(No Model.)

J. F. MEHREN.

MEANS FOR PROTECTING THE CARBON HOLDERS OF ELECTRIC ARC LAMPS.

No. 502,465. Patented Aug. 1, 1893.

Fig. 1.

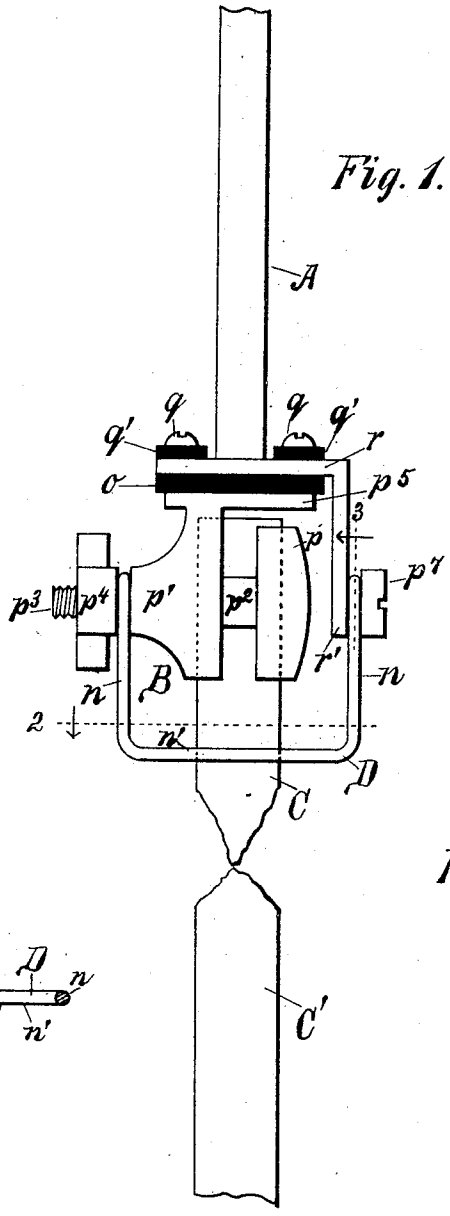


Fig. 2.

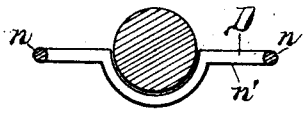
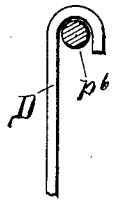


Fig. 3.



Witnesses:
H. J. Frost
M. E. Wines.

Inventor:
Jacob F. Mehren,
By Dyrenforth & Dyrenforth,
Attorneys.

UNITED STATES PATENT OFFICE.

JACOB F. MEHREN, OF CHICAGO, ILLINOIS.

MEANS FOR PROTECTING THE CARBON-HOLDERS OF ELECTRIC-ARC LAMPS.

SPECIFICATION forming part of Letters Patent No. 502,465, dated August 1, 1893.

Application filed October 6, 1892. Serial No. 448,014. (No model.)

To all whom it may concern:

Be it known that I, JACOB F. MEHREN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Means for Protecting the Carbon-Holders of Electric-Arc Lamps, of which the following is a specification.

As electric arc-lamps are commonly constructed, they contain mechanical provision for so adjusting the upper and lower (or opposite) carbon-pencils, which are provided in lengths proportioned to their relative consumption, that they shall be automatically cut out before any destructive action by burning the holders results from contact of carbons with the holders of completely consumed carbons. Where all the conditions are favorable, the provision referred to may be effective; but experience has demonstrated that the conditions necessary to the desired end cannot always be maintained, for frequently the holders in a lamp (and occasionally, even, their feeding-rod portions) are destroyed owing to undue consumption of a carbon (or undue relative consumption of the carbons—the term "consumption" including the breaking off of a section of a carbon) whereby the arc is formed between the remaining carbon and a holder-detail of the consumed carbon, which holder is thus quickly burned; and considerable expense is incurred in renewing the injured part or parts.

My invention relates to an improvement in the class of means employed to protect the carbon-supporting mechanism of electric arc-lamps against burning owing to undue consumption of carbons, by automatically interposing a circuit-breaker into the arc of a lamp before it can attack the holder-mechanism.

My improvement is illustrated in the accompanying drawings, in which—

Figure 1 is a broken view representing the two vertical carbons of an electric arc-lamp with the upper one in a clamp-support of well-known construction and having a protector applied to it in accordance with my invention. Fig. 2 is a section taken at the line 2 on Fig. 1 and viewed in the direction of the arrow; and Fig. 3 is a broken sectional view illustrating the manner of attaching the protector to the holder, the section being taken at the line 3 on Fig. 1 and viewed as indicated by an arrow, and the screw-head being removed.

As my improvement is applicable to electric arc-lamps generally, whatever construction their mechanism may involve, and the details of which are well known and are not of my invention, I show, in the drawings, only one of various forms of carbon-holders of an arc-lamp to illustrate the application and operation of my protection.

A represents part of the upper carbon-feeding rod, usually of metal, to which is secured the metal plate r.

B is the metal clamp-portion of a carbon-holding mechanism and is formed with an adjustable jaw p having extensions p^2, which embrace the carbon C transversely and terminate in a threaded stem p^3 passing through the companion-jaw p' of the clamp and carrying on its protruding threaded portion a thumb-nut p^4. The jaw p' is secured at its head p^5 to the plate r by screws q having non-conducting material q' under their heads; and a plate o of non-conducting material is interposed between the parts r and p^5. Thus the plate r and clamp B are electrically insulated, and thereby, also, the carbon-holder, or clamp, is insulated from the frame of the lamp, except for the normal electric connection between the two by the protector hereinafter described.

D is a protector in the form of a readily fusible wire bent at one end around the stem p^3 between the nut p^4 and jaw p' and at its opposite end about a screw p^6 projecting outward from the lower end of a vertically depending extension r' of the plate r and having a head p^7. Between its ends the wire is bent into the form of a rectangle with its vertical arms n, n extending some distance below the clamp B to be in advance thereof, and having its part n', which extends across the plane of the carbon-pencil C, bent into concavo-convex shape (see Fig. 2) to conform to the transverse contour of the pencil, with which, however, it is not necessarily in contact.

The clamp and protector might, as well, be applied to the lower carbon C', (if its holder be movable) but the application would be the same as to the upper one, and need not be

described as it will be readily understood from the explanation of the operation of the mechanism illustrated, as follows: The protector D establishes, obviously, electrical connection between the plate r and clamp B to the carbon-pencil C and thereby between the lamp-frame and carbon holder. Assuming the above-described arrangement of parts to be in an arc-lamp, the current, as ordinarily provided, will enter at one of the lamp-terminals on the lamp frame, pass to the feeding-rod A and plate r and its extension r', and thence by the wire or protector D to the clamp B and upper carbon-pencil C, forming an arc between the latter and the lower carbon-pencil C', whence it passes to the other terminal of the lamp. Should the carbon-pencil C continue to feed downward till the arc reaches that point in the carbon which is adjacent to the part n' of the protecting wire, the arc will establish itself between the wire and the lower carbon-pencil C' and, almost instantly, fuse and burn the wire in two, thereby causing immediately a break in the current and consequent extinguishment of the arc, thus checking any further burning of the carbon-pencils and, therefore, protecting the holder against any possibility of destruction by burning which would otherwise ensue should the consumption of one carbon be such as to cause the other to be fed so closely to the holder of the first as to form the arc with the latter.

The form of protector thus shown and described is in the nature of a guard carried by and movable with the carbon holder and which becomes automatically interposed in the arc before the latter can reach the holder-mechanism, and the heat of the arc destroys it, thereby breaking the circuit and saving the holder.

When the lamp is trimmed, a new protecting wire may be provided and readily adjusted, at a trifling cost, to supplant the one destroyed.

My invention of means for automatically interposing in the arc of an electric arc-lamp a circuit-breaker under the conditions and for the purpose stated may be embodied and applied in various forms; hence I do not wish to be understood as limiting it to the particular mechanism illustrated though the details illustrated and described are the best for the purpose known to me, and therefore preferred.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an electric arc-lamp, the combination of a movable carbon-holder and an automatic circuit-breaker forming a portion of the normally closed arc-producing circuit in the lamp and interposed in the plane of the arc and attached to and movable with the carbon-holder, substantially as and for the purpose set forth.

2. In an electric arc-lamp, the combination of a movable carbon-holder and an automatic circuit-breaker comprising a fusible conductor forming a portion of the normally closed arc-producing circuit in the lamp and interposed in the plane of the arc and attached to and movable with the said carbon-holder, substantially as and for the purpose set forth.

3. In an electric arc-lamp, the combination of a carbon-holder supported by and insulated from the lamp-frame, and a circuit-breaker of conducting material attached to and electrically connecting the said insulated parts and interposed between its ends in the plane of the arc, substantially as and for the purpose set forth.

4. In an electric arc-lamp, the combination of a movable carbon-holder supported by and insulated from the lamp-frame, and an automatic circuit-breaker comprising a fusible strip of conducting material attached at its opposite ends to and electrically connecting the insulated parts and movable with the said carbon-holder and bent to extend between its ends across the plane of the carbon, substantially as and for the purpose set forth.

5. In combination, the insulated carbon-supporting clamp B of an electric arc-lamp, comprising the connected adjustable jaws p and p' and a protector D, comprising a conducting wire electrically connecting the clamp in the circuit and normally extending across the plane of the carbon between the clamp and carbon-point, substantially as and for the purpose set forth.

6. In combination, the carbon-supporting clamp B of an electric arc-lamp, comprising the movable jaw p having a threaded stem p^3 carrying an adjusting nut p^4, and the stationary jaw p' on the said stem and provided with a head p^5, the feeding-rod A terminating in a plate r fastened to and insulated from the said head and provided with an extension r' having a lug p^6 carrying an adjusting-nut p^7, and a protector D comprising a conducting wire fastened at opposite ends to the lug p^6 and stem p^3, extending thence downward and across the plane of the carbon-pencil and bent to conform to the contour of said pencil, substantially as and for the purpose set forth.

JACOB F. MEHREN.

In presence of—
J. W. DYRENFORTH,
M. J. FROST.