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2,631,040

ARTIFICIAL FIREPLACE LIGHTING SYSTEM

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FIG. 1.

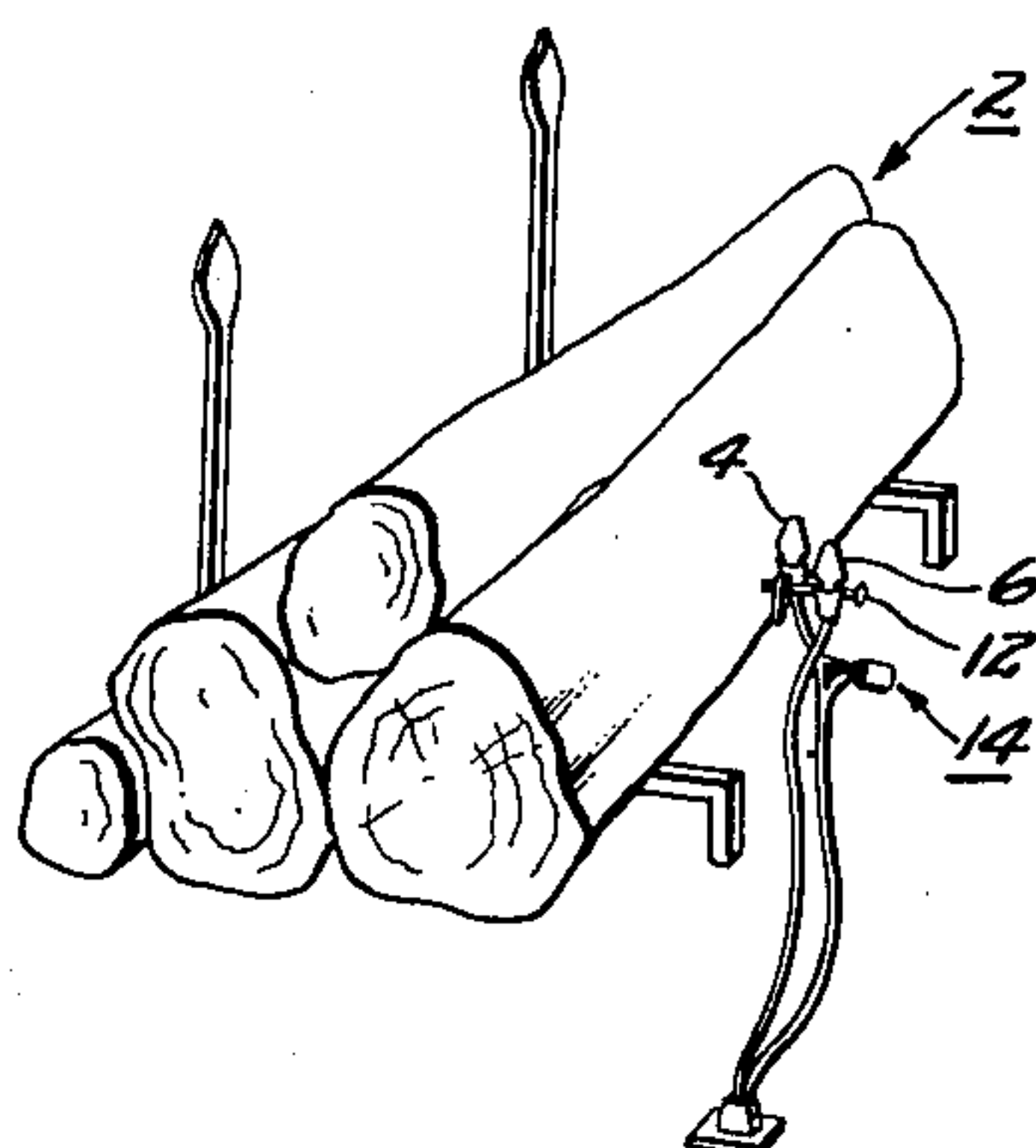
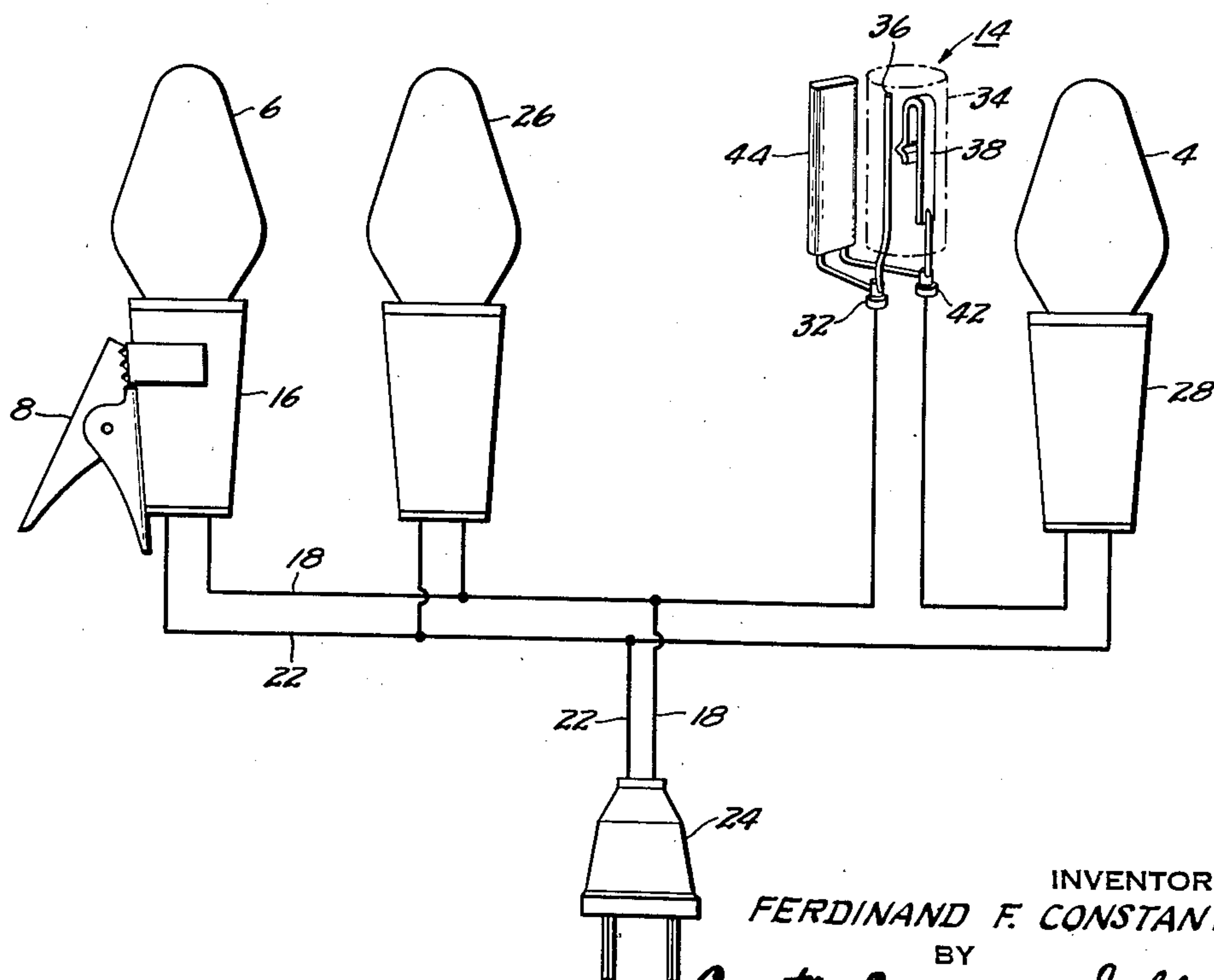


FIG. 2.



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## UNITED STATES PATENT OFFICE

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## ARTIFICIAL FIREPLACE LIGHTING SYSTEM

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2 Claims. (Cl. 272-8)

1

This invention relates to the limitation of fire in a natural or artificial fireplace.

Various arrangements have been used for creating the illusion that a fire is actually burning in an artificial fireplace. Most of these arrangements have been relatively unsuccessful and the resulting appearance gives little suggestion of a fireplace flame. For example, various brightly colored rotating structures have been provided, but in general they provide a gradually changing appearance and fail completely to provide any simulation of the random flickering of a fireplace flame. The various proposed arrangements in many instances have been complex and therefore expensive to manufacture, and in other instances have been so delicate as to require extreme care in handling.

The present invention provides a lighting system for artificial fireplaces which, to a large extent, overcomes the above disadvantages and provides a random flickering illumination remarkably similar to the light given off by an actual flame. This invention contemplates the use of a first source of substantially continuous colored light augmented by a second light source which may be of the same color or a different color which, at random intervals, increases and decreases in intensity to provide a continually varying intensity of illumination. This flickering effect is obtained by using an impedance control device in series with the continually varying light source which opens and closes an electrical circuit at random intervals. A glow switch of the type ordinarily used for starting fluorescent lamps is well suited for this purpose and provides a compact, reliable, low-cost interrupter, that permits the lamp to glow at all times, but changes the intensity of illumination at random intervals.

Other features and objects of the invention will be apparent from the following description considered in conjunction with the accompanying drawings in which:

Figure 1 is a perspective view of a portion of the interior of a fireplace showing the arrangement of the light source; and

Figure 2 is a schematic diagram showing the electrical circuit of the apparatus.

In one method of use, logs 2, real or artificial, are placed on the andirons in the usual manner. Two incandescent electric lamps 4 and 6 are secured to the rear of one of the logs, for example, by means of clamps such as are shown at 8 in Figure 2 of the drawings, which are secured to a nail or other suitable support.

2

The lamps 4 and 6 may be orange or red in color, and may be of the same or different colors. The lamp 4 is secured at a position nearest the logs and is connected in series with a circuit interrupter, generally indicated at 14, which causes this lamp to flicker, in an irregular manner. The lamp 6 is connected to the electrical circuits so that it is illuminated steadily. Ordinary 115 volt lamps such as are ordinarily used for Christmas tree decorations have been found well suited for this purpose.

The colored lamp 6 is supported by a conventional socket 16, which also may be of the type used for Christmas tree lights, and is connected through two leads 18 and 22 to a conventional plug 24 which, in turn, is connected to conventional alternate or direct current power mains (not shown).

This circuit diagram also shows another lamp 26 similar to lamp 4 and connected in parallel therewith. Either a single continuously burning lamp, as shown in Figure 1, or two or more continuously burning lamps, as illustrated by Figure 2, may be used depending upon the particular effects desired.

The lead 22 is connected also through a socket 28 to one terminal of the lamp 4. The other lead 18 is connected to a terminal 32 of the glow switch 14. This glow switch comprises a hermetically-sealed glass envelope 34 which contains an ionizable gas, such as argon or helium, or a mixture of such gases. Two normally spaced electrodes 36 and 38 are mounted within the envelope and connected respectively to terminals 32 and 42. The electrode 36, for example, may be in the form of a metal rod, of nickel or other suitable material, and the electrode 38 comprises a bi-metallic strip formed of two strips of metal having different coefficients of linear expansion and securely welded together. The inner strip has a greater coefficient of expansion than the outer strip, so that as the temperature is increased the free end of the electrode 38 moves toward the electrode 36, and moves away from the electrode 36 with decreasing temperature. Such glow switches are widely used for starting fluorescent lights and may be incorporated in the arrangement described herein.

A condenser 44 is connected across terminals 38 and 42 to suppress radio interference. The terminal 42 of the glow switch 14 is connected through the socket 28 to the other terminal of lamp 4.

In operation, when a suitable voltage, for example, 115 volts A. C., is applied to the leads 22



3

and 18, the lamps 6 and 26 are energized and glow continuously. The gas in the envelope 34 is ionized by the voltage appearing between electrodes 36 and 38, allowing a small amount of current to flow through the lamp 4 and causing it to glow at low intensity. This current through the interrupter 14 causes the electrode 38 to become heated so that the end of the electrode 38 moves toward electrode 36 and makes contact with it to complete the circuit through lamp 4 and cause it to glow at full brilliancy. As soon as the contact between electrodes 36 and 38 is completed, the electrode 38 cools off because the gas has been de-ionized and the resistance of electrode 38 is relatively small. The end of electrode 38 then moves away from the electrode 36 to open the circuit of the lamp 4. The gas then immediately ionizes again causing the lamp 4 to glow dimly and the temperature of electrode 38 to again increase. This cycle is ordinarily repeated at a relatively rapid and irregular rate producing the desired flickering effect.

The rate at which the lamp 4 will flicker depends, among other factors, upon the pressure of the gas in the envelope 34. I have found that a slight increase in the pressure of the gas over that used in conventional fluorescent lamp starters gives a somewhat more realistic flickering effect. Glow switches of the general type utilized in the above embodiment of the invention are described more fully in U. S. Patents 2,332,809 and 2,329,134.

I claim:

1. Apparatus for simulating the light given off by a flame, comprising means connectible to a source of power, a first lamp connected to said means so as to glow continuously, a glow switch including means for automatically and continuously varying its electrical conductivity, an incandescent filament type second lamp connected in series with said glow switch and to said first

4

named means, whereby said glow switch causes said second lamp to flicker continually and irregularly thereby simulating the light produced by a natural fireplace.

2. In an artificial fireplace, a log-like member, a support extending rearwardly of said member, a first colored electric lamp secured to said support adjacent said member, a second colored electric lamp secured to said support at a point farther removed from said log-like member than said first lamp, a glow switch of the type ordinarily used for starting fluorescent lamps including first and second electrodes, said second electrode having a by-metallic strip arranged to complete the circuit between said electrodes when its temperature is increased, plug means connectable to a source of power, circuit means connecting said glow switch in series with said first lamp and to said plug means and connecting said second lamp directly to said plug means, whereby when electrical energy is applied thereto through said plug means said first lamp is caused to flicker continually and irregularly and said second lamp to glow steadily.

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