J. T. DRUFVA.

PORTABLE ELECTRIC LIGHT.

APPLICATION FILED JULY 31, 1917.

1,287,918. Patented Dec. 17, 1918.

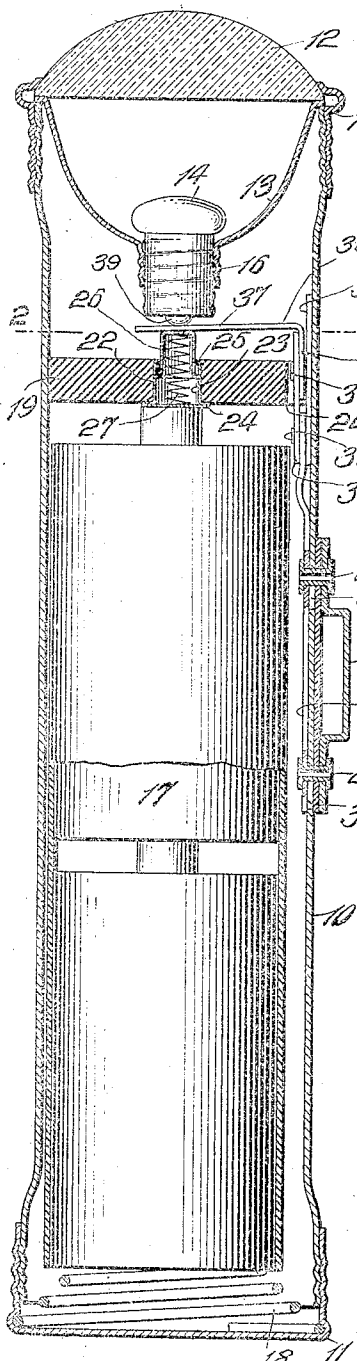


Fig. 1.

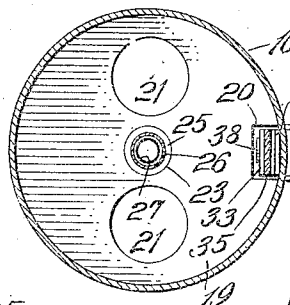


Fig. 2.

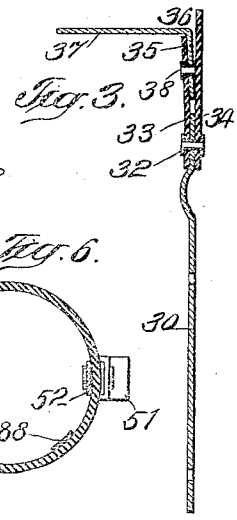


Fig. 3.

Fig. 6.

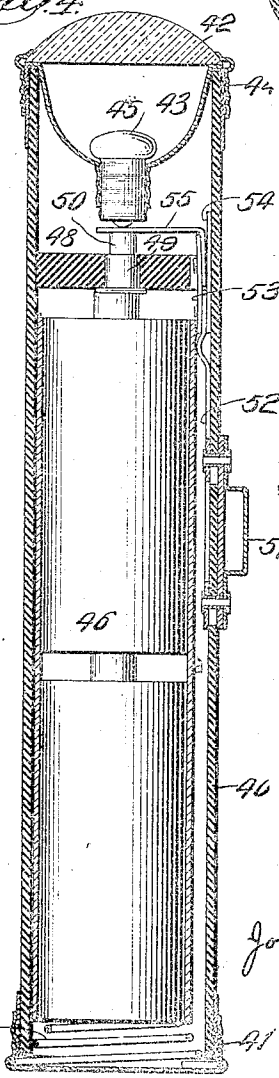


Fig. 4.

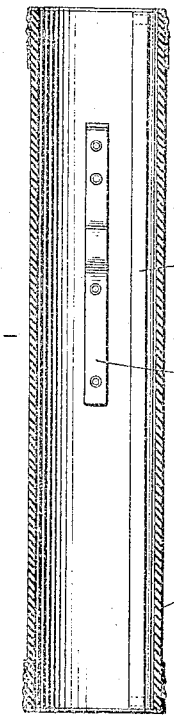


Fig. 5.

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PORTABLE ELECTRIC LIGHT.

1,287,918. Specification of Letters Patent. Patented Dec. 17, 1918.

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To all whom it may concern:

Be it known that I, JOHN T. DRUFVA, a citizen of the United States, and a resident of Longmeadow, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Portable Electric Lights, of which the following is a specification.

The invention pertains more particularly to the character of electric flash lights to be held in the hand and lighted, as occasion may require, by the manual movement of a slide or switch applied to the exterior casing of the device.

My invention resides more particularly in novel means for completing the circuit between the lamp and battery and in a construction which prevents the accidental creation of a circuit through the lamp and battery by the contact of the device with metal articles, such as might arise when a flash light, otherwise constructed, is placed in a box of tools.

The flash-light of my invention, in its preferred form, comprises an exterior metal tubular casing; a plural cell battery therein; a reflector, lamp and lens at the outer end of said casing; a spring conductor engaging the negative pole of the battery and a closing cap at the rear end of said casing, and novel means for completing the circuit through a terminal of the lamp and the positive pole of the battery, these means comprising a disk of insulating material mounted within said casing above the battery, a spring actuated contact held by said disk and normally under a tension pressing the same toward a terminal of the lamp, a slide on the exterior of the casing and a conducting member or switch connected with said slide and interposed between said terminal of the lamp and said spring contact, said switch being insulated from the casing. When the switch is moved against the lamp terminal, said spring contact follows the same so as to establish through said switch electrical connection between the lamp and the positive pole of the battery, and when said switch is moved in a direction from the lamp, said spring contact is pressed to its inoperative position, but still remains in electrical connection with the switch and the positive pole of the battery.

I have hereinbefore referred to the exterior casing as being of metal, but the novel features of my invention are also applicable to flash lights having fiber exterior casings and an embodiment of my invention within a fiber casing will be hereinafter described.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which:

Figure 1 is a central vertical section through a flash light embodying the invention, the wrapping on the battery being partly broken away and the casing of the flash light being of metal;

Fig. 2 is a transverse section of the same taken on the dotted line 2—2 of Fig. 1;

Fig. 3 is a detached vertical section through the switch mechanism operable from the exterior of the casing for completing the circuit through the lamp and battery;

Fig. 4 is a view corresponding with Fig. 1 but illustrating my invention as applied to a flash light having a fiber casing;

Fig. 5 is a vertical section through the fiber casing illustrated in Fig. 4 and is presented to illustrate more particularly the conductor and switch, and

Fig. 6 is a horizontal section of the same taken on the dotted line 6—6 of Fig. 5.

In the drawings, referring to Figs. 1 to 3 inclusive, 10 designates a tubular metal casing having a closing cap 11 at its lower end and at its forward end a lens 12, reflector 13, electric lamp 14 and metal ring 15, by means of which the laterally turned edge of the reflector is bound against the edge of the casing 10 and the lens 12 is secured in position against said edge of said reflector. The reflector 13 has a threaded sleeve 16, as usual, to receive the threaded body of the lamp 14, said body constituting one terminal of the lamp and being in electrical connection with the reflector.

Within the casing 10 is placed a plural cell battery 17 of known type, and within the lower end of the casing and below said battery is confined a coiled conducting spring 18 which is in electrical connection with the negative pole of the battery and also with the cap 11 and casing 10. The spring 18 also performs its usual duty of pressing the battery in a direction toward the lamp.

Within the forward portion of the casing 10 and between the lamp 14 and battery 17

is provided a transverse disk 19 of insulating material, and said disk at one edge is recessed, as at 20, to permit the movement of a switch, hereinafter referred to, and at opposite sides of its center said disk is preferably formed with openings 21 (Fig. 2) through which an instrument may be applied for forcing the battery 17 from the casing 10 in the event that said battery should not readily slide from said casing when necessary. At the center of the disk 19 is formed an opening 22 to receive a metal cup 23 which is cylindrical in cross-section and has a flange 24 at its lower end to prevent upward movement of the cup 23 from its proper position within the disk 19, and at its upper edge said cup 23 is flanged inwardly, as at 25, to engage the lower outwardly flanged edge of a cap 26 which is held at its inner portion within the cup 23 and has a normal outward tension in a direction therefrom by reason of a spring 27 which is confined within said cup and cap, the lower end of the spring bearing against the bottom of the cup and the upper end of the spring against the crown of the cap.

Upon the exterior of the casing 10 is provided a thumb-piece or slide 28 of any usual or suitable construction, and this slide is connected by rivets 29 with a longitudinally movable plate or strip 30 located at the inner side of the casing 10, said casing being formed with slots 31 to permit the slide and rivets 29 with the plate or strip 30 to have a given longitudinal movement, said parts being shown in Fig. 1 as having been moved forwardly to complete the circuit through the lamp and battery. The outer end portion of the plate or strip 30 is secured by the rivet 32 between two non-conducting or insulating strips 33, 34, as shown more clearly in Fig. 3, and between the outer portions of these strips 33, 34, is confined an arm 35 of the switch 36, which comprises the longitudinally disposed arm 35 and a transverse arm 37, both arms being formed from a strip of metal, one end of which is bent at right-angles to the body of the strip. The arm 35 of the switch 36 is secured by a rivet 38 to the insulating strip 33, and said rivet 38 is insulated from the casing 10 by means of the fiber strip 34. The arm 35 of the switch 36 is separated by a space from the upper end of the strip 30, as shown in Fig. 3, so that there may be no electrical connection between said two parts. The arm 37 of the switch 36 extends transversely between the cap 26 and the inner terminal 39 of the lamp 14, and in all positions of the switch 36 the arm 37, cap 26 and cup 23, are in electrical connection with each other and with the positive pole of the battery 17, which is maintained in constant engagement with the inner end of the cup 23 by means of the spring 18. In Fig. 1 I illustrate the switch 36 as having been moved forwardly by means of the slide 28, and in this position of the said parts the arm 37 of the switch is against the terminal 39 of the lamp and an electric circuit exists from the positive pole of the battery through the cup 23, cap 26, arm 37 and terminal 39 of the lamp, and from the negative pole of the battery through the spring 18, casing 10, and reflector 13 to the lamp. The lamp will remain lighted so long as the parts are in the relative positions shown in Fig. 1, and when it is desired to extinguish the lamp the slide 28 will be moved toward the inner or rear end of the casing 10 and through the strip or plate 30, and strips 33, 34 draw the arm 37 of the switch 36 away from the lamp 14 and toward the disk 19, the result being that said arm 37 will telescope the cap 26 within the cup 23 in opposition to the force of the spring 27. The spring 27 must not be of sufficient strength to move the slide 28 and switch 36 outwardly toward the lamp, but said spring must have sufficient force to keep the cap 26 always pressed against the arm 37 of the switch so that when said arm is against the terminal 39 of the lamp there will be maintained an electrical connection between said arm and the positive pole of the battery. When the slide 28 and switch 36 are moved outwardly toward the lamp the circuit will be established and the lamp lighted, and when said slide and switch are moved in a reverse direction the cap 26 will be telescoped within the cup 23 and the circuit will be broken and the lamp extinguished.

In Figs. 1 to 3 inclusive I illustrate my invention as applied to a flash light having a tubular metal exterior casing, and in Figs. 4, 5 and 6 I illustrate the same invention as applied to a flash light having a tubular fiber casing or one of non-conducting material as distinguished from the casing 10 of conducting material, shown in Fig. 1.

Referring to Figs. 4, 5 and 6, 40 denotes a fiber casing having a closing cap 41 at its rear end and at its forward end a lens 42, reflector 43, metal band 44 and lamp 45, these parts being of customary construction. 46 denotes the battery, 47 a conducting spring engaging the cap 41 and negative pole of the battery, and 88 a conductor which extends lengthwise within the casing 40 and is in electrical connection with the reflector 43 and cap 41, which is in electrical connection through the spring 47 with the negative pole of the battery. Within the casing 40, forwardly of the battery 46, I provide a disk 48 of insulating material having a cup 49 and spring cap 50 corresponding exactly with the like features shown in Fig. 1. Upon the exterior of the casing 40 is secured a thumb-piece or slide

51 which is connected with a plate or strip 52 having secured upon its forward end insulating strips 53, 54 between which an arm of the switch 55 is secured and which arm is spaced from the strip or plate 52. The parts numbered 51 to 55 inclusive correspond exactly with the switch features described with respect to Figs. 1 to 3 and hence do not require further description. The construction shown in Fig. 4 corresponds with the construction shown in Fig. 1 with the exception that the exterior casing 40 being of fiber a conductor 88 must be employed for permitting the making of the circuit. When the metal casing 10 is used, the conductor 88 is not required, because the circuit may be made through the casing, but when a fiber casing is employed a conductor, such as 88, must be provided.

What I claim as my invention and desire to secure by Letters Patent, is:

1. A flash light having at its forward end a lens and lamp and containing a battery whose negative pole is in electrical connection with one terminal of the lamp, and circuit making means comprising a conductor in engagement with the positive pole of the battery and comprising a fixed member, a movable member adapted to telescope therewith and a spring acting against said movable member to project the same in a direction toward the other terminal of the lamp, a switch having a transverse arm extending between said other terminal of the lamp and said movable member and engaged with and controlling the position of said member, and an external thumb-piece connected with said switch for moving the same toward and from said lamp terminal, whereby on the movement of said switch in one direction the circuit is completed and in the other direction the circuit is broken.

2. A flash light having at its forward end a lens and lamp and containing a battery whose negative pole is in electrical connection with one terminal of the lamp, and circuit making means comprising a conducting cup in engagement with the positive pole of the battery, a cap telescoping therewith, a spring confined between said cup and cap and pressing the cap toward the other terminal of the lamp, a switch having a transverse arm between said other terminal of the lamp and said cap and always engaged with and controlling the position of said cap, and an external thumb-piece connected with said switch for moving the same toward and from said lamp terminal, whereby on the movement of said switch in one direction the circuit is completed and in the other direction the circuit is broken.

3. A flash light having at its forward end a lens and lamp and containing a battery whose negative pole is in electrical connection with one terminal of the lamp, and circuit making means comprising a conductor in engagement with the positive pole of the battery and having a fixed member engaging said pole, a movable member adapted to telescope therewith and a spring acting to project said movable member toward the other terminal of the lamp, a non-conducting transverse disk rigidly supporting said fixed member of said conductor, a switch having a transverse arm extending between said other terminal of the lamp and said movable member and engaged with and controlling the position of said member, and an external thumb-piece connected with said switch for moving the same toward and from said lamp terminal, whereby on the movement of said switch in one direction the circuit is completed and in the other direction the circuit is broken.

Signed at Springfield, in the county of Hampden and State of Massachusetts, this 27th day of July, A. D. 1917.

JOHN T. DRUFVA.

Witnesses:
W. H. BLAKE,
HENRY HYMAN.