July 18, 1939. W. O. BENJAFIELD 2,166,282

ELECTRIC LAMP

Original Filed June 3, 1936

Fig. 1.

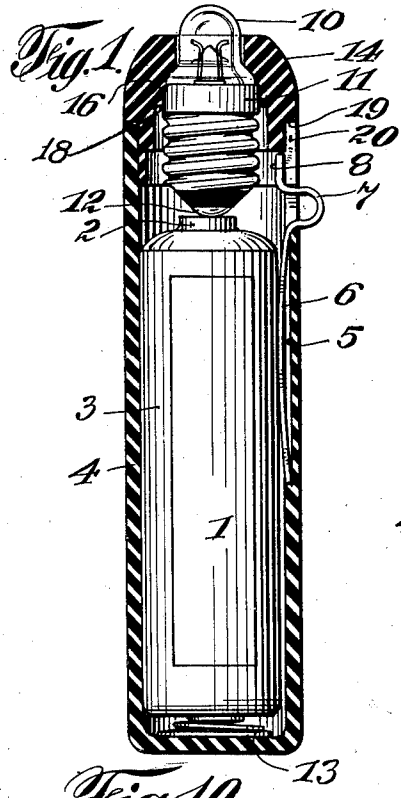


Fig. 2.

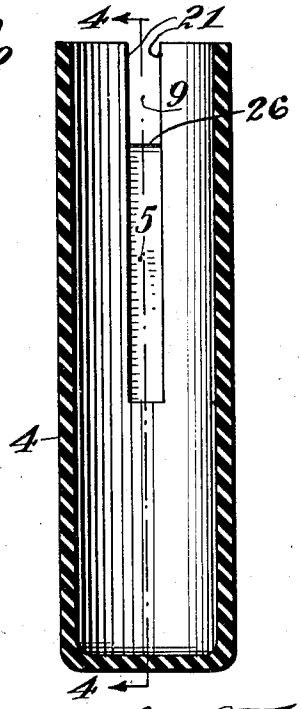


Fig. 4.

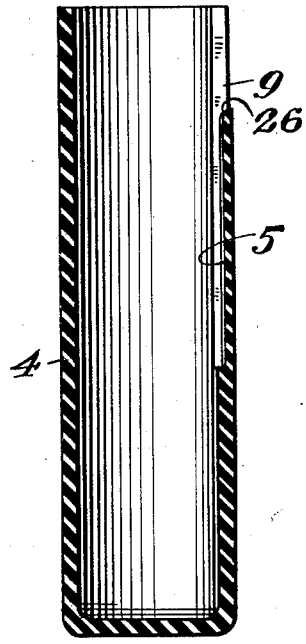


Fig. 10.

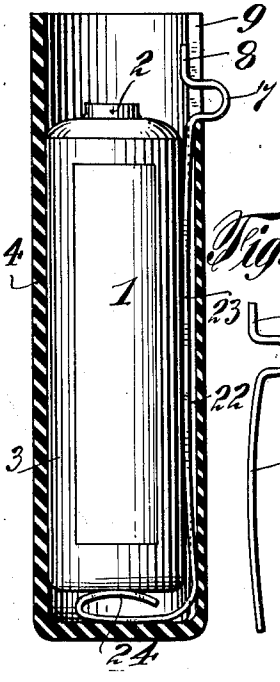


Fig. 3.

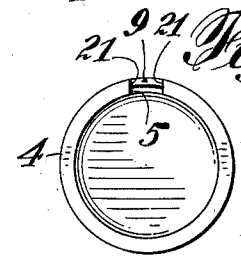


Fig. 5.

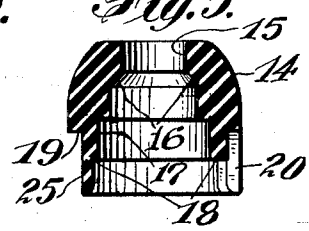


Fig. 8.

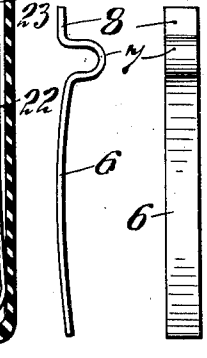


Fig. 9.

Fig. 7.

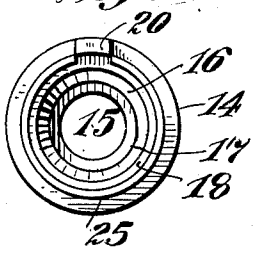
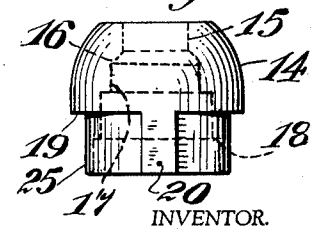


Fig. 6.



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UNITED STATES PATENT OFFICE

2,166,282

ELECTRIC LAMP

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Application June 3, 1936, Serial No. 83,258
Renewed December 13, 1938

6 Claims. (Cl. 240—10.68)

This invention relates to electric battery lamps and particularly to those intended for carrying in a pocket or in a pocket book.

A feature of the invention is the provision of such an electric lamp which may be assembled complete from molded or machine products without any supplemental operations such as riveting, or crimping, whereby the cost of manufacture may be substantially reduced.

A feature of the invention is the provision of such an electric lamp which can be easily, accurately, and precisely assembled or disassembled with a battery and an incandescent lamp, by any person unskilled in the art.

A further feature of the invention is the provision of a spring switch operable by a button-like loop, accessible externally of the casing, provided at one end with a substantially flat contact surface for electrical contact with the neck of an electric incandescent lamp and a part which lies partly within an internal vertical recess within the casing and with an inner loop for resiliently engaging a battery to hold the battery snug in the casing and to make electrical contact with the metal battery casing. The spring is easily assembled between the battery and the container by providing an enlargement in the form of an upwardly and outwardly extending bevel on the wall of the container thereby providing an enlarged aperture to permit initial entrance of the lower end of the spring into a slot between the battery and the casing. This spring switch may be extended in an extension of the vertical inner slot to the bottom of the lamp casing and the lower extremity formed in a loop to displace the usual coil spring which is used to keep the battery terminal and the electric incandescent lamp terminal in engagement.

Another feature of the invention is the provision in an electric lamp of a resilient friction jointure between a cap and a casing which also exerts pressure to resiliently hold an electric lamp in operative position, having two vertical sides, forming a slot, on one piece which engage a rectangular extension on another piece, the inner piece having a slightly larger diameter in the area of jointure than that of the inner bore of the outer piece.

Another feature of the invention is the provision in a low-cost electric battery lamp of a complete two-part casing made entirely of moldable material, such as urea base material, and susceptible of a great variety of beautiful colors, both parts of the same color, or of separate colors.

Another feature of the invention is the provision in an electric battery lamp of a non-threaded resilient socket that secures and positively positions the lamp in the assembled position.

Other features of the invention will appear as the description proceeds.

Reference is made to the drawing which is hereby made a part of this specification, in which—

Fig. 1 is a vertical section showing the parts assembled but with the switch open.

Fig. 2 is a vertical section showing the vertical inner recess in the casing and the upper slot.

Fig. 3 is a top plan view of the casing.

Fig. 4 is a vertical section on line 4—4 of Fig. 2.

Fig. 5 is a vertical section of the cap.

Fig. 6 is an elevation of the cap.

Fig. 7 is a bottom plan view of the cap.

Fig. 8 is a side view of the spring switch.

Fig. 9 is a front view of the spring switch.

Fig. 10 is a vertical section of a modification.

As shown in Fig. 1, a standard cylindrical battery 1 has the usual terminal 2 at its upper end and a metal casing 3. A cylindrical container 4 may be formed as a single molded unit of, some moldable insulating material such as urea which has some slight resiliency, and having an inner cylindrical chamber of substantially the same size as the battery 1, but enough larger that the battery 1 easily slides into and out of the chamber. Positioned on the inner wall of the chamber is a vertical shallow rectangular recess 5 terminating at the tip in an outwardly and upwardly rounded or beveled edge. The depth of the recess 5 is substantially the same as the thickness of a flat resilient contact and switch spring 6 except at the upper edge where the depth of the recess 5 is somewhat increased by the bevel edge 26 of the recess 5 to permit the facile insertion of the lower end of the flat spring 6 which is bowed slightly to resiliently engage the metal casing 3 of the battery 1, both to hold the battery 1 tight in the container 4 and to make a good contact between the switch 6 and the battery 1. The length of the recess 5 is sufficient to permit the spring 6 to slide down between the battery 1 and the container 4 until the under edge of an outwardly turned loop or button bend 7 in the spring 6 engages the upper edge of the recess 5. The upper end of the spring 6 terminates in a flat extension 8 adapted to make contact with the neck of an electric incandescent lamp 10. Above the recess 5 the wall of the container 4 is provided with a slot 9 having parallel walls 21, the slot 9 being approximately the same width as the recess 5. The electric lamp 10 may

be the standard Mazda filament bulb lamp designed for use with a single standard pocket battery 1, in which the diameter of the bulb is less than that of a brass covered neck 11 the upper zone of which is a smooth cylinder and the lower zone of which is screw threaded and insulated from a terminal 12. A conical spiral coil spring 13 placed in the bottom of the container 4 tends to maintain contact between the battery terminal 2 and the lamp terminal 12 and compensates for any variations in the length of the battery and the lamp.

A cap 14 may also be formed of urea or the like, possessing slight resiliency and preferably being translucent to utilize all the light rays emanating from the lamp 10, providing an upper central cylindrical bore 15 terminating at the bottom in an outwardly beveled shoulder 16 which connects the bore 15 with a larger bore 17. The shoulder 16 provides a stop to engage the upper edge of the lamp plug 11 to prevent outward movement of the lamp 10 in the cap 14. The plug 11 may fit snugly in the cylindrical bore 17, which may terminate in a shoulder 18 above the lower end of the cap 14 and so in the assembled unit provide a recess for the upper contact end 8 of the spring 6, and further provides a thinner wall at the lower end to enhance the frictional resilient engagement of cap 14 and container 4. The outer wall of cap 14 may have a shoulder 19 extending around except for the rectangular piece 20, and providing a cylindrical collar 25, except for the rectangular piece 20, which is the same width as the slot 9. But when assembled the lower part of slot 9 is left uncovered by the cap 14 to provide an aperture which is filled by the button bend 7 of a flat spring 6. In diameter the collar 25 is slightly greater than the inside diameter of the upper part of the container 4 so that when assembled the upper part of the container tends to spread a bit and so frictionally and resiliently engage the cap 14, which may also be slightly resiliently compressed to hold the lamp 10. The piece 20 tends to act as a lock to prevent rotative movement of the cap 14 with reference to the container 4 which might lessen the frictional engagement. The loop in the spring 6 in contact with the battery casing 3 tends to prevent loose-motion thrusts by the battery against the lamp 10, which might also tend to break frictional engagement of the collar 25 and the inner wall of the container 4.

The device is assembled as follows: The coil spring 13 is dropped in the bottom of the container 4 with the top of the spiral upwards. The battery 1 is next dropped into the container 4. The spring 6 is pushed into the recess 5 between the battery 1 and container 4 until the button bend 7 engages the upper edge of the recess 5. The lamp 10 is inserted in the bore 15 and the cap 14 then pushed home on the container 4. The cap and container may be made in a variety of beautiful colors, uniform or different colors.

A modification is shown in Fig. 10 in which the spring 23 may be the same as spring 6 but be continued to the bottom of the container 4 and a loop 24 formed to take the place of the coil spring 13. In this case a recess 22 may be provided below the recess 5 in the inner wall of container 4.

Parts may be used without others and changes may be made in mechanical details, as for example a screw threaded connection might be used, or one part, or both parts might be metal.

I claim:

1. An electric battery flashlight comprising in combination an electric lamp, a container of insulating material having some resiliency, a battery in said container, a spring under said battery and tending to move said battery axially, a metal spring switch between said battery and said container, accessible on the outside wall of the container and adapted to electrically contact the casing of said battery and to exert resilient pressure on said battery sidewise, an aperture in the wall of said casing above said battery, a part of said spring switch lying in said aperture, a slot in the wall of said container connecting with said aperture and separating the top edge of said container whereby said switch can be quickly and facilely inserted between the battery and the container into assembled position, and a cap closing the open end of said container and having a socket to prevent outward movement of an electric lamp, said switch having a part adapted to contact a metal neck of said lamp.

2. An electric battery flashlight comprising in combination an electric lamp, a container of insulating material having some resiliency, a battery in said container, a spring under said battery and tending to move said battery axially, a metal spring switch between said battery and said container, accessible on the outside wall of the container and adapted to electrically contact the casing of said battery and to exert resilient pressure on said battery sidewise, an aperture in the wall of said casing above said battery, a part of said spring switch lying in said aperture, a slot in the wall of said container connecting with said aperture and separating the top edge of said container, and an insulating cap closing the open end of said container and having a socket to prevent outward movement of an electric lamp, said cap having an inset neck adapted to fit within the top of said container and a rectangular projection adapted to interfit with said slot above said aperture and coextensive with the outer wall of said container, said switch having a part adapted to contact a metal neck of said lamp.

3. An electric battery flashlight comprising in combination an electric lamp having a metal neck, a container of insulating material having some resiliency, a battery in said container, a spring under said battery and tending to move said battery axially to engage the central contacts of the battery and the lamp, a metal spring switch having a part between and exerting pressure on the sides of said battery and container and also having a part accessible on the outer side wall of the container, said switch having another part engageable with the metal neck of the lamp to establish contact between the wall of the battery and said metal neck, an aperture in the wall of the container above said battery in which lies the part of the switch accessible on the outer side wall of the container, and a centrally apertured cap closing the end of said container and part of the aperture and having a socket to prevent outward movement of the electric lamp.

4. An electric battery flashlight comprising in combination an electric lamp, a battery, a container of insulating material having a side aperture, a spring for making electrical contact with the side wall of the battery and for resiliently engaging said container, having a metal composition, a lengthwise inwardly bowed portion, an upper portion for engaging the neck of the lamp, and an intermediate transverse outward button-like bend extending through said aperture, and a separate spring in the bottom of the container for engaging the central contacts of the battery

and the lamp, said container having a lengthwise recess below said aperture in its inner wall to hold said spring in assembled position.

5. An electric battery flashlight comprising in combination an electric lamp, a battery, a container of insulating material having a side aperture, a spring for making electrical contact with the side wall of the battery and for resiliently engaging said container, having a metal composition, a lengthwise inwardly bowed portion, an upper portion for engaging the neck of the lamp, and an intermediate transverse outward button-like bend extending through said aperture, and a separate spring in the bottom of the container for engaging the central contacts of the battery and the lamp, said container having a lengthwise recess below said aperture in its inner wall to hold said spring in assembled position, the wall of the container between said recess and said aperture being beveled outwardly to provide a space to admit the bottom of said spring facilely between the battery and the container in assembly.

6. In an electric battery flashlight, a battery, an electric lamp, a container of insulating material having a side aperture transversely of the neck of the lamp, a spring switch for making electrical contact with the side wall of the battery and for resiliently pressing said battery axially against said lamp to engage their central terminals, having a metal composition and at one end a transversely and upwardly extending bend, an adjacent lengthwise but inwardly bowed portion, an upper lengthwise portion to contact the neck of the lamp, and an intermediate transverse outward button-like bend extending through said aperture.

WALTER O. BENJAFIELD.