(No Model.)

G. D. ALLEN.

ELECTRIC ARC LAMP.

No. 273,336. Patented Mar. 6, 1883.

Fig. 2.

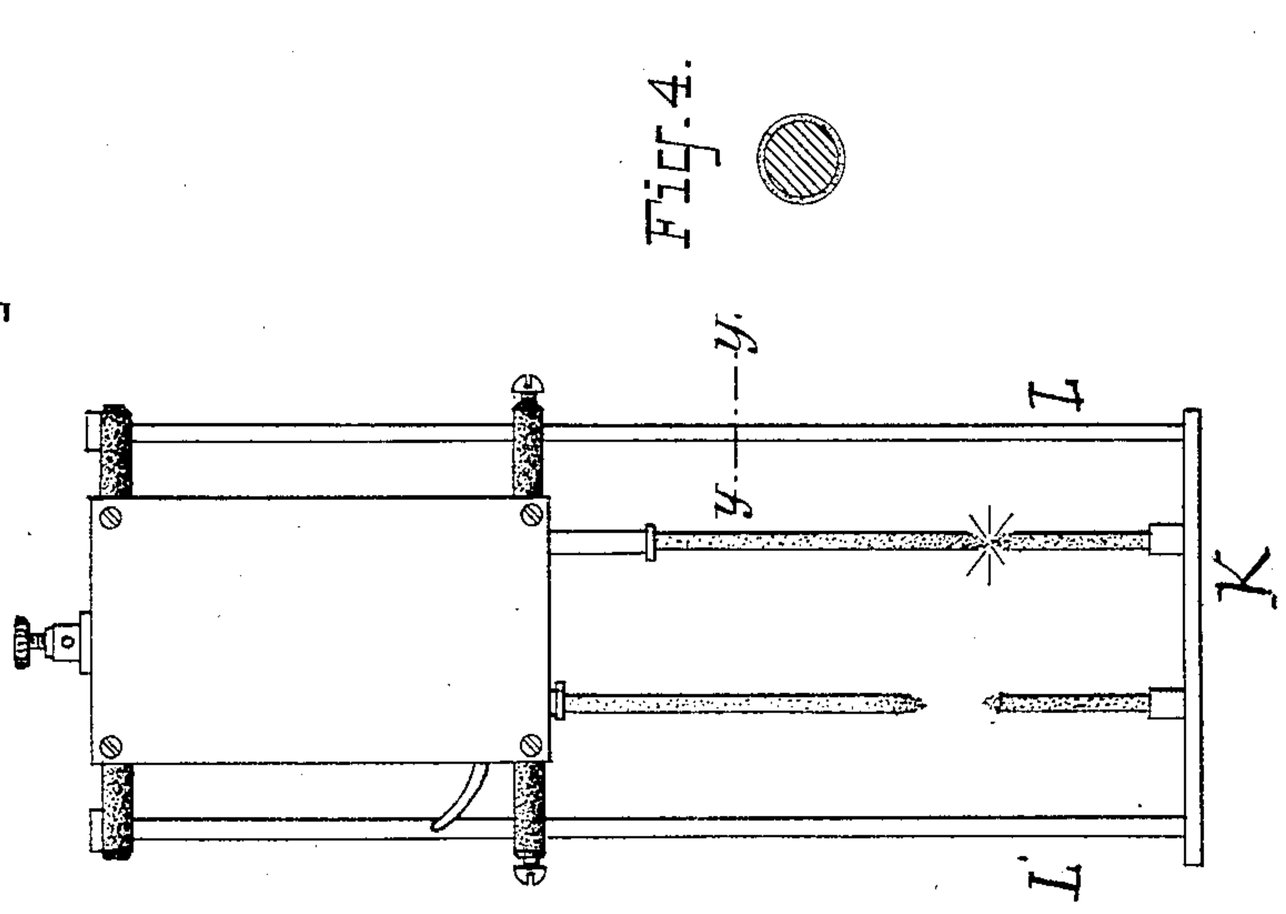


Fig. 4.

Fig. 1.

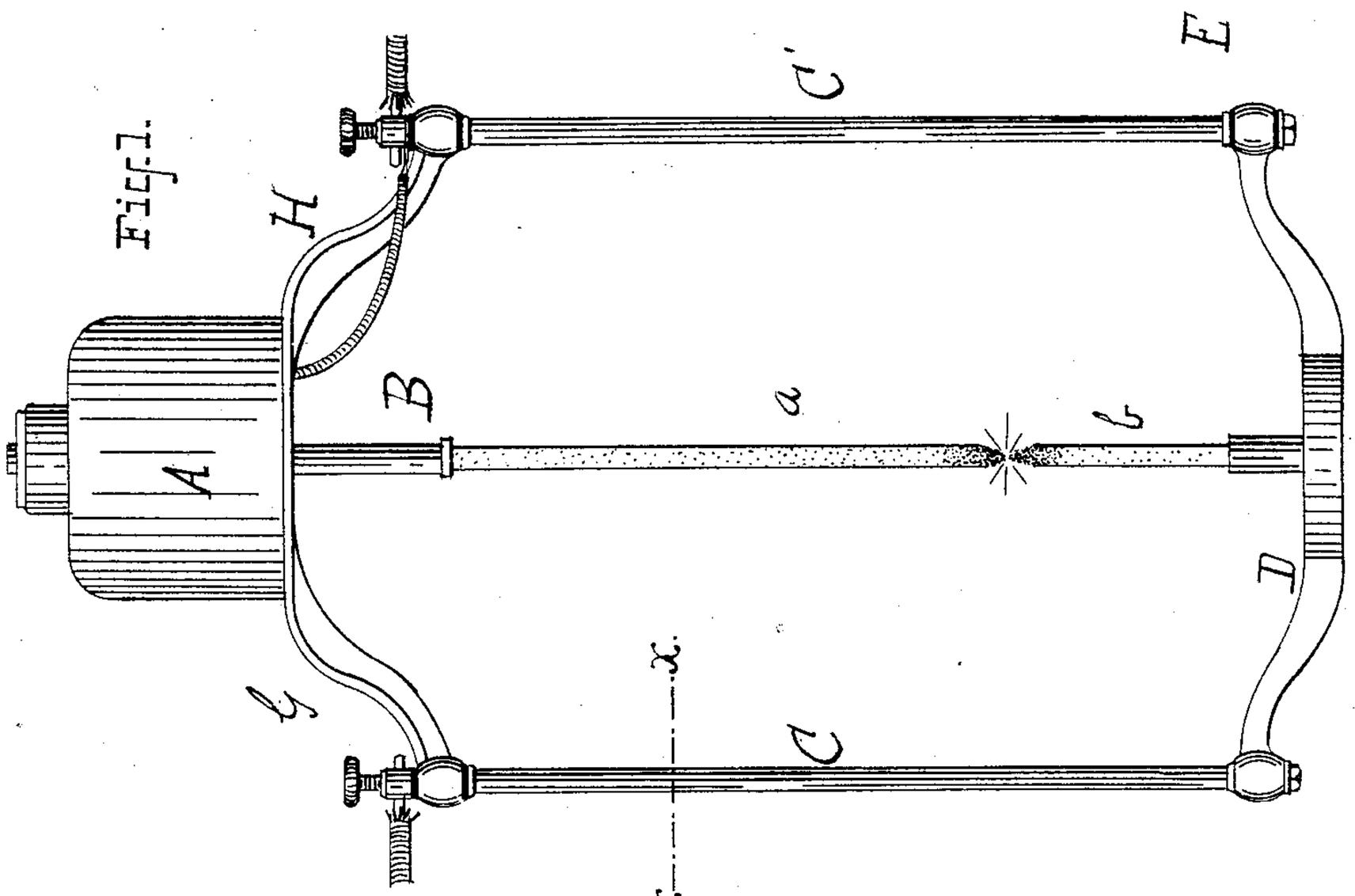
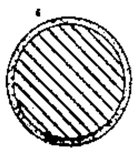


Fig. 3.



ATTEST:

Julian A. Hurdle.

Thomas Toomey.

INVENTOR:

Geo. D. Allen

by H. C. Townsend

Atty

UNITED STATES PATENT OFFICE.

GEORGE D. ALLEN, OF BROOKLYN, NEW YORK.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 273,336, dated March 6, 1883.

Application filed December 5, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEO. D. ALLEN, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electric Lamps, of which the following is a specification.

My invention relates to the construction of electric-arc lamps; and its object is to avoid the dangers and difficulties attending the use of lamps whose conducting portions are ordinarily exposed, and to overcome the difficulties by means that shall be more effective and cheaper to apply than those heretofore employed, and that shall have the additional advantage of adding to the strength of the parts and of improving their appearance.

In constructing electric lamps it is usual to make one or both of the hanging side rods which support the lower carbon a conducting-path for the current flowing from said carbon. It has also been usual to convey the current to the upper carbon through the supporting-rod upon which the regulating mechanism acts. This construction is attended with danger to surrounding combustible objects when the lamp is in use, from the formation of accidental cross-connection between the parts, due to accidental contact therewith by exterior conducting objects. This difficulty and danger might be avoided by conveying the current to the upper and lower carbon by insulated flexible lead cords connected directly to said holders. This plan would, however, require at the same time the employment of some special construction or device which shall insulate the holders from their immediate supporting parts, in order to make the device effective for the purposes for which it is intended—viz., the prevention of accidental cross-connection by a conductor coming simultaneously into contact with the supporting-rods for the lower carbon or the cross-bar and with the upper carbon or its holder. It has also been proposed to make the pillar or support for the carbon hollow, and to string an ordinarily-insulated conducting-wire through the same. The latter arrangement requires that some special means should be used for making connection with the lower-carbon holder, which connection is liable to become deranged, while, moreover, the construction is clumsy, and the insulating material on the conducting-wire may deteriorate so as to expose the wire and form a hidden connection. The flexible conductors would also be liable to derangement and breakage. I aim to avoid these difficulties, while at the same time securing the desired ends, by a novel means, as simple and cheap as those referred to, and possessing other and additional advantages, to be hereinafter mentioned.

My invention consists in a conducting pillar, rod, or supporting side bar for an electric lamp in direct and ordinary metallic connection with the carbon or carbon-holder, coated with porcelain or such like material formed by fusion into a vitreous or semi-vitreous mass, and adhering to or united with the conducting pillar, side bar, or its equivalent, as hereinafter set forth. By such construction no special mechanical constructions or devices are required for insulating the holders, while at the same time the lamp has a pleasing appearance. When the porcelain is applied to the said rods or a pillar supporting one of the carbons the rigidity of the lamp-frame is increased, and the liability of the carbons to get out of alignment by accidental springing of the frame is decidedly lessened.

In the accompanying drawings I have illustrated two ordinary forms of electric lamp, Figure 1 showing a single-carbon lamp; Fig. 2, a double-carbon lamp; Fig. 3, a cross-section of a supporting-rod, pillar, or side frame, on the line *x x* of Fig. 1; and Fig. 4, a cross-section on the line *y y* of Fig. 2.

In Fig. 1, A represents the casing for the electro-magnets and other operative portions of the lamp.

B represents the metallic rod which is the carrier or support for the upper carbon, *a*, and conveys the current thereto, and which is controlled in its movement by the regulating devices in the ordinary way.

C C′ are metallic supporting-rods for the metallic cross-bar D, upon which is supported the holder for the lower carbon, *b*, all of these parts being in ordinary metallic connection with one another, as is the case if they are secured together by ordinary mechanical means without the employment of special insulating devices.

In the lamp here shown the current is sup-

posed to be conveyed from the lower carbon through the bar D and the rod C to the negative binding-post. The rod C is insulated from the cross-bar D at the point E. With lamps thus constructed, and with the current conveyed to and from the carbons in the manner described, a piece of conducting material accidentally coming into contact with either of the parts C D and the upper carbon or the rod B′ will short-circuit the arc and form a cross-connection, with consequent derangement of the lamp and liability of damage to surrounding combustible objects. So, also, if the rod C′ be in electrical connection with the positive binding-post, a cross-connection between it and the upper carbon or the rod B might result in derangement of the regulating portion of the lamp.

To prevent the above inconveniences and dangers, I coat the exposed metallic portions with porcelain, applied thereto in the manner well-known to those skilled in the art by fusing or forming the porcelain envelope directly upon the metal. The coating thus formed is an excellent non-conductor, and thoroughly insulates the surfaces, is not easily destroyed, does not soften or disintegrate at ordinary temperatures, as is the case with the insulating material upon the flexible conductors ordinarily employed in this connection, and may be so applied as to add permanently to the appearance of the lamp. It is, moreover, cheaply and readily applied. It also makes it possible to use iron as the material for the principal portions of the lamp, and yet to give the lamp an attracting appearance. The principal objects to be attained are, however, those before mentioned.

I ordinarily prefer to make the parts to be coated of iron, as materials requiring a high degree of heat to fuse them may be applied to the surface. When the supporting side rods are coated with the porcelain they are not readily bent, and the whole supporting-frame for the lower carbon is of great rigidity. If desired, the rod B′ may also be coated, although this is not necessary when the parts C D are protected.

In lamps as ordinarily constructed the casing A and the arms G H are not in electrical connection with the conducting portions of the lamp. If they are connected, they also by preference should be coated.

Fig. 3 shows a cross-section of a conducting pillar, rod, or support for a carbon-rod, C, the porcelain coating being represented at *h*. For the purpose of compensating for the extra weight given by the porcelain, I propose to make the supporting-rods of tubing, and to also make other parts hollow where it is practicable.

My invention, so far as protecting the supporting-rods and cross-bar is concerned, may be readily applied to lamps already constructed and in use, these parts being ordinarily readily detached.

In Fig. 2 I have represented a double-carbon lamp. In this case, also, the connection from the negative or lower carbons to the negative binding-post is formed through the cross-bar K and either or both supporting-rods L L. The electrical connection to the upper carbon is formed through the metallic supporting-rods for said carbons.

The portions of the lamp, as before described in connection with Fig. 1, through which there is a liability to the formation of a cross-connection are coated with porcelain.

I do not desire to limit myself to any particular kind of vitreous or semi-vitreous material for forming the non-conducting coating, fused or vitrified upon the metal, as many kinds of porcelain may be employed, and other materials may be used which, like porcelain, are formed by fusing vitrifiable materials, and which are fusible only at exceedingly-high temperature, are good non-conductors, and are hard and not easily fractured when applied as a coating to the metal.

What I claim as my invention is—

1. In an electric-arc lamp, a conducting pillar, rod, or support for a carbon carrier or holder in direct mechanical and electrical connection with said holder and coated with porcelain or such like material formed by fusion into a vitreous or semi-vitreous mass adhering to or united with the surface of the pillar, rod, or support, as and for the purpose described.

2. A frame for an electric-arc lamp, the side bar or rods of which are in direct electrical connection with the carbon and are coated with porcelain applied thereto in the manner and for the purposes set forth.

GEORGE D. ALLEN.

Witnesses:
THOMAS TOOMEY,
H. C. TOWNSEND.