

Jan. 1, 1935.

E. R. COMER

1,986,251

ELECTRIC DISPLAY DEVICE

Filed Dec. 9, 1933

2 Sheets-Sheet 1

Fig. 1.

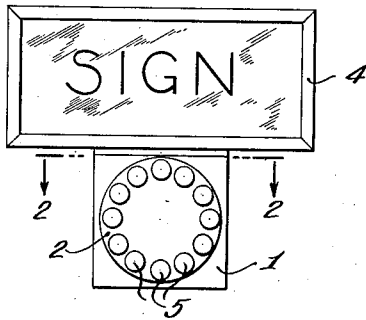
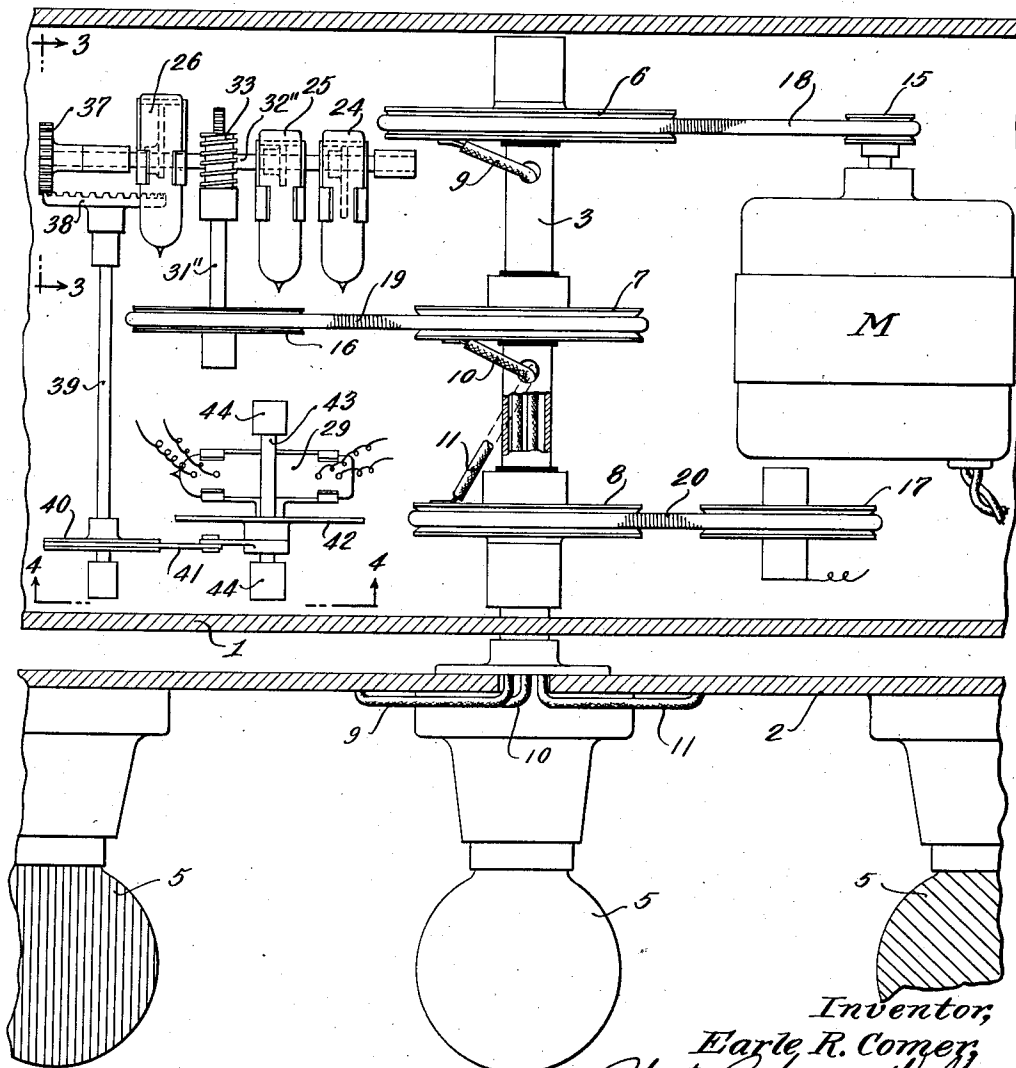


Fig. 2.



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Fig. 3.

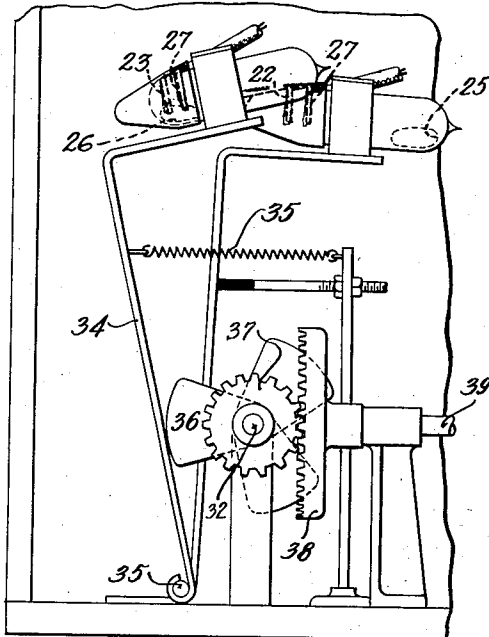


Fig. 4.

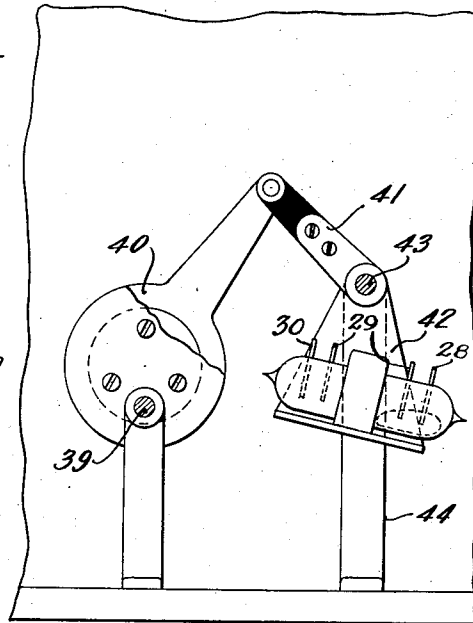


Fig. 5.

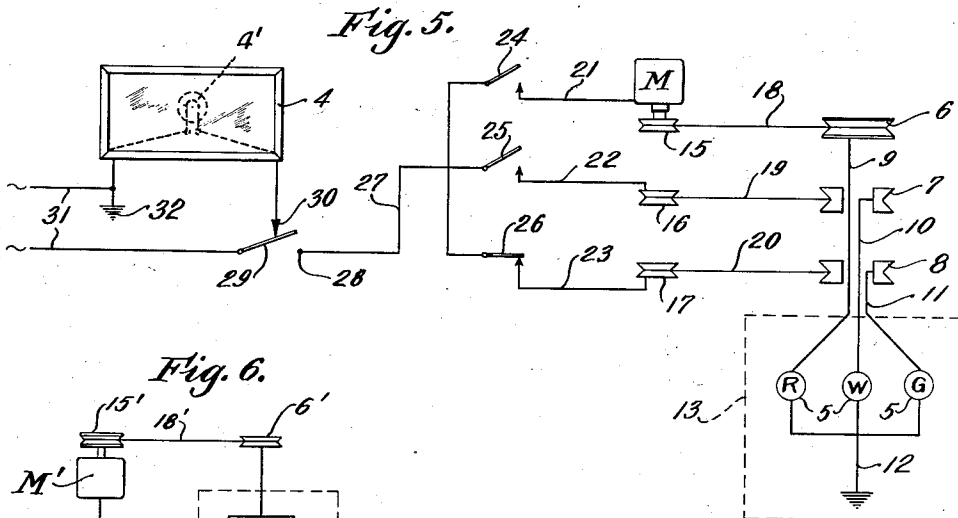
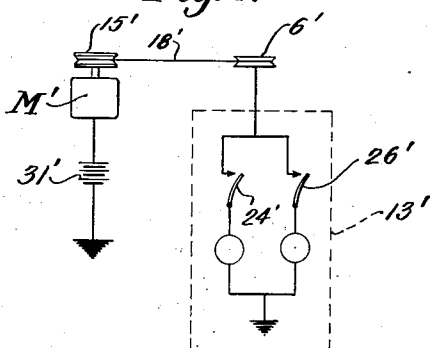


Fig. 6.



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UNITED STATES PATENT OFFICE

1,986,251

ELECTRIC DISPLAY DEVICE

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Application December 9, 1933, Serial No. 701,675

7 Claims. (Cl. 40—130)

This invention relates to electric display devices of the type having a rotor carrying lights and means for opening and closing the circuits of the lights while the rotor is revolving.

5 The principal objects of the invention are to produce a unique lighting effect involving the appearance of a continuous circle of light which changes color periodically, and to provide improved means for controlling rotor circuits which is free from the objectionable features of brushes and slip rings and which is characterized by long life and freedom from sparking.

10 According to this invention the lights are mounted on the rotor in an annular row which is approximately concentric with the axis of the rotor, successive lights differing in color along the row to provide a plurality of sets of differently colored lights similarly disposed with relation to the axis, the lights of different colors preferably being interspersed in regular sequence, and suitable means are provided to light the sets in sequence while the rotor is revolving, thereby to produce a circle of light which changes color as the sets are lighted in sequence.

15 The invention also comprises rotor current-supplying means involving a shaft for the rotor, one or more insulated pulleys on the shaft connected to the rotor lights, a conducting pulley aligned with each insulated pulley, and conducting belts, preferably in the form of coil springs, encircling each pair of aligned pulleys. The belts are utilized not only for conduction of current to the rotor but preferably also for driving purposes such as driving the rotor shaft by a motor, driving switching mechanism from the rotor shaft, etc.

20 In another aspect the invention involves means of various kinds for controlling the various light sets while the rotor is revolving. For example, in one embodiment the sets are connected to a main circuit through branches including thermostatic switches mounted on the rotor, and in another embodiment the circuits leading to the various sets extend through mechanically operated switches off the rotor. In either case the rotor is preferably associated with a stationary display device, with switching means synchronized with the rotor for lighting the two devices alternately.

25 For the purpose of illustration typical embodiments of the invention are shown in the accompanying drawings in which,

- 30 Fig. 1 is a front elevation;
Fig. 2 is a section on line 2—2 of Fig. 1;
Fig. 3 is a section on line 3—3 of Fig. 2;
Fig. 4 is a section on line 4—4 of Fig. 2;
35 Fig. 5 is a circuit diagram; and
Fig. 6 is a circuit diagram of a modification.

40 The particular embodiment of the invention illustrated in Figs. 1 to 5 comprises a casing 1, a rotor 2 mounted on the forward end of a shaft 3 projecting through the forward face of the cas-

ing 1, and another casing 4 mounted on the casing 1, the casing 4 having a transparent front face for displaying a sign by means of suitable lighting means 4' inside the casing 4.

45 The rotor 2 carries an annular row of lights 5 on its forward face near its periphery, successive lights differing in color along the row to provide a plurality of sets of differently colored lights similarly disposed with relation to the axis of the rotor. In the illustrative example the lights are divided into three sets, such as red, white and green, the lights of the different colors preferably being interspersed in regular sequence, such as red, white, green, red, etc.

50 Mounted on the shaft 3 inside the casing 1 are three pulleys 6, 7 and 8. As shown in Fig. 2 these pulleys are insulated from the shaft 3 and each pulley is connected to one of the three sets of lights on the rotor through a conductor, such as 9, 10 and 11, these conductors extending through the hollow shaft 3 and thence to the different light sets. The other sides of the lights 5 may be grounded on the rotor to form a common return as illustrated at 12 in Fig. 5 where the broken outline 13 represents the rotor.

55 Aligned with the pulleys 6, 7 and 8, respectively, are secondary pulleys 15, 16 and 17 and interconnecting each pair of aligned pulleys is a metallic belt, preferably in the form of a coil spring, these belts being shown at 18, 19 and 20.

60 As shown in Fig. 5 the circuits for the three light sets on the rotor extend through the pulleys and belts respectively, thence through conductors 21, 22, 23, switches 24, 25 and 26, the three branches then joining in a main circuit 27 which extends to one contact 28 of a single-pole, double-throw switch 29, the other contact 30 of which extends to the lighting means inside the casing 4. A suitable source of current is connected to the circuit 31; one side of which is grounded at 32 and connected to the other terminal of the sign 4 and the other side of which extends to the switch 29. Thus when the switch 29 is in the position shown in Fig. 5 the sign 4 is illuminated and when the switch 29 is in the opposite position one or more of the sets of lights on the rotor are illuminated depending upon the positions of the switches 24, 25 and 26, these switches being controlled as follows:

65 The pulley 16 drives a shaft 31' which is geared to a cross shaft 32' as indicated at 33 in Fig. 2. Adjacent the shaft 32 the three switches 24, 25 and 26 are mounted on arms 34 pivoted at 35. These arms are normally urged toward the shaft 32 by means of springs 35 and the shaft 32 carries three cams 36, spaced 120° apart around the shaft, to move the switches into circuit closing position in sequence, the switch 26 being shown in circuit closing position and the switches 24 and 25 being shown in open-circuit position. The

switch 29 is driven from the shaft 32 through the gears 37 and 38, a shaft 39, an eccentric 40, a link 41 and a switch cradle 42 pivotally supported at 43 on uprights 44. The ratio of gears 37 and 38 is such that during one cycle shaft 32'' makes two revolutions while shaft 39 makes one revolution. During one-half revolution of shaft 39 and one full revolution of shaft 32'' the switch 29 closes the circuit 31-29-28-12 to the rotor lights, the switches 24, 25 and 26 being effective during this half-cycle to light the rotor lamps in sequence; and during the other half revolution of shaft 39 and the next full revolution of shaft 32'' the switch 29 opens the rotor circuits and closes circuit to sign 4, the switches 24, 25 and 26 being ineffective during this half-cycle for the reason that the rotor circuits are open at 28. Inasmuch as the switch shaft 32'' is connected to the rotor shaft 3 through reduction gearing 33 the rotor shaft makes more than one revolution during each cycle of differently colored lights.

In the modification shown in Fig. 6 the rotor 13' carries only two sets of lights R' and G' and the two switches 24' and 26' in the branches of the light circuit comprise thermostatic switches mounted on the rotor. With this arrangement only one conductor need be led from the rotor through the hollow shaft of the rotor, this circuit continuing through pulley 6', belt 18', pulley 15', motor frame M' and thence to a suitable source of current 31', the other side of the source of current being grounded at one side of the branch circuit of the rotor being grounded as illustrated in Fig. 6.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. An electric sign comprising a rotor, an annular row of lights mounted on the rotor approximately concentric with the axis thereof, successive lights differing in color along the row to provide a plurality of sets of differently colored lights similarly disposed with relation to the said axis, means for lighting said sets in sequence, and means to turn the rotor at a speed high enough to produce a circle of light which changes color as the sets are lighted in sequence and at a rate greater than one revolution per sequence of lights.

2. An electric sign comprising a rotor, a plurality of sets of differently colored lights mounted on the rotor approximately equi-distantly from the axis thereof, the lights of the different colors being interspersed in regular sequence, means for lighting said lights in sequence while the rotor is revolving, and means to turn the rotor at a speed high enough to produce a circle of light which changes color as the sets are lighted in sequence and at a rate greater than one revolution per sequence of lights.

3. An electric sign comprising a rotor, a plurality of sets of differently colored lights on the rotor, a shaft for driving the rotor, insulated

pulleys on the shaft connected to said sets respectively, conducting pulleys aligned with said pulleys, conducting belts extending around each pair of pulleys respectively, said conducting pulleys being connected to circuits for supplying current to said light sets respectively, a switch in each of said circuits, and means driven by one of said conducting pulleys for closing said circuits in sequence, thereby to light said sets in sequence.

4. An electric sign comprising a rotor, a plurality of sets of differently colored lights on the rotor, a shaft for driving the rotor, insulated pulleys on the shaft connected to said sets respectively, conducting pulleys aligned with said pulleys, conducting belts extending around each pair of pulleys respectively, said conducting pulleys being connected to circuits for supplying current to said light sets respectively, and a motor for driving said shaft through one of said conducting belts and associated pair of pulleys.

5. An electric sign comprising a rotor, a plurality of sets of differently colored lights on the rotor, a shaft for driving the rotor, a motor, conducting pulleys on said shaft and motor, and a conducting coil-spring belt kinematically interconnecting the two pulleys, the shaft pulley being insulated from the shaft and interconnecting with said lights by a conductor extending along the shaft, whereby the lights on the rotor may be supplied with current through said belt and pulleys.

6. An electric sign comprising a stationary display device, a rotor, a plurality of sets of differently colored lights on the rotor, a shaft for driving the rotor, insulated pulleys on the shaft connected to said sets respectively, conducting pulleys aligned with said pulleys, conducting coil-spring belts extending around each pair of pulleys respectively, said conducting pulleys being connected to branches of a circuit for supplying current to said light sets respectively, a switch in each of said branches, a two-way switch in the main circuit, one side of which is connected to said branches and the other side of which is connected to said stationary display device, and means for actuating said switches in succession, whereby the display device is lighted during a portion of each cycle and the light sets are lighted during other portions of the cycle.

7. An electric sign comprising a stationary display device, a rotor, a plurality of sets of differently colored lights on the rotor, a shaft for driving the rotor, means associated with said shaft for conducting current to said sets from a main circuit through branches leading to said sets respectively, a switch in each of said branches, a two-way switch in the main circuit, one side of which is connected to said branches and the other side of which is connected to said stationary display device, and means for actuating said switches in succession, whereby the display device is lighted during a portion of each cycle and the light sets are lighted during other portions of the cycle.

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