

July 10, 1951

L. W. BROOKS
DECORATIVE LIGHTING FIXTURE

2,559,706

Filed July 15, 1947

2 Sheets-Sheet 1

FIG. 1.

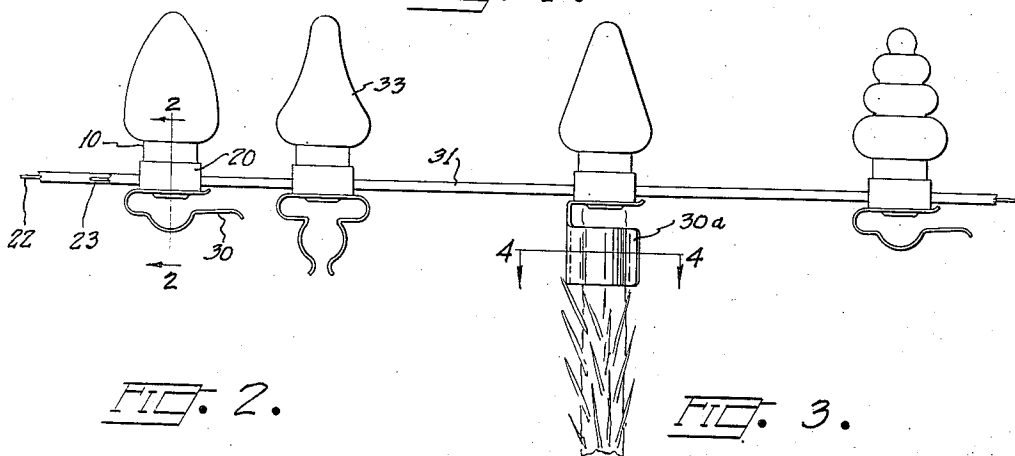


FIG. 2.

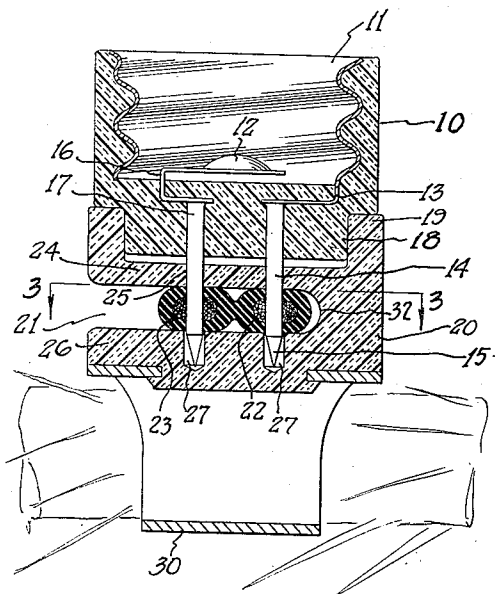


FIG. 3.

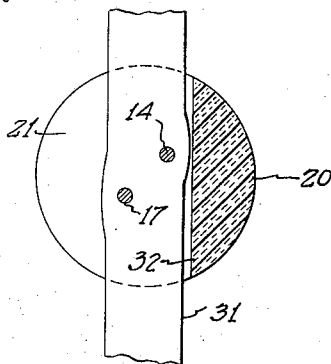


FIG. 5.

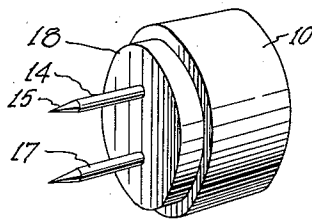
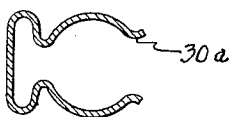


FIG. 4.



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FIG. 6.

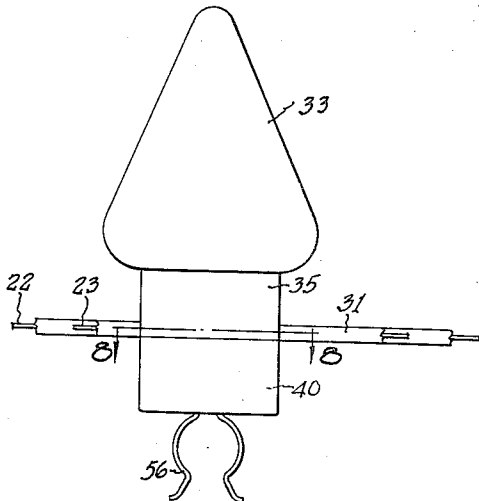


FIG. 8.

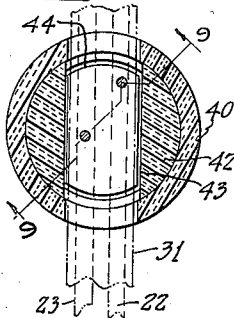


FIG. 7.

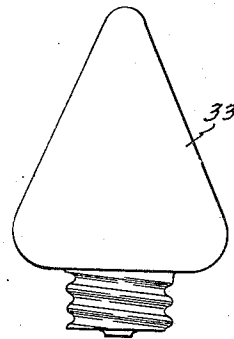


FIG. 9.

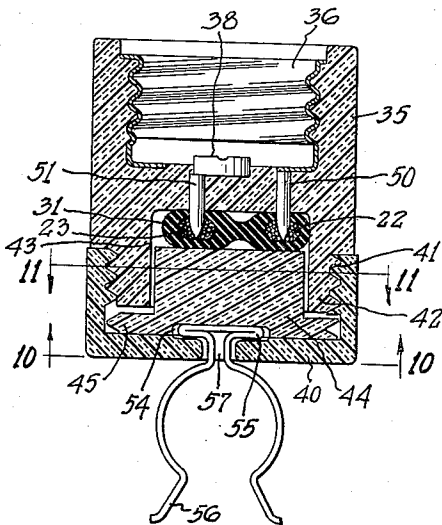


FIG. 10.

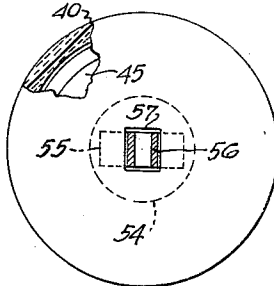


FIG. 12.

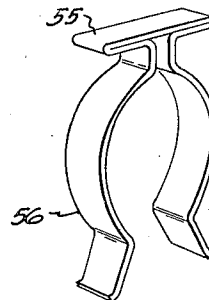
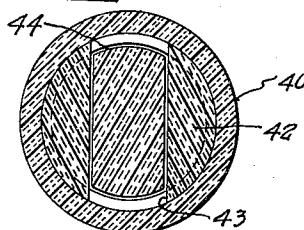


FIG. 11.



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DECORATIVE LIGHTING FIXTURE

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5 Claims. (Cl. 173—340)

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This invention relates to improvements in decorative lighting fixtures, and has particular reference to lighting fixtures for decorating Christmas trees and the like.

Objects of the invention are to provide improvements in fixtures of the type described to enable them to be mounted at random along a length of a twin conductor cord so that lamps may be readily placed where desired to obtain particular decorative effects, to provide sockets for small lamps which may be readily connected with and disconnected from energized wires to place the lamps in parallel circuit without cutting, separating or damaging the wires or removing the insulation therefrom, to provide a rugged and inexpensive socket fixture for making connections in the manner described without the use of tools, to provide improved means for attaching such socket or fixtures in various ways upon the branches of a Christmas tree or other support, to provide a novel construction of the fixture enabling it to be installed and removed more easily than conventional fixtures for this purpose and to provide a fixture which is safe and harmless and will not involve the danger of short circuit or fire in the presence of inflammable materials.

The principles of the invention are illustrated in the drawings in two preferred embodiments particularly adapted for disposing colored lights on a Christmas tree or the like. In each embodiment the fixture comprises a socket for a lamp which may be connected at any point with a pair of circuit wires and attached to a branch of the tree or other support. Any number of such fixtures may be connected with a conductor cord in parallel circuit at any desired intervals to produce the intended decorative effect when the lamps are lighted. Each fixture contains a pair of sharp prongs adapted to pierce through the insulation on the wires and make electrical contact with the usual stranded conductors therein to energize the contacts in the lamp socket when the fixture is mechanically mounted on the wires. The fixture is designed so that the prongs are enclosed at all times while they are in contact with the circuit wire so that it is impossible for a person to touch the prongs to obtain a shock therefrom while they are energized and so that they cannot be short circuited by tinfoil or other metallic particles which are frequently used with such decorative lighting fixtures. In both embodiments the contact-making prongs are carried directly by the lamp socket, and the circuit wires are inserted laterally into a slot in the

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fixture so that the prongs may be caused to pierce into the stranded wires, the parts being held in mechanical and electrical connection by either frictional or screw threaded engagement of two separable parts of the fixture. The prongs are diagonally arranged in the conductor slot to pierce the two conductors at different points along their length to avoid the possibility of weakening both wires at the same point in case some of the conductor strands might be severed by the prongs. If the insulation on the two wires is united along adjacent edges it need not be separated to apply the fixture.

With the foregoing and other objects in view which will appear as the description proceeds, the invention further comprises certain novel features of construction, arrangement and combination of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportion, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:

Figure 1 illustrates a number of lighting fixtures embodying the principles of the invention connected at random points to a pair of electric conductors and showing the manner of attachment of one of the fixtures to the tip or branch of a Christmas tree;

Figure 2 is an enlarged sectional view of one of the fixtures taken approximately on the line 2—2 of Figure 1;

Figure 3 is a cross sectional view taken on the line 3—3 of Figure 2;

Figure 4 is a cross sectional view showing one form of clip for attaching a fixture to a Christmas tree branch or the like, taken on the line 4—4 of Figure 1;

Figure 5 is a perspective view of the detachable lamp socket member shown in Figure 2;

Figure 6 is an enlarged view of a modified form of fixture;

Figure 7 is a view of the lamp bulb shown in the fixture in Figure 6;

Figure 8 is a cross sectional view taken on the line 8—8 of Figure 6;

Figure 9 is an enlarged sectional view taken on the line 9—9 of Figure 8;

Figure 10 is a bottom plan view taken on the line 10—10 of Figure 9;

Figure 11 is a cross sectional view taken on the line 11—11 of Figure 9; and

Figure 12 is a perspective view of the clip shown in Figure 9.

A first embodiment of the invention is illustrated in Figures 1 to 5. The numeral 10 designates a socket member preferably of molded insulating material and adapted to mount small ornamental lamps. The form of socket, of course, depends upon the type of lamp to be used, the present embodiment showing by way of example a screw threaded metallic socket shell 11 and a central contact 12 insulated therefrom to receive a standard screw threaded lamp base. The shell 11 forms one contact for energizing the lamp and is connected by a metallic tongue 13 with a metallic prong 14 having a sharpened point 15. The central contact 12 forms the other terminal for the lamp circuit, and it is mounted on a resilient metallic tongue 16 which is connected with a second sharply pointed prong 17. The prongs 14 and 17 are molded rigidly into the bottom wall of the socket member 10 with a portion of the resilient tongue 16 extending out of the wall of the socket member so that the end of the tongue carrying the contact 12 can spring or deflect downwardly when a lamp is tightened in the socket.

The socket member 10 has an extending cylindrical end portion 13 providing the major part of the wall thickness in which the prongs are secured, and this end portion is designed to fit snugly within a cup formed by an upstanding wall or flange 19 on a base member 20. The base member 20 is provided with a transverse slot 21 of sufficient height to receive the insulated conductors 22 and 23 with which the fixture is to be connected. The upper side of the slot 21 is closed by a wall 24 which also forms the bottom of the cup within the upstanding flange 19 and is apertured at 25 to permit insertion of the prongs 14 and 17. On its lower side the slot 21 is closed by a wall 26 which forms a base for the fixture and is provided with a pair of holes 27 to receive the points of the prongs in the manner shown. Integrally mounted on the base wall 26 is a spring clip 30 which may take various forms as shown in Figure 1 to detachably mount the fixture on a Christmas tree branch or other desired support.

The base 20 is particularly suited for use with a unitary conductor cord 31 which consists of two insulated wires whose insulated coverings are joined together along adjacent sides to form substantially a flat strip in which the conductors 22 and 23 are preferably flexible bundles of fine wires which thereby have a uniform parallel spacing throughout the length of the cord. The slot 21 is provided with a straight back wall 32 between the upper and lower walls 24 and 26 to align the cord 31 in the slot in mounting the fixture on the cord. The prongs 14 and 17 and the holes 25 and 27 are arranged as shown in Figures 2 and 3 so that when the conductor element 31 is positioned in the slot 21 with one side disposed parallel and closely adjacent the back wall 32 the stranded conductor wires 22 and 23 lie between the holes 25 and 27 to be pierced by the prongs. Conductor cords having individually insulated wires which are not joined together may also be used with the present fixture by placing them in the slot 21 in parallel side by side relation so that each of the prongs pierces one of the conductors.

Figure 4 shows a modified form of clip 38a for mounting a lamp fixture directly on top of

the tree or extending from the end of a branch or the like.

Figure 5 shows the socket member 10 removed from the base member 20.

It is apparent that the fixture may be mounted temporarily or permanently on such a conductor cord anywhere along its length, and that any number of such fixtures may be mounted thereon to connect the various lamps 33 in parallel circuits. It is preferred to have the prongs 14 and 17 and the holes 25 located on a line which intersects the conductor cord and the wall 32 at an oblique rather than a right angle to obtain greater spacing of the prongs and to avoid the possibility of weakening both conductor wires at the same point in the cord. If the prongs should sever some of the fine strands of wire in the conductors, a weak point might be produced in the cord which would cause it to bend or kink more easily at that point after the fixture was removed. By staggering the prongs along the wires as shown in Figure 3 a localized weakening of the cord is avoided.

Also, the prongs 14 and 17 need not be made long enough to project out through the insulation after piercing the stranded conductor wires. These prongs may be shortened to pierce only through the wire core in the manner shown in Figure 9 relating to another embodiment in which case the bottom holes 27 in Figure 2 may be omitted. Shortening the prongs in this manner would avoid the possibility of thrusting a broken end of a wire strand out through the insulation where it would be in an exposed position after the fixture had been removed from a particular position on the cord. A shortened prong also reduces the likelihood of breaking the conductor strands and leaves only one hole in the insulation which causes less damage to the cord. After the prongs are removed the small holes in the insulation readily close up to cover the conductors.

In using the present fixture to mount lights for decorative purposes, the position for a light on the tree may be determined and the conductor cord 31 strung out to the selected position. Then with the socket member 10 removed from the base member 20, the conductor cord is inserted in the slot 21 in the manner shown in Figure 3 to bring the metallic conductor elements under the holes 25. The prongs of the socket element 10 are then inserted in the holes 25 and the socket and base members are pressed together to cause the points of the prongs to pierce through the conductor elements and to cause the projection 13 on the socket element to become firmly engaged with the upstanding flange 19 on the base member to hold the parts together. If the conductors 22 and 23 have been connected to a source of electrical supply, and if a lamp has previously been inserted in the socket member, the lighting of the lamp will indicate that satisfactory circuit connections have been completed as the socket member is pressed home in the base member. Following this procedure the conductor cord 31 may be draped over the tree or other support from one lamp position to the next to produce the intended decorative lighting effect.

When it is desired to remove one of the fixtures or to change its position on the electrical cord, the cord is immediately released from the base member by merely withdrawing the socket 10. If a conductor cord with rubber or other soft insulating material is used, the piercing points in the

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rubber close up after the prongs have been withdrawn to maintain the insulated covering substantially intact to prevent short circuits if tinfoil or other metallic ornaments or the like should come into contact with the conductor cord where a fixture had been removed.

Figures 6 to 12 illustrate a second embodiment of the invention having the same general objects and advantages as the first embodiment just described, but employing a somewhat different construction and arrangement of parts.

The second embodiment comprises four separable parts which are held together by a screw threaded connection between two of the parts as shown in Figure 9. The socket or body member 35 contains a conventional metallic screw threaded shell 36 to receive a screw threaded lamp base as shown on the lamp 33 in Figure 7. This shell is electrically connected with a prong 50 molded in the base of the socket member, and a central contact 38 is similarly connected with a second prong 51 which is spaced from the prong 50. A cap 40 is mounted on screw threads 41 on the lower end of the socket member to hold together the socket member and the other parts presently to be described.

The lower part of the socket member 35 carrying the screw threads 41 comprises a segmental circular rim or flange 42 which is discontinuous around the body of the socket member by reason of a transverse slot 43 extending therethrough. A base member 44 in the form of a plug or piston fits loosely within the slot 43 and has an end flange 45 to be engaged by the cap 40 so that the base member may be forced into the slot to clamp the conductor cord 31 in the bottom of the slot. Both the slot 43 and the plug-like base member 44 have straight and parallel side walls as shown in Figure 11 to prevent the base member from turning in the slot, the width of the slot between these side walls being equal to the width of the usual conductor cord 31 on which the fixture is to be mounted. When the cord 31 lies flat in the bottom of the slot, the stranded conductors 22 and 23 are pierced by the ends of the respective prongs 50 and 51 to energize the socket contacts 36 and 38. When the cap member 40 is rotated to clamp the parts together, the base member 44 is constrained against rotation in the socket member 35 by the flat side walls of the slot 43 so that the only movement of the base member is in an axial direction as a piston or ram to force the conductor cord against the prongs and maintain the electrical engagement, as shown in Figure 9.

A circular recess 54 is provided in the face of the base member 44 to receive the head 55 of a spring clip 56 of suitable form for mounting the fixture on a tree branch or other support. This clip passes through an opening 57 in the cap 40 whereby the clip is secured by the cap in such a manner that it may be readily removed or replaced by a different form of clip for supporting the fixture in the position desired.

In the second embodiment just described it will be observed that the various parts are held in assembled relation by screw threaded engagement which may be securely tightened for positive retention. The advantage of a screw threaded connection is thereby obtained without separating the wires in the conductor cord and without requiring the use of a screw driver or other tool to tighten or loosen the connection as the threads 41 may be made fairly coarse and the parts large enough to be easily gripped in the fingers. In

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installing and removing the fixture from the conductor cord, the prongs are not exposed at any time after they have become energized by piercing the conductors so that the fixture may be installed without danger on a live conductor cord.

The rim of the flange 45 on the plug member 44 is provided with threads like the threads 41 and the threads in the cap 40 are removed at the bottom of the cap so that the plug may be screwed into the cap until it revolves freely to permit the cap to turn relative to the plug when it is being screwed on the socket member 35. The last thread in the bottom of the cap constitutes a peripheral abutment or retainer for the plug or piston element 44, as shown in Figure 9, whereby the spring clip 56 is also held in operative position.

It will be noted in Figure 9 that the prongs 50 and 51 are only long enough to pierce into the conductor strands so that holes are made in only one side of the insulating sheath. This reduces the likelihood of breaking any of the fine wire strands in the usual flexible conductors and prevents any broken strands from being pushed out through the insulation as might happen if the prongs were thrust entirely through the cord.

It will be observed in Figure 8 that the conductor piercing prongs are arranged on a line diagonal rather than perpendicular to the side walls of the slot 43 so that any mechanical weakening of the two conductors by the piercing action will not be concentrated at the same point in the cord 31. This and other features enumerated hereinabove materially lessen the effects of the present fixture on the conductor cable whereas conventional piercing connectors heretofore used for this purpose have often caused objectionable damage to the connector cord making it impractical to move the fixtures from time to time to different positions on the cord.

Conductor cords of the type shown are so standardized by manufacturers that it is feasible to make the slot 21 in Figure 2 or the slot 43 in Figures 8 and 9 to fit the outer dimensions of the insulating sheath quite snugly to quite accurately position and align the conductors beneath the prongs by merely pressing the sheath properly into the slot, but the fixture in either embodiment may also be applied to conductor cords in which the two wires are not joined together.

Having now described my invention and in what manner the same may be used, what I claim as new and desire to protect by Letters Patent is:

1. In a light socket fixture, a cap having a piston element to force a conductor cord against a pair of prongs to make electrical connection with conductors in said cord, an apertured end wall in said cap, a mounting clip extending through said aperture and having a portion disposed against the inside of said end wall, a base on said piston element disposed to bear against said portion of said mounting clip to hold the socket upright on the clip, and an annular abutment in said cap engaging said base of the piston element to hold the piston element in the cap for relative rotation.

2. In a light socket fixture, a cap having a piston element to force a conductor cord onto contact prongs to establish a circuit with conductors in said cord, a mounting clip for the fixture having a portion confined within the cap between the end of the cap and said piston element to hold the socket upright on the clip, and an integral annular abutment in said cap at a distance from said end of the cap to retain the piston element in the cap for relative rotation.

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3. A miniature lighting fixture, comprising a body member having a light bulb socket in one end and a transverse conductor cord slot in the other end, contact prongs in said slot to pierce a conductor cord and energize said socket, a screw threaded cap for the slotted end of said body member, a piston element adapted to enter said slot and force a conductor cord in the slot onto said contact prongs, a flanged base on said piston element rotatably seated in the bottom of said cap, an opening in the bottom wall of said cap, a mounting clip extending through said opening and having a portion disposed in the cap between said bottom wall and the base of the piston element to hold the clip in an outstanding position for mounting the fixture upright, and an abutment in said cap engaging the rim of said flanged base to hold the piston element in the cap when the cap is removed from the body member.

4. In a light socket fixture, a cap having a piston element to force a conductor cord against a pair of prongs to make electrical connection with conductors in said cord, an apertured flat end wall in said cap, a mounting clip extending through said aperture and having a flat portion disposed against the inside of said wall, a flat base on said piston element disposed to bear against said portion of said mounting clip to hold the socket upright on the clip, and an integral annular abutment in said cap at a distance from said end wall and engageable with said flat base to hold said piston element and mounting clip in the cap for relative rotation of said piston element.

5. In an electrical socket fixture having a conductor cord slot equipped with prongs for piercing and making circuit connections with the conductors of a conductor cord in said slot, a cap for the fixture having a piston element to enter said slot and bear against said conductor cord on said

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prongs, a flanged base on said piston element seated in the bottom of said cap, an internal screw thread in said cap for mounting the cap on the fixture, said screw thread terminating above said flanged base and having an inside diameter less than the diameter of said base to form a peripheral abutment to hold the piston element for unlimited rotation in the cap, the bottom of said cap having an aperture, and a mounting clip having a portion extending through said aperture and confined in the cap between the bottom of the cap and the base of the piston element.

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