

April 2, 1957

F. D. GRIDLEY

2,787,088

ANIMATED DISPLAY DEVICE

Filed May 10, 1956

5 Sheets-Sheet 1

Fig. 1

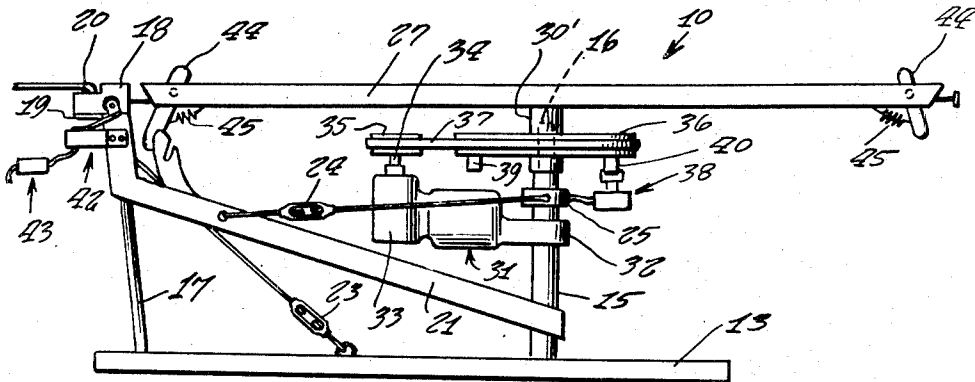
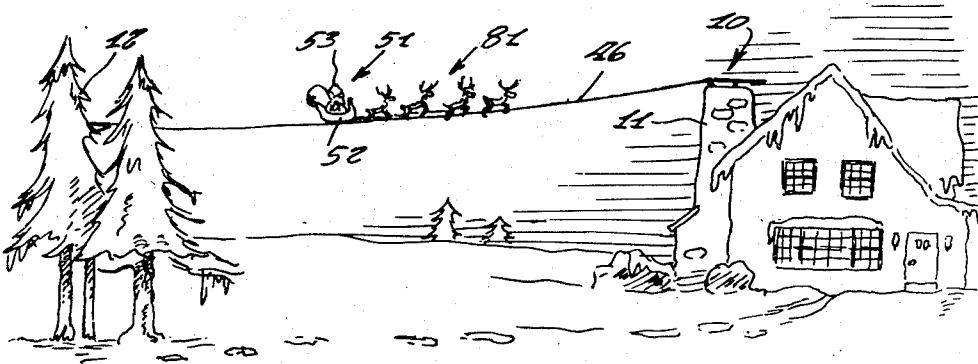


Fig. 2

INVENTOR.

Fred D. Gridley

April 2, 1957

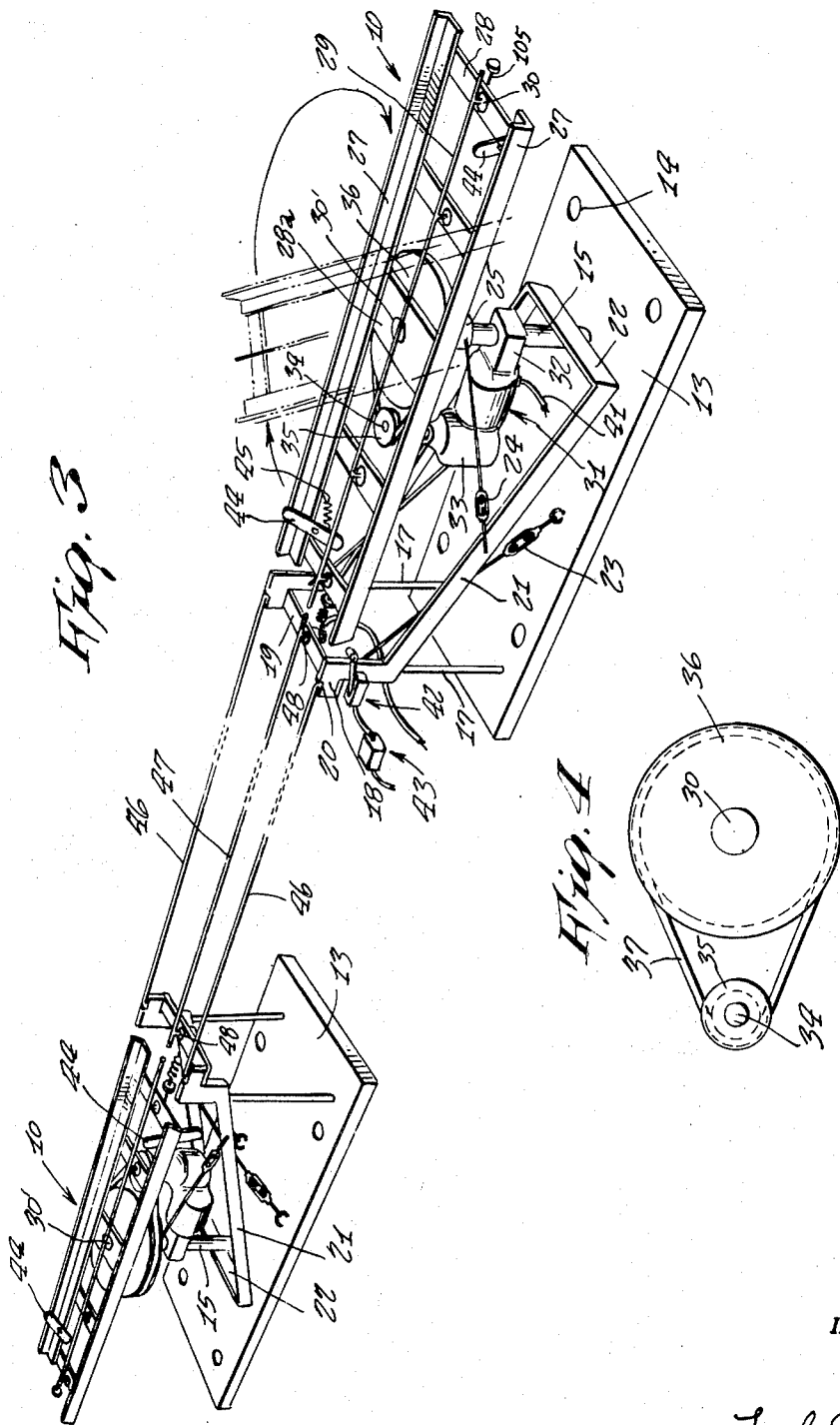
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5 Sheets-Sheet 2



INVENTOR.

Fred D. Gridley

April 2, 1957

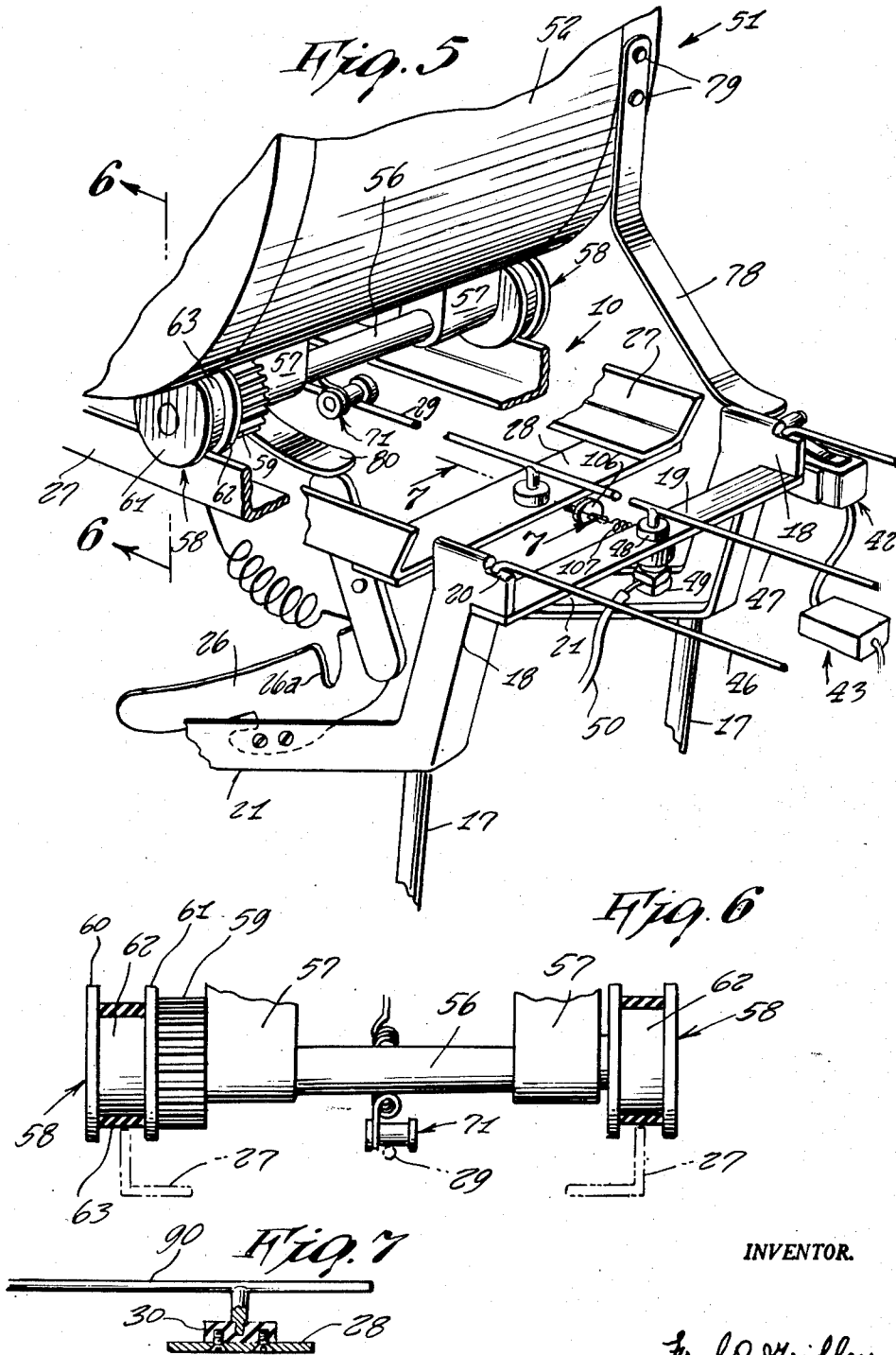
F. D. GRIDLEY

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ANIMATED DISPLAY DEVICE

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5 Sheets-Sheet 3



INVENTOR.

Fred D. Gridley

April 2, 1957

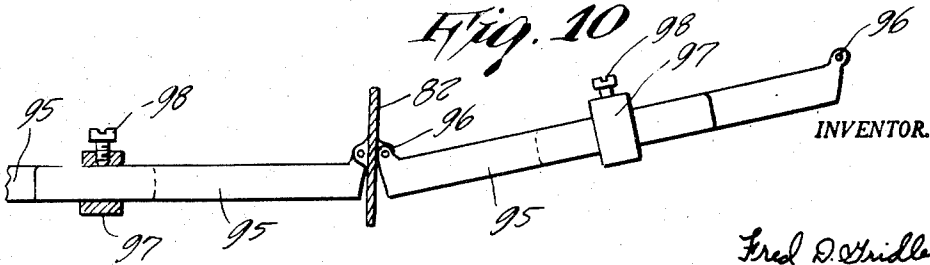
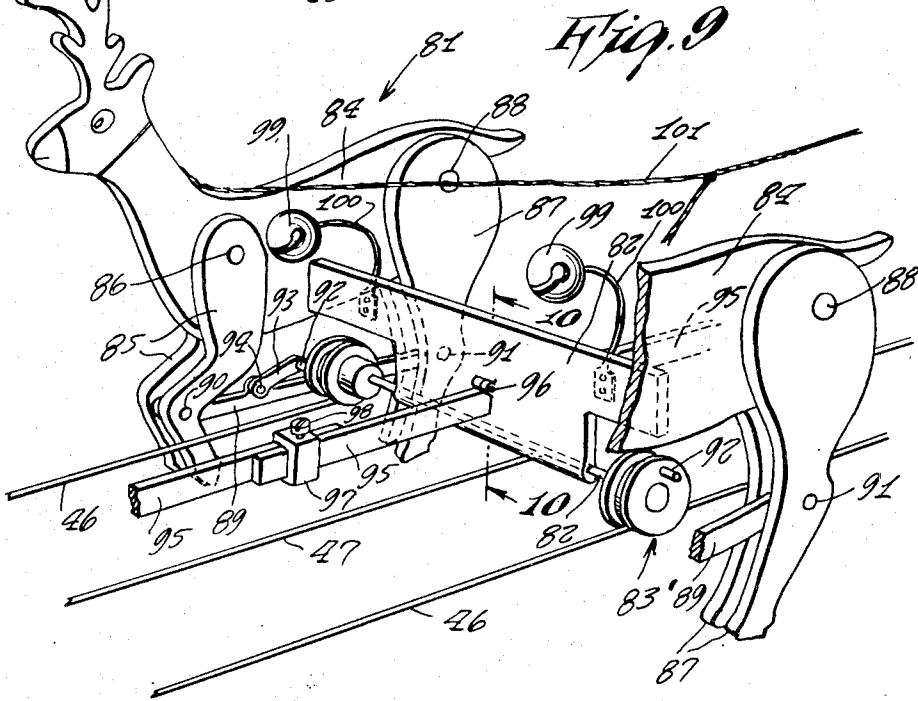
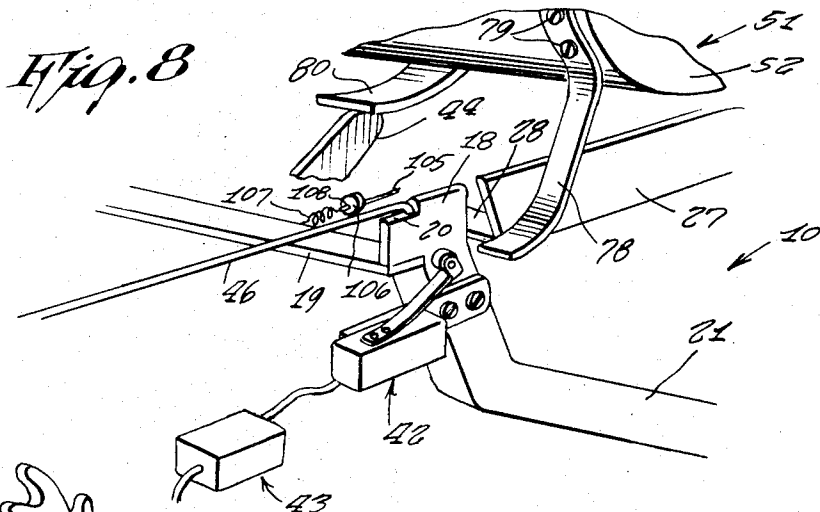
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2,787,088

ANIMATED DISPLAY DEVICE

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5 Sheets-Sheet 4



Fred D. Gridley

April 2, 1957

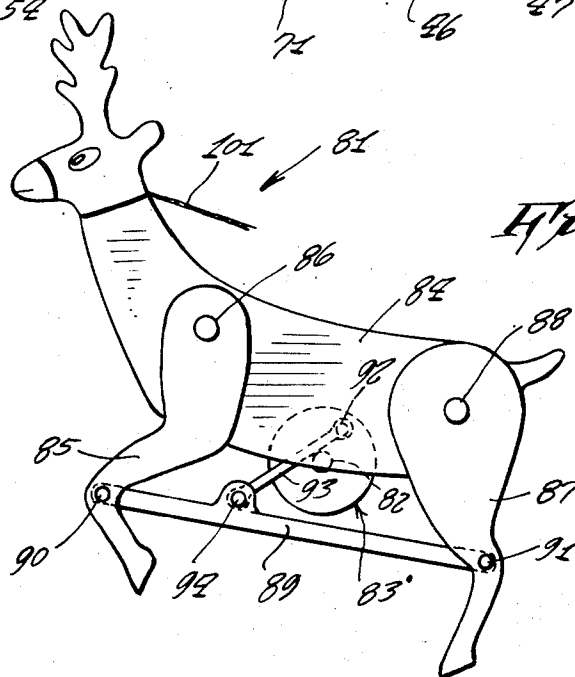
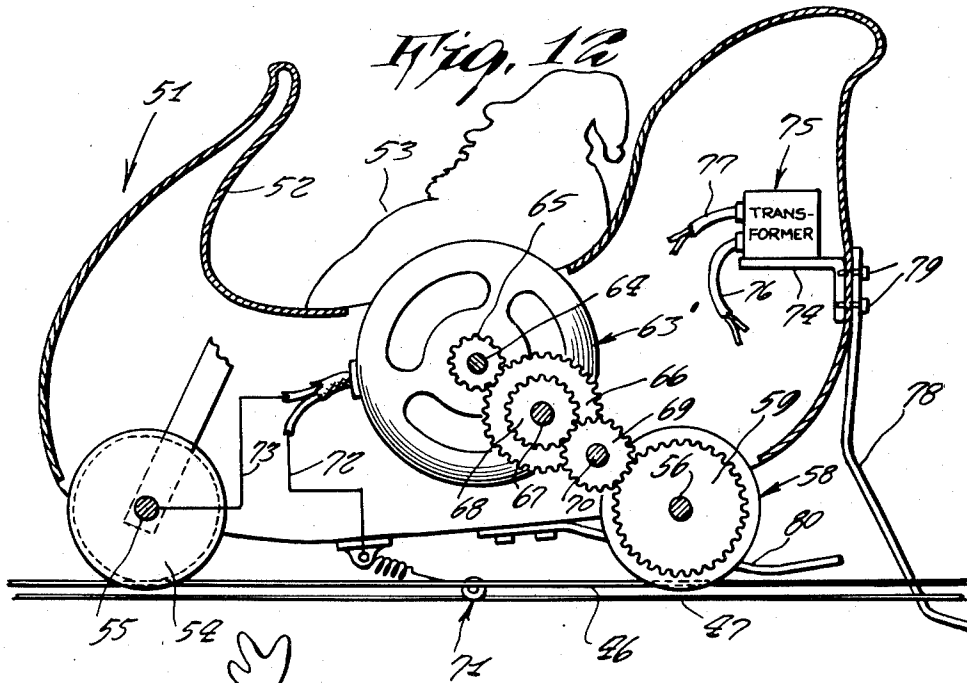
F. D. GRIDLEY

2,787,088

ANIMATED DISPLAY DEVICE

Filed May 10, 1956

5 Sheets-Sheet 5



INVENTOR.

Fred D. Gridley

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2,787,088

ANIMATED DISPLAY DEVICE

Fred D. Gridley, Three Oaks, Mich.

Application May 10, 1956, Serial No. 583,957

15 Claims. (Cl. 46—226)

This invention relates to display devices.

It is an object of the present invention to provide a display device which will have universal appeal and which provides for the continuous movement of colorful figures across the adjustable path of travel.

It is another object of the present invention to provide a display device of the above type which is particularly adapted for Christmas and which includes a sleigh containing Santa Claus and which is drawn by a plurality of novelly actuated reindeer.

It is still another object of the present invention to provide a display device of the above type which is vastly superior to conventional Santa Claus displays wherein Santa Claus and his reindeer have been released from being nailed or secured to stakes on front lawns in front of flood lights or propped against a chimney on someone's roof and wherein the figures will move continuously back and forth across a path of adjustable length, for example from the roof chimney to a pole or tree.

It is still another object of the present invention to provide a display device of the above type which will replace many electric trains in large department stores and display windows at Christmas time and wherein the cost of the display device would not be prohibitive to larger stores, firms, or individuals who are interested in exceeding the displays of their neighbors at Christmas time.

It is still another object of the present invention to provide a display device of the above type which is entirely automatic in operation and wherein the adjustable length of travel permits the concealing of the turntables forming a part of the invention behind shrubs, buildings, or perhaps from a pole to a roof top.

Other objects of the invention are to provide a display device bearing the above objects in mind which is of simple construction, has a minimum number of parts, is inexpensive to manufacture and is effective in use.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which:

Figure 1 is a perspective view of a preferred embodiment of the present invention shown in operative use;

Fig. 2 is a side elevational view of one of the turntables forming a part of the invention;

Fig. 3 is a perspective view of the turntables and tracks forming a part of the invention and illustrating in phantom the intermediate position of one of the turntables;

Fig. 4 is a top plan view of the belt and pulley arrangement forming a part of the invention for actuating the turntables;

Fig. 5 is an enlarged fragmentary perspective view of the sleigh after it has passed onto one of the turntables;

Fig. 6 is a transverse sectional view shown partly in elevation and taken along the line 6—6 of Fig. 5;

Fig. 7 is a fragmentary longitudinal sectional view shown partly in elevation taken along the line 7—7 of Fig. 5;

Fig. 8 is a fragmentary perspective view of the micro-

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switch and relay mechanism and showing the sleigh after it has passed onto the turntable before the rotation of the latter;

Fig. 9 is a perspective view shown partly broken away of the reindeer assembly forming another part of the invention;

Fig. 10 is a vertical longitudinal sectional view taken along the line 10—10 of Fig. 9;

Fig. 11 is a side elevational view of the reindeer assembly; and

Fig. 12 is a vertical sectional view shown partly in elevation of the sleigh.

Referring now more in detail to the drawing, and more particularly to Fig. 3, 10 indicates generally a pair of electrically operated turntable assemblies suitably mounted at opposite ends of the path of travel, for example, as shown in Fig. 1, one of the turntables may be mounted on top of the chimney 11 and the other on the tree 12.

Each of the turntables 10 are identical in construction and therefore only one will be described in detail. Each turntable assembly includes the base 13 adapted to rest on the supporting surface and having the mounting openings 14. A standard 15 extends upwardly at right angles to the base 13 near the outer end thereof and is provided with a shaft 16 at its upper end, for a purpose which will hereinafter become clear.

A pair of supports 17 extend upwardly from the inner end of the base 13 in laterally spaced relationship and serve to support the laterally aligned L-shaped brackets 18 connected by the transverse support 19. The upper edges of the brackets 18 at their inner ends are recessed, as at 20. The lower ends of the brackets 18 are connected to the downwardly and outwardly extending braces 21 connected at their lower ends by the transverse brace 22 which is in turn secured in suitable manner to the standard 15. The assembly is retained rigid by means of the turnbuckles 23 which connect the brackets 18 with the base 13, and the turnbuckles 24 which connect the brackets 21 with a collar 25 fixedly carried by the standard 15.

A guide or sheath 26 is fixedly carried by one of the braces 21 inwardly of the brackets 18, the sheath 26 being curved (Fig. 5) and having its central position extending inwardly and aligned longitudinally with the latch 44. This central portion is provided with a slot 26a within which the lower end of latch 33 is normally retained by spring 45.

A turntable track is provided and includes a pair of laterally spaced angle bars 27 connected by the transverse supports 28 and the central transverse support 28a. A centrally disposed, longitudinally extending track or rod 29 is mounted intermediate the tracks 27 parallel thereto by the insulators 30. It will be noted that the ends of the tracks 27 and 29 terminate short of the brackets 18 (Fig. 3). As shown in Fig. 2, a hollow cylindrical hub 30' is suitably secured at its upper end to the transverse support 28a, the hub 30' being rotatably mounted on the shaft 16. The hub 30' is retained on the shaft 16 by the weight of the turntable track and may be removed when desired.

An electric motor indicated generally at 31 is mounted on the standard 15 by means of the bracket 32 and is connected to a reduction gear casing 33 from which the drive shaft 34 extends upwardly parallel to the shaft 16 (Fig. 2). A relatively small pulley 35 is secured to the shaft 34 and is connected to a relatively large pulley 36 secured to the hub 30' by means of the belt 37 whereby, upon operation of the motor 31, the turntable will rotate about the axis of the shaft 16.

A microswitch indicated generally at 38 is mounted

on the collar 25 below the pulley 36 and is actuated by a pair of depending actuator studs 39 and 40 positioned at oppositely disposed points on the undersurface of the pulley 36. The microswitch 38 is connected in series with the motor 31 and is designed to stop the latter at the end of the 180 degree rotation of the turntable track by the contact of one of the stops 39 or 40 with the switch, as will be obvious. The studs are adjustable by adjusting the position of the pulley 36 and the hub 30' to advance or retard the stopping of the turntable.

The motor 31 is connected to a suitable source of power by means of the insulated electrical cord 41 (Fig. 3) and is started by means of a microswitch indicated generally at 42 mounted on the outside of one of the brackets 18 and a relay indicated generally at 43, the switch 42 and relay 43 being connected in the circuit of the motor 41.

A latch 44 is pivotally mounted below one of the tracks 27 at the end thereof and is normally urged into the position of Fig. 2, i. e. operative engagement with the sheath 26 by means of a spring 45 whereby to properly align the turntable tracks with the tracks to be hereinafter described. An identical latch 44 is similarly mounted at the other end of the other track 27 for similar cooperative action with the sheath 26 upon rotation of the turntable track through the 180 degrees. It will be noted that the turntable normally will be locked in the longitudinally aligned position by the latch 44.

As shown in Fig. 3, outside rails 36 or rods or wires extend between the turntables, being connected to the brackets 18 within the recessed portions 20 thereof. A central wire or track 37 is similarly mounted at opposite ends on the transverse supports 19 by means of the insulators 48.

A suitable source of voltage is provided, not shown, and the positive terminal of the source of voltage is connected to the terminal 49 (Fig. 5) by means of the insulated conductor 50, the terminal 49 being connected electrically to the central track 47 and being insulated, of course, from the transverse support 19.

An electrically driven sleigh indicated generally at 51 (Fig. 12) is provided and includes the hollow body 52 and the figure 53 simulating the appearance of Santa Claus, substantially as illustrated. A pair of front wheels 54 are rotatably mounted on the front axle 55 suitably mounted on the body 52 and are flanged on the inner and outer faces thereof whereby to retain the same on the outside tracks 46, as will be obvious. A rear axle 56 is rotatably mounted in the depending bearing members 57 (Fig. 5) and serves to mount the rear wheels indicated generally at 58. The rear wheels 58 are secured to the rear axle 56 and are driven by the gear 59 similarly secured thereto adjacent one of the wheels (Fig. 6). The wheels 58 are similar in construction to the front wheels 54, having the inner and outer flanges 60 and 61 to retain the wheels on the outside wires 46. However, the central portion 62 is provided with a rubber sleeve 63 for traction.

As shown in Fig. 12, an electric motor indicated generally at 63' is suitably mounted within the sleigh 51 and includes a drive shaft 64 to which a gear 65 is secured, the gear 65 being in mesh with a larger gear 66 secured to a shaft 67 suitably journaled within the sleigh. A smaller gear 68 is also secured to the shaft 67 and is in mesh with an intermediate gear 69 secured to a shaft 70 journaled at opposite ends of the sleigh intermediate the shaft 67 and 56, the gear 69 being in mesh with the gear 59 whereby to drive the sleigh upon operation of the motor, as will be obvious. The gears will reduce the speed of the motor as well as develop power. A trolley or roller indicated generally at 71 is mounted on the undersurface of the sleigh and rides the central wire 47 whereby to pick the positive current up therein and deliver it to the motor through the conductor 72. The

other terminal of the motor is grounded through the axle 55 by means of the conductor 73. The axle 55 makes ground contact for the entire system.

A bracket 74 is suitably mounted at the rear of the sleigh on the interior thereof and mounts a small transformer indicated generally at 75, the transformer 75 being fed from the trolley pick up 71 by means of the conductors 76 and providing a reduced output for the conductor 77, for a purpose which will hereinafter become clear.

A trip lever 78 depends from the rear of the sleigh 51 being mounted at its upper ends by means of the fastening means 79 and is adapted to contact the microswitch 42 (Fig. 5) as the sleigh moves onto the turntable. A second trip lever 80 is secured to the undersurface of the sleigh and is designed to trip the latch 44 as the sleigh moves onto the turntable whereby to move the latch from the sheath 26 and to permit the operation or rotation of the turntable upon tripping the microswitch 42.

A reindeer assembly indicated generally at 81 (Fig. 1) is provided and includes four pair of laterally aligned and spaced reindeer which are actuated in a novel manner. Each pair of reindeer are identical in construction and therefore only one pair will be described in detail. Each pair of reindeer includes the T-shaped transverse plate 82 (Figs. 9, 10 and 11) which rotatably mounts at the lower end of the central portion thereof the axle 83 on the ends of which are mounted the wheels indicated generally at 83' and identical in construction with the wheels 58 previously described. Reindeer bodies 84 are secured to the opposite ends of the transverse plate 82 and include the head and tail sections substantially as illustrated. A pair of front legs 85 are pivotally connected to opposite sides of each of the body portions 84 at the front ends by means of the pins 86 while a pair of rear legs 87 are similarly mounted at the rear of the bodies by means of the pins 88. It will be noted that the legs 85 and 87 are disposed on the outside of the outer tracks or wires 46, while the wheels 83' with their rubber traction will ride the wires 46, the plates 82 having clearance for the wheels. A longitudinal link 89 is pivotally connected at its forward end intermediate each pair of front legs 85 by means of the pin 90 and is pivotally connected at its rear end intermediate each pair of rear legs 87 by means of the pin 91. An outwardly extending eccentric pin 92 is fixedly carried by each of the wheels 83' and is pivotally connected to a link or crank arm 93 which is in turn pivotally connected to each of the links 89 by means of the pin 94.

The pairs of reindeer are connected together and to the sleigh by means of the centrally disposed, longitudinally extending links 95 which are pivotally connected to the plates 82 and the sleigh at their outer ends by means of the pins 96, the inner ends of the links 95 overlapping each other and being secured together in longitudinally adjusted relationship by means of the clamps 97 having the clamp screws 98.

A pair of laterally spaced bells 99 are secured to opposite ends of the plates 82 by means of the flexible wires 100.

The reins 101 extend from the pairs of reindeer to the sleigh.

Electric lamp means, not shown, are provided in the nose of the foremost reindeer and is connected to the transformer 75 by fine enamel wire twisted in with the reins 101, the bulb being surrounded by a transparent red covering, to simulate Rudolph, the red-nosed reindeer.

It will be evident from an inspection of Figs. 9 through 11 that as the reindeer are pushed along the tracks by the sleigh which is electrically powered, the wheels 83' will rotate to move therewith the eccentric ends 92 which will raise and lower the longitudinal links 89 and therewith the legs 85, 87 and reindeer bodies 84 which will pivot about the axle 82, this animation also imparting sounds to the bells 99, in a realistic and life-like manner.

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The hinged connection of the longitudinal links 95 to the plates 82 and to the sleigh compensate for sag of the wires 46 and 47 under weight and the over the hump action approaching the level turntable top.

In operation, as the device is energized, the sleigh motor 63' drives the sleigh 51 and reindeer assembly 81 along the wires 46 and 47 and up onto the turntable 10, which latter is slightly longer than the combined sleigh and reindeer train. At the precise instant that the rear wheels 58 of the sleigh strike the turntable tracks 27, the trip lever 80 will release the latch 44 from the sheath 26 against the action of the spring 45 whereby to release the turntable for turning movement. Immediately thereafter the trip lever 78 will trip the microswitch 42 and energize the relay 43 to start the operation of the turntable motor 31, which automatically breaks the third wire connection between the energized middle wire 47 and the turntable middle wire 29. To effect this make-break connection, a brass rod 105 (Fig. 8) is secured to the underside of the turntable track transverse support 28 in suitable manner, the other end of the rod 105 being provided with the flared end 106. A steel spring 107 is secured at one end to the underside of the entrance of the turntable and is provided at its other end with a lead tip 108 which contacts the flared end 106 when the turntable is aligned with the wire tracks. As the turntable starts to turn, the aforesaid connection automatically breaks the third wire connection, stopping the gear train instantly. The turntable continues to rotate through 180 degrees until the microswitch 38 is contacted by the stud 39, breaking the circuit of the turntable motor. The other latch 44 then falls into place within the sheath 26. A second brass rod 105 and flared end 106 similarly provided at the other end of the turntable moves into contact with the lead tip 108 whereupon the sleigh motor 63' again starts and moves along the wires 46, 47 to the turntable 10 at the other end, thus completing the cycle and providing for the continuous operation of the sleigh train back and forth across the wires.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

The microswitch 42 is normally open and is closed by the trip lever 78. The microswitch 38 is normally closed and is opened by the movement of the studs 39 and 40. The switch 38 is again automatically opened, as the stud 39 moves out of contact therewith. However, during the interval that the switch 38 was opened, the relay 43 again opens the switch 42 to prevent the turntable from rotating after the switch 38 is again closed until the next action of the trip lever 78.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. A display device comprising track means, turntable means electrically operated at opposite ends of said track means, a display adapted to ride said track means and to be reversed at opposite ends thereof by said turntable means, electric motor means for driving said display, first switch means connected in the circuit of said electric turntable means for rotating the same, first trip lever means carried by said display for closing said first switch means when the display has moved onto one of said turntable means whereby to rotate the same, second switch means connected in the circuit of said electric turntable means for stopping the turntable after rotation through 180 degrees, latch means for aligning said turntable means with the ends of said track means, second trip lever means carried by said display for releasing said latch means when the display has moved onto the turntable, second latch means for aligning the turntable with said track means after it has rotated through 180 degrees and connector means connecting said track means at opposite ends to said turntable means when aligned there-

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with to permit the display to move off in the opposite direction after the turntable has rotated.

2. A display device according to claim 1, said turntable means each comprising a base member, a pair of laterally spaced supports at one end of said base member, a centrally disposed standard at the other end of said base member, a hub member rotatably mounted on the upper end of said standard for rotation about a vertical axis, a pair of laterally spaced parallel outer tracks carried by said hub member and fixedly connected thereto, transverse supports connecting said outer tracks to each other, a central track parallel to said outer tracks, insulator means mounting said central track on said transverse supports, electric motor means mounted on said standard below said tracks and including a drive shaft extending parallel to the axis of rotation of said hub, a first relatively small pulley connected to said drive shaft, a second relatively large pulley connected to said hub member and belt means connecting said first and second pulleys whereby to rotate said turntable through 180 degrees until stopped by the opening of said second switch means.

3. A display device according to claim 2, said second switch means comprising a microswitch mounted on said standard below said relatively large pulley, and a pair of oppositely disposed depending studs carried by said pulley and adapted to temporarily open said microswitch when in contact therewith, said microswitch being adapted to again close after said studs have moved out of contact therewith.

4. A display device according to claim 3, said first switch means comprising a second microswitch mounted along the outside of one of said supports, said second microswitch being normally open and being closed by said first trip lever means, and a relay connected in the circuit of said motor and adapted to open said second microswitch during the interval that said first microswitch is open.

5. A display device according to claim 4, said first latch means comprising a lever pivotally mounted about a horizontal axis at one end of one of said turntable outer tracks, an arcuate guide fixedly carried by the support adjacent thereto and having a centrally disposed slot adapted to receive the lower end of said latch normally therewithin under the action of said spring means whereby to align the turntable with said track means, said second latch means comprising a second lever pivotally mounted at the other end of the other of said turntable outside tracks about a horizontal axis, second spring means for retaining said latch member in an operative position, said second latch member being adapted to move into said slot upon rotation of said turntable through 180 degrees.

6. A display device according to claim 5, said connector means comprising a pair of elongated rods mounted at opposite ends of the turntable on the endmost of said transverse supports, each of said elongated rods being electrically connected to the central rail of the turntable and terminating in an enlarged head, a transverse support connecting the upper ends of said supports, a spring member supported on said transverse member in electrical contact with the centermost rail of said track means and terminating in a contact adapted to abut the enlarged ends of said rods when the latter are moved into contact therewith whereby to make electrical contact with the turntable center rail when the latter is aligned longitudinally with said track means and to break electrical contact during intermediate positions of the turntable.

7. A display device according to claim 6, said track means comprising a pair of outer wires connected at opposite ends to said supports, and a center rail connected at opposite ends to said transverse members and to said spring connectors, positive voltage being applied to the centermost of said wires, the outermost of said wires being grounded.

8. A display device according to claim 1, said display comprising a sleigh, a pair of front wheels rotatably sup-

porting the front of said sleigh on said track means, a pair of rear wheels rotatably mounting the rear of said sleigh on said track means, said track means comprising a pair of outer wires and a central wire, the positive terminal of said source of voltage being applied to said center wire, electric motor means mounted within said sleigh, gear means connecting said electric motor means with said rear wheels whereby to drive the same, a centrally disposed conductor roller mounted on the bottom of said sleigh and adapted to ride said central track, one terminal of said electric motor means being connected to said roller, the other terminal of said electric motor means being grounded through said front wheels.

9. A display device according to claim 8, said front and rear wheels having inner and outer flanges to prevent displacement off said outer wires, said rear wheels around the intermediate portions thereof being covered with rubber to provide traction.

10. A display device according to claim 9, comprising a reindeer assembly including a plurality of pairs of oppositely disposed reindeer figures, each of said pairs of figures comprising a transverse plate having cutaway portions at the opposite ends at the bottom thereof, a transverse shaft journaled through the lower end of said plate, a pair of wheels at opposite ends of said shaft, each of said wheels having inner and outer flanges and being adapted to ride the outermost of said wires, a reindeer body secured to opposite ends of said plate having a head and tail, a pair of front legs pivotally mounted at their upper ends on opposite sides of each of said bodies at the front thereof, a pair of rear legs pivotally mounted on opposite sides of said body at the rear thereof, a pair of longitudinal links pivotally connected at their forward ends to said front legs and at their rear ends to said rear legs, an eccentric outwardly extending pin fixedly carried by each of said wheels, and a second link pivotally connected at one end to said pin and at the other to said longitudinal link whereby to animate said reindeer figures upon rotation of said wheels.

11. A display device according to claim 10, including a plurality of longitudinal members pivotally connected at their outer ends to said plates and to said sleigh, the inner ends of said links overlapping, and clamp means connecting the overlapping ends of said links in adjusted relationship.

12. A display device according to claim 11, including a plurality of bells, and flexible members connecting said bells to said plate whereby to sound the same upon actuation of the figures.

13. A display device according to claim 12, including transformer means located within said sleigh and adapted to pick up voltage from said track means and to reduce the voltage thereof, electric lamp means in the nose of one of the forwardmost of said reindeer figures, said lamp means having a red covering, and conductor means connecting said lamp means to said transformer means whereby to simulate the appearance of a red nosed reindeer by illuminating said lamp means.

14. A display device according to claim 13, including reins extending from said sleigh to said reindeer figures said conductor means being entwined in said reins.

15. A display device according to claim 9, said first trip lever means comprising a downwardly offset lever secured to the undersurface of said sleigh and adapted to contact said latch means whereby to release the turntable means, said second trip lever means comprising a depending lever secured to the rear of said sleigh at one side and adapted to contact said first switch means after said latch means has been contacted by said first trip lever to start the operation of the turntable motor.

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