(No Model.) 2 Sheets—Sheet 1.

W. McELROY & G. W. BAYLEY.

LIGHT FIXTURE OR ANALOGOUS ARTICLE.

No. 535,069. Patented Mar. 5, 1895.

FIG. 1.

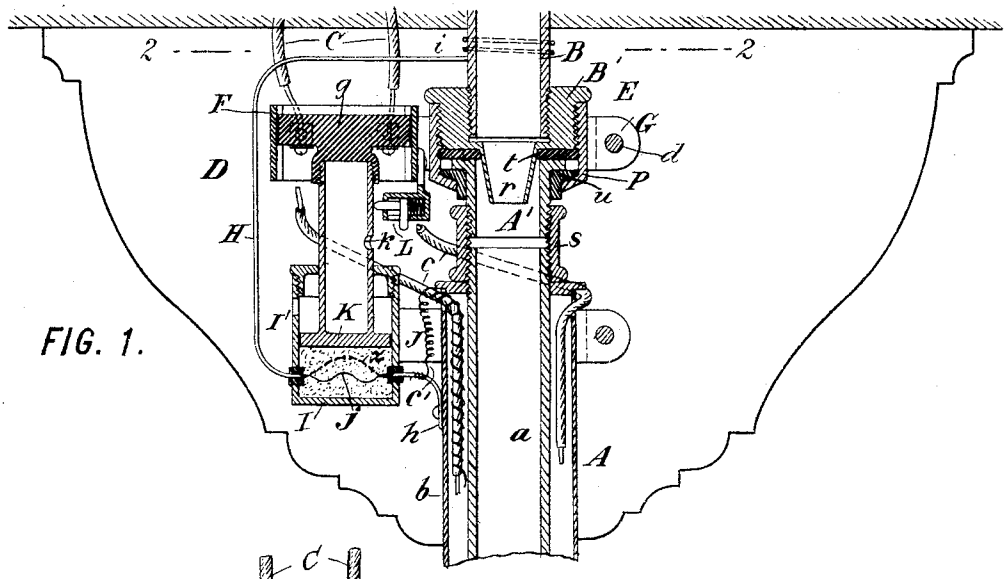


FIG. 2.

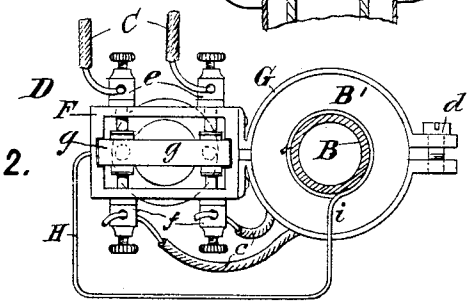
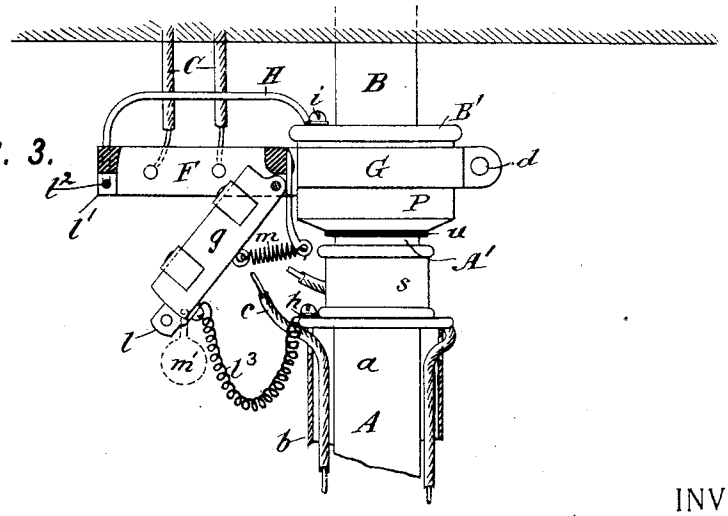


FIG. 3.



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Fred White

INVENTORS:

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 4.

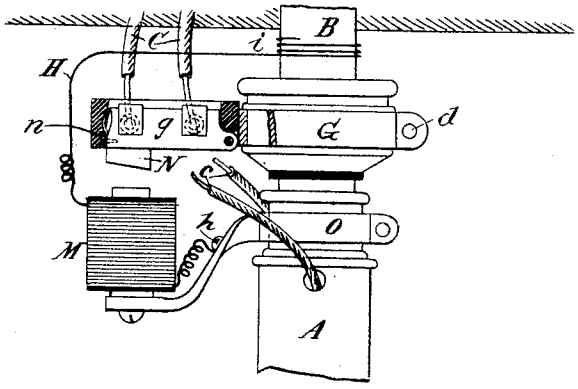


FIG. 5.

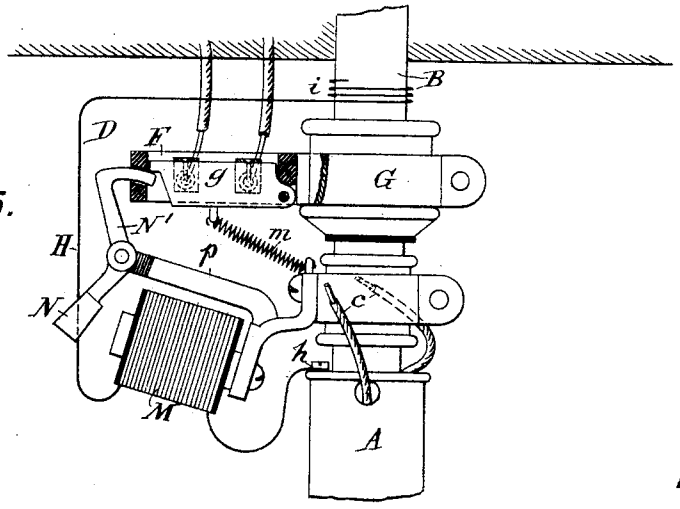


FIG. 7.

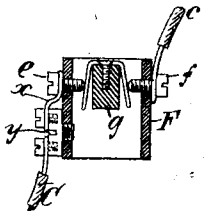
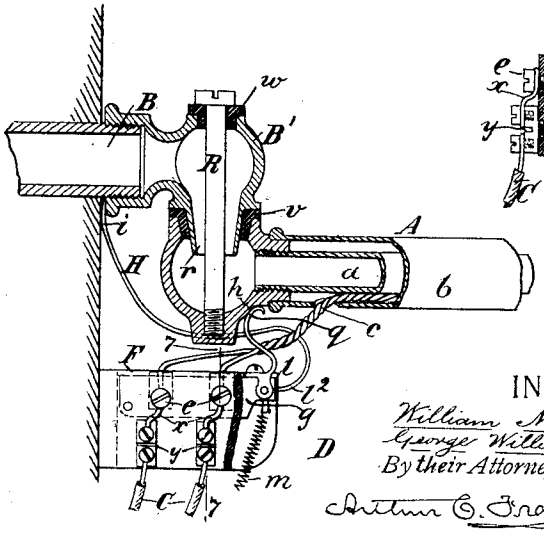


FIG. 6.



WITNESSES:
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UNITED STATES PATENT OFFICE.

WILLIAM McELROY AND GEORGE WILLIAM BAYLEY, OF BROOKLYN, ASSIGNORS OF ONE-THIRD TO FRED WHITE, OF NEW YORK, N. Y.

LIGHT-FIXTURE OR ANALOGOUS ARTICLE.

SPECIFICATION forming part of Letters Patent No. 535,069, dated March 5, 1895.

Application filed May 9, 1891. Serial No. 392,224. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM MCELROY and GEORGE WILLIAM BAYLEY, both citizens of the United States, and residents of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Light-Fixtures or Analogous Articles, of which the following is a specification.

This invention relates to electric light fixtures, and to fixtures used for both electricity and gas.

The object of the invention is to render such fixtures less dangerous than heretofore, and to further provide an improved insulated coupling between the light carrier and its support.

Heretofore in fixtures of this class when the insulated covering of the wires of the electric circuit for feeding the lamps has become defective within the fixture, as is frequently the case, the contact between the naked wire and the metallic fixture has permitted a leakage to earth when the fixture was not insulated from its support, and when insulated it has been dangerous to persons coming in contact with the fixture, as in case they should by any possibility establish a circuit to earth a severe shock would be the result. To overcome these disadvantages according to our invention we provide a cut out in the electric circuit for feeding the lamps, and insulate the lamp-carrier from its support, and provide a conductor between said carrier and earth and adapted when traversed by an electric current to cause said cut out to operate to break the circuit through said carrier, whereby in case of leakage to said carrier it will be automatically cut out from said electric circuit, and thereby all danger incident to contact therewith or to a short circuit to earth is avoided. We prefer to provide a sound producing device constructed to operate when said conductor is traversed by an electric current, whereby in case of leakage an alarm is sounded to notify the proper persons of the defective condition of the fixture, and also various improvements in cut outs and insulated couplings for light fixtures, all of which will be fully hereinafter set forth.

In the accompanying drawings which illustrate the preferred form of our invention, Figure 1 is a vertical axial fragmentary section of a combined gas and electric chandelier. Fig. 2 is a horizontal cross section thereof cut on the line 2—2 in Fig. 1. Fig. 3 is an elevation of a portion of the fixture similar to Fig. 1, showing a modified form of cut out in section. Fig. 4 is a similar elevation showing another modification. Fig. 5 is a view similar to Fig. 4 but showing a modification thereof, and Fig. 6 is a vertical axial fragmentary section of a horizontal fixture, and Fig. 7 a fragmentary cross-section thereof on the line 7—7.

Referring to the drawings let A designate the lamp carrier; B, the usual gas pipe; C, the wires of the electric circuit feeding the lamps; D, the cut out, and E the insulating coupling between the lamp carrier A and its supporting gas pipe B.

The lamp-carrier A may be of any well known construction, either for a vertical fixture, as an ordinary chandelier, or for a horizontal bracket. That shown in Fig. 1 consists of a gas pipe *a*, and an outer ornamental tube *b*, between which and the pipe *a* is an annular space through which pass the wires *c c* leading to the lamps. An ornamental casing in the form of an inverted bell is shown as inclosing the coupling between the light carrier and its support.

The cut out D may be of any suitable construction which will serve when operated to cut the lamp-carrier and its wires *c c* entirely out of the electric circuit of which the leading in wires C C constitute a part. In the construction shown in Figs. 1 and 2 the cut out consists of a frame F of insulating material mounted upon a clamp G which may be secured to the fixture by being clamped around the latter and tightened by its screw *d*; or it may be supported in any other manner and from any other point.

Two binding posts *e e* receive the ends of the wires C C and are secured in the frame F in such manner that their inner ends project into the hollow interior thereof as contact points. At the opposite side of the frame F, and coinciding with the posts *e e* are two simi-

lar posts *f f*, to which are connected the upper ends of the wires *c c* leading to the lamp.

Within the frame F is mounted a block of insulating material *g* which normally rests between the opposing ends of the binding screws *e f*, and on which are mounted two transverse contact pieces, constructed to make elastic contact with the inner ends of the opposing binding posts when the block *g* is in the normal position, and thereby complete the circuit connections through the cut out. The block *g* is constructed to be movable in the frame F, and when moved until its contact pieces are out of contact with the binding posts the electric circuit to the lamp-carrier is broken and the fixture is cut out.

The block *g* may be operated in many ways when it is not used as an automatic cut out for the fixtures, but according to our invention we prefer to provide means whereby it will be automatically and instantaneously operated in case of any leakage from the electric circuit to the lamp-carrier. To accomplish this we provide an electric conductor communicating between the lamp-carrier and earth and adapted when traversed by an electric current to cause the cut out to operate. In the form shown in Fig. 1 this is accomplished by the conductor H which makes electrical contact with the lamp-carrier at *h*, and with the support therefor, which in this instance is the gas pipe D, at *i*, and intermediate of these points traverses in the form of an incandescing wire *j* an explosive compound adapted when ignited by the incandescence of the wire *j* to explode and move the block *g* out of contact with the binding posts *e f*.

In the form shown in Fig. 1 a cylinder I is supported beneath the cut out D by a clamp J secured to the lamp-carrier, and the explosive compound used is placed within the cylinder I and beneath a piston K therein, the vertical rod of which projects upwardly and is secured at its upper end to the block *g*, the whole being so constructed that the explosive force will drive the piston upwardly and thereby quickly lift the piece *g* and its contacts out from between the binding posts. A catch or other means for holding the parts in the elevated position is provided. Preferably a spring bolt L is provided on the fixture with its end in elastic contact with the rod of piston K, and the said rod is provided with a notch *k* into which the spring bolt snaps as the piston reaches the upper position, whereby until the spring bolt is released the parts must remain in the elevated position and the lamp-carrier will be cut out of the electric circuit.

The wires *c c* may if desired be covered with an exterior layer of conducting material, as the fine copper wire *c'*, throughout their length within the lamp-carrier, and the end of this wire *c'* may be electrically connected to the conductor H instead of connecting the latter directly to the lamp-carrier, whereby in case of any break in the insulating covering of the wires *c c* the leakage resulting therefrom will be conducted directly through the wire *c'* and to the conductor H without being communicated to the metallic portion of the lamp-carrier.

In order to provide warning of the defective condition of the light fixture, some suitable sound-producing device is provided which is constructed to operate when the conductor H is traversed by an electric current. This may be accomplished in various ways, but we prefer to rely upon the explosion produced within the cylinder I for giving the required audible alarm when a leakage occurs.

A modified form of cut-out is shown in Fig. 3. In this construction the movable block *g* is hinged to the frame F at one end and has an eye *l* at its other end which enters a notch *l'* in the frame F, and is held thereon by the fusible end of wire l^2 while the circuit is complete. In this instance the conductor H consists of the wire l^2, the metallic eye *l*, and a wire l^3 secured to the latter and electrically connected at its other end to the lamp-carrier at *h*, whereby as the current seeks earth through the fixture, it traverses the wire l^3, eye *l* and fusible wire l^2, which latter is fused as the current traverses it, thereby freeing the eye from its fastening to the frame F and permitting it to fall under the tension of a spring *m* whereby the circuit is broken.

A weight *m'*, shown in dotted lines in Fig. 3, or any other suitable device, may be used instead of the spring *m* for moving the block *g*.

Fig. 4 shows a modification in which the conductor H traverses an electro-magnet M which is energized by the passage of an electric current through the conductor, and attracts an armature N secured to the under side of the block *g*, drawing down the armature and block from between the binding posts of the frame F and thereby cutting out the circuit. In this instance the block *g* is retained in the closed position by a leaf-spring *n* which bears frictionally against its end. The magnet M may be mounted in any desired manner. It is shown as supported on a strap O fixed to the lamp-carrier and serving as a conductor to the point *h* where the wire of the conductor H is electrically connected to it.

Fig. 5 shows another modification in which an electro-magnet is used in the conductor H to cause the cut-out to operate. In this instance the armature N of the magnet M is mounted on an elbow-lever N' fulcrumed to a frame *p*, and constructed at its other end in the form of a stop taking under the end of the block *g* and sustaining the latter between the binding posts of the cut-out against the tension of the spring *m*. When the magnet M is energized by a current through the conductor H its armature N will be attracted, the lever N' tilted until its end is freed from the block *g*, whereupon the latter will fall and cut out the lamp-carrier.

Fig. 6 shows our invention as applied to a

horizontal fixture or bracket. In this construction, the arm F is secured to the wall and the block g is hinged in the frame and carries on its forward end a contact spring q which makes electrical connection with a metallic portion of the lamp-carrier. The conductor H is connected at i to the gas-pipe B, and at its other end terminates in a fusible wire l^2 which passes through the frame F and an eye l in the block g in the same manner as shown in Fig. 3. In case of a leakage to the lamp-carrier, the current will pass therefrom through the spring q and into the fusible end of the wire l^2, fusing the latter and permitting the spring m to draw down the block g from between the binding posts of the electric circuit, thereby cutting out the fixture.

Our improved insulating coupling is best shown in Fig. 1, and in its preferred form consists in providing an annular depending lip formed integrally with the uppermost of the tubular metallic sections insulated from each other, which lip is of less diameter than the adjacent interior of the lowermost of said sections, and preferably projects through and below the insulating washer, whereby the drip through the coupling is precipitated within the lowermost section near its center and falls downwardly therein instead of bridging the space between the adjacent sections and forming a conductor between them.

In Fig. 1, let the lamp-carrier A constitute one metallic section and the gas-pipe B and its attachment the other. Preferably a cap B′ is screwed over the end of the pipe B, and has a central depending funnel-shaped annular lip r formed integrally withit which extends downwardly in line with the axis of the pipe B. The flanged thimble A′ is provided at the upper end of the lamp-carrier, being preferably secured thereto by a screwthreaded coupling s. An insulating washer t surrounding the lip r is placed against the under side of the cap B′ and between it and the top of the thimble A′. An insulating ring u is placed beneath the flange of the thimble A′ and has a downwardly extending tubular portion surrounding the latter through a part of its length. A coupling ring P having an inwardly projecting flange engages the insulating ring u, and extends thence upwardly and is screwed onto the exterior of the cap B′. As the coupling ring P is screwed into position it clamps the thimble A′ of the lowermost section between the insulating washer t and the insulating ring u and against said cap B′, thereby firmly coupling the sections together and insulating them electrically from each other. The lip r projects preferably well through the insulating washer t and into the thimble A′, whereby all moisture, coal tar, and other substances likely to accumulate in the gas-pipe will drop from the lowermost edge of the lip r downwardly near the center of the pipe of the lowermost section.

Fig. 6 shows our improved insulating coupling as applied to a horizontal bracket. In this instance the part B′ consists of an elbow screwed onto the gas-pipe B and provided with the lip r depending into the hollow interior of the lamp-carrier A. Around the lip r is formed an annular seat on which rests a ring v of insulating material, and the adjacent portion of the lamp-carrier is provided with a seat which engages with the insulating ring v. Another insulating ring w is provided above the part B′, and a connecting screw R passes through this ring and through the depending lip r and engages the lamp-carrier A, thereby drawing the lamp-carrier against its seat on the insulating ring b, whereby a tight joint is formed between the upper and lower sections of the fixture at this point.

In operation the current for feeding the lamp will traverse the electric circuit of which the wires C C, cut-out D, and lamp wires $c\,c$ constitute part, but when through any cause there is a leakage from that portion of the circuit within the lamp-carrier A, the leak will traverse the conductor H and immediately cut out the lamp-carrier from the circuit. The defect will then be apparent either by the sounding of the alarm when that is used, or by the failure of the lamps to operate. In applying the insulating coupling the cap B′ will be screwed onto the ordinary gas pipe with its insulating rings, thimble A′ and coupling ring P in position. The usual screw-coupling s will then, together with the lamp-carrier A, be screwed onto the end of the thimble A′.

Our invention provides a new safety device for electric fixtures, whereby all danger of shock by contact with a defective fixture, or of fire by reason of a short-circuit to earth, is immediately avoided in case of any leakage to the fixture, by completely cutting out the latter from the feeding circuit.

It will be understood that we do not limit ourselves to the specific forms and constructions of our invention herein set forth, as it may be variously modified and applied as experience or the judgment of those skilled in the art may dictate, without departing from its essential features.

In order to permit escape of gases of combustion from the cylinder I, an aperture I′ is provided in the upper part thereof.

The usual fusible cut-out for the lamp employed to break the circuit in case of an excessive current, is according to our invention, preferably combined with the leakage cut-out D. This is preferably done as shown in Figs. 6 and 7, wherein a fusible wire x in the line, connected at one end to the binding post e and at its other to an additional post y which is in electrical connection with one of the electric circuit wires C, serves as the fusible cut-out. The post y is screwed to the insulating frame F and is connected to the wires C and x by binding screws.

The dotted lines z in Fig. 1 represent spark-

ing wires within the cylinder I and forming part of the conductor H. These may be used as a substitute for the incandescing wire *j*.

What we claim is, in light-fixtures or analogous articles, the following defined novel features and combinations, substantially as hereinbefore set forth, namely:

1. In an electric light fixture, the lamp-carrier, a support therefor insulated therefrom, and the electric circuit for feeding the lamp, in combination with a cut-out, and a conductor communicating between said carrier and earth, said conductor adapted when traversed by an electric current to cause said cut-out to operate to break the circuit to said carrier, whereby in case of leakage to said carrier it will be automatically cut out from said electric circuit.

2. In an electric light fixture, the lamp-carrier, a support therefor insulated therefrom, and the electric circuit for feeding the lamp, in combination with a cut-out, a device for operating the latter, and a conductor communicating between said carrier and earth and adapted when traversed by an electric current to cause said device to operate said cut-out to break the circuit to said carrier, whereby in case of leakage to said carrier it will be automatically cut out from said electric circuit.

3. In an electric light fixture, the lamp-carrier, a support therefor insulated therefrom, and the electric circuit for feeding the lamp, in combination with a cut-out, and a conductor communicating between said carrier and earth, said conductor adapted when traversed by an electric current to cause said cut-out to operate to break the circuit to said carrier, and a sound-producing device constructed to operate when said conductor is traversed by an electric current, whereby in case of leakage to said carrier it will be automatically cut out from said electric circuit and an alarm will be sounded.

4. In an electric light fixture, the lamp-carrier, a support therefor insulated therefrom, and the electric circuit for feeding the lamp, in combination with a cut-out, a device for operating the latter, a conductor communicating between said carrier and earth, and an explosive compound arranged to be exploded by the passage of an electric circuit through said conductor and adapted to operate said cut-out, whereby in case of a leakage to said carrier it will be automatically cut out from said circuit.

5. In an electric light fixture, the lamp-carrier, a support therefor insulated therefrom, and the electric circuit for feeding the lamp, in combination with a cut-out, a device for operating the latter consisting of a cylinder for containing an explosive compound, a piston for said cylinder connected to a movable part of said cut-out to operate the latter, and a conductor communicating between said carrier and earth and entering said cylinder in the form of an incandescing wire, whereby in case of a leakage to said carrier the electric current traversing said conductor will explode the contents of said cylinder and said cut-out will operate.

6. In an electric light fixture, the lamp-carrier, a support therefor insulated therefrom, and the electric circuit for feeding the lamp, in combination with a cut-out, a device for operating the latter, consisting of a cylinder for containing an explosive compound, a piston for said cylinder connected to a movable part of said cut-out to operate the latter, a catch for locking said cut-out in the open position, and a conductor communicating between said carrier and earth and entering said cylinder in the form of an incandescing wire, whereby in case of a leakage to said carrier the electric current traversing said conductor will explode the contents of said cylinder and said cut-out will operate and will be locked in position.

7. An insulated joint for light fixtures, comprising two tubular metallic sections, one above the other, a piece of insulating material between said sections for insulating them and a depending lip in said joint out of electrical contact with the lowermost of said sections, constructed to receive the drip from the uppermost section and precipitate it through the joint near the center of the passage therethrough, whereby the drip is prevented from accumulating across the joint and thereby forming electrical connection between said sections.

8. An insulated joint for light fixtures, comprising two tubular metal sections, one above the other, a piece of insulating material between said sections for insulating them, and an annular depending lip in said joint out of electrical contact with the lowermost of said sections and constructed of less outer diameter than the adjacent interior of the lowermost section, and adapted to receive the drip through the joint and precipitate it within said lowermost section near its center, whereby the drip is prevented from forming electrical communication between said sections.

9. An insulated joint for light fixtures comprising two tubular metallic sections, one above the other, a piece of insulating material between said sections for insulating them, having an aperture coinciding with their tubular interiors, and an annular lip above said insulating material receiving the drip from the uppermost section precipitating it within the lowermost section near its center, and preserving said insulating material from contact with such drip, whereby the latter is prevented from impairing the insulating material and from accumulating across the joint and thereby forming electrical communication between its sections.

10. An insulating coupling for light fixtures, comprising two tubular metallic sections, insulated at their junction by a piece of insulating material having an aperture constituting a conduit between said sections, and an annular depending lip in said joint, travers-

ing the aperture to said insulating material and constructed to receive the drip from the upper of said sections above said insulating material and to discharge it below the latter near the center of the lowermost of said sections, whereby the drip is prevented from accumulating across said joint and thereby forming electrical connection between said sections.

11. An insulated coupling for light fixtures, comprising two tubular metallic sections insulated at their junction by a washer of insulating material, the uppermost of said sections carrying an annular depending lip arranged out of electrical contact with the lowermost section and constructed of less outer diameter than the adjacent interior of the lowermost of said sections, whereby the drip through the coupling is precipitated within said lowermost section near its center.

12. An insulated coupling for light fixtures, comprising two tubular metallic sections insulated at their junction by a washer of insulating material, the uppermost of said sections being provided with an integral annular depending lip of less outer diameter than the adjacent interior of the lowermost of said sections, whereby the drip through the coupling is precipitated within such lowermost section near its center.

13. An insulated coupling for light fixtures, comprising two tubular metallic sections insulated at their junction by a washer of insulating material, the uppermost of said sections being provided with an integral annular depending lip of less outer diameter than the adjacent interior of the lowermost of said sections, and projecting through and below said washer, whereby the drip through the coupling is precipitated within such lowermost section near its center and below said washer.

14. In an electric light fixture, the combination with the lamp-carrier, and the electric circuit for feeding the lamps, of a cut-out for said circuit, a conductor leading from said carrier to earth and adapted when traversed by an electric current to cause said cut out to operate to cut out said carrier from said circuit, and a fusible cut-out in said circuit adapted to operate to cut out said carrier in case of an excessive current in said circuit, whereby said carrier will be automatically cut-out in the event of either leakage or excessive current.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

WILLIAM McELROY.
GEORGE WILLIAM BAYLEY.

Witnesses:
GEORGE H. FRASER,
FRED WHITE.