March 25, 1969 P. J. KAYATT 3,435,286

PLURAL LAMPS FOR SIMULATING A CANDLE FLAME

Filed Sept. 17, 1965

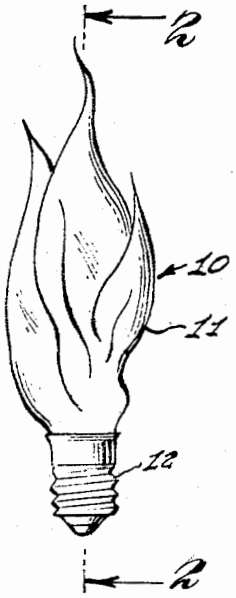

Fig. 1

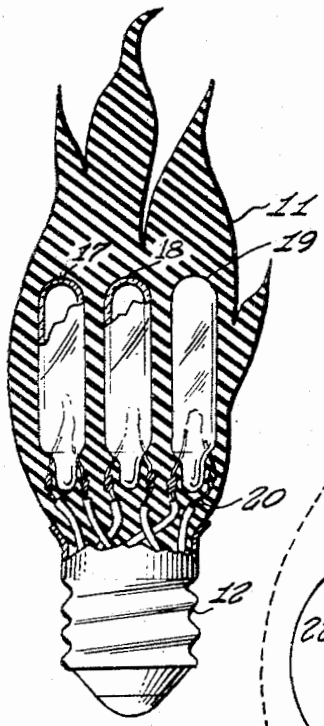

Fig. 2

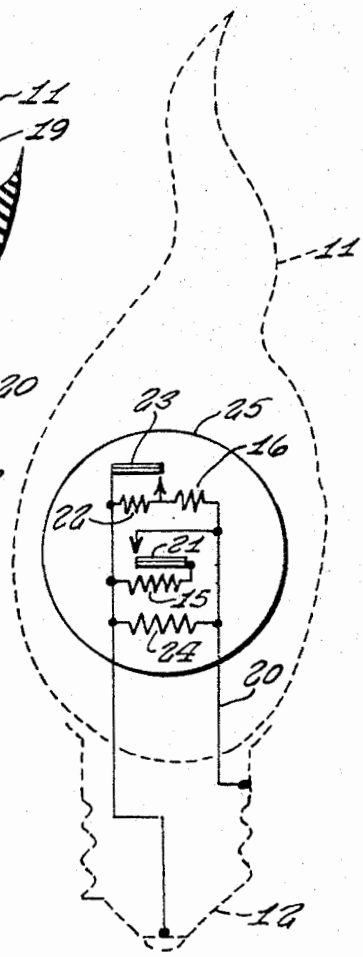

Fig. 4

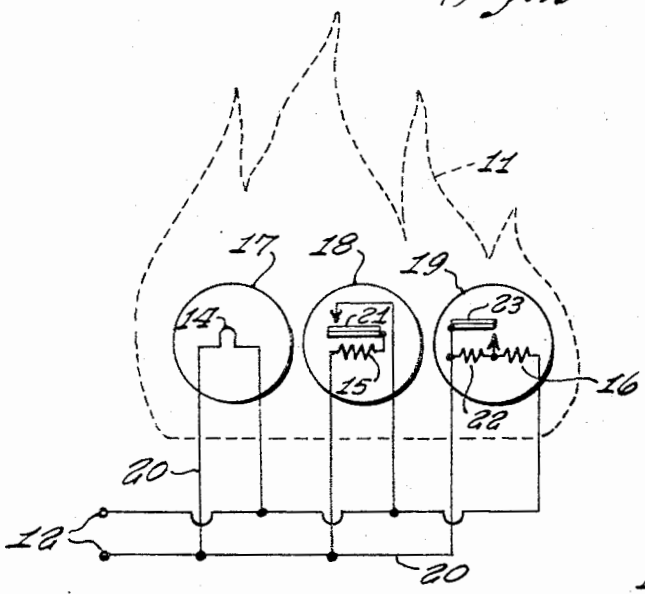

Fig. 3

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3,435,286

Patented Mar. 25, 1969

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3,435,286
PLURAL LAMPS FOR SIMULATING A CANDLE FLAME

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Filed Sept. 17, 1965, Ser. No. 488,117
Int. Cl. H01j *1/00;* H01k *1/14*
U.S. Cl. 315—47 8 Claims

ABSTRACT OF THE DISCLOSURE

Illumination means for simulating the visual flame like effect of a candle having a steady state light source and at least one intermittently operated light source. Both the steady state and intermittent light sources are connected in parallel to a source of voltage and are mounted in close proximity for simultaneous viewing so that the operation of the intermittent light source produces a visual flame-like effect.

The present invention relates to light sources of the incandescent filament type which simulate the flickering illumination of a candle.

The device comprises at least two light sources one of which is steady and the other of which changes its intensity periodically at a frequency which approximates the flicker frequency of a candle. Such a frequency is in the range from one to ten cycles per second and preferably about three or four cycles per second. A combination of three light sources of which one is steady and the other two of which change their intensities at different repetition rates will produce a very satisfactory simulation of a candle. The incandescent filaments may be formed either of tungsten or carbon. The non-steady filaments are flashed by thermosensitive switch elements in conventional manner and the switching may be either to fully off or partially off, as circumstances may render preferable.

The filaments may be enclosed in a common evacuated glass envelope or in individual envelopes. Additionally, a translucent flame-shaped covering formed of a suitable plastic applied to the common envelope or the group of individually enclosed light sources will prevent direct observation of the filaments and enhance the simulation of an actual candle flame.

Various objects, features and advantages of the invention will become apparent upon reading the following specification with reference to the accompanying drawing forming a part hereof.

Referring to the drawing:

FIGURE 1 is a side elevational view of a lamp embodying the invention.

FIGURE 2 is an enlarged elevational view partly broken away and shown in section taken along the line 2—2 of FIG. 1.

FIGURE 3 is a schematic view of the lamp shown in FIGS. 1 and 2 illustrating the electrical circuitry.

FIGURE 4 is a view similar to FIG. 3 showing a modification in which all of the light sources are enclosed in a common glass envelope.

Referring to the drawing, the lamp designated generally as **10** comprises a flame-shaped covering **11** formed of a translucent plastic material such as a silicone rubber which may be conveniently applied as by dipping, for example. Molding and other techniques may be employed where suitable. The lamp is shown provided with the usual screw-type base **12** for insertion in a complementary socket (not shown) connected to a suitable power supply.

In the embodiment shown in FIGS. 2 and 3, light sources **14**, **15** and **16** are enclosed in individual envelopes **17**, **18** and **19**, respectively. The light sources are connected in parallel by conductors **20** to the terminals of the base **12**. Light source **14** is of the continuously energized or steady type and is illustratively shown as comprising a carbon filament. A tungsten filament may, of course, be substituted for the carbon filament shown. Light source **15** is of the tungsten filament type and is shown connected in series with a bimetallic thermally responsive flasher switch **21** which automatically flashes the light source **15** from fully on to fully off at a repetition rate of about two to six flashes per second. The on and off times are about equal. A ratio of on time to off should be in the range from 2:1 to 1:2 for best results.

Light source **16** is a tungsten filament connected in series with a further tungsten filament **22**. A bimetallic flasher **23** periodically short circuits the further filament **22** thereby bringing light source **16** to full brilliancy. With flasher **23** open, the temperature of light source **16** may drop to a dull red or lower. The rate of rise to full brilliancy is accelerated by starting from a dull red temperature. The flasher **23** may thus operate at a more rapid repetition rate than flasher **21** which brings light source **15** to a fully off condition.

The arrangement of FIG. 4 is similar to that of FIGS. 2 and 3 except that the steady light source **24** is constituted by a tungsten filament instead of a carbon filament as for light source **14**. Additionally, all three light sources are enclosed in a common glass envelope **25**. The common envelope **25** is enclosed in a translucent flame-shaped covering **11** as described above.

In operation, the steady light source **14** or **24** provides a predetermined minimum illumination independently of the flashing sources **15** and **16**. The flashing sources produce intermittent illumination which varies the total light output from the three sources as in the total light output of a candle flame. By having two different repetition rates for the two flashing sources, the effect of a candle flame is further accentuated. The lateral spacing of the light sources produces an optical effect which simulates the lateral movement of a candle flame. Although one of the two flashing light sources may be omitted, a better simulation is obtained by the use of at least two flashing sources with different repetition rates. All of the flashing sources may be of the same type, such as the type of source **15** or source **16**, if desired. The flame effect will be obtained with the covering **11** omitted. Its use is desirable, however, because the translucency distorts the appearance of the light sources and combines their illuminative effects in a manner which strengthens the optical illusion of an actual flame.

While I have shown and described what I believe to be the best embodiments of my invention, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. A flame-simulating illumination device for operation from a source of voltage comprising: a steady light source, first and second intermittent light sources, a respective means for connecting said steady and said first and second intermittent light sources in parallel to said voltage source, said respective means connecting the first and second intermittent light sources to the voltage source operating to vary the intensity of the output of each of said sources at a different repetition rate within the range from one to ten cycles per second while still permitting current to pass through the steady light source at all times, said means for connecting the steady light source to the voltage source operating the steady source continuously, and means for mounting all of said light

sources in close proximity to each other for simultaneous observation by a user of the device, said device producing a visual flame-like effect.

2. A device according to claim **7**, wherein said light diffusing means is a flame-shaped covering of translucent material at least partially surrounding all of said sources.

3. A device according to claim **2**, wherein each of said sources is constituted by an incandescent filament, said means for connecting said intermittent sources to the voltage source each comprising thermally actuated flasher means for varying the intensity of illumination of its associated filament.

4. A device according to claim **3** wherein one of said thermally actuated flasher means alternately connects and disconnects the filament of one of said sources from the voltage source.

5. A device according to claim **3** wherein the filament of one of the intermittent sources is formed of two parts and the flasher means associated with said one intermittent source periodically shorts out one of the parts of said filament.

6. A device according to claim **4** wherein the filament of the other of said intermittent sources is formed of two parts and the flasher means associated with said other source periodically shorts out one of the parts of said filament of said other intermittent source.

7. A device according to claim **1**, further comprising light diffusing means common to and at least partially covering all of said light sources.

8. A device according to claim **2**, wherein said translucent material is a silicone rubber.

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U.S. Cl. X.R.

313—317, 315; 315—65, 72, 75, 50; 240—10