ABSTRACT OF THE DISCLOSURE

An electric permanent candle is described where the bulb in the shape of a flame is mounted on a (jack) pin and the top of the candle is fitted with a jack receiver socket. An insulating cam affixed to the pin is of a geometry to provide a make-break circuit operated by the rotation of the bulb in the absence of additional switches. A like arrangement is described for mating the base of the candle with a recharging fixture.

This invention relates to electrical apparatus, and more particularly to decorative electrical apparatus such as permanent candles. As most people are aware, candles and the luminous effect thereof have widespread appeal. There is, however, frequently a reluctance to employ candles because of the fire hazard, a primary disadvantage which attends their use. There is also the disadvantage that candles, particularly specially designed candles, are consumed in use at an accumulating replacement cost. Moreover, attention to replacement and to wax removal is frequently required. All of these disadvantages make permanent candles relatively attractive.

Many attempts have been made to provide the appeal that the candle offers and also eliminate the consumption of the candle and the fire hazard. Some of these attempts have at best been partially successful in eliminating only the candle consumption but not the fire hazard. Other attempts have, somewhat, even reduced the fire hazard but at the expense of the design of the candle. If it is acknowledged that a major part of the appeal of a candle is in its design, then it is clear that adherence to design requirements cannot be sacrificed for expedience.

For electrically powered permanent candles, of prime concern is the electrical switch, which normally includes a physical appearance to the candle which does violence to acceptable design.

An object of this invention is to provide a new and novel portable electric candle.

Another object of this invention is to provide an electric switch arrangement which permits the illumination and the extinguishing of a permanent candle "flame" in a manner compatible with candle design considerations.

The foregoing and further objects of this invention are realized in one embodiment thereof wherein an electric bulb is secured to a conductive jack mounting (pin) for releasably mating with an electrically energized jack receiver (socket). The jack mounting is equipped with a cam for alternately making and breaking the power supply to the bulb filament by the rotation of the bulb itself or either direction. The bulb is equipped with a convoluted translucent cap within which the bulb is positioned for realistically reproducing the appearance of a flame. The candle is battery powered and rendered compatible with a recharging fixture including a controllable electrically jack mounting. The jack receiver for this last-mentioned jack mounting is mounted on the battery housing and is electrically in contact with the batteries. Accordingly, a feature of this invention is an electric candle including an electrified jack receiver.

Another feature of this invention is an electric bulb secured to a jack mounting for providing a bulb assembly which can be releasably mated to an electrified jack receiver connected to a power supply.

Another feature of this invention is an electric bulb secured to a jack mounting including a cam for making and breaking the power supply to the bulb filament in response to the rotation of the bulb.

A further feature of this invention is a convoluted translucent cap for an electric bulb including means for positioning the bulb therewithin for realistically reproducing the appearance of a flame.

A still further feature of this invention is a battery housing including a first and second jack receiver affixed thereto.

The foregoing and further objects and features of this invention will be understood more fully from a consideration of the following detailed discussion rendered in conjunction with the accompanying figures wherein;

FIG. 1 is a partially exploded view of candle arrangements in accordance with this invention; and

FIG. 2 is an enlarged exploded view of a portion of the arrangement of FIGURE 1.

Specifically, FIG. 1 shows a partially exploded view of an electrically powered permanent candle arrangement in accordance with this invention. The candle arrangement comprises a hollow elongated cylindrical member 11 (batter housing) the diameter of which is smaller at a first end 12 than it is at the other end 13 to provide illustratively a slightly tapered appearance of a candle. Battery housing 11 comprises conventionally an electrically conducting material typically aluminum with an anodized or plastic coating.

A jack receiving assembly 20, shown in an enlarged exploded view in FIG. 2, is connected to end 12 of housing 11. The assembly 20 comprises a tubular member 21 having both internal (bore) and external diameters reduced over a portion thereof providing an internal seat 22 for additional members mating therewith. A T-shaped member 23 is mated with member 21 and held tightly against internal seat 22 by a member 24 which slidably engages the relatively large internal diameter of member 21 to provide a snug fit therewith. Member 24, as can be seen from the figure includes an opening (bore) axially therethrough for receiving the shaft 25 of T-shaped member 23. The T-shaped member 23 also includes an axial opening aligned with the axial opening of relatively small internal diameter of element 21. The T-shaped element is electrically conducting and is of a shape such that shaft 25 thereof protrudes beyond member 24 when the last-mentioned member is secured in position for connection with batteries not shown within housing 11. The remaining elements of the jack-receiving assembly comprise electrically insulating material, typically Teflon or a high-impact styrene. Member 21 includes an axially aligned flat portion 26 along its external surface. Stepped elongated flat electrically conducting member 27 is adapted to fit against flat portion 26 to which it is secured by an electrically conducting resilient annulus 28 which snap-fits about the smaller external diameter of member 21 and conducting member 27. Conducting member 27 when secured in position by annulus 28 makes electrical contact with battery housing 11 and extends beyond the member 21.

Jack-receiving assembly 20 is adapted to fit within battery housing 11 at the end 12 thereof and also at end 13 thereof, as represented in FIG. 1, for recharging embodiments where coupling to a recharging fixture is desired. In the absence of a jack-receiving assembly at end 13 of housing 11, a conventional spring bearing, electrically conducting cap (not shown) may be employed.

Housing 11 is of an internal geometry for housing commercially available batteries for the replacement of which the assembly at end 13 thereof is conveniently removable.
Alternatively, battery housing 11 may include permanent nickel-cadmium batteries along with a permanent termination at end 13.

A jack-mounted bulb assembly 30, shown in enlarged exploded view in FIG. 2, is designed for mating with a jack-receiving assembly 20 at end 12 of battery housing 11. To this end the internal diameter of T-shaped member of the jack-receiving assembly 20 is adapted as a socket, or, alternatively, may include a socket (not shown) to receive a jack mounting (pin) in a pressure or snap fit. Bulb assembly 30 comprises, illustratively, a small bulb 31 comprising a filament 32 with first and second leads 33 and 34, respectively. Lead 33 is enclosed by tubular electrical insulating member 35, typically electrical "spaghetti", and continued through an electrically insulating member 36. Member 36 has an axially stepped external diameter and an axially oriented opening (bore) of single (internal) diameter therethrough. Lead 33 continues through the axial opening of member 36 and is connected to a jack-mounting (pin) 37 secured (conveniently by cementing) to member 36 at the opposite end of that opening. The central portion 38 of member 36 has a relatively large external diameter. An electrically conductive eyepet 39 mates with member 36 over the end portion thereof, to which pin 37 is connected, and seats against the shoulder provided by the enlarged central portion of member 36. Importantly, that enlarged central portion of member 36 has a diameter greater than that of eyepet 39. Also importantly, that enlarged central portion includes an axially oriented flat surface along its periphery, designated 40 in the figure. At that flat portion, eyepet 39 protrudes therefrom. Accordingly, the enlarged central portion of member 36 acts as a cam exposing an electrically conductive connection to eyepet 39 as assembly 30 is related clockwise or counterclockwise about its axis. Member 27 of the jack-receiving assembly 20 extends beyond member 21 of that assembly to turn that cam action to account. Consequently, electrical contact is provided between eyepet 39 of the jack-mounted bulb assembly 30 and flat conducting member 27 of jack-receiving assembly 20 when eyepet 39 is exposed by rotation of (protrudes beyond) the enlarged central portion 38 of insulating member 36. Lead 34 of bulb assembly 30 is connected to eyepet 39 via the flat external portion of insulating member 36, thus, enabling energization of filament 33. A flame-shaped, partially hollow, translucent member 41 fits over bulb 31 engaging member 41 in a manner to seat against enlarged central portion 38 of that member snugly fitting the side thereof, opposite to that which eyepet 39 engages. Flame-shaped member 41 is of a design to permit bulb 31 to extend well within its internal hollow. Electrical "spaghetti" 35, accordingly, is chosen of a length to permit such a positioning of bulb 31. In this manner, and particularly when member 41 is tinted (by any well-known means) a very realistic flame effect is provided with a dark area under the "flame" as is provided by an illuminated wax candle.

The permanent candle, in accordance with this invention, is, accordingly, provided by two snap-together assemblies the relative motion between which about a common axis provides a means for switching the "flame" between illuminated and extinguished states. This convenient switching means permits wide flexibility in candle designs in the absence of uneconomical mechanical switching apertures; As was mentioned hereinbefore, jack-receiving assembly 20 is employed conveniently at end 13 of battery housing 11 which houses batteries (not shown) in an embodiment of this invention adapted for recharging of those batteries. Recharging fixture 50 is designed to mate with that last-mentioned jack-receiving assembly and includes an assembly much like jack-mounted bulb assembly 30 to this end. More specifically, recharging fixture 50 includes, illustratively, first and second candle receivers 51 and 52 (shown in FIG. 1) designed like candlestick holders to receive permanent candles in accordance with this invention. At the bottom of each of these candle receivers is a jack-mounted assembly much like bulb assembly 30 except that a power source (not shown) is provided between leads 33 and 34 of an analogous such jack-mounted bulb assembly. A pin 37 is shown in candle receiver 51 in FIG. 1. Electrical contact provided between recharging fixture 50 and a jack-receiving assembly connected to an end 13 of a permanent candle in accordance with this invention is substantially as described in connection with the mating of a jack-mounted bulb assembly 30 at the opposite end of that permanent candle.

The recharging fixture conveniently comprises a suitable transformer (not shown) to which power is supplied via male plug 53 from an electrical source. The various electrical connections for this implementation are well understood in the art and are not further discussed herein.

Importantly, a rechargeable permanent candle is provided in accordance with this invention, not only wherein the flame is illuminated and extinguished by rotating the "flame" (the bulb assembly) with respect to the candlestick (battery housing) but also wherein batteries within the candlestick are recharged by rotating the candlestick with respect to a candlestick holder (recharging fixture).

Alternatively, in the assembly 20 within end 13 of battery housing 11, eyepet 39 may have a diameter larger than that of central portion 38 for permitting recharging merely by inserting the candlestick into recharging fixture. Further, permanent candles in accordance with the invention completely avoid any fire hazards which attend similar prior art apparatus, a significant advantage particularly for commercial establishments where the use of apparatus attended by fire hazards is strictly regulated by law.

An adapter end member A, as shown in FIG. 1, may be provided on end 13 of (battery housing) member 11 for rendering a permanent candle compatible with variously shaped candle holders. Such adaptive members may be interchangeable and are, conveniently, removably connected to member 11.

The invention has been described in terms of a permanent candle including a battery power supply connected to a jack receiver for mating with a jack-mounted bulb assembly. It should be clear that the power need not be battery supplied but may be supplied, alternatively by, for example, house current via a suitable transformer. The bulb and jack-receiving assemblies permit other and different decorative implementations when so powered. Moreover, the battery housing herein is described, illustratively, as electrically conducting. This is not necessary. The housing need only include a conducting path for permitting a closed circuit between the batteries and the bulb.

What has been described is considered to be only illustrative of the principles of this invention. Thus, numerous and varied other arrangements may be devised, in accordance with those principles, by those skilled in the art without departing from the spirit and scope of the invention.

What is claimed is:
1. In combination, an electrical element including first and second spaced-apart portions, a conductive pin affixed to said element and making a first electrical connection to said first portion of said element, a circular conductive member coaxial with and insulated from said pin and having a first diameter, said circular conductive member making electrical connection to said second portion of said element, and insulating means affixed to said pin for controllably exposing electrically said circular member for connection to a second electrical conductor in response to the rotation of said pin said last-mentioned means comprising an annular electrically insulating element having a second diameter greater than said first diameter and including a section of reduced diameter for permitting said circular conductive member to protrude therebey.
2. In combination, an electric bulb including a filament with first and second ends, a conductive pin making a first electrical connection to said first end of said fila-
ment, a circular conductive member having a first diameter affixed to said pin in an electrically insulated manner, said circular conductive member making electrical connection to said second end of said filament and insulating means having a second diameter greater than said first diameter affixed to said pin, said insulating means having a portion of reduced geometry for controllably connecting electrically said circular conductive member to a second electrical conductor in response to the rotation of said bulb.

3. A combination in accordance with claim 2 wherein said insulating means comprises an electrically insulating cam fixed coaxially with respect to said pin, said cam having a second diameter greater than said first diameter and including a section of reduced dimensions for permitting said circular conductive member to protrude therebeyond.

4. A combination in accordance with claim 3 including a hollow flame-shaped translucent cap, and means for positioning said bulb within said cap to provide a light and relatively dark area within said cap when said bulb is illuminated.

5. A combination in accordance with claim 3 including a battery housing having first and second ends, and a first jack-receiving assembly including said second conductor mounted within said first end for receiving said jack-mounted bulb assembly.

6. A combination in accordance with claim 5 including a second jack-receiving assembly mounted within said second end of said battery housing.

7. A combination in accordance with claim 6 including a recharging fixture having receivers for said battery housing including a jack mounting, said jack mounting being adaptable for connection to a power supply.

8. A combination in accordance with claim 2 including a power supply comprising first and second electrical conductors, and a first jack-receiving assembly connected to said first conductor for rotatably receiving said jack mounting.

9. In combination, an electrical element including first and second spaced-apart portions, a jack mounting making a first electrical connection to said first portion of said element, a circular conductive member having a first diameter affixed to said jack mounting in an electrically insulating manner and making a second electrical connection to said second portion insulating means affixed to said jack mounting, said insulating means comprising an insulating cam having a second diameter larger than said first diameter with a section of reduced diameter for controllably exposing electrically said circular conductive member for connection to a second electrical conductor in response to the rotation of said jack mounting, and a power supply including first and second electrical conductors and a jack-receiving assembly connected to said first conductor for rotatably receiving said jack mounting.

10. An electrical element comprising a jack-mounted assembly including both a conductive pin and a circular conductive member having a first diameter affixed coaxial with said pin and insulating therefrom, a jack-receiving assembly including both a conductive element forming a socket for rotatably receiving said pin and a second conductor, and electrically insulating means affixed to said pin, said last-mentioned means having a second diameter greater than said first diameter and having a portion of reduced diameter for alternately making and breaking electrical contact between said circular conductive member and said second conductor in response to the rotation of said pin within said socket.

11. In combination with an electrical element in accordance with claim 10, an electric bulb connected between said conductive pin and said circular conductive member.

12. In combination with an electrical element in accordance with claim 10, a power supply connected between said conductive element forming said socket and said second conductor.

13. A combination in accordance with claim 11 including a hollow flame-shaped translucent cap, and means for positioning said bulb within said cap to provide a light and relatively dark area within said cap when said bulb is illuminated.

14. A combination in accordance with claim 12 wherein said power supply comprises batteries.

15. A combination in accordance with claim 14 including a candle-shaped battery housing for said batteries, said battery housing including first and second ends, said jack-receiving assembly being fixed to a first end of said battery housing.

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