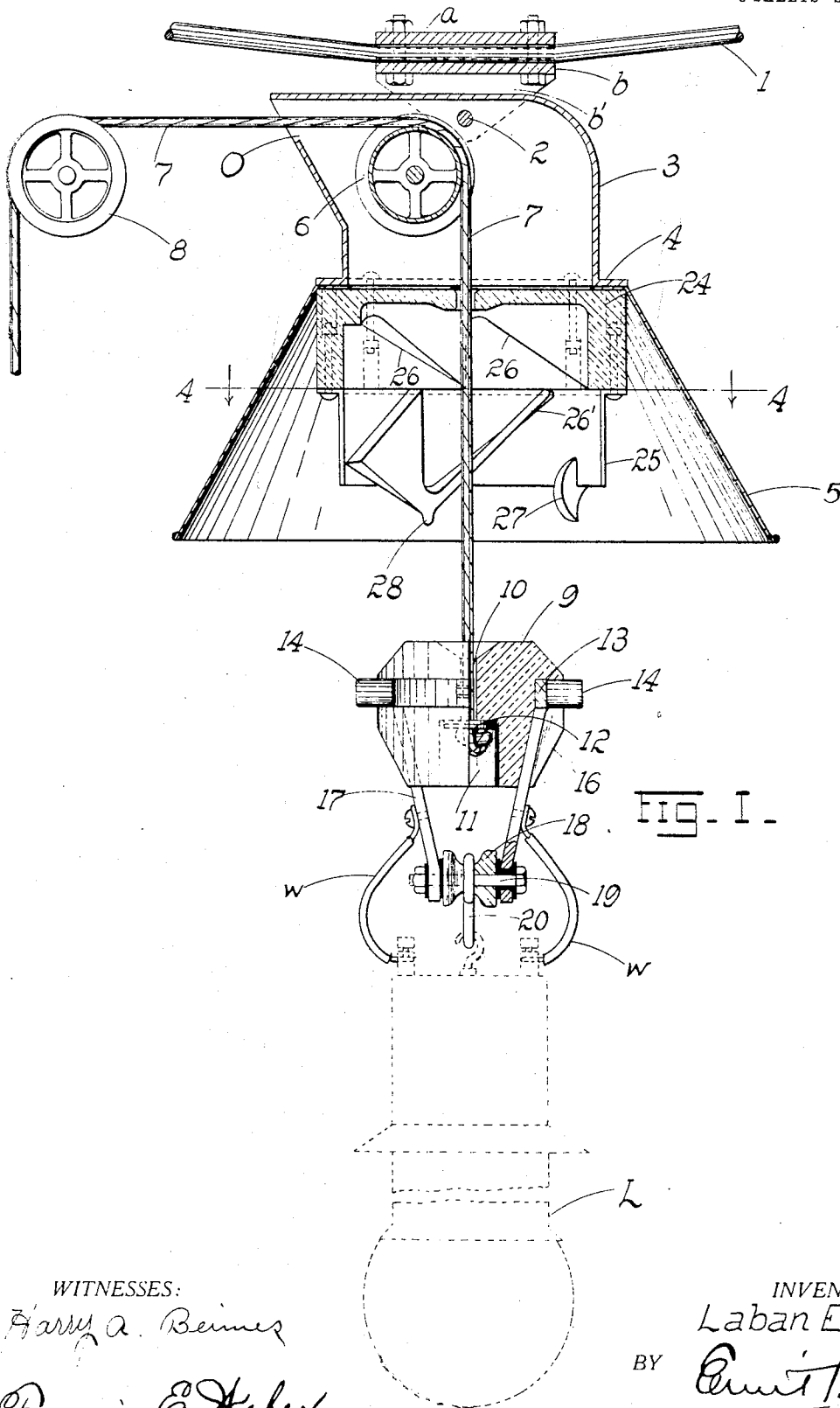


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ARC LAMP CUT-OUT.
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932,613.

Patented Aug. 31, 1909.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 3.

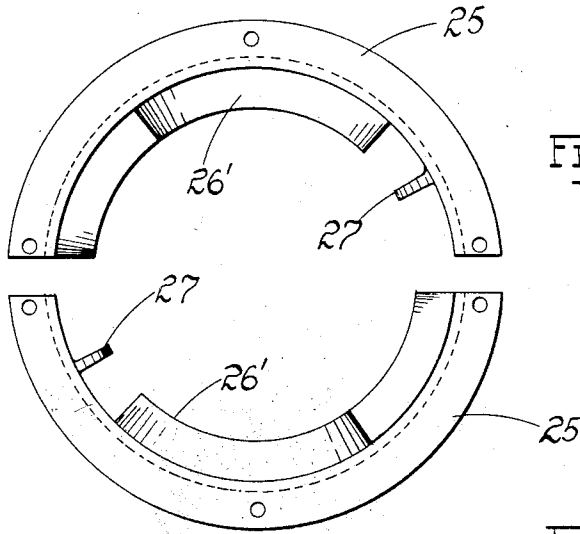


FIG. 4.

FIG. 5.

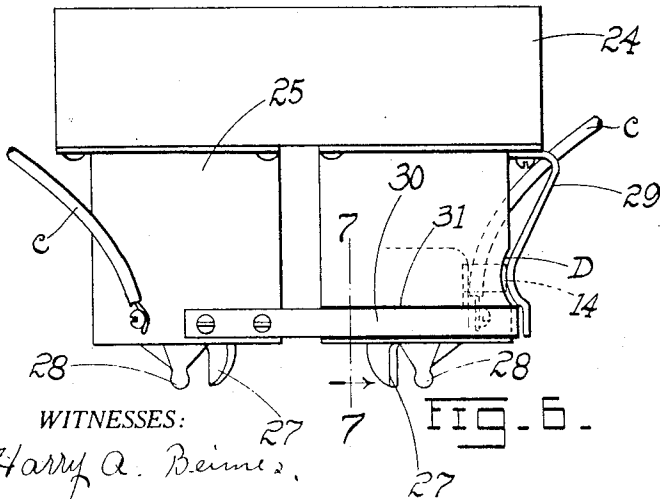
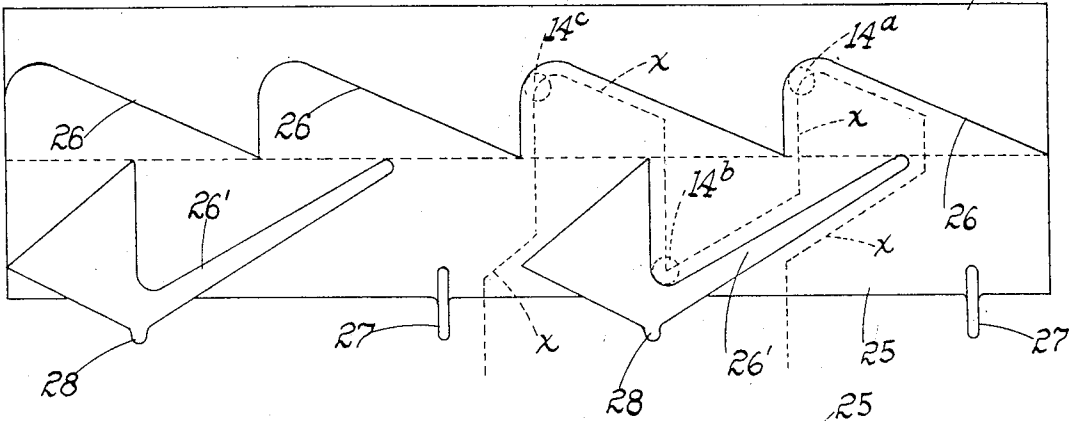


FIG. 6.

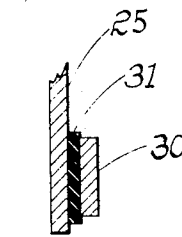


FIG. 7.

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ARC-LAMP CUT-OUT.

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To all whom it may concern:

Be it known that I, LABAN E. JONES, citizen of the United States, residing at Anaconda, in the county of Deerlodge and State of Montana, have invented certain new and useful improvements in Arc-Lamp Cut-Outs, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in cut-outs for arc-lamp hangers; and it consists in the novel construction of cut-out more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a combined vertical elevation and section on the line 1—1 of Fig. 2; Fig. 2 is an elevation at right angles to Fig. 1, parts being broken away; Fig. 3 is a cross section on the line 3—3 of Fig. 2 the bands carrying the contact lugs being shown in edge view; Fig. 4 is a section on the line 4—4 of Fig. 1, the plane of section being taken so as to show a top plan of the sectional metallic cylinder of the hanger; Fig. 5 is a diagrammatic view or development of the composite cylinder which guides the lamp-supporting plug into position; Fig. 6 is a side elevation of a cylinder specially adapted for series lighting; and Fig. 7 is a sectional detail on line 7—7 of Fig. 6.

The object of my invention is to construct a cut-out for arc-lamp hangers which will automatically cut off the current as the lamp is being lowered from its support or hanger, and automatically restore the current when the lamp is elevated to its normal position.

A further object is to so construct the cut-out as to make the same applicable to either a multiple or series system of lighting all as will herein more fully appear from a detailed description of the invention which is as follows:—

Referring to the drawings, and for the present to Figs. 1 to 5 inclusive, 1, represents a supporting wire or cable, the same being provided with a clamp composed of the clip sections *a*, *b* bolted together, the lower clip having depending bracket arms *b'* between which is passed a pin 2 from which the upper casing 3 of the hanger is suspended, this arrangement insuring for the hanger a substantially vertical suspension. To the basal

flange 4 of the casing 3 is secured a hood 5 for protecting and sheltering the lamp L (shown dotted). Between the side walls of the top or casing 3 is mounted a sheave 6 over which runs the supporting and lifting cable 7, the cable passing out of the casing through an opening O and over a sheave 8 whence it passes downward to any point within easy reach of the line-man. The cable 7 passes downward through the open bottom of the casing 3 where it is connected to a porcelain lamp-supporting and cut-out plug 9, the latter being provided with a central passage-way 10 terminating in an enlarged cavity 11, where the cable is tied into a knot, the knot bearing against suitable washers 12 and forming a swivel joint at this point. For high voltage series systems the knot should be free from the lamp hook which is the case here as presently will appear. The plug 9 is substantially of the form as shown, being provided with circumferential grooves *m*, *m*, for the reception of the bands 13 carrying the contact lugs or bosses 14, the ends of the bands being fastened together by screws 15 properly insulated, the screws passing through the ribs *r* serving as partitions between the grooves *m*, *m*. Cast with the bands 13 and resting in longitudinal grooves 16 formed in the plug 9 are conducting arms 17 from which lead the conducting wires *w*, *w* to the lamp L, the lower ends of the arms having mounted between them a spool or sheave 18 whose spindle 19 (as well as the sheave) is properly insulated from the arms as shown, the spindle serving to support the hook 20 from which the lamp L is suspended.

To the flange 4 of the casing 3 are secured the brackets 21 the terminal wooden pins 22 of which carry the insulators 23 for the line wires W, W (feed and return) as usual and well understood in the art.

To the casing or top 3 is fastened a cylinder or ring 24 made of porcelain or equivalent insulating material and to this in turn is fastened a hollow metallic cylinder 25 made in two parts or halves which are insulated either by an intervening air space as shown (Fig. 4) or by insulating material (not shown). To the respective halves or sections of the cylinder 25 are attached the terminal wires *c*, *c* leading from the line wires W, W. The cylinders 24 and 25

jointly thus form a composite cylinder of porcelain and metal, the inner surface of such composite cylinder being provided respectively with suitably disposed zig-zag supporting guides or ribs 26, 26', resulting in corresponding ways or grooves, the said ribs being supplemented by diametrically disposed guide-lobes 27, 27' along the lower edge of the cylinder 25, and by guide lugs 28 at the lower edges of the ribs 26'. This composite cylinder is shown unfolded in Fig. 5, and shows the development of the inside of the cylinder and of the course prescribed for the contact lugs 14 in the act of raising or lowering of the plug 9 from which the lamp is suspended. In fact the operation of the cut-out may be described to the best advantage by a reference to the development Fig. 5, in which the cylinder is shown unfolded, but before describing said operation it may be stated that in the actual cylinder one guide or rib has a corresponding guide located diametrically opposite thereto, and in the lowering or raising operation of the plug 9, the lugs 14 in following the inclined edges of the ribs are given a partial rotation, a fact not only obvious from the drawings, but still more obvious if we assume the ends of the development figure brought together so as to complete the cylinder which it represents unfolded.

Suppose the plug 9 with its lamp to be detached from the cylinder and the lamp is in the act of being raised. The lugs 14 (see Fig. 5) will first be guided into their proper grooves or ways by the lobes 27 and lugs 28, and as the plug is being raised said lugs will approach from below along the dotted line z , shown in Fig. 5, and no matter in what position it strikes the guides, it will slide along the inclined surfaces thereof until it reaches the position indicated by 14^a and remain there as long as the tension on the lifting cord remains; when the lamp is allowed to lower, the lugs will settle to the position shown at 14^b in the recesses or pockets of the ribs where it remains connected to the line ready for use. When the lamp is raised again the lugs will seek the position marked 14^c and when lowered will glide out of the hanger entirely and is then ready to be lowered. For the positions 14^a and 14^c the current of course is cut off since it can not pass through the porcelain section of the composite cylinder. For the position 14^b the current is on, this being the only position where the current is needed. As stated before, the lugs 14 in sliding along the inclined edges of the ribs 26, 26' are of course given a slight rotation, but this is necessary to bring about the result with guides having the specific form and disposition as shown. When the lamp (or rather the plug 9) is hanging the current passes from the line wires W , into wires c thence through

cylinder 25, lugs 14, arms 17, wires w into the lamp L . Naturally, for a direct current circuit the wire w identified with the upper carbon of the lamp should be connected to the positive terminal of the line, or with the lug 14 which for the hanging position of the lamp rests in the pocket of that section of the cylinder 25 which is at such positive terminal. In raising the plug 9 with its suspended lamp the line-man can always take the necessary precaution to start the plug properly into its recesses in the cylinder 25, so that the positive pole of the lamp shall be in circuit with the positive section of the cylinder 25.

Obviously, the hanger so far described is suitable for use in multiple service, but with slight modification it may be made to serve in a series system. Without repeating unnecessary details, I have shown a modified form of hanger which will serve in series lighting in Figs. 6 and 7. The hanger in all essential particulars is the same as that already described, but is modified in details by which the lamp will cut itself in circuit when in place and will close the circuit when lifted out of the hanging position thereby leaving the series circuit in condition to be operated without interruption. These details may be described as follows: Fastened to one side of one of the sections of the metal complement of the composite cylinder is a strong spring 29 so arranged that it projects slightly through an opening or hole D in the side of the cylinder. When the lug 14 on the supporting plug seeks position 14^b (or running position) it presses the spring outward sufficiently (as shown) to force the free end thereof from its resting place and breaks contact with the insulated band 30 (the insulating strip being denoted at 31) which band is securely fastened to the side of one of the sections of the metal cylinder 25, but is insulated from the adjacent section by the strip 31. When this contact between the spring 29 and band 30 is broken, the current must pass through the lamp in order to get from one section of the metal cylinder to the opposite section; when the lamp is removed, the spring 29 presses firmly upon the band 30 thereby closing the lamp circuit without the aid of the lamp and its supporting plug 9. This allows the series circuit to operate without interruption. In all cases the bolt heads or screws set in the porcelain disk or cylinder are supposed to be filled in with insulating cement, not necessary to describe.

The parts from which the lamp-supporting plug 9 is detachable may be considered the support or hanger proper, and the plug with its supporting arms and contact lugs (14) is the means for closing and cutting out the circuit or it constitutes the cut-out proper. Of course the entire device is a

hanger for the lamp, but the above distinction is made for convenience and for a better understanding of the invention.

Having described my invention what I claim is:—

1. In combination with an electric-lamp hanger provided with two conducting semi-cylindrical sections in circuit with the line wire and insulated from one another, a lamp-supporting plug of insulating material provided with diametrically disposed contact lugs, arms leading therefrom for the support of the lamp and in circuit therewith, and ribs disposed on the semicylindrical sections and conjointly forming zig-zag guides for the lugs whereby upon movement of the plug into the sections and subsequent release thereof the lugs are guided to position of support on the ribs.
2. In combination with an electric-lamp hanger comprising a composite cylinder composed of a cylinder of insulating material and two semicylindrical conducting sections secured thereto and insulated from each other, a lifting cable freely passing through the composite cylinder, an insulating plug to which the cable is fastened, contact lugs on the plug, conducting members leading from the lugs and supporting, and in circuit with the lamp, and zig-zag guide formations and cooperating lugs on the composite cylinder affording available recesses or pockets for the support of the contact lugs, the said formations being properly inclined to the horizontal to direct the lugs to said recesses upon the raising of the plug into the cylinder and release thereof, and to guide the plug out of the cylinder by a subsequent raising and release of the plug.
3. In combination with an electric-lamp

hanger provided with two conducting semi-cylindrical sections in circuit with the line wire and insulated from one another, a spring on one section normally in circuit with the adjacent section whereby the current travels from one section direct through the other section, a lamp-supporting plug provided with diametrically disposed contacts for respectively engaging one section, and the spring of the opposite section and forcing the spring out of the immediate circuit between the sections, whereby the current is caused to pass from one section through the lamp to the opposite section.

4. An electric-lamp hanger for a series system comprising a composite cylinder composed of a cylinder of insulating material, and semicylindrical conducting sections insulated from one another and secured to the first named cylinder, a band connecting the conducting sections and insulated from one of said sections, a spring having one end secured to one of the sections and projecting with its free end into said section, and normally engaging the band aforesaid, in combination with a lamp-supporting plug provided with contact lugs in circuit with the lamp and adapted to respectively engage one of the sections and force the spring out of contact with the band whereby the current normally passing from one section to the other is diverted through the lamp into the other section.

In testimony whereof I affix my signature, in presence of two witnesses.

LABAN ELLSWORTH JONES.

Witnesses:

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