

[54] COMPACT, BATTERY-POWERED LIGHT

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[51] Int. Cl. **F211 7/00**

[58] Field of Search **240/6.4 R, 6.42, 10.6 R, 240/10.66, 67, 68, 70, 84, 25; 248/156; 52/165**

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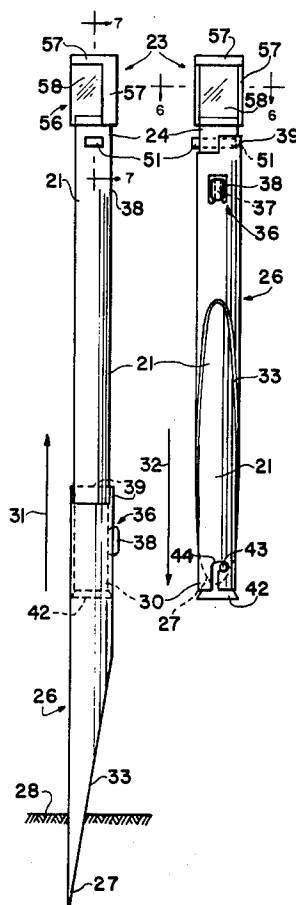
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[57]

ABSTRACT

A compact, self-supporting, battery-powered light, primarily designed for use by campers and outdoorsmen, is disclosed. The battery-powered light includes an elongated tubular body formed for receipt of battery means therein, an electrically actuated light bulb mounted proximate a first end of the body, and an integral, collapsible ground stake means. The elongated ground stake is mounted to the body of the light for selective movement to and from an extended position and a stored position. The pointed stake end is positioned in close proximity to the body of the light upon collapsing of the stake for compactness and safety. In a preferred embodiment the ground stake is formed as a tube mounted for reciprocation about the body of the light, and in another embodiment the ground stake is pivotally mounted to the body of the light.

6 Claims, 7 Drawing Figures



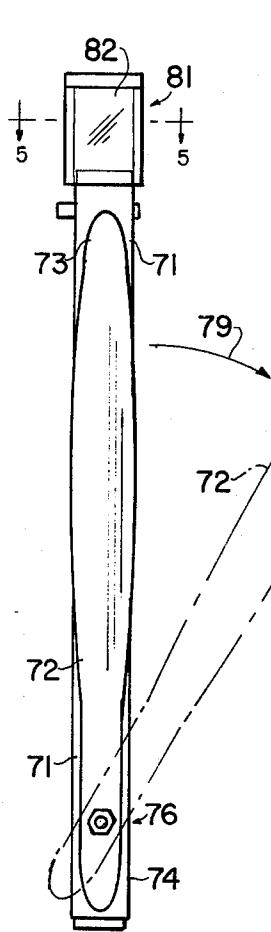


FIG.-3

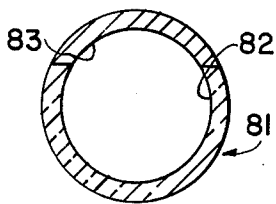


FIG.-5

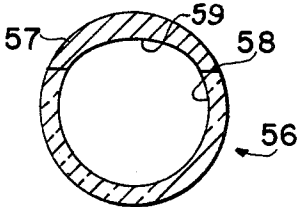


FIG.-6

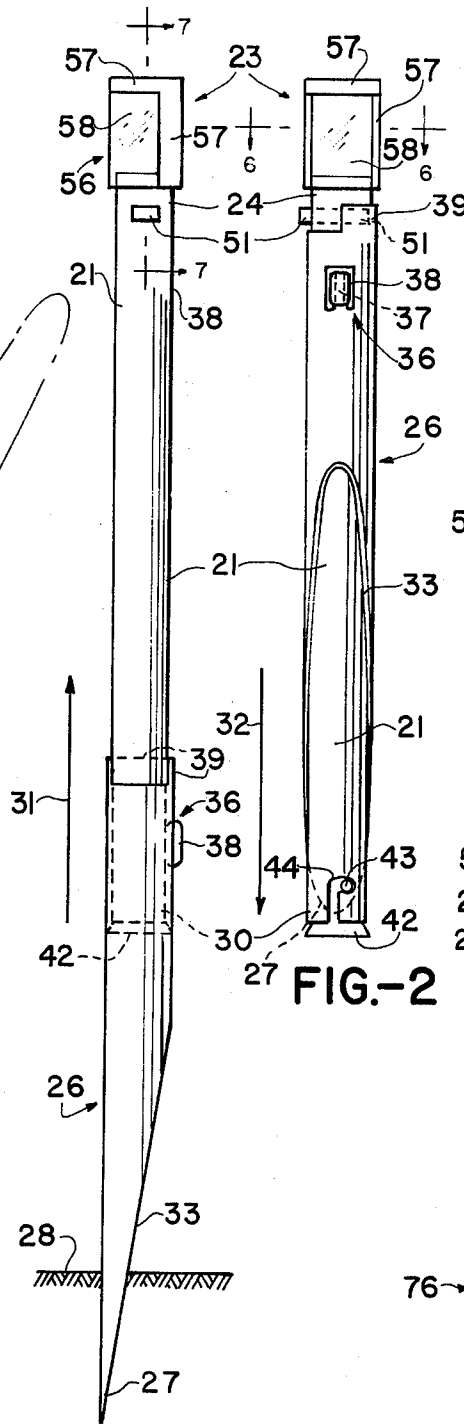


FIG.-1

FIG.-2

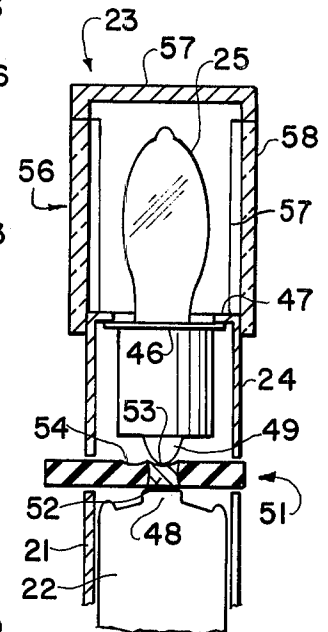


FIG.-7

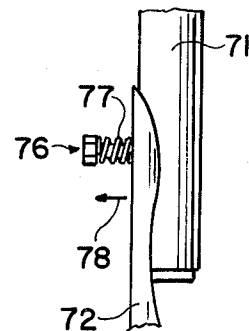


FIG.-4

COMPACT, BATTERY-POWERED LIGHT

BACKGROUND OF THE INVENTION

Virtually all campers and outdoorsmen carry some type of portable light source with them on their camping trips. Usually the light source is a flashlight. While flashlights are adequate for use by the camper or outdoorsman in many situations, there are numerous other instances when the conventional flashlight is inadequate for the camper's needs. For example, general area lighting is often highly desirable in order to perform tasks such as cooking and preparing for sleep, and a flashlight, with its focused beam, does not satisfy this need. Still further, the outdoorsman often needs to use both hands while performing many tasks, and conventional flashlights are primarily designed for handheld use and are most difficult to rest or support in a manner directing the beam to a desired area.

As also will be apparent, it is always highly desirable, and sometimes absolutely necessary, that any portable light source be compact, lightweight and easy to operate. This is particularly true when the light source is to be used by a backpacker, who is faced with both size and weight limitations on his load.

Conventional flashlights have been modified to act as emergency lights, as for example is shown in U.S. Pat. No. 2,647,254; and self-supporting structures, such as ground stakes, have been associated with various types of outdoor lights, as is shown in U.S. Pat. Nos. 3,104,064, 2,549,627 and 2,517,239. Moreover, various folding and telescoping support structures have been associated with lights, as is shown in U.S. Pat. No. 3,026,409. While these various approaches have been suitable for the use to which they have been put, they are too bulky, heavy, complex or expensive or are inherently too dangerous or unwieldy for use in a light for the outdoorsman.

Accordingly, it is an object of the present invention to provide a battery-powered light which is compact and yet self-supporting and which further may be used for general area lighting.

It is another object of the present invention to provide a compact, self-supporting, battery-powered light suitable for use by campers, outdoorsmen and the like in which the supporting structure is easy to operate and is carried as an integral element of the light.

Still a further object of the present invention is to provide a compact, battery-powered light for campers which may be easily and safely stored, is suitable for both directional and area lighting, is sturdy and durable for outdoor use, and has a minimum of operating elements.

The compact, self-supporting, battery-powered light of the present invention has other features, objects and advantages as are shown and set forth in detail in connection with the accompanying drawing and description of the preferred embodiments.

DESCRIPTION OF THE DRAWING

FIG. 1 is a side elevational view of a battery-powered light constructed in accordance with the present invention with a ground stake means shown in extended position.

FIG. 2 is a front elevational view of the battery-powered light of FIG. 1 with the ground stake means shown in stored position.

FIG. 3 is a front elevational view of an alternative embodiment of a battery-powered light constructed in accordance with the present invention with a ground stake means shown in stored position and shown in phantom rotated approximately 30°.

FIG. 4 is a fragmentary, side elevational view of the light of FIG. 3 with the ground stake means shown in extended position.

FIG. 5 is an enlarged, cross-sectional view taken substantially along the plane of line 5 — 5 of FIG. 3.

FIG. 6 is an enlarged, cross-sectional view taken substantially along the plane of line 6 — 6 of FIG. 2.

FIG. 7 is an enlarged, fragmentary, side elevational view in cross-section taken substantially along the plane of line 7 — 7 of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to FIGS. 1, 2 and 7, the compact, battery-powered light of the present invention can be seen to be comprised, briefly, of an elongated tubular body 21 formed for receipt of battery means 22 therein, and electrically actuated light emitting means, generally designated 23, and preferably including a conventional light bulb 25, mounted proximate a first end 24 of body 21. Light emitting means 23 is adapted for electrical connection to battery means 22, as will be set forth in more detail hereinafter. In order to provide a compact, self-supporting structure for the light of the present invention, the light further includes the improvement of elongated ground stake means 26 formed with a stake end 27 adapted to be urged into a supporting surface 28. Ground stake means 26 is mounted to body 21 for selective positioning in and movement to and from an extended position, as is shown in FIG. 1, and a stored position, as is shown in FIG. 2. Stake end 27 extends outwardly of the second end 30 of body 21 for self-support of the light in the extended position, and the stake end is positioned in close proximity to the body in the stored position to provide a very compact structure and to minimize possible damage or injury from the stake end when the light is not in use.

As is shown in the embodiment of FIGS. 1 and 2, it is a feature of the present invention that ground stake means 26 be reciprocally mounted to body 21 for movement to and from the stored and extended positions. Arrow 31 shows the direction of movement from extended to stored position, and arrow 32 shows the direction of movement from stored to extended position. This may most advantageously be accomplished by forming ground stake means 26 as a tubular member telescopically mounted on body 21.

In order to provide a stake end 27 which may be easily driven into a supporting surface, stake end 27 may be diagonally sheared along the plane of line 33, as best may be seen in FIG. 1. Such a diagonal shearing of tubular ground stake 26 allows the stake end to be easily urged into supporting surfaces such as soil, sand, and the like, as well as to be easily wedged between rocks or inserted in a crack between wood members, or even driven into other objects. As will be readily understood, it is not necessary that ground stake 26 be formed as a tubular member, nor is it necessary that the tubular member have its pointed end provided by a cut or slash 33 diagonally across the tubular member.

Ground stake means 26 should be mounted to body 21 in a manner which will enable full support of the

weight of the light when the ground stake is in the extended position. Thus, when the ground stake is in the form of a tubular member telescopically mounted on body 21, it is preferable to further provide the compact light of the present invention with detent means 36 formed to releasably secure tubular ground stake 26 in the extended position of FIG. 1 and also, preferably, in the stored position of FIG. 2.

One form of detent means 36 which has been found to be suitable for use in the battery-powered light of the present invention may be constructed by forming a tab 37 (best seen in FIG. 2) on which is mounted cap-like rubber element 38 which frictionally engages tubular body 21. The tab will normally be resilient when the tubular ground stake is formed of a metallic material, which is preferred in the present invention. Rubber cup 38 will frictionally engage body 21 in both the stored and the extended positions and, in fact, at any position along the length of body 21. The frictional forces between the cup and the body are sufficient to support the weight of the light, but they will not prevent manual reciprocation of the ground stake with respect to body 21. It should also be noted that the downward frictional force on cup 38 tends to rotate tab 37 about the base thereof inwardly toward body 21. Thus, detent 36 has a tendency to wedge cup 38 against body 21 under the weight of the light and lock the ground stake in any selected position.

As will be immediately appreciated, it is possible to form the detent means for the telescoping ground stake in a number of different manners, including the formation of protrusions or enlarged sections on body 21, the use of simple spring clips and mating recesses, the use of a bayonet-type of interlock, etc.

The compact, battery-powered light of the present invention preferably employs between two to four batteries 22 which are arranged in axial alignment in tubular body 21 in a conventional manner. In the preferred form of the invention three size AA 1.5 volt batteries are employed. Releasably mounted in the second end 30 of body 21 is an end closure element 42. End closure element 42 may be provided with a pin 43 which protrudes into a track 44 formed in body 21 to provide a bayonet-type of releasable securement of the end closure element to the body of the light. The end closure element further preferably carries a spring (not shown) which urges the batteries toward light bulb 25 in a conventional manner.

End closure element 42 is further preferably formed with a protruding portion which extends radially outwardly of body 21. Thus, the end closure element cooperates with detent means 36 to prevent accidental removal of the ground stake from the end of the body. If the end closure element is formed with a surface having a high coefficient of friction, such as rubber, rubber cup 38 will engage rubber end closure 42 and securely hold the ground stake on the body of the light. Thus, it is an important feature of the present invention that the ground stake supporting structure is carried as an integral element of the light, and not as a separate piece which can become lost or mislaid. It is further possible, however, to remove the ground stake if necessary or desirable by first removing end closure element 42, but this is not likely to occur accidentally.

Electrical connection of light bulb 25 to the battery means can be accomplished in a number of manners. It is preferred to form body 21 of an electrically con-

ducting material which contacts flange 46 of bulb 25 at the inwardly protruding annular seat 47 at end 24 of the light body (best seen in FIG. 7). Additionally, the spring carried by end closure element 42 is electrically connected to body 21 and provides an electrical contact between the battery terminal and the body to complete the electrical circuit. The opposite battery terminal 48 is electrically connected to terminal 49 of the light bulb through light actuating switch means 51. As shown in FIG. 7, the light actuating switch means preferably is formed as an electrically insulating member, which may be reciprocated transversely of body 21. Switch 51 has a conductive path 52 which may be selectively interposed between or brought into alignment with terminals 48 and 49 to complete the circuit.

In order to assist in indexing switch means 51, a first recess 53 in conductive material is formed to mate with terminal 49 and a second recess 54 in the electrically insulating portion of switch 51 is similarly formed to mate with terminal 49 on the "on" and "off" positions, respectively. It should be noted that the spring carried by end closure element 42 will urge the batteries 22 against light actuating switch means 51, with this axial force tending to maintain the switch means in either the "on" or the "off" position by urging the selected one of recesses 53 and 54 upwardly against terminal 49.

As best seen in FIG. 2, the end of ground stake 26 proximate switch 51 is formed with a longitudinally extending collar or flange 39 which can be advantageously used to lock the switch in the "off" position for storage and transportation.

Other forms of light actuating switch means may be employed with the present invention. Similarly, it is possible to form body 21, and ground stake 26 of plastic materials or electrically insulating materials. In such a construction a strip of electrically conductive material can run from end closure 42 to flange 46 of the light bulb, as is conventionally done with flashlights formed from plastic materials. It should be noted further that the light actuating switch means can be independently operable of the ground stake, as is shown in the embodiment of the invention of FIGS. 1, 2 and 7, or the switch means can be actuated as a result of reciprocation or movement of the ground stake from the stored to the extended position.

It is believed that the compact, self-supporting, battery-powered light of the present invention can most advantageously be used by campers and outdoorsmen as an area lighting device. It is possible to provide the light of the present invention with a reflector which forms a beam, but many outdoorsmen find that area lighting by a self-supported light is more useful than directional lighting. Accordingly, light emitting means 23 may include a cap-like element 56 having an opaque or translucent, and preferably light reflective, area 57 which defines a transparent section 58 through which light is emitted. As will be seen, the opaque or reflecting sections 57 prevent or reduce the emission of light in selected directions, and the transparent section 58 allows light to be emitted in a horizontal and downwardly oriented sector. As thus far described, the end cap would not focus the light in a beam for directional use, but instead would concentrate the light in an outwardly and downwardly direction, making the light extremely useful for area lighting of the supporting surface adjacent the ground stake.

If it is contemplated that the compact light of the present invention is to be used to a substantial degree for directional lighting as well as area lighting, it is possible to provide end cap 56 with a parabolic reflective surface 59, as shown in FIG. 6. The parabolic reflective surface 59 would be designed with respect to bulb 25 so as to produce a focused beam, although a substantial quantity of light would not be focused and would be usable for area lighting. Such a construction would enable both area and directional lighting.

As will be seen from the description thus far, a highly compact, self-supporting, battery-powered light is provided in which the various elements serve multiple purposes. Thus, body 21 is used to store the batteries, acts as an electrically conductive path, and very importantly combines with the length of ground stake 26 to elevate the light emitting means to a substantial and remote distance above the supporting surface into which the ground stake is urged. In this regard, it is further preferable that the ground stake 26 have an overall length about equal to the length of body 21. Such a construction insures the maximum elevation of the light emitting element while also greatly enhancing the compactness of the light. It is possible, although not felt necessary, to provide a plurality of telescoping members and detent means to further elevate the light if necessary. For most applications, however, a single telescoping tube has been found to provide sufficient height.

More particularly, when the battery-powered light of the present invention is formed to be powered by three size AA batteries, the overall length of the light is about 8 inches and the diameter about $\frac{3}{4}$ of an inch, when the ground stake is in stored position. When the ground stake is fully extended, the light bulb will be elevated to about one foot over the supporting surface with the ground stake driven into the supporting surface to a depth of about 2 inches. This elevation of the light is usually sufficient to enable the performance of tasks such as preparing food, reading, searching for items in your pack, getting ready for bed, etc.

End cap 56 can advantageously be formed of a resilient plastic material having a coating 57 thereon to define the desired light emission pattern. Such an end cap can also be readily removed from the end 24 of the body of the light and ground stake 26 used as a handle. When so used, the extra length of the ground stake allows the light bulb to be positioned more remotely of the hand of the user. Thus, when the user is walking down a trail, he may remove cap 57, extend ground stake 56 and hold onto the ground stake so that the light may be held close enough to the ground to provide good lighting of the same even though the light is not in the form of a focused beam.

Notwithstanding the above noted advantages and versatility of the light of the present invention, when the ground stake is in the stored position of FIG. 2, the pointed end of the ground stake presents absolutely no safety hazard to the user. Thus, the light may be easily packed with the equipment of the camper without endangering the other equipment or the camper himself. The sharp end of the ground stake is positioned in such close proximity and nested relationship to the body of the light that the overall light takes the form of an elongated, substantially cylindrical object.

Referring now to FIGS. 3, 4 and 5, an alternative embodiment of the compact, battery-powered light of the present invention is shown. Pivotaly mounted on body

71 is ground stake means 72 which is formed for movement to and from the stored position, shown in FIG. 3, and the extended position, shown in FIG. 4. Ground stake 72 is shown as a section of a tubular member having a surface substantially conforming to and mating with body 71 along the length of the body. The ground stake terminates in a pointed end 73 formed for urging into a supporting surface. Pivotal mounting of the ground stake to body 71 is effected at the second end 74 of the body by pivotal mounting means, generally designated 76. The pivotal mounting means includes a spring element 77 to enable resilient displacement of the ground stake means outwardly as indicated by arrow 78 as ground stake 72 is rotated as indicated by arrow 79. Thus, the resilient mounting by the spring element releasably secures the ground stake in angularly locked relation to body 71 in the stored and in the extended positions. Again, this simple construction enables an integrally carried ground stake to be compactly stored with the pointed end thereof safely positioned proximate the body of the light, and yet, the ground stake may be easily and rapidly locked in extended position to provide a supporting structure of substantial height for the light.

The light emitting means in this embodiment of the present invention again is preferably constructed as a cap 81 having a transparent section 82 from which light is emitted and an opaque and/or reflective surface 83. As shown in FIG. 5, surface 83 is cylindrical and primarily used to concentrate the light, rather than focus the same into a beam. The construction of the light of FIGS. 3, 4 and 5 can otherwise be substantially as set forth above in connection with the previous embodiment specifically described.

I claim:

1. In a compact, battery-powered light for campers including an elongated tubular body formed for receipt of battery means therein, and electrically actuated light emitting means mounted proximate a first end of said body and adapted for electrical connection to battery means positioned in said body, the improvement comprising:

elongated ground stake means formed with a pointed stake end adapted to be urged into a supporting surface and an opposite stake end adapted for mounting of said ground stake means to said body, said light emitting means being formed for the illumination of an area of said supporting surface proximate said ground stake means, said body having an overall length substantially equal to the combined length of battery means to be positioned in said body and said light emitting means, and said ground stake means having a length less than said body and being mounted to said body by said opposite stake end for selective positioning in and movement to and from an extended position and a stored position, said pointed stake end extending outwardly of said body for support of said light in said extended position, and said ground stake means being further mounted to said body to locate both said pointed stake end and said opposite stake end between said first end of said body and an opposite second end of said body and in close proximity to said body in said stored position to maximize compactness and to minimize possible damage or injury from said pointed stake end when said light is not in use.

2. A compact, battery-powered light as defined in claim 1 wherein,

said ground stake means is pivotally mounted to said body for movement to and from said stored position and said extended position.

3. A compact, battery-powered light as defined in claim 2 wherein,

said body is formed with a substantially circular horizontal cross-section, and said ground stake means includes a member having a surface substantially conforming to and mating with said body along the length of said body and terminating in a pointed end, said member being mounted to said body for resilient displacement outwardly away from said body and being mounted for pivotal movement substantially in a plane passing tangentially to the circular cross-section of said body and slightly outwardly of said body and being further mounted for resilient securement in locked relation to said body in said stored position and said extended position by mating engagement of said member with said body in both positions.

4. A compact, battery-powered light as defined in claim 1 and

light actuating switch means mounted to said body and adapted for actuation of said light emitting means independently of the operation of said ground stake means, said switch means being formed as an electrically insulating element mounted for movement to and from a position electrically interposing said element between said light emitting means and said battery means.

5. In a compact, battery-powered light for campers including an elongated tubular body formed for receipt of battery means therein and having a first end and an opposite second end, and electrically actuated light emitting means mounted proximate said first end of said body and adapted for electrical connection to battery means positioned in said body, said body having an

overall length about equal to the combined length of said battery means and said light emitting means, the improvement comprising:

5 elongated ground stake means formed with a pointed stake end adapted to be urged into a supporting surface and an opposite stake end adapted for mounting of said ground stake means to said body, said ground stake means being formed as a tubular member having a length less than the length of said body, said ground stake means being reciprocally mounted to the exterior of said body for selective positioning in and movement to and from an extended position and a stored position, said pointed stake end extending axially from said second end of said body for support of said light in said extended position, said light emitting means being formed for the illumination of an area of said supporting surface proximate said ground stake means when said ground stake means is in extending position and said light is supported on said supporting surface by said ground stake means, and said ground stake means being formed for reciprocation to a mating position with said body with said pointed stake end and said opposite stake end both positioned intermediate said first end of said body and said second end of said body in said stored position to maximize compactness and to minimize possible damage or injury from said pointed stake end when said light is not in use.

6. A compact, battery-powered light as defined in claim 5 wherein,

said ground stake means includes at least one tubular member telescopically mounted on the exterior of said body and detent means formed to releasably secure said tubular member in said extended position formed with pointed end to provide said pointed stake end.

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