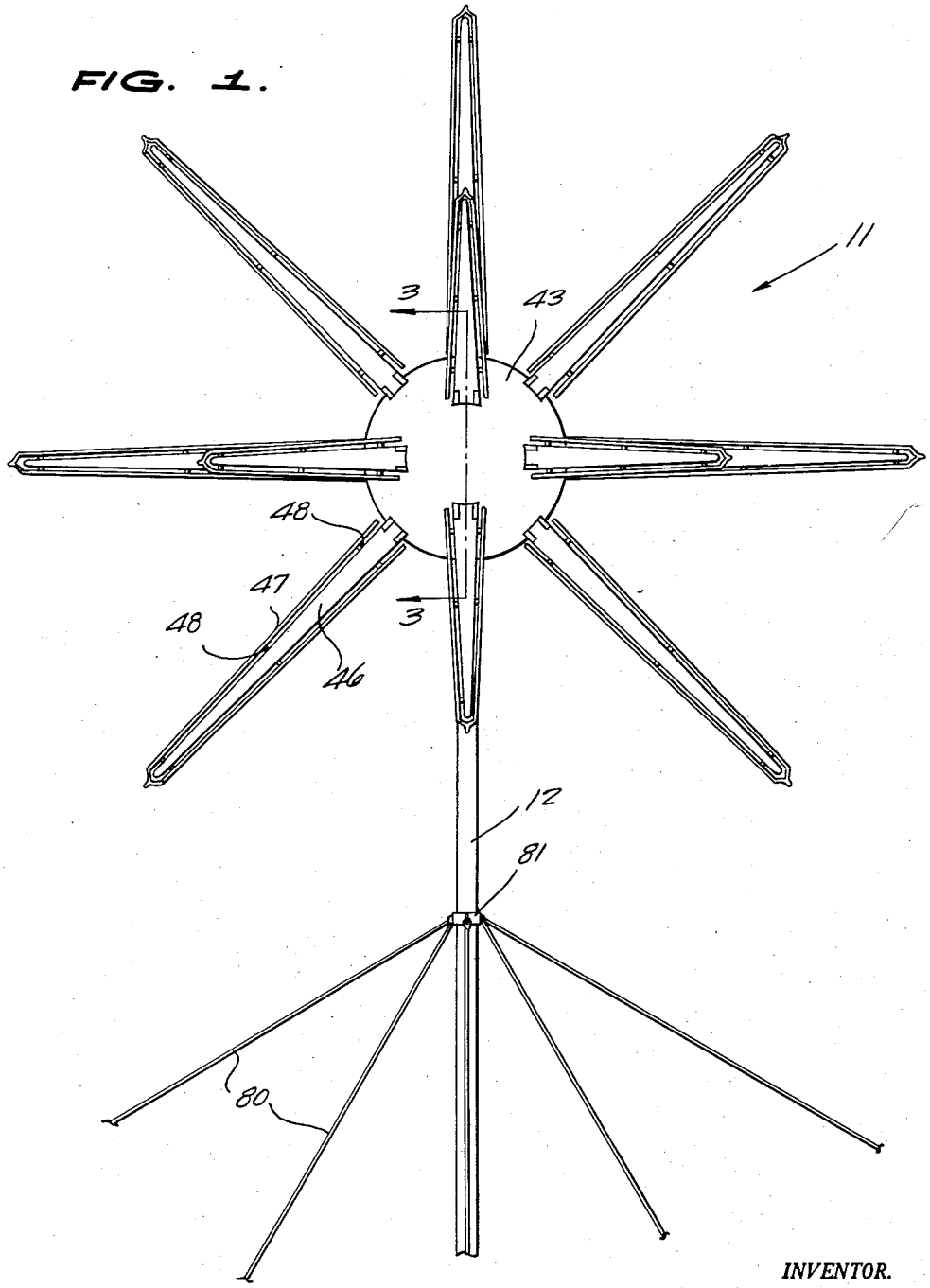
Feb. 21, 1961 W. D. MILKS 2,972,202

ELECTRIC DISPLAY DEVICE

Filed July 29, 1960 3 Sheets-Sheet 1

FIG. 1.



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ELECTRIC DISPLAY DEVICE

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FIG. 2.

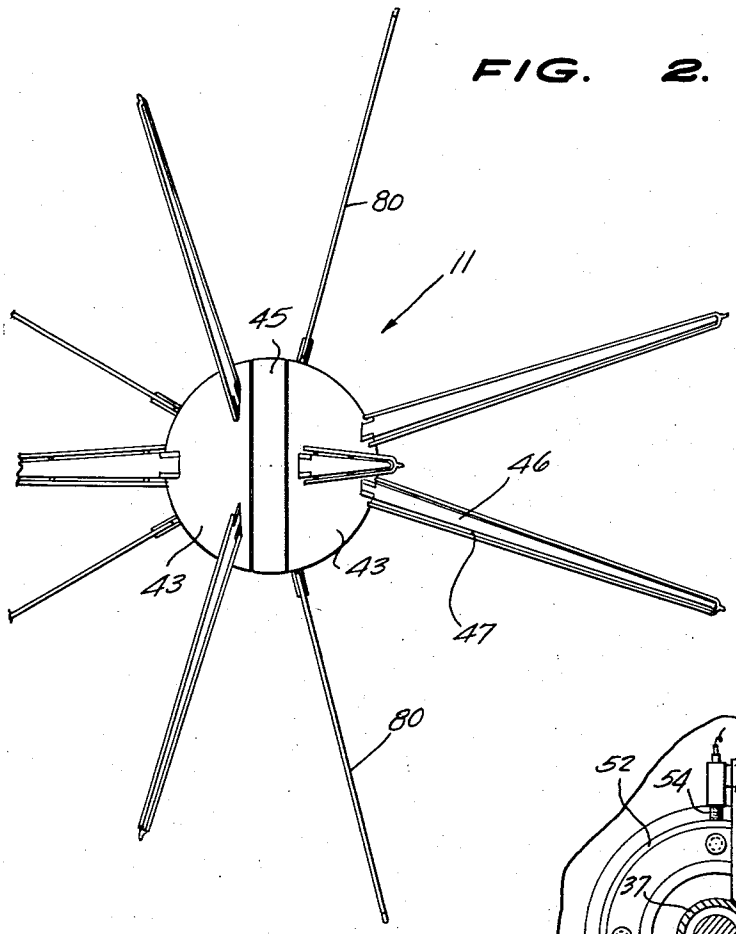


FIG. 4.

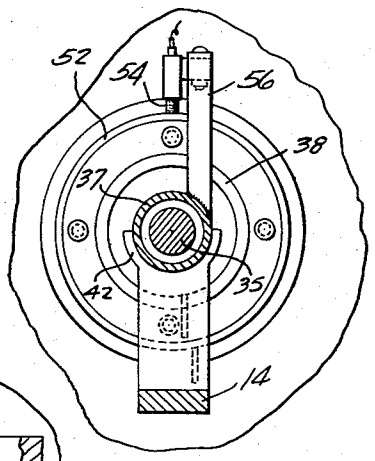
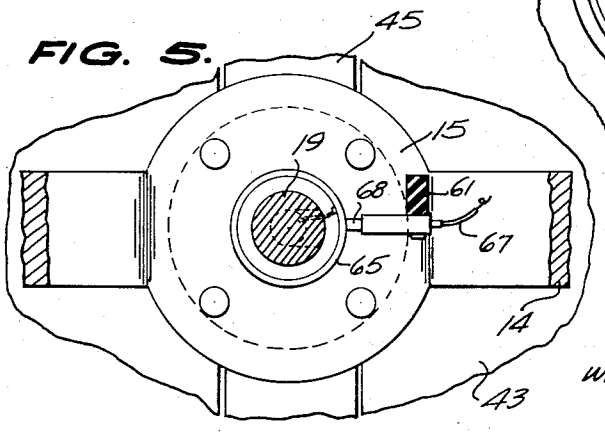


FIG. 5.



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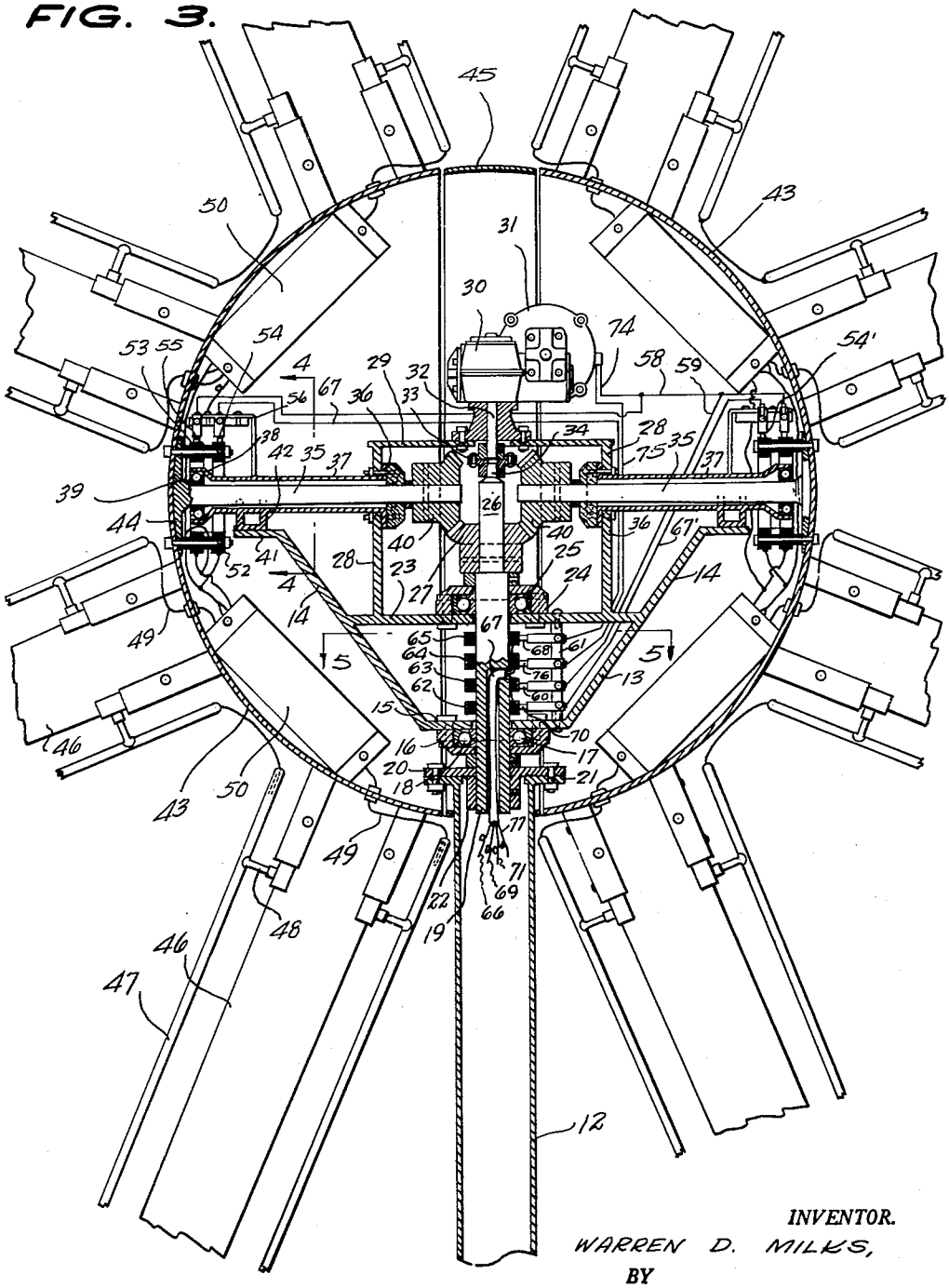
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FIG. 3.



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2,972,202

ELECTRIC DISPLAY DEVICE

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Filed July 29, 1960, Ser. No. 46,141

8 Claims. (Cl. 40—33)

This invention relates to display devices, and more particularly to an electric display device which includes illuminated elements rotating with respect to each other and also with respect to a stationary support on which the device is mounted.

A main object of the invention is to provide a novel and improved electric display device which includes lamp elements mounted so as to project from the device and provided with means to rotate certain of the lamp elements with respect to other of the lamp elements in opposite directions and also provided with means to rotate the main portion of the assembly around a stationary support, the device involving relatively simple components, being highly attractive, and being reliable in operation.

A further object of the invention is to provide an improved illuminated electric display device which involves relatively inexpensive components, which is durable in construction, and which provides a highly unusual and spectacular visual effect.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a side elevational view of an improved electric display device constructed in accordance with the present invention.

Figure 2 is a fragmentary top view of the electric display device of Figure 1.

Figure 3 is an enlarged vertical cross sectional view taken substantially on the line 3—3 of Figure 1.

Figure 4 is an enlarged vertical cross sectional view taken substantially on the line 4—4 of Figure 3.

Figure 5 is an enlarged horizontal cross sectional view taken substantially on the line 5—5 of Figure 3.

Referring to the drawings, 11 generally designates a display device constructed in accordance with the present invention. The display device 11 comprises an upright tubular supporting standard 12 adapted to be rigidly secured to a suitable support, for example, to a portion of the roof of a building, at a conspicuous location. Designated at 13 is a supporting frame which is rotatably mounted on the top end of the standard 12, the frame 13 comprising a pair of upwardly and outwardly inclined arms 14, 14 integrally connected at their inner ends to a disc member 15 which is secured to the outer housing collar 16 of a ball bearing assembly 17, the inner collar element 18 of the bearing assembly being secured to an upstanding vertical shaft member 19 which is rigidly fastened to the top end of the tubular standard 12. Thus, the axial shaft element 19 has rigidly secured thereto an outwardly extending annular flange 20 which is bolted to the outwardly extending annular flange 21 provided on the top end of the tubular standard 12. The housing member 16 is rotatably supported on a bearing washer 21 secured around the upstanding shaft element 19 and supported on the flange 20. Flange 20 is provided with a depending guide collar 22 which receives the lower portion of the upstanding shaft element 19 and which is rigidly secured thereto.

The intermediate portions of the arms 14, 14 are rigidly connected by a horizontally extending plate member 23 which rotatably supports the upper portion of the shaft member 19. Thus, the shaft member 19 extends rotatably through an aperture 24 provided in the center of the member 23 and is journaled thereto by a ball bearing assembly 25 similar to the ball bearing assembly 17. Shaft member 19 is provided with a reduced top portion 26 on which is secured a bevel gear 27.

Designated at 28, 28 are respective upstanding vertical wall elements formed integrally with the horizontal plate-like member 23 adjacent the inclined arms 14, 14, the top ends of the wall members 28, 28 being integrally connected by a horizontally extending top wall member 29. Mounted on the top wall member 29 is a speed reduction unit 30 which is part of a motor assembly 31, the motor 31 and reduction unit 30 having a unitary housing which is rigidly connected to the top wall 29 so that the motor is supported by and moves with the frame 14. The shaft 32 of the motor is axially aligned with the shaft element 26 and is drivingly coupled thereto by a coupling assembly 33.

As shown in Figure 3, the top end of the shaft element 26 is formed with a further reduced portion 34 which is substantially the same diameter as the depending vertical motor shaft element 32, and the assembly 33 comprises a conventional sleeve arrangement including opposite end portions receiving the shaft elements 32 and 34 and fastened thereto by set screws or similar locking means.

As will be readily apparent, since the motor 31 and the speed reduction unit 30 are rigidly fastened to the frame 13, energization of the motor develops a torque between the shaft element 32 and the shaft element 19 which causes the frame 13 to rotate around the stationary shaft element 19.

Designated at 35, 35 are respective opposing, horizontally extending shaft members which are journaled in axial alignment in the upper portions of the respective vertical wall members 28, 28, as by means of suitable ball bearing assemblies 36, 36. The shaft members 35 are contained in respective tubular housings 37, 37, rigidly secured to the upper portions of the wall members 28, 28 coaxially with the shaft members 35, 35. The tubular housings 37 are provided at their outer ends with enlarged bell portions 38 which contain ball bearing assemblies 39 rotatably supporting the outer end portions of the shaft elements 35. Rigidly secured to the inner ends of the shaft elements 35 are bevel gears 40 which are in meshing engagement with the bevel gear 27, so that the shaft elements 35, 35 are rotated simultaneously but in opposite directions, responsive to the rotation of the frame 13 around the shaft member 19.

The top end portions of the arms 14, 14 are provided with horizontal flanges 41 on which are mounted supporting brackets 42 which supportingly receive the outer end portions of the tubular sleeve members 37, the bracket members 42 being located relatively closely adjacent to the bearing housing elements 38 so that the load on the ball bearing assemblies 39 is transmitted in a substantially direct manner to the supporting arms 14, 14 of frame 13.

Designated at 43, 43 are respective generally hemispherical housing segments which are centrally secured in opposing relationship to the outer ends of the shaft member 35, for example, being secured to circular disc elements 44 integrally formed with the outer ends of the shaft elements 35. Disposed between but spaced from the inner edges of the opposing housing segments 43, 43 is a generally circular ring member 45 which is rigidly secured to the frame 13 and which is of sufficient width to substantially fill the space between the inner peripheral edges of the opposing housing segments 43, 43, while al-

lowing said housing segments to rotate freely with respect thereto.

As shown in Figure 3, the opposing housing segments 43, 43 and the intervening ring member 45 substantially define a hollow sphere which is bodily rotatable around the vertical axis of the stationary standard 12 but wherein the opposing segments 43, 43 are rotatable around the horizontal axis defined by the aligned shaft elements 35, 35, the housing segments 43, 43 being rotated in opposite directions simultaneously with the rotation of the frame 13, as above described, because of the gearing cooperation between the bevel gears 40 and the bevel gear 27.

Rigidly secured to the rotatable housing segments 43 are a plurality of outwardly projecting radial arms 46 which may be formed of any suitable material, such as sheet metal, or the like, and to which are secured respective generally U-shaped tubular gas discharge lamps 47, the lamps extending around and being substantially parallel to the edges of the arms 46, as is clearly shown in Figure 1, so as to thereby define the outlines of said arms. The tubular gas discharge tubes 47 may comprise neon tubes, or other suitable gas discharge tubes of conventional construction. The tubes 47 are secured to the marginal portions of the arms 46 by conventional supporting brackets 48 spaced along the tubes, in the manner shown in Figure 1.

Each pair of successive tubes 47 is electrically connected in series, and the terminal wires 49, 49 of the serially connected pair of tubes are connected to the respective secondary terminals of a conventional gas discharge tube transformer 50 mounted in the associated housing segments 43 adjacent the inner ends of the associated arms 46, 46, as shown in Figure 3. The respective terminals of the primary windings of the transformers 50 are connected to respective pairs of slip rings 52 and 53 mounted on and secured to the inner center members 44 associated with the segments 43 and surrounding the outer end portions of the associated tubular housing members 37, the slip rings 52, 53 being suitably insulated from each other and from the supporting center members 44. The slip rings 52 and 53 are engaged by respective brushes 54 and 55 mounted on but insulated from supporting brackets 56 rigidly secured to the associated tubular housing members 37, as shown in Figure 3.

The brushes 55 are connected to a common energizing wire 58 which is in turn connected by a wire 59 to one of the brushes 60 mounted on a multiple brush supporting assembly 61 provided in the lower portion of the frame 13 and disposed adjacent four slip rings 62, 63, 64 and 65 mounted one above the other on the shaft member 19 and suitably insulated therefrom and from each other. Thus, the brush 60 engages the slip ring 63 and is thus electrically connected to an energizing line wire 66 contained in a suitable multiple conductor cable 67 extending through a suitable passage provided therefor in the shaft member 19 and extending from the shaft member through the tubular supporting standard 12.

The remaining primary terminal brush 54 associated with one of the segments is connected by a wire 67 to a brush 68 forming part of the assembly 61, the brush 68 engaging the slip ring 65. Slip ring 65 is connected to an energizing conductor 69 which may be connected to the remaining terminal of the power source through any suitable control device adapted to intermittently open and close the circuit in accordance with a desired schedule of energization of the gas discharge lamps 47 associated with the first side of the device. The remaining primary terminal brush of the other side of the device, shown at 54', is connected by a wire 67' to a brush 70, forming part of the assembly 61, which engages the slip ring 62. Slip ring 62 is connected to an energizing wire 71, forming part of the cable 67, which may be connected to the remaining terminal of the power source through another switching device, adapted to intermittently open and close the energizing circuit of the gas discharge lamps on the side of the display device associated with said brush 54'. Thus, the respective opposite sides of the device may be energized in accordance with different or alternating sequences by providing appropriate switching devices connected in their line wires 69 and 71.

One terminal of the electric motor 31 is connected to the common energizing wire 58 by a wire 74. The remaining terminal of the motor is connected by a wire 75 to the remaining brush 76 of the brush assembly 61, the brush 76 engaging the slip ring 64. The slip ring 64 is connected to a line wire 77. Thus, the motor 31 may be energized by connecting the line wires 77 and 66 to a suitable source of current, for example, the domestic alternating current supply wires. The respective gas discharge lamps on the opposite sides of the device may be likewise energized by connecting the common energizing wire 66 and the remaining line wires 69 and 71 to the alternating current supply wires, a suitable switch device being employed in the lamp energizing wires 69 and 71 to provide a desired sequence of energization of the gas discharge lamps on the opposite sides of the device, if such is desired.

In operation, when the motor 31 is energized, the main body of the device rotates around the vertical axis of the standard 12, as above described, and simultaneously the opposing segments 43, 43 rotate in opposite directions around a horizontal axis defined by the opposing shaft segments 35, 35. The lamps 47 are simultaneously energized, and may flash off and on in a predetermined sequence, either simultaneously, or alternately, in accordance with the switching arrangement employed in the wires 69 and 71. The gas discharge lamps may be of different colors, and therefore the assembly provides a highly attractive and spectacular visual effect.

As shown in Figure 1, the upstanding vertical standard 12 may be suitably supported against excessive swaying by employing a plurality of guy rods 80 secured to a common collar 81 surrounding the standard 12, the lower ends of the rods 80 being suitably anchored to the building or other structure on which the display device is mounted.

While a specific embodiment of an improved electric display device has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. A display device comprising an upright standard, a supporting frame rotatably mounted on said standard, drive means connected between said standard and frame for rotating the frame around the standard, opposing shaft elements journaled in the frame, means rotating said shaft elements responsive to rotation of the frame around the standard, respective opposing housing segments mounted on said shaft elements and defining an enclosure therebetween, and a plurality of outwardly projecting tubular lamps secured to said housing segments.

2. A display device comprising an upright standard, a supporting frame rotatably mounted on said standard, electrically operated drive means connected between said standard and frame for rotating the frame around the standard, opposing shaft elements journaled in the frame, means rotating said shaft elements simultaneously in opposite directions responsive to rotation of the frame around the standard, respective opposing housing segments mounted on said shaft elements and defining an enclosure therebetween, a plurality of outwardly projecting tubular gas discharge lamps secured to said housing segments, and respective energizing transformers mounted in said housing segments and electrically connected to the gas discharge lamps secured to the housing segments.

3. A display device comprising an upright standard, a supporting frame rotatably mounted on said standard, an electric motor mounted on the frame, means drivingly coupling the shaft of said motor to said standard, means to energize the motor, whereby to rotate the frame around the standard, opposing shaft elements journaled in the frame, means rotating said shaft elements simultaneously in opposite directions responsive to rotation of the frame around the standard, respective opposing housing segments mounted on said shaft elements and defining an enclosure therebetween, and a plurality of outwardly projecting tubular lamps secured to said housing segments.

4. A display device comprising an upright standard, a supporting frame rotatably mounted on said standard, an electric motor mounted on the frame, means drivingly coupling the shaft of said motor to said standard, means to energize the motor, whereby to rotate the frame around the standard, opposing shaft elements journaled in the frame, means rotating said shaft elements simultaneously in opposite directions responsive to rotation of the frame around the standard, respective opposing housing segments mounted on said shaft elements and defining an enclosure therebetween, a plurality of outwardly projecting tubular gas discharge lamps secured to said housing segments, and respective energizing transformers mounted in said housing segments and electrically connected to the gas discharge lamps secured to the housing segments.

5. A display device comprising an upright standard, a supporting frame rotatably mounted on said standard, an electric motor mounted on said frame, means drivingly coupling the shaft of the motor to the standard, whereby to rotate the frame around the standard responsive to energization of the motor, opposing shaft elements journaled on said frame, means gearingly coupling said shaft elements to said standard, whereby to rotate the shaft elements responsive to rotation of the frame around the standard, respective opposing housing segments mounted on the shaft elements and substantially enclosing said frame, and a plurality of outwardly projecting tubular lamps secured to said housing segments.

6. A display device comprising an upright standard, a supporting frame rotatably mounted on said standard, an electric motor mounted on said frame, means drivingly coupling the shaft of the motor to the standard, whereby to rotate the frame around the standard responsive to energization of the motor, opposing shaft elements journaled on said frame, means gearingly coupling said shaft elements to said standard and being constructed and arranged to rotate the shaft elements simultaneously in opposite directions responsive to rotation of the frame around the standard, respective opposing housing segments mounted on the shaft elements and substantially enclosing said frame, and a plurality of outwardly projecting tubular lamps secured to said housing segments.

7. A display device comprising an upright standard, a supporting frame rotatably mounted on said standard, an electric motor mounted on said frame, means drivingly coupling the shaft of the motor to the standard, whereby to rotate the frame around the standard responsive to energization of the motor, opposing shaft elements journaled on said frame, means gearingly coupling said shaft elements to said standard and being constructed and arranged to rotate the shaft elements simultaneously in opposite directions responsive to rotation of the frame around the standard, respective opposing housing segments mounted on the shaft elements and substantially enclosing said frame, a plurality of outwardly projecting tubular gas discharge lamps secured to said housing segments, and respective energizing transformers mounted in the housing segments and electrically connected to the gas discharge lamps secured to the housing segments.

8. A display device comprising an upright standard, a supporting frame rotatably mounted on said standard, an electric motor mounted on said frame, means drivingly coupling the shaft of the motor to the standard, whereby to rotate the frame around the standard responsive to energization of the motor, opposing shaft elements journaled on said frame, a first bevel gear fixedly secured to said standard, additional bevel gears secured to said shaft elements and meshing with said first bevel gear, whereby to rotate the shaft elements simultaneously in opposite directions responsive to rotation of the frame around the standard, respective opposing housing segments mounted on the shaft elements and substantially enclosing said frame, a plurality of outwardly projecting tubular gas discharge lamps secured to said housing segments, and respective energizing transformers mounted in the housing segments and electrically connected to the gas discharge lamps secured to the housing segments.

No references cited.