May 6, 1947. L. G. SHERWOOD ET AL 2,420,152

FLASHLIGHT

Filed April 6, 1944

Fig. 1.

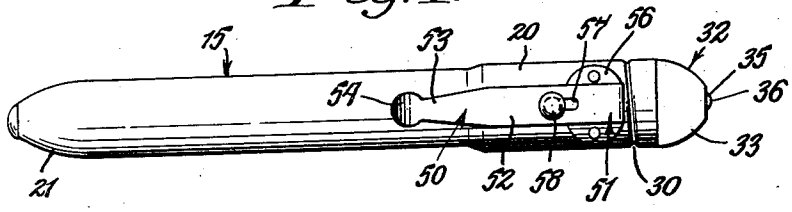



Fig. 2.

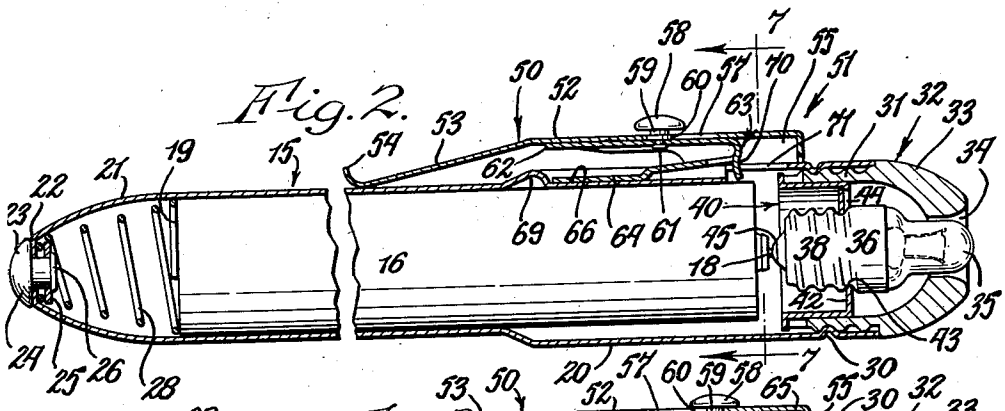



Fig. 3.

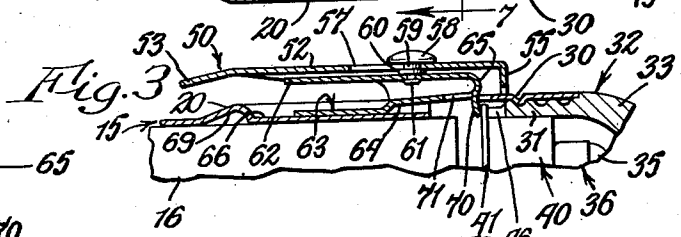



Fig. 4.

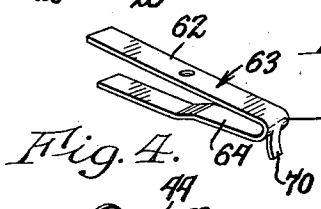



Fig. 5.

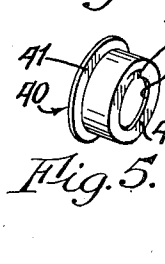



Fig. 6.

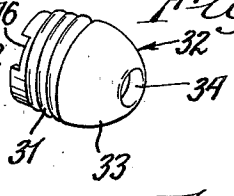



Fig. 7.

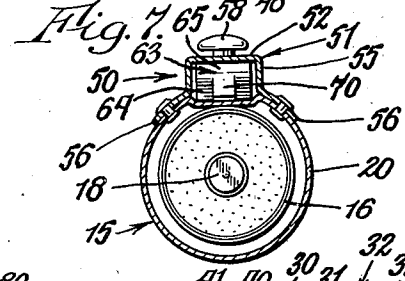



Fig. 8.

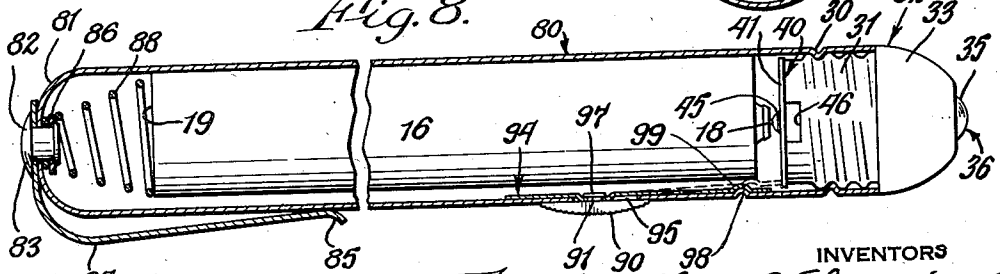



Fig. 9.

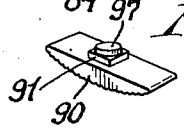
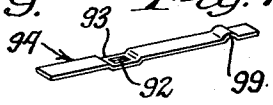



Fig. 10.




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## FLASHLIGHT

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3 Claims. (Cl. 240—10.68)

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This invention relates to a flashlight and more particularly to a flashlight of approximately the same size and shape of a pocket pen and provided with a similar clip so that it can be carried in the pocket in the same manner as a pocket pen and is immediately available for use.

One of the objects of the present invention is to provide such pocket flashlight of such elongated form which is compact and does not produce a bulky bulge when carried in the pocket.

Another object is to provide such a pocket flashlight having a clip for fastening to one wall of the pocket and also having a switch so constructed and arranged that placing the flashlight in the pocket does not close the switch, this being an important objection to such flashlights as now constructed.

Another object is to provide such a flashlight having the general form and shape of a pocket pen in which the light bulb is arranged at the upper end of the flashlight when clipped in place in the pocket. By this means the flashlight is instantly in position for use when withdrawn from the pocket and is not required to be awkwardly reversed in the hand after being withdrawn from the pocket.

Another object is to provide a simplified and inexpensive mounting for the electric light bulb and for the translucent guard which surrounds the electric light bulb.

Another object is to provide such a pocket flashlight which can readily be taken apart and put together by one having little skill to facilitate the replacement of batteries, and the electric light.

Another object is to provide such a pocket flashlight which is ornamental and attractive in appearance.

Other objects are to provide such a pocket flashlight which is of simple and inexpensive construction and which will stand up under conditions of severe and constant use without getting out of order or requiring repair.

In the accompanying drawings:

Fig. 1 is a side elevation of a pocket flashlight embodying the present invention.

Fig. 2 is a longitudinal central sectional view therethrough and showing the switch open.

Fig. 3 is a fragmentary view similar to Fig. 2 and showing the switch closed.

Fig. 4 is a perspective view of the movable contact of the switch.

Fig. 5 is a perspective view of the socket for the electric light.

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Fig. 6 is a perspective view of the translucent guard for the electric light.

Fig. 7 is a transverse sectional view taken on line 7—7, Fig. 2.

Fig. 8 is a view similar to Fig. 2 and showing a modified form of the invention.

Fig. 9 is a perspective view of the finger piece of the switch in the form of the invention shown in Fig. 8.

Fig. 10 is a perspective view of the movable contact of the switch in the form of the invention shown in Figs. 8 and 9.

The metal casing or body 15 of the form of the pocket flashlight shown in Figs. 1–7 is of tubular form of the general shape and size of a pocket pen and is adapted to receive a series of small cylindrical dry batteries 16, these being arranged end to end to place them in series, each battery having a central terminal 18 at one end and its end wall 19 providing the other terminal, the sides of each battery being insulated from the casing 15 by the usual paper cover. The front end of the tubular body or casing 15 is enlarged, as indicated at 20 and the rear end is tapered, as indicated at 21, this taper leading to a small end wall 22 at the rear end of the casing or body.

A rivet 23 extends through this small end wall 22, this rivet having a large outer head 24 forming a continuation of the taper 21 of the body and forming an ornamental end piece. The shank of the rivet 23 carries a washer 25 and the inner head 26 of the rivet compresses this washer against the small end convolution of a spiral spring 28, this end convolution being firmly clamped against the small end wall 22 of the casing or body. The large end convolution of this spiral spring 28 bears against the bottom terminal 19 of the innermost battery 16 and thereby establishes an electrical connection between this terminal of this battery and the body or casing 15 as well as urging the batteries 16 axially toward the forward end of the body or casing.

A single thread 30 is rolled in the enlarged forward end 20 of the body or casing 15 and in this enlarged end is screwed the externally threaded tubular shank 31 of a guard or casing 32 for the electric light, this guard or casing being made of a translucent plastic so as to be rendered luminous by the electric light. The head 33 of this translucent guard is of larger diameter than the threaded shank 31 so as to provide a shoulder seating against the open end of the enlargement 20 of the body or casing 15 and extends a substantial distance axially outward from the casing or body. This head 33 of the guard is provided

with an axial opening 34 extending therethrough and which receives the bulb 35 of the electric light 36, the direct light from the filament of this electric bulb being projected forwardly through the opening 34 to provide a relatively intense beam and the filament also rendering the head 33 of the plastic guard 32 luminous.

The socket for the threaded base 38 of the electric light 36 is in the form of a cup shaped cylindrical metal thimble 40 which fits snugly within the threaded shank 31 of the plastic guard 32 and is provided at its inner end with a radially outwardly projecting annular flange 41 which seats against the inner end of the shank 31 of the guard 32. The opposite end wall 42 of the socket is provided with a circular opening 43 for the base 38 of the electric light and at one side this wall is slotted radially and then laterally from the opening 43 to form an L-shaped slit as indicated at 44. This provides a circumferentially extending tongue at the margin of the opening 43, this tongue being flexed rearwardly by the leading end of the screw on the base 38 and thereby permit the base to be screwed into the opening 43, which is of a diameter intermediate the maximum and minimum diameters of the thread on the base 38. By this means screwing the electric light 36 into the opening 43 of the socket 40 automatically distorts this tongue and end wall 42 into helical or thread form thereby to reliably hold the electric light 36 in the socket.

The end contact 45 of the electric light bulb 36 is held in firm electrical contact with the contact 18 of the outermost battery 16 by the spiral spring 28.

In order to permit of the ready removal of the socket 40 from the guard 32, recesses 46 are provided in the opposite sides of the end of the shank 31 of the guard so as to permit the insertion of one's fingernails therein. With one's fingernails in engagement with the forward side of the flange 41 of the socket it will be seen that the socket can readily be withdrawn from the plastic guard 32.

As with a pocket pen, a clip 50 is provided for the flashlight. This clip comprises an attaching portion 51, the outer wall 52 of which is extended to provide a spring finger 53 which inclines toward the body or casing 15 so that its rounded reversely formed end 54 is in contact therewith. The attaching portion 51 of the clip has side walls 55 which engage the body or casing 15 of the flashlight and are provided with a pair of laterally outwardly extending ears 56 which are riveted or otherwise secured to the enlarged end 20 of the casing. An important feature of the invention resides in the fastening of the clip 50 adjacent to the light end of the flashlight and so that its holding finger 53 extends away from the light. By this means, when the flashlight is clipped in one's pocket, the light is uppermost. Consequently, when one withdraws the same, the thumb holds the flashlight near the light end thereof and hence in position to immediately direct the light beam as may be desired. This avoids the necessity of awkwardly reversing the position of the flashlight after withdrawing it from one's pocket, which would be necessary if the clip were not arranged as shown.

A keyhole slot 57 is provided in the outer wall 52 of the clip 50 to extend lengthwise of the body and has its enlarged end arranged remote from the light end of the flashlight. In this keyhole slot is arranged a button or finger piece 58, comprising an outer head; a shank 59 of reduced diameter and adapted to fit into the reduced portion of the keyhole slot 57; an enlargement 60 adapted to fit into the enlarged part of the keyhole slot; and a small stem 61 riveted to one leg 62 of a movable contact 63, this contact being thereby secured against the enlargement 60 of the finger piece.



The movable contact 63, as best shown in Fig. 4, is of hairpin form having its flat leg 62 arranged to bear against and slide lengthwise in the attaching portion 51 of the clip between the side walls 55 thereof and having another flat leg 64 connected by a bend 65 to one end of the leg 62. This inner leg 64 rides in a longitudinal groove 66 provided by ridges 69 in the enlarged part 51 of the body or casing, this groove being arranged under the clip 50. Good electrical contact is thereby provided between the movable contact 63 and the body of the flashlight.

A small finger 70 is cut out of the body of the leg 64 of the movable contact near its bend 65, as best shown in Fig. 4, and is arranged to project through a longitudinal slot 71 in the enlargement 20 of the body or casing 15, this slot being arranged under the forward end of the attaching portion 51 of the clip. This small finger is of sufficient length to be moved into contact with the flange 41 of the socket 40 for the electric light.

In use, assuming the parts to be in the position shown in Fig. 2, the user presses on the button of the finger piece 58 so as to press the enlargement 60 thereof out of the enlargement of the keyhole slot 57 and the reduced part 59 of the finger piece into this slot. Since this reduced part 59 of the stem of the finger piece can enter the reduced part of the keyhole slot 57, it will be seen that the finger piece can now be slid lengthwise of this slot and since the finger piece is riveted to the outer leg 62 of the movable contact 63, this movable contact is likewise capable of being slid along its groove 66 provided in the body or casing of the flashlight. The finger piece 58 and movable contact 63 are so moved along the respective slot and groove until the small finger 70 at the bend of the movable contact, and which extends through the slot 71, contacts the flange 41 at the inner end of the cup shaped socket 40 for the electric light bulb. When this occurs, a circuit is established from the terminal 18 of the outermost battery 16, electric light 36, its socket 40, contact finger 70 and through the movable contact 63 to the metal casing or body 15 of the flashlight, this casing being connected to the other terminal 19 of the batteries by the spiral spring 28.

Upon now drawing the finger piece 58 rearwardly, the movable contact 63 and its finger 70 are moved out of engagement with the socket 40 of the electric light so as to break this circuit and extinguish the flashlight. When the user fully withdraws the finger piece rearwardly, the lateral spring pressure of the leg 62 of the movable contact 63 causes it to snap the enlargement 60 of the finger piece into the enlargement of the keyhole slot 57 thereby latching the finger piece in its off position. It will particularly be noted that when in this condition the flashlight can be clipped in one's pocket without danger of lighting the light. Thus, since the finger piece is latched in the off position, the sliding contact, of any part of the user's clothing in placing it in his pocket cannot close the switch.

In the form of the invention shown in Figs.

8–10, the tubular metal body or casing 80 is of uniform diameter and at its open end is provided with a rolled thread to receive the socket and guard for an electric light bulb, the construction of these being identical to the form of the invention shown in Figs. 1–7 and the same reference numerals being therefore employed. The closed end 81 of the body or casing carries a rivet 82 which is generally similar to the rivet 23 of the form of the invention shown in Figs. 1–7, the outer head 83 of this rivet 82, however, securing a spring clip 84, this clip extending alongside the body and having a reversely bent end 85 which contacts the body at one side so that the flashlight can be clipped to the wall of the user's pocket. The inner head of the rivet 82 clamps a washer 86 against the small end convolution of a spiral compression spring 88, the large end convolution of this spring contacting the end wall and terminal 19 of the adjacent battery 16 in the same manner as with the form of the invention shown in Figs. 1–7, the spring 88 also holding the terminal 45 of the electric light bulb in firm contact with the terminal 18 of the battery 16 at the front end of the flashlight.

The principal feature of the form of the invention shown in Figs. 8–10 resides in the construction of the switch for making and breaking the circuit through the electric light bulb. This switch includes a finger piece 90 which can be of any suitable form to be slidable axially along the side of the body or casing 80 and is provided on its inner side with a square or out of round projection 91, this projection fitting into a corresponding square or out of round hole 92 provided in an offset 93 of a movable contact strip 94.

The body or casing 80 is provided in one side near the front end thereof with an axially extending, parallel sided slot 95, this slot being of the same width as the width of the offset 93 of the contact strip 94 and the contact strip is arranged in contact with the inside of the casing or body with its offset 93 in this slot, the engagement of the edges of this offset with the edges of the slot serving to hold the contact strip 94 parallel with the flashlight casing and the offset 93 being slidable along the slot. The finger piece 90 is arranged against the outside of the body or casing 80 with its square projection 91 projecting into the slot 95 and into the square opening 92 in the contact strip 94. The projection 91 of the finger piece terminates in a round part 97 which is peened over to hold the finger piece and the contact strip 94 in this assembled relation.

In line with the contact strip 94 and near the flashlight bulb, the casing or body 80 is indented to provide an inwardly projecting teat or ridge 98 on which the end of the contact strip 94 rides. Near its end this contact strip is formed to provide a transverse ridge 99 into which the teat or ridge 98 fits when the parts are in the off position shown in Fig. 8 in full lines. In this position the contact strip and finger piece are held against axial movement by the interlatching of the teat or ridge 98 of the casing with the ridge 99 of the contact strip. When, however, the user presses the finger piece axially forward the flat body of the contact strip 94 rides up on the ridge 98, this bringing the contact into line with the flange 41 of the socket for the electric light bulb. Further forward movement brings the end of the contact 94 into electrical contact with this flange 40.

When this occurs an electrical circuit is established from the foremost battery terminal 18, electric light bulb and its socket 40, movable contact 94, body or casing 80 and spring 88 to the terminal 19 of the rearmost battery 16, thereby illuminating the bulb. Withdrawing the finger piece 90 axially breaks this circuit and causes the ridges 98 and 99 to interlatch. It will be particularly noted that when the flashlight is inserted in the user's pocket, this being front end first, the engagement of the finger piece 90 with the walls of the pocket does not turn on the light, both because such movement would merely tend to retract the finger piece further from its operative position and also because such movement is prevented by the limiting stop provided by the end of the slot 95.

From the foregoing it will be seen that the present invention provides a flashlight having the general form and size of a pocket pen and which is of simple, durable and inexpensive construction. Further with both forms of the invention there is no danger of the flashlight being turned on while being inserted in one's pocket. Also in the form of the invention shown in Figs. 1–7, the bulb is at that end where it is ready for use on directly withdrawing it from one's pocket and the switch is also located where it naturally comes under one's thumb in withdrawing it.

We claim as our invention:

1. An elongated pocket flashlight, comprising a tubular metal casing adapted to receive cylindrical batteries and having an electric light at one end, a clip fastened to one end of said casing and having a spring finger extending toward the other end thereof to permit of clipping the casing to the wall of the user's pocket, a hairpin switch contact slidingly mounted between said clip and casing for movement longitudinally of said casing, said hairpin switch contact having one leg yieldingly pressing toward the inner face of said clip and its other leg yieldingly pressing toward the wall of said casing, a contact finger formed integrally with said other leg and extending through an elongated slot in said casing, a finger piece slidingly mounted on said clip and operatively connected with said switch contact, and means operatively connecting said contact finger with said batteries and electric light to establish a circuit therethrough when moved to one extreme position in its slot.

2. An elongated pocket flashlight, comprising a tubular metal casing adapted to receive cylindrical batteries and having an electric light at one end, a clip fastened to one end of said casing and having a spring finger extending toward the other end thereof to permit of clipping the casing to the wall of the user's pocket, a hairpin switch contact slidingly mounted between said clip and casing for movement longitudinally of said casing, said hairpin switch contact having one leg yieldingly pressing toward the inner face of said clip and its other leg yieldingly pressing toward the wall of said casing, a contact finger formed integrally with said other leg and extending through an elongated slot in said casing, a finger piece connected to said one leg of said switch contact and extending through a keyhole slot in said clip which extends lengthwise of said casing, said finger piece having enlarged and reduced parts adapted to enter, respectively, the enlarged and reduced parts of said keyhole slot upon moving said finger piece and said one leg of the switch contact laterally, and means operatively connecting said contact finger with said batteries and electric light to establish a circuit therethrough when moved to one extreme position in its slot.

3. An elongated pocket flashlight, comprising a tubular metal casing having an enlarged open end and having an end wall at its opposite end, said casing being adapted to receive batteries having end terminals connected in series, a compression spring in said casing and secured thereto adjacent said end wall and arranged to contact one battery terminal, a socket removably secured in the open end of said casing and insulated therefrom, an electric light bulb in said socket and contacting the other battery end terminal, a clip fastened to the open end of said casing and having a spring finger extending toward the other end thereof to permit of clipping the casing to the wall of the user's pocket, a hairpin switch contact slidingly mounted between said clip and casing for movement longitudinally of said casing, said hairpin switch contact having one leg yieldingly pressing toward the inner face of said clip and its other leg yieldingly pressing toward the wall of said casing, a contact finger formed integrally with said other leg and extending through an elongated slot in said casing, a finger piece connected to said one leg of said switch contact and extending through a keyhole slot in said clip which extends lengthwise of said casing, said finger piece having enlarged and reduced parts adapted to enter, respectively, the enlarged and reduced parts of said keyhole slot upon moving said finger piece and said one leg of the switch contact laterally, said contact finger being movable into engagement with said socket to establish a circuit through said batteries, electric light, socket, contact finger, casing and compression spring.



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## REFERENCES CITED

The following references are of record in the file of this patent:


UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 1,983,818 | Seiss | Dec. 11, 1934 |
| 2,231,585 | Maslin | Feb. 11, 1941 |
| 2,059,977 | Williams | Nov. 3, 1936 |
| 2,249,690 | Gelardin | July 15, 1941 |
| 1,150,066 | Rosenfeld | Aug. 17, 1915 |
| 1,272,781 | Drufva | July 16, 1918 |
| 1,311,899 | Kaplan | Aug. 5, 1919 |
| 2,134,856 | Burgess | Nov. 1, 1938 |
| 2,271,421 | Gits | Jan. 27, 1942 |
| 1,353,348 | Koretzky | Sept. 21, 1920 |
| 2,252,088 | Meyerhoefer | Aug. 12, 1941 |
| 1,263,674 | Janovsky | Apr. 23, 1918 |
| 2,164,148 | Swanson | June 27, 1939 |
| 2,389,591 | Brown | Nov. 27, 1945 |

FOREIGN PATENTS

| Number | Country | Date |
|---|---|---|
| 484,676 | British | May 6, 1938 |