

July 28, 1964

JAMES W. KECK
CHRISTMAS TREE STAND

3,142,269

Filed Feb. 15, 1963

3 Sheets-Sheet 1

FIG. 1.

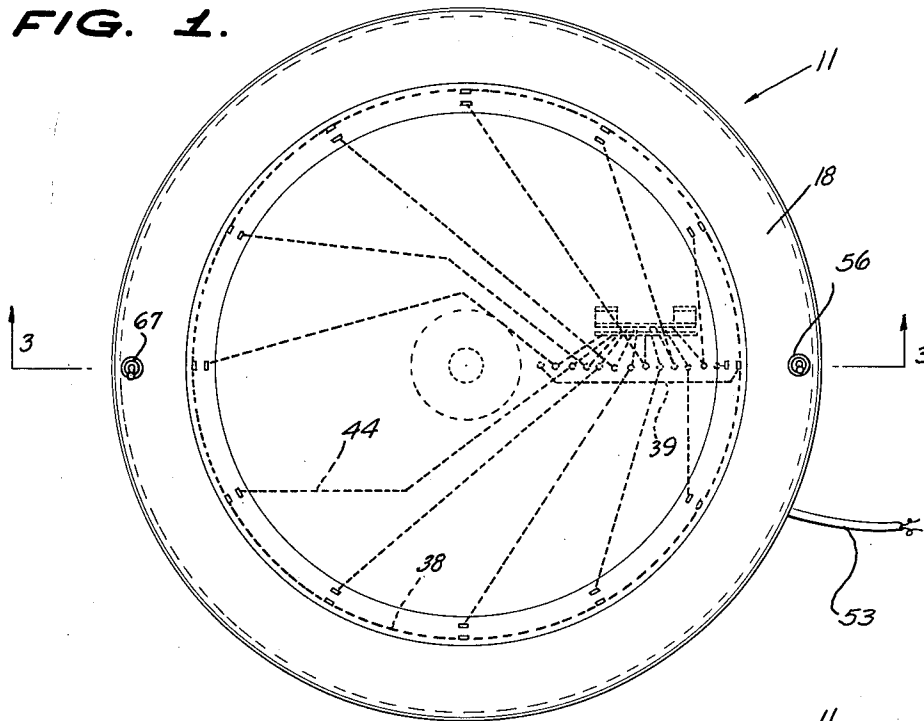


FIG. 2.

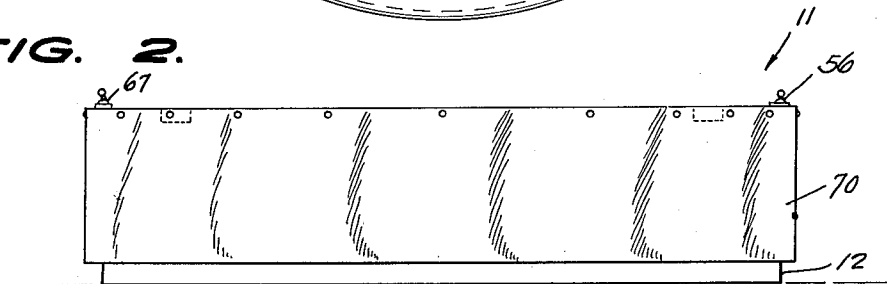
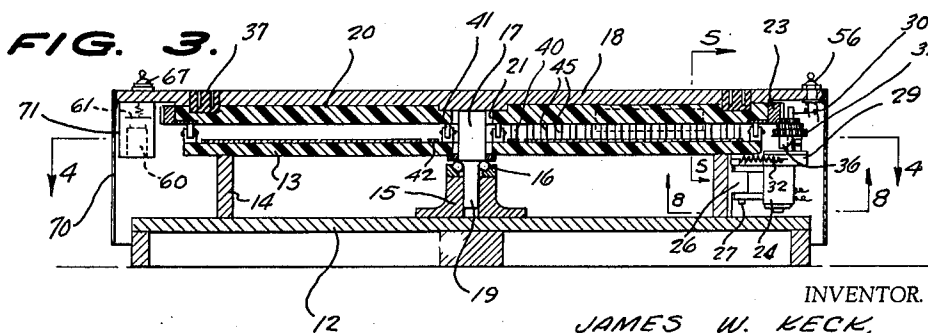


FIG. 3.



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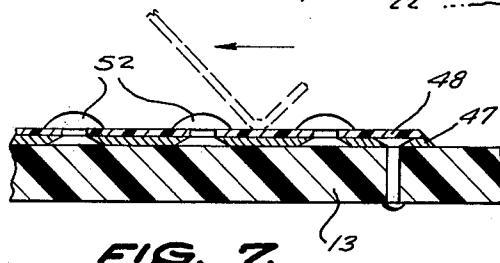
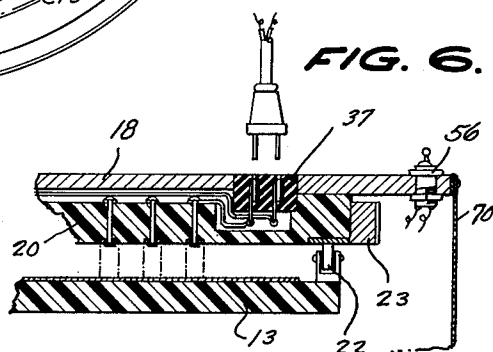
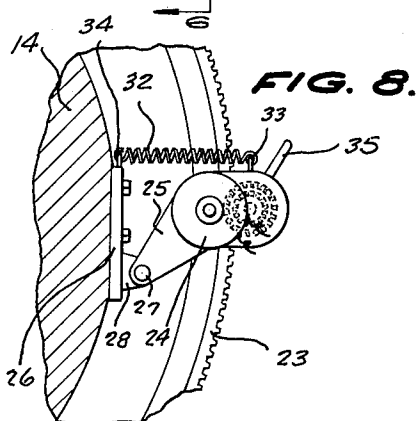
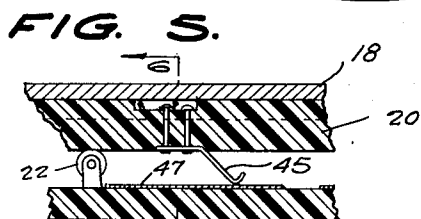
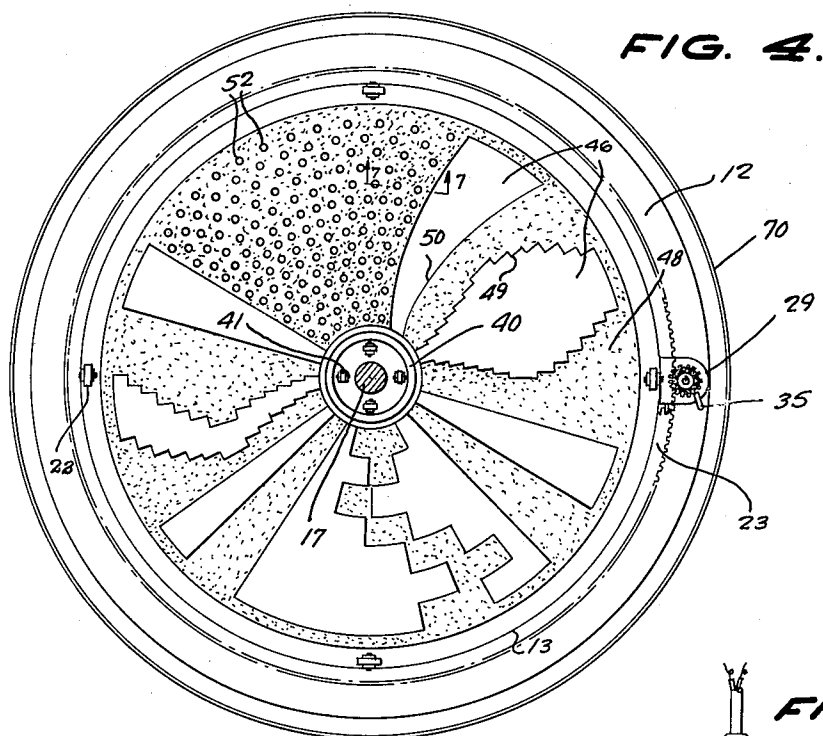
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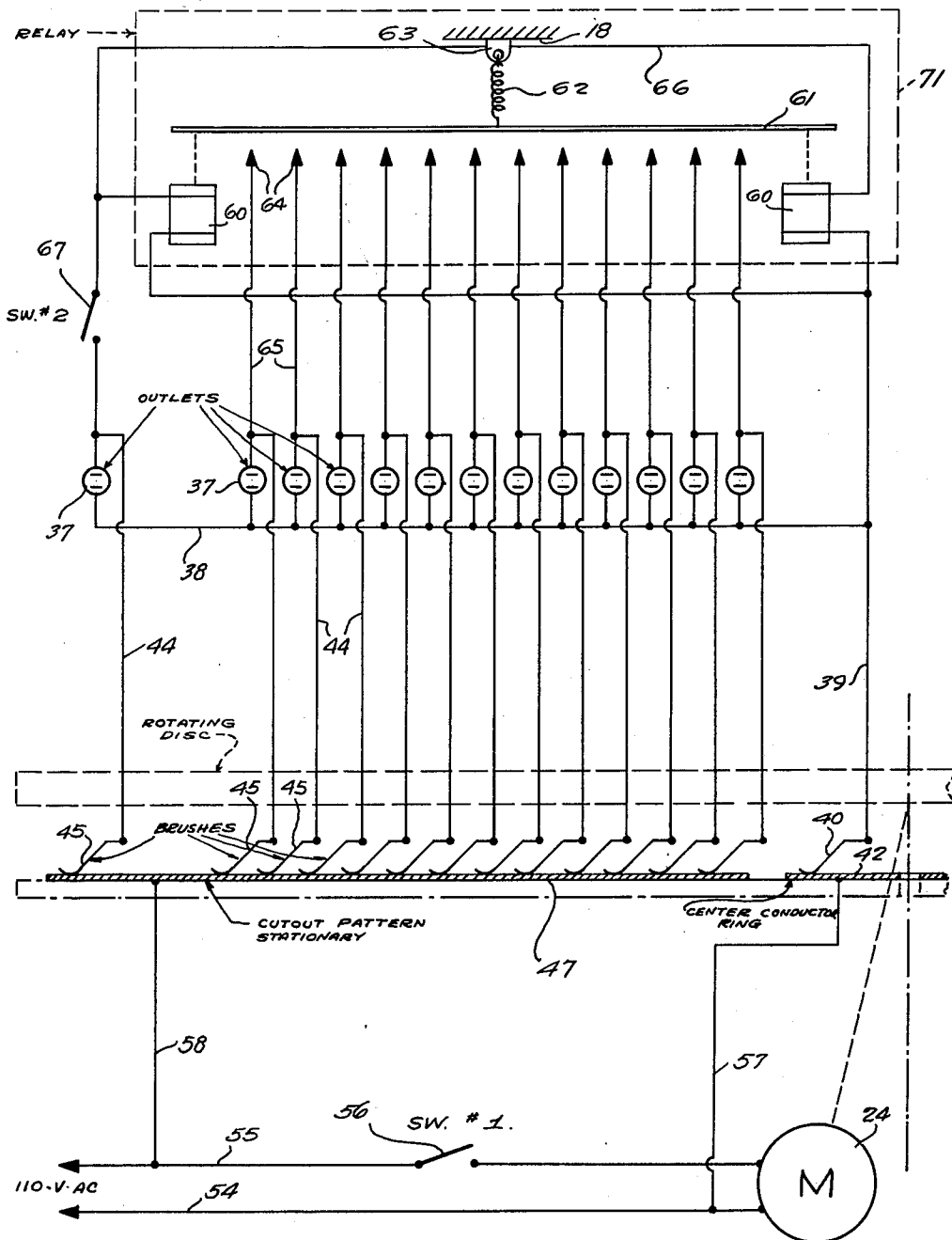


FIG. 9.

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Filed Feb. 15, 1963, Ser. No. 258,703

6 Claims. (Cl. 148-20)

This invention relates to rotating stands or supports, and more particularly to a stand for rotatably supporting an illuminated Christmas tree and for intermittently energizing the circuits of strings of lamps on the tree.

A main object of the invention is to provide a novel and improved display stand for rotatably supporting an illuminated Christmas tree and for intermittently energizing the lamp circuits thereof, the stand being relatively simple in construction, being compact in size, and being quiet in operation.

A further object of the invention is to provide an improved display stand for rotatably supporting a Christmas tree and for intermittently energizing the circuits of strings of lamps on the tree, the stand involving inexpensive components, being rugged in construction, being neat in appearance, and having means for adjusting the speed of rotation thereof.

A still further object of the invention is to provide an improved display stand for rotatably supporting a Christmas tree and for intermittently energizing the lamp circuits thereof, the stand having relatively few moving parts, having respective plug receptacles for receiving plugs associated with the different strings of lamps on the tree, and being provided with means to at times electrically connect all of the lamp circuits in parallel, whereby, if so desired, all of the strings of lamps may be simultaneously energized.

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 top plan view of an improved display stand constructed in accordance with the present invention.

FIGURE 2 is a side elevational view of the display stand of FIGURE 1.

FIGURE 3 is a transverse vertical cross sectional view taken through the display stand substantially on the line 3-3 of FIGURE 1.

FIGURE 4 is a horizontal cross sectional view taken substantially on the line 4-4 of FIGURE 3.

FIGURE 5 is an enlarged fragmentary vertical cross sectional view taken substantially on the line 5-5 of FIGURE 3.

FIGURE 6 is a fragmentary vertical cross sectional view taken substantially on the line 6-6 of FIGURE 5.

FIGURE 7 is an enlarged vertical cross sectional view taken substantially on the line 7-7 of FIGURE 4.

FIGURE 8 is an enlarged horizontal cross sectional view taken substantially on the line 8-8 of FIGURE 3.

FIGURE 9 is a wiring diagram showing the connections of the electrical elements of the rotary display stand illustrated in FIGURES 1 to 8.

Referring to the drawings, 11 generally designates an improved display stand constructed in accordance with the present invention. The display stand 11 comprises a generally circular base 12 on which is concentrically mounted a generally circular terminal plate 13 of insulating material, the plate 13 being arranged parallel to the base 12 and being spaced therefrom by an annular supporting skirt 14 secured between the underside of the terminal plate 13 and the top surface of the main circular body of base 12.

Centrally secured on the base 12 is an annular bearing bracket 15 provided at its top end with a ball bearing

unit 16 which rotatably receives and supports a depending spindle 17. The spindle 17 is rigidly secured at its top end to the center of a supporting platform 18 which is of generally circular shape and which is thus rotatably supported on base 12 above and parallel to the terminal plate 13. As shown in FIGURE 3, the spindle 17 is provided with the reduced lower portion 19 which extends through the ball bearing unit 16 and which is rotatably received in the central vertical bore of the annular bearing bracket 15. The reduced lower portion 19 of spindle 17 is of substantial length and cooperates with the bore of the bracket 15 to maintain the platform 18 in a horizontal position parallel to terminal plate 13 and the main circular body of base 12.

Secured to the underside of platform 18 is a generally circular block 20 which is centrally apertured at 21 to provide clearance for the spindle 17. The block 20 is rotatably supported on a plurality of rollers 22 mounted at the peripheral portion of the terminal plate 13 and being spaced at equal angles around the axis thereof, as is clearly shown in FIGURE 4, cooperating with the reduced lower portion 19 of spindle 17 to support the platform 18 in its horizontal position. Any suitable number of rollers 22 may be employed, for example, four rollers as illustrated in the specific embodiment of the invention presented in the drawings.

The peripheral edge of block 20 has secured thereto a continuous circular ring gear 23. Designated at 24 is an electric motor which is pivotally connected to the skirt member 14 by a pair of parallel horizontal lugs 25, 25 rigidly secured to the motor 24 and pivotally connected to a bracket 26 rigidly secured to the skirt member 14, as by a vertical pivot pin 27 passing through a lug 28 on the bracket 26 and through the pivot lugs 25, 25 disposed respectively above and below the lug 28, as shown in FIGURES 3 and 8. The top end of the motor 24 carries a gear reduction unit 29 having an output shaft 30 on which is splined a multiple pinion unit 31 of stepped configuration, as shown in FIGURE 3, the various pinion elements of the stepped gear unit 31 being selectively meshingly engageable with the ring gear 23. A coiled spring 32 connects a lug 33 on the reduction unit 29 to a lug 34 on the bracket 26, biasing the motor 24 in a counterclockwise direction, as shown in FIGURE 8, namely, in a direction to maintain the selected gear element of unit 31 in mesh with the ring gear 23. The gear unit 31 is provided with an operating arm 35 for manipulating same to selectively engage the gear elements of the unit with the ring gear 23. The arm 35 may be attached to an elevating cam 36 surrounding the output shaft 30 and cooperating with suitable abutment means of a conventional nature provided on the top wall of the reduction unit 29 to rotatably support the gear unit 31 in an adjusted position with a selected element thereof meshing with ring gear 23.

As previously mentioned, the multiple gear unit 31 is splined to the output shaft 30 so that the ring gear 23 is driven by the selected element of the multiple pinion unit 31, the speed of rotation of the ring gear 23 being determined by the size of the selected driving pinion element.

Mounted in the peripheral portion of the platform 18 and spaced evenly therearound are a plurality of conventional plug receptacles 37, each being adapted to receive a conventional two-prong electric plug. As shown in FIGURE 1, the receptacles 37 may be arranged with their plug-receiving apertures radially aligned relative to the axis of the platform 18, or alternatively, in any other desired orientation. In the arrangement illustrated in the drawings, the outer terminal sleeve of each receptacle 37 is electrically connected to a common circular conductor 38, the common conductor 38 being connected by a wire

39 to a first depending resilient contact brush 40 secured to the underside of block 20 adjacent to the spindle 17.

As shown in FIGURE 3, additional supporting rollers 41 may be provided on the terminal plate 13 adjacent spindle 17 to support the central portion of the platform 18. The depending contact brush 40 is located outwardly adjacent to the circle on which the roller 41 is located, said depending contact brush 40 making wiping engagement with a circular contact ring 42 secured on the terminal plate 13 concentrically therewith. The inner terminal sleeves of the receptacles 37 are connected by respective wires 44 to additional depending resilient brush elements 45 secured to the underside of the block 20 and being spaced outwardly from the first depending brush element 40 along a substantially radial line, as shown in FIGURE 3.

The row of spaced contact brush elements 45 is located so that such brush elements are intermittently engageable with respective exposed contact areas 46 of a conductive disc member 47 secured on the terminal plate 13, said exposed contact areas 46 being defined by cut-out portions of an insulating disc 48 secured over the conductive disc 47. As shown in FIGURE 4, the cutout contact areas 46 are arbitrarily shaped, and the edge portions thereof may be stepped or otherwise serrated, as shown at 49 in FIGURE 4 to allow the depending contact brushes 45 to come into contact with the exposed surfaces of disc member 47 at different times as the platform 18 rotates. The edges of the exposed areas 46 may be curved or otherwise irregularly shaped, for example, may be arcuately curved, as shown at 50, to provide a similar irregularity of engagement of the brush elements 45 with the exposed areas 46 as platform 18 rotates.

The conductive member 47 may comprise a suitable sheet metal disc, and the insulating member 48 may comprise a relatively thin layer of suitable insulation material, such as sheet plastic material, or the like, suitably cutout to define the contact element areas 46. A portion of the circular area swept over by the brush elements 45 may comprise a plurality of circular rows of rivets 52 extending through the sheet metal conductive member 47 and the insulating layer 48, with the head portions of the rivets exposed above the insulating layer 48, the rows of the rivets 52 being in arcuate rows aligned with the respective depending brush members 45, so that the brush members sequentially engage in the heads of the rivets as the platform 18 rotates, providing a twinkling effect of the lamps connected to the receptacles 37, as will be presently described.

The apparatus is provided with a line cord 53 comprising the supply conductors 54 and 55. A control switch 56 is mounted on the margin of the platform 18, as shown in FIGURE 1. The conductor 54 is connected to one terminal of the motor 24. The line cord conductor 55 is connected to the other terminal of motor 24 through the control switch 56.

The central conductor ring 42 is connected by a wire 57 to the line conductor 54, and the conductive sheet metal disc 47 is connected by a wire 58 to the line conductor 55. Thus, it will be seen that the outer terminal of each of the receptacles 37 is connected to the line conductor 54 through wire 57, ring 42, brush 40, wire 39 and wire 38. The inner terminal of each outlet 37 is connected to the remaining line conductor 55 through the wire 58, the conductive sheet metal disc 47, the associated brush 45 and the associated lead wire 44 when the brushes 45 are in contact with an exposed contact surface 46 or with the exposed rivet head 52. It will therefore be apparent that as the platform 18 rotates, the receptacles 37 are intermittently energized, causing corresponding similar intermittent energization of the circuits of strings of lamps connected to the respective receptacles 37, for example, the lamp circuits of a Christmas tree mounted on the platform 18. Each such lamp

circuit may be connected by a conventional two-prong plug to a receptacle 37, whereby the circuit will be energized whenever the associated brush element 45 comes into contact with an exposed surface of disc member 47 or with an exposed head of a rivet 52. In the case of the exposed rivet heads, the associated circuits are intermittently energized as the brushes 45 pass from the head of one rivet 52 to the next, causing a twinkling action or illusion, because of the sequential intermittent energization of the associated lamps.

Means may be provided for simultaneously energizing all of the receptacles 37, namely, for connecting said receptacles in parallel, whereby the devices connected thereto may be simultaneously energized intermittently as the platform 18 rotates. Thus, such means may comprise a relay 71 attached to the underside of the platform 18 and including a pair of solenoids 60, 60 whose plungers are connected to the respective ends of a conductive bar 61 which is connected at its center portion by a conductive spring 62 to a depending bracket 63 of insulating material secured to the underside of platform 18. A plurality of contacts 64 are provided, corresponding in number to the number of receptacles 37 which are to be connected in parallel, for example, corresponding to all but one of the receptacles 37. The contacts 64 are arranged to be engaged by conductive bars 61 responsive to the energization of the solenoids 60, 60. Said contacts 64 are connected by wires 65 to the inner terminals of the associated receptacles 37, as shown in FIGURE 9. One terminal of the winding of each solenoid 60 is connected to the wire 39. The other terminals of the solenoids are connected together to a common wire 66, which is connected through the spring 62 to the wire 61. Wire 66 is connected through a suitable control switch 67 to the inner terminal of the remaining receptacle 37, namely, the receptacle with which all the other receptacles 37 are to be connected in parallel. Thus, when the switch 67 is closed, the solenoids 60, 60 are energized, pulling the conductive bar 61 downwardly into conductive engagement with the contacts 64, thus connecting the wire 66 to the wires 65 and thereby connecting all the inner terminals of the receptacles 37 in parallel. Under these conditions all the lamp circuits connected to the receptacles 37 are energized and deenergized simultaneously as the platform 18 rotates.

A protective flexible skirt member 70 of any suitable flexible sheet material, such as thin sheet plastic material may be secured to the rim of the platform 18, depending a sufficient distance to cover the space between platform 18 and the base 12, so as to conceal the mechanism of the device and to cover the electrical elements thereof.

As will be obvious, a Christmas tree may be mounted on the platform 18, and the various strings of lamps placed thereon may be electrically connected to the different receptacles 37 so as to intermittently energize the circuits of said strings of lamps as the platform 18 rotates in a manner determined by the configuration of the cutout contact element areas 46 and in accordance with the distribution of the exposed heads of the rivets 52. The device may be employed to intermittently energize various circuits of a display mounted on the platform 18, other than a Christmas tree, if so desired.

While a specific embodiment of an improved stand for rotatably supporting a Christmas tree or other display article and for intermittently energizing the circuits of strings of lamps or the like on the tree or other article has been disclosed, 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 stand for rotatably supporting a display article and for intermittently energizing the circuits of devices on the article comprising a base, a horizontal terminal

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plate secured on said base, an article supporting platform, means rotatably supporting said platform on said base over said terminal plate for rotation around a vertical axis, a ring gear mounted on the platform concentric with said axis, motor means on the base, a pinion gear on the shaft of the motor means meshing with said ring gear and drivingly coupling the motor means to said platform to rotate the platform, a plurality of spaced contact elements on said terminal plate, respective depending brush elements on the platform intermittently engageable with said contact elements responsive to rotation of the platform, a plurality of plug receptacles on the platform adapted to be connected to respective devices on an article supported on the platform, a line cord, and means connecting the line cord to the plug receptacles through the respective sets of interengageable contact elements and brush elements.

2. A stand for rotatably supporting a display article and for intermittently energizing the circuits of devices on the article comprising a base, a horizontal terminal plate secured on said base, an article supporting platform, means rotatably supporting said platform on said base over said terminal plate for rotation around a vertical axis, a ring gear mounted on the platform concentric with said axis, motor means on the base, a pinion gear on the shaft of the motor means meshing with said ring gear and drivingly coupling the motor means to said platform to rotate the platform, a continuous contact ring on the base concentric with said axis, a plurality of contact elements on said terminal plate spaced outwardly from said contact ring, a first depending brush element on the platform engaging said contact ring, respective additional depending brush elements on the platform intermittently engageable with said last-named contact elements responsive to rotation of the platform, a plurality of plug receptacles on the platform adapted to be connected to respective devices on an article supported on the platform, a line cord, and means connecting the line cord to the plug receptacles through said first depending brush element and continuous contact ring and through the respective sets of interengageable contact elements and depending brush elements.

3. A stand for rotatably supporting a display article and for intermittently energizing the circuits of devices on the article comprising a base, a horizontal terminal plate secured on said base, an article supporting platform, means rotatably supporting said platform on said base over said terminal plate for rotation around a vertical axis, a bracket pivoted to said base, a motor mounted on the bracket, a pinion gear on the shaft of the motor, a ring gear on the platform meshingly engageable by said pinion gear, spring means connecting the motor to the base and biasing said pinion gear into meshing engagement with the ring gear, to rotate the platform, a plurality of spaced contact elements on said terminal plate, respective depending brush elements on the platform intermittently engageable with said contact elements responsive to rotation of the platform, a plurality of plug receptacles on the platform adapted to be connected to respective devices on an article supported on the platform, a line cord, and means connecting the line cord to the plug receptacles through the respective sets of interengageable contact elements and brush elements.

4. A stand for rotatably supporting a display article and for intermittently energizing the circuits of devices on the article comprising a base, a horizontal terminal plate secured on said base, an article supporting platform, means rotatably supporting said platform on said base over said terminal plate for rotation around a vertical axis, a ring gear mounted on the platform concentric with said axis, a bracket pivoted to said base, a motor mounted on the bracket, a pinion gear on the shaft of the motor, a ring gear on the platform meshingly engageable by said pinion gear, spring means connecting the motor to the base and biasing said pinion

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gear into meshing engagement with the ring gear to rotate said platform, a continuous contact ring on the base concentric with said axis, a plurality of contact elements on said terminal plate spaced outwardly from said contact ring, a first depending brush element on the platform engaging said contact ring, respective additional depending brush elements on the platform intermittently engageable with said last-named contact elements responsive to rotation of the platform, a plurality of plug receptacles on the platform adapted to be connected to respective devices on an article supported on the platform, a line cord, and means connecting the line cord to the plug receptacles through said first depending brush element and continuous contact ring and through the respective sets of interengageable contact elements and depending brush elements.

5. A stand for rotatably supporting a display article and for intermittently energizing the circuits of devices on the article comprising a base, a horizontal terminal plate secured on said base, an article supporting platform, means rotatably supporting said platform on said base over said terminal plate for rotation around a vertical axis, a ring gear mounted on the platform concentric with said axis, a bracket pivoted to said base, a motor mounted on the bracket, a pinion gear on the shaft of the motor, a ring gear on the platform meshingly engageable by said pinion gear, spring means connecting the motor to the base and biasing said pinion into meshing engagement with the ring gear, whereby to rotate the platform, a continuous contact ring on the base concentric with said axis, a plurality of contact elements on said terminal plate spaced outwardly from said contact ring, a first depending brush element on the platform engaging said contact ring, respective additional depending brush elements on the platform intermittently engageable with said last-named contact elements responsive to rotation of the platform, a plurality of plug receptacles on the platform adapted to be connected to respective devices on an article supported on the platform, a line cord, and means connecting the line cord to the plug receptacles through said first depending brush element and continuous contact ring and through the respective sets of interengageable contact elements and depending brush elements, said terminal plate including a conductive sheet metal member, a layer of insulating material on said sheet metal member, and spaced headed rivet elements secured to said sheet member and exposed above said layer of insulation material and being located for intermittent engagement by the depending brush elements.

6. A stand for rotatably supporting a display article and for intermittently energizing the circuits of devices on the article comprising a base, a horizontal terminal plate secured on said base, an article supporting platform, means rotatably supporting said platform on said base over said terminal plate for rotation around a vertical axis, motor means on the base drivingly coupled to said platform to rotate the platform, a continuous contact ring on the base concentric with said axis, a plurality of contact elements on said terminal plate spaced outwardly from said contact ring, a first depending brush element on the platform engaging said contact ring, respective additional depending brush elements on the platform intermittently engageable with said last-named contact elements responsive to rotation of the platform, a plurality of plug receptacles on the platform adapted to be connected to respective devices on an article supported on the platform, a line cord, means connecting the line cord to the plug receptacles through said first depending brush element and continuous contact ring and through the respective sets of interengageable contact elements and depending brush elements, and means to at times electrically connect all of said additional depending brush elements together, whereby to simultaneously energize the plug receptacles whenever any one of

said additional brush elements engages a contact element on the terminal plate.

References Cited in the file of this patent

UNITED STATES PATENTS

1,444,042 Schwalbach ----- Feb. 6, 1923

5

1,704,821
1,885,801
1,943,659
2,527,969
2,831,580
3,017,150

Brown ----- Mar. 12, 1929
Chester ----- Nov. 1, 1932
Eason ----- Jan. 16, 1934
Siebenkittel ----- Oct. 31, 1950
Carbone ----- Apr. 22, 1958
Kahle ----- Jan. 16, 1962