Dec. 31, 1940. V. H. CHRISTEN 2,227,123

ELECTRIC CONNECTION AND THE LIKE

Filed Sept. 12, 1938

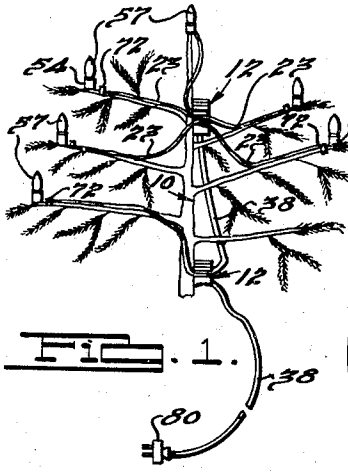


FIG. 1.

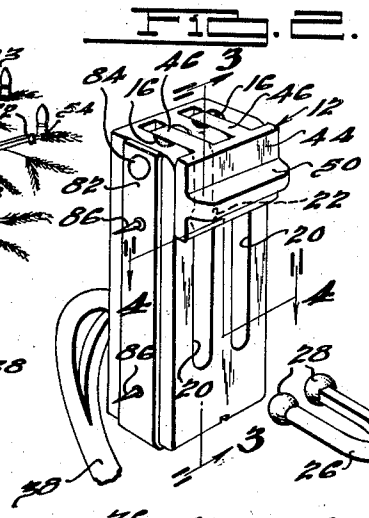


FIG. 2.

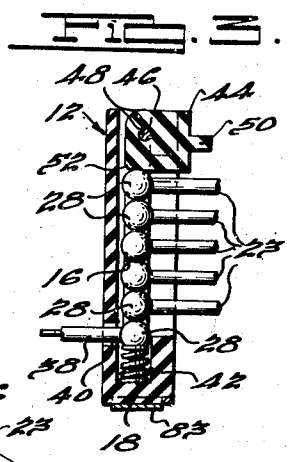


FIG. 3.

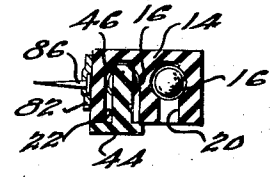


FIG. 4.

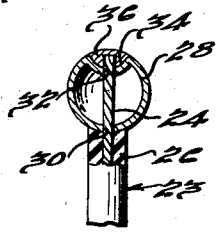


FIG. 5.

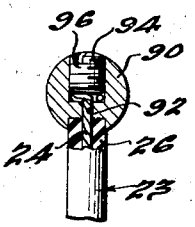


FIG. 6.

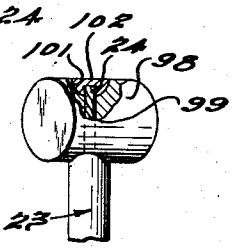


FIG. 7.

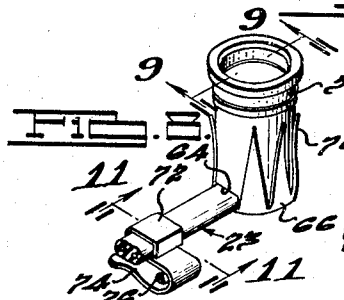


FIG. 8.

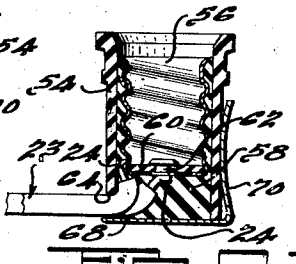


FIG. 9.



FIG. 10.

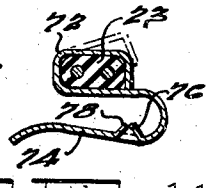


FIG. 11.

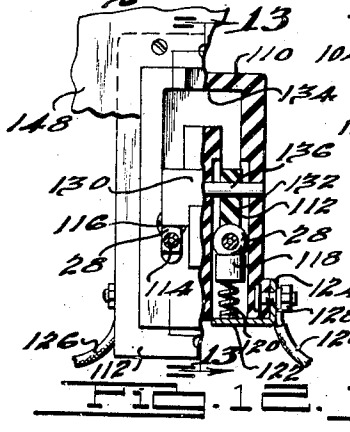


FIG. 12.

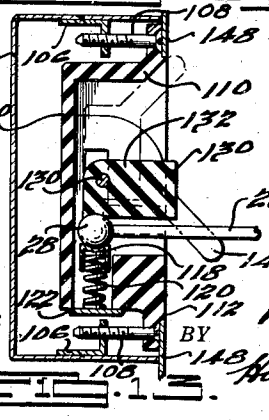


FIG. 13.

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UNITED STATES PATENT OFFICE

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ELECTRIC CONNECTION AND THE LIKE

Victor H. Christen, Detroit, Mich.

Application September 12, 1938, Serial No. 229,465

6 Claims. (Cl. 173—334)

The present invention relates to electric connector means and particularly relates to electric light connections for Christmas trees and the like.

One of the primary objects of the present invention is to provide an improved socket construction which is adapted to separately receive and retain therein circuit contact elements in an improved manner.

Another object of the invention is to provide an improved multiple socket which is adapted to receive a plurality of pairs of conductor elements whereby the individual pairs are in parallel.

Another object of the invention is to provide an improved electric contact terminal element associated with an electric lead wire.

Another object of the invention is to provide an improved socket which is adapted to separably receive conductor elements and in which cam or wedging means are provided for wedging the conductor elements into positive electric contact with associated contact elements.

Another object of the invention is to provide an improved bulb socket construction in which a cap is provided over the bottom and extends up along and resiliently engages the sides of the socket.

Another object of the invention is to provide improved Christmas tree lights having a plurality of separable, multiple sockets and separable wire sockets connectable thereto, in which the wires may be of different lengths and in which the circuits are in parallel.

Another object of the invention is to provide an improved clamping means associated with the lead wires, instead of the socket, whereby an economical construction is provided and in which the socket may be placed on top of a branch of a tree rather than on the side thereof.

Another object of the invention is to provide an improved manner of fastening sockets on the tree trunk of Christmas trees.

Other objects of the invention will become apparent from the following specification, the drawing relating thereto and from the claims hereinafter set forth.

In the drawing, in which like numerals are used to designate like parts in the several views throughout:

Figure 1 is a side elevational view of a Christmas tree having electric connections according to the present invention associated therewith;

Fig. 2 is an enlarged perspective view of one of the multiple sockets with an associated conductor separated therefrom according to the present invention;

Fig. 3 is a cross-sectional view taken substantially along the line 3—3 of Fig. 2 and showing the conductors in position within the socket;

Fig. 4 is a cross-sectional view taken substantially along the line 4—4 of Fig. 2 and also showing the conductors within the socket;

Fig. 5 is an enlarged elevational view with parts broken away showing parts in cross-section of an improved form of connection construction for the conductors according to the present invention;

Figs. 6 and 7 are views similar to Fig. 5 illustrating modified forms thereof;

Fig. 8 is a fragmentary perspective view illustrating the lamp socket, the bottom cover therefor, the conductor extending into the socket, and the clamping means for the wire, all according to the present invention;

Fig. 9 is a cross-sectional view taken substantially along the line 9—9 of Fig. 8;

Fig. 10 is a perspective view of the cover means illustrated in Figs. 8 and 9;

Fig. 11 is a cross-sectional view taken substantially along the line 11—11 of Fig. 8;

Fig. 12 is a front elevational view with parts broken away illustrating parts in cross-section of an electrical connection adapted for use as a wall plug according to the present invention; and,

Fig. 13 is a cross-sectional view taken substantially along the line 13—13 of Fig. 12.

Referring to the drawing, in Fig. 1 the top portion of a Christmas tree 10 is illustrated having multiple sockets generally indicated at 12, according to the present invention, attached thereto.

In Figs. 2 to 5 a socket and conducting wires according to the present invention, are illustrated in detail. The socket includes a housing 14 formed of suitable insulating material such as Bakelite or the like; and such socket is provided with a pair of longitudinally extending substantially parallel recesses 16 which are preferably circular in cross-section. Such recesses 16 may be formed through the top wall of the housing and extend downwardly toward the bottom but terminate short of the bottom thereof to provide a seat 18. Longitudinally extending narrow slots 20 are provided through the front face of the housing and communicate each of the recesses 16 with the outside through the front face. The slots 20 are enlarged as indicated at 22 toward the top thereof and such enlarged portions 22 are of substantially the same width as the width of the recesses 16.

The circuit includes a plurality of conductors

23 each having a pair of conducting wires 24 which are covered with insulating material 26. The pairs of wires are joined together, by the insulating material, over substantially their entire length but are separated adjacent their ends in the form of a fork as shown in Fig. 2. Each wire extends beyond the insulation 26, as best shown in Fig. 5, and this extending end portion is adapted to be fixed in electrical contact with an enlarged terminal member 28.

In Fig. 5 the enlarged terminal member is in the form of a hollow ball or bead having diametrically opposed openings 30 and 32 therein. The wire extends through the openings 30 and 32 and extends slightly beyond the opening 32. The ball 28 is recessed as indicated at 34 adjacent the opening 32 so that the extending end of the wire 24 is lodged within the recess 34. In order to fix the wire 24 to the terminal element 28 the extending end may be soldered to the recessed portion 34 by means of solder 36. The insulating material 26 extends up against the portion of the terminal member 28 surrounding the opening 30 so that the member 28 forms an enlargement over the conductors formed by the wire 24 with the surrounding insulating material 26.

A conductor 38 having a pair of wires and insulation similar to the conductors 23 is also provided and such conductor is adapted to extend to a suitable source of electric current. The conductor 38 has enlarged ball members 28 disposed on one end of each of the wires in the same manner as those described above.

In order to dispose the conductors within the housing 12 the two wires having the insulating material thereon forming the conductor 38 are inserted through openings 40 in the rear wall of the housing 12, one of such openings 40 being provided for each of the grooves 16. The ends of the wires of the conductor 38 are forked or separated a greater distance along the length thereof than the conductor 23 so that the ends of the wires may extend forwardly through the enlarged openings 22. The enlarged terminal elements 28 may then be attached to the exposed ends of the wires of the conductor 38 in the manner described above. Such enlarged terminals 28 may then be moved through the enlarged openings 22 to positions within the recesses 16. The terminals 28 of the conductor 38 are adapted to be placed lowermost within the recesses 16 and seat upon resilient coil springs 42 which are located within the recesses 16 adjacent the lower end thereof.

The terminal members 28 of each of the pairs of conductor elements 23 may then be inserted within the enlarged spaces 22 to positions within the recesses 16. When all of the pairs of terminal elements 48 have been received within the recesses such terminal members contact with each other and with the member 28 of the conductor 38 so that all of the terminal members 28 within each of the recesses are in contact with each other.

When the terminal members 28 are in the position indicated the insulated wires extend through the slots 20 and such terminal members 28 may not be laterally displaced due to the fact that the slot 20 is of less width than the width of the recesses 16 and the width of the terminal members 28.

In order to prevent longitudinal displacement of the terminal members 28 so that such members may not move outwardly through the enlarged opening 22, and to retain such terminal members in contact with each other, a wedging and closure means is provided. Such closure means includes a plate member 44 having integral legs 46 formed on the rear face thereof. The legs 46 are adapted to be received within the slots 22 and within the recesses 16 and aligned openings are provided in such portions 46 which are adapted to pivotally receive a pivot pin 48. The pivot pin 48 may be fixed in the end walls of the housing 16 so that the member 44 with the projecting legs 46 may be pivoted relative to the housing. A forward projection 50 may be provided on the front face of the member 44 to provide a convenient means for grasping the plate member 44 to pivot the same about the pivot pin 48. The leg portions 46 are so constructed and arranged and are preferably curved as indicated at 52 so that as the member 44 is pivoted the leg portions 46 engage and wedge the terminal members 28 downwardly within the recesses 16 and resiliently against the springs 42. The plate member 44 covers the enlarged openings 22 so that the terminal members 28 may not be displaced therethrough. This construction assures contact between the members 28 and also prevents accidental or unintentional displacement of the terminal members 28 from within the housing.

The conductor members 23 may be of non-uniform length and the outer ends of the wires may be placed in electrical contact with bulb socket members as shown in Figs. 8 and 9. Such bulb socket members include an outer housing member 54 which is generally cylindrical in shape and which is open through the top. A metallic contact member 56 which is adapted to threadably receive the base of a bulb 57 is fixed within the housing 54 by means of suitable insulating material 58. An insulated base 60 is disposed within the base of the member 56 and receives a contact element 62 therethrough which is insulated from the member 56. One of the wires 24 is adapted to be fixed to the member 62 in electrical contact therewith. The other wire 24 is adapted to be fixed to the member 56. The circuit is then through the bulb in the usual way.

So that the bolt socket 54 may be placed on a Christmas tree branch in an upright position, a lateral opening 64 is provided through the wall of the member 54 adjacent the lower end thereof. The conductor 23 is adapted to extend through this lateral opening so that the base of the socket may rest upon the top of a branch, and the bulb be positioned within the socket in an upright position as shown in Fig. 1.

In order to cover the base and provide a decorative appearance, a cup-shaped member 66 having a circular base portion 68 and upstanding resilient fingers 70 is provided. Such cup member may be disposed over the lower end of the member 54 with the fingers 70 resiliently engaging the outer walls of the member 54 to resiliently retain the cap in place. This cap member prevents accidental chipping or breaking of the insulating material 58 and provides an economical manner of constructing the bulb socket.

In order to fixedly retain the bulb-socket in proper position on the Christmas tree, a clip member 72 is provided which is preferably formed of a resilient strip metal member. Such clip member is bent to embrace the conductor 23, as best shown in Figs. 8 and 11 and is provided with a reversely bent resilient portion 74. Such reversely bent resilient portion 74 is bent inwardly as indicated at 76 to preferably form broken

edges 78 which are adapted to bite into the branch of the Christmas tree in order to retain the bulb socket in position. The clip 72 is placed closely adjacent to the juncture of the conductor element 23 with the socket 54, and the resilient portion 74 extends under the conductor 23 so that the conductor and bulb socket 54 may be disposed on the top of one of the branches. Such clip may also be placed on other portions of the conductor element if desired so as to further fix the conductor element on the branches.

A plurality of the multiple sockets 12 may be placed on the Christmas tree in which event only one of such sockets need be provided with a wall plug 80. Such wall plug 80 is fixed to one of the conductor elements 38. The other conductor elements 38 may be formed at each end with the enlarged terminal members 28 so that one end of the conductor 38 may be placed within one of the housings 12 as shown in Fig. 3 while the other end may be placed within another socket 12 in the same manner as the conductor element 23. In this way any number of such multiple sockets may be used to accommodate any number of lights.

An improved and simplified manner of attaching the multiple socket to the Christmas tree is provided which includes a plate member 82 which is bent adjacent the lower end to extend under the member 12 as indicated at 83 and extends upwardly along one side thereof. The top end of the member 82 may be fixed to the housing by means of a tack or rivet 84. A plurality of tacks 86 are disposed through openings in the member 82 so that the heads thereof lie behind the member 82 with the sharp points projecting outwardly therefrom. Such sharp points may be readily driven into the trunk of the Christmas tree to attach the members 12 thereto.

In Fig. 6 a modified form of terminal element is provided which includes a substantially solid metal ball member 90. Such ball member 90 has an opening 92 therethrough through which the extending end of the wire 24 projects. A tapped opening 94 is provided through the member 90 and is adapted to threadably receive therein a screw member 96. The end of the wire 24 lies within the recess provided by the tapped opening 94 and the wire may be fixed to ball member 90 by screwing the member 96 against the wire 24. This construction provides a ready means by which the terminal members 90 may be removed when desired.

In Fig. 7 another modified form of terminal member is provided in the form of a solid cylinder 98. Such cylinder is provided with an opening 99 therethrough through which the wire 24 extends. A recess 101 is provided in the member 98 and the extreme end of the wire 24 extends within this recess. The wire may then be fixed to the member 98 by means of solder 102 which is disposed within the recess 101.

In Figs. 12 and 13 a modified form of the present invention is illustrated in which the invention is adapted for use on wall outlets. Such wall outlets generally involve the removal of plaster from the wall providing an opening and the insertion of a metal shell 104 within such opening. Such metal shell is provided with inwardly disposed angle brackets 106 having tapped openings therethrough for the reception of screws 108. Such screws 108 are adapted to be received through suitable openings in the housing of the socket member in order to removably retain such socket member in place.

According to the present invention an insulated housing 110 is provided having an outwardly disposed flange 112 therearound with oppositely disposed openings therethrough for the reception of the screws 108 in order to removably fix the housing to the brackets 106. The housing 110 is generally formed in the same manner as the housing described above in that it is provided with longitudinally extending recesses 112 which correspond to the recesses 16 above described. Longitudinally extending slots 114 having enlarged portions 116, corresponding to the slots 20 and the enlarged portions 22 above described, are also provided through the front face of the housing 110. The terminal members 28 are adapted to be received through the enlarged portions 116 and seat within the recesses 112 with the insulated wires extending through the slots 114 in the same relation as the corresponding elements described above.

The terminal members 28 are adapted to seat upon metal contact members 118 in the form of inverted cups which in turn rest upon spring elements 120. The spring elements 120 bear against metal contact members 122 which are disposed across the lower open ends of the recesses 112. The contact members 122 are angle shaped so that one side thereof extends along the side of housing 110. Suitable screws 124 are disposed within the housing 110 and extend through openings in the members 122 to fix these members in place on the housing. Suitable lead wires 126 are electrically connected to the respective contact members 122 through nuts 128 on the screw members 124 in the usual way.

The ball members are retained within a slot 112 by means generally similar to the plate member 44 above described. Such means include a plate member 130 which extends across the front face of the housing 110 and is provided with rearwardly disposed legs 132 which extend within the slots 114. The slots 114 extend upwardly to a position adjacent the top of the housing and are connected by a communicating slot 134. The portions 132 are pivotally mounted on a pivot pin 136 which extends transversely of the housing and may be fixed to the end walls thereof. A forwardly projecting handle 140 may be formed integral with the member 130 on the front face thereof so that the member 130 may be readily pivoted from the position shown in broken lines to the position shown in full lines in Fig. 13. When the handle is in its uppermost position the enlarged openings 116 are exposed so that the terminal members 28 may be inserted therethrough or removed therefrom. When in the position shown in full lines the lower edge of the members 132, which are preferably cam shaped in order to provide a wedging action, urge the terminal member 28 downwardly against the cup members 118.

A rectangular frame member 148 may be disposed around the peripheral edge of the housing 110 and in overlapping relation to the shell 104 for decorative purposes if desired.

Formal changes may be made in the specific embodiment of the invention described without departing from the spirit and substance of the invention, the scope of which is commensurate with the appended claims.

What is claimed is:

1. An electric connector means comprising, in combination, a pair of insulated conducting wires having enlarged metallic contact elements at their terminals, an insulated housing having a

pair of elongated recesses therein, said recesses opening through narrow elongated slots in one face of said housing, said slots having enlarged portions for the reception of said contact elements, the major portion of said slots being narrower than said contact elements so that said contact elements are retained within said recesses with said wires extending through said slots, other contact elements disposed within said housing engaging said first named contact elements for establishing an electrical connection therebetween, and a movable means covering the enlarged portions of said slots movable into engagement with said first named contact elements to hold said first named contact elements in contact with said other contact elements.

2. An electric connector means comprising, in combination, a pair of insulated conducting wires having enlarged metallic contact elements at their terminals, an insulated housing having a pair of elongated recesses therein, said recesses opening through narrow elongated slots in one face of said housing, said slots having enlarged portions for the reception of said contact elements, the major portion of said slots being narrower than said contact elements so that said contact elements are retained within said recesses with said wires extending through said slots, other contact elements disposed within said housing engaging said first named contact elements for establishing an electrical connection therebetween, and movable means having wedging surfaces pivotally mounted on said housing, said last named means being so constructed and arranged as to cover the enlarged portions of said slots and to engage and wedge said first named contact elements downwardly within said recesses when said movable means is in one position into contact with said other contact elements.

3. An electric connector means comprising, in combination, a plurality of pairs of insulated conducting wires each having enlarged metallic contact elements at their terminals, an insulated housing having a pair of elongated recesses therein, said recesses opening through narrow elongated slots in one face of said housing, said slots having enlarged portions for the reception of said contact elements so that said pairs of contact elements are received in contact and in superimposed relation to each other within said recesses, the major portion of said slots being narrower than said contact elements so that said contact elements are retained within said recesses with said wires extending through said slots, and movable means engaging said contact elements to prevent longitudinal displacement of said elements along said recesses.

4. An electric connector means comprising, in combination, a plurality of pairs of insulated conducting wires each having enlarged metallic contact elements at their terminals, an insulated housing having a pair of elongated recesses therein, said recesses opening through narrow elongated slots in one face of said housing, said slots having enlarged portions for the reception of said contact elements, so that the contact elements for said pairs of conducting wires are arranged in contact and in superimposed relation to each other within said recesses, the major portion of said slots being narrower than said contact elements so that said contact elements are retained within said recesses with the wires extending through said slots, and movable means having wedging surfaces pivotally mounted adjacent said enlarged portions of said slots so as to cover said slots and engage said contact elements to prevent displacement of said elements along said recesses.

5. An electric connector means adapted for use on a Christmas tree, comprising, in combination, a plurality of pairs of insulated conducting wires, said pairs of wires being of different lengths, each of said wires having enlarged metallic contact elements at their terminals, an insulated housing having a pair of elongated recesses therein, said recesses opening through narrow elongated slots in one face of said housing, said slots being enlarged for the reception of said contact elements so that said contact elements are received within said recesses and arranged so that said pairs of conducting wires are in parallel circuit, the major portion of said slots being narrower than said contact elements so that said contact elements are retained within said recesses with said wires extending through said slots, and movable means covering the enlarged portion of said slots.

6. An electrical connector means comprising, in combination, a pair of insulated conducting wires having enlarged metallic contact elements at their terminals, an insulated housing having a pair of elongated slots in one face of said housing, said slots having enlarged portions for the reception of said contact elements, the major portion of said slots being narrower than said contact elements so that said contact elements are retained within said recesses with said wires extending through said slots, other contact elements disposed within said housing engaging said first named contact elements for establishing an electrical connection therebetween, and means engaging said first named contact elements to hold said first named contact elements in contact with said other contact elements.

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