Jan. 10, 1928.

1,656,067

W. F. HENDRY

FLASHLIGHT

Filed Jan. 6, 1925

Fig. 1.

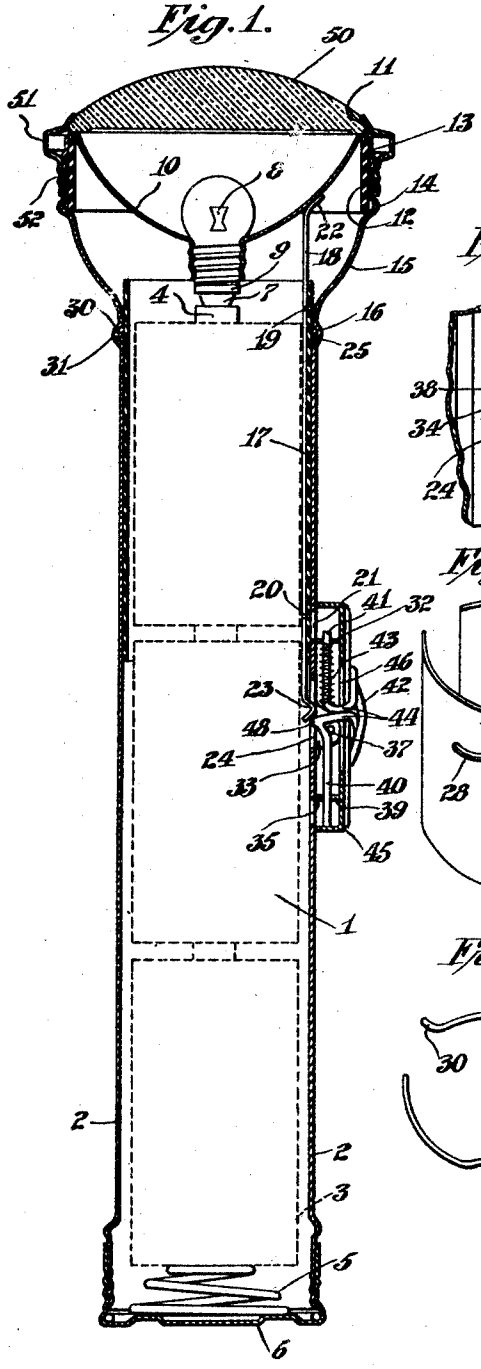


Fig. 3.

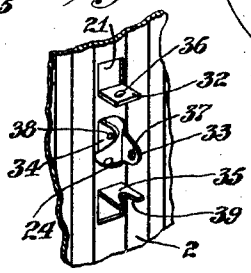


Fig. 4.

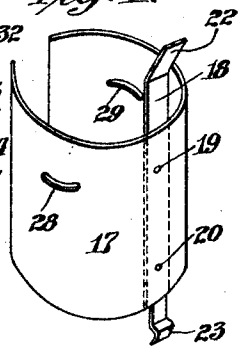


Fig. 5.

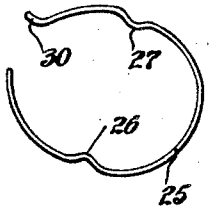
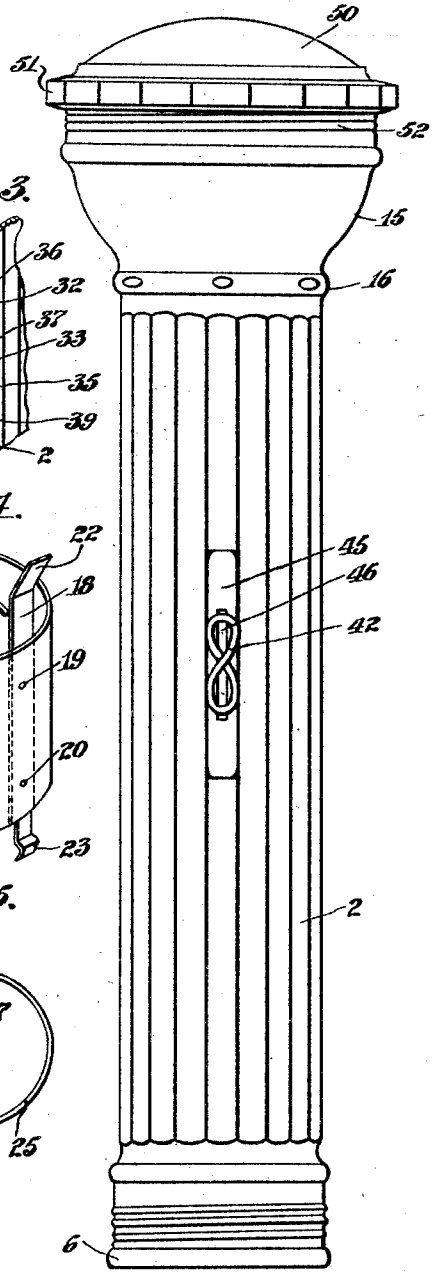


Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM F. HENDRY, OF OSSINING, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO NATIONAL CARBON COMPANY, INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

FLASH LIGHT.

Application filed January 6, 1925. Serial No. 814.

This invention relates to flashlights and more particularly to circuit control switches adapted for mounting on flashlights or hand lamps.

The object of the present invention is to provide a flashlight in which the switch may be readily mounted on the casing without the use of rivets, screws or the like, permitting thus easy removal and repair of the switch parts.

With this object in view, I provide the movable part of the switch in the form of a plunger which cooperates with a resilient contact through which the lamp circuit may be completed. The plunger is mounted in a housing which is carried by, but is readily removable from, the flashlight casing.

In addition to these features, the invention has to do with the manner in which the resilient contact is held in place and other features of the flashlight assembly which will more clearly appear from the following detailed description of a preferred embodiment thereof and the appended claims.

In the drawings, Fig. 1 is a vertical cross-section of a flashlight casing and switch constructed in accordance with the present invention; Fig. 2 is a side elevation of the flashlight casing; Fig. 3 illustrates in perspective that part of the flashlight casing which carries the switch housing; and Figs. 4 and 5 are perspective views of parts of the flashlight assembly.

The flashlight itself is of the well-known construction in which three dry cells 1 are provided one above the other within a tubular metallic casing 2. The zinc container electrodes of the dry cells are wrapped in paper 3 or other insulating material to prevent contact with the casing 2, but the bottoms of such zinc electrodes are exposed, thus making possible contact between the zinc electrode of one cell and the carbon electrode 4 of the lower cell. The bottom of the lowermost cell 1 is in electrical contact with the casing 2 through a coiled spring 5 held in a screw cap 6 which fits over the lower end of the casing 2. The carbon electrode 4 of the top cell 1 contacts with a terminal provided in the insulated base 7 of a small incandescent lamp 8, the other terminal of said lamp being, in the well-known manner, connected with the shell 9 which screws into a suitable opening of a metallic reflector 10. The edge 11 of the metallic reflector rests on a ring 12 of insulating material. This ring is within the upper screw-threaded end 13 of the casing 2 and the lower edge of the ring is seated in a groove 14 provided in the casing just below the screw-threaded part 13.

The upper portion of the casing 2 is flared as indicated at 15, and between the flaring portion 15 and the tubular portion of the casing a groove 16 is provided. Between the upper end of the tubular casing 2 and the cell 1 a flexible sheet or cylinder or sleeve of insulating material 17 is provided. The upper edge of this insulating material protrudes within the cavity formed by the flaring portion 15 and the lower edge extends slightly below the top of the second cell. A leaf spring or conductor 18 is riveted at 19 and 20 to the cylindrical insulating sleeve 17. The rivet 19 is located near the upper protruding edge of the sleeve 17 and therefore within the flaring portion of the casing and the rivet 20 near the lower edge of the sleeve opposite an opening 21 in the casing. Thus both rivets are out of contact with the casing 2, the spring 18 being insulated from the zinc container electrodes of the cells by means of the paper wrappers 3. The upper end 22 of spring 18 is bent and contacts with the reflector 10. The lower end of the spring 18 is provided with a hump 23 which projects within an opening 24 provided in the casing just below the opening 21. The insulating sleeve 17 is held in place by means of a wire ring 25 which lies within the groove 16. This ring has two projections 26 and 27 which, when surrounding the sleeve 17, lie within notches 28 and 29 cut in the sleeve 17. One end of the spring 25 is bent back, as indicated at 30, and when the ring is in place the end 30 lies within an opening 31 in the casing 6.

Those portions of the casing which have been cut away to form the openings 21 and 24 are bent up at right angles and form ears 32, 33 and 34. Similarly, an ear 35 is turned up at right angles. The ear 32 is perforated at 36 and a groove 39 is formed in the ear 35. Lugs 37 and 38 project from ears 33 and 34. A heavy and rigid rod or wire bent into a shape having two legs or plungers 40 and 41 which are in substantially the same plane, and a knob 42, is used

as the movable part of the circuit-closing mechanism. The free end of the plunger 40 lies in the groove 39 and free end of plunger 41 projects through the opening 36. A coiled spring 43 surrounding plunger 41 abuts at one end against the ear 32 and at the other end against the neck-shaped portion 44 of the wire. The spring 43 opposes the upward or forward movement of the plungers. The plunger as well as the turned-up portions illustrated in Fig. 3 are enclosed within an oblong housing 45 provided with a slot 46 through which the neck portion 44 of the plungers project with the knob 42 on top of the housing 45. Two apertures are provided in the side walls of the housing 45 and are adapted to be engaged by the lugs 37 and 38 projecting in opposite directions from the ears 33 and 34, thus affording a means for holding the housing 45 firmly in place on the casing 2.

The upper end of the plunger 40 is bent into a rigid elbow 48 which slightly projects within the opening 24 and lies in the path of the turned-up resilient end 23 of spring 18. When, therefore, the plunger is pushed by means of knob 42 against the tension of coiled spring 43, the elbow 48 will engage spring 18 at 23, establishing thus an electrical circuit for lamp 8 from the carbon electrode 4 of the dry cell through 7, lamp 8, sleeve 9, reflector 10, spring 18, the turned-up end 23 of the spring, elbow 48, plunger 40, ear 35, casing 2, spring 5 and then to the zinc electrode of the lowermost dry cell. When the knob 42 is released the spring 43 will return the plunger 40—41 to normal position. If, however, the knob 42 is pushed up far enough for the elbow 48 to pass beyond the contact end 23 then, owing to the resiliency of spring 18, the plunger 40—41 will be held in this advanced position and the circuit thus maintained closed until the operator brings the knob 42 back to normal or into a position where the elbow 48 passes below the uppermost portion of spring end 23. Obviously, other forms of plunger than the one herein illustrated may be used without departing from the spirit of the present invention.

In assembling the flashlight, first the sleeve 17 is inserted in place with the ring 25 holding it in position. Then the insulating ring 12 is placed within the screw-threaded flange 13 of the casing and the reflector 10 with the lamp 8 in place is seated on this ring. The reflector is held down by means of a glass lens 50, which in turn is clamped to the casing by means of a ring 51, a screw-threaded flange 52 of which engages the screw-threaded end 13 of the casing. The dry cells 1 are put within the casing and held in position by means of spring 5 and cap 6. The plunger 40—41 is then inserted through the slot 46 within the housing 45. The upper end of the leg 41 is pushed through the hole 36 and the housing forced down until the lugs 37, 38 snap within the apertures in the walls of the housing.

When it is desired to repair or replace parts of the circuit-controlling mechanism, which are the most vulnerable parts of a flashlight, it is not necessary to break off any rivets with the attendant difficulties of replacement. By means of a suitable tool the two lugs 38 and 37 may be pushed in, whereupon the housing with the plunger may be removed. Similarly, if the spring 18 breaks or needs adjustment, it may be readily pulled out by pushing in the end 30 of the wire 25 and then pulling out the whole sleeve 17 with the spring attached to it. It should be noted also that the width of the housing enclosing the switch is substantially the same as the flutings provided on the casing 2, enhancing thus the appearance of the structure.

What I claim is:

1. In a flashlight, a metallic casing, a dry battery within said casing, an incandescent bulb having one of its terminals connected with one pole of the battery, a piece of insulation between said battery and said casing, resilient means for holding said insulation stationary in said casing but removable therefrom, a conductor connected with the other terminal of said bulb and fastened to said insulation, and a movable contact member connected with said casing and cooperating with said conductor.

2. In a flashlight, a metallic casing, a dry battery within said casing, an insulating jacket for said battery, an incandescent bulb having one of its terminals connected with one pole of the battery, a connection between the other pole of said battery and said casing, a sleeve of insulating material between said insulating jacket and said casing, a ring of resilient material for holding said sleeve stationary in said casing, a conductor connected with the other terminal of said bulb and held between said jacket and sleeve, and a movable contact member cooperating with said conductor.

3. In a flashlight, a metallic casing, a dry battery within said casing, an insulating jacket for said battery, an incandescent bulb having one of its terminals connected with one pole of the battery, a connection between the other pole of said battery and said casing, a sleeve of insulating material removably mounted between said insulating jacket and said casing, means for holding said sleeve stationary in said casing, a leaf spring riveted to said sleeve and connected with the other terminal of said bulb, and a movable rigid contact member cooperating with a free resilient end of said leaf spring.

4. In a flashlight, a metallic casing, a dry battery within said casing, an insulating

jacket for said battery, an incandescent bulb having one of its terminals connected with one pole of the battery, a connection between the other pole of said battery and said casing, a sleeve of insulating material between said insulating jacket and said casing, an annular groove in said casing, a resilient wire in said groove to hold said sleeve stationary in said casing, said wire having a projection engaging an opening in said casing, a conductor connected with the other terminal of said bulb fastened to said sleeve, and a movable contact member cooperating with said conductor.

5. In a flashlight, a metallic casing having an opening intermediate its ends, a bell shaped head for said casing, a dry battery within said casing, an insulating jacket for said battery, a metallic reflector mounted in said head and insulated therefrom, an incandescent bulb carried by said reflector and having one of its terminals connected with one pole of the battery, a connection between the other pole of said battery and said casing, a sleeve of insulating material between said insulating jacket and said casing, said sleeve extending from said opening to a point within said head, a leaf spring with one end engaging said reflector and with the other end projecting within said opening, two rivets for fastening said spring to the inside surface of said sleeve, one of said rivets being within said opening and the other within said head, an annular groove in said casing near said head, a resilient wire in said groove, projections on said wire engaging corresponding openings in said sleeve, a projection on said wire engaging a hole in said casing, and a movable rigid contact member fastened to said casing and cooperating with said other end of said leaf spring.

6. In a flashlight, a case, a dry battery within said case, an incandescent electric lamp, a connection between one pole of said battery and one terminal of said lamp, a metallic spring one end of which is connected to the other terminal of said lamp and the other end of which is free and resilient, a housing attached to said case, a spring-pressed plunger within said housing, a connection between said plunger and the other pole of said battery, a projection on said plunger lying in the path of said free end of the spring, and means operable outside of the housing for moving said plunger against spring tension.

7. In a flashlight, a metallic case, a dry battery within said case, a connection between one pole of said battery and said case, an electric lamp, a connection between the other pole of said battery and one terminal of said lamp, a metallic reflector within said case and electrically connected with the other terminal of said lamp, insulation between said reflector and said case, a metallic spring one end of which is contacting with said reflector and the other end of which is free and resilient, a housing attached to said case, a spring-pressed plunger within said housing, a projection on said plunger lying in the path of said free end of the spring, and means operable outside of the housing for moving said plunger against spring tension.

8. In a flashlight, a metallic casing, a dry battery within said casing, a connection between one pole of said battery and said casing, an electric lamp, a connection between the other pole of said battery and one terminal of said lamp, a metallic spring one end of which is connected to the other terminal of said lamp and the other end of which is free and resilient, two ears struck up from the casing, said ears being provided with projections, a housing covering said ears being provided with recesses co-operating with said projections, a spring-pressed plunger within said housing, a projection on said plunger lying in the path of said free end of the spring, and means operable outside of the housing for moving said plunger against spring tension.

9. In a flashlight, a metallic casing, a dry battery within said casing, a connection between one pole of said battery and said casing, an electric lamp, a connection between the other pole of said battery and one terminal of said lamp, a metallic spring one end of which is connected to the other terminal of said lamp and the other end of which is free and resilient, four ears struck up from said casing, a housing covering said ears and held in position by a pair of ears, a spring-pressed plunger mounted on the other pair of ears, a projection on said plunger lying in an opening of the casing afforded by the ears and in the path of said free end of the spring, and means operable outside of the housing for moving said plunger against spring tension.

10. In a flashlight, a casing, a dry battery within said casing, an electric lamp connected with said battery, a conductor connected with said lamp, a movable switch member cooperating with said conductor and connected with said battery, a housing having recesses in the sides thereof enclosing said movable member, and resilient means integral with said casing having projections engaging with said recesses to hold said housing against said casing.

11. In a flashlight, a metallic casing, a dry battery within said casing, an electric lamp connected with said battery, a conductor connected with said lamp and insulated from said casing, a movable switch member cooperating with said conductor, a metallic housing enclosing said movable member, and resilient ears struck up from the casing

exerting pressure on opposite walls of said housing to hold said housing against said casing.

12. In a flashlight, a casing having a tubular and a flaring portion, a source of current supply provided within said tubular portion, a sleeve of insulating material projecting within said flaring portion and extending part way within said tubular portion, a leaf spring fastened to the inside of said sheet with one end in contact with said reflector, a spring-pressed plunger mounted on said casing, a projection on said plunger in an opening of said casing, a nose at the lower end of said leaf spring projecting within said opening into the path of said projection, an electric incandescent lamp, and a circuit for said lamp controlled by said plunger and leaf spring.

13. In a flashlight, a metallic casing having an aperture in the side thereof, a resilient member within the casing and insulated therefrom, a projection on said resilient member opposite said aperture, an upwardly extending perforated ear near one end of the aperture, an upwardly extending notched ear near the other end of the aperture, resilient ears at the sides of the aperture provided with projections thereon, a switch member slidable through said perforation and resting in said notch and having a portion extending within said casing for engagement with the projection on the resilient member, and a housing having recesses in the sides thereof for engagement with the projections on the resilient ears, said housing cooperating with said notched ear to hold the slidable member in position.

In testimony whereof I have signed my name to this specification this 29th day of December, 1924.

WILLIAM F. HENDRY.