Nov. 7, 1961 M. L. DICKENS ET AL 3,008,038

SHOE WITH ELECTRIC BULB PROVIDING ILLUMINATION

Filed July 29, 1959 2 Sheets-Sheet 1

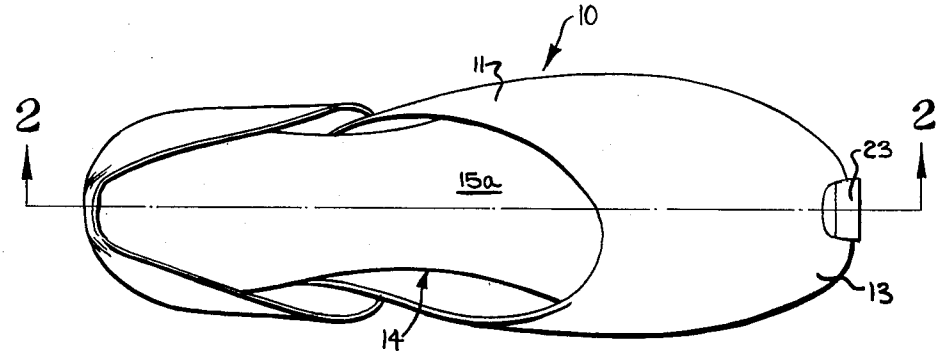


FIG- 1

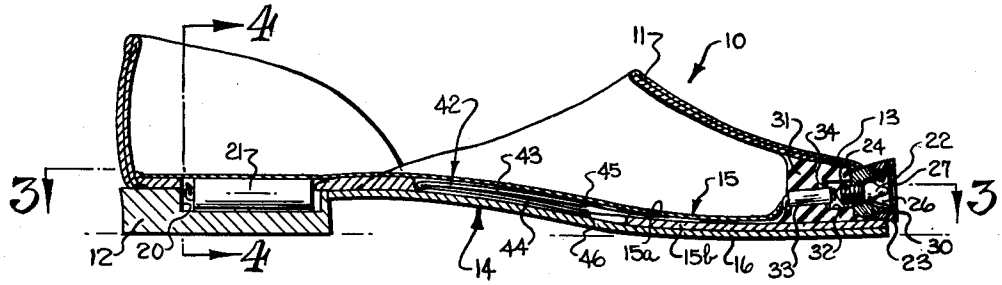


FIG- 2

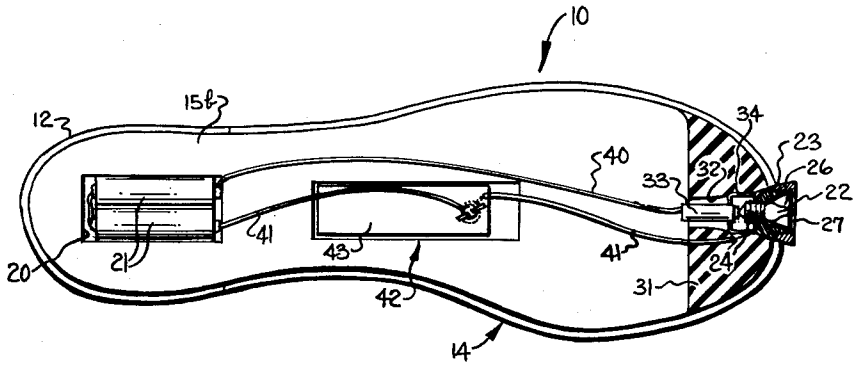


FIG- 3

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SHOE WITH ELECTRIC BULB PROVIDING ILLUMINATION

Filed July 29, 1959 2 Sheets-Sheet 2

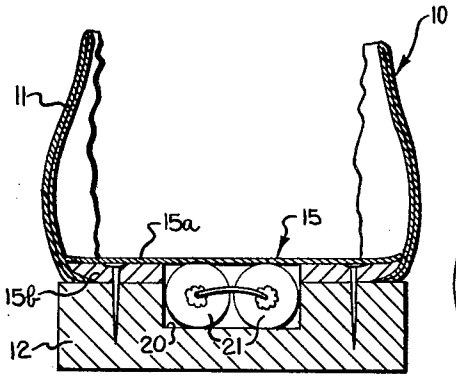


FIG. 4

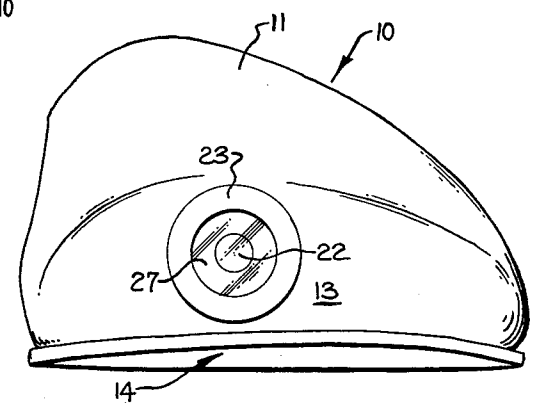


FIG. 5

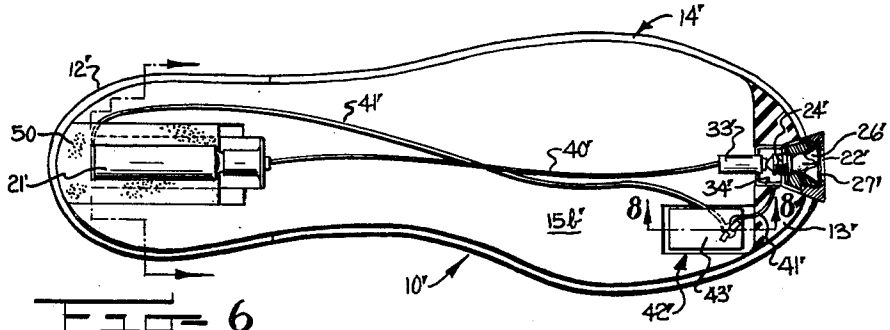


FIG. 6

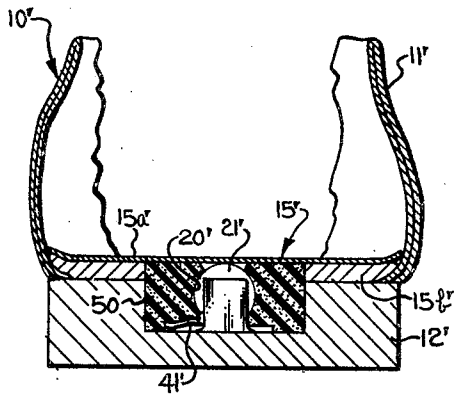


FIG. 7

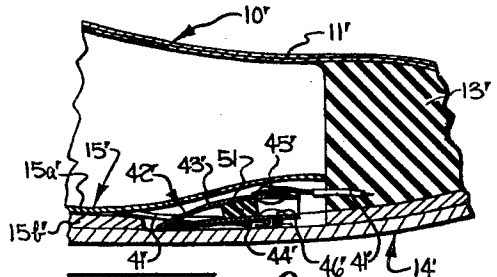


FIG. 8

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3,008,038

SHOE WITH ELECTRIC BULB PROVIDING ILLUMINATION

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1 Claim. (Cl. 240—6.4)

This invention relates to improvements in a shoe of the type having a light thereon, and more particularly to novel means for lighting the electric lamp or bulb mounted on the shoe.

A person is often required to walk in darkness or in dimly lighted areas where it is difficult to see clearly—one such frequently occurring instance being the necessity for a person to move through a room in a building, such as a residence, at nightime when the room is dark and a light switch is not within reach. Under such conditions, furniture and other objects are likely to be unseen and could cause serious personal injuries if stumbled against or fallen over while the person gropes around in the darkness.

It has been heretofore proposed to provide a source of illumination on a shoe which can be worn to overcome the difficulties above described, wherein the illumination is controlled by a manually operated switch disposed on the exterior of the shoe. The manually operated switch, when so located, is exposed to foreign matter which exhibits a corrosive action on the switch contacts eventually preventing a good electrical connection therebetween upon closing the switch. Corrosion of the switch contacts results in the failure of the switch to complete an electrical circuit in which the electric bulb is disposed with a consequent failure of the bulb to become lighted or illuminated. Components of the electrical circuit such as the switch and wire conductors, are often exposed to view in conventional structures incorporating a light on a shoe and detract from the appearance of the shoe. Prior efforts to conceal the switch and wires with decorative material, although preventing the unsightly appearance of exposed circuit elements, have not prevented the entrance of foreign matter around the switch and between its contacts which may eventually cause malfunction of the switch due to corrosion of its contacts.

The wearer of such a shoe is also required to open and close the manually operated switch for illuminating the bulb by hand. Ordinarily, the manually operated switch is disposed in a relatively inaccessible location on the shoe so that its unsightly appearance will not be readily visible. In such instances, the manipulation of the switch by hand between open and closed positions is bothersome.

A shoe with a light or lights thereon is also useful in creating an unusual lighting effect for a dance routine so as to make an audience more appreciative of the talents of the dancer. A dancing shoe having an electric bulb thereon and a push-button switch in the heel thereof for allowing the pressure of the heel on the floor or ground to close the switch for lighting the bulb is known. In the latter instance, the push-button switch automatically opens upon lifting the heel of the shoe from the floor as the dancer goes through the steps in his routine, the result being an intermittent flashing of the light on the shoe producing an unusual and pleasing effect. In a shoe of this type the wearer has little control over the illumination of the bulb on the shoe, since the illumination necessarily ceases when the shoe is lifted from the floor.

It will be understood that a shoe providing intermittent illumination is principally, perhaps exclusively, for use as a dancing shoe to produce unusual lighting effects. Such a shoe does not give a continuous source of light which would enable its wearer to walk safely in darkness or in dimly lighted surroundings.

It is an object of this invention to provide an improvement in a shoe of the type having a bulb thereon for providing illumination wherein the illumination of the bulb is controlled by a circuit breaker in the electrical circuit in which the bulb is connected, the circuit breaker comprising a switch disposed within the shoe and operable in response to the pressure of a foot in the shoe thereagainst. The illumination of the bulb on the shoe may be either continuous or intermittent depending upon the location of the switch within the shoe, thus affording the wearer safety in walking along unlighted areas while allowing the desirable "flashing" effect to be created when the shoe is used for dancing purposes.

It is another object of this invention to provide an improvement in a shoe of the type having a bulb thereon for providing illumination, wherein the bulb is connected in an electrical circuit having a circuit breaker disposed therein, the circuit breaker comprising switch means located in the inner sole of the shoe at a position so as to underlie the great toe of the wearer's foot in the shoe, and the switch being operable in response to the pressure of the great toe thereagainst to close the circuit and illuminate the bulb. In this manner, the wearer of the shoe can either impose continuous pressure on the switch from his great toe to provide a constant source of light, or may alternately relieve and replace the pressure of his great toe thereagainst so as to intermittently illuminate the electric bulb.

It is a more specific object of this invention to provide an improved means of illuminating an electric lamp or bulb on a shoe wherein the bulb is connected in an electrical circuit having a circuit breaker disposed therein, the circuit breaker comprising switch means located in the inner sole of the shoe and including upper and lower plates resiliently hinged together at one end thereof, and the other ends of the plates being spaced apart and carrying opposed electrical contacts thereon so as to render the switch means operable in response to the pressure of a foot within the shoe against the upper plate, forcing it downwardly toward the lower plate to cause engagement between the contacts for completing the circuit and illuminating the bulb.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawings, in which—

FIGURE 1 is a top plan view of a shoe having an electric lamp or bulb installed thereon for illumination purposes in accordance with the present invention;

FIGURE 2 is a longitudinal vertical sectional view taken along the line 2—2 in FIGURE 1;

FIGURE 3 is a longitudinal horizontal sectional view taken along the line 3—3 in FIGURE 2;

FIGURE 4 is an enlarged fragmentary transverse vertical sectional view taken along the line 4—4 in FIGURE 2;

FIGURE 5 is an enlarged front elevational view of the shoe illustrated in FIGURE 1;

FIGURE 6 is an longitudinal horizontal sectional view similar to that shown in FIGURE 3, but illustrating a modified form of the means for illuminating the electric lamp or bulb on the shoe;

FIGURE 7 is an enlarged fragmentary vertical sectional view taken along the line 7—7 in FIGURE 6; and

FIGURE 8 is an enlarged fragmentary vertical sectional view taken along the line 8—8 in FIGURE 6.

Referring more specifically to FIGURES 1–5, inclusive, of the drawings, there is disclosed a shoe 10, which is shown in the form of a bedroom slipper for purposes of illustration, although it is contemplated that the invention

may be embodied in a shoe of any desired type. The shoe 10 comprises an upper shell 11, a heel 12, a toe 13, and a sole 14.

The sole portion 14 is formed of a plurality of layers, there being an inner sole 15 comprised of an upper layer 15*a* and a lower layer 15*b* and an outer sole 16.

A cavity 20 is formed by an elongated recess in the heel portion 12 and a cut-out portion in the lower layer 15*b* of the inner sole 15 in alinement with the recess, the upper layer 15*a* of the inner sole 15 serving as a closure for the cavity 20. Within the cavity 20, there is housed a source of electrical energy in the form of a pair of electric cells or dry batteries 21. The cells 21 provide electrical energy for an electric bulb or lamp 22 which is mounted in the toe 13 of the shoe 10 in a manner to be presently described.

As best shown in FIGURES 2 and 3, the toe 13 of the shoe 10 is suitably apertured to receive a lamp socket 23 comprising a two-piece housing threadably secured together and having a bore therethrough, the bore being provided with a rear threaded portion for engagement with the threaded base 24 of the bulb 22 and a tapered outwardly diverging portion for reception of a conical reflector member 26. A shock resistant transparent disk or shield 27 covers the forward end of the bore in the lamp socket 23, the disk 27 being held in place between the forward end of the reflector 26 and an overhanging flange 30 provided on the housing of the lamp socket 23. It will be observed that the central axis of the bulb 22 is disposed in substantially parallel relationship with respect to the surface on which the shoe 10 is placed, thus affording a beam of light extending directly ahead of the shoe 10 to best illuminate the area forwardly of the shoe 10 upon energization of the bulb 22 as will be presently described.

A mass or block 31 of resilient material, such as rubber or the like, is positioned within the shoe 10 in the toe portion 13 thereof, the block 31 being suitably contoured to correspond to the shape of the toe 13 and forming a protective guard for a foot within the shoe 10 against injury from protruding portions of the threaded lamp base 24. In addition, the resilient block 31 provides a shock-absorption means for the electric bulb 22 and the socket 23 in which it is installed for protection against damage from obstacles which strike thereagainst in the course of normal usage of the shoe 10.

It will be noted that the forward end of the resilient block 31 is provided with a recess or slot 32 which receives the threaded base 24 of the bulb 22. An electrically conductive plug 33 is embedded in the resilient block 31 and protrudes into the slot 32 formed therein. The plug 33 is adapted to abut the rear end of the threaded base 24 of the bulb 22 upon threading the bulb 22 into the socket 23. A substantially U-shaped bracket 34 is secured to the rear end of the lamp socket 23 at its open end, while its rear end is suitably apertured to receive the plug 33 therethrough, it being noted that the U-shaped bracket 34 bounds the bottom wall and side walls defining the slot 32 in the resilient block 31.

The electric cells 21 are connected to the electric bulb or lamp 22 by an electrical circuit, such circuit comprising an electrical conductor or wire 40 which extends from the plug 33 in abutment with the bulb 22 to the terminal of one cell 21, the casing of which is electrically connected to the terminal of the other cell 21. An electrical conductor or wire 41 is connected at one end to the casing of the other cell 21 and is secured at its opposite end to the U-shaped bracket 34 which serves as a ground connection to complete the circuit.

The illumination of the bulb 22 provided by electrical energy from the cells 21 is controlled by a circuit breaker comprising switch means 42 disposed in the wire 41 and forming a break therein so as to interrupt the electrical circuit. The switch means 42 is disposed in a cut-out portion formed in the lower layer 15*b* of the inner sole 15 and comprises a unitary actuator member having an upper plate 43 and a lower plate 44 which are resiliently hinged together at their rear ends. The forward ends of the upper and lower plates 43, 44 are spaced apart under normal unstressed conditions and carry opposed electrical contacts 45, 46 respectively. The contact 45 is electrically connected to the adjacent terminal end of one segment comprising wire 41, while the contact 46 is electrically connected to the adjacent terminal end of the other segment comprising wire 41. The plates 43 and 44 are preferably formed from resilient, flexible non-conductive material and insure that the electrical circuit through the bulb 22 will not be completed in the absence of engagement between the contacts 45, 46.

Upon the insertion of a foot within the shoe 10, the pressure of the foot on the upper plate 43 through the upper layer 15*a* of the inner sole 15 causes the upper plate 43 to be moved downwardly toward the lower plate 44 for engaging the contacts 45, 46 carried thereby to complete the electrical circuit by bridging the gap between the segments comprising wire 41. Upon completion of the electrical circuit, the bulb 22 is supplied with electrical energy from the cells 21 and is illuminated. It will be understood that the foot inserted within the shoe 10 is of a proper size to be received therein for exerting downward compressive force on the upper plate 43 so as to complete the circuit in the manner described.

The wires 40, 41, the electric cells 21 and the circuit breaker or switch means 42 are hidden from view beneath the upper layer 15*a* of the inner sole 15 of the shoe 10, thereby preventing the entrance of foreign matter around the switch means 42 and eliminating the corrosive action on the contacts 45, 46 caused by such foreign matter which could otherwise result in the malfunction of the electrical circuit. Moreover, no unsightly components of the electrical circuit are exposed to detract from the appearance of the shoe 10.

In the form of the invention illustrated in FIGURES 1–5, inclusive, the switch 42 is positioned at an intermediate location on the sole 14, being spaced substantially equidistant of the sides of shoe 10 so as to lie beneath the arch of a foot inserted in the shoe 10. The closing of switch 42 effected by the pressure of a foot against the upper plate 43 thereof provides a constant source of illumination from the bulb 22, the illumination of the bulb 22 ceasing only when the foot is withdrawn from the shoe 10 or otherwise no longer exerts a downward pressure on the upper plate 43 of the switch 42. It will be understood that the resiliency and the flexibility of the hinged connection between the upper and lower plates 43, 44 permit the upper plate 43 to spring back to its original unstressed state, wherein the contact 45 carried thereby is spaced apart from the contact 46 carried by the lower plate 44, upon the downward compressive force of the foot being removed therefrom. When this happens, the electrical circuit is interrupted and the illumination from the bulb 22 ceases until the circuit is again completed by closing the switch 42 in the manner previously described.

The modified form of the invention illustrated in FIGURES 6–8, inclusive, is basically similar to the form of the invention illustrated in FIGURES 1–5, inclusive, and corresponding elements thereof shall bear the same reference characters with the prime notation added. Hence, only those features in FIGURES 6–8, inclusive, which necessarily require description will be set forth to avoid undue repetitious matter. Thus, FIGURES 6 and 7 show an electrical circuit including a single electric cell or dry battery 21′ for providing electrical energy to the electric bulb 22′, the cell 21′ being encased or embedded in a resilient jacket 50 filling the cavity 20′. The electrical circuit through the bulb 22′ may be traced accordingly. Wire 40′ is connected at one end to the plug 33′ which is in abutment with the threaded base 24′ of the bulb 22′, the opposite end of wire 40′ being connected to the ter-

minal of cell 21'. Electrical conductor or wire 41' extends from the casing of the cell 21' to the U-shaped bracket 34' which serves as the ground connection to complete the circuit.

A circuit breaker or switch means 42' is disposed in the wire 41' forming a break therein whenever the switch means 42' is in open position. As seen in FIGURE 8, the switch means 42' is provided with a resilient buffer element 51 of suitable non-conductive material, such as rubber, interposed between the upper and lower plates 43', 44' of the switch 42' to insure that the contacts 45', 46' carried by these two plates respectively are spaced apart when the switch 42' assumes its normal unstressed position. The pressure of a foot inserted in shoe 10' against the upper plate 43' forces the upper plate 43' downwardly toward the lower plate 44' while compressing the resilient buffer element 51 until the contacts 45', 46' are in engagement to complete the electrical circuit and illuminate the bulb 22'.

It will be observed that the switch 42' is disposed in a cut-out portion of the lower layer 15*b*' of the inner sole 15', the switch 42' being located adjacent the toe 13' of the shoe 10' and one side edge of the shoe 10' so as to lie beneath the great toe of a foot inserted in the shoe 10'. In this instance, the outer layer 15*a*' of the inner sole 15' is raised somewhat in the area overlying the switch 42' to acquaint the wearer of the shoe 10' as to the exact location and presence of the switch 42' beneath the great toe of his foot.

It has been determined that a person can exercise control over his great toe independently of the remaining toes on the foot even though the foot is within a shoe and may alternately press the great toe downwardly or release such presssure, according to his own desires. Thus, in the form of the invention illustrated in FIGURES 6–8, inclusive, the illumination of the bulb 22' may be controlled by the wearer of the shoe 10' who may press downwardly with his great toe so as to exert pressure on the upper plate 43' to force the upper plate 43' toward the lower plate 44' for engaging the contacts 45', 46' to complete the electrical circuit and illuminate the bulb 22'. The wearer may intermittently illuminate the bulb 22' or maintain constant illumination thereof in accordance with his own wishes by controlling the switch 42' through the use of his great toe.

When the downward pressure on the upper plate 43' is relieved, the resilient buffer element 51 expands to its normal size, causing the upper plate 43' to be retracted away from the lower plate 44' to break the engagement between the contacts 45', 46', whereupon the illumination of the electric bulb 22' ceases. It will be understood that the switch means 42 of the form of the invention illustrated in FIGURES 1–5, inclusive, may utilize a buffer element therewith. In like manner, the upper and lower plates 43', 44' of the switch means 42' for the form of the invention illustrated in FIGURES 6–8, inclusive, may depend upon the inherent flexibility and resiliency of the hinged connection therebetween in the absence of the buffer element 51 to break the engagement between the contacts 45', 46' when the downward pressure on the upper plate 43' is relieved.

We have disclosed improvements in providing a source of illumination from a shoe wherein an electric bulb mounted on the shoe is illuminated in response to the insertion of a foot within the shoe, the foot serving as an actuating means to close a switch for completing an electrical circuit in which the electric bulb is disposed. Illumination emanating from the bulb in the shoe promotes safety in walking along dark areas or in dimly lighted surroundings, thus substantially decreasing the possibility that the wearer of the shoe may stumble or fall over an obstacle or into a hole which could cause serious injury. Moreover, the shoe with the illuminated bulb is suitable for use in dance routines to provide unusual lighting effects for increasing an audience's enjoyment of the dance. It will also be understood that an electric device of any suitable character, such as a noise-maker, could be substituted for the electric bulb and operated in the same manner to provide a different form of novelty shoe.

In the drawings and specification there have been set forth preferred embodiments of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claim.

We claim:

In a shoe having heel, outer sole, inner sole and toe portions, said heel portion having a horizontally extending elongate recess therein, said inner sole portion having a downwardly opening recess adjacent the toe portion and in a position to underlie the great toe of a foot inserted in the shoe, at least one electric cell seated within the recess in said heel portion, an exposed electric bulb for providing illumination seated in said toe portion, an electrical circuit connecting said cell and said bulb, a circuit breaker seated in the recess in said inner sole portion and connected in said circuit for controlling the illumination of said bulb, said circuit breaker comprising pressure-sensitive switch means having substantially horizontally extending upper and lower non-conductive plates resiliently hinged together at one end thereof, a resilient non-conductive buffer element disposed between said upper and lower plates to normally maintain said plates in spaced apart relationship, opposed electrical contacts mounted on the other ends of said plates respectively, said contacts being connected in said circuit and separated from each other by said buffer element to form a break in said circuit, portions of said inner sole portion completely covering both the recess in the heel portion and the recess in the inner sole portion, said outer sole extending beneath said switch means and closing said cut-out recess in the inner sole portion and said heel portion extending beneath said electric cell and closing the recess in the heel portion, the covering portions of said inner sole portion, said outer sole and said heel portion cooperating with said recesses to define fully enclosed switch and electric cell receiving chambers to prevent the introduction of foreign matter around said switch means and said electric cell, and said switch means being selectively operable in response to controlled movement of the great toe thereagainst pressing the other end of said upper plate toward the other end of said lower plate against the action of said buffer element for engaging said contacts to close said circuit for illuminating said bulb.

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