Nov. 22, 1955 V. A. D'ARBELOFF 2,724,769

ILLUMINATED APPAREL

Filed March 24, 1953

FIG. 1.

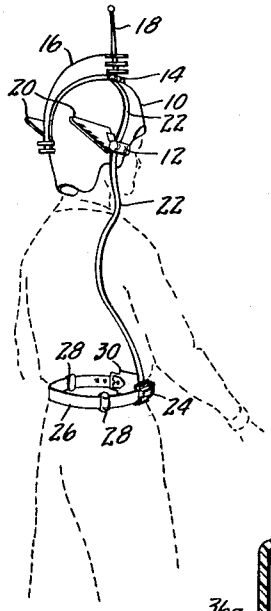


FIG. 2.

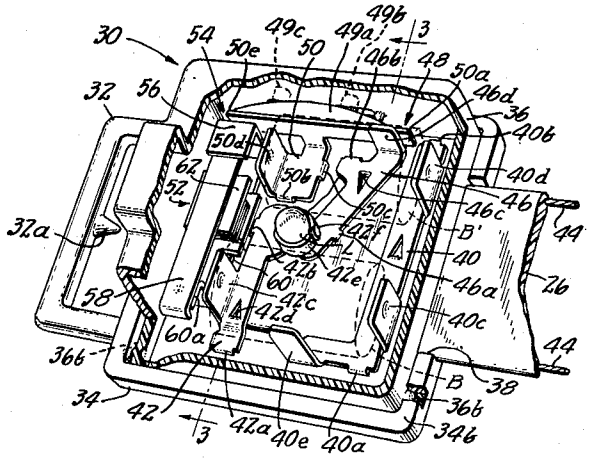


FIG. 3.

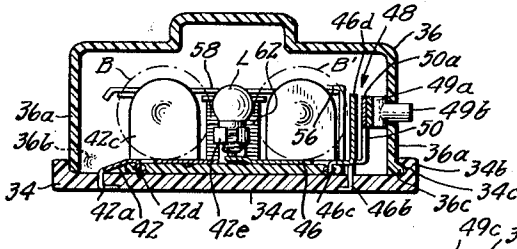


FIG. 4.

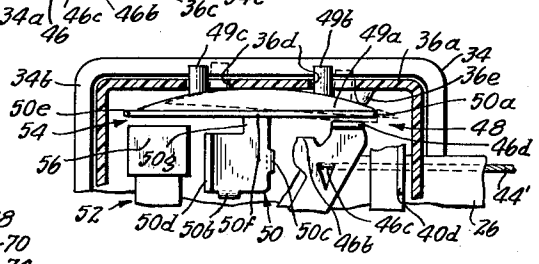


FIG. 5.

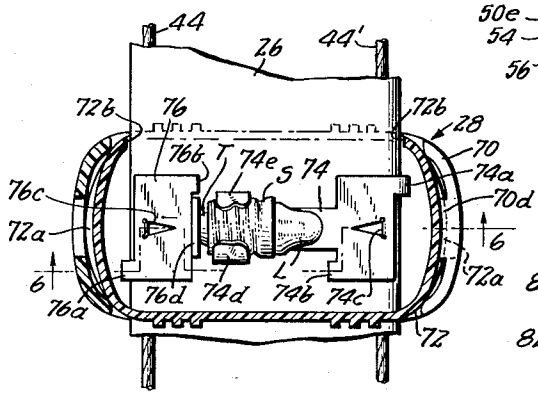


FIG. 6.

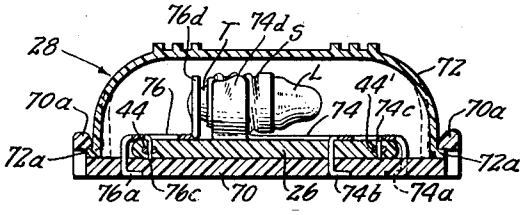
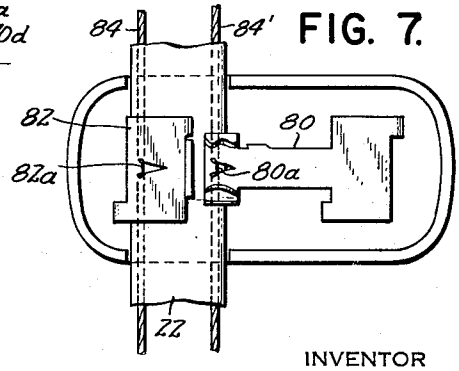


FIG. 7.



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ILLUMINATED APPAREL

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12 Claims. (Cl. 240—59)

The present invention relates to illuminated apparel and particularly to helmets, belts and the like which include one or more electric light bulbs and are provided with suitable battery supplies, so that the wearer will be visible at night, for example, as a traffic safety precaution.

It is among the objects of the present invention to provide illuminated articles of apparel which are so constructed that they may be worn comfortably and conveniently. Another object of the invention is that of providing illuminated articles of apparel which may be constructed inexpensively and yet which are rugged enough to survive the ordinary abuses of wear and handling. Other and further objects of the invention will be in part obvious and in part pointed out hereinafter.

These objects are accomplished according to the present invention by providing wearing apparel containing insulated conductors and having mounted thereon light boxes and battery boxes the electrical terminals of which are formed of unitary sheet metal stampings which are conductively connected to the insulated conductors by means of integral, insulation-piercing prongs. The battery box includes control switches the contacts of which are formed integrally with the electrical terminals.

In the drawings:

Figure 1 is a perspective view of a helmet and belt embodying features of the present invention, with the body of a wearer being partially shown in broken lines to illustrate the relative positions in which these articles are worn;

Figure 2 is a perspective view, at enlarged scale, of the combination belt buckle and battery box of the apparatus;

Figure 3 is a vertical section taken generally along the line 3—3 of Figure 2;

Figure 4 is an enlarged fragmentary sectional view of the portion of the battery box which includes one of the control switches;

Figure 5 is a vertical section through one of the light boxes on the belt of the apparatus;

Figure 6 is a vertical section taken generally along the line 6—6 of Figure 5; and,

Figure 7 is a plan view of one of the light boxes on the helmet of the apparatus, with the cover and the light bulb removed for clarity.

The helmet and belt illustrated are so constructed that they may be worn either together or separately. As shown in Figure 1, the helmet generally comprises a concavo-convex shell or body member **10** which is shaped generally to fit the head of the wearer but may be somewhat larger than the head and provided with an inner, floating network of straps for spacing the helmet from the head to enhance the protection which the helmet affords and to make it more comfortable.

The helmet is provided with three light boxes, including a pair of side light boxes over the ears, one of which boxes may be seen at **12**, and another light box **14** at the top center of the helmet. The light boxes are formed

with removable covers of translucent plastic material so that the electric light bulbs therein, when illuminated, will cause the light boxes to be readily visible at night. For decorative effect, the covers may be colored.

Along the longitudinal center line at the top of the helmet, there is mounted a crest or comb **16** formed of transparent plastic material such as Lucite. The comb **16** projects from the outer surface of the helmet along the medial plane of the helmet, which bisects the top light box **14**. A mast or antenna **18**, also of transparent plastic material, is secured to the comb **16** and projects upwardly therefrom along the medial plane of the helmet, with the axis of the mast passing approximately through the center of the top light box **14**. Thus, when the light box **14** is illuminated, the comb **16** and mast **18** are edge-lighted by it so that their outlines are clearly visible in darkness. Wing-like projections **20** also project from each of the side light boxes **12** with the inner ends of the wings forming the bases of the light boxes. The wings **20** are similarly formed of transparent plastic, and are illuminated by the light bulbs in the boxes **12**, so that their outlines glow visibly in darkness.

Electrical current is supplied to the light bulbs in the light boxes **12** and **14** through a two-conductor electrical cord **22** comprising a flat, flexible strip of insulating material having imbedded therein, in spaced relation, a pair of electrical conductors. This electrical cord **22** extends from the remote side light box, as viewed in the figure, up the remote side of the helmet, through the top light box **14**, down the near side of the helmet, through the other side light box **12** and from thence down to a battery box **24** which is adapted to be worn on a belt around the waist.

The belt shown in the figures includes a flat, flexible strip **26** of insulating material which, like the electrical cord **22**, has imbedded therein, in spaced relation, a pair of electrical conductors, but which is considerably wider and somewhat thicker than the cord **22**, in the fashion of a conventional belt. Secured to the belt are a pair of light boxes **28** containing light bulbs which are conductively connected to the electrical conductors in the strip **26**, as described hereinafter. These light bulbs are supplied current through the conductors by means of batteries contained in a battery box **30** which also serves as the buckle of the belt, being provided with a bail or loop portion **32** which is adapted to receive an end portion of the strip **26** and to engage the same to secure the belt in snug relation about the waist.

Figures 2, 3 and 4 show the details of construction of the combination belt buckle and battery box **30**. As may be seen in these figures, the battery box is formed of insulating material, such as molded plastic, and includes a generally rectangular base **34** and a cover **36** having a skirt **36***a* to give depth to the box, the cover being hingedly secured to the base **34** by means of bosses **36***b* at opposite ends of the skirt **36***a* which are journalled in recesses in the inner edges of a shallow flange **34***b* on the base **34**. The cover is fastened in normally closed position by friction catch means including a latch **36***c* on the skirt **36***a* and a mating recess **34***c* in the flange **34***b*. The resilience of the skirt **36***a* permits the cover to be deformed sufficiently to engage or disengage the latch **36***c* and the recess **34***c*. One end portion of the strip strip **26** extends through an opening **38** (Figure 2) at one end of the battery box and along the floor of the interior of the battery box as shown in Figure 3, for approximately three-fourths of the length of the battery box, and is secured to the battery box by means described hereinafter. The other end portion of the strip **26** is provided with a row of holes to cooperate with an inwardly extending tongue **32***a* (Figure 2) in the bail **32** of the belt

buckle. The bail 32 and tongue 32*a* are molded integrally with the base 34 of the battery box.

A battery contact 40 is secured to the battery box near its right-hand end, as viewed in Figure 2. This battery contact is stamped of a unitary piece of sheet metal such as spring brass or light-gauge, plated steel. It is secured to the battery box by means of prongs 40*a* and 40*b* which are formed at either end of the contact 40 and are driven through the base 34 of the battery box at either side of the strip 26 and are clinched over against the undersurface 34*a* of the battery box.

The contact 40 is provided with integral, upstanding tabs 40*c* and 40*d* which are adapted to engage the opposite end terminals of a pair of dry cell batteries B and B' positioned in side-by-side relation within the battery box as indicated in broken lines in Figures 2 and 3—that is to say, the batteries are oriented in the battery box so that the center pole terminal of one battery contacts one of the two tabs 40*c* or 40*d* while the shell or base terminal of the battery is engaged by the other of these two tabs so that the batteries are effectively connected in electrical series by means of the battery contact 40. The battery contact 40 is additionally provided with an upstanding tab 40*e* which is positioned to engage the outer side of the adjacent battery B and keep the battery in proper position.

Another battery contact 42 is provided near the opposite end of the battery box, the contact 42 being similarly stamped from a unitary piece of sheet metal and being secured to the battery box by prongs 42*a* and 42*b*. The contact 42 has an integral tab 42*c* which projects upwardly in position to engage the adjacent end terminal of the battery B. The spacing between the tab 42*c* of contact 42 and the tab 40*c* of contact 40 is such as to admit between them a standard size dry-cell battery, with the inherent resilience of the sheet metal tabs maintaining a slight pressure on the opposite end terminals of the battery to keep the battery in proper position by frictional engagement and to insure good electrical contact with its end terminals. The contact 42 is electrically connected to one of the two conductors 44 in the strip 26 by means of an integral, sharpened prong or lancing 42*d* which is punched from the contact 42 and which is driven into the insulating strip 26 to make electrical contact with the conductor 44, as shown in Figure 3.

Near the inner end of the battery contact 42 a pair of opposed tab portions of the contact are bent upwardly and around to form generally cylindrically curved clasp members 42*e* and 42*f* which serve as the opposite halves of a socket adapted to grip and make electrical contact with the base shell of a miniature electric light bulb L. The edges of the clasp members 42*e* and 42*f* are deformed slightly in conformity to the contours of the threads on the shell of a conventional screw base light bulb L so that the bulb may be threaded into the socket to achieve and maintain proper positioning of the bulb.

Beneath the clasp members 42*e* and 42*f*, in position to engage the base tip contact of the light bulb L, is one end of a contact member 46 which is secured to the battery box by means of prongs 46*a* and 46*b*. The contact 46 is electrically connected to the other conductor 44' of the strip 26 by means of an integral prong 46*c* which is punched from the contact 46 and pierces the strip 26 to make electrical contact with the conductor 44'. as shown in Figure 3. The contact 46 is also provided with an integral upstanding tab 46*d* which serves as the stationary contact of a single-pole-single-throw, normally open push-button switch generally indicated at 48. Tab 46*d* also engages the outer side of the battery B' and serves to keep it in proper position. The socket for the light bulb L is adapted to engage the inner sides of the batteries B and B' and cooperate with the tabs 40*e* and 46*d* in positioning of the batteries.

The movable contact 50*a* of the switch 48 is provided by a resilient arm integrally formed on a battery contact 50 which is secured to the battery box by means of prongs 50*b* and 50*c*. The contact 50 is also provided with an integral upstanding tab 50*d* which is positioned to engage the adjacent end terminal of the other battery B'.

From the foregoing description, it will be understood that closure of the contacts 46*d* and 50*a* of the switch 48 effectively connects the two batteries B and B' in series across the two conductors 44 and 44' in the strip 26 through a circuit from conductor 44' through contact 46, switch 48, battery contact 50, battery B', battery contact 40, battery B and battery contact 42 to conductor 44. And, since the terminals of the light bulb L are in respective engagement with the contacts 42 and 46, which are in turn respectively connected to the conductors 44 and 44', the closure of switch 48 will also cause current to flow from the batteries B and B' through the light bulb to illuminate it.

The battery box 30 also contains an annunciator or "buzzer," generally indicated at 52, which is actuated under control of a single-pole-single-throw, normally open push-button switch, generally indicated at 54. The buzzer 52 is of conventional construction and includes a fixed contact 56 and a vibratory armature 58 which cooperates therewith, the armature 58 being secured at one end, as by spot welding, to a post 60*a* which extends upwardly from one end of a unitary steel base member 60. The opposite end of the base member 60 extends upwardly to form the core of the solenoid 62 which actuates the vibratory armature 58. One of the ends of the solenoid winding 62 is connected to the armature 58 through the base 60, while the other end of the winding is connected to the battery contact 42. This latter connection is made by the bare wire end, which extends between the undersurface of the contact 42 and the strip 26 therebeneath, as shown in Figure 3.

An integral, resilient arm 50*e* of the battery contact 50 serves as the movable contact of switch 54, while the adjacent fixed contact 56 of buzzer 52 serves as the stationary contact of switch 54. Closure of the switch 54, by depressing the arm 50*e* into conductive engagement with the fixed contact 56, completes a circuit from the series connected batteries B, B' through the battery contact 50, fixed contact 56, armature 58, base member 60, solenoid 62 and battery contact 42. Current from the batteries thus energizes solenoid 62 and causes it to attract armature 58, thereby separating it from fixed contact 56 and breaking the circuit. This de-energizes solenoid 62 and allows the resilient armature 58 to spring back into engagement with the fixed contact 56, again completing the circuit; this cycle is repeated as long as the switch 54 is closed, to keep the armature vibrating rapidly and generate an audible buzzing sound.

The switches 48 and 54 which respectively control the lights L and the buzzer 52 are actuated by means of a dual push button which is shown in detail in Figure 4. This member includes a base portion 49*a* with a relatively flat bottom adapted to engage the outer surfaces of the arms 50*a* and 50*e* of contact 50. The opposite surface of the base portion 49*a* is convexly curved and is adapted to bear against the inner surface of the skirt 36*a* of the cover. Near opposite ends of the base portion 49*a* are a pair of push buttons 49*b* and 49*c* which project through slots 36*d* in the skirt 36*a*. Depressing push button 49*b* closes switch 48 to illuminate the light bulbs L and depressing push button 49*c* closes switch 54 to operate the buzzer 52. Sliding the push button member longitudinally to the position shown in broken lines in Figure 4 causes the inclined surface at one end of the base portion 49*a* to ride over a boss 36*e* at the inner surface of the skirt 36*a* and cam this end of the push button member inwardly, closing switch 48, and holding it closed until the push button member slides back to the position shown in full lines. This allows the light bulbs to be kept illuminated without the necessity of keeping the push button 49 manually depressed.

The portion **50***f* of the contact **50** which is between the arms **50***a* and **50***e* and which adjoins the base portion **50***g* of this contact is relatively stiff and acts as a fulcrum about which the push button member rocks when one of the push buttons **49***b* or **49***c* is depressed. The movement of the push button member to the broken line position to lock its end under the boss **36***e* therefore prevents depressing the push button **49***c*. When the lights have been switched on, the buzzer therefore cannot be operated, a feature of the apparatus which results in protecting the batteries B and B' from overload.

Figures 5 and 6 show the construction of one of the two identical light boxes **28** on the belt **26**. As may be seen in these figures, each of the light boxes includes a base **70** and a translucent cover **72** which is removably secured to the base **70** by means of overhanging flanges **70***a* at opposite ends of the base **70** which engage projecting lips **72***a* formed at the lower edges of the cover **72**. The construction of the cover is such that it may be compressed resiliently, as indicated in broken lines in Figure 6, to allow the lips **72***a* to be inserted under the flanges **70***a*, or removed therefrom. The cover **72** is provided with notches **72***b* (Figure 5) in its lower edges at opposite sides of the cover to admit the strip **26**, which extends through the light box along the outer surface of the base **70**.

A socket for a miniature light bulb L is provided in the light box, said socket comprising a shell contact **74** and a tip contact **76**, each formed of sheet metal such as spring brass or light gauge plated steel. The shell contact **74** is secured to the base **70** by means of prongs **74***a* and **74***b* and the tip contact **76** is secured by means of prongs **76***a* and **76***b*, all of which are driven through the base, as shown in Figure 6, and are clinched over against the undersurface thereof. The prongs **74***b* and **76***b* pass through the strip **26** and thereby serve to secure the light box in position on the belt.

The shell contact **74** is electrically connected to one of the conductors **44'** in the strip **26** by means of an integral prong **74***c* which pierces the strip **26** and engages the conductor **44'**, as shown in Figure 6. The shell contact is provided with opposed integral tabs which are bent to form generally cylindrically curved clasp portions **74***d* and **74***e* adapted to grip and conductively engage the base shell S of the light bulb L. As may be seen in Figure 5, these clasp portions **74***d* and **74***e* are deformed along their edges to engage the threads of the shell S so that the light bulb may be threaded between the clasps to achieve and maintain proper positioning of the light bulb in the socket.

The tip contact **76** is electrically connected to the other conductor **44** in strip **26** by means of an integral prong **76***c* which pierces the strip and makes electrical contact with the conductor **44**. Contact **76** is also provided with an integral upstanding tab **76***d* which is positioned to engage the base tip T of the light bulb L. The light bulb L is thus connected across the conductors **44'** and **44** and, when switch **48** is closed to connect the batteries B in series across these conductors, as previously described, the light bulb L in each of the light boxes **28** will be illuminated and be visible through the translucent covers **72**.

Figure 7 shows the construction of one of the light boxes **12** on the helmet of the apparatus. As may be seen, the light boxes **12** are similar to the light boxes **28**, being provided with a shell contact **80** adapted to make electrical connection between one of the conductors **84'** in electrical cord **22** and the base shell of a miniature light bulb, and a tip contact **82** adapted to make connection between the other conductor **84** in cord **22** and the base tip of the light bulb. These contacts are similar to the corresponding elements **74** and **76** in the light boxes **28**, except for such changes as are necessary to accommodate the narrower electrical cord **22**. For example, the shell contact **80** of each of the light boxes **12** is provided with a prong **80***a* at a different position than the corresponding prong **74***c* of the shell contact **74** of each of the light boxes **28** so as to pierce the cord **22** in proper position to engage the conductor **84'** therein.

The battery box **24** (Figure 1) which supplies electrical current to illuminate the light boxes **12** and **14** on the helmet is generally similar in construction to the battery box **30** previously described except that the light L and the buzzer **52** may be omitted from the battery box **24** if desired. Normally, there will be no interconnection between the electrical circuit of the battery box **24** and helmet on the one hand and that of the battery box **30** and the belt on the other hand. For that reason the battery contacts in the battery box **24** are normally not provided with prongs which make contact with the conductors **44** and **44'** in the belt strip **26**, but instead are provided with prongs which pierce the electrical cord **22** which extends from the helmet and make contact with the conductors **84** and **84'** therein.

It will be appreciated that the apparatus shown and described affords illuminated apparel which, though simple and inexpensive in construction, is rugged and durable. It is also in such form that it may be worn comfortably and conveniently. The construction and design of the apparel is such that it is attractive to children, who will therefore be persuaded to wear it and obtain the safety benefits which it affords.

It will therefore be appreciated that the aforementioned as well as other desirable objects have been achieved. However, it should be emphasized that the particular embodiment of the invention which is described herein is intended as merely illustrative and not as restrictive of the invention.

I claim:

1. An illuminated article of apparel including a flexible strip of insulating material having imbedded therein, in spaced relation, a pair of electrical conductors, a sheet metal shell contact mounted on said strip with an integral prong of said shell contact piercing said strip to make electrical contact with one of said conductors, said shell contact having at least one integral tab portion bent to form a generally cylindrically curved clasp adapted to grip and make electrical contact with the base shell of a miniature electric light bulb, and a sheet metal tip contact mounted on said strip adjacent said shell contact with an integral prong of said tip contact piercing said strip to make electrical contact with the other of said conductors, said tip contact having an integral tab portion bent upwardly in position to engage the base tip of such light bulb.

2. An illuminated article of apparel including a flexible strip of insulating material having imbedded therein, in spaced relation, a pair of electrical conductors, a sheet metal shell contact mounted on said strip with an integral prong of said shell contact piercing said strip to make electrical contact with one of said conductors, said socket contact having a pair of integral tab portions bent upwardly to form opposed, generally cylindrically curved clasp portions adapted to grip and make electrical contact with the base shell of a miniature incandescent light bulb and having portions bent inwardly to engage threads on said shell base contact and hold said light bulb in a predetermined axial position, and a sheet metal tip contact mounted on said strip adjacent said shell contact with an integral prong of said tip contact piercing said strip to make electrical contact with the other of said conductors, said tip contact having an integral tab portion bent upwardly in position to engage the base tip of such light bulb.

3. An illuminated article of apparel including a flexible strip of insulating material having imbedded therein, in spaced relation, a pair of electrical conductors, a battery container secured to said strip, a pair of sheet metal battery contacts mounted on said battery container, with integral portions adapted for electrical connection to the

respective terminals of at least one battery in said battery container and having integral prongs piercing said strip and making contact with the respective conductors therein, and at least one light socket mounted on said strip and having contacts engaging said respective conductors and adapted for electrical connection to the respective contacts of a miniature electric light bulb.

4. An illuminated belt including a flexible strip of insulating material having imbedded therein, in spaced relation, a pair of electrical conductors, a battery container secured near one end of said strip, said battery container having a bail extending therefrom to receive the other end portion of said strip, said bail including means for engaging said strip and for securing said belt about the body, a pair of sheet metal battery contacts mounted on said battery container, with integral portions adapted for electrical connection to the respective terminals of at least one battery in said battery container and having integral prongs piercing said strip and making contact with the respective conductors therein, and at least one light socket mounted on said strip and having contacts engaging said respective conductors and adapted for electrical connection to the respective contacts of a miniature electric light bulb.

5. An illuminated headgear comprising a concavo-convex body member adapted to fit over the head, a flexible strip of insulating material secured to said body member, said strip having imbedded therein, in spaced relation, a pair of electrical conductors, at least one light assembly mounted on said helmet, said light assembly including at least one light socket assembly mounted on said body member, said light socket assembly including a sheet metal shell contact having an integral prong piercing said strip to make electrical contact with one of said conductors and at least one integral tab portion bent to form a generally cylindrically curved clasp adapted to grip and make electrical contact with the base shell of a miniature electric light bulb, and a sheet metal tip contact having an integral prong piercing said strip to make electrical contact with the other of said conductors and an integral tab portion bent upwardly in position to engage the base tip of such light bulb, and a battery container adapted for carrying at a position remote from said body member, said battery container having a pair of sheet metal battery contacts with integral portions adapted for electrical connection to the respective terminals of at least one battery in said battery container and having integral prongs piercing said strip and making contact with the respective conductors therein.

6. An illuminated headgear comprising a concavo-convex body member adapted to fit over the head, a flexible strip of insulating material secured to said body member, said strip having imbedded therein, in spaced relation, a pair of electrical conductors, at least one light assembly mounted on said helmet, said light assembly including at least one light socket assembly mounted on said body member, said light socket assembly including a sheet metal shell contact having an integral prong piercing said strip to make electrical contact with one of said conductors and at least one integral tab portion bent to form a generally cylindrically curved clasp adapted to grip and make electrical contact with the base shell of a miniature electric light bulb, and a sheet metal tip contact having an integral prong piercing said strip to make electrical contact with the other of said conductors and an integral tab portion bent upwardly in position to engage the base tip of such light bulb, at least one decorative member of translucent plastic material attached to said body member with an edge of said decorative member adjacent said light socket whereby said decorative member will be edge-lighted by such light bulb, and a battery container adapted for carrying at a position remote from said body member, said battery container having a pair of sheet metal battery contacts with integral portions adapted for electrical connection to the respective terminals of at least one battery in said battery container and having integral prongs piercing said strip and making contact with the respective conductors therein.

7. In an illuminated article of apparel, a flexible strip of insulating material having imbedded therein, in spaced relation, a pair of electrical conductors, a battery box secured on said strip, said battery box including a base, and a movable cover on said base, a first sheet metal battery contact secured to said base and adapted conductively to engage the opposite end terminals of a pair of dry cell batteries mounted side-by-side in said battery box, second and third sheet metal battery contacts secured to said base and adapted for respective electrical connection to the other terminals of said batteries and each of the latter said contacts having integral prongs piercing said strip and respectively making contact with said conductors.

8. In an illuminated article of apparel, a flexible strip of insulating material having imbedded therein, in spaced relation, a pair of electrical conductors, a battery box secured on said strip, said battery box including a base, and a movable cover on said base, a first sheet metal battery contact secured to said base and adapted conductively to engage the opposite end terminals of a pair of dry cell batteries mounted side-by-side in said battery box, a second sheet metal battery contact secured to said base and adapted for conductive engagement with the other end terminal of one of said batteries and having an integral prong piercing said strip and making contact with one of said conductors, a third sheet metal battery contact secured to said base and adapted for conductive engagement with the other end terminal of the other of said batteries, a pronged member of sheet metal piercing said strip and making contact with the other of said conductors, and switch means adapted for completing an electrical circuit between said third sheet metal battery contact and said pronged member.

9. The invention as claimed in claim 8, wherein said switch means includes an integral upstanding tab on said pronged member, a resilient contact arm conductively connected to said third sheet metal battery contact and extending therefrom to a position adjacent said upstanding tab, and an actuating member arranged to actuate said resilient arm member and cause it to engage said upstanding tab, said actuating member extending through an opening in said battery box whereby said switch means may be manually actuated from outside said battery box.

10. In an illuminated article of apparel, a flexible strip of insulating material having imbedded therein, in spaced relation, a pair of electrical conductors, a battery box secured on said strip, said battery box including a base, and a movable cover on said base, a first sheet metal battery contact secured to said base and adapted conductively to engage the opposite end terminals of a pair of dry cell batteries mounted side-by-side in said battery box, second and third sheet metal battery contacts secured to said base and adapted for respective electrical connection to the other terminals of said batteries and each of the latter said contacts having integral prongs piercing said strip and respectively making contact with said conductors, one of the latter said contacts having thereon at least one integral tab portion bent to form a generally cylindrically curved clasp adapted to grip and make electrical contact with the base shell of a miniature electric light bulb and the other of said contacts having an integral portion positioned adjacent said clasp in position to engage the base tip of such light bulb, and said cover having a translucent portion adjacent the position of such light bulb whereby the illumination of said bulb will be visible from outside said battery box.

11. In an illuminated article of apparel, a flexible strip of insulating material having imbedded therein, in spaced relation, a pair of electrical conductors, a battery box secured on said strip, said battery box including a base,

and a movable cover on said base, a first sheet metal battery contact secured to said base and adapted conductively to engage the opposite end terminals of a pair of dry cell batteries mounted side-by-side in said battery box, a second sheet metal battery contact secured to said base and adapted for conductive engagement with the other end terminal of one of said batteries and having an integral prong piercing said strip and making contact with one of said conductors, a third sheet metal battery contact secured to said base and adapted for conductive engagement with the other end terminal of the other of said batteries, a pronged member of sheet metal piercing said strip and making contact with the other of said conductors, an annunciator in said battery box, said annunciator including a fixed contact, a vibratory armature adapted for engagement with said fixed contact and a solenoid arranged to actuate said armature and connected in series between said armature and said second battery contact, and switch means for selectively completing electrical circuits between said third sheet metal battery contact and said pronged member or said fixed contact, said switch means including integral resilient contact arms extending from said third battery contact in

positions respectively adjacent said pronged member and said fixed contact, and push button means arranged to depress said resilient contact arms into respective engagement with said pronged member and said fixed contact as desired.

12. The invention as claimed in claim 11 wherein said push button means is arranged for rocking movement between two positions at one of which one of said contact arms is engaged with said pronged member and at the other of which the other of said contact arms is engaged with said fixed contact, whereby actuation of said push button means to one of said positions to cause engagement of one of such pairs of contacts tends to prevent simultaneous closure of the other of said pairs of contacts.

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2,523,786	Soreng	Sept. 26, 1950
2,636,067	Gilbert	Apr. 21, 1953