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L. A. SEISS

2,785,289

PORTABLE ELECTRIC LAMP

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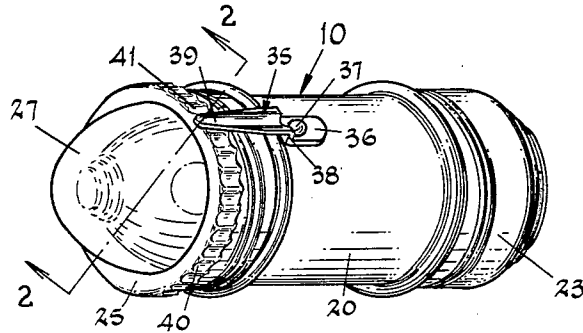


Fig 1

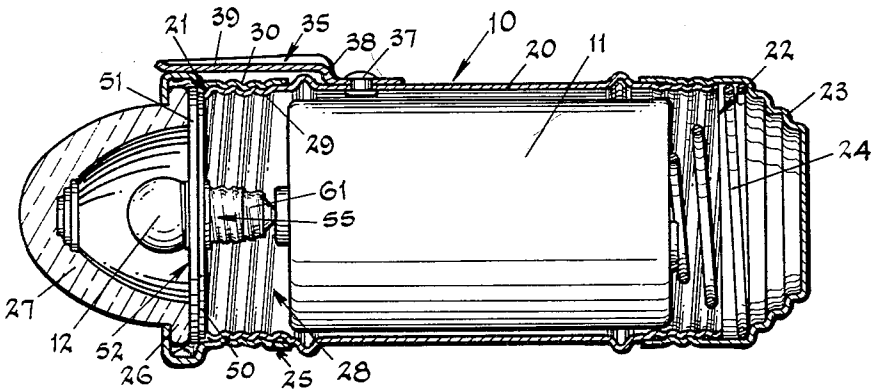


Fig 2

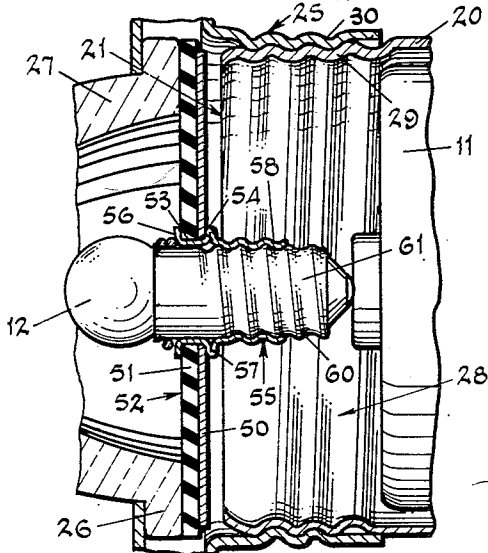


Fig 3

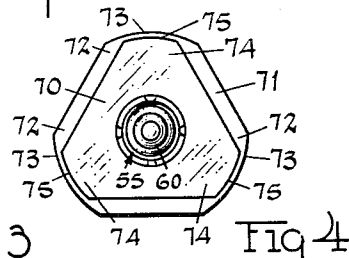


Fig 4

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PORTABLE ELECTRIC LAMP

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4 Claims. (Cl. 240—10.68)

My invention pertains to electric lamps, particularly to a portable electric lamp of the self-contained battery powered type.

The invention comprehends an improved portable electric lamp of greatly simplified circuit connecting arrangements by which the source of power may energize a light producing lamp bulb. More specifically in this connection, my invention proposes an improved means by which the light producing circuit is closed or opened without the use of conventional manually operable switching elements.

The omission of such conventional switching elements not only saves the cost of their provision and installation but also eliminates the need for making openings in the battery containing housing of the lamp through which the switching elements extend to the exterior to be accessible for manual operation. The elimination of such openings is important because very often battery corroding moisture, dust and other elements enter through such openings. This is of great concern in instances where the portable lamp is to be used as a marine signal or running light and is regularly exposed to moisture and its continued functioning under the most adverse conditions is of the most critical need.

Others, such as the patentees named in U. S. Letters Patents Nos. 2,123,491; 2,355,247; 2,059,977 and 2,427,526, prior to my invention have been concerned with this same problem. My invention proposes to advance the consequences of these predecessors and offers material improvements thereover.

Heretofore, it has been thought essential that to obtain the desired results the battery housing or at least the lens holding part or cap thereof should be formed from a dielectric, particularly a plastic or the like material. Plastic has not proven to be satisfactorily capable of withstanding the shock and impact of normal use conditions and at best is but a substitute for metal. As plastic ages, the process of curing continues through the stage of a desired form into that of a more crystalline structure. Hence, a lens formed of plastic, as suggested by my predecessors, soon loses its clarity and becomes ultimately incapable of projecting anything more than a diffusion of light.

To that purpose, the invention provides, in a conventional portable lamp housing comprising a metal tubular body closed at its open end by a lens supporting metal ferrule, a novel light bulb supporting means within the housing by which circuit control, without the use of switching elements, may be obtained. Said novel light bulb supporting means is characterized by comprising a pair of concentrically disposed plates, one of which is a non-conductor of electricity and bears slidably on the housing inner wall surface to removably support the other plate, which is a conductor of electricity, in current conducting relation to the lamp socket. By relatively moving the latter plate to the metal tubular body so as to bring them into electrical contact, a circuit to the lamp bulb

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from the tubular body without the use of switches and such is completed.

In addition to providing the mentioned novel light bulb supporting means, my invention provides means on and engaging the tubular body and ferrule which is yieldably resistant to relative movement of the tubular body and ferrule and thus tends to prevent any undesired relative movement thereof. This feature is used to particularly good advantage where the relative movement of the tubular body and ferrule controls the circuit of current flow to the light bulb and where the lamp is subject to considerable vibration in use.

The invention has for other objects to provide other advantageous structures and arrangements which will appear from the following description and an examination of the accompanying drawing. Structures containing my invention may take various forms. The preferred and modified forms shown in the accompanying drawing and described hereinafter are those which I select to illustrate an embodiment of my invention because they now appear to me as the best modes in which my invention may be carried out. Reference herein to the accompanying drawing is had only to facilitate the description. I do not imply in making this description or by reference therein to the accompanying drawing that variations therefrom which embody my invention made manifest herein are beyond the contemplation of my invention.

Figure 1 of the accompanying drawing illustrates a perspective view of a portable electric lamp embodying the features of my invention. Figure 2 illustrates a view of a longitudinal section of the lamp taken along the plane of the line 2—2, indicated in Figure 1. Figure 3 illustrates an enlarged view of the lamp holding means shown in Figure 2. Figure 4 illustrates an enlarged face view of a modified form of lamp holding means.

In the accompanying drawing, a portable electric lamp embodying the features of my invention is shown as having a housing 10 for enclosing a source of electric power, such as that embodied in a dry cell battery 11, and a light producing element, such as a light bulb 12.

The housing 10 is conventional to the art having a main tubular body 20 formed of metal. Such tubular body 20 is preferably open at both ends 21 and 22. It is through the open end 22 that needed dry cells may be introduced for continued operation. The open end 22 is closed by a metal cap 23 which threadably engages with the tubular body 20. Preferably, the cap 23 has battery contacting means embodied in a metal coil spring 24. One end of the spring 24 is connected with the cap 23 and the other end is adapted to bear against the zinc case of the dry cell battery 11. The spring 24 thus not only establishes a circuit between the tubular body and the battery but also biases the battery 11 outward through the open end 21 of the tubular body.

The open end 21 of the tubular body 20 is closed as by a ferrule 25 which has means such as the bezel groove 26 for engaging edges of a lens 27. The ferrule 25 is adapted to fit telescopically over the open end 21 of the tubular body 20 and thus close such open end. This forms a chamber 28 within the tubular body for containing a dry cell like the one shown at 11.

In order to hold the ferrule 25 in the described end closing relation to the tubular body 20 and to more effectively close the chamber 28 against the intrusion of moisture and dust as might cause corrosion of a dry cell therein, the ferrule 25 and tubular body 20 have meshing threads. The tubular body has threads 29 around its open end 21 and the ferrule has threads 30 which are adapted to mesh with threads 29. Thus, when the ferrule and tubular body are rotated relative to each other in one direction about their common axes, the ferrule 25 will be drawn toward the open end 21 of the tubular body 20.

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When these parts are relatively rotated in the opposite direction the ferrule 25 and tubular body 20 move apart.

For one feature my invention provides means tending to resist relative rotation of the ferrule 25 and the tubular body 20. Provision of such means limits the relative rotation mentioned to that which is directed and caused by the user and prevents relative rotation which might be caused by chance vibration or undirected contact of extraneous things with the electric lamp. The embodiment of such means shown in the accompanying drawing comprises a spring pressed dog 35. The dog 35 is preferably supported at one end of and is integral with an arm 36 connected as at 37 to the tubular body 20. The arm 36 is preferably L-shaped with a shorter upstanding flexible portion 38 in radially outwardly extending relation to the tubular body 20 and the longer bridging portion 39 being in nearly parallel relation to the tubular body 20 and extending endwise therefrom toward the ferrule 25. The arm 36 supports the dog 35 so as to engage and resiliently bear against the outer surface of the ferrule 25 to resist movement of such ferrule relative to the tubular body.

In order to increase the effectiveness with which the dog 35 resists said relative movement of ferrule and tubular body, the ferrule 25 may be provided, as I in the accompanying drawings show, with an outer astragal or ridge 40 along and over which the dog moves, as the ferrule 25 is rotated relative to the tubular body 20.

The astragal 40 extends in concentric relation to the axis of the ferrule 25, preferably being formed by that portion of the ferrule metal displaced in shaping the bezel groove 26. The crown of the astragal 40 is serrate having a plurality of notches 41 in arcuately spaced sequence. The notches 41 are each of a size that permits the dog 35 to enter. Hence, rotation of the ferrule 25 relative to the tubular body requires application of a force sufficient to dislodge the dog 35 from a succession of notches 41 against the resistance of the resilient leg portion 38.

This provides a click-pawl locking system tending to prevent movement of the ferrule 25 with respect to the tubular body 20. In addition to assuring that the housing chamber 28 remains closed against the entry of corroding moisture and dust, this provision also operates to maintain desired circuits established by the relative positions of the tubular body 20 and the ferrule 25. The path of these circuits and the means provided by my invention for conducting them to the light bulb 12 will now be described.

A pair of plates 50 and 51 are disposed in surface engaging concentric relation to each other. Preferably, the plates are discular in outline and are disposed in concentric relation within the housing 10, particularly within the ferrule 25 thereof. The plate disc 50 is a conductor, being preferably formed of metal, and the plate disc 51 is a non-conductor formed, for example, from a fiber material. Preferably, the plate disc 51 is formed of fiber board with a calendered surface of high gloss providing a light reflector surface 52 for the lamp. The plate disc 51 has diameter substantially equal to the inner diameter of the ferrule 25 and the plate disc 50 has a lesser diameter than that of the plate disc 51 but not less than diameter of the open end 21 of the tubular body 20.

As will be seen from the accompanying drawings, particularly from Figs. 2 and 3 thereof, the plate disc 51 provides a support for the plate disc 50. The edges of the plate disc 51 slidably engage the inner surface of the ferrule 25 and thereby sustain the plate disc 50 in spaced non-conducting relation to the walls of the ferrule 25, despite the relative movement of the ferrule and tubular body or vibration of the housing 10.

These so paired plate discs 50 and 51 provide means for supporting a light bulb 12. To that end, each has an axial bore 53 and 54. Through the axial bores 53 and 54, a metal thimble 55 extends. The thimble 55 provides the sole means of supporting the discs 50 and 51 in their described concentric, surface engaging relation.

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One end of the thimble 55 is slightly flanged, as shown at 56. This flanged end 56 engages portions of the disc 51 surrounding the axial bore 54 therein. In axially spaced relation to the end 56, thimble 55 has a grommet flange 57. The grommet flange 57 by being in swedged pressing relation to the portions of disc 50 surrounding the axial bore 53 therein cooperates with the flanged end 56 to hold the discs 50 and 51 in their described position. In addition, the flange 57 electrically connects the thimble 55 to the disc 50 for reason which will later appear.

Also spaced from the end 56, the thimble 55 has threads 58. The threads 58 are adapted for meshing with threads such as those shown at 60 on a base 61 of the light bulb 12. The thimble 55 thus forms a socket to receive and support the light bulb 12 and to place the same in circuit with the disc 50.

The paired discs 50 and 51 are placed in the ferrule 25 so that the disc 51 is in surface contact with the lens edges and the disc 50 faces toward the open end 21 of the tubular body 20. When the ferrule 25 is rotated relative to the tubular body 20 on the threads 29 and 30 in a direction to draw the ferrule 25 and tubular body together, the disc 50 will also be drawn to engage the end 21 of the tubular body 20. This will establish an electric circuit between the light bulb 12 and the tubular body 20 and through the circuit causes the light bulb to be energized.

When the ferrule 25 is rotated relative to the tubular body in the opposite direction, the spring 24 acting through the battery 11 and bulb base 61 urges the discs 50 and 51 to move with the ferrule 25 away from the end 21 of the tubular body, opening the heretofore described circuit to the light bulb 12.

In lieu of plates of discular outline, like those indicated at 50 and 51, plates 70 and 71 of an approximate triangular outline, like those shown in Figure 4 may be used. The plate 70, like discular plate 50, is a conductor and plate 71 is dielectric being preferably formed of fibre board or the like. The plate 71 has legs 72 whose rounded end edges 73 engage the inner surface of the ferrule to support the plate 70 from contact therewith. The plate 70 has legs 74 whose rounded end edges 75 are adapted to engage the open end 21 of the tubular body 20 in the fashion described in connection with the plate disc 50. The plates 70 and 71 like those heretofore described provide support and electrical conducting to the bulb 12.

Thus, it will be seen that a portable electric lamp embodying my invention eliminates dielectric materials in the formation of the housing parts. Also such lamp is simple and inexpensively built, without any sacrifice of the characteristic of reliability in operation. Its structural provisions withstand weather and vibration conditions of use and provide a portable electric lamp of attractive compactness and usefulness as is described in the claims hereto appended.

I claim:

1. In a portable electric lamp of the self-contained battery powered type having a housing comprising a metal tubular body with an open end, a metal ferrule having a bezel groove and a lens having its edge in said bezel groove, the ferrule being in telescopically fitting relation over the tubular body open end and supporting said lens to close said tubular body and provide a space within said tubular body to enclose and thereby support an electric battery in current conducting relation with said tubular body; a means for supporting a light bulb within said housing and in focus with said lens and for controllably connecting said bulb in circuit with said tubular body comprising a pair of plates within said ferrule and in surface engaging relation to each other, one plate being nearer the tubular body open end edge and being an electric conductor and of a dimension less than the inner diameter of the ferrule but greater than the inner diameter of the tubular body and the other plate being an electric non-conductor and of a dimension greater than that of the first mentioned plate and substantially equal to the inner diam-

eter of the ferrule, said plates having concentric bores, a metal cylindrical thimble extending through said bores and providing the sole means of supporting the plates in said mutual surface engaging relation, one end of said thimble being in engagement with portions of the non-conductor plate surrounding the bore therein, the thimble having a grommet flange and threads in spaced relation to said thimble end, the grommet flange being in swedged pressing relation against the conductor plate to lock it against relative movement on the thimble and to electrically connect said thimble to said conductor plate, the threads on said thimble adapted to mesh with threads on a base of a lamp bulb and hold said base in a position to be engaged with a terminal of an electric battery within said tubular body, said ferrule and tubular body having meshing threads for holding the ferrule in said end closing telescopic relation to said body and for drawing the conductor plate axial-wise of said tubular body into end engagement therewith to establish a circuit between said tubular body and thimble to energize a lamp in said thimble.

2. In a portable electric lamp as described in claim 1 having in addition a dog on said tubular body and in a position with respect thereto that when said ferrule telescopically fits over said tubular body end said dog will engage said ferrule and by said engagement resist movement of the ferrule relative to said tubular body.

3. In a portable electric lamp of the self-contained battery powered type having a housing comprising a metal tubular body with an open end, a metal ferrule having a bezel groove and a lens having its edge in said bezel groove; the ferrule being in telescopically fitting relation over the tubular body open end and supporting said lens to close said tubular body and provide a space within said tubular body to enclose and thereby support an electric battery in current conducting relation with said tubular body; a means for supporting a light bulb within said housing and in focus with said lens and for controllably connecting said bulb in circuit with said tubular body comprising a pair of plates within said ferrule and in surface engaging relation to each other; one plate being nearer the tubular body open end edge and being an electric conductor and of a dimension less than the inner diameter of the ferrule but greater than the inner diameter of the tubular body open end and the other plate being an elec-

tric non-conductor and of a dimension greater than that of the first mentioned plate and substantially equal to the inner diameter of the ferrule; said plates having concentric bores; a metal cylindrical thimble extending through said bores and providing the sole means of supporting the plates in said mutual surface engaging relation, one end of said thimble being in engagement with portions of the non-conductor plate surrounding the bore therein; the thimble having a grommet flange and threads in spaced relation to said thimble end, said grommet flange being in swedged pressing relation against the conductor plate to lock it against relative movement on the thimble and to electrically connect said thimble to said conductor plate; the threads on said thimble adapted to mesh with threads on a base of a lamp bulb and hold said base in a position to be engaged with a terminal of an electric battery within said tubular body; said ferrule and tubular body having meshing threads for holding the ferrule in said end closing telescopic relation to said body and for drawing the conductor plate axial-wise of said tubular body into end engagement therewith to establish a circuit between said tubular body and thimble to energize a lamp in said thimble; said ferrule having an outer concentric annular astragal; said astragal having a plurality of notches in arcuately spaced sequence along said astragal; and a dog on said tubular body in a position with respect thereto that when said ferrule telescopically fits over said tubular body end said dog will engage said astragal and enter one of said notches thereon to thereby resist movement of the ferrule relative to the tubular body.

4. In a portable electric lamp as described in claim 3 having in addition flexible means in engagement with and intermediate of said dog and tubular body tending to bias the dog against said astragal and into the notches thereof.

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