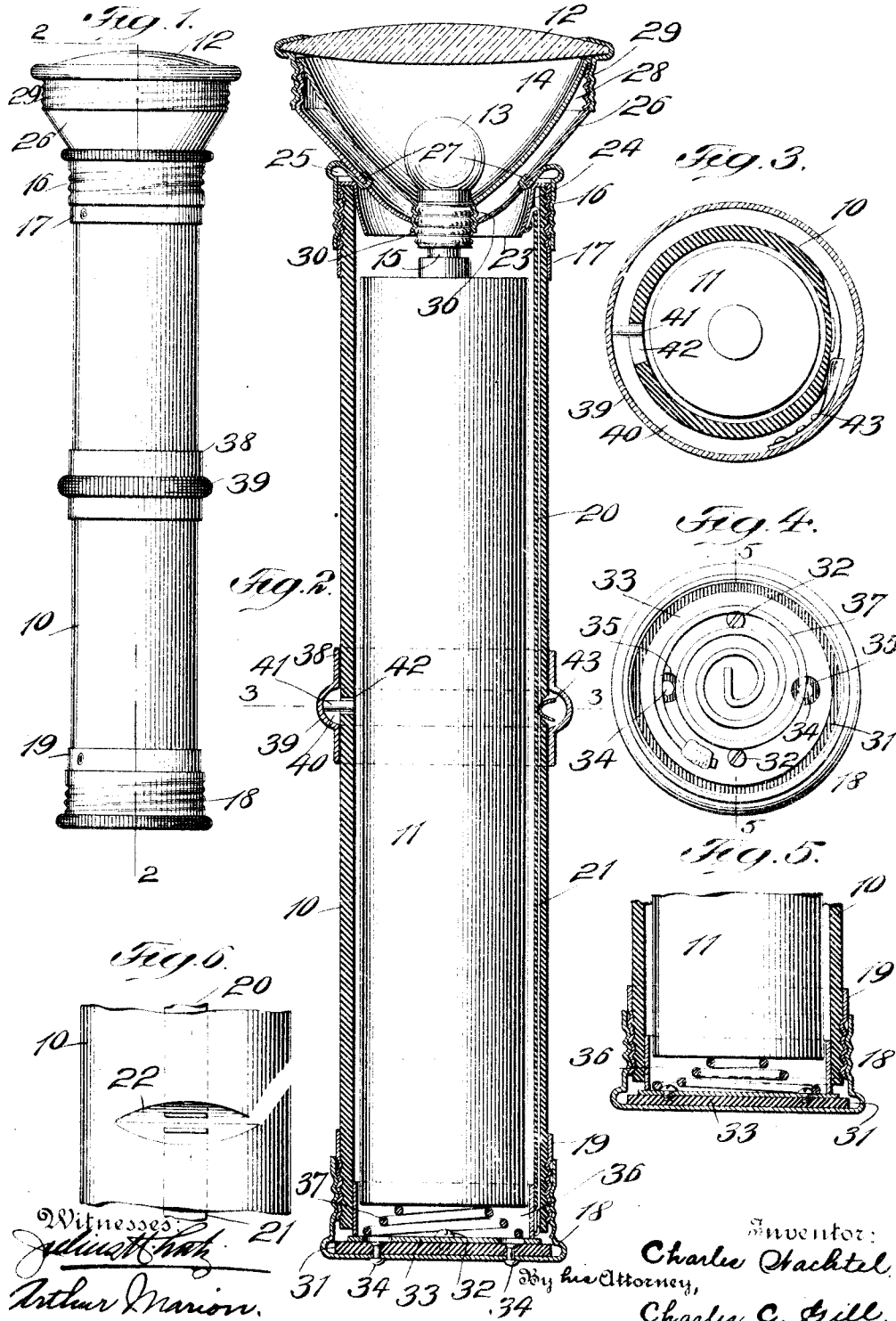


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PORTABLE ELECTRIC LIGHT.
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UNITED STATES PATENT OFFICE.

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PORTABLE ELECTRIC LIGHT.

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To all whom it may concern:

Be it known that I, CHARLES WACHTEL, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Portable Electric Lights, of which the following is a specification.

The invention pertains more particularly to improvements in the class of electric lamps designed to be held in the hand and sometimes used as flash lights and at other times for affording a permanent light for a short period, and one object of the invention is to provide a novel and efficient construction of lamp of the class referred to, with the parts so designed, arranged and combined that the circuit may not be closed by the placing of the electric lamp in a box of tools or against another electric lamp or against any body of conducting material which might connect the caps at the upper and lower ends of the usual electric lamp or flash light. These flash lights are frequently carried by workmen in a box of tools, and it has frequently happened that some metal tool has by lying against the electric lamp completed the circuit through the battery, with the result that the lamp was lighted and the battery unnecessarily consumed.

In accordance with my invention I obviate the objection just referred to and provide a construction in which a metal tool lying against the side of the casing will be unable to complete the circuit. I illustrate my invention as embodied in what is known as a miners' electric lamp or flash light, without intending to confine the invention in all its parts to a lamp or flash light of any particular denomination or intended for any particular use.

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 side elevation of a portable electric lamp or flash light embodying my invention; Fig. 2 is a central vertical section, on a larger scale, through the same on the dotted line 2—2 of Fig. 1; Fig. 3 is a horizontal section through the same on the dotted line 3—3 of Fig. 2; Fig. 4 is a detached top view of the bottom cap and parts carried thereby of the lamp; Fig. 5 is

a sectional view, partly broken away, through the lower end of the lamp taken on the dotted line 5—5 of Fig. 4, and Fig. 6 is a side elevation, partly broken away, of the central portion of the exterior casing of the lamp, with the circuit closer or switch omitted, this figure being presented to illustrate the manner of exposing the two circuit conductors at their adjoining ends so that the circuit closer spring when manually operated may connect said ends for completing the circuit through the lamp.

In the drawings, 10 designates a paper or fiber casing for the lamp, 11 the battery therein, 12 the lens, 13 the electric lamp bulb, 14 the reflector, 15 the usual connection of the battery with the lamp, 16 an upper cap screwed upon a metal sleeve 17 which is fastened to the upper end of the casing and 18 a lower metal cap which is screwed upon a metal sleeve 19 fastened upon the lower end of the casing 10.

The casing 10 is equipped with two conductors or strips of metal 20, 21 which are to be placed in electrical connection with each other at their adjoining ends when the lamp is to be lighted, as hereinafter explained. The casing 10 is preferably formed from a spirally wound sheet of fiber, and the conductors 20, 21 in one continuous piece are wound within said sheet or placed in between the convolutions thereof during the formation of the tube or casing 10, and thereafter a V-shaped recess 22 is formed in the exterior wall of the casing 10 and extended through the metal strip intended to form the conductors 20, 21, as illustrated in Fig. 6. The formation of the recess 22 and extending it through the metal strip serves to sever said strip and leave the adjacent ends of the sections thereof, said sections forming the conductors 20, 21, separated from each other by a narrow space and exposed at the walls of the recess to be engaged by the circuit closer, which at the proper time is utilized for placing said exposed ends of the conductors 20, 21 in electrical connection with each other, thereby to complete the circuit through the lamp.

The sleeve 17 screwed upon the upper end of the casing 10 is integrally formed with an interior downwardly extending band 23 which, as said sleeve is screwed upon the casing 10, concentrically enters said casing

and inclines downwardly and inwardly from the upper edge thereof, that portion of the metal connecting the sleeve 17 proper with the band 23 finally engaging the upper edges of the casing 10 and arresting the sleeve and band in their downward movement. The band 23 serves to add durability to the upper end portion of the lamp structure and is a conductor which is in electrical connection with the upper end of the conductor 20, as shown in Fig. 2. The connection of the upper end of the conductor 20 with the band 23 is formed by recessing out the inner upper portion of the casing 10 in line with the said conductor 20, as at 21, and then bending inwardly and downwardly the upper end of the said conductor 20 from said recess and finally securing the said end by solder or otherwise against the exterior surface of the band 23, as shown in Fig. 2. The band 23 may, of course, instead of being integral with the sleeve 17, be separately formed and secured thereto by soldering or the like.

The cap 16 is flanged inwardly and downwardly at its upper open end, as at 25, forming an annular seat for a metal shell 26, and said flange 25 at its inner lower edges is formed with a series of tongues 27 which are inserted through holes formed in said shell and then bent upwardly against the inner surface of the same, these tongues serving to secure the shell against the cap 16 and so connecting the shell and cap that the two pieces may be handled as one. The shell 26 has an upper threaded annular portion 28 to receive the lens-holding ring 29 and thence said shell has its walls converged downwardly and inwardly defining approximately a cone-shape. The lower end of the shell 26 is open and at the edges of the opening therein said shell tightly fits and is secured by solder or the like to a threaded neck 30 on the lower end of the reflector 14. The reflector 14 has a flanged upper edge which rests upon the upper edge of the threaded portion 28 of the shell 26, and said reflector extends downwardly on converging lines within the shell 26 and receives within its threaded neck 30 the threaded socket of the lamp bulb 13.

The construction just described about the upper end of the lamp is one of great durability and admits of the employment of a reasonably large lamp bulb, reflector and lens, as shown. The path for the current from the upper end of the battery is through the lamp socket, reflector 14, shell 26, cap 16, sleeve 17 and band 23 to the conductor 20.

The cap 18 at the lower end of the casing 10 contains a disk of insulating material 31 upon which is fastened by screws 32 a disk of brass or other conducting material 33. The non-conducting disk 31 may be secured by rivets 34 to the lower cap 18, said rivets

at their upper ends being disposed within recesses 35 (Fig. 4) in the disk 33 so as to be out of contact therewith. Within the lower end of the casing 10 and extending below the lower edge thereof is secured a metal band 36 whose lower edges will be engaged with the conducting disk 33 when the lower cap 18 is screwed upon said casing or upon the sleeve 19 carried thereby, as shown in Fig. 2. The lower end of the conductor 21 is exposed at a recess cut for that purpose in the lower inner edge of the casing 10 and placed in firm engagement with the band 36, and hence there is an electrical connection between the conductor 21, band 16 and disk 33. The disk or plate 33 is placed in electrical connection with the lower end of the battery by means of a spring 37 of customary character. One of the essential features connected with the construction at the lower end of the casing 10 is the avoidance of the use of the cap 18 as a conductor in the circuit. It is customary to connect a conductor, such as 21, by means of an eyelet or rivet with the sleeve 19 on the lower end of the casing, thus placing said sleeve in circuit, and thereupon when the cap 18 of the former make has been screwed upon the sleeve 19, the circuit from the lower end of the battery was through the spring 37, lower cap 18 and sleeve 19 to the conductor 21. In accordance with my invention the sleeve 18 is insulated from those portions of the lamp which serve to conduct the current, and this is for the very important purpose of preventing the circuit through the battery and lamp being formed by any metal tool against which the lamp might be placed and which would extend from the lower cap 18 to the upper cap 16 or from the commonly used circuit closing casing connected with the conductor 21 to the upper cap 16. One of the main purposes of my invention is to prevent the lamp from being lighted and the battery wasted by the completing of the circuit due to the lamp being placed against a tool in a tool box or against any other conductor which might extend in former constructions, from the cap at the lower end of the outer casing to the cap at the upper end thereof or from the circuit closer casing to said upper cap.

The circuit closer or switch mechanism comprises a band 38 closely encompassing the outer casing 10 and extending over the recess 22 formed therein. The middle portions of the band 38 extend outwardly in the form of an annular hollow beading 39 wherein is formed a chamber 40. The band 38 has secured to it a pin 41 which extends into a slot 42 formed in the casing 10 and said band is adapted to have a rotary movement imparted to it to the extent permitted by the length of the slot 42, said band being moved in one direction to effect the closing

of the circuit between the adjacent ends of the conductors 20, 21 and in the opposite direction to effect the breaking of the circuit between said conductors. Within the chamber 40 of the band 38 is secured a leaf-spring 43 whose free end is of V-outline and within the recess 22 of the casing 10. When the band 38 is in the position in which it is shown in Fig. 3, the spring 43 is not in engagement with the adjacent ends of the conductors 20, 21, but when the band 38 is manually turned until the pin 41 reaches the other end of the slot 42, the free end of said spring 43 will pass in between the adjacent ends of the conductors 20, 21 and serve to electrically connect said conductors and complete the circuit.

It will be observed that in accordance with my invention the circuit closer casing is not riveted to or in electrical connection with either of the conductors 20, 21, and therefore that there is no normal electrical connection either between said casing (in this instance the band 38) and the lower cap 18 or between said casing and the upper cap 16. The lower cap 18 is not at any time in circuit, and hence the flash light as a whole may be placed in a tool box or with any metal articles without danger of the circuit being accidentally made by the contact of the lamp with the blade of a tool or the like. Ordinarily it has been customary in the construction of flash lights of the character in question to rivet the circuit-closer casing to a conductor corresponding with 21 and have one end of the circuit closer spring in electrical connection with its casing, and in this way the casing was always in electrical connection with the lower exposed cap on the exterior shell, and it has been customary to connect the upper end of a conductor, corresponding with 20, to the cap on the upper end of the outer shell, with which the reflector for the lamp was in electrical connection, and under these conditions it is plain that a metal tool, such as a screw-driver, lying against the circuit closer casing and the upper cap or against the lower cap and the upper cap of a flash light, would make the circuit and result in the battery being unnecessarily consumed. My invention remedies the condition just stated, as hereinbefore explained.

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

1. A portable electric light of the class described comprising an exterior casing containing a battery and having at its upper end an electric lamp in electrical connection with said battery, a reflector having a threaded neck receiving said lamp, a lens and means for holding and attaching said lamp, reflector and lens comprising a threaded sleeve on said casing, a threaded cap engaging said sleeve having an open center

and flanged inwardly and formed with tongues along its opening, a shell of approximately inverted cone-shape entering said cap and secured thereto by said tongues and having an open lower end to receive the threaded neck of the reflector and a threaded upper end, and a threaded lens-holding ring engaging the threaded upper portion of said shell and the edge of the lens, combined with circuit terminal conductors for the lamp and battery extending, in part, along said casing and normally separated from each other at adjacent ends, and manually operative circuit closing means for electrically connecting the adjoining ends of said terminal conductors for completing the circuit.

2. A portable electric light of the class described comprising an exterior casing containing a battery and having at its upper end an electric lamp in electrical connection with said battery, a reflector having a threaded neck receiving said lamp, a lens and means for holding and attaching said lamp, reflector and lens comprising a threaded sleeve on said casing, a threaded cap engaging said sleeve having an open center and flanged inwardly and formed with tongues along its opening, a shell of approximately inverted cone-shape entering said cap and secured thereto by said tongues and having an open lower end to receive the threaded neck of the reflector and a threaded upper end, and a threaded lens-holding ring engaging the threaded upper portion of said shell and the edge of the lens, combined with a conducting band (23) extending within the upper end of said exterior casing and in electrical connection with the lamp, circuit terminal conductors for the lamp and battery extending, in part, along said casing and normally separated at adjacent ends from each other and one of which is connected with said band, and manually operative circuit closing means for electrically connecting the adjoining ends of said terminal conductors for completing the circuit.

3. A portable electric light of the class described comprising an exterior casing closed at its lower end by a removable cap and containing a battery and having at its upper end a lamp in electrical connection with the battery, a reflector and a lens for the lamp, conducting means at the lower end of said casing in electrical connection with said battery and insulated from said lower cap, circuit terminal conductors extending along said casing normally separated from each other at adjacent ends and one of which is in electrical connection with the lamp while the other is in electrical connection with the said conducting means at the lower end of the casing, and manually operative circuit closing means for electrically connecting the adjoining ends of said terminal con-

ductors for completing the circuit, said conducting means at the lower end of said casing comprising a spring engaging battery, a conducting plate on which the spring bears and
5 a band engaging said plate and with which the lower terminal conductor is engaged.
Signed at Brooklyn, in the county of

Kings and State of New York, this 19th day of May, A. D. 1914.

CHARLES WACHTEL.

Witnesses:

ARTHUR MARION,
CHAS. C. GILL.