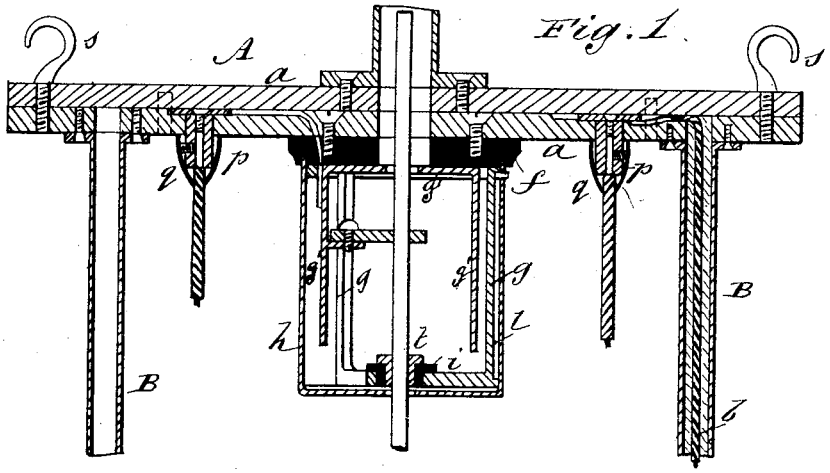
(No Model.)

C. A. COOLEY.

ELECTRIC ARC LAMP.

No. 267,155. Patented Nov. 7, 1882.

Fig. 1.



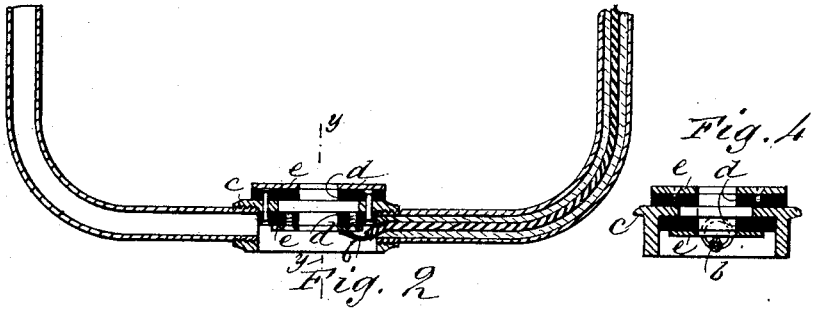


Fig. 2.

Fig. 4.

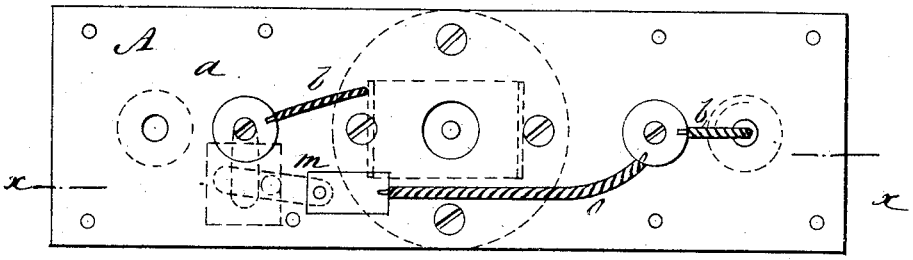
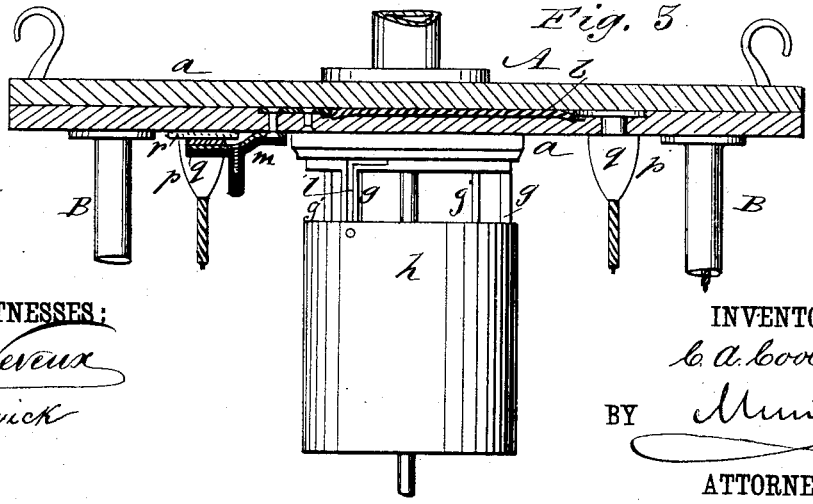


Fig. 3.



WITNESSES:

C. Neveux

L. Sedgwick

INVENTOR:

C. A. Cooley

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

CHARLES A. COOLEY, OF NEW BRITAIN, CONNECTICUT.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 267,155, dated November 7, 1882.

Application filed July 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. COOLEY, of New Britain, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Electric Lamps, of which the following is a full, clear, and exact description.

My invention relates to electric lamps, and is designed to provide an improvement in that class of electric-arc lamps in which some of the exposed parts are insulated from the current. In my lamp accidental contact of a conducting substance with any portion of the lamp or frame will result in no diversion of the current operating the lamp; also, to provide a lamp-case in which may be placed any mechanism for feeding the carbons which seems best suited to accomplish the end desired.

My invention consists in the novel features of construction hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation of my improved lamp. Fig. 2 is a plan view with the upper plate of the frame removed, and Fig. 3 is a section on line *x x* of Fig. 2. Fig. 4 is a vertical section on line *y y*, Fig. 1.

A is the frame supporting the lamp-case. I use for this frame-case two plate-pieces, *a a*, of wood, held firmly together by screws, so as to practically form a single piece; but I do not limit myself to the use of wood, as two pieces of metal will accomplish the same end. Between these pieces are placed the wires *b*, for conveying the current, the pieces being grooved to receive the same. Attached to this frame are the tubular side rods, B B, which also carry the current-wires. These rods are curved in the present case, and are firmly attached to the circular piece which forms the lower-carbon support. The lower-carbon support is composed of the circular inverted cup *c*, with hole in center, and two plates, *d*, of insulating material, placed one on each side of the cup. These insulating-plates are faced on their outer surfaces with metal to avoid wearing the insulating plates in adjusting the lower-carbon pillar. This pillar may be of any design, but should have a broad bearing-surface to rest upon the upper plate, and also an extension for clamping to the lower plate, *e*. The wire carrying the current from the arc is attached to this lower plate, *e*, and then passes up through the side rod to the binding-post.

The lamp-casing is also insulated from the current, and is made as follows: A circular piece, *f*, of vulcanite or other non-conductor, is attached to the horizontal frame A—in this lamp to the lower side of the frame; but it will be seen that either side may be used with advantage. To this insulating-plate is attached a skeleton frame, *g*, extending downward, and of such diameter as to allow the cylinder *h*, forming the outer covering, to slide freely upon it. This skeleton frame is made with several rods or pieces, which are joined to a small platform or support, *i*, at their lower ends, forming with the platform, a support for holding the lower bushing, *t*, through which the carbon rod slides. This bushing is insulated from the supporting-frame. The upright rods or pieces of the skeleton frame *g* are provided with grooves in their outer or bearing surfaces, as shown at *l*, which engage screws or pins attached to the cylindrical covering for limiting its motion. These grooves are extended horizontally at the upper part to allow the cylinder to be moved sidewise for the purpose of locking it in place after the feeding mechanism is adjusted.

To exclude dust, I provide a circular groove in the insulating-plate of the dimensions of the outer casing, allowing said casing to be pushed into it, thus forming a tight joint.

The feeding mechanism, that may be of any ordinary character, is attached to an inner iron frame, *g'*, suspended from the insulating-plate and carrying the upper support for the carbon-rod. The current passes through this frame and down the rod to the arc.

The switch (shown at *m*) for short-circuiting the lamp is of metal, covered with insulating material, except at its contact part, and moves in a bushing in the frame, and is connected by this bushing with the short circuit-wire *o*, passing between the pieces of the frame.

The binding-posts *p p* of the circuit-wires are made as plain as possible, the line-wires entering at their ends, and the binding-screws placed in the sides, with no head projecting beyond the surface of the post. Before the wires are

inserted rubber sleeves *q* are slipped over their ends, and then the wires are put into the posts and held by the screws. The rubber sleeves are then forced over the binding-posts, thus insulating them from contact with stray wires, &c. Their covering will protect the wires beyond the binding-posts. The post receiving the + wire has a projection upon its side which forms the contact-plate for the switch-lever to rest against.

To prevent the spark which forms whenever the contact with switch is broken from firing the frame, I place a plate, *r*, of glass or other non-conductor, under the contact-plate and make it extend beyond it some distance.

The hooks *s* serve to suspend the lamp, and they are attached to the upper surface of the horizontal frame A, at the two ends, rather beyond the upright side rods.

The current enters at the left-hand binding-post, passes to wire connected with feed mechanism and the inner iron frame, down the rod and carbons to lower pillar, through clamp to the under metal plate attached to the under insulating-plate, to which is attached the wire conveying the current upward through the right-hand rod to the negative binding-post and thence to line. The short circuit is from switch to right-hand binding-post, through the wire passing between the horizontal frame. The shunt-wire is from inner iron frame to right-hand binding post.

The wires I use are heavily-insulated office-wire; and I further insulate in the tubular side rods by pouring melted paraffine or rosin around the wire after it is inserted.

The advantages of this construction are simplicity, ease of adjustment—by lowering the outer casing, thus exposing the feed mechanism—and perfect insulation.

I do not limit myself to this particular construction of lamp, as the appearance may be varied without departing from the claims presented.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electric lamp, the grooved insulating-plate *f*, attached to the frame and carrying the lamp-feeding mechanism, the skeleton frame *g*, and the outer cylindrical covering, *h*, combined substantially as shown.

2. In an electric lamp, an inner skeleton frame, *g*, fitting the outer casing, and provided with upright and horizontal slats for receiving the guiding screws or pins, substantially as described.

3. In an electric lamp of the arc type, the lower-carbon support composed of the cup-shaped inverted device *c*, adapted for attachment to the tubular rods forming part of the lamp-frame, the insulating-plates *d d*, applied on the upper and under sides of said device, and metal facing-plates *e e*, all as shown and described.

4. The combination, with the inner skeleton frame, *g*, of the inclosing cylinder *h*, which is adapted to slide vertically thereon, as shown and described.

5. In an electric lamp, the binding-post provided with insulating-covering, and having a contact-plate for the switch, attached substantially as described.

6. In an electric lamp, the safety-plate *r*, attached under the contact-plate and switch, for the purpose described.

CHARLES A. COOLEY.

Witnesses:

DANIEL J. SAVIN,

FRANK E. SCOVILL.