intensely heated.

I accomplish the first-named object by bending the ends of the filament in a horizontal direction—that is, perpendicularly to the sides of the filament, either inwardly or outwardly—and employing expansible leading-in wires attached thereto, which permit an expansion and contraction of the straight sides of the filament; and the second-named object is attained by making the positive clamp, or both clamps, of such form that a mass of metal greater than is necessary for clamping is at the point nearest the heated portion of the conductor, so that the greatest heat is applied to such a mass of metal as is not likely to be fused thereby. The clamp which I prefer to use is made by flattening the larger end of a tapered wire, which may be the platinum leading-in wire or a short copper or other wire attached thereto, and bending it into a cylinder around an end of the filament. A washer or wedge is used to clamp the cylinder tightly upon the carbon. While it is necessary only that the positive clamp be formed in this way, I prefer to make both clamps alike, because in use changes may occur in the direction in which the current is passed through the lamp. The expansibility of the leading-in wires is secured by making them of spiral form. It is evident that this form of clamp can be used in connection with the filament having bent ends and spiral wires, or without them, and also that the filament with bent ends could be employed without the

spiral wires, or the spiral wires without the bent filament.

My invention is illustrated in the annexed drawings, in which Figure 1 is a view of a lamp showing the filament bent outwardly and without the spiral leading-in wires, and Fig. 2 a view of a lamp with the ends of the filament bent inwardly and provided with spiral leading-in wires.

A is the inclosing-globe, and B the inner stem or wire support, of an incandescing electric lamp. C is the flexible carbon filament.

In Fig. 1 the filament C is bent outwardly near its ends, and in Fig. 2 the ends are bent inwardly. The leading-in wires 1 2 are flattened and taper outwardly near their ends, and are bent into a cylindrical form around the filament, as shown in my application No. 91,955. A ring or washer, *a*, is placed around the cylinder, and clamps it closely against the filament.

In Fig. 2 the leading-in wires within the globe are formed into spirals *b b*. The bent form of the filament and the spirals of the leading-in wires readily permit the longitudinal expansion and contraction of the carbon under the various temperatures to which it is subjected in use. The bent wires of Fig. 1, being flattened as described, are also flexible, and permit the filament to expand without injury.

A mass of metal is employed in the clamps larger than that necessary merely for clamping, and so large as not to be readily affected by the heat of the incandescent particles which are continually transferred to it.

What I claim is—

1. The flexible carbon filament of an incandescing electric lamp, formed as an arch or loop with straight or approximately straight sides, and having a single bend near each end in a direction perpendicular to its sides, substantially as set forth.

2. In an incandescing electric lamp, the combination, with the filament bent horizontally near its ends, of the continuous expansible leading-in wires attached thereto, substantially as and for the purpose set forth.

3. In an incandescing electric lamp, the gradually-enlarged leading-in wires, substantially as set forth.

4. In an incandescing electric lamp, the lead-

ing-in wires having their greatest mass of metal at their ends, such ends being flattened and formed into clamps for the incandescing conductor, substantially as set forth.

- 5 5. In an incandescing electric lamp, the combination, with the filament having horizontally-bent ends, of the spiral gradually-enlarged leading-in wires formed into clamps

for holding said filament, substantially as set forth. 10

This specification signed and witnessed this 8th day of May, 1883.

THOS. A. EDISON.

Witnesses:

WM. H. MEADOWCROFT,
H. W. SEELY.