April 17, 1934. J. MUROS 1,955,511

ELECTRIC FLASH LIGHT

Filed Dec. 21, 1931

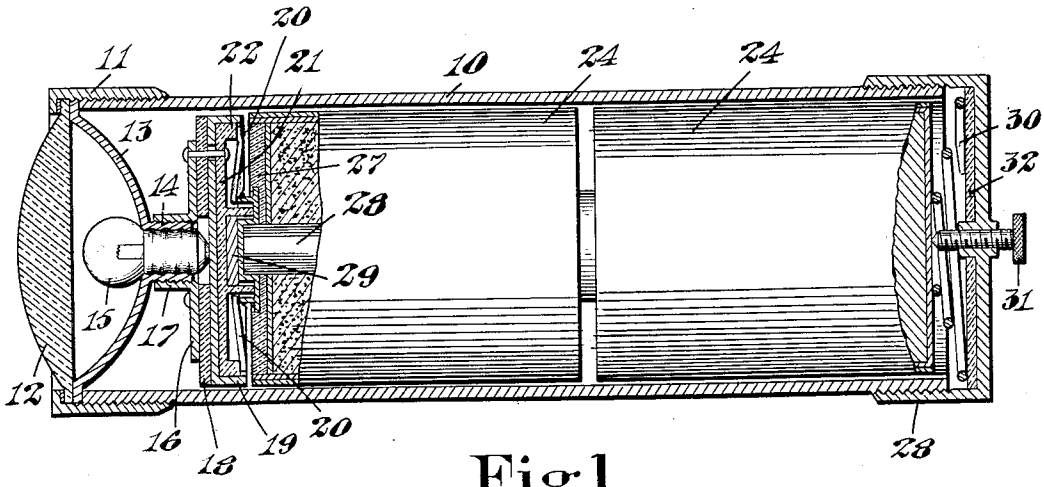


Fig.1.

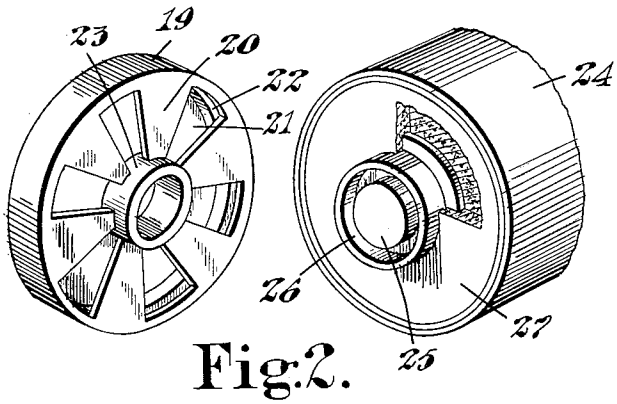


Fig.2.

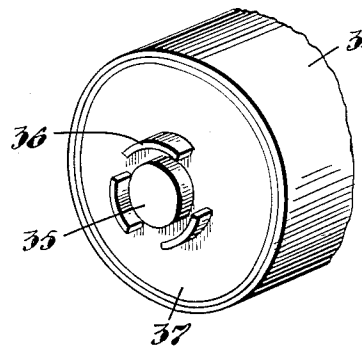


Fig.3.

INVENTOR.

Joseph Muros.

by Kenway & Witter, Attys

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ELECTRIC FLASH LIGHT

Joseph Muros, Belmont, Mass.

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11 Claims. (Cl. 240—10.66)

This invention relates to improvements in electric flashlights and consists in certain novel features of construction whereby the life, efficiency and reliability of the flashlight is improved and the user is safeguarded against inadvertently using batteries of unauthorized manufacture which may be of imperfect and inferior construction.

The features of mechanical improvement consist in providing a plurality of yielding contact points between the battery and the lamp bulb and in so arranging these that the flow of current will not be interrupted and the light fail when the flashlight is suddenly moved or dropped. This construction presents the further advantage of cushioning, and thus safeguarding, the light bulb from the direct impact of the battery in case the flashlight is dropped or brought into contact with an obstruction of any kind. It also improves the reliability of the contact in that failure of one or more contact points does not break the circuit to the light bulb.

In the construction herein shown, the construction of the contact points and of the battery is designed with a view to aligning the battery accurately within the flashlight casing and also preventing shifting movement therein, which is objectionable from the standpoint of destructive wear and also in that it tends to impair the efficiency of the electric circuit supplying the lamp bulb.

The mechanical features of advantage above discussed are important and valuable in themselves but I have taken advantage of them also to provide a flashlight in which batteries having only the characteristic construction of the flashlight manufacturer may be used and in which batteries of the commercial construction heretofore available will not serve. This feature is extremely important and eliminates a serious problem which has confronted all manufacturers of high-grade electric flashlights for many years. The replaceable batteries offered to the public for use in electric flashlights cannot be distinguished one from another by the closest examination of exterior appearance. The result is that a large number of batteries thus offered to the public are manufacturered with little or no regard to the service expected of them. Cheap and inferior materials are employed in their construction and in service they cannot be relied upon for more than a few hours satisfactory output. The most discriminating purchaser of an electric flashlight is, therefore, likely to be caught by replacement batteries or "bootleg batteries", as they are termed in the trade, which may leave him in the dark at a critical moment. My invention solves this troublesome and continuing problem, in that it provides an electric flashlight construction adapted for use only in connection with a battery of superior and characteristic shape and construction. It also offers an expedient for identifying special purpose cells and insuring their use with appliances for which, by their construction, they are particularly adapted and intended. In one aspect my invention comprises a flashlight cell provided with a contact surface in one end of annular shape either in the form of a complete annulus or in the form of projections or segments arranged in a generally circular design. Such a battery is adapted for use in an electric flashlight having cooperating contact points arranged to engage the annular contact surfaces of the battery at points offset or out of line with the longitudinal axis of the battery. In another aspect my invention comprises the combination of a flashlight casing having such contact points with a battery of the character described.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawing, in which

Fig. 1 is a view of an electric flashlight in longitudinal section;

Fig. 2 is a view in perspective of one end of a battery and the corresponding elements of the flashlight casing; and

Fig. 3 is a view in perspective of one end of a battery of alternative construction.

The casing of the flashlight comprises a cylindrical shell 10 which may be of metal or molded plastic material and which is exteriorly threaded at either end. A flanged cap or ring 11 is threaded upon one end of the casing 10 and serves to retain in place the lens 12 through the medium of a rubber ring or gasket. As herein shown, the flange of the cap 11 engages the margin of the lens 12 and also the margin of a reflector 13 between itself and the end wall of the casing 10, thus holding them permanently in place therein. The reflector 13 is provided with a threaded stem 14 within which is received the shank of the light bulb 15, which is thus positioned at the proper time with respect to the focus of the reflector and lens. The elements above described may be of any desired construction and form no part of the present invention.

The threaded stem 14 of the reflector receives and supports the tubular stem 17 of a metal disk 16 which serves as a carrier for an insulating

disk 18 of slightly less diameter than the interior diameter of the casing 10 and centrally recessed to permit access to the inner end of the stem of the light bulb 15 which carries one of the terminal points of the bulb.

A metallic contact member 19, comprising in its appearance a short partially closed cylinder, is permanently secured to the metal disk 16 by rivets which pass through the insulating disk 18 and are headed upon a flanged insulating disk 21 which is contained within the cylindrical contact member 19, as will presently be explained. The rivet holes in the disk of the contact member 19 afford clearance for the rivets so that this member is not in electrical contact with the disk 16 but is arranged to bear directly upon the terminal point of the stem of the light bulb 15. In its outside diameter the contact member 19 corresponds substantially to that of the insulating disk 18, that is to say, a clearance space is afforded between it and the inner wall of the casing or shell 10. The rear head of the contact member 19 comprises a plurality of radially-disposed, inwardly-projecting arms 20 having inwardly converging edges and being of resilient character so that they may yield in the direction of the axis of the flashlight. The flanged insulating disk 21 is placed within the contact member 19 before the spring arms 20 are turned inwardly. The assembled relation of these parts is best shown in Fig. 2, from which it will be apparent that the insulating disk 21 is provided with an upstanding peripheral flange 22 which lies against the outer wall of the contact member 19 and with a centrally disposed upstanding annular flange 23 which protrudes outwardly between the ends of the yielding arms 20 with sufficient clearance to permit free movement thereof. In their normal position the yielding arms 20 lie in a plane substantially at right angles to the axis of the flashlight and in use they are deflected inwardly, as shown in Fig. 1, by engagement with the contact surface of the battery, as will now be explained.

I have shown in Figs. 1 and 2 one form of battery adapted for use in a flashlight of the construction thus far described. Each battery 24 encloses filling material of the usual type, in which is embedded a carbon rod 28 constituting the positive element of the battery and sealed therein by a wax cover disk 27. Secured upon the end of the rod 28 is a flanged metallic cap 25. This is shaped to cover and be secured upon the end of the rod 28 and includes an upstanding annular ring 26 spaced concentrically from the body of the cap 25. The cap itself is sealed in the cover disk 27 so that the end of the battery presents only a projecting circular cap 25 surrounded by a spaced concentric ring 26. The cap 25 is of such diameter as to be received freely within the annular flange 23 of the insulating disk 21 and the flange 26 of the battery is of such diameter as to receive telescopically the flange 23. In other words, the three circular members 25, 23 and 26 are concentrically arranged and adapted to telescope within each other, as shown in Fig. 1, and when assembled in such relation the end surface of the contact ring 26 of the battery engages the inner ends of the spring contact arms 20 of the contact member 19, thus establishing a plurality of contact points between the battery and the contact member 19 through which current flows to the light bulb. It will be apparent that on account of the yielding nature of the individual contact arms 20 the contact of each arm with the battery is independently maintained and that contact will be established at these points regardless of irregularities in the contour of the flange 26. It will be further noted that the contact arms 20 terminate in a circle concentric with the axis of the flashlight but spaced so as to be entirely out of range of the contact cap of any commercial battery heretofore available. A filler disk 29 of insulating material may be secured in the flanged insulating disk 21 within the flange 23, if desired, where it will be engaged by the cap 25 of the battery and so determine the endwise position of the battery in its casing.

The rear end of the flashlight is constructed in usual manner, having a cap 28 threaded thereon and provided internally with an insulating disk 32 and a boss through which is threaded a contact screw 31. A compression spring 30 is interposed between the cap 28 and the bottom of the battery 24 and contact is made or broken by manipulating the screw 31 to engage or disengage the zinc bottom of the battery, which constitutes its negative contact point.

In Fig. 3 I have disclosed an alternative form of battery 34, in which the positive contact cap 35 is supplemented by projecting segments 36 rather than a complete ring of the character above described. The segments 36 are arranged in circular or annular design and sealed within the cover disk of the battery. Each segment is of sufficient circumferential length to engage one of the contact arms 20 of the contact member 19 in whatever angle of position the battery may be presented and thus three independent contacts are established between the battery and the member 19.

It will be apparent from the foregoing description that the interlocking relation of the various annular members of the combination accurately and effectively center the battery in the shell or casing 10 of the flashlight and in respect to those members which are carried by the reflector 13. Looseness and displacement of the parts is thus prevented and they are compactly retained in the most advantageous position in the flashlight.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An electric flashlight comprising a casing containing a light bulb having a centrally disposed end terminal, a battery with a projecting cap and a battery terminal offset with respect to the cap, an interposed disk having a projecting ring for receiving and centering the battery by engaging said cap and holding it in spaced relation from said light bulb terminal, and conductive members separate from and spaced outside the cap for connecting the light bulb and battery terminals.

2. An electric flashlight comprising a casing containing a light bulb having an end terminal, a battery with an annular terminal within the periphery of its end face, and an interposed member in electrical contact with the light bulb terminal and having conductive arms extending inwardly to engage the annular battery terminal at a plurality of points spaced from the axis of the battery.

3. An electric flashlight comprising a casing containing a light bulb having an end terminal, a battery with a cap and a projecting terminal concentrically spaced from the cap within the periphery of the end face of the battery, an interposed member having an insulating projection

for engaging and centering the battery by engaging its cap, and a conductive member in electrical contact with said battery terminal having radially extending projections which overlap the terminal surface of the battery.

4. An electric flashlight comprising a casing containing a light bulb having a terminal, a battery having a projecting terminal ring in its end face, and interposed elements including an insulating member located in line with the axis of the battery and a conductive member having arms which extend inwardly to overlap the ring while leaving its center clear.

5. An electric flashlight comprising a casing containing a light bulb having an end terminal, a battery having a projecting terminal ring within the periphery of its end face, an interposed insulating element arranged to fit within said ring and a conductive member in electrical contact with the light bulb terminal and having contact arms extending inwardly to make contact with said ring.

6. An electric flashlight comprising a casing containing a light bulb having a centrally disposed end terminal, a battery having a terminal in its end face located out of line with its axis, and interposed elements including an insulating stop for the battery, and a conductive member in electrical contact with said light bulb terminal having a contact arm arranged to engage the terminal of the battery.

7. An electric flashlight comprising a casing containing a light bulb having an end terminal, a battery having an annular terminal disposed within the periphery of its end face, a cylindrical metallic contact member engaging said bulb terminal and having a series of yielding radially extending arms for engaging said annular terminal of the battery, and an insulating disk secured within said contact member and having a circular flange arranged to fit inside the annular terminal of the battery.

8. An electric flashlight comprising a casing having a light bulb with an end terminal and inclosing a battery having a ring-shaped terminal disposed within the periphery of its end face, spacing elements interposed between the bulb and the battery to prevent direct engagement thereof, and a contact member in electrical contact with the light bulb terminal, and including a series of yielding metallic arms extending in position to engage the ring-shaped terminal of the battery.

9. An electric flashlight comprising a casing having a light bulb with an end terminal and inclosing a battery having a ring-shaped terminal of spaced segments disposed within the periphery of its end face, and spacing elements interposed between the bulb and the battery to prevent engagement thereof and including a member in electrical contact with said light bulb terminal having a series of yielding metallic arms extending into position to engage the spaced segments of the battery terminal regardless of the angular position of the battery in the flashlight.

10. An electric flashlight comprising a tubular casing, a bulb supported in one end thereof and having an end terminal, a conducting plate in contact with the end terminal of the bulb, means supporting the plate within but out of contact with the casing, a battery within the casing and having an annular terminal within the periphery of its end face projecting toward the bulb, and resilient means carried by the plate and extending radially in the casing for engaging with said battery terminal.

11. An electric flashlight comprising a tubular casing, a bulb supported in one end thereof and having an end terminal, a conducting plate in contact with the terminal of the bulb, and having a rearwardly extending flange at its periphery, means supporting the plate within but out of contact with the casing, a battery within the casing and having one terminal thereof projecting outwardly therefrom toward the bulb, cooperating elements disposed at the longitudinal axis of the battery and carried by the battery and said means for centering the battery within the casing, and resilient arms carried by the plate and extending radially inward from said flange for engaging with said battery terminal.

JOSEPH MUROS.