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[54] **ALTERNATE LIGHT LIGHTING FIXTURE**

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[51] **Int. Cl.** **H02j 1/00**

[58] **Field of Search**.....315/86, 88, 93; 307/38, 157

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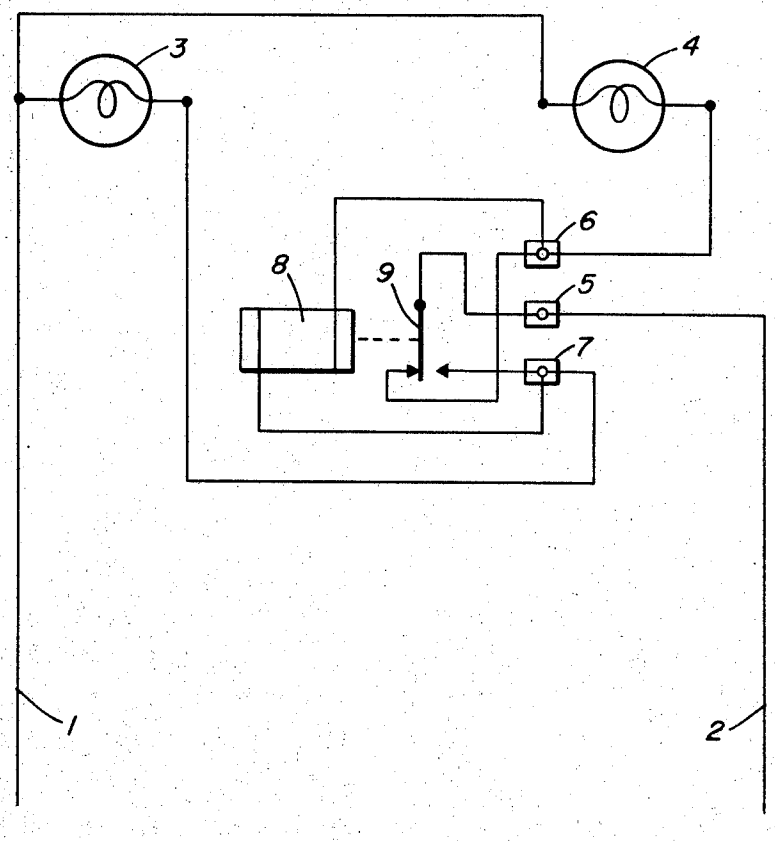
Primary Examiner—L. T. Hix

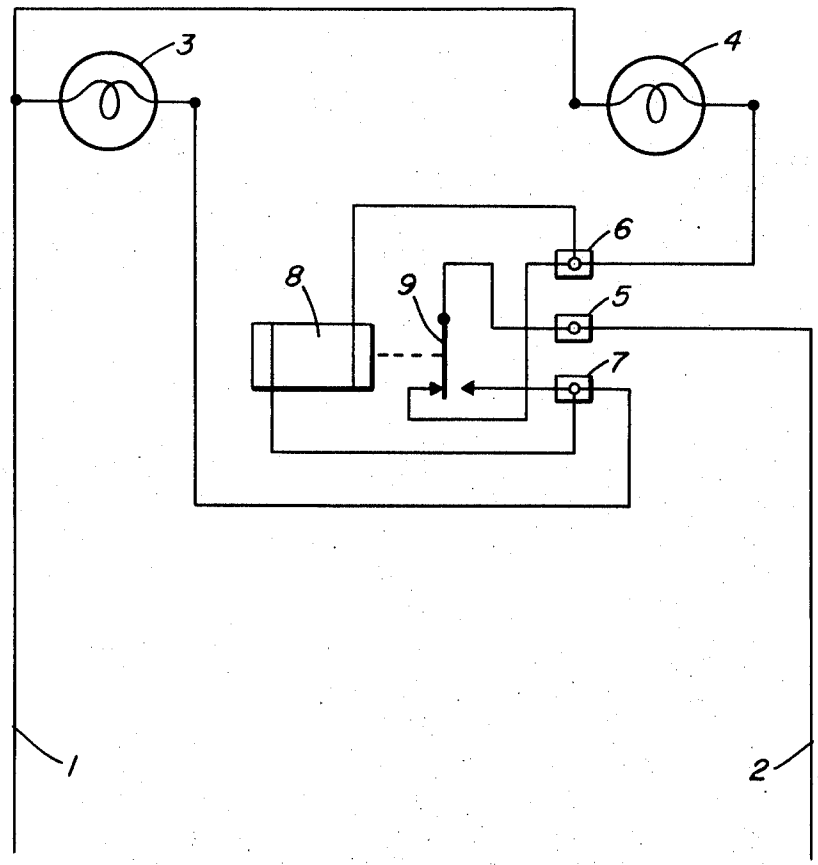
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[57] **ABSTRACT**

A primary lamp and a spare standby lamp are interconnected in parallel with a source of electrical energy through an automatic lamp changing device in order to provide illumination from the standby lamp should there be burn out of the primary lamp. Lamp change-over operation is effected by momentarily switching off the lamp energizing circuit following burn out of the primary lamp and involves a single relay device connected in series with the standby lamp to maintain the same energized in a circuit parallel to that of the primary lamp when operating.

2 Claims, 1 Drawing Figure




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ALTERNATE LIGHT LIGHTING FIXTURE

This invention relates to a lamp change-over device wherein illumination is provided by a standby lamp bulb whenever a primary lamp bulb burns out to thereby reduce the frequency of manual replacement of the burnt out lamp bulb.

Automatic lamp changing devices achieving the general purposes of the present invention, are well known. All of such lamp changing devices involve the switching of the power source from the primary lamp to the standby lamp in response to burn out or failure of the primary lamp. Relay devices and associated switching mechanism are accordingly associated with such prior lamp changing devices. Such prior lamp changing devices are however usually relatively complex or involve power consuming relay components connected in series with the lamps to thereby reduce the energy available for energizing the lamps and producing illumination. It is therefore an important object of the present invention to provide a lamp changing device which will automatically turn on an alternate light in a new and useful manner.

In accordance with the present invention, an electrical power supply is connected through a relay switch to a pair of lamps. The relay switch is actuated from a position engaging a normally closed relay contact by energization of a relay coil into engagement with a normally open relay contact. In the position of the relay switch engaging the normally closed contact, the standby lamp is momentarily energized when power is supplied to the circuit in parallel with a relay energizing circuit which includes the relay coil in series with the primary lamp connected across the power supply by the relay switch. The relay switch is accordingly actuated so as to transfer power to the normally open contact of the relay device to thereby complete a relay holding circuit through the relay coil in series with the standby lamp and at the same time connecting the primary lamp across the power supply in bypass relation to the relay coil. The primary lamp as well as the relay coil are thereby maintained energized as long as the primary lamp is in operation. Thus, when the primary lamp burns out, the relay energizing circuit is interrupted by momentary interruption of the power supply. The energization of the relay device will then transfer power to the standby lamp while re-energization of the relay coil will be prevented in view of the burn out of the primary lamp.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawing forming a part hereof, wherein like numerals refer to like parts throughout.

Referring now to the drawing in detail, a suitable power supply is connected to the lamp changing system of the present invention through power lines **1** and **2** respectively extending from two power supply terminals. Power line **1** is connected to both a primary lamp **3** and a spare standby lamp **4** which may be of the incandescent filament type as shown in the drawing. Power line **2** on the other hand is connected to a single pole, double throw relay switch **9** associated with a relay device having a switch actuating relay solenoid or coil **8.** Also associated with the relay device, is a normally closed contact **6** connected to one terminal of the standby lamp **4** opposite the terminal to which the power line **1** is connected, and a normally open relay contact **7** connected to the other terminal of the primary lamp **3** opposite the terminal to which the power line **1** is connected. The normally open contact **7** is also connected to one terminal of the relay coil **8,** the other terminal of which is connected to the normally closed relay contact **6** as shown in the drawing.

In operation, when power is supplied to the power lines **1** and **2** upon closing of an on-off switch (not shown), an energizing circuit is momentarily established through the standby lamp **4** in series with the relay switch **9** and normally closed contact **6.** A parallel, relay energizing circuit is also then established through the relay coil **8** in series with the primary lamp **3** resulting in energization of the relay coil **8** and actuation of the relay switch **9.** when relay switch **9** is actuated, power is disconnected from the standby lamp and a relay holding circuit established through the normally open relay contact **7** by connecting the relay coil **8** in series with the standby lamp **4** across the power supply through the power lines **1** and **2.** At the same time, a lamp energizing circuit is completed by the relay switch **9** and normally open contact **7** through the primary lamp **3** in bypass relation to the relay coil **8.** Thus, the primary lamp **3** will be energized by means of a circuit that does not include the relay coil in series therewith, the relay coil being maintained energized however through a relay energizing circuit involving the standby lamp **4** in series with the relay coil. The primary lamp **3** is therefore maintained energized for producing illumination without any voltage reducing load in series therewith as long as the standby lamp filament is intact since it is in the circuit maintaining the relay coil energized. If any open circuit occurs in the standby lamp, the relay coil **8** will be de-energized thereby also de-energizing the primary lamp. On the other hand, should there be any burn out of the primary lamp **3,** it will also be extinguished. Assuming that the standby lamp is intact when burn out of the primary lamp occurs, the power supply is momentarily disconnected from the circuit in order to effect de-energization of the relay coil **8.** When the power supply is connected once again to the power lines **1** and **2,** the relay coil **8** will not be energized because its circuit will be held open by the burnt out primary lamp **3.** The standby lamp will therefore be maintained energized through the relay switch **9** engaging the normally closed contact **6.**

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

I claim:

1. In combination with a source of electrical energy and a pair of lamps alternatively energized by said source for providing illumination, automatic lamp changing means comprising a relay device having a relay coil, a relay switch actuated in response to energization of the relay coil, a normally closed contact engaged by the relay switch and a normally open contact engageable by the relay switch when actuated, a relay energizing circuit connecting said relay coil to the source in series with one of the lamps through the normally closed contact and the relay switch in engage-

ment therewith, a lamp energizing circuit connecting said one of the lamps to the source in by-pass relation to the relay coil through the normally open contact and the actuated relay switch in engagement therewith, and standby circuit means connecting the other of the lamps to the source in parallel with the relay and lamp energizing circuits through the relay switch for alternatively maintaining the relay coil and the other of the lamps energized whereby the other of the lamps is maintained energized in response to de-energization of the relay coil following burn out of said one of the lamps.

2. The combination of claim **1** wherein said other of the lamps is connected in series with the relay coil to the source by the standby circuit means to maintain the relay coil energized, the relay coil being initially energized through the relay energizing circuit opened in response to actuation of the relay switch.

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