Dec. 28, 1965 R. L. BUSTAMANTE 3,226,538

ILLUMINATING MEANS

Filed Nov. 19, 1963

Fig. 1

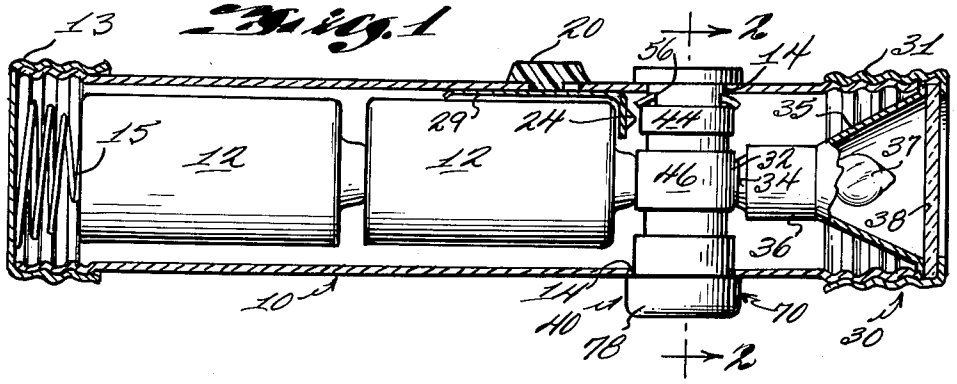


Fig. 2

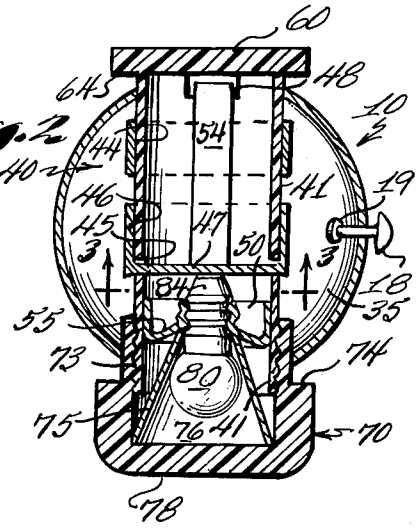


Fig. 4

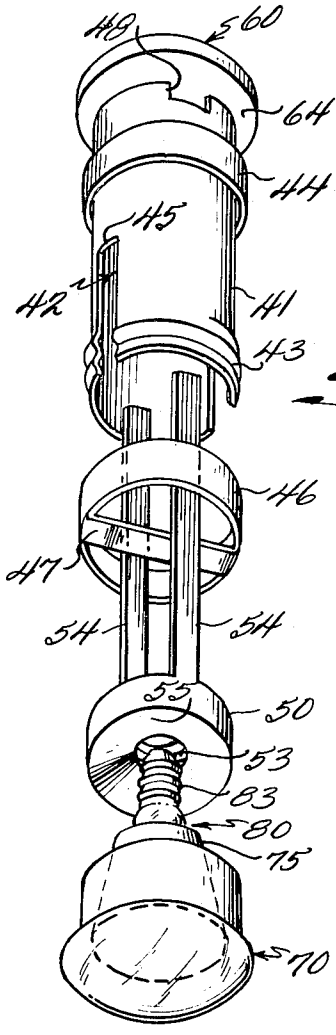
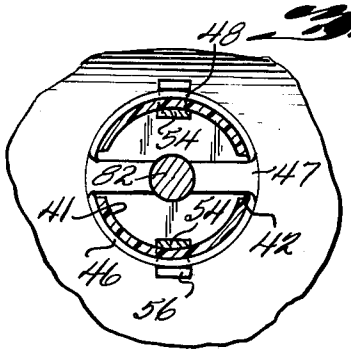


Fig. 3



INVENTOR

ROBERTO L. BUSTAMANTE

BY Cushman, Darby & Cushman

ATTORNEYS

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ILLUMINATING MEANS

Roberto L. Bustamante, 4a C.P. No. 40,
Santa Ana, El Salvador

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This application is a continuation-in-part of my co-pending application, Serial No. 216,847, filed Aug. 14, 1962, now abandoned.

This invention relates to improvements in flashlights and more particularly to improvements in flashlights and other portable electric lamps having a plurality of light sources.

In the use of flashlights and portable electric lamps, attempts have been made to provide, auxiliary to the head lamp, primary or principal light source, a secondary lamp or light source of similar or smaller size, merely for novelty purposes, or for use as an emergency, warning or guiding light. In such cases, for example, the secondary light source is often of smaller size and thus uses less of the available electric power to provide illumination for greatly extended periods of time.

Frequently, the constructions providing the secondary light source are complex and costly, and often unreliable for emergency use. In cases where the secondary light source is employed as an auxiliary guiding light, its operation has been cumbersome and often necessitates the use of an extra hand to manipulate the switch, little effort having been made in the art to develop secondary light sources for flashlights to a useful degree. For example, in certain instances of using a flashlight in darkened areas, the bearer of the flashlight, while having the ability by means of the head lamp or principal light source to perceive objects located at some distance away, often experiences difficulty in discerning obstacles in his immediate proximity when such obstacles are not directly in the beam of light case by the flashlight.

Accordingly, it is desired as an object of this invention to provide a lateral light assembly in the form of a unitary, separable assembly for simplicity of manufacture and ease in adapting the use thereof to any known flashlight or hand lamp.

It is another object of this invention to provide a portable hand lamp with a lateral light source for projecting light to the side and down to illuminate lateral obstacles. This is an advantageous feature as it affords clear vision for the bearer of flashlights and other hand lamps in areas immediately adjacent the head light, which areas are commonly in substantial darkness.

Still another object of this invention is to provide a unitary lateral light assembly for incorporation into known hand lamps and flashlights without deleteriously affecting the operation and structure thereof.

A further object of the invention is to provide known flashlights and hand lamps with a lateral light source and switching assembly for operating the lateral light source with the hand holding the flashlight, and thereby provide auxiliary light without a necessity for moving or relocating the primary light source.

Other and further objects and advantages of this invention will become more apparent when reference is had to the following description and drawings.

The objects of this invention are accomplished by first providing an ordinary flashlight having a protective and sometimes electrically conductive exterior casing, a source of electric power, a switch assembly in electrical contact with the source of electric power, and at least one primary light source. The improvement realized by the present invention comprises providing a secondary light source in any area of the flashlight exterior casing, without regard to the location of the primary light source, and then providing first unitary electrical contact means for directly connecting the primary and secondary light sources with said source of electric power. Second electrical contact means are also provided in electrical connection with said secondary light source and are adapted to be contacted with a switch assembly that may be the same as or in addition to the primary light source switch assembly for operation of the secondary or lateral light. Finally, the lateral light is preferably also provided with a third electrical contact means in direct association with the secondary light source itself, the third electrical contact means providing the electrical connection between the second contact means and the light source.

In producing the flashlight assembly of the present invention, it also has been found possible and desirable to construct the secondary or lateral light assembly so that its parts are very small and of miniature size. In a manner to be understood from a review of the following disclosure, the present lateral light assembly may be integrated with and utilized in flashlights of known construction without depreciation of the operating facilities, utility and effectiveness of such flashlights since the consumption of electricity and the size of the lateral light of this invention are both relatively small. Moreover, the operation and construction of this lateral light are both surprisingly relatively simple, leading to obvious advantages in cost and use.

In accomplishing the objects of this invention, it also has been found that in providing flashlights with a lateral light source, it is possible to adapt the same for use as a temporary or emergency table lamp. This is also an important advantage as it permits a person to utilize the lamp while having the free use of both hands.

For a better understanding of this invention, reference should now be had to the accompanying specification and drawings in which identical reference characters have been employed to denote the same or similar parts, and in which:

FIGURE 1 is a side elevation of a conventional flashlight, partly in section, and modified according to the invention to show a suitable relationship thereof with the lateral light structure of this invention;

FIGURE 2 is a cross sectional view taken along lines 2—2 of FIGURE 1 to show constructional details of the lateral light structure of this invention;

FIGURE 3 is a top view, partly in section, taken along lines 3—3 of FIGURE 2 to show suitable constructional details for a first unitary electrical contact means; and

FIGURE 4 is an exploded perspective view showing assembly details for the several components of the lateral light assembly.

Referring now to FIGURES 1 and 2, an ordinary flashlight may comprise a tubular casing, indicated generally by the reference numeral **10**, that may be prepared from or provided with any suitable electrical conducting material, for example, a strip, coil or cylinder of sheet metal, held together by or covered with an exterior insulating casing when desired or found necessary for protection from the effects of moisture, and mechanical or electrical shock, etc. As shown, the flashlight is provided with two dry cell batteries **12**, a rear closure member **13**, flexible contact spring **15**, an interrupter type switch assembly indicated generally at **18** (shown in end view in FIGURE 2), and a head lamp portion **30** having front closure **31**, a socket assembly comprising contact button **32**, insulating footing **34** and socket member **36**, reflector **35**, bulb **37** and a lens **38**. One electrode and the bottom of bulb **37** is in contact with button **32**, while the other electrode of the bulb **37** is in contact with socket member **36**, member **36** and button **32** being insulated from one another

by insulating footing **34** in a manner known in the art. Socket member **36** may be of the screw thread or bayonet slot type, depending on the configuration of bulb **37**.

According to this invention, flashlight casing **10** is provided with two casing openings **14** for receiving the lateral light assembly indicated generally by the reference numeral **40**. According to a preferred embodiment of this invention, lateral light assembly **40** provides electrical connection from contact button **32** to batteries **12** by means of primary electrical contact ring **46** which is in direct connection between batteries **12** and the button **32**. The electrical circuit to the head lamp socket of the primary or parent flashlight assembly is, of course, completed through batteries **12**, spring **15**, closure **13** and casing **10**, and through switch arm **19** to reflector **35** (FIGURE 2), socket **36** and bulb **37** (FIGURE 1). The electrical circuit to the lateral lamp assembly also operates through batteries **12** and primary contact ring **46** since both the primary and secondary light sources are in direct electrical connection with ring **46**. As will be appreciated more fully hereinafter, the lateral lamp exterior electrical circuit is completed by connection of the auxiliary switch assembly **20** to the batteries **12** or other source of electrical energy within the flashlight circuit, the lateral light electrical circuit passing from batteries **12** through spring **15**, closure **13**, and casing **10**, to the contact point **24** of switch arm **29** and to secondary electrical contact ring **44**.

As best shown in FIGURE 2, there is illustrated a suitable form for a protective insulating casing for the present lateral light **40**, shown as cylinder **41**, prepared from any convenient plastic or other insulating material and provided with a central opening which extends to the interior wall of a contiguous cover portion **60** provided with a substantially cylindrically shaped head, as shown, having a peripheral lip portion **64**. Next to interior wall of cover portion **60** and adjacent the peripheral lip portion **64**, the walls of cylinder **41** are provided with one or more lateral openings **48** for receiving the bent over ends **56** of an electrical conductor **54**, which are in electrical connection with second contact ring **44** (see FIGURE 1), both ends **56** and secondary contact ring **44** being insulated from contact with casing **10**.

In the forward open end of cylinder **41**, that is the end opposite cover portion **60**, the cylinder is also provided with one or more additional lateral openings **42**. The position of the openings **48**, with respect to the openings **42**, is generally in the form of a cross (see FIGURE 3) although it is obvious that any angular position may be employed. In the same open extremity, cylinder **41** is provided with a suitable exterior thread **43** for connection of the cylinder with a shade and lens assembly **70** which also serves as a closure member, also constructed of any convenient plastic or other insulating material of transparent or translucent qualities and connected to cylinder **41** by means of screw threads **73** which coact with threads **43**. Central opening **76** of this lens assembly extends to the interior wall of the dome-shaped lens structure **78**. This dome structure may be of any suitable shape, and in the embodiment shown, is provided with a a rounded and widened lip portion **74** which serves as a stop or limiting member, as will be seen in connection with FIGURE 1.

Also in FIGURE 2, it is seen that the shade and lens assembly **70** may be provided with a separable or integral reflector **75** of conical shape, which, in the embodiment shown is located adjacent member **55** prior to the bulb **80**, and has a narrow opening sufficiently wide to permit assembly of the threaded portion **83** of bulb **80**. The widest portion of reflector **75** is located in member **70** so that the body portion of reflector **75** is sufficiently narrow to lay on the inside of threads **43–73**. The reflector **75** may also be constructed so that the narrow opening is wide enough to permit passage of the globe portion of the bulb **80**, in which case, reflector **75** may be formed as an integral part of lens assembly **70**. Alternatively, the face portion **55** of contact ring **50** may have a slight dish or funnel shape to replace reflector **75** and provide reflectivity, but this is by no means essential.

In FIGURE 2 it is seen that the lateral light assembly **40** may pass along a line defining the diameter of the casing **10**, and form semi-circular spaces on both sides, one of which contains the switch **18** and arm **19** which remain isolated and out of physical contact with the lateral light **40**. The position of the lateral light **40**, with respect to the switch assembly **18–19**, is generally shown in the form of a cross and this permits the lateral light assembly to be used in the form of a unitary separable assembly for incorporation within ordinary flashlights without deleteriously affecting the operation and structure thereof. The invention is of course not limited to such cross configurations and it is only desirable for the embodiment shown that there be some form of insulating separation between switch arm **19** and light assembly **40**.

In the several figures, there are shown three electrical contact elements **44**, **46** and **50** that may be essentially ring-shaped or any other suitable and usable shape, the latter or third contact ring **50** including conductors **54**, and each contact element being preferably constructed from sheet metal or other electrically conductive material. Secondary contact ring **44** is of ordinary cylindrical or ring form and is preferably located adjacent the head wall of cover portion **60** and around the exterior of insulating casing **41**, just above openings **48**, but out of electrical contact with casing **10**. As shown in FIGURE 1, contact ring **44** is intended to provide electrical connection between switch arm **29**, contact point **24**, conductor ends **56** (also electrically insulated from casing **10**) and conductors **54** located generally on the inside of cylinder **41**.

Primary contact element **46** is also located on the exterior surface of cylinder **41**, and may also be substantially ring shaped, although other apparent configurations are indicated hereinafter. In a preferred embodiment, the location thereof is determined by the co-action of lateral openings **42** with the additional electrical conductor **47** which may be in the form of a bridge of a strip of sheet metal, or may be a wire, rod, etc. This bridge (see FIGURE 3) may pass along a line defining the diameter of contact ring **46** to form semi-circular spaces on both sides thereof, although the invention is not limited to this configuration, it only being necessary that some means be provided for facilitating electrical connection between contact ring **46** and the contact button **82** of the secondary light bulb **80**.

The third contact ring **50**, also prepared from a strip of sheet metal and adapted to receive an electric light bulb, is substantially ring shaped in the embodiment shown and is provided with one or more electrical conductors **54** shown in the form of strips of sheet metal, although wires or metal coatings on the interior of cylinder **41** may also be employed. These conductors, as will be appreciated, may be flat, parallel and opposite each other, although other structural and angular configurations may also be employed. Third contact ring **50** is also provided with a socket member or light bulb receiving assembly comprising a somewhat disc-shaped face member **55** which is provided with screw threaded socket **53** which mate with the threads **83** of bulb **80**. Besides threads **83**, bulb **80** is composed of contact button **82**, and insulating footing **84**, helical threaded portion **83** and contact button **82** providing the two electrode connections for bulb **80**. In a alternative embodiment, socket member **55** may be provided with a bayonet slot or other configuration to receive any preferred socket configuration of bulb **80**. For example, in the case of very miniature bulbs, the socket is usually adapted to merely receive two external electrode wires passing through the glass bead or pressure footing of the bulb.

Referring more particularly to screw threaded socket

53, the same may be enlarged to reduce the size of or substantially eliminate the face member 55 when dimensions of contact ring 50 and the entire lateral light assembly 40 are reduced to such a degree that the diameter thereof substantially corresponds with the diameter of the threaded portion 83 of the bulb 80. Similarly, the dimensions of lateral light assembly 40 may range from that of a separable miniature flashlight to a diameter that may be less than that of ordinary miniature flashlight bulbs such that the screw thread socket 53 takes up the entire periphery of contact element 50.

From the drawings, and particularly the exploded view of FIGURE 4, is it seen that the lateral lamp assembly comprises the combination of insulating cylinder 41 with electrical contact rings 44, 46 and 50, primary ring 46 and secondary ring 44 being on the outside of cylinder 41 and thus insulated from the bulb receiving ring 50 which is on the inside of cylinder 41. In the embodiment shown, bridge conductor 47 passes through lateral openings 42 and into the inside of cylinder 41 to rest on the end portions 45 of openings 42 and thus fix the location of contact ring 46. Conductors 54 pass from ring 50 along the inside walls of cylinder 41 but remain out of physical contact with conductor 47 (see FIGURE 3). The location of the several contact rings may be further assured by employing various securing means such as screws, adhesives, protruding friction members, or shrink fitting tolerances, etc., or by providing the several contact rings 44, 46 and 50, as well as electrical conductors 54, in the form of printed circuitry type metal coatings, embedded wires, powdered metal particles, etc.

In the construction shown, contact rings 50 and 44 maintain their positioning by reason of the connection of conductors 54 with ring 44 through lateral openings 48 as in FIGURE 1. Although not necessary to the invention, the bent extensions 56 of conductors 54 may be soldered or otherwise securely adhesively attached to contact ring 44 for additional securance. Thus, the interior electrical circuit comprises the connection of contact ring 44 to conductors 54, to contact ring 50 and socket assembly 53–55, all of which are insulated from contact ring 46 and bridge conductor 47. When positioned as described, contact rings 46 and 50 are adapted to receive the contacts of the electric light bulb 80 to complete the lateral light interior electrical circuit, for example by screw threads 53 receiving mating threads 83 of the bulb while the contact button 82 of the bulb rests on bridge conductor 47, although bayonet slot and spring arrangements for securing such bulbs may be employed, as indicated above.

Following assembly of the foregoing elements onto cylindrically shaped insulating casing 41, the same may be inserted into openings 14 of flashlight 10 so that the lip 64 of cover portion 60 rests on the outside of the flashlight adjacent the switch assembly 20, although any other location in the structure of flashlight casing 10 may be used with suitable modifications of the various electrical contact elements. Thereafter, the closure cover and lens assembly 70 may be inserted through the other opening 14 and screwed home on casing 41, until lip portion 74 of the cover is in snug abutting relationship with casing 10 of the flashlight. In the interest of providing a more weather-tight seal, lip 64 and lip 74 may be shaped to mate with the exterior shape of flashlight casing 10 and accordingly may have an arcuate and plain or ribbed, polygonal, or other suitable shape. In an alternative form of assembly, cover 70 may first be inserted on casing 10, followed by insertion of cylinder 41 into cover 70 from the opposite side of casing 10, either or both cover portions 60 and 70 being provided with partially ribbed or knurled surfaces to facilitate assembly or removal, when desired. Pliable insulating washers may also be employed beneath lips 64 and 74 at openings 14 to provide a weather-tight seal. Further, a weather-tight seal can be provided with the use of close tolerances between openings 14 and casing 41 and additionally or alternatively by the flattening of portions of flashlight casing 10 adjacent openings 14, beneath lips 64 and 74.

With the prevent invention, it will be appreciated that the headlight bulb 37 of an ordinary flashlight may be used in its usual fashion due to direct connection between bulb 37, contact button 32, contact ring 46 and batteries 12 in the embodiment shown, merely by releasing switch assembly 18 to complete the circuit from batteries 12, spring 15, closure 13 and casing 10 to switch arm 79, reflector 35 and socket member 36. It is also possible according to the present invention to eliminate the usual switch assembly 18–19 and permit switch assembly 20 to operate both lights, for example by permitting spring 15 to expand and force batteries 12 to slide forward and touch contact ring 46. With either embodiment, the lateral light is operated by sliding the switch assembly 20 forward from the position shown in FIGURE 1 until the contact 24 of switch arm 29 touches contact ring 44, completing electrical connection between casing 10 and conductors 54, ring 50, threads 83 and bulb 80. The button 82 of bulb 80 is, of course, in contact with bridge 47 to complete the circuit to contact ring 46 and batteries 12.

It should be understood that the details of the switch 18–19 and other components of the parent flashlight assembly are only presented for the purpose of aiding the understanding of this invention and the structure of such parent flashlight is not to be considered as limiting the present invention.

Thus, while various mechanical elements, materials of construction and structural shapes have been described for ease in illustrating the invention and facilitating the understanding thereof, it is to be understood that various changes may be made in the foregoing disclosure without departing from the spirit of this invention, except as defined in the scope of the following claims.

What is claimed is:

1. In a flashlight having a protective exterior casing, a source of electric power, switch means in electrical contact with said source of electric power, and a primary light source, the improvement comprising providing a secondary light source in an area of the protective exterior casing as a separable assembly provided with a protective casing of insulating material, first and second electrical contact means on said separable assembly, said first electrical contact means being insulated from said second electrical contact means, said first electrical contact means providing electrical connection between said source of electric power and said primary and secondary light sources, said second electrical contact means being in electrical contact with said secondary light source, and means adapting said electrical switch means to contact said electrical contact means and thereby complete the electrical circuit between said source of electric power and said secondary light source.

2. In a flashlight having a protective exterior casing a source of electric power, switch means in electrical contact with said source of electric power, and a primary light source, the improvement comprising providing a secondary light source in an area of the protective exterior casing as a separable assembly provided with a protective casing of insulating material, top and bottom closure covers, first and second electrical contact means surrounding said insulating material casing, said electrical contact means being insulated from each other, said first electrical contact means providing electrical connection between said source of electric power and said primary and secondary light sources, said second electrical contact means being in electrical contact with said secondary light source, and adapting said electrical switch means to contact said second electrical contact means and thereby complete the electrical circuit between said source of electric power and said secondary light source.

3. The flashlight of claim 2 wherein the protective insulating casing of the secondary light source assembly is provided with lateral openings at first and second ends.

4. The flashlight of claim 3 wherein the lateral openings at said second end provide for electrical connection between said second electrical contact means and said secondary light source.

5. The flashlight of claim 4 wherein electrical connection between said secondary light source and said second electrical contact means is provided by at least one electrical conductor located within the protective insulating casing of the secondary light source, said electrical conductor being connected with said second electrical contact means through the lateral openings at said second end.

6. The flashlight of claim 3 wherein the lateral openings at said first end provide for electrical connection between said secondary light source and said electrical contact means.

7. The flashlight of claim 6 wherein said electrical connection is provided through said lateral openings by means of an electrical conductor.

8. In a flashlight having a protective exterior casing, a source of electric power, a primary light source and a first switch assembly in electrical contact with said source of electric power and adapted to provide electrical connection with said primary light source, the improvement comprising providing said flashlight with a second switch assembly in electrical contact with said source of electric power, and providing a lateral light assembly as a separable assembly in an area of the protective exterior casing, said lateral light assembly being provided with a secondary light source and a protective casing of insulating material, top and bottom closure covers, and first and second electrical contact elements, said electrical contact elements being insulated from each other, a third electrical contact element in electrical connection with said secondary light source, said third electrical contact element being provided with electrical conductors located within the protective insulating casing, said first electrical contact element providing direct electrical connection between said source of electric power and said primary and secondary light sources, said second electrical contact element being in electrical contact with said secondary light source by connection to said electrical conductors, said second switch assembly being adapted to contact said second electrical contact element and thereby complete the electrical circuit between said source of electric power and said secondary light source.

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NORTON ANSHER, *Primary Examiner.*