June 11, 1968 D. R. LARSEN 3,388,245

MULTICOLOR LIGHTING APPARATUS

Filed Jan. 21, 1966 4 Sheets-Sheet 1

FIG_1

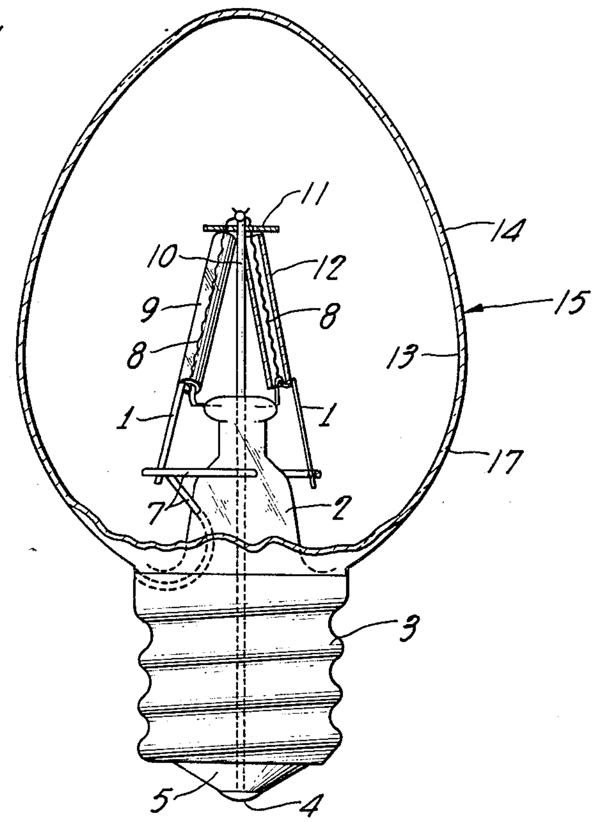
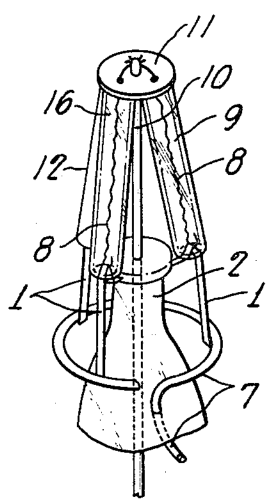


FIG_1A



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MULTICOLOR LIGHTING APPARATUS

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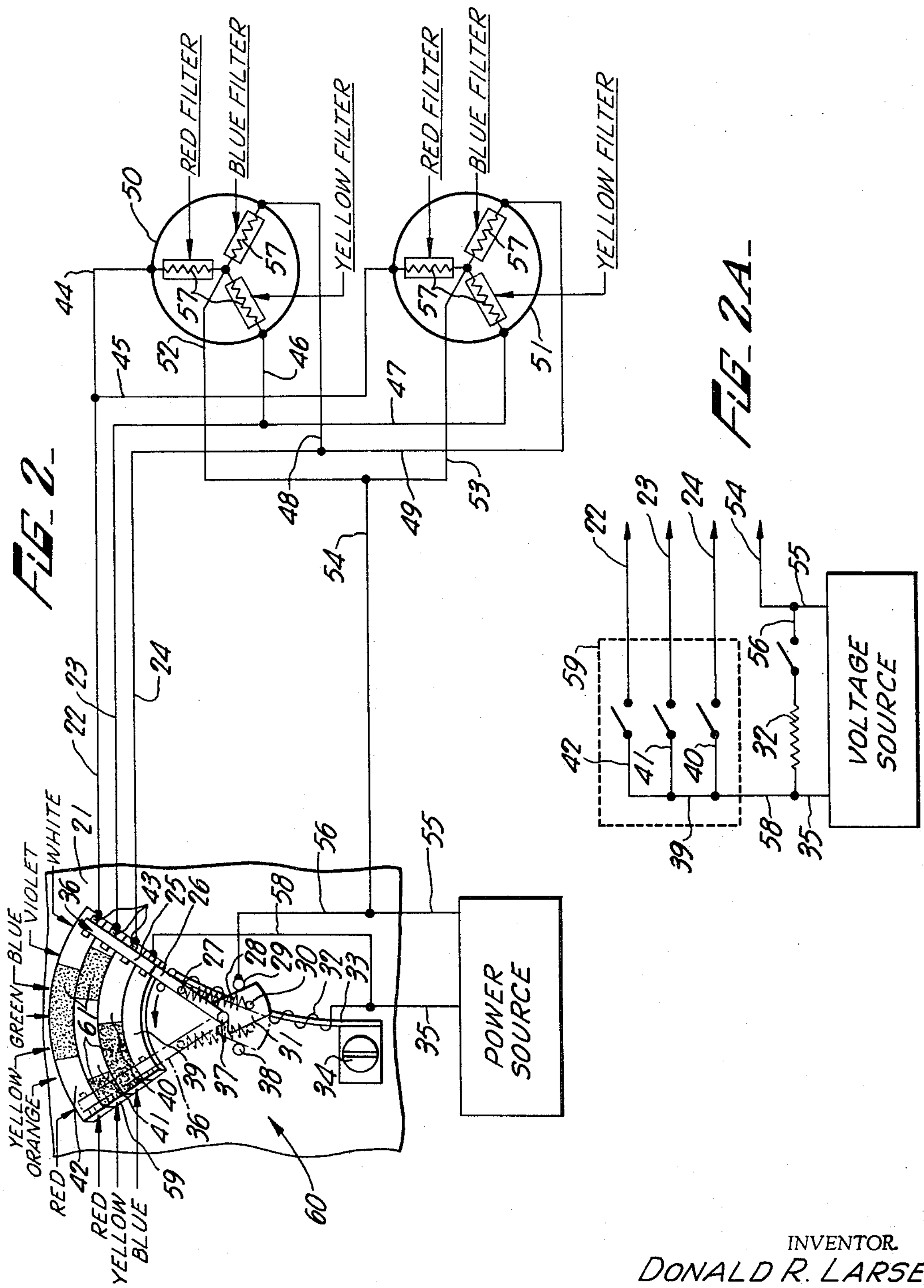

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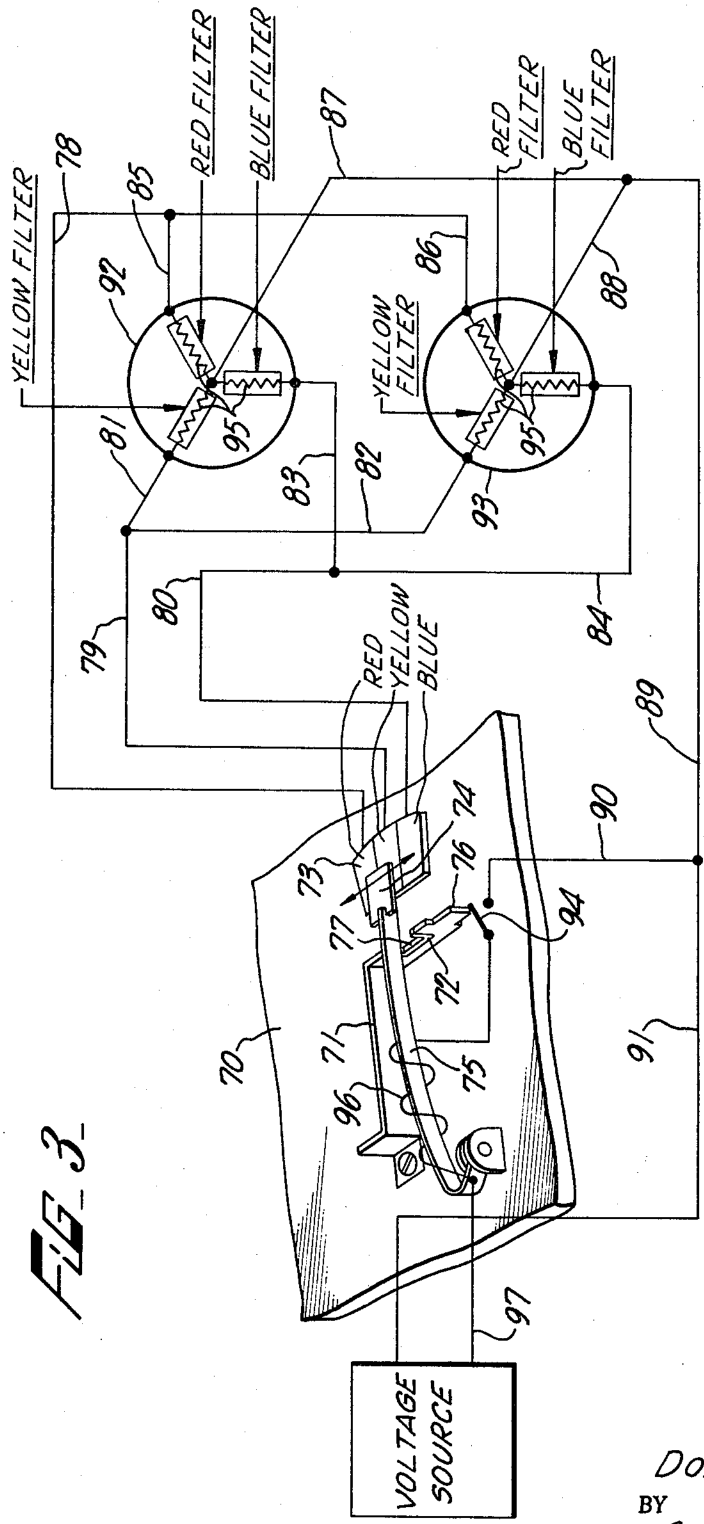

FIG. 3

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MULTICOLOR LIGHTING APPARATUS

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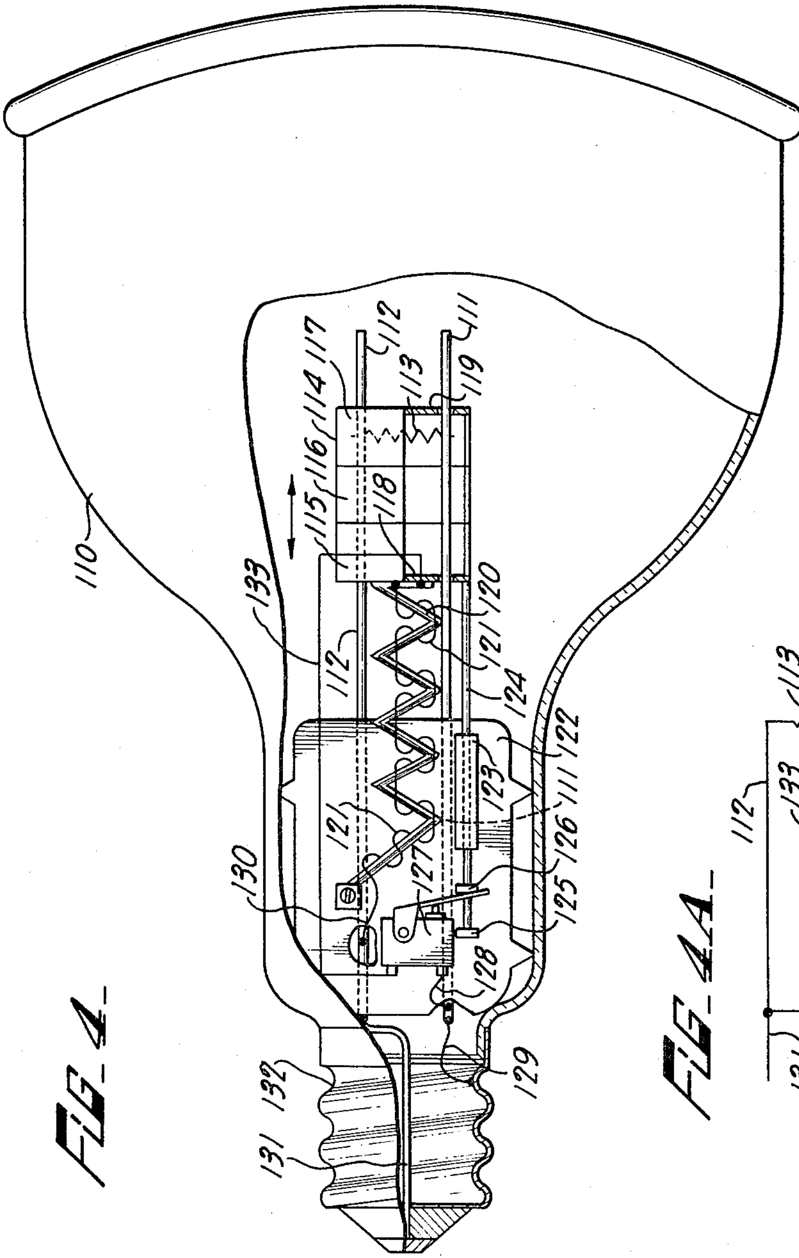

FIG. 4

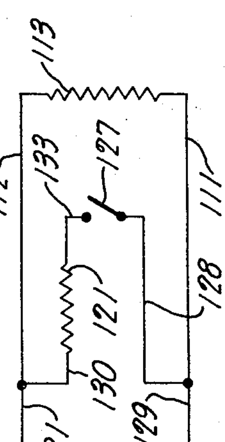

FIG. 4A

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MULTICOLOR LIGHTING APPARATUS

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15 Claims. (Cl. 240—3.1)

ABSTRACT OF THE DISCLOSURE

In one embodiment a light is provided which has two or more filaments with associated different colored color filters. The filaments are connected in series between a first and a second electrode through bimetallic strips. The second electrode extends annularly around the first electrode with the strips biased against the second electrode's annular portion to effect a normally closed circuit. The filters are arranged to obtain a resultant color when two or more filaments are energized simultaneously. In an alternate form the production of a resultant color is effected through a bimetallic strip actuated commutator. A third form of the invention includes a bimetallic spring which is coupled to the color filters. The spring is operable to expose individual of the color filters to a single filament and to expose adjoining filters to effect the resultant of their color.

This invention relates to a lighting apparatus having the capability of producing different colored lights at different times. More particularly, this invention relates to a lighting apparatus which is capable of producing certain individual colors as well as colors which are a resultant of the individual colors.

Lighting apparatus capable of producing different colored lights are known and employed, for example, in advertising, decoration and ornamental displays. These apparatus either employ a plurality of different colored light sources or a single light source capable of casting different colored light at different points of time. However, no lighting apparatus characterized by a single source of light capable of producing different individual colors and the resultants of these individual colors has heretofore been devised.

The instant invention has the capability of producing, at different times, each of a selected group of individual colors as well as resultant colors of the individual colors. Briefly, the invention contemplates the use of at least one source of light together with at least two associated color filters. The source of light and color filters are housed in an envelope. Each of the color filters used has the ability, when exposed to the source of light, to produce one of the selected group of individual colors. These filters cooperate with one or more sources of light in such manner that their individual colors as well as a resultant color of at least two of the filters is capable of being produced and observed by a viewer at different times. To accomplish the change in color, means are provided for exposing each of the filters individually to the source of light to produce its color, and for exposing at least two filters to the source of light at the same time to produce a resultant color.

The selected group of individual colors, each of which is produced by exposing one of the filters to the source of light, is preferably of the class of colors consisting of red, blue, green and yellow. The use of the primary colors red, blue and yellow, theoretically produces the capability for the widest variety of colors along the color spectrum. However, it has been found that for at least some arrangements, the substitution of green for yellow will produce a white light when the green, blue and red filters are simultaneously exposed to the source of light. Nonetheless, the choice of colors which form the selected group of individual colors is dependent upon the colors sought to be produced and, accordingly, this invention is not limited to the use of the primary colors.

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In one embodiment of this invention, a lighting apparatus capable of producing multiple colors is achieved by using a plurality of filaments disposed within an envelope as sources of light. These filaments are capable of being in electrical communication with a source of electrical energy and are energized to produce light by such energy. Associated with each of the filaments is a color filter capable of producing one of the selected group of individual colors when its associated filament is in electrical communication with the power source. Such an association is preferably produced by enclosing each of the filaments in a cylindrical color filter fabricated from, for example, light-pervious glass. The filaments and filters are disposed in an envelope. Each of the filters and its corresponding filament is positioned relative to at least one other filter and its corresponding filament to produce a resultant color of the two individual filter colors when both filaments are energized. Different of the individual colors of the selected group of colors and at least some of their resultant colors are produced by having the facility to interrupt the electrical energy supplied to each of the filaments at different points in time. This facility is preferably accomplished by inserting a bimetallic member in electric circuit with each of the filaments. The heat from the filament will increase the temperature of the bimetallic member causing its deflection; the deflection opening the circuit. After the circuit is open, the bimetallic member cools and deflects back into circuit with the filament reestablishing current flow and light. The bimetallic member can be warmed by other means including a heating coil connected in such a manner as to be periodically energized and deenergized, as well as through its electrical resistance.

Another embodiment of the present invention envisions the use of a color selector disposed away from the sources of light. The color selector controls the production of each of the group of selected colors and various of their combinations through a commutator having individual segments each electrically insulated from the other. As in the previously described embodiment, a plurality of filaments is used as the sources of light. Each of the filaments is in association with a color filter capable of producing one of the selected group of individual colors. More than one envelope and filament unit may be conveniently employed by, for example, connecting a filament in one envelope in parallel with corresponding filaments in another envelope. Each of the commutator segments is in electrical communication with one of the filaments and has a conductive and a nonconductive portion. A wiper arm is disposed relative to the commutator to sweep across each of the segments. The wiper arm conducts electricity to each of the segments energizing the filaments unless it is positioned over a nonconductive portion. Connected to the wiper arm is a bimetallic member which is heated by a heating coil. The heat produces a deflection which moves the arm relative to the commutator. When the arm reaches a predetermined point, current flow to the heating coil is terminated, and the member is allowed to cool. As the member cools, it forces the wiper arm to retrace its path over the commutator conducting current to the conductive portions of each segment and in turn to the filaments. When the bimetallic member is sufficiently cool, the heater coil is again activated and the heating cycle is begun anew. Thus the commutator determines the flow of current to each of the filaments in an envelope or a plurality of corresponding filaments in a plurality of envelopes. At different points in time different individual and combinations of the filaments can be energized causing different colored light to be produced.

In still another embodiment of the present invention, a commutator having a plurality of segments each electrically insulated from the other is once again used. Each segment is in electrical communication with a filament in an envelope having a plurality of filaments. A different colored color filter is associated with each of the filaments. A bimetallic wiper arm in electrical communication with a power source determines which of the filaments is energized by sweeping back and forth across the commutator and conducting current to each of the segments at different times. The portion of the wiper arm in contact with the commutator is of sufficient dimension to contact more than one segment as it traverses from one segment to the next adjoining segment, thus energizing two filaments in an envelope producing a resultant color. The bimetallic wiper arm is heated by a heating coil to cause its deflection in one direction. Current flow to the heating coil is periodically terminated to allow the wiper arm to cool and deflect in the opposite direction. This switching is preferably accomplished by using a bistable member which is displaced from one position to another when the wiper arm reaches the limits of its travel in either direction. The bistable member turns a switch on at one extreme of its travel and then off at the other extreme, energizing or de-energizing the heating coil.

In still another embodiment of this invention, multicolored light is produced from a lamp having but a single filament. This is accomplished by producing relative motion between the color filters and the filament in such manner that the filters are individually and collectively exposed at different points of time to produce different colors. The filters can be conveniently moved through the use of a bimetallic member, which, as it cools and expands, moves the filters in relation to the filaments. Other means for moving the filters in relation to the filament are also possible, such as through the use of a small vibratory motor which drives a ratchet wheel which in turn drives a drive chain to move the filters.

In all the above described embodiments as well as others which will occur to those skilled in the art, it has been found that frosting the interior or exterior of the light-pervious enclosure enhances the resolution of resultant colors to produce a more uniform color observable by a viewer. Moreover, while all the preferred forms of the instant invention employ electrically operated filaments as sources of light, other sources could be used, for example, small neon bulbs.

One of the distinctive features of the present invention is the ability to produce more colors than the number of color filters used in an envelope. This facility makes the production of many colored lights feasible at low cost thus overcoming the necessity of employing different lamps of different colors. Moreover, the effect produced is more startling because the many colors are produced from but one envelope. Within the ambit of the instant invention are several embodiments allowing a broad range of colored lighting selection for different applications. For example, the choice between external and internal switching of colors is possible and the choice between illumination akin to a household incandescent lamp on the one hand and flood lighting on the other is possible.

These and other features, advantages, and aspects of this invention will be developed and become more apparent from the following description, appended claims and drawings, in which:

FIGURE 1 is an elevational view, partly in section, of one embodiment of the instant invention;

FIGURE 1*a* is a perspective view of the filament and color filter assembly of FIGURE 1;

FIGURE 2 is a plan view, partly schematic, of another embodiment of the present invention;

FIGURE 2*a* is a schematic view of the electric circuit of FIGURE 2;

FIGURE 3 is a perspective view, partly schematic, of still another embodiment of the present invention;

FIGURE 4 is a side view partly in section of still another embodiment of the present invention; and

FIGURE 4*a* is a schematic of the electric circuit of FIGURE 4.

Referring now to FIGURES 1 and 1*a* there is seen a typical lighting apparatus **15** having a light-pervious envelope **14** secured to cap or base **3**. Within the envelope **14** is a standard insulator **2** which serves to support and insulate center electrode **10**. The upper portions of bimetallic members **1**, here shown as bimetallic strips, are secured in the upper portion of the insulator **2**, as shown. A portion of electrode **7** is annularly disposed about and spaced from the insulator **2**; the electrode **7** also being in electrical communication with the cap **3**. The bimetallic strips **1** are biased against and normally in electrical communication with the annular portion of electrode **7**. Each of the filaments **8** is serially connected to one each of the bimetallic strips **1** and each extends through insulating spacer **11** to be secured in electrical communication with the center electrode **10**. Thus, each of the filaments and its corresponding bimetallic strip is in parallel with each other filament and bimetallic strip combination. The bimetallic strips are disposed to deflect inwardly, upon heating, towards the insulator **2** away from the annular portion of the electrode **7**. Heating of the bimetallic strips is produced by virtue of electric current flowing through the strips; however, it has been found that the filaments are primarily responsible for the heating of these strips. When sufficiently heated, each of the bimetallic strips will break the electrical circuit to their respective filament. Around each of the filaments is disposed a different colored color filter. These filters are preferably cylindrical in order that they completely surround the filaments to produce a uniform color. The color filters and filaments are preferably disposed in a cluster with each color filter-filament combination being roughly parallel to the other color filter filament combination. This array is preferred because it allows the assembly of filters and filaments to be relatively compact, thus producing a unit source of light. The color of each color filter is preferably selected from the colors: red, blue, yellow or green; but, for purposes of description the primary colors will be used. The red, yellow and blue filters are denoted by reference numerals **9**, **12** and **16** respectively. Insulated ring **5** insulates base contact **4** from the base or cap **3**. When the inner surface **13** or outer surface **17** of envelope **14** is frosted, a truer resultant colored light is observed by a viewer because of the diffusion caused by the frosting.

The operation of the embodiment shown in FIGURES 1 and 1*a* is dependent on the flow of electric current from electrode **7** through the bimetallic strips **1** and filaments **8** to electrode **10** and the periodic interruption of current through each filament bimetallic strip combination. When in circuit, each filament emits a different colored light through its respective color filters. Because these color filters are of different colors, there will be resultant colored light seen by an observer when more than one filament is energized. The periodic interruption of current through each filament-bimetallic strip combination is accomplished by the warming of the bimetallic strips and their resulting deflection inwardly away from and out of contact with electrode **7**. Once an individual bimetallic strip is out of circuit, it will cool and deflect back into contact with electrode **7**, thus reestablishing the circuit to its corresponding filament. The tendency of the bimetallic strips to move inwardly under the influence of heat may be adjusted by biasing them against the annular portion of the electrode **7**.

Circuit interruption can be made to occur in a random fashion through differences in biasing pressure and the geometry between the bimetallic strips. Differences in the color observed by a viewer are typically produced as follows: When the bimetallic strip leading to the filament having a blue filter 16 is out of circuit, and the remaining bimetallic strips and their corresponding filaments are in circuit, the resultant color viewed by an observer will be orange. Similarly, when the circuit having red filter 9 is out of circuit and the circuits to yellow and blue filters 12 and 16 respectively are energized the resultant color viewed will be green. When the yellow filter 12 is not exposed and the red and blue filters 9 and 16 respectively are exposed to the light produced by their filaments, the resultant color will be violet. It is obvious that with different combinations of filaments in circuit, different colors will be observed. Moreover, it is clear that one of the primary colors, red, blue or yellow, will also appear to an observer in the course of events. In addition, it is also possible to use color filters capable of producing colors other than the primary colors.

FIGURES 2 and 2*a* depict still another embodiment of the instant invention wherein the different colors observed by a viewer are controlled by a selector 60 outside of a lighting source or sources enclosed in light-pervious envelopes 50 and 51. Mounted on base 21 of the selector 60 is a commutator 59 having conducting strips or segments shown by reference numerals 40, 41 and 42, respectively, which correspond, for example, to the primary colors blue yellow and red respectively. Each of these strips is electrically insulated from the other and has a nonconductive portion 61. Electrically connected to segments 40, 41 and 42 are leads 24, 23 and 22, respectively. Current to each of the segments 40, 41 and 42 is supplied from the upper section 25 of wiper arm 36 through its brushes 43. Current to the upper section 25 of the wiper arm 36 is in turn supplied through one of the brushes 43 which is in electrical communication with conductive segment 39 which in turn receives electrical energy from a power source through leads 58 and 35. The wiper arm 36 moves back and forth across the commutator 59 to accomplish selective illumination of the filaments 57 disposed in envelopes 50 and 51. This movement is produced through the use of bimetallic strip 33 and the toggle spring 28. The bimetallic strip 33 is secured at one end to the lower section 26 of the wiper arm 36, and is anchored on base 21 at its other end by anchoring means 34. The bimetallic strip 33 is preferably heated by bimetallic strip heating coil 32 which receives its electrical energy through lead 35 from the power source. The circuit including heating coil 32 is completed by virtue of the conductivity of the lower section 26 of the wiper arm 36 which is in electrical communication with toggle plate 31 which in turn is normally in contact with lead 56 through conductive stop 29. The upper section 25 and the lower section 26 of the wiper arm 36 are, of course, electrically insulated from each other. As the bimetallic strip 33 is heated it urges the wiper arm 36 across the commutator 59 until the toggle spring 28 moves to the left of the wiper arm 36 and toggle pin 37 whereupon the toggle plate 31 rotates about the pin 37 against stop 38. In this position, the heating coil 32 is no longer in circuit and the bimetallic strip 33 begins to cool and move the wiper arm 36 back across the commutator 59. This movement continues until the circuit to the heating coil 32 is reestablished when the toggle plate 31 moves against contact 29, from the action of the toggle spring 28, as it passes to the right of the toggle pin 37. The toggle spring 28 is mounted on the lower section 26 of the wiper arm 36 by pin 27 and on the toggle plate 31 by pin 30. The selector 60, as previously mentioned, determines the flow of current to the lighting sources in the form of filaments 57 in envelopes 50 and 51. The filament envelope arrangement here is much the same as described with reference to FIGURES 1 and 1*a*, with the exception of the absence of bimetallic strips or switching means within the confines of the envelopes. Accordingly, many of the considerations previously described are applicable here. Thus, each has three filaments 57 around each of which is disposed a different colored color filter. Leads 22, 44 and 45 are to the filaments having an associated red color filter. This circuit is completed by providing common 52 from within envelope 50 and common 53 from within envelope 51, both of which are connected to leads 54 and 55. Similarly, electrical communication to the filaments corresponding to the yellow filters is provided by leads 23, 46 and 47, and to the filaments corresponding to the blue filters through leads 24, 48 and 49. The completion of these circuits is effected through commons 52 and 53, together with leads 54 and 55. Thus, each of the circuits corresponding to each of the different colored filters is in parallel with each of the other circuits having different colored filters. Moreover, each of the filaments corresponding to one of the colored filters is in parallel with all other filaments corresponding to the same colored color filter.

In operation the selector lighting source combination shown in FIGURES 2 and 2*a* allows individual illumination of each distinct colored filter and simultaneously illumination of different colored filters to produce a resultant color. As the wiper arm 36 moves across the commutator 59 by the action of the bimetallic strip 33, the brushes 43 will contact the conductive and nonconductive portions of the segments 40, 41 and 42. When a brush is in contact with a conductive portion of a segment, current will flow in its corresponding circuit. Thus, in the position shown, current is capable of flowing to all three segments 40, 41 and 42 and leads 24, 23 and 22, respectively, to all three filaments in each of the envelopes 50, and 51 producing a resultant light of the three colors: red, blue and yellow. When the wiper arm 36 is in the position shown in phantom, that is, on the left side of the commutator, only the red conductive segment 42 is in electric circuit. Current will then flow through lead 22 to its filaments producing red light by virtue of the red color filter. For various positions of the wiper arm different colors will be observed by a viewer of the lighting sources as specifically indicated in FIGURE 2. In the the embodiment shown the wiper arm 36 always conducts current whether it is sweeping to the left or to the right. Accordingly, at least some of the filaments will be in electric circuit producing light.

FIGURE 3 shows still another switching mechanism for energizing filaments to produce various color combinations to a viewer. This switching mechanism includes bistable member 71 mounted on base 70. Groove 77 within bistable member 71 receives an insulating collar 72 and a portion of bimetallic strip 75. On one end of the bistable member 71 is a tip 76 which closes switch 94 to establish current flow through the switch. The bistable member 71 is normally biased against the switch 94 in one of its stable positions to keep the switch closed and the heating coil 96 in circuit. Bimetallic strip 75 is received in groove 77 but is normally out of contact with the periphery of the insulating collar 72. Current flows into the metallic strip 75 through lead 97. Lead 97, as well, completes the circuit to the heating coil 96. When the switch 94 is closed current flows through the heating coil 96, and lead 90 and 97, causing the heating of the bimetallic strip 75. This heating deflects the strip away from tip 76 and deflection continues until bimetallic strip 75 contacts the insulating collar 72 which forces the bistable member 71 away from switch 94 into its other stable position, causing the latter to open. Upon the termination of current flow in the heating coil 96, the bimetallic strip 75 cools and moves towards the tip 76 until it contacts the portion of the insulating collar 72, closest to the tip 76. This latter contact forces the bistable member 71 through its tip 76 to close the switch 94, reestablishing current flow to the heating coil 96. The bistable characteristic of bistable member 71 allows it to remain in the position forced onto it by the bimetallic strip 75 until the latter forces it into a second position. Current flowing through bimetallic strip 75 and wiper

74 passes into commutator 73, having for purposes of illustration, red, yellow and blue segments each insulated from the other. The position of wiper 74 relative to the commutator 73 determines which of the leads 78, 79 and 80 are energized. Because the wiper 74 can contact more than one of the segments of the commutator, more than one of the leads, 78, 79 and 80 may be energized. When the wiper is in the position shown, current will flow into the red and yellow segments of the commutator 73, establishing the flow of current in leads 78, 79, 85, 86, 81 and 82, illuminating two of the three filaments 95 in light-pervious envelopes 92 and 93. Because of the yellow and red filters associated with the illuminated filaments an orange light will be seen by a viewer. Similarly, when the wiper 74 passes over the blue segment, out of contact with the red and yellow segment, current will flow through leads 80, 83 and 84 to the filaments having a blue color filter producing a blue light. The circuit to each filament is completed by common 87 for envelope 92 and common 88 for envelope 93; both of these commons being connected to leads 89 and 91, the latter lead is connected to the voltage source.

With reference now to FIGURES 4 and 4*a* there is seen a single filament embodiment of the present invention. Within flood lamp 110 is mounted a first electrode 111 and a second electrode 112, which are serially connected by a filament 113 and receive electrical energy through leads 131 and 129. Leads 129 and 131 are insulated from each other and connected to mutually insulated portions of cap 132. Cap 132 is of the type found in most commercially available incandescent light sources. On mounting board 122 which is disposed within flood lamp 110, is secured switch 127 which is turned on and off by the movement of rod 124 as it travels back and forth within the flood lamp 110. Rod 124 is journalled in sleeve 123. Bimetallic spring 120 is connected at one end to the mounting board 122 and at its other end to end plate 118. The bimetallic spring is fabricated from a plurality of bimetallic strips so connected to expand as a unit upon heating and to contract as a unit upon cooling. End plate 118 as well as end plate 119 are slidably mounted on electrodes 111 and 112 and form a part of filter cylinder 114. This cylinder has a plurality of colored filters disposed along its surface. These filters may be, for example, red filter 115, blue filter 116, and yellow filter 117. Heating coil 121 is connected to lead 130, which in turn is connected to lead 131. The circuit to the heating coil 121 is completed through switch 127 by leads 133 into the switch 127 and by leads 128 and 129 from the switch 127. In some applications, a mask may be introduced in association with filament 113 to channel its light only through the color filters which are proximate thereto.

When the switch is closed, current will flow through lead 130 to heating coil 121, back through lead 133, the switch 127, and lead 128. The heating coil 121, thus energized, causes the bimetallic spring 120 to move away from the cap 132 which in turn causes the filter cylinder 114 to move away from the cap 132. As the filter cylinder 114 moves away from the cap 132 each of the filters 115, 116 and 117 will be in a position relative to the filament 113 to create a distinct colored light. When yellow filter 117 is exposed to the filament 113 the light produced by the flood lamp will be yellow. As the filter cylinder 114 continues to move away from the cap 132, blue filter 116 will be exposed to filament 113 and a blue light will be cast; however, before blue filter 116 is fully exposed to filament 113, yellow filter 117 will still be under its influence. The combined color of yellow and blue, or green will then be produced. Finally, as the filter cylinder 114 moves further away from cap 132, red filter 115 will come under the influence of the filament 113, first causing the combined colors of red and blue, violet, to be produced, and then red. When the filter cylinder reaches its furthermost position away from the cap 132, shoulder 125 will open the switch 127, terminating the flow of current in the heating coil 121. The bimetallic spring 120 then begins to cool contracting and forcing the filter cylinder 114 towards the cap 132. At a predetermined point, shoulder 126 on rod 124 closes the switch 127 to once again establish current flow in heating coil 121, and the cycle is reinitiated.

With the teachings of this invention, those skilled in the art will appreciate that other means are available to produce distinct colors of a selected group of colors as well as resultant colors produced by combining two or more of the colors of the selected group of colors at different times. For example, a bimetallic strip actuated ratchet wheel connected to a drum type commutator may be used. Further, by way of example, it is possible to coaxially mount a plurality of color filters in association with an appropriate drive in such manner as to expose each filter individually as well as two or more filters collectively in order to achieve a multicolored lighting apparatus. In the embodiment described with reference to FIGURES 4 and 4*a*, a coil type bimetallic spring can be used. Moreover, different color filter-filament combinations in different envelopes may be connected in the same electric circuit to produce different colors at the same time in different envelopes. Therefore, the following appended claims should not be limited in their spirit and scope to the specific embodiments of the invention just described.

What is claimed is:

1. A lighting apparatus capable of producing different colored light at different times comprising:
   (a) a light pervious envelope;
   (b) at least two filaments disposed within the envelope;
   (c) a color filter in the envelope associated with each of the filaments, each of the color filters producing a distinct color upon the individual energization of its associated filament, the color filters being of different colors and disposed with respect to each other to produce the resultant of the different colors when their associated filaments are simultaneously energized; and
   (d) means for independently energizing each of the filaments to produce its associated color and for simultaneously energizing at least two of the filaments to produce the resultant of their associated colors including:
      (i) a base;
      (ii) a commutator on the base having at least two segments, each segment being electrically insulated from each other segment;
      (iii) electrical conductor means for providing electrical communication between each of the segments and a corresponding one of the filaments;
      (iv) a bimetallic strip mounted on the base operable upon heating and cooling to electrically communicate each of the segments with a power source at different times and to communicate at least two of the segments to the power source at the same time; and
      (v) means for periodically heating and cooling the bimetallic strip.

2. The lighting apparatus claimed in claim 1 wherein:
   (a) at least some of said segments have a nonconductive portion and all have a conductive portion;
   (b) a wiper arm is provided which is pivotally mounted at a pivot point on said base, the wiper arm having a first current conductive section disposed for electrical communication with the conductive portions of said segments and movement over said segments, the first section of the wiper arm being capable of providing electrical communication with the power source; and
   (c) the bimetallic strip is connected at one end to said wiper arm and at the other end to said base

such that the means for periodically heating and cooling said bimetallic strip causes the first wiper arm section to move back and forth over said segments.

3. The lighting apparatus claimed in claim 2 wherein:

(a) said wiper arm has a second current conductive section electrically insulated from said first section, said wiper arm being pivotally mounted on said base in the second section, and said bimetallic strip being connected to the second section; and

(b) said means for periodically heating and cooling said bimetallic strip comprises:

(i) a heating coil in heat communication with said bimetallic strip and in electrical communication with the second section of said wiper arm;

(ii) a toggle plate pivotally mounted at the pivot point and in electrical communication with the second section of said wiper arm;

(iii) a toggle spring having one end connected to said wiper arm and its second end connected to said toggle plate; and

(iv) a first and second stop on said base spaced apart such that said toggle plate is capable of contacting only one of said stops at a time, said first stop being capable of electrical communication with said toggle plate and a power source to establish a circuit through said heating coil, the second section of said wiper arm and said toggle plate such that said bimetallic strip is heated by said heating coil and deflected to force the first section of said wiper arm across the segments to a position allowing said toggle spring to pivot said toggle plate about the pivot point away from said first stop and against said second stop to break the circuit to said heating coil whereby the bimetallic member cools forcing the first section of said wiper arm back across the segments until said toggle spring pivots said toggle plate about the pivot point to contact said first stop and to reestablish the circuit to the heating coil.

4. The lighting apparatus claimed in claim 3 wherein said envelope is frosted such that light passing therethrough from its interior will be diffused.

5. The lighting apparatus claimed in claim 1 including:

(a) a bistable member having one end attached to said base and its other end capable of moving between a first stable position and a second stable position;

(b) an electric switch activated to its on position when said bistable member is in its second stable position and activated to its off position when said bistable member is in its first stable position; and wherein:

(i) said means for heating and cooling the bimetallic strip includes a heating coil in electric circuit with said electric switch, said bimetallic strip being in heat communication with said heating coil; and

(ii) the bimetallic strip is attached at one of its ends to said base and has a wiper at its other end, the wiper being capable of electrical communication with one of the segments at one time and at least two of the segments at another time and of movement back and forth across the segments in response to the heating and cooling of the bimetallic strip, said bimetallic strip being in position to contact said bistable member after being heated by said heating coil to cause said bistable member to move to its first stable position and in position to contact said bistable member after cooling to cause said bistable member to move to its second stable position.

6. The lighting apparatus claimed in claim 5 wherein said bistable member has a groove which receives said bimetallic strip, the groove having a dimension in the direction of the deflection of said bimetallic strip slightly smaller than the total deflection of such strip when it is heated by said heating coil.

7. The lighting apparatus claimed in claim 6 wherein said envelope is frosted such that light passing therethrough from its interior will be diffused.

8. A lighting apparatus capable of producing different colored light at different times comprising:

(a) a light pervious envelope;

(b) at least one source of electrically actuated light disposed within the envelope;

(c) at least two different colored filters in the envelope capable of light communication with the light source, each of the color filters producing its color upon its individual exposure to the source of light, at least two of the color filters being disposed with respect to each other to produce the resultant color of the two filters upon their exposure to the source of light;

(d) a mounting board within the envelope;

(e) a bimetallic spring secured at one end to the mounting board and at its other end to the color filters; and

(f) means for periodically heating and cooling the bimetallic spring such that each of the color filters is independently exposed to the source of light during successive time intervals and at least two of the color filters are exposed simultaneously to the source of light to produce their resultant color.

9. The lighting apparatus claimed in claim 8 wherein said source of light comprises a filament; said periodic heating means comprises;

(a) a heating coil in heat communication with said bimetallic spring; and

(b) a switch in circuit with said heating coil and turned on and off by said bimetallic spring as it reaches the extremes of its travel.

10. The lighting apparatus claimed in claim 9 wherein said bimetallic spring comprises a series of bimetallic strips with an end of the first and last strip being respectively connected to the mounting board and the color filters and with the remaining ends of the strips being connected in end-to-end fashion to form an acute included angle between each connected strip, the strips being disposed to expand as a unit upon heating by said heating coil and to contract as a unit when said switch is off.

11. The lighting apparatus claimed in claim 10 wherein said color filters are disposed on a color filter cylinder connected to the last strip.

12. The lighting apparatus claimed in claim 11 wherein said envelope is frosted such that light passing therethrough from its interior will be diffused.

13. In an incandescent type light of the type having an electrically conductive base, a light pervious envelope on the base, and a base contact electrically insulated from the base, an improvement comprising:

(a) a first electrode and a second electrode, the first electrode having a portion extending into the envelope, the second electrode having a portion extending into the envelope annularly about and space away from the first electrode, one of the electrodes being in electrical communication with the base contact and the other of the electrodes being in electrical communication with the base;

(b) at least two filaments in the envelope, each filament being connected in series with the first electrode;

(c) a color filter disposed in the envelope for each of the filaments such that the color corresponding to each color filter is produced upon the individual energization of such color filter's associated filaments, at least two of the color filters being of different colors and disposed with respect to each other to produce the resultant color of the two different colors when their associated filaments are simultaneously energized; and

(d) a bimetallic strip connected in series with each of the filaments and disposed to urge against the annular portion of the second electrode to maintain a normally closed circuit between the electrodes, the bimetallic strips being disposed such that upon the passage of current therethrough the strips tend to deflect away from the annular portion of the second electrode to open the circuit to their associated filaments.

14. The improvement claimed in claim **13** wherein:

(a) an insulator is included which extends from the base into the envelope;

(b) the first electrode passes through the insulator into the envelope with a portion thereof extending above the insulator;

(c) the filaments are connected to the portion of the first electrode which extends above the insulator;

(d) the second electrode is annularly disposed about the insulator; and

(e) each bimetallic strip is anchored at one of its ends in the insulator with its other end being free, the free end of the bimetallic strips extending below

the annular portion of the second electrode, the filaments being connected to the bimetallic strips proximate the latters' anchored ends.

15. The improvement claimed in claim **14** wherein each of the color filters substantially encloses its associated filament.

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