June 17, 1930. C. H. PAJEAU 1,763,815

FLASH LIGHT

Filed June 7, 1928

Fig. 1

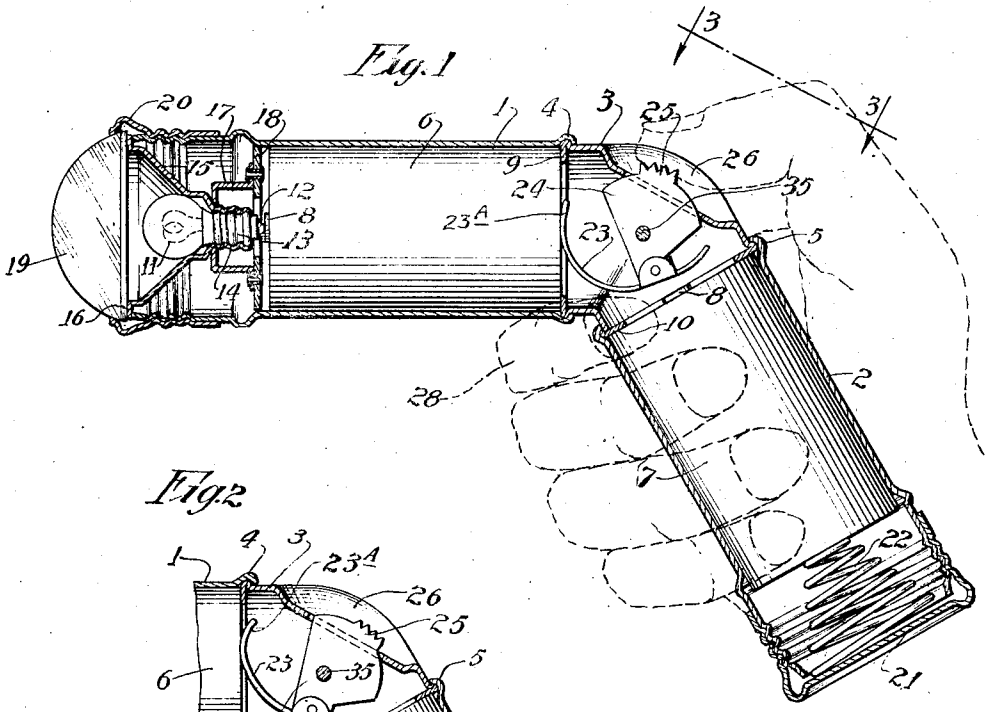


Fig. 2

Fig. 4

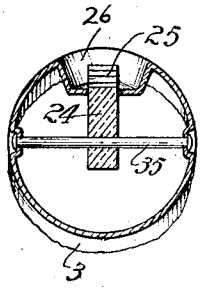
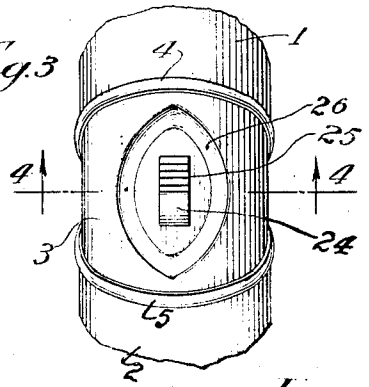


Fig. 3



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UNITED STATES PATENT OFFICE

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FLASH LIGHT

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My invention relates to flash-lights and its main object includes the providing of a flash-light which can be handled with less fatigue to the user than the usual cylindrical type, and the providing of novel and advantageously arranged switching means for controlling the light.

Since a flash-light is employed mostly for projecting light either horizontally or downwardly forward, the customary cylindrical flash-light must be held with the axis of its casing either substantially horizontal or at a downwardly forward inclination, thereby requiring the hand of the user to be in a strained position which is fatiguing even if the flash-light is horizontally disposed, and which is still more fatiguing if the light is projected downwardly. Furthermore, a cylindrical casing needs to be tightly gripped to prevent it from sliding out of the hand of the user, and this tight gripping adds to the fatiguing effect.

My present invention aims to overcome these objections by providing an angular casing in which the rearward and manually held portion will slope forwardly upward during the ordinary use of the flash-light, thus adapting it to a more normal and much less tiresome position of the hand. Furthermore, my invention aims to provide a flash-light which will be approximately balanced about the first finger of the hand which holds it, so that a quite light grip will suffice.

In another major object, my invention aims to locate the switching or light-controlling means so as to aid in securing the approximate balancing of such a flash-light about its elbow, aims to provide a novel disposition of the switch with respect to the battery cells and a novel mounting for the switching member, and aims to provide simple and effective means for holding the battery cells in proper operative position with respect to the switching member.

Moreover, my invention aims to provide a flash-light in which the digitally operable portion of the switching member is conveniently reached by the user when he is holding the flash-light in a position which will not cause undesirable fatigue.

Still further and also more detailed objects will appear from the following specification and from the accompanying drawings, in which

Fig. 1 is a central, vertical and longitudinal section through a flash-light embodying my invention, with dotted lines showing portions of a hand holding the same, and with the switching member in its "off" or circuit-opening position.

Fig. 2 is a section similar to the medial portion of Fig. 1, but with the switching member in its "on" or circuit-closing position.

Fig. 3 is a fragmentary view looking downward from the line 3—3 of Fig. 1.

Fig. 4 is a transverse section, taken along the lines 4—4 of Fig. 3.

In the illustrated embodiment, the tubular casing of my flash-light comprises a forward tubular section 1, a rearward tubular section 2, and an interposed elbow section 3. These three sections are rigidly connected to each other, as for example by clinching a rear end bead 4 on the section 1 and a forward end bead 5 on the section 2 respectively over the radially enlarged ends of the intermediate section 3. Battery cells 6 and 7 are respectively disposed in the sections 1 and 2, with the axial terminal 8 of each at its forward end, and these battery cells are limited in their approach toward each other by suitable stop means on the casing, such as annular flanges 9 and 10 formed respectively on the forward and rear ends of the elbow section 3.

Supported within the forward end of the casing in any suitable manner is a lamp bulb 11 which has its axial contact 12 abutting against the axial contact 8 of the forward battery cell 6. As a suitable mounting, I am showing the shell 13 of the lamp bulb base as threaded into the tubular rear end 14 of a forwardly flaring reflector 15 which has at its mouth an annular flange 16 bearing against the forward end of the casing section 1, and am also showing the threaded reflector end 14 as connected by a stirrup 17 to an insulating washer 18 which fits the bore of the forward casing section 1 and holds the lamp bulb axial of that section. A lens 19 bears against

the reflector flange 16 and is drawn rearward by a clamping collar 20, this collar being threaded on the casing section 1 so that its attaching will effect a rigid assembly of the section 1 with the above described parts housed by this section, and with the bulb of the lamp base pressing the battery cell 6 tightly against the stop flange 9.

The free end of the rear casing section 2 is closed by a threadedly attached cap 21, and a compression spring 22 is interposed between this cap and the battery cell 7 for the double purpose of clamping the cell against the stop flange 10 of the elbow section and of electrically connecting the rear terminal of the cell 7 with the casing.

To connect the two battery cells in series, I interpose a movable switching member between them, and preferably mount this member in the elbow section 3 of the casing. For this purpose, the drawings show a resilient switching element 23 secured to a flat insulator 24 which is pivoted on a pin 35 extending through the elbow section 3 transversely of the common plane of the axes of the forward and rear casing sections. The insulator 24 projects through a slot in the outwardly directed side of the elbow sections to expose a ribbed portion 25 for digital manipulation by the user of the flash-light, and the elbow section preferably has this slot in a recess 26 so that the projecting part of the insulator is shielded against accidental contact.

The switching element 23 (which may be of bronze) is shaped so that it will contact with the opposed terminals of both battery cells when the insulator 24 is at one end of its normal movement (as shown in Fig. 2), and so that this switching element will be out of contact with at least one of these terminals when the digitally movable insulator is at the other limit of its movement (as shown in Fig. 1). In practice, I preferably form and dispose this switching element so that it will continuously engage one of the battery cells and so that the resiliency of this element will cause it to be retained in either of its said two extreme positions by this engagement.

Thus, the drawings show the forward arm of the switching element as having a tip portion 23A bent at such an angle to the adjacent main portion that this tip portion will engage the rear end of the battery cell 6 substantially flatwise (as in Fig. 1) to hold the switching member in its "off" position; while another portion of the switching element will engage the same battery cell 6 in the "on" or circuit-closing position (as shown in Fig. 2) in which the rear end of the switching element contacts with the axial terminal 8 of the rear battery cell 7. When so arranged, the switching member, in the position of Fig. 1, connects the two batteries in series with each other and with the casing through the filament of the lamp bulb.

With the rear casing section 2 held in the hand of the user and with the exposed insulator portion 25 directed upwardly, this actuating portion of the switching member is disposed for convenient reach by the thumb of the same hand, as shown in dotted lines in Fig. 1. With counterpart battery cells and with the index finger 28 of the hand close to the rear end of the forward casing section, the flash-light is approximately balanced about this finger and requires only a slight pressure to rock it on this finger. Consequently, my flash-light is easily carried with security while grasped so lightly as not to fatigue the user.

What is more, my flash-light can readily be proportioned so that the total weight of the forward casing arm (with its relatively heavy lens, reflector and socket arrangement effectively balances the weight of the rear casing arm about the index finger, so that gravity will tend to hold the flash-light in a position in which the forward arm inclines somewhat downwardly, or substantially the position most needed for path finding. Since this still leaves the manually gripped rear casing section with its axis directed forwardly upward, I entirely avoid the fatigue which would be encountered with the ordinary cylindrical types of flash-lights when using the same for lighting a path. The bend in the casing also deters the flash-light from sliding in the hand of the user, so that the digitally actuable portion 26 of the switching member is always conveniently reached by the thumb of the user. Moreover, a casing of such an angular shape will not roll after the manner of straight cylindrical casings, so that my flash-light can be laid with safety even on a sloping table or bench.

However, while I have pictured and described my flash-light in an illustrative embodiment in which the casing is made up of three sections, in which the switching member is pivotally mounted, and in which the battery cells are spaced by stops on an elbow-forming casing section, I do not wish to be limited to these or other details of the construction and arrangement thus disclosed. Many changes might obviously be made without departing either from the spirit of my invention or from the appended claims.

I claim as my invention:

1. A flash-light comprising a casing, a lamp bulb supported in its forward end, two battery cells disposed within the casing, one of the battery cells having a terminal continuously contacting with the lamp bulb, and control means including a switching member mounted between the two battery cells continuously contacting with the other terminal of the last named battery cell, the switching member including a resilient conducting ele-

ment and continuously pressing the last named battery cell against the lamp bulb and movable into and out of a position in which it electrically contacts with a terminal of the other battery cell.

2. A flash-light comprising a tubular casing having the axes of its forward and rearward portions at an oblique angle to each other, a single battery cell in each of the said casing portions, a lamp bulb and a lens in the forward end of the casing, and switching means mounted at the juncture of the said casing portions for controlling the connection of the battery cells to the lamp bulb; the switching means including a digitally operable portion exposed outwardly of the angle between the said casing portions so as to be digitally operable by the thumb of a hand grasping the rearward casing portion; the battery cells being symmetrically disposed with respect to the juncture of the casing portions, so that the weight of the lens will cause the contents of the forward casing portion to overbalance those of the rear casing portion, whereby the flashlight will have its forward casing portion tilted forwardly downward when loosely supported by a finger of the said hand.

3. A flash-light comprising a tubular casing having the axes of its forward and rearward portions at an oblique angle to each other, a battery cell in each of the said casing portions, a lamp bulb in the forward end of the casing, and switching means mounted at the juncture of the said casing portions for controlling the connection of the battery cells to the lamp bulb; the casing having a depression at the said juncture, the depression opening outwardly of the angle between the said casing portions, and the switching means including a digitally operable portion exposed within the said depression.

4. A flash-light comprising a tubular casing having the axes of its forward and rearward portions at an oblique angle to each other, a battery cell in each of the said casing portions, a lamp bulb in the forward end of the casing, and switching means mounted at the juncture of the said casing portions for controlling the connection of the battery cells to the lamp bulb; the casing having a depression at the said juncture, the depression opening outwardly of the angle between the said casing portions, the casing having a slot in the bottom of the said depression and the switching means including a switching member movably mounted in the casing, the switching member means including a switching member movably mounted in the casing, the switching member projecting through the depression and being laterally guided by the walls of the slot.

5. A flash-light comprising an elbow-shaped tubular casing, two battery cells respectively disposed in the two arms of the casing, a lamp bulb mounted in the forward arm of the casing and engaging a terminal of the forward battery cell, means electrically connecting the opposite polarity terminal of the rear cell with the other terminal of the lamp bulb, and switching means disposed within the casing between the two cells and operable from outside the casing for connecting the other two terminals of the two cells, the switching means including a member pivoted in the bend of the elbow shaped casing and arranged for continuously pressing the forward battery cell against the first named terminal of the lamp bulb.

6. A flash-light as per claim 5, in which the switching means include a resilient member pivoted in the bend of the elbow shaped casing and arranged for continuously engaging one battery cell, said resilient member being movable into and out of a position in which it also engages the other battery cell and is so shaped as to latch the switching means yieldingly in either of the two positions in which the said resilient member respectively is in and out of engagement with the other battery cell.

7. In a flash-light, a casing comprising a forward section, a rearward section and a separately formed and rigid intermediate tubular section secured to the aforesaid sections to dispose the latter at an oblique angle to each other; a lamp bulb mounted in the forward casing portion, a battery cell in each of the two first named sections, and switching means mounted in the intermediate casing section for controlling the circuit from the battery to the lamp bulb, the switching means including a digitally operable element mounted within and projecting through the intermediate section.

8. A flash-light comprising a casing having forward and rearward portions of approximately equal length connected at an angle to each other by a bend in the casing, two counterpart battery cells respectively disposed in the said forward and rearward casing portions adjacent to its said bend, both cells having the same polarity terminal forwardly directed, a lamp bulb mounted in the forward end of the casing and having its axial terminal engaging the said polarity terminal of the forward battery cell, means electrically connecting the other lamp bulb terminal with the other polarity terminal of the rear battery cell, and a switching member mounted in the said bend of the casing and having an actuating portion projecting through the casing outwardly of the angle of the said bend, the switching member being movable into and out of a position in which it electrically connects the first named polarity terminal of the rearward battery with the opposite polarity terminal of the forward battery.

9. In a flash-light, a casing comprising a

tubular elbow having inwardly directed stop formations at each end, and two tubular casing portions respectively secured to the two ends of the elbow; a single battery cell disposed in each tubular casing portion, each cell engaging one of the said stop formations; a lamp bulb mounted in the forward tubular casing portion and engaging the outer end of the battery cell in that casing portion; spring means within the other casing portion engaging the outer end of the battery cell within the last named casing portion; and switching means pivotally mounted in the elbow for selectively connecting the two battery cells in series with each other and with the lamp bulb.

Signed at Evanston, Illinois, May 29th, 1928.

CHARLES HAMILTON PAJEAU.