J. VINCE.

FLASH LIGHT.

APPLICATION FILED SEPT. 18, 1919.

1,347,423.

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Fig. 4.

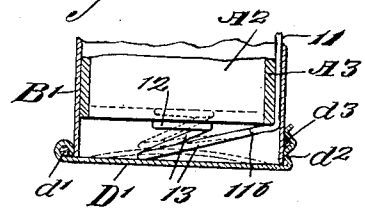


Fig. 1.

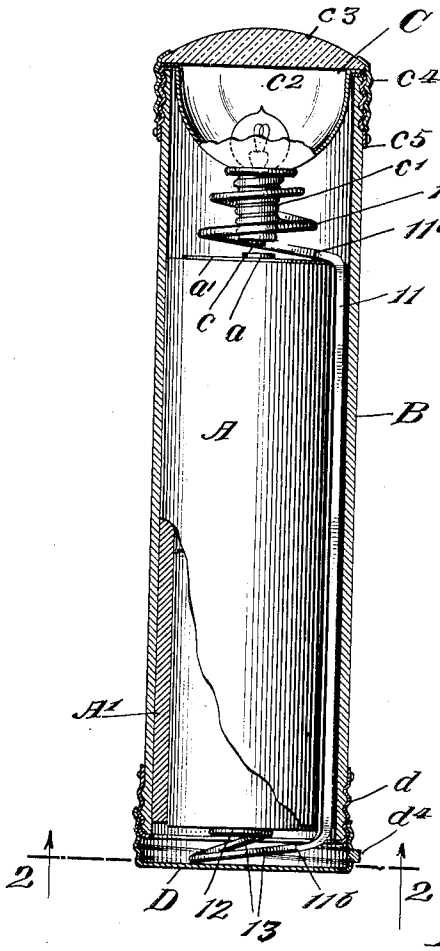


Fig. 3.

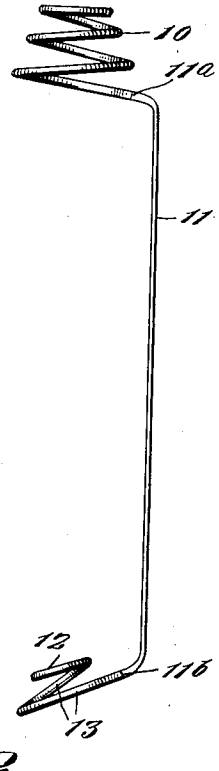
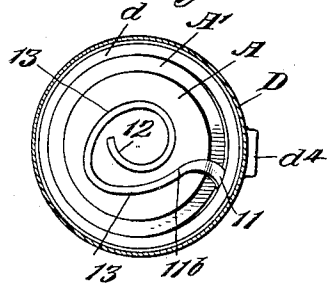


Fig. 2.



WITNESSES

H. C. Kelly

J. K. McCulloch

INVENTOR

JOSEPH VINCE

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

JOSEPH VINCE, OF BROOKLYN, NEW YORK.

FLASH-LIGHT.

1,347,423. Specification of Letters Patent. Patented July 20, 1920.

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To all whom it may concern:

Be it known that I, JOSEPH VINCE, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and improved Flash-Light, of which the following is a description.

My invention relates to portable electric lights of those types generally termed flashlights and comprising an inclosing shell supporting at the front end an electric lamp and closed at the rear by a cap generally termed the bottom cap, said shell inclosing a battery of one or more cells according to the size of the light. In the flashlights referred to the circuit is usually formed by insulated contact strips on the shell, together with a switch controlled usually by either a sliding external manually movable device or by a transversely movable push-button according to the size and form of the flashlight. In flashlights in question the battery is liable to sweat and corrode which results in the battery "freezing" to the shell, thereby requiring the forcing of the battery out of the shell. The forcing of the battery from the shell generally results in damage or stripping of the contacts on the shell.

The general object of my invention is to provide a flashlight radically improved in various particulars whereby to possess distinctive characteristics and advantages among which are the following: Means is provided advantageously in the form of a spring tending to separate the front battery contact from the opposed lamp contact to normally maintain the circuit open at this point; the spring means for separating the front battery contact and lamp contact advantageously in the preferred form is made a portion of the circuit-forming means; a permanently closed circuit is provided in the light except for the separation of the front battery contact from the opposed lamp contact and the circuit is entirely independent of the shell so that movement of the battery out of the shell cannot damage the contacts; the circuit-forming means between the battery and lamp is placeable and removable with the placing and removing of the battery; the circuit-forming means is given a form to be placed in position on the battery as an adjunct thereto; the making and breaking of the circuit is effected by a movement of the battery relatively to the lamp contact; the bottom cap on the shell is made the medium of effecting the making and breaking of the circuit by a movement of said cap bodily on the shell or a flexure of the cap, there being means interposed between the cap and the bottom or rear end of the battery and serving to cause the movement of the battery in response to the movement or flexure of the bottom cap; the usual contacts on the shell with their insulations are entirely done away with, thereby reducing the cost of manufacture of the shell, while the circuit-forming means provided by my invention involves the minimum cost for material and the use thereof eliminates material items of cost in time and labor in the manufacture of the flashlight; and the invention is capable of embodiment in a form to adapt it to batteries of standard makes, as well as to adapt it to shells of standard dimensions and shapes and equipped with the usual lamp and its retaining means and with the usual rear or bottom cap.

The stated characteristics and advantages, and others as will appear, are all present in the preferred form of the invention given for illustration and hereinafter particularly described.

Reference is to be had to the accompanying drawings forming a part of this specification, it being understood that the drawings are merely illustrative of one example of the invention.

Figure 1 is a sectional side elevation of a flashlight embodying my invention, my improved circuit-forming attachment being shown in elevation and the covering of the battery being partly broken away;

Fig. 2 is an inverted sectional plan, the section being indicated by the line 2—2, Fig. 1;

Fig. 3 is a side elevation of the device for completing the circuit through the battery and lamp showing said device in its preferred form;

Fig. 4 is a vertical section through the lower portion of the shell and its bottom cap thereon of a different form from the cap shown in Fig. 1, a portion of the battery and my improved circuit-forming device being in side elevation.

Referring particularly to Figs. 1, 2 and 3,

the letter A indicates a battery which may be of any approved form and composed of one or more cells, A^1 indicating the usual paper or like insulating wrapper on the battery, *a* the front contact of the battery, and *a'* indicating the usual sealing wax or like insulating material applied to the front end of the battery except at the contact *a*. The letter B indicates the shell usually employed in flashlights of the indicated character for inclosing the battery A and carrying at its front end the electric lamp designated generally by the letter C as well as a bottom cap D, the threaded flange of which engages a threaded external band *d* on shell B.

The shell B of my invention can be of the conventional form and dimensions except that the usual contact elements thereon and the switch to close the circuit usually carried by said shell are all omitted in carrying out my invention. The lamp C shown is of known form having the usual contact *c* to engage the opposed front battery contact *a*, *c'* indicating the usual neck of the lamp; c^2 the reflector; c^3 the lens; and c^4 the usual threaded retaining ring for said lens and arranged to engage the threaded band c^5 fixed to the shell at the forward end.

In carrying out my invention means is provided tending to force the battery A rearwardly to separate the contacts *a*, *c* for breaking the circuit. For the purpose, use preferably is made of a spring and preferably and advantageously, said spring is a compression spring 10 coiled about the lamp neck *c'* and bearing at its front end against the reflector c^2 and bearing at its inner end against the front of the battery A. Said spring 10 is utilized in the preferred form of my invention as part of the means for completing the circuit at the outside between the lamp reflector and the rear end of the battery, for which purpose said spring may, as shown, be formed integral with an elongated conductor strip 11 lying close to the battery A outside of the paper wrapper A' of the battery between the same and the shell B.

In order that the bottom cap D may serve for moving the battery A toward the lamp contact *c*, and in order also to complete the circuit through the rear end of the battery, I provide means interposed between the cap D and the back of the battery to be engaged by said cap when the latter is in position. Preferably said interposed means consists of a continuation of the conductor strip 11 which continuation may, as shown, terminate in a coil or partial coil 12 which connects with the strip 11 by integral bent members 13 more or less of spiral form and disposed at such an angle to the plane of the cap D as to be engaged by the latter. The connecting members 13, and the member 12 bearing against the battery, complete the circuit from the strip 11 to the back of the battery and the dimensions and angular disposition of the integral connecting members 13 are such as to give a desired amplitude of movement of the battery A to insure the completion of the circuit through the contacts *a* and *c* and provide a sufficient clearance for the battery A in moving away from the contact *c* under the influence of the spring 10 when the cap D is turned back. The described arrangement of the members 12, 13 relatively to the bottom cap and the back of the battery A insures a constant engagement of the cap and battery by said members 12, 13 which is particularly advantageous in some forms of flashlights as for example such as illustrated in Fig. 4 which conventionally illustrates in section a bottom cap D' hinged at one end as at *d'* and having a spring catch d^2 at the opposite end to engage a lug d^3 or the like on the inclosing shell B'. In said Fig. 4 A^2 indicates the battery and A^3 the paper wrapper thereof. The flashlight, Fig. 4, is of a small type of lamp usually oval or oblong in cross section so that the cap B' is usually rectangular. Said cap when in closed and latched position obviously cannot move bodily on the shell as does the screw cap D but it is adapted to be flexed after the manner of an oil can bottom to thereby function for moving the battery A^2 forwardly to close the circuit at the contacts *a*, *c* whereas engagement of the adjacent member 13 with the cap D' prevents any lost motion in the flexure of said cap so that its flexure through the action of the members 12 and 13 will move the battery. It will be readily understood that the caps D, D' may be round, rectangular, hexagonal or of other desired shape at the edge of the back or bottom thereof. The conductor strip 11 similarly may have any suitable cross section but advantageously, in practice said strip is made flat to occupy the minimum space between the battery and the shell. In practice, also, the conductor strip 11 and more or less of the elements 10 and 13 are shellacked or otherwise insulated to prevent the possibility of short circuiting by the wearing of the wrapper A at the front end or the wearing of the insulation *a'* of said battery. The lines 11^a, 11^b indicate the terminals of the insulation on the strip 11 in the illustrated example. The usual space between the battery and the shell B in known makes is provided to accommodate the usual contact strips on the shell B which provides ample space for the conductor strip 11.

In practice, the making of the elements 10, 11, 12 and 13 integral or as a single unit enables the attachment to be applied as a unit to the battery A before inserting said

battery in the shell and the battery is thereby clamped between the spring 10 and the member 12, it being understood that the members 13 are resilient. Thus, the unit formed by the members 10, 11, 12 and 13 constitutes the sole means additional to the battery and lamp for completing the circuit since the front end of the spring 10 engages the metallic reflector c^2 in the illustrated example or will engage, in any other form of lamp, a metallic part appurtenant to the lamp while the member 12 has contact with the metal of the battery at the back. Thus, the circuit from the contact c of the lamp is through the filament to the neck c' and the reflector c^2, spring 10, conductor strip 11, members 13 and 12 to the battery at the back or at another point rearward of the front contact a and through the battery to the contact a to be completed through the contact c whenever the contacts a, c, are in engagement. Thus, there is a circuit formed including the lamp and battery and permanently closed except for the breaking thereof by the separation of the contacts a, c. The bodily movement of the battery in the shell in the making and breaking of the circuit gives the battery less liability of freezing to the shell due to the sweat and corrosion of the battery but should the light be in disuse for a sufficient period to cause freezing of the battery, following sweating thereof, or the deposit otherwise of moisture thereon, the forcing out of the battery from the shell after the removal of the lamp and bottom cap will carry with it the complete exterior conductor elements and without damage to the latter, thereby overcoming the danger of damaging the contacts and conductor strips as in the ordinary flashlights.

If desired, the bottom cap D may have rigid therewith at the edge a finger or thumb rest d^4 to aid in turning the cap in making it feasible to turn the cap with a finger or the thumb of the hand holding the light.

The conductor strip 11 may be continued forwardly beyond the spring 10 to make contact with the lamp reflector or other conducting lamp part, in which case the conductivity of the spring would be immaterial although in this case the spring may be integral with or secured to the conductor strip for convenience in applying and removing the parts as a unit. Or, again, the spring may be separate from the conductor strip when the latter makes contact with the lamp, the spring in that case performing solely its function of being arranged to so act on the battery as to tend to move the same away from the lamp. Similarly, at the rear end of the conductor strip 11, the same may make contact with the battery for circuit purposes and the elements 13 or equivalent means such as a spring be separately formed independently of the conductor strip and serving to move the battery forwardly in response to the bottom cap of the shell.

I would here mention that the doing away with the separate switch employing the usual flashlight marks a distinct advance in the art in that the switches employed if made loose to be readily operable are liable to accidentally move to a position closing the switch and when the switch and its operating device are made stiff to a point of absolute safety against accidental closing, then undue pressure is required to close the switch and I obviate these objections by my construction. Moreover, the usual flashlights in which provision is made by parts on the shell to form the circuit involve the danger that short-circuiting can be caused even when the switch is open by contact of the external metallic parts with metallic articles as in the usual box of an automobile.

I would state in conclusion that while the illustrated example constitutes a practical embodiment of my invention, I do not limit myself strictly to the mechanical details herein illustrated, since manifestly the same can be considerably varied without departure from the spirit of the invention as defined in the appended claims.

Having thus described my invention I claim:

1. A light of the indicated class including a battery and lamp, the one movable relatively to the other, a shell inclosing said battery and supporting said lamp, said lamp and battery having means to connect the same in circuit at the front of the battery, and means independent of said shell for completing an electric circuit including said lamp and battery; together with means tending to separate the lamp and battery to break the circuit at the front of the battery.

2. In a light of the indicated class, a shell, an electric lamp supported thereon, a battery in said shell and movable toward or from the lamp, said battery having a front contact and the lamp an opposed contact to be engaged thereby, a conductor element independent of the shell between the same and the battery, a spring between the battery and lamp tending to separate the same, said spring being in circuit with said conductor strip and with the exterior of the lamp, and means in circuit with said conductor strip at the opposite end from the spring and in contact with the battery rearward of its front contact.

3. A light of the indicated class including a lamp, and a battery movable relatively thereto and adapted to be inserted in a lamp casing, said lamp and battery presenting opposed contacts, and a conductor unit independent of said contacts at the exterior of the battery to be insertible and removable to and from a casing with the insertion and removal of the battery, said unit serving to

complete an electric circuit with said lamp and battery when said contacts are in engagement.

4. A light of the indicated class including a lamp and a battery movable relatively thereto, said lamp and battery presenting opposed contacts to connect the same in circuit, a shell containing said battery and carrying said lamp, and conductor means at the exterior of the battery and independent of said shell, said conductor means being in contact with said lamp and with the battery rearward of its said contact and completing an electric circuit with said lamp and battery.

5. A light of the indicated class including a lamp and a battery movable relatively thereto, said lamp presenting a contact to engage one pole of the battery, and means external of the lamp and battery, said means establishing electrical connection between the other pole of the battery and said lamp and said external means further including means to move the lamp away from the battery to break contact of said first pole and said lamp.

6. A light of the indicated class including a lamp, a battery movable relatively thereto, said lamp and battery presenting opposed contacts to connect the same in circuit when the contacts are engaged, means tending to move the battery away from the lamp to separate said contacts and conductor means external of the lamp and battery and completing an electric circuit with said lamp and battery; together with means optionally operable and adapted to move the battery in opposition to said separating means for bringing said opposed contacts into engagement.

7. A light of the indicated class including a shell, a lamp supported thereby at the front end, a battery in said shell and movable toward or from said lamp, said lamp and battery presenting opposed contacts, means tending to give relative movement to said lamp and battery to separate said contacts, conductor means to complete an electric circuit with said lamp and battery, means bearing against the battery at the rear end, and a cap on the shell at the opposite end from the lamp and adapted to bear against said last-mentioned means for moving the battery toward the lamp and engage said opposed contacts.

8. A light of the class described including a shell, a lamp supported thereby, a battery removably inclosed by said shell and adapted to make contact at its front end by one pole with said lamp, and conductor means on said battery externally thereof to be removable with the latter from the shell.

9. A light of the class described including a shell, a lamp supported thereby at the front end, a battery in circuit independently of the shell with the lamp and movable relatively thereto and relatively to the shell to make or break the circuit by engaging or separating the opposed lamp and battery contacts, a cap on the shell at the back, and means subject to the movement of said cap to cause engagement or disengagement of the lamp and battery contacts.

10. A light of the class described including a shell, a lamp supported thereby at the front end, a battery in said shell to be placed in circuit with the lamp and movable relatively to the lamp to make contact by one pole with the opposed lamp contact, and to make or break the circuit by engaging or separating the battery and lamp, conductor means on the battery externally thereof and independent of the shell and of the lamp and battery contact to complete the circuit, a cap on the shell at the rear end and means interposed between said cap and battery and subject to said cap to move the battery toward the lamp for making contact therewith.

11. A light of the class described including a shell, a lamp supported thereby at the front end, a battery in circuit independently of the shell with the lamp and movable relatively thereto and to said shell to make or break the circuit by engaging or separating the opposed lamp and battery contacts, a cap on the shell at the back, and means subject to said cap to cause engagement or disengagement of the lamp and battery contacts; together with means tending to separate the battery and lamp.

12. An attachment for the battery of a flashlight, said attachment including a conductor element having means to detachably secure it to the battery to range longitudinally thereof outside of the external covering of the battery, and means on said element at the front end in position to be interposed between the battery and the lamp of the flashlight and make contact with an external conducting part of the lamp.

13. An attachment for the battery of a flashlight, said attachment including a conductor element having means to detachably secure it to the battery to range longitudinally of the battery, means on said element at the front end in position to be interposed between the battery and the lamp of the flashlight and make contact with an external conducting part of the lamp, and means on said element at the rear end adapted to make contact with the battery rearward of its lamp engaging contact.

14. An attachment for the battery of a flashlight, said attachment including a conductor element attachable to the battery to extend along the same at the exterior, a compression spring on said element at the front end offset laterally therefrom to be interposed between the lamp and battery of the

flashlight and laterally offset means on said element at the rear end adapted to contact with the rear end of the battery and with the rear cap of the shell of the light.

15. An attachment for the battery of a flashlight, said attachment including a conductor element having means to attach it to the battery to extend along the same at the exterior and partake of any movement of the battery into or out of a lamp casing, means at the front end of said element to make contact with an external conducting part of the lamp, and resilient means at the rear end of said element in position to be interposed between the rear end of the battery and the shell cap.

16. In a light of the class described comprising a shell, a lamp thereon at the front, a cap thereon at the rear end, a battery in the shell and movable relatively to the lamp to make contact by its adjacent pole with the lamp contact: external conductor means including a conductor element between the battery and shell, resilient means at the front end of the first means in circuit therewith, between the lamp and battery, and making contact with an external conducting part of the lamp, and resilient means at the rear end of said conductor means and in circuit therewith said last-mentioned resilient means being interposed between the battery and the rear cap of the shell and engaging both to be subject to the movement of the cap for exerting a forward pressure on the battery for moving it toward the lamp.

17. An attachment for the battery of a flashlight to form part of the electric circuit of the light, said attachment comprising an element adapted to extend at the exterior of the battery, and resilient conductor means at the front and rear ends of said conductor element at a side thereof adapted to effect detachable holding engagement with the battery at the front and rear.

18. An attachment for the battery of a flashlight, the same including a conductor element attachable to the battery insertible in and removable from a casing with the insertion and removal of the battery and provided with means at the front and rear ends adapted to detachably engage the battery at said front and rear ends, said element connecting said front and rear means and having a longitudinal dimension to extend lengthwise of the battery at the exterior thereof.

19. An attachment for the battery of a flashlight to be inserted in and removable from the flashlight casing with the insertion and the removal of the battery, said attachment including a conductor element having a length to extend along the battery at the exterior and having means to detachably secure it to the battery, said element being adapted to complete an electric circuit with the battery and lamp.

20. An attachment for the battery of a flashlight, the same including a conductor element having means to attach the same to the battery and adapted to complete an electric circuit with the battery and lamp, said conductor element presenting resilient means thereon at the front and rear in positions to be interposed respectively between the battery and lamp and between the battery and the rear cap of the shell of the light.

21. An attachment for the battery of a flashlight, the same including a conductor element having means to attach the same to the battery and adapted to complete an electric circuit with the battery and lamp, said conductor element presenting resilient means thereon at the front and rear in positions to be interposed respectively between the battery and lamp and between the battery and the rear cap of the shell of the light, said front resilient means being of a form to bear respectively against the lamp and battery to exert a separating pressure thereon.

22. In a light of the class described, a shell, a lamp supported thereby at the front, a cap thereon at the rear end, and having a threaded connection therewith to be moved forward or back, a battery in the shell and movable toward or from the lamp to make contact by its adjacent pole with the lamp contact or to break contact therewith, and means to effect the movement of the battery and to complete a circuit with the battery and lamp, said means including a conductor element mounted on the battery at the exterior to partake of the movements thereof, and means controllable by the forward and rearward movement of the cap to make and break contact between the battery and lamp by relative movements of the battery.

23. In a light of the class described, a shell, a lamp supported thereby at the front, a cap thereon at the rear end, and having a threaded connection therewith to be moved forward or back, a battery in the shell and movable toward or from the lamp to make contact by its adjacent pole with the lamp contact or to break contact therewith, and means to effect the movement of the battery and to complete a circuit with the battery and lamp, said means including a conductor element on the battery and independent of the shell, and means controllable by the forward and rearward movement of the cap to make and break contact between the battery and lamp by relative movements of the battery to thus make and break the circuit through said element, said cap having a member thereon at a side thereof adapted to constitute a finger hold for the turning of said cap by a finger of the hand holding the lamp.

24. In a light of the class described, a 13

shell, a lamp thereon at the front, a cap thereon at the rear end and adapted to be flexed, a battery in the shell and movable toward or from the lamp to make contact by its adjacent pole with the lamp contact or to break contact therewith, and means to effect the movement of the battery and to complete a circuit with the battery and lamp, said means including a conductor element on the battery at the exterior and independent of the shell, and means controllable by a flexure of the cap to make and break contact between the battery and lamp by relative movements of the battery.

JOSEPH VINCE.