

Aug. 9, 1966

T. E. PICKERING ETAL
PORTABLE, BATTERY-OPERATED WARNING LIGHT FOR MOUNTING
ON BARRICADES AND THE LIKE

3,266,015

Filed March 19, 1962

2 Sheets-Sheet 1

FIG. 1.

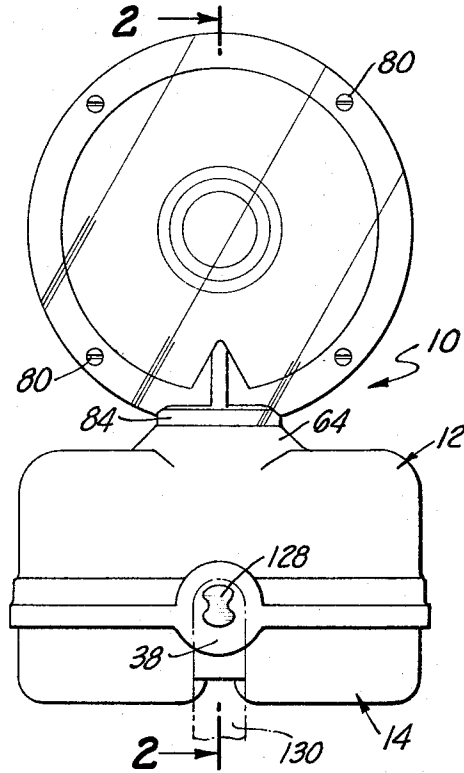
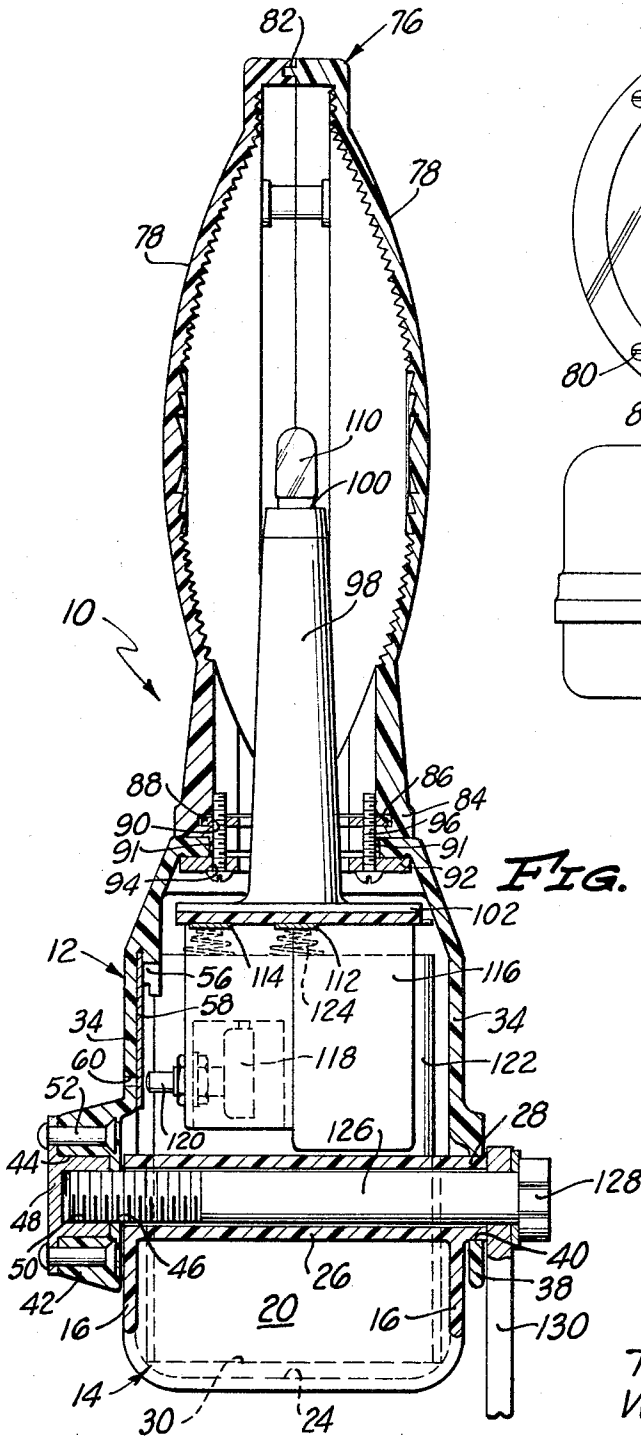


FIG. 2.



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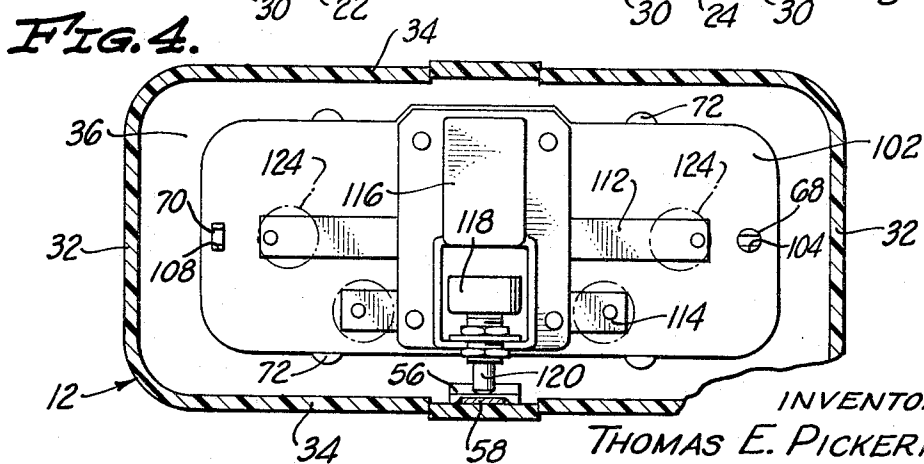
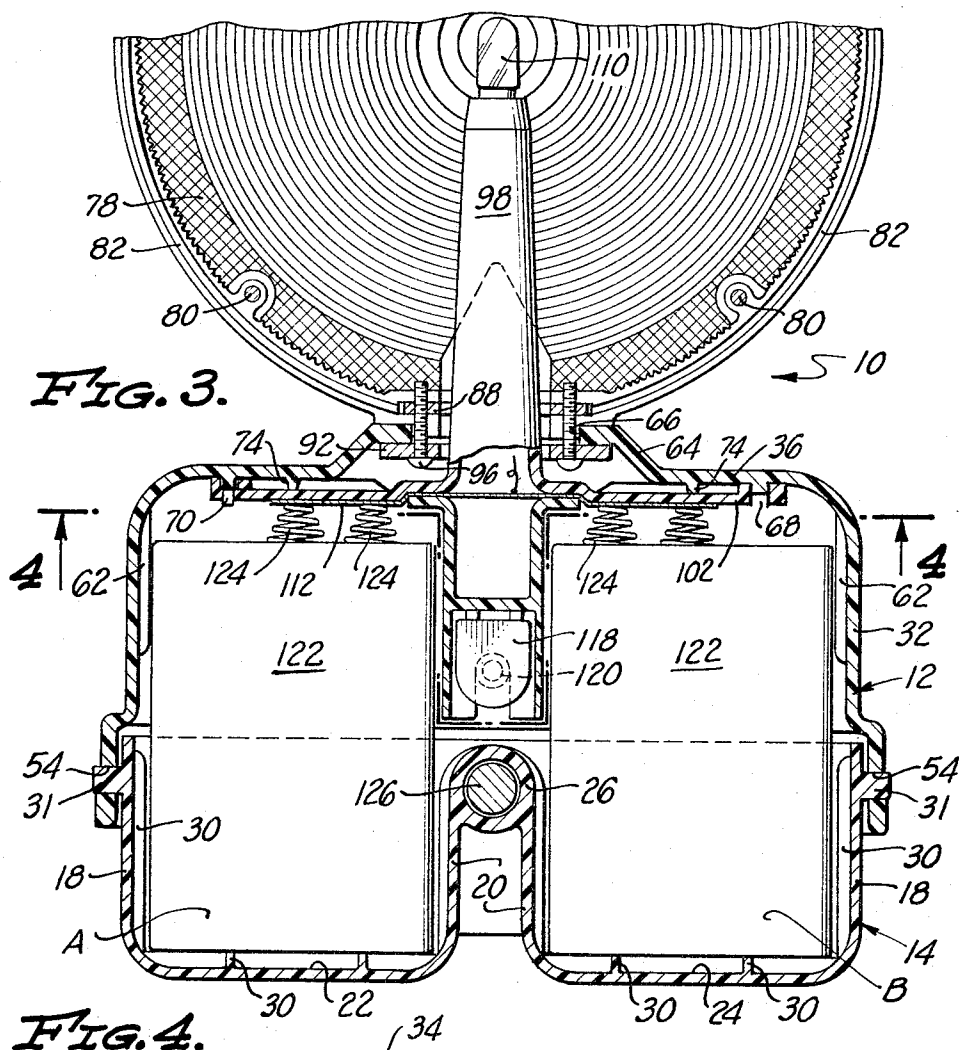
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PORTABLE, BATTERY-OPERATED WARNING LIGHT FOR MOUNTING ON BARRICADES AND THE LIKE

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Filed Mar. 19, 1962, Ser. No. 180,430

15 Claims. (Cl. 340-81)

The present invention relates generally to the lighting fixture art and more particularly to a novel electrical warning light which flashes intermittently and which is adapted to be mounted on wooden barricades and the like.

It is an object of the present invention to provide a novel warning light which can be easily and quickly energized and de-energized. More particularly, it is an object to provide such a light which contains a concealed switch to prevent small boys and vandals from tampering with it and which can be easily and quickly actuated by a simple tool fashioned from a length of rigid wire.

A further object is to provide a novel warning light which is substantially waterproof as to rain and snow, and which is relatively unbreakable. More particularly, it is an object to provide such a light which includes a plastic lens assembly and housing, and which has the parts thereof constructed and assembled in a manner to prevent damage to the battery and switches and to prevent rain, water and snow from entering into the device.

Yet another object is to provide a novel warning light which is relatively tamper-proof by uniformed vandals and small children but which can be easily and quickly disassembled for the replacement of the batteries and the lamp bulb once one has been advised as to the construction of it. More particularly, it is an object to provide such a light which includes a plurality of interlocking projections which must be released in order to open the device and which also contains a locking bolt which appears to be used primarily for mounting the device on a barrier or support but which also functions to connect together the portions of the case or housing.

Another and further object is to provide a novel warning light with a lens construction which can be rotated through 360° and fastened in any rotated position relative to the housing and which includes means for emitting a directional beam of light.

Further objects and advantages of the present invention will be apparent from the following detailed description, reference being had to the accompanying drawings wherein a preferred embodiment of the present invention is shown.

Briefly stated, one embodiment of the present invention which fulfills the aforementioned objects comprises top and bottom cases which fit together in an overlapping telescopic relationship to provide two electrical battery-receiving compartments, the overlapping relationship of the cases preventing rain water and snow from entering the device. A lens assembly is mounted on the upper wall of the top case so that it can be rotated through 360° and fastened in any selected rotational position relative to the case. A stem portion with a lamp-receiving socket at the upper end thereof is removably fastened within the top case so as to extend into the lens assembly. A switch is provided adjacent the lower end of the stem portion and includes an actuating member which is operable from outside the top case by inserting a thin rod through a small opening formed in a side wall of the case. The two cases are removably fastened together at a plurality of positions around the interlocking por-

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tions thereof so as to deter vandals and small children from opening the unit.

In the drawings:

FIG. 1 is a rear elevational view of a warning light constructed in accordance with the teachings of the present invention;

FIG. 2 is an enlarged vertical sectional view taken on the line 2-2 in FIG. 1 with the lamp-supporting stem and switch assembly shown in elevation;

FIG. 3 is a fragmentary enlarged vertical sectional view of the device shown in FIG. 1 taken on a plane at right angles to the plane of FIG. 2, with the lamp-supporting stem and storage batteries shown in elevation; and

FIG. 4 is a horizontal sectional view taken on the line 4-4 in FIG. 3.

Referring to the drawings more particularly by reference numerals, 10 indicates generally a novel warning light embodying the teachings of the present invention, and which includes a top case 12 and a bottom case 14, both of which are preferably molded from a relatively strong plastic material such as high-impact polyethylene.

The bottom case 14 (FIGS. 2 and 3) includes opposed side walls 16, opposed end walls 18, and spaced-apart intermediate walls 20 which divide the bottom case into two chambers A and B which have bottom walls 22 and 24, respectively.

Joining together the upper ends of the intermediate walls 20 is a member 26 (FIG. 3) which is preferably tubular in shape and which is open at both ends with an end portion 28 (FIG. 2) projecting beyond the side wall adjacent thereto. Spaced-apart intersecting ridges 30 are formed on the inner surfaces of the end, side, and bottom walls of the chamber A and B for a purpose to appear. Projecting outwardly from the end walls 18 adjacent the upper edges thereof are lugs 31 (FIG. 3) which aid in securing together the top and bottom cases.

Turning to a consideration of the top case 12, it includes opposed end walls 32, opposed side walls 34 and a top wall 36, the bottom portions of the end and side walls being flared outwardly as shown in FIG. 3 whereby the top case 12 fits over the bottom case 14 in telescopic relationship therewith. Formed in one of the side walls 34 adjacent the center thereof is a depending ear 38 (FIG. 2) which contains a circular aperture 40 of a size to receive the projecting end portion 28 of the tubular member 26. The other side wall of the top case is provided with a hub-like portion 42 (FIG. 2) which contains a circular recess 44 and a counterbore aperture 46. A cup-like metal socket 48 with an internally threaded recess 50 is fastened in the circular recess 44 as by means of pin-like members or rivets 52.

Formed in the end walls 32 of the top case adjacent the edges thereof are elongated recesses 54 (FIG. 3) which are of a size to receive the lugs 31. A depending flange portion 56 (FIG. 2) is formed on the inner surface of one side wall 34 above the hub 42 so as to support a depending flexible metal strip 58 which is in engagement with the inner surface of said side wall and which covers a small aperture 60 positioned immediately above the hub-like portion 42.

The inner surfaces of the end and side walls 32 and 34 of the top case are also provided with spaced-apart vertically extending ridges 62 (FIG. 3) of substantially the same depth or thickness as the ridges 30 in the bottom case.

The top wall 36 of the top case has a frusto-conical center portion 64 (FIG. 3) which contains a circular aperture 66 adjacent the center thereof. The inner surface of the top wall 36 is also provided with two spaced-apart slotted detents 68 and 70 (FIGS. 3 and 4), the de-

tent 68 being circular in shape and the detent 70 being of rectangular configuration. The inner surface of the top wall also contains four semicircular guide members or bosses 72 (FIG. 4) and a plurality of pin-like supporting members 74 (FIG. 3) for a purpose to appear.

Mounted on the upper wall of the top case 12 is a hollow lens assembly 76 (FIG. 2) which is preferably molded from a strong plastic material such as high-impact butyrate, and which includes two interlocking disc-like lens halves 78 fastened together by a plurality of machine screws 80, said lens halves being interconnected by a tongue and groove construction 82 (FIG. 2) adjacent their peripheries to prevent water from entering the lens assembly. As shown in FIG. 2, the inner surfaces of the lens halves are formed to provide a directional beam of light along a line which passes transversely through the centers of the lens halves. Formed integral with each of the lens halves adjacent the bottom thereof is a semi-circular base portion 84 (FIGS. 2 and 3) which contains an arcuate groove 86 for receiving a flat metal ring 88 provided with circumferentially spaced tapped openings 90. Depending from each of the base portions 84 is a flange 91 which fits within the aperture 66 whereby the lens assembly is supported on the upper wall 36 of the top case. A metal retaining ring 92 (FIGS. 2 and 3) is positioned below the aperture 66 within the top case and contains circumferentially spaced openings 94 for receiving screws 96 which may be threaded into the aforementioned tapped openings 90 in the metal ring 88. It will be readily apparent that when the screws 96 are loosened the lens assembly can be rotated through 360° to any selected position relative to the top case, and that when the screws are tightened the rings 88 and 92 securely maintain the assembly in its selected position.

The mechanism for providing the illumination within the lens assembly includes an elongated tubular stem portion 98 (FIGS. 2 and 3) which contains a bayonet-type lamp socket 100 at the upper end thereof and an integrally formed flat rectangular base portion 102 at the lower end. Here, again, the stem portion and base portion are preferably molded from a plastic material. As shown in FIG. 4, the opposed ends of the base portion are provided with round and rectangular-shaped openings or detents 104 and 108, respectively, for receiving the co-operating detent projections 68 and 70, respectively, and the side edges of the base portion engage the inner flat surfaces of the guide members or bosses 72, whereby the stem portion and base portion are supported on the upper wall 36 of the top case in a predetermined position. Due to the differences in the shape of the detents 68 and 70, the stem and base portions can be fastened to the top case in only one position for a purpose to appear. At this time it may be advisable to also point out that because of the projecting end portion 28 of the tubular member 26 and the opening 40 in the top case which receives it, the top and bottom cases can be assembled in only one position.

The pin-like supporting members 74 previously described engage the upper surface of the base portion 102 so as to maintain it in position substantially parallel with the upper wall of the top case whereby a lamp 110 received in the lamp socket 100 will be properly positioned adjacent the centers of the lens halves.

Fastened to the bottom surface of the stem base portion 102, as with rivets, are two elongated metal contact strips 112 and 114 of unequal lengths (FIG. 4). Also fastened to the bottom of said stem base portion adjacent the center thereof is an instrument case 116 (FIG. 2) which includes a control mechanism (not shown) and an electrical switch 118 containing an actuating pin 120 which has the end thereof projecting laterally and in substantial alignment with the metal strip 58 and the opening 60 when the device is assembled. Thus, with the actuating pin 120 in alignment with the metal strip 58

the switch 118 can be easily actuated by inserting a thin rod or the like through the opening 60 so as to press the metal strip 58 against the free end of the actuating pin 120. As mentioned hereinabove, the detents 104 and 108 and their co-operating detent projections 68 and 70, respectively, are constructed so that the instrument case 116 cannot be reversed. This is to prevent the pin 120 from being positioned on the side away from the aperture 60. The lamp socket 100, the contact strips 112 and 113, the switch 118 and the control mechanism are interconnected by electrical conductors (not shown) so that when a D.C. voltage is impressed across the contact strips 112 and 114 (as will be described hereinafter) and the switch 118 is closed, the control mechanism in the instrument case will cause the lamp 110 to be intermittently energized so that it will "blink" or "flash" at short intervals of time.

The D.C. power source previously referred to consists of two dry cell batteries 122 (FIG. 3) positioned in the chambers A and B and which are provided with spring-type terminals 124 which engage the contact strips 112 and 114. The terminals 124 are offset in the manner shown in FIG. 4 so that they will engage the ends of the contact strips 112 and 114 only when they are properly installed, and will not engage the strip 114 if they are reversed as to polarity.

The ridges 30 in the bottom case and the ridges 32 in the top case position the batteries away from the side and bottom walls so as to reduce the possibility of damage to the batteries and also to facilitate the circulation of air around them. The spring-type terminals at the top of the batteries also cushion them against shocks in the vertical direction. The ridges 30 in the bottom of the chambers A and B have the further advantage in that they provide a space to receive condensation or any fluid which may leak from the batteries.

Referring to FIG. 2, a mounting bolt 126 with a special head 128 is provided for locking together the top and bottom cases and for mounting the warning light on a strap 130 of a barrier (not shown), the bolt passing through the member 26 and into the threaded portion of the metal socket 48. It will be noted that the member 26 maintains the side walls 16 and 34, respectively, in spaced-apart relationship so that the case will not be crushed when the bolt 126 is tightened.

The bolt 126 would also appear to be only a mounting bolt and therefore children and vandals who would endeavor to disassemble the warning light without removing it from the barrier would be unable to do so. However, even if such a person were to remove the bolt 126, he would continue to have trouble opening the cases because they are held together at a plurality of locations, i.e. at the lugs 31 at opposite ends of the device and also by the end of the tubular portion 28 which is received in the aperture 40 (FIG. 2).

For obvious reasons, children and uninformed vandals are unable to locate the switch for de-energizing the device once it has been placed in operation because of a very small access opening 60 which appears to be blocked by the metal strip on the inside of the top case. On the other hand, authorized personnel who have been instructed in the operation and construction of the device have no trouble in opening it to replace the batteries, or in removing the stem portion and stem base portion in order to replace a burned-out lamp.

Thus, it is apparent there has been provided a novel warning light which fulfills all of the objects and advantages sought therefor. It is substantially tamper-proof because of the numerous interlocking elements and the concealed switch actuating means and can be used in rain and snow without adversely affecting its operations. The lens can be rotated through 360° so that the illumination produced thereby can be projected in any selected direction regardless of the position of the case or housing, and the flashing or blinking light not only aids in attracting

the attention of motorists and pedestrians but also reduces the drain on the dry cell batteries.

It is to be understood that the foregoing description and the accompanying drawings have been given only by way of illustration and example and that changes and alterations in the present disclosure which will be readily apparent to one skilled in the art are contemplated as within the scope of the present invention.

We claim:

1. A portable, battery-operated warning light, comprising:

- a housing for receiving an electrical battery and containing an upper wall and a side wall;
- an aperture in said upper wall;
- a hollow lens assembly mounted on the upper wall of the housing in alignment with said aperture;
- an elongated stem portion having a lamp-receiving socket at the upper end thereof extending through the aperture and into the interior of the lens assembly, the lower end of the stem portion being provided with a base portion removably fastened to the upper wall of the housing;
- a switch assembly mounted on said base portion and depending into the housing, said assembly including a reciprocating actuating member positioned adjacent the side wall of the housing;
- a small opening in said side wall in substantial alignment with the actuating member;
- a flat resilient pressure transmitting member fastened within the housing so as to extend between the small opening and the actuating member, said pressure transmitting member normally being positioned against the side wall of the housing to impede the entry of rain water and to give the appearance that the opening is blocked; and
- contact means contained on the base portion interconnected with the lamp base and the switch assembly, said contact means being engaged by a battery positioned in the housing.

2. A portable, battery-operated warning light, comprising:

- a housing for receiving electrical batteries and containing an upper wall;
- an aperture in said upper wall;
- a hollow lens assembly mounted on the upper wall of the housing in alignment with said aperture, said assembly containing a base portion positioned in the aperture;
- removable retaining means within the housing fastened to said base portion providing for varying the rotational position of the lens assembly relative to the housing;
- an elongated stem portion having a lamp-receiving socket at the upper end thereof extending through the aperture and into the interior of the lens assembly, the lower end of the stem portion being provided with a base portion having opposed ends, each end of the base portion containing one member of a set of disengageable fastening means, the other member of each set being connected to the inner surface of the upper wall of the housing, each set being different from the other set whereby the base portion can be fastened in the housing in only a predetermined position with the stem portion in the lens assembly;
- a switch assembly mounted on said base portion;
- two contact bars of unequal length mounted on the base portion for engagement with the terminals of batteries positioned in the housing; and
- conductor means interconnecting the contact bars, the switch assembly and the lamp base.

3. A portable, battery-operated warning light, comprising:

- a bottom case having side walls and opposed end walls;
- a rigid hollow element open at both ends extending between the side walls dividing the case into two bat-

tery-receiving compartments, one end of said element projecting beyond the side wall adjacent thereto;

- a top case having a top wall, side walls, and opposed end walls and adapted to fit on the bottom case in overlapping telescopic relationship;
- an opening in one side wall of the top case for receiving the projecting end of the hollow element, the other side wall containing a concealed threaded female member in alignment with the hollow element for receiving the end of a bolt extending through said element, whereby the top and bottom cases can be fastened together;
- an aperture in the upper wall of the top case;
- a hollow lens assembly mounted on said upper wall in alignment with the aperture;
- an elongated stem portion having a lamp-receiving socket at the upper end thereof extending through the aperture and into the interior of the lens assembly, the lower end of the stem portion being provided with a base portion removably fastened to the upper wall of the top case; and
- a switch assembly mounted on said base portion.

4. A portable, battery-operated warning light, comprising:

- a bottom case having side walls and opposed end walls;
- a rigid tubular element open at both ends and connected to and extending between the side walls dividing the case into two battery-receiving compartments, one end of the tubular element projecting beyond the side wall adjacent thereto;
- a top case having a top wall, side walls, and opposed end walls and adapted to fit on the bottom case in overlapping telescopic relationship;
- an opening in one side wall of the top case for receiving the projecting end of the tubular element, the other side wall containing a concealed threaded female member in alignment with the tubular element for receiving the end of a bolt extending through the tubular element, whereby the top and bottom cases can be fastened together;
- an aperture in the upper wall of the top case;
- a hollow lens assembly mounted on said upper wall in alignment with the aperture;
- an elongated stem portion having a lamp-receiving socket at the upper end thereof extending through the aperture and into the interior of the lens assembly, the lower end of the stem portion being provided with a base portion removably fastened to the upper wall of the top case;
- a switch assembly containing an actuating member mounted on said base portion so as to be positioned above the tubular element intermediate the battery-receiving compartments; and
- switch actuating means on said switch assembly operable from outside the top case.

5. A housing for a warning light which includes:

- top and bottom cases adapted to be assembled together to provide a compartment therebetween,
- each of said cases containing opposed side walls;
- a partition in one of said cases extending transversely of the side walls thereof dividing the compartment into a plurality of chambers;
- a passageway in said partition also extending transversely of said side walls,
- the passageway being of a size to slidably receive an elongated bolt-like member; and
- means on a side wall of the other case for receiving one end of said elongated member in holding relationship when the cases are assembled together.

6. A housing for a warning light which includes:

- top and bottom cases adapted to be assembled together to provide a compartment therebetween,
- each of said cases containing opposed side walls;

a rigid partition in one of said cases extending transversely between the side walls thereof maintaining said walls in predetermined spaced-apart relationship;
 a passageway in said partition extending from adjacent one side wall of said one case to adjacent the other side wall thereof,
 said passageway being of a size to slidably receive an elongated bolt-like member;
 means supported on a side wall of the other case in axial alignment with said passageway for receiving one end of the elongated member in holding relationship when the cases are assembled together.

7. A housing for a warning light which includes:
 top and bottom cases adapted to be assembled together in telescoping relationship to provide a compartment therebetween,
 the top case having opposed side walls and opposed end walls with lower edges,
 the bottom case having opposed side walls and opposed end walls with upper edges, and
 the lower edges of the walls of the top case overlapping the upper edges of the walls of the bottom case in the assembled position;
 rigid partition means in said bottom case extending transversely of the side walls thereof maintaining them in spaced-apart relationship;
 a passageway in said partition also extending transversely of said side walls and having opposed ends, said passageway being of a size to slidably receive an elongated bolt-like member;
 an aperture in one side wall of the top case in axial alignment with said passageway when the cases are in the assembled position; and
 means fastened to the other side wall of the top case for receiving one end of said elongated member in holding relationship,
 said receiving means being in axial alignment with the other end of said passageway when the cases are in the assembled position.

8. A housing for a warning light which includes:
 top and bottom cases adapted to be assembled together in telescoping relationship to provide a compartment therebetween,
 the top case having opposed side walls and opposed end walls with lower edges,
 the bottom case having opposed side walls and opposed end walls with upper edges, and
 the lower edges of the walls of the top case overlapping the upper edges of the walls of the bottom case in the assembled position;
 rigid partition means in said bottom case extending transversely of the side walls thereof maintaining them in spaced-apart relationship;
 a passageway in said partition also extending transversely of said side walls and having opposed ends, said passageway being of a size to slidably receive an elongated bolt-like member;
 an aperture in one side wall of the top case in axial alignment with said passageway when the cases are in the assembled position;
 means fastened to the other side wall of the top case for receiving one end of said elongated member in holding relationship when the cases are in the assembled position;
 lugs on the end walls of one of said cases projecting from said walls; and
 apertures in the end walls of the other case positioned to receive said lugs in holding relation when the cases are in the assembled position.

9. A housing for a warning light which includes:
 top and bottom cases adapted to be assembled together in telescoping relationship to provide a compartment therebetween,
 the top case having opposed side walls with lower edges,

the bottom case having opposed side walls with upper edges, and
 the lower edges of the walls of the top case overlapping the upper edges of the walls of the bottom case;
 a tubular portion for receiving an elongated fastening member extending transversely of the side walls of the bottom case maintaining said walls in predetermined spaced-apart relationship,
 one end of said tubular portion extending beyond one of said side walls;
 an aperture adjacent the lower edge of one side wall of the top case for receiving said extending tubular portion when the cases are in the assembled position; and
 socket means carried by the other side wall of the top case for receiving one end of the elongated fastening member when the cases are in the assembled position.

10. A portable, battery-operated warning light, comprising:
 a housing for receiving an electrical battery and including an upper wall and a side wall;
 an aperture in said upper wall;
 a hollow lens mounted on the upper wall in alignment with said aperture;
 a lamp supporting assembly including an elongated stem portion having a lamp-receiving socket at the upper end thereof extending through the aperture and into the interior of the lens, and a base portion with a bottom surface at the lower end of the assembly removably mounted in the housing adjacent the upper wall thereof;
 a switch assembly containing an actuating member supported by said base portion within the housing;
 contact means on the bottom surface of the base portion interconnected with the lamp receiving socket and the switch assembly and engageable by the terminals of a battery received in the housing; and
 means for engaging the actuating member of the switch assembly from outside of the housing.

11. A portable, battery-operated warning light, comprising:
 a housing for receiving an electrical battery and including an upper wall and a side wall;
 an aperture in said upper wall;
 a hollow lens mounted on the upper wall in alignment with said aperture;
 a lamp-supporting assembly including an elongated stem portion with a base portion adjacent the lower end thereof removably mounted in the housing with the base portion adjacent the upper wall of said housing,
 the stem portion having a lamp-receiving socket at the upper end thereof extending through the aperture and into the interior of the lens;
 a switch assembly including an actuating member supported by said base member,
 the actuating member being positioned adjacent the side wall of the housing;
 a small aperture in said side wall in close proximity with the actuating member whereby a thin rod can be inserted through the small aperture to engage the actuating member; and
 contact means interconnected with the switch assembly and engageable by the terminals of a battery received in the housing.

12. The portable, battery-operated warning light set forth in claim 11 which includes a yieldably mounted pressure transmitting member within the housing between the small aperture in the side wall and the actuating member,
 the pressure transmitting member being larger than the small aperture and being normally posi-

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tioned adjacent the side wall so as to block the aperture on the inside of the housing.

13. A portable, battery-operated warning light, comprising:

- a housing for receiving an electrical battery and including an upper wall and a side wall;
- an aperture in said upper wall;
- a hollow lens mounted on the upper wall in alignment with said aperture;
- a unitary lamp supporting assembly removably mounted in the housing,

said assembly including an elongated stem portion having a lamp-receiving socket at the upper end thereof extending through the aperture and into the interior of the lens, and a base portion at the lower end of the assembly positioned adjacent the upper wall of the housing;

means on said supporting assembly preventing it from being mounted in the housing in any position other than the predetermined operative position;

a switch assembly containing an actuating member mounted within the housing; and

contact means within the housing interconnected with the switch assembly and the lamp-receiving socket for engagement with the terminals of a battery mounted in the housing.

14. A portable, battery-operated warning light, comprising:

a housing for receiving an electrical battery and including an upper wall and a side wall;

an aperture in said upper wall;

a hollow lens mounted on the upper wall in alignment with said aperture;

a unitary lamp supporting assembly removably mounted in the housing,

said assembly including an elongated stem portion having a lamp-receiving socket at the upper end thereof extending through the aperture and into the interior of the lens, and a base portion at the lower end of the assembly positioned adjacent the upper wall of the housing;

sets of unlike disengageable fastening means contained on the upper wall of the housing and the base portion of said assembly whereby the lamp-supporting assembly can be mounted in the housing in only one predetermined operative position relative thereto;

a switch assembly containing an actuating member mounted within the housing; and

contact means on the base portion interconnected with the switch assembly and the lamp-receiving socket for engagement with the terminals of a battery mounted in the housing.

15. A portable, battery-operated warning light, comprising:

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top and bottom housing cases adapted to be assembled together to provide a compartment therebetween,

the top case including an upper wall,

each of said cases containing opposed side walls;

a partition in the bottom case extending transversely of the side walls thereof dividing the compartment into a plurality of chambers;

a passageway in said partition also extending transversely of said side walls,

the passageway being of a size to slidably receive an elongated bolt-like member;

means on a side wall of the top case for receiving one end of said elongated member in holding relationship when the cases are assembled together;

an aperture in said upper wall;

a hollow lens mounted on the upper wall in alignment with said aperture;

a lamp supporting assembly including an elongated stem portion having a lamp-receiving socket at the upper end thereof extending through the aperture and into the interior of the lens, and a base portion with a bottom surface at the lower end of the assembly removably mounted in the housing adjacent the upper wall thereof;

a switch assembly containing an actuating member supported by said base portion within the housing;

contact means on the bottom surface of the base portion interconnected with the lamp receiving socket and the switch assembly an engageable by the terminals of a battery received in the housing; and

means for engaging the actuating member of the switch assembly from outside of the housing.

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