

No. 613,293.

Patented Nov. 1, 1898.

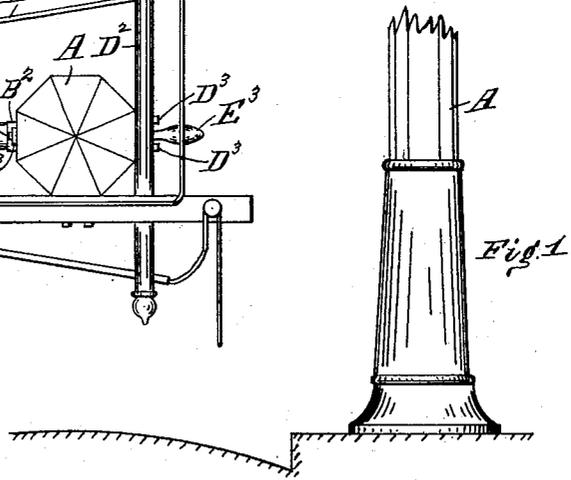
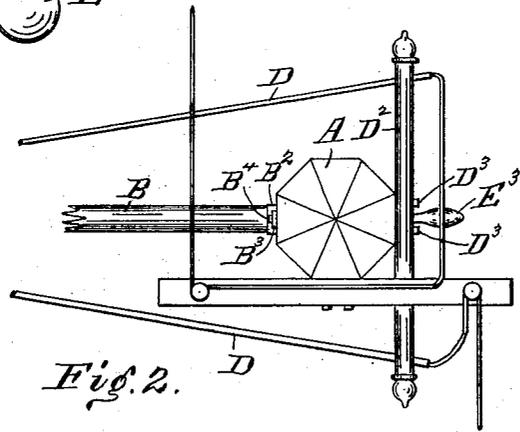
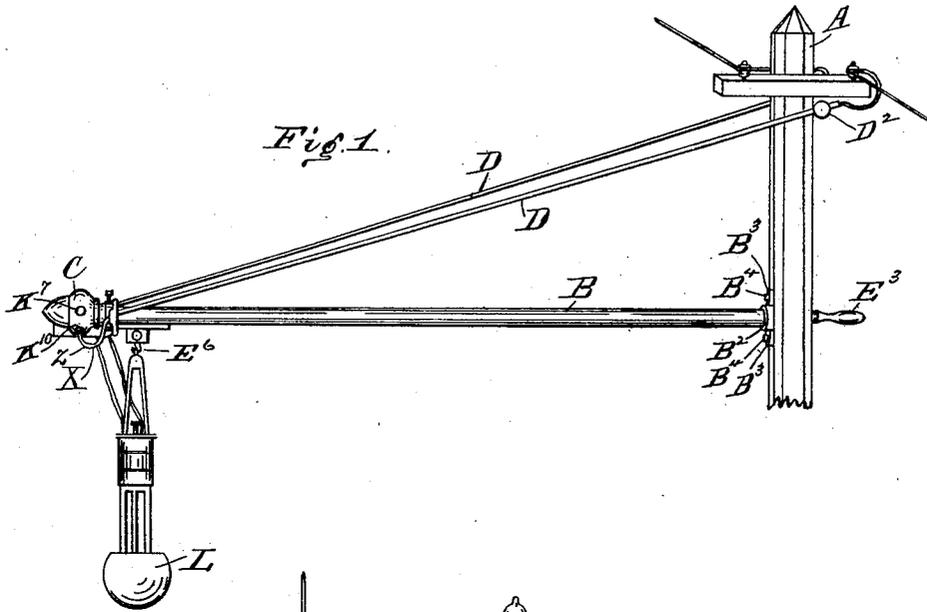
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MECHANISM FOR SUPPORTING ELECTRIC ARC LAMPS.

(Application filed Nov. 18, 1895.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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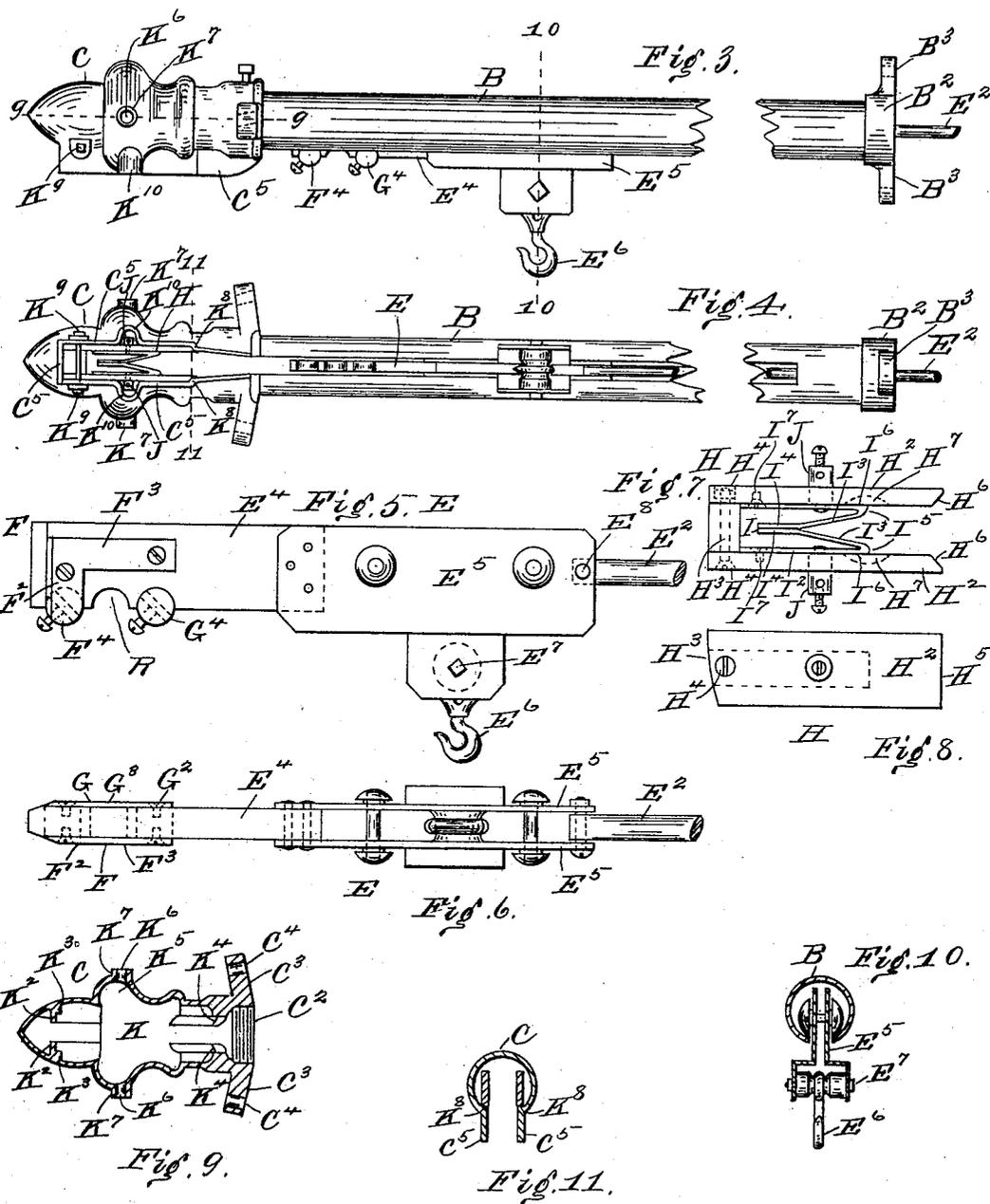
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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MECHANISM FOR SUPPORTING ELECTRIC-ARC LAMPS.

SPECIFICATION forming part of Letters Patent No. 613,293, dated November 1, 1898.

Application filed November 18, 1895. Serial No. 569,258. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. McCALLUM, a citizen of the United States, and a resident of the village of Avondale, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Mechanism for Supporting Electric Lamps, of which the following is a specification.

The several features of my invention and the various advantages resulting from their use, conjointly or otherwise, will be apparent from the following description and claims.

In the accompanying drawings, making a part of this application, and to which reference is hereby made, similar reference-letters indicate corresponding parts.

Figure 1, Sheet 1, is a side elevation of a construction embodying my invention. Fig. 2, same sheet, represents an enlarged top view of a portion of the structure shown in Fig. 1. Fig. 3, Sheet 2, is an enlarged side elevation of a mast-arm and its accompanying mechanism embodying my invention. Fig. 4 is an enlarged view of the under side of this arm and its mechanism. Fig. 5 is a side elevation of the sliding mechanism for carrying the electric lamp and for making and breaking the circuit. This elevation is on a scale larger than that of Figs. 3 and 4. Fig. 6 is a top view of the mechanism shown in Fig. 5 and upon the same scale. Fig. 7 is a plan view of the mechanism to be lodged in the outer end of the mast-arm to make and break the circuit, in connection with the sliding mechanism shown in Figs. 5 and 6. Fig. 8 is a side elevation of the mechanism shown in Fig. 7. Fig. 9 represents a horizontal section of the outer or free end of the mast-arm, taken in the plane of the dotted line 9 9 of Fig. 3. Fig. 10 represents a vertical transverse section of the mast-arm and its contents, taken in the plane of the dotted line 10 10 of Fig. 3 and looking at that part of the section which faces toward the right in said Fig. 3. Fig. 11 is a transverse vertical section at the plane of the dotted line 11 11 of Fig. 4.

A indicates the vertical mast or pole whereby the mast-arm B is supported and to which the latter is secured. The preferred means of connection consist of the collar B² and lugs B³ thereof, the latter being bolted to the mast A by means of bolts B⁴ in the usual manner.

The mast-arm is supported in outreaching position by means of stays D D, preferably made of iron pipes, not only for lightness and economy, but for another purpose hereinafter mentioned. These stays are at one end connected to the horizontal brace D², secured to the mast preferably by bolts D³ D³, as shown.

The outer head or end C of the mast-arm is fastened thereon preferably by being screwed to the arm, a screw-thread for this purpose being shown at C², Fig. 9. The stays D D, respectively, are each connected to their adjacent lug C³ of the mast-arm head C and may pass through the lug at C⁴ and have a nut on their end beyond the lug.

Within the hollow of the mast-arm B is a sliding carriage E for supporting the electric lamp L and for making electrical connection with the wires of the circuit. This carriage E is capable of being reciprocated within the mast-arm, the means employed being the rod E², extending from the rear end of the carriage through the mast A.

The construction of the carriage will now be specified. It consists of a central longitudinal portion E⁴, of an insulating (non-conducting) material, and the main side runners E⁵ E⁵, bolted together and holding thereby the lamp-hook E⁶, swiveled at E⁷. Attention is called to the construction of the forward portion. This consists of the longitudinal portion, as E⁴, narrow across and provided on one side with the metal circuit-plate F, right angled, its vertical arm F² extending down and terminating in the binding-post F⁴, the latter receiving and holding one of the circuit-wires extending to the lamp. To the other side of the portion E⁴ and opposite the metal circuit-plate F is secured a metal circuit-plate G, having a horizontal arm G³ opposite the horizontal arm F³ of the plate F, and also having a vertical plate G², not exactly opposite the vertical plate F², but farther back, as shown, so that the vertical plates dodge each other to better afford room to secure the binding-posts G⁴ and F⁴ at a good distance apart and also increase their insulation by increasing the distance between, as hereinafter specified. Between the binding-posts F⁴ and G⁴ is a recess R in the under part of the insulator E⁴. The purpose of this recess is to prevent moisture from passing

along the bottom of the insulator E^4 from one of these posts to the other. To this vertical plate F^2 is secured a binding-post F^4 , the latter receiving and holding the other
 5 circuit-wire extending to the lamp. The metal circuit-plates are secured to the portion E^4 , preferably by screws, as illustrated.

The preferable mode of securing the draw and push rod E^2 to the carriage E is by inserting it between the plates E^5 and bolting it thereto by a bolt E^8 . This rod E^2 has at its free end a handle E^3 , and when the carriage E is moved toward the outer end of the mast-arm as far as it will go the handle will still
 10 project from the rear side of the mast-arm a sufficient distance to be readily grasped by the operator, as shown in Fig. 1.

The device for making electrical contact with the contacts of the sliding carriage E , I herein term the "contact-holder" and designate it in general by the character H . The construction of this contact-holder H is as follows: The frame of the holder is of insulating material, vulcanite preferred, and
 20 consists of the sides H^2 H^2 and the end H^3 . Thus the frame is open at rear. In case the end H^3 is in a separate piece from the sides H^2 H^2 , as it preferably will be for purposes of manufacture, it is secured to the sides by a bolt or screw, as H^4 . Within the holder are located the contact-plates I , formed so that when the carriage E is withdrawn therefrom the plates will touch each other and make electrical circuit continuous outside of
 30 and independent of the lamp L , and when the carriage is fully advanced the plates will be separated and make contact with the electrical conductors of the carriage, thereby placing the lamp L in electrical circuit. To this end and to secure other advantages resulting from my new construction, I form each plate as shown—to wit, in a straight part I^2 and parts I^3 I^4 , the part I^3 being bent back at the knuckle I^5 from part I^2 at a return angle, as shown, and in a forward direction, the parts I^3 of each plate I converging toward one another at a meeting point. The continuation or plate I^4 of the plate I extends forward from the part I^3 , and these continuations extend in planes substantially parallel to the plates or part I^2 aforementioned. The plates I are of spring metal, and the portions I^3 and I^4 will always (when permitted) elastically spring out from their respective sides H^2 of the frame and toward the center of the holder and meet and make electrical contact.
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The preferred mode of securing each plate I in position is by means of a screw I^7 in front part of plate I^2 and a recess H^7 in the side H^2 of the frame, the recess receiving a projection I^6 of the knuckle I^5 . The plate I is further secured in place by the binding-post J , extending through the side H^2 of the frame and at inside of the latter screwed or otherwise fastened to plate I^2 . The binding-post extends outwardly from the frame H , as shown, and receives and holds a circuit-wire of and
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from the line-circuit. Thus each plate I of the contact-holder H is, by means of its binding-post J , in connection with the line-circuit. 70 Through each of these hollow stays D there passes from the mast an electrical conducting-wire X , covered with an insulating material. These wires are of the circuit whereby the electrical lamp of the mast-arm is lighted. 75 Each of these wires as it leaves the outer end of the stay which thus carries it passes down by the adjacent outside of the chamber K and then passes up through the adjacent opening K^{10} in the bottom of the chamber to the adjacent contact (binding-screw) J , to which latter it is connected, as aforementioned. The wire X is purposely allowed to hang down in loop or bow between the stay D and its binding-post J . Thus any dew, rain, or moisture 85 present on the wire X between the point where it leaves the stay D and the point where it enters the binding-post will follow down to the bottom Z of the bend and run off, thereby preventing this moisture from short-circuiting the electrical current. 90

I have especially adapted the head C of the mast-arm to receive and hold the contact-holder aforementioned. The head is chambered, and at front of the chamber K are stops, as K^2 , and side guides K^3 , adjacent to the latter. At the rear end of the chamber K are the inclined (beveled) and stop guides K^4 . The distance between the guides K^4 and the stops K^2 is the length of the contact-holder H . 100

The chamber K is enlarged at each side, forming the side chambers K^5 K^5 for the admission of the binding-posts J J . Each side chamber K^5 communicates with an opening K^6 through the adjacent side of the wall of the head C , and this opening is to admit of the introduction of a screw-driver to adjust the screw of the adjacent binding-post J of the holder. 105

For the more perfect protection of each binding-post J each opening K^6 has a hood K^7 extending outward as a cover from the dew and rain. 110

In adjusting the contact-holder in the mast-arm head C the end H^5 is first inserted into the chamber K , the bevels H^6 of the end H^5 fitting, respectively, the bevels of the guide-stops K^4 of the chamber and above the stops K^2 , located at the lower ends of the guides K^4 . 115

The forward end H^5 of the holder is curved, and thus this latter end is enabled to pass into the chamber K , as it (said end) describes a curve in being inserted in the chamber. 120

The stops K^2 prevent the rear end H^5 of the holder from slipping down and out of the head. A bolt K^9 , inserted in the fore part of the head C and crossing below the holder H , prevents the fore part of the holder from slipping down out of the head. Thus the entire holder H is securely held in place in the head. 125 130 The sides of the chamber K are continued down below the main portion of the head in the form of flanges C^5 to prevent the entrance of rain.

It will be understood that the chamber K opens downward and that the top and sides of the head C are closed except at the points K⁷.

The manner in which my invention is operated is as follows: The rod E² is retracted through the mast-arm and draws with it the carriage E toward the mast. Thus the contacts F² F³ G² G⁴ are withdrawn from contact with the contact-holder H and the lamp L is moved toward the mast, where it can be fitted with a new carbon. In the meantime the contact-plates I I have met and the circuit is continued unbroken through the line-wire. After the lamp has been provided with fresh carbon the rod E² is moved outward toward the mast-arm head C, thus moving the carriage E and conveying the lamp L out to the head C. The forward end of the carriage E strikes against the inclined parts I³ I³ of the plates I and automatically pushes them aside and moves forward between the parts or contacts I³ I³ of the holder H, thus breaking the direct or line-circuit contact between said parts I³ I³ and bringing the lamp into the line-circuit. The rod E² is pushed forward until the forward end of the carriage E strikes the end H³ of the holder H. The operator is thus informed that the operation of hanging the lamp at the mast-arm head and at the same time bringing the lamp into the circuit of the line-wire is completed.

Among the numerous and various advantages resulting from the use of my invention are the following, viz: The construction is a very simple one and not easy to get out of order. It is economical of manufacture and durable. The holder may readily and quickly be withdrawn from the mast-arm head and be as quickly and readily replaced therein. Thus it may easily be reached for repair. The operator is never at a loss to know when he has completed contact between the lamp-electrodes and the line-circuit. He has only to push on the rod E² until the carriage E stops against the end H³ of the holder, and he can do this with his eyes shut. In those other devices now in use the operator moves the lamp forward by a cord and often fails to bring the lamp into circuit and often unwittingly leaves the lamp not in contact and the line-circuit broken. My invention obviates this contingency.

I would particularly call attention to the rod E². In operating other mast-arms the cord with which they are operated gives much trouble by frequent breakage, as it wears out rapidly with the constant use, and in wet freezing weather it sags down and becomes coated with ice and can then only be operated with difficulty or not at all. In other devices when the carriage is reciprocated by the feed and return wires connected to it being used to drag the carriage in the mast-arm they wear off the insulation and cause trouble by short circuits and danger to operator and frequent cost of repairs. My manner of operation with rod overcomes all these

troubles and makes mast-arms that have been a source of great trouble and objection a simple and practicable device.

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

1. The mast-arm head carrying the contact-holder, and the contact-carriage E, and the lamp suspended from the carriage, the mast-arm being hollow, and the carriage moving therein, and the rod connected to the carriage for reciprocating the latter, and located within the arm, and an opening through the mast through which the rod plays, substantially as and for the purposes specified.

2. In a mast-arm, the combination of the chamber K in the head thereof, and the side or sub chambers K⁵, having openings K⁶, contact-holder H having frame H², H², H³, and elastic separable spring-contacts I, composed of parts I², knuckle I⁵, inclined part I⁸, and straight portion I⁴, the knuckle projection received into a recess in the frame H², the plate being secured also by the binding-post, extending through and outside of the contact-holder, and binding-posts J extending without and into said chamber, and a reciprocating lamp-carriage having contacts, and when advanced parting the spring-plates I, and making contact, substantially as and for the purposes specified.

3. The adjustable contact-holder, having frame open at rear, and the elastic separable spring-contacts within, and binding-posts, the frame having beveled ends H⁶ and curved end H³, and the mast-arm and head, having chamber K and subchambers K⁵ and beveled guides K⁴, and securing-detent K⁹, and a reciprocating carriage having a contact-piece entering between the spring-contact plates I, I, substantially as and for the purposes specified.

4. The adjustable contact-holder, having frame open at rear, and the elastic separable spring-contacts within, and binding-posts, the frame having beveled ends H⁶, and curved end H³ and the mast-arm and head, having chamber K and subchambers K⁵, and beveled guides K⁴ and stops or catches K⁸, and securing-detent K⁹, and a reciprocating carriage having a contact-piece entering between the spring-contact plates I, I, substantially as and for the purposes specified.

5. The adjustable contact-holder, having frame open at rear, and the elastic separable spring-contacts within, and binding-posts, the frame having beveled ends H⁶, and curved end H³, and the mast-arm and head having chamber K and subchambers K⁵, and openings K⁶ and outer hoods K⁷, and beveled guides K⁴ and securing-detent K⁹, and a reciprocating carriage having a contact-piece entering between the spring-contact plates I, I, substantially as and for the purposes specified.

6. In a mast-arm, the combination of the head having chamber K, and an adjustable contact-holder having separable spring-con-

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tacts, and binding-posts, and a lamp-carriage having the contact-head provided with the side angulated contact-plates F^2 , F^3 , with binding-posts F^4 , and G^2 , G^3 , with binding-
5 post G^4 , the vertical plates F^2 and G^2 dodging each other, and a recess R of the insulator E^4 located between them, the contact-head being

capable of reciprocation, substantially as and for the purposes specified.

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Attest:

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