March 19, 1935. G. H. BARBER ET AL 1,995,141

FLASH LIGHT

Filed Aug. 29, 1930

FIG.1.

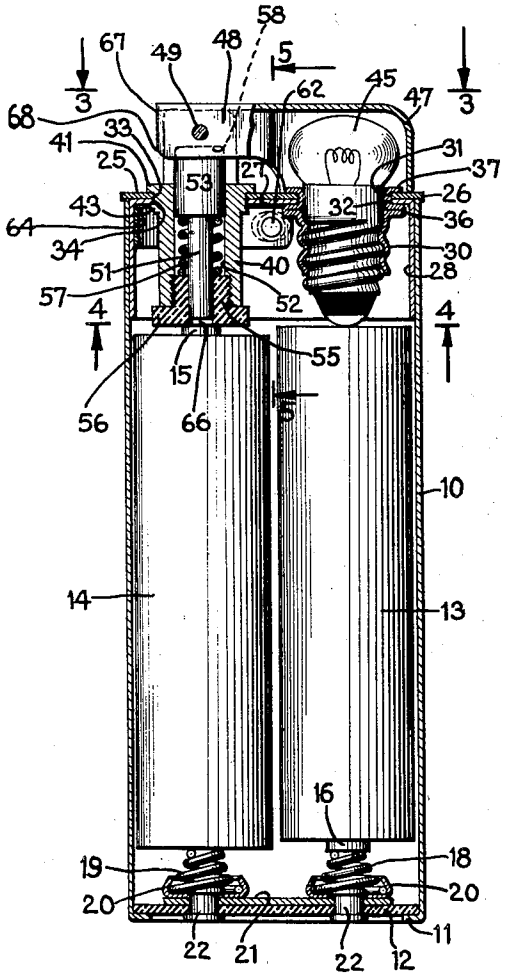


FIG.2.

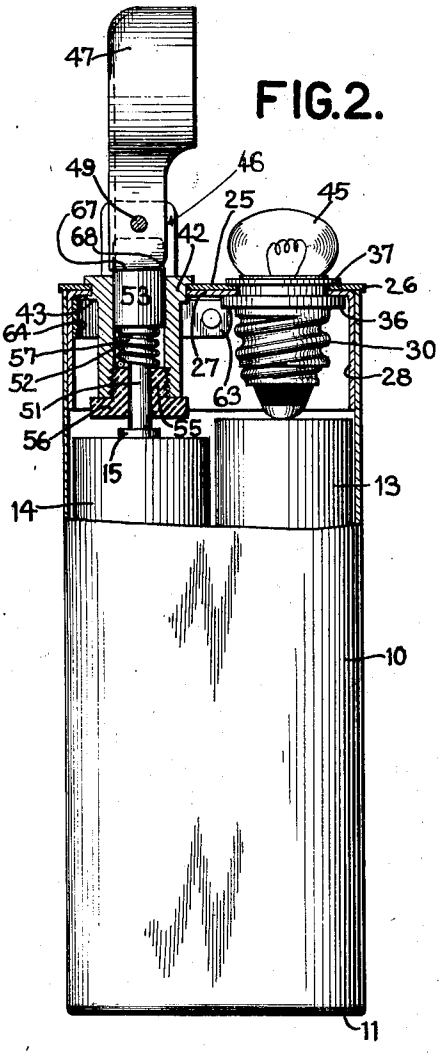


FIG.5.

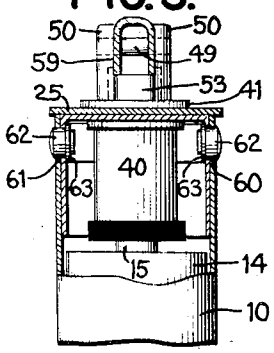


FIG.3.

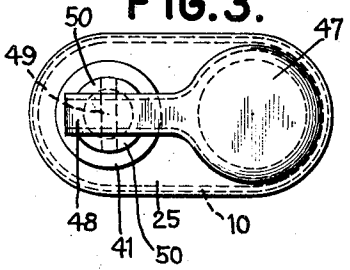
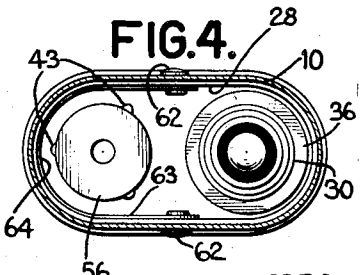


FIG.4.



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Patented Mar. 19, 1935 1,995,141

UNITED STATES PATENT OFFICE

1,995,141

FLASH LIGHT

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Application August 29, 1930, Serial No. 478,608

11 Claims. (Cl. 240—10.65)

This invention relates broadly to electric flashlights, handlanterns and the like and more particularly to the so-called vest pocket type of flashlight of small dimensions adapted to be carried in a pocket of the clothing and utilizing, as a general rule, a dry battery of approximately three volts.

One object of the invention is the provision of a flashlight in which the lamp is enclosed or covered when not in use and wherein movement of the lamp enclosure to uncover the lamp serves to complete the circuit through the batteries and illuminate the lamp.

It is also an object of the invention to provide a flashlight in which it is immaterial how the cells are inserted in the casing, that is, in which direction the electric current flows from the batteries through the lamp.

Another object of the invention is a flashlight of this character in which the lamp socket is immovably mounted in the casing and is always a part of the electrical circuit.

The invention also seeks a flashlight in which a cover for the lamp bulb serves to control the circuit.

The invention also has for an object a flashlight in which the battery for the vest pocket type of flashlight is readily removable from and replaceable in the casing.

Still another object of the invention is the disposition of the batteries to simplify the circuit and attain a reduction of parts.

A further object of the invention is to provide a flashlight which shall be practical from the standpoint of ease and cheapness of manufacture, convenience and practicability in assembly and durability and attractiveness in use.

These and other objects of the invention and the means for their attainment will be more apparent from the following detailed description, taken in connection with the accompanying drawing, illustrating one embodiment by which the invention may be realized, and in which:—

Figure 1 is a view in longitudinal section showing a flashlight according to this invention with the parts in open circuit position.

Figure 2 is a view substantially similar to Figure 1, but showing the parts in closed circuit position.

Figure 3 is a view showing the top of the flashlight, looking from above on the line 3—3 of Figure 1.

Figure 4 is a transverse sectional view, taken on the line 4—4 of Figure 1, looking in the direction of the arrows and showing the means for removably securing the closure to the flashlight casing.

Figure 5 is a fragmentary vertical sectional view taken on the line 5—5 of Figure 1, looking in the direction of the arrows, and showing details of the circuit closing devices and the top cap or closure securing means.

The flashlight casing 10 is of substantially tubular shape, preferably oval in cross-section, as shown in Figure 4, to fit the user's pocket although, obviously, any cross-sectional shape is equally applicable. The casing 10 has an inwardly turned flange 11 at its lower end to support the bottom of the casing, which may be an oval disc 12, preferably of non-metallic or insulatory material. The battery is disposed within the casing and is shown as comprising two separate and relatively movable cells 13 and 14 side by side, one inverted with respect to the other, that is, one cell 14 is placed in the casing 10 with its central or positive terminal 15 uppermost and the other cell 13 is disposed with its positive terminal 16 lowermost. The zinc cups of the two cells 13, 14 are insulated from one another and from the casing 10 in any convenient manner as will be understood by those skilled in the art. To complete the circuit between the cells 13, 14, the bottom 12 is provided with conductive means leading between a terminal of one polarity of the other cell and the terminal of opposite polarity of the other cell. As shown, the cells 13, 14 rest upon conductive members 18, 19 which resiliently urge the cells 13, 14 upwardly. Preferably these resilient conductive members take the form of coiled springs 18, 19 removably mounted in metallic cups 20 secured to a metallic conductive member 21 lying upon the insulatory bottom 12, the respective cups 20, conductive member 21 and bottom 12 being united by rivets or eyelets 22 preferably spaced to hold the springs in position to engage the respective cells 13, 14.

The upper end of the casing 10 is shown open and adapted to be closed by a readily removable closure 25—28 or top cap comprising an upper disc 25 preferably of metal which rests upon the upper edge thereof and extends outwardly slightly beyond the periphery all around as at 26 to afford convenient grasp with the fingers and a downwardly facing cup shaped guiding member 27, 28 fitting snugly within the casing 10 and secured to the bottom of the upper disc 25. The closure 25 serves as the support for the lamp socket 30 and the circuit closing devices. Also the lamp socket 30 and the circuit closing devices secure the top disc 25 and the base 27 of the guiding cup together. Obviously, the battery could

be inserted from below, or otherwise, in which event the top 25 need not be removable.

Preferably, on its major axis, the closure, i. e., disc 25 and cup base 27 are provided with two registering holes 31, 32 and 33, 34, respectively, one pair, 31, 32, forming a socket receiving aperture and the other pair 33, 34, receiving a circuit closer. These apertures are preferably equally spaced from the transverse axis of the oval top disc 26 and are so disposed as to be coaxial or concentric with the respective battery cells 13, 14.

The lamp socket 30 is of the usual threaded tubular shape and has a portion 36 near its upper end outwardly bent and reversely turned to form an intermediate flange 36 adapted to engage the lower side of the closure 25, 27, i. e., the upper disc and the cup, the upper edge 37 of the socket being turned over the upper face of the closure as a flange 37 to clamp the closure between itself and the turned over intermediate flange 36 and secure the lamp socket 30 in the hole.

The circuit closing devices are disposed in the other aperture 33, 34, in the closure. A generally cylindrical conductive member or sleeve 40 having a flange 41 at its upper end and of the same shape as the aperture is disposed within the aperture 33, 34. As shown, the upper portion 42 of the cylinder is of increased transverse dimension for a distance slightly greater than the thickness of the closure 25, 27, thereby affording material which can be upset or punched outwardly in the form of ears 43 at spaced points about the periphery below the closure to clamp the closure between the flange 41 and the ears 43 on the circuit closer and hold the same rigidly and permanently on the closure. When not in use the lamp bulb 45 is protected by a cover 47 conveniently stamped in cup shape out of metal, and formed with an extended portion or lever arm or cam member 48 by which the cover 47 is pivotally or hingedly mounted on the casing closure. For convenience, the cover lever arm 48 is pivotally mounted on a pivot pin 49 extending between two upwardly extending arms or ears 50, disposed, one on each side of the hole in the cylinder and of a material width so as to serve as a bearing to guide the cover 47 from open to closed position. This cover lever arm 48 functions as a circuit controlling device by limiting the position of a circuit completing plunger 51 and is, in effect, a cam surface. The cylinder 40 is so called because it is provided with a bore 52 coaxial with a dry cell 14 within which bore 52 reciprocates the circuit completing conductive plunger 51. The cross sectional shape of the bore 52 and plunger 51 is round for convenience in manufacture and operation but, obviously, a plunger and bore of any shape will serve the purpose. The plunger 51 is of the transverse dimension of the bore at its upper portion 53 and is of a lesser dimension at its lower end 51. The lower end 51 slides and is guided within a non-conductive or insulatory bushing 55 threaded into the lower end of the cylinder 40 and having a flanged portion 56 therebelow. This bushing 55 serves not only as a guide for the contact making plunger 51 but also as an insulatory abutment against which the terminal 15 of the battery is pressed by the bottom spring 19. It insulates the cylinder 40 and closure 25, 27 from the battery and, in addition, provides an abutment for resilient means, shown as a spring 57, which tends to urge the plunger 51 upwardly away from the battery terminal 15. The plunger 51, in its upward movement, is limited by downwardly facing shoulders 58 carried with the cover fulcrum, i. e., the pivot supporting arms 50. To provide these shoulders 58, the outer marginal surfaces of the arms 50 preferably define an upwardly extending cylindrical or rod-like portion integral with the cylinder 40 which portion is slotted as at 59 to receive the cover lever arm 48, while the bore 52 of the cylinder is extended upwardly within the rod-like portion to a point slightly above the upper limit of the plunger stroke as permitted by the cam end on the cover. The shoulders 58 prevent ejectment of the plunger 51 when the cover 47 is not in place.

To retain the closure 25, 28 on the casing 10, registering apertures 60, 61 are provided in the casing 10 and closure guide 28, respectively, which apertures receive locking lugs 62 carried upon the ends 63 of a U-shaped spring 63, 64, disposed within the cup shaped guide 28 and secured in place, say, by the inherent resiliency of the spring 63, 64. If desired, of course, it may be secured by spot welding, rivets or the like.

To assemble the flashlight for use, the cover 47 is first turned upwardly about its fulcrum 49 to the position shown in Figure 2 and a lamp 45 is screwed into the socket 30. Then the cover 47 is turned down to enclose the lamp bulb as shown in Figure 1 and protect it. To remove the closure 25, 27 for the insertion of a battery, the lugs 62 on the U-shaped spring are pressed inwardly until their ends clear the holes 60 in the casing, whereupon the closure 25, 27 can be withdrawn by grasping the slightly protruding edge 26 of the top disc 25. The cells 13, 14 are then inserted side by side, as shown in Figures 1 and 2, one, say 13, with the positive terminal 16 downwardly and one, say 14, with the corresponding terminal 15 upwardly. Each cell 13, 14 rests on a bottom spring 18, 19, respectively. The closure guide 28 is then inserted until the lugs 62 snap into the casing apertures 60. At this time both cells 13, 14 are pressed upwardly, one with its negative terminal, say, against the central terminal of the lamp base and the other cell with, say, its positive terminal against the insulatory bushing 55. It will be noted that the lower end of the contact plunger 51 is urged upwardly by the plunger spring away from the cell terminal when the cover is down over the lamp so that there is a space 66 between the cell terminal 15 and the lower end of the plunger, and in this position, with the cover down, the plunger is pressed upwardly against the bottom face of the cover lever arm or cam surface by the plunger spring 57 as shown in Figure 1 and the circuit is open.

When the flashlight is to be used, the cover is turned upwardly about the pivot 49 to a position substantially perpendicular with respect to the closure as shown in Figure 2. The end 67 of the closure lever arm, in swinging downwardly in a counter-clockwise direction, as viewed in Figures 1 and 2, cams the contact plunger 51 downwardly to bring its lower end into contact with the cell terminal, thus completing the circuit through the lamp 45 and illuminating it.

It will be recognized that the radial distance from the pivot axis 49 to the bottom 46 of the cover arm 48 is less than the radial distance from the pivot to the end 67 of that arm. As the cover is turned to uncover the lamp, it will be apparent that the lower corner of the cover lever arm must pass the plunger. While this is rounded off as shown at 68, it is nevertheless at a greater radial distance from the lever axis 49 than is the end surface 67 and hence in riding over the plunger 51, it forces the plunger down further than its normal circuit closing position and in so doing de-

presses the cell 14. This depression of the cell, however, is permitted by the contraction of the bottom spring 19, which, when the plunger 51 recedes in following the cam, to the position shown in Figure 2, causes the cell 14 to follow the plunger 51 and remain in contact therewith.

The terms "upper" and "lower" used in the foregoing description are use in a relative sense and are not to be deemed as limiting the disposition of the parts.

It will thus be seen that a flashlight has been provided of the so-called vest-pocket type wherein the battery is readily replaceable by the removal of a cap or closure of simple construction held to the casing by a simple and easily operable securing device. The component elements of the flashlight conform to standard practice and the lamp socket is always in the electrical circuit while the circuit is controlled by the covering and uncovering of the lamp. The lamp is readily inserted and removed from a standard socket.

Various modifications will occur to those skilled in the art in the composition, configuration and disposition of the component elements going to make up the invention as a whole, as well as in the selection and/or combination of certain of the features independently of others and no limitation is intended by the phraseology of the foregoing description or illustrations in the accompanying drawing except as indicated in the appended claims.

What is claimed is:—

1. In a flashlight, in combination, a casing, cells therein, a lamp in electrical connection with a cell terminal, a sleeve carried with the casing, a plunger slidable in the sleeve, a lamp cover, means to move the cover to expose the lamp and thereby engaging and depressing the plunger, a spring to retract the plunger, a non-conductive abutment for a cell, and means to urge the cell toward the plunger.

2. In a flashlight, in combination, a casing, cells therein, a lamp whereof a terminal is in electrical connection with the cell terminal, a sleeve, a plunger slidable in the sleeve, a lamp cover, and means to move the cover to expose the lamp and thereby depress the plunger into contact with a cell terminal of opposite polarity.

3. In a flashlight, in combination, a casing, cells therein, a removable closure, a lamp socket carried with the closure and in electrical connection therewith, a lamp in the socket whereof a terminal is in contact with a cell terminal, a conductive sleeve in electrical connection with the closure, a plunger slidable in the sleeve, a lamp cover movable on the closure and having a portion to engage and depress the plunger, a spring to retract the plunger, a non-conductive abutment for a cell and means to urge a cell toward the plunger.

4. In a flashlight, in combination, a casing, cells therein, a removable closure, a lamp socket carried with the closure and in electrical connection therewith, a lamp in the socket whereof a terminal is in contact with a cell terminal, a conductive sleeve in electrical connection with the closure, a plunger slidable in the sleeve, a lamp cover, a fulcrum therefor, means carried by the cover to engage and depress the plunger, a spring to retract the plunger, a non-conductive abutment for a cell and means to urge a cell toward the plunger.

5. In a flashlight, in combination, a tubular casing, cells therein, a removable closure for the casing, a lamp socket fixed in the closure and in electrical connection therewith, a lamp in the socket whereof the central terminal is in contact with a cell terminal, a conductive sleeve fixed in the closure and in electrical connection therewith, a plunger slidable in the sleeve, a lamp cover, a fulcrum therefor, a cam carried by the cover to engage and depress the plunger into contact with a terminal of opposite polarity of another cell, a spring to retract the plunger, a non-conductive abutment for the latter cell and electrically connected means to urge the cells toward the closure.

6. In a flashlight, in combination, a tubular casing, an insulatory bottom supported therein, cells therein side by side, one cell inverted in respect of the other, a removable closure, a lamp socket fixed in the closure and in electrical connection therewith, a lamp in the socket whereof the central terminal is in contact with a terminal of one cell, a conductive sleeve carried by and in electrical connection with the closure, a plunger slidable in the sleeve, a lamp cover formed with an arm, a pivot bearing carried with the sleeve, a pivot for the arm carried by the bearing, said arm being adapted to engage and depress the plunger into contact with the terminal of opposite polarity of another cell, a spring to retract the plunger, a non-conductive bushing carried by the sleeve as a stop for said other cell, a conductive member carried by the bottom and coil springs in contact therewith to engage the cells, respectively, and urge them toward the closure.

7. In a flashlight, in combination, a tubular casing formed with a pair of oppositely disposed apertures, a removable closure for the casing having a cup shaped portion telescoping within the casing, said cup shaped portion being formed with apertures to register with the first named apertures, a U-shaped spring secured within the cup shaped portion with its free ends over the apertures and lugs carried by said free ends, respectively, and adapted to enter the registering apertures.

8. In a portable self contained flash lamp of the type having a lamp carried by the end thereof and a lid normally covering said lamp and operable to its open position to operate said lamp, the combination of a housing, one or more electric cells disposed within said housing and a structurally unitary closure element for said casing comprising a plate closing the end of said casing, a stationary lamp receiving socket and a movable switch element extending below the inner face of said plate and interiorly of said casing, and means operable by said lid for the direct operation of said switch element to move the same to its closed position when the lid is moved to the open position, and a spring for moving the switch element to its open position when the lid is moved to its closed position, said spring also cooperating with said lid to hold the same in its open position.

9. In a portable self contained flash lamp of the type having a lamp carried by the end thereof and a lid normally covering said lamp and operable to its open position to operate said lamp, the combination of a housing, one or more electric cells disposed within said housing and a closure element consisting of a unitary assembly and comprising a plate closing the end of said casing, a lid disposed on the outer face of said plate, a lamp receiving socket, a switch element associated with said lid in relatively movable relation therewith, and a resilient device cooperating with said switch element and lid, said lid, switch element and resilient device being so arranged and

constructed that the switch element is moved to its closed position against the action of said device when the lid is moved to its open position and is moved to its open position by said spring when the lid is moved to its closed position, said resilient device cooperating with said switch element to retain said lid in its open or closed position.

10. In a portable self contained flash lamp of the type having a lamp carried by the end thereof, and a lid normally covering said lamp and operable to its open position to operate said lamp, the combination of a housing, one or more electric cells disposed within said housing and a closure element consisting of a unitary assembly and comprising a plate closing the end of said casing, a lid disposed on the outer face of said plate, a lamp receiving socket, a switch element associated with said lid in relatively movable relation therewith, and a resilient device cooperating with said switch element and lid, said lid, switch element and resilient device being so arranged and constructed that the switch element is moved to its closed position against the action of said resilient device when the lid is moved to its open position and is moved to its open position by said spring when the lid is moved to its closed position, said resilient device cooperating with said switch element to retain said lid in its open or closed position, said socket, switch element and resilient device being disposed mainly below said plate and extending downwardly therefrom and interiorly of said housing.

11. In a portable self contained flash lamp of the type having a lamp carried by the end thereof and a lid normally covering said lamp and operable to its open position to operate said lamp, the combination of a housing, one or more electric cells disposed within said housing and a structurally unitary closure element for said casing comprising a plate closing the end of said casing, a lamp receiving socket carried by said plate, a switch element associated with said lid in relatively movable relation therewith, and a helical compression spring for moving the switch element to its open position when the lid is moved to its closed position, said spring also cooperating with said lid to hold the same in its open position.

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