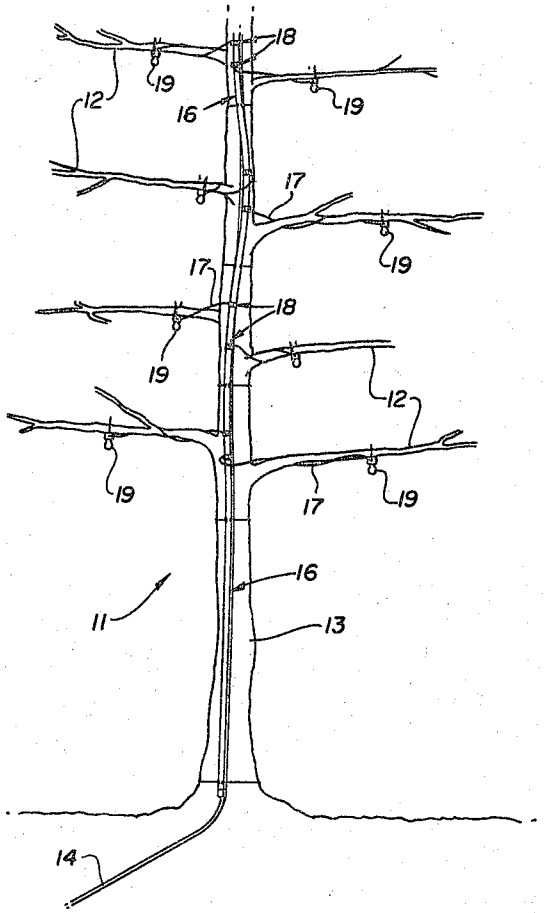
May 23, 1967 D. M. SCHLANGEN 3,321,730

TREE LIGHTING APPARATUS

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Fig. 1



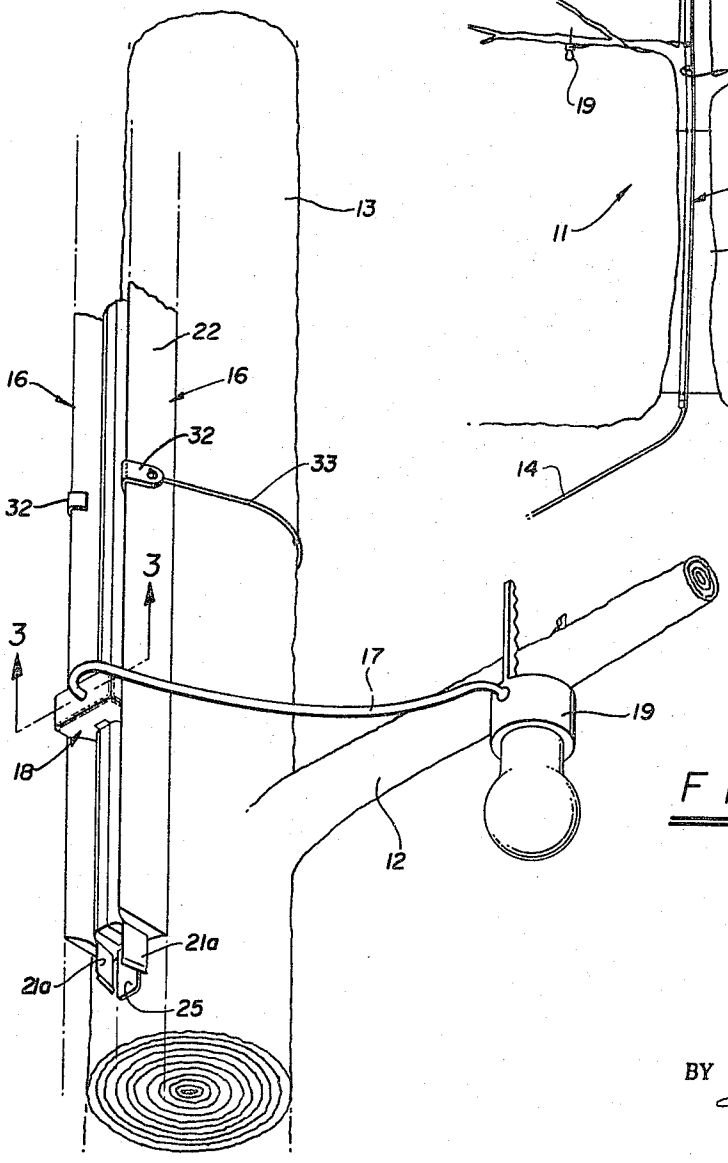


Fig. 2

INVENTOR.
Donald M. Schlangen
BY Fleit & Swain
Attorneys

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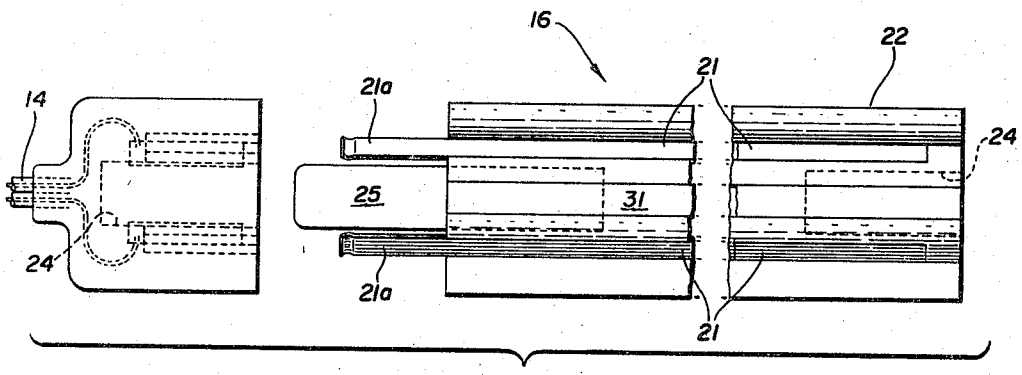


Fig. 4

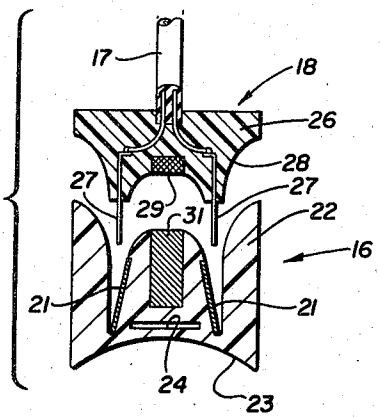
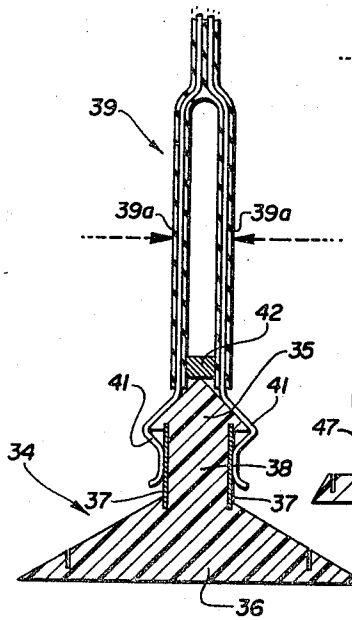


Fig. 3

Fig. 5



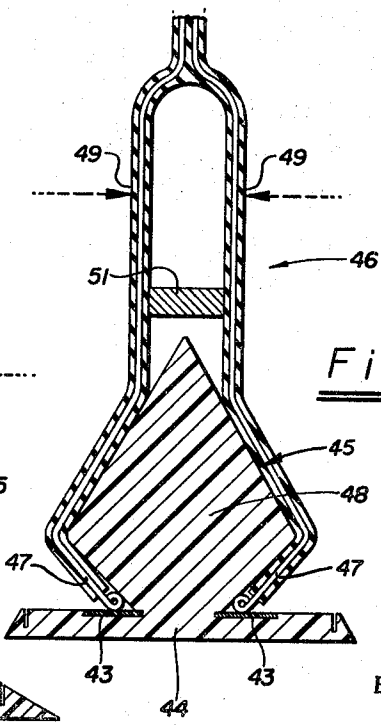


Fig. 6

INVENTOR.
Donald M. Schlangen
BY Fleh & Swain
Attorneys

United States Patent Office 3,321,730 Patented May 23, 1967

3,321,730

TREE LIGHTING APPARATUS

Donald M. Schlangen, 393 Lakewood Lane, Geyserville, Calif. 95441

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3 Claims. (Cl. 339—12)

This invention relates to a tree lighting apparatus and more particularly to such apparatus employing a continuous strip conductor as a main line or bus; the term continuous strip conductor being used to indicate a conductor to which separable connection may be made anywhere along its length.

Commercially available tree lighting systems of the prior art have generally been of the string type wherein a wire or pair of wires, having a number of light sockets thereon, is strung about the tree. While continuous strip conductors, with individual connections for each bulb have been considered, they have not met with success for a variety of reasons. One of these reasons lies in the manner in which electrical connection has been attempted to the continuous strip. In the past, such connections have been by the use of friction between the continuous strip and the plugs to be attached. This frictional attachment requires relatively sturdy plug terminals which not only adds to the expense of the system but also to its size.

It is a general object of this invention to overcome the above mentioned deficiencies by the use of connection means other than friction.

It is an object of the present invention to provide a lighting apparatus employing a continuous strip conductor which is flexible and easily mounted and dismounted.

It is another object of the invention to provide a lighting apparatus employing a continuous strip conductor which can be constructed in sections, enabling the length thereof to be varied by adding or subtracting sections.

It is another object of the invention to provide lighting apparatus of the above character in which plugs are provided that are adapted to easily yet positively, connect with the continuous strip conductor.

It is another object of the invention to provide a lighting apparatus, in the above character in which friction is not relied upon to retain the plugs to the continuous strip conductor.

Other objects and features of the invention will be apparent from the accompanying drawings and following description.

Referring to the drawings:

FIGURE 1 shows a tree equipped with lighting apparatus according to my invention;

FIGURE 2 is a view in perspective showing a section of a tree trunk and a branch with tree lighting apparatus installed thereon according to the invention;

FIGURE 3 is a cross-sectional view taken along the line 3—3 of FIGURE 2 but with the parts shown slightly separated;

FIGURE 4 is an exploded view of a joint between two sections of a continuous strip conductor or bus according to my invention;

FIGURES 5 and 6 are cross-sectional views, somewhat similar to FIGURE 3 but with parts shown completely connected, and showing other embodiments of tree lighting apparatus constructed according to my invention.

Referring now to FIGURE 1, there is shown a tree 11 having limbs or branches 12 and a trunk 13. A power line 14 extends along the ground to the base of the tree and provides a connection to a source (not shown) of conventional electrical energy such as 110 volt A.C.

A main line or bus for transporting electrical energy up the tree trunk 13 takes the form of a continuous strip

conductor 16. Branch lines 17 connect from the conductor 16 by means of plugs 18 to bulbs and sockets 19 secured to the branches 12 of the tree.

Referring now to FIGURES 1 to 4. The continuous strip conductor 16 comprises a pair of flexible electrically conductive members 21 supported in spaced relationship in an elongated body 22 of flexible electrical insulating material. As shown in FIGURE 3, the body 22, in transverse cross section, is formed in a generally W-shape. The base 23 of the body 22 may be slightly curved to permit a good fit to the generally cylindrical tree trunk.

As can be seen in FIGURE 4, the body 22 has an alignment slot 24 extending inwardly from one end thereof and an alignment bar 25 mounted in and projecting outwardly from the other end thereof. Sections of the continuous strip conductor 16 can be joined mechanically by pushing them together end to end and causing the alignment bar 25 of one section to be inserted in the alignment slot 24 of another section. The bar and slot serve to position the members correctly and, by friction or otherwise, to hold and retain them in a connected configuration.

In order to electrically connect the sections of the conductor 16 when pushed together end to end, extensions 21*a* of the conductive strip members 21 on an adjacent section to form an electrically conductive joint between the sections.

Means is provided for making connection to the conductor 16 and may include a plug 18 having a body 26 made of a suitable insulating material such as rubber and a pair of spaced-apart prongs 27 embedded in the body. The prongs 27 are spaced to correspond generally to the spacing of the conductive members 21.

As is shown particularly in FIGURE 3, the shape of the lower face 28 of the plug 18 is made to mate with the shape of the conductor 16 and consequently, to be self-aligning therewith when connected. The plug 18 has a small permanent magnet 29 embedded in the lower centermost portion thereof. A strip or ribbon 31 of magnetic material is embedded in the upper center portion of the main line section 16 at a point which is opposite the magnet 29 when the parts are joined together. The magnet 29 and ribbon 31 serve to retain the plug on the conductor 16. The prongs 27, electrically connected to the branch line 17, are constructed of a suitable conductive spring-like material which will maintain resilient contact with the conductive strips. It should be apparent, however, that the prongs 27 are not employed to form a frictional bond with the members 21 and, therefore, need not be particularly rugged. Actually the prongs 27 may take the form of relatively light wire.

As shown in FIGURE 2 means is provided for securing the conductor 16 to the trunk of the tree and consists of clips 32 and spring 33. The clips 32 are constructed to overlie and hold the edges of the main line sections while the spring 33 connects from each clip 32 around the tree trunk to the other clip 32.

Referring now more particularly to FIGURES 5 and 6, alternate embodiments of my invention are shown in which spring locks are employed rather than magnetic attraction. In FIGURE 5 the continuous strip conductor 34 is shaped, in transverse cross section, like an arrow with a head 35 and tail 36. Conductive strips 37 are disposed parallel and in line along a web portion 38 joining the head 35 and tail 36. A plug body 39 supports a pair of spring prongs 41 in the form of hooks in spaced apart relation. The plug body 39 is constructed to be compressible at the area indicated at 39*a* so as to open the prongs 41 by lever action about an incompressible spacer 42.

In FIGURE 6 there is shown a different configuration in which conductive members 43 lie in a plane generally parallel to the base 44 of the continuous strip conductor 45. A plug 46 includes spring prongs 47 in the form of hooks which are bent to conform to the shape of an enlarged upper portion 48 of the conductor 45. The prongs 47 reach around the upper portion 48 to the base 44 and may be separated by squeezing generally at the location indicated at 49 by lever action about the spacer 51.

I have, therefore, provided an improved tree lighting apparatus in which a composite main line takes the form of a continuous strip conductor. The continuous strip conductor is transversely flexible throughout its length and plugs are retained in electrical connection to the conductor by means other than friction between the prongs conductive members. Furthermore, my invention provides a novel plug shape wherein the plug is self-aligning with and may be plugged in anywhere along the main line.

While I have shown preferred forms of apparatus for practicing the invention, I wish it to be understood that various changes may be made therein by those skilled in the art without departing from the invention as defined in the following claims.

I claim:

1. A power line section and plug for attachment thereto, said power line section comprising an elongated body of flexible insulating material having a tail portion, an enlarged head portion, a pair of conductive strip members disposed along the body and generally between said head portion and said tail portion, one of said conductive strip members lying on each side of said head portion, a forked plug having two prongs and including body of flexible insulating material, a conductor running through and extending beyond each of said prongs, and a rigid spacer disposed between the prongs, said plug and said body so constructed that the plug prongs are openable by force applied to the plug prongs on that side of the spacer away from the ends of the plug conductors to allow the plug to be positioned over the head portion of the body, release of the prongs causing the plug conductors to contact the conductive strip members.

2. A power line section and plug as in claim 1 in which said power line section includes a web portion disposed between and connecting the tail and head portions, said conductive strip members disposed along and on each side respectively of said web portion.

3. A power line section and plug for attachment thereto, said power line section comprising an elongate

member of flexible insulating material, said member having a pair of spaced parallel slots thereon opening substantially along the entire length of said power line section and facing generally in a common direction, a pair of elongate conductors, one of said conductors being disposed in each said of said slots for supplying power to a plug, said power line section including means for retaining and supporting each of said conductors within its respective slot, and a plug including a pair of conductive prongs, a body for securing and retaining the prongs in insulated spaced relationship so that the prongs can be simultaneously inserted into the slots of said elongate member, and said power line section and plug being so constructed that when the plug is rotated about a line transverse to the section and intersecting points of contact therebetween, the plug and section are separated by body forces exerted between them, said prongs and said elongate conductors being so constructed and arranged that they make essentially frictionless, wiping contact with each other as the plug is inserted and withdrawn, one portion of a magnetic retaining means being disposed on said body of said plug and between the prongs, another portion of magnetic retaining means being disposed on said elongate member between the slots thereon and adapted for registry with the first portion of said magnetic retaining means on said plug when the plug is connected to the power line section, said magnetic means constituting the sole means for retaining the power line section to the plug so that when said plug is rotated about a line transverse to the power line section and intersecting points of contact between the plug and the power line section said magnetic retaining means is broken open and said plug is freely movable to thereby permit easy withdrawal of said plug from said power line section without requiring significant external support of the power line section.

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NORTON ANSHER, *Primary Examiner.*