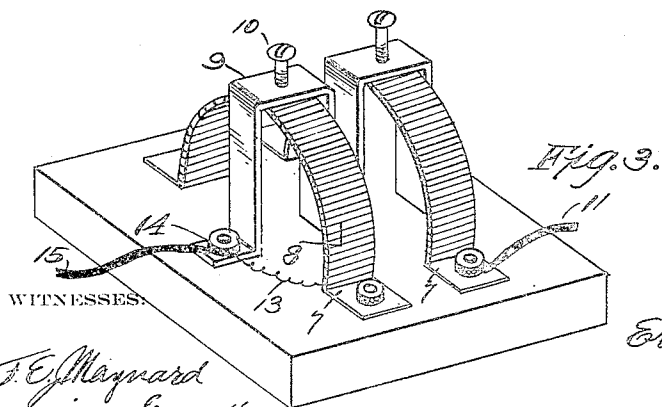
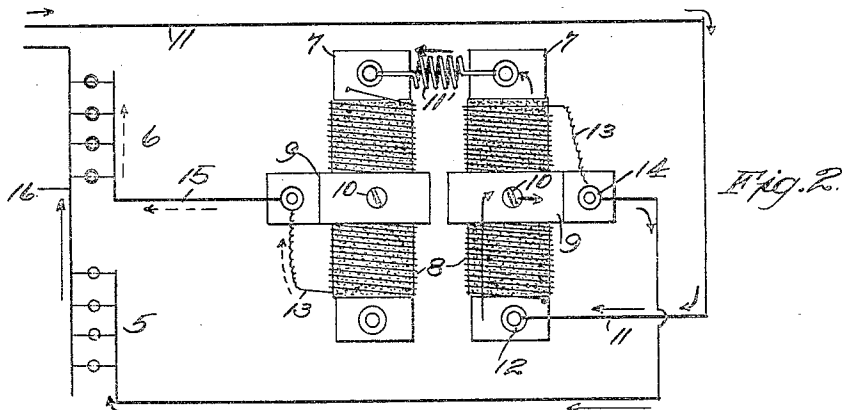
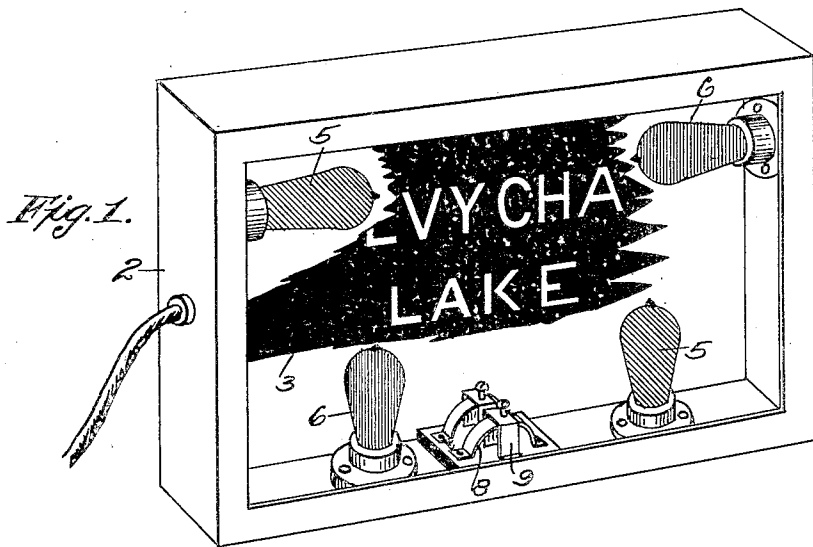


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 ELECTRIC FLASHER FOR MULTIPLE SETS OF LAMPS.
 APPLICATION FILED MAR. 23, 1914.

1,127,655.

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ELECTRIC FLASHER FOR MULTIPLE SETS OF LAMPS.

1,127,655.

Specification of Letters Patent.

Patented Feb. 9, 1915.

Application filed March 23, 1914. Serial No. 926,511.

To all whom it may concern:

Be it known that I, ERNEST C. LORENZ, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Electric Flashers for Multiple Sets of Lamps, of which the following is a specification.

This invention relates to flasher for electric lights, particularly where it is desired to attain novel lighting effects by causing different colored lights to flash at intervals either alternately or at different rates of speed, or to occasionally blend their colors.

The object of the present invention is to provide means for automatically controlling the energization of a multiplicity of electric lights which may be mounted in independent circuits, the means comprising an apparatus whereby the lamps or sets of lamps can be independently energized for predetermined periods of time, and deenergized immediately, said means further providing for the energization of the lights of the independent circuits so that the lamps, which may be of different colors, can be flashed for periods of time which relatively overlap, causing the multiple lights to be illuminated at one time; the device automatically operating to cut out the energizing circuit.

It is an important object of the present invention to provide a light-flashing apparatus which is independent of any moving, mechanically actuated parts, and dispense with a motor, and which is operable with rapidity.

The present invention comprises in combination with multiple circuits of electric lamps, temperature operated circuit controllers, each with means for varying the period of time during which the respective lamps are energized or deenergized.

The present invention is particularly useful in display or sign apparatus, and is designed to eliminate the use of motors and driving mechanism, thus eliminating the initial cost of the motors and mechanism, and saving directly the cost of operation of the motor.

The present invention includes means which are directly mounted in the lighting circuits and are controlled by, and consume only a fraction of, the actual lighting current.

Figure 1 is a perspective of a sign, em-

bodying the present invention. Fig. 2 is a diagrammatic view showing the flashing circuits. Fig. 3 is a perspective of an approximately full-size scale showing the flashers.

At 2, there is shown a box or casing provided with a front sign-bearing panel 3, which may be of suitable material, and which may be provided with opaque, translucent or transparent portions, and colored as desired. Within the casing 2 are mounted in suitable electric circuits, groups of lights 5 and 6, the lamps comprising each group being of similar color, and the groups being varicolored.

The energization of the groups of lights is controlled by a flasher or flashers shown in Fig. 3 as comprising arcuate, thermoelectric conductors 7, preferably of thin metal, of which there is one in each individual flasher, each conductor being wound with a resistance wire 8 insulated from the metal of the conductor 7; the function of the resistance coil being, when energized, to heat its core or conductor 7 so that the latter will expand into contact with a circuit-closing bridge shown as a U-shaped member 9, arranged transversely over the expansible arch 7. The bridge piece, or conductor 9, is preferably provided with an adjustable contact member or screw 10, the lower end of which is movable toward or from the upper adjacent part of the expansible arch 7, the distance of the tip of the screw 10 from the crown of the expansible arch 7 determining the length of time elapsing before the expansible arch 7 will electrically contact with the screw 10, due to the heat produced by the passage of the current of electricity through the heating coil 8 wound upon the thermostatic arch 7. The wiring for the apparatus is clearly shown in Fig. 2 in which 11 is a lead wire or feeder connected by a binding-post 12 to an end of one of the flasher arch members 7. In Fig. 2 two of the flashers are shown as connected to the feed wire 11. In order that an electric circuit will be closed constantly through the flasher arch members 7, the ends of the heating coils 8 are grounded upon their respective members, and a fine conductor 13 connects the arch member 7 to its bridge member 9, each of which is provided with a binding-post 14, from which runs a lamp circuit wire 15 which extends to and connects with the lamps 5 or 6 as the case may be, these lamp

circuits joining a common return or feed line 16.

The first or primary closed circuit is as follows: Following along the line 11 current is delivered to the arch members 7 at their binding-posts 12, thence the current flows through the resistance windings 8 of each, and over the fine or resistance wire 13 to the binding-posts 14 from which the current wires 15 convey current to their lamps 5 and 6 which are joined to the common or return line 16, thereby completing the circuit, including the resistance coils 8. Assuming that the operator has previously adjusted the contact members or screws 10 of each flasher at different distances as to their respective expansile arch members 7, then as soon as one of the respective arch members expands sufficiently, due to heating by its resistance coil, and is forced into contact with its respective contact screw or pin 10, then a circuit will be closed, and its respective bridge or conductor 9 over its circuit wire 15 to energize its group of lamps, group 5. Owing to the cutting out of the resistance coil 8 the current will flow freely through the contact screw 10 and line 15 to the group 5 with sufficient force to fully energize its lamps; whereas, when the current is traversing the resistance coil 8, before the short circuit has been made at the screw 10, engaging the expansile arch 7, the quantity of current reaching the wire 15 through the resistance wire 13 will be insufficient to energize its light group.

When any of the arch members or flashers 7 have been expanded into engagement with its respective screw 10 so that the load is taken from the resistance coil 8, the latter will cool in temperature and allow a loss of temperature in its respective core or arch member 7, and the latter will shrink away from electrical contact with its circuit-closing bridge screw 10, whereupon the load of the current will again be thrown in the resistance coil 8, and the heating of the same will cause the reexpansion of the thermostatic arch member 7, which will again close its circuit at the short-circuiting screw 10 of a member 9. From this it will be seen that by the adjustment of the circuit-closing screw or member 10 of each of the flashers toward or from its cooperative expansile conductor 7, the length of time elapsing between the successive closures of a circuit by the engagement of the expansile member 7 with its contact member 10 will be accurately and easily controlled and determined; for instance, if it is desired to illuminate the red group of lamps 6 at frequent and short intervals, its respective contact screw 10 would be adjusted so that its tip would be spaced from the crest of thermic arch 7 and this would be required to expand across the intervening space before

engaging the screw tip so that if the latter is adjusted at a point remote from the crest of the arch member 7, this will expand to its maximum degree before engaging the tip. Then as soon as the engagement or contact is complete and the current short-circuited from the conductor 7 to the conductor 9, it will be seen that upon the cooling of the member 7 it will quickly retract from contact with the screw point and thus extinguish the light; the retraction being very quick as the cooling of the arch member 7 begins, owing to the loss of heat in the thermic coil when the current has been short-circuited.

If it is desired to produce long period flashes, for instance, of the green lamps 5, then the screw contact of the respective flasher device would be adjusted to close to the crest of its respective arch, when the latter is cool. Then when current is turned into the heat coil 8 the expansion of the arch member 7 would quickly bring it into contact with the closely adjusted screw 10. Owing to the continued expansion of the arch, while remaining in engagement with the screw, the length of the flash or illumination of the lamps would be the desired time controlled by the position of the screw contact as stated, in close proximity to the arch member 7. Between the minimum period of flash and the maximum period of flash any intervening periods may be obtained by varying the position of the contact screw. After the adjusting contact members 10 of the several flashers have been adjusted as desired, the lights of the several groups will continue to be automatically flashed and extinguished, the groups operating independently of one another, and each having a different period of flashing and expansion, this effect being accomplished by the same current passing through the flash-controlling devices, as that which energizes the lamps, and therefore extraneous mechanism and other independent circuits consuming additional electricity are entirely eliminated.

Not only have I succeeded in eliminating electromagnetic mechanism with movable elements and eliminating all forms of operating and extraneous mechanism, but a further advantage is that by the present means I have provided a flashing system which is of a practically constantly closed circuit, and the variation of the intensity of the strength to the lamps is produced without any tendency of sparking in the flashing devices, because of the fact that there are no circuits which are opened and closed and which would tend to produce arcs. The thin aluminum arch 7 cools and heats quickly, thus permits and produces rapid flashing in succession because of the speed of movement during expansion and

contraction of the thermo members. The members 7 may be preferably connected by an open coil, copper connector 11' which serves to radiate heat derived from the members, and this prevents heat trans-
5 missions.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

10 An electric light flashing and dimming apparatus, comprising in combination, a plurality of sets of lamps, an arched ex-
pansible conductor for each set of lamps, a fixed contact member mounted over the top
15 of each arched conductor and having a connection with its respective set of lamps, an

insulated resistance coil wound around each expansible conductor and having one terminal connected to the front end of its supporting conductor and its opposite end con-
20 nected to its respective fixed contact, feed wires connected to said expansible conductors and a return wire connected to said sets of lamps.

In testimony whereof I have hereunto set
25 my hand in the presence of two subscribing witnesses.

ERNEST C. LORENZ.

Witnesses:

O. C. KIEFER,
F. E. MAYNARD