April 3, 1951 J. E. BURG 2,547,152

MULTIPLANE ROTATING MOVEMENT
FOR AERIAL AMUSEMENT RIDES

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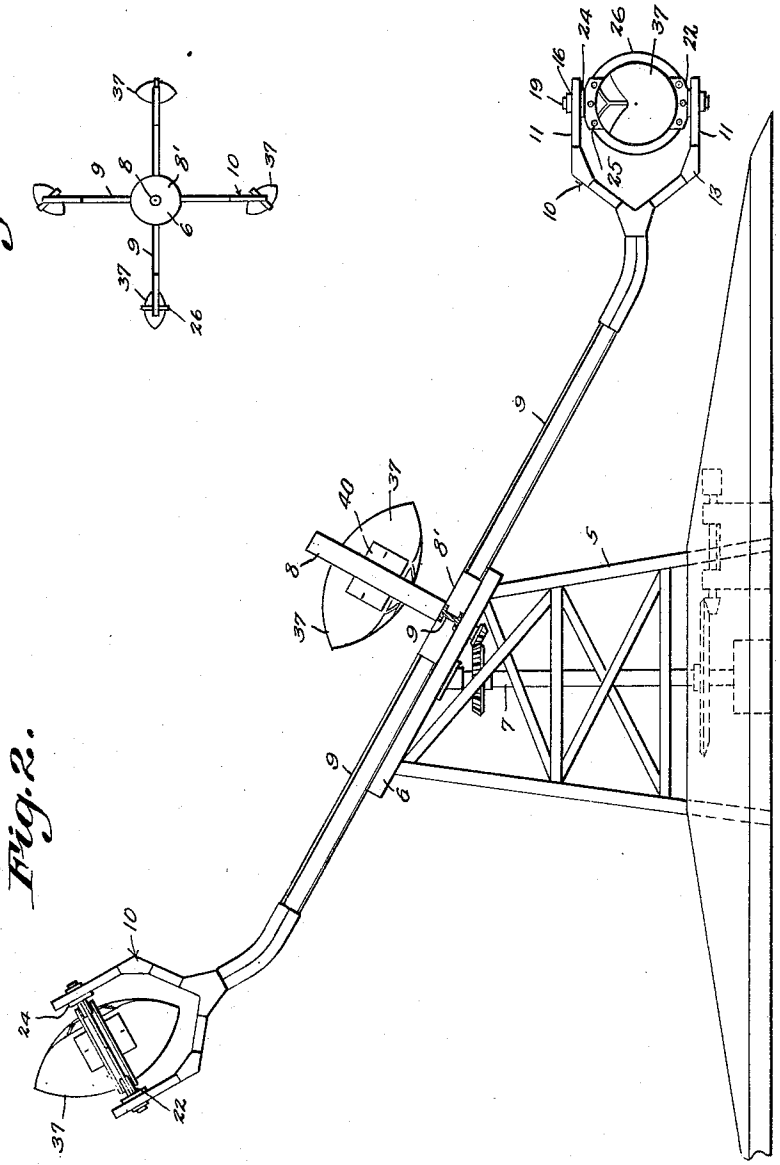
Fig. 1.

Fig. 2.



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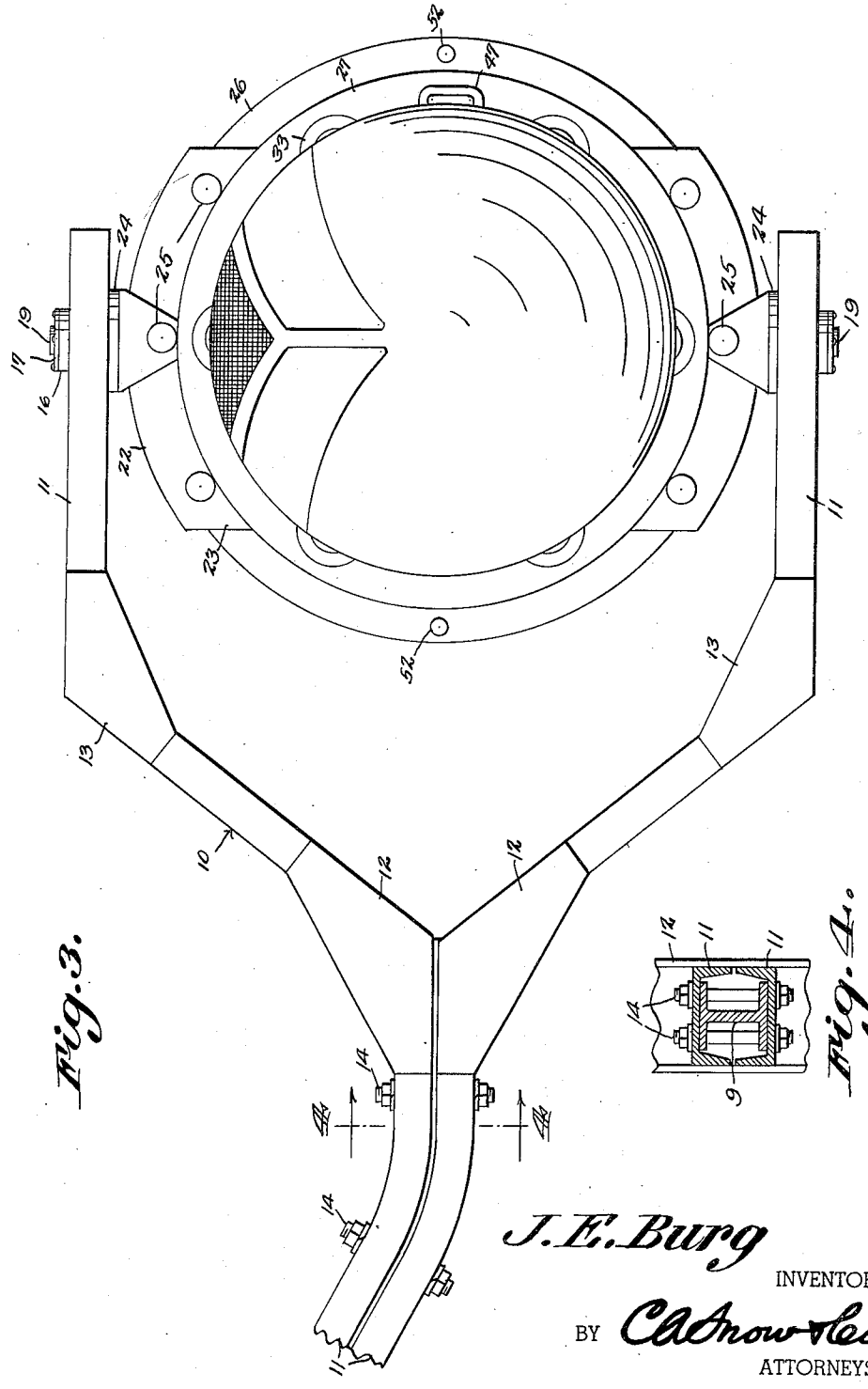

Fig. 3.

Fig. 4.

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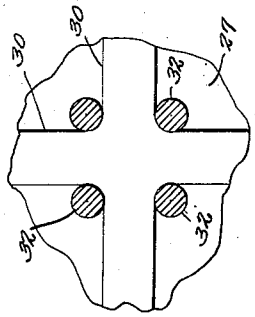

Fig. 9.

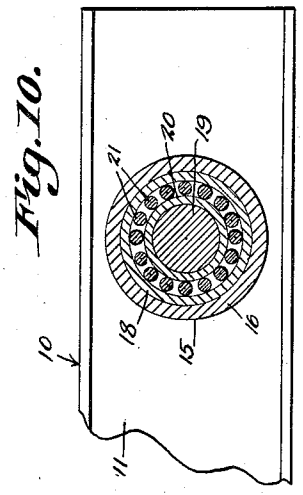

Fig. 10.

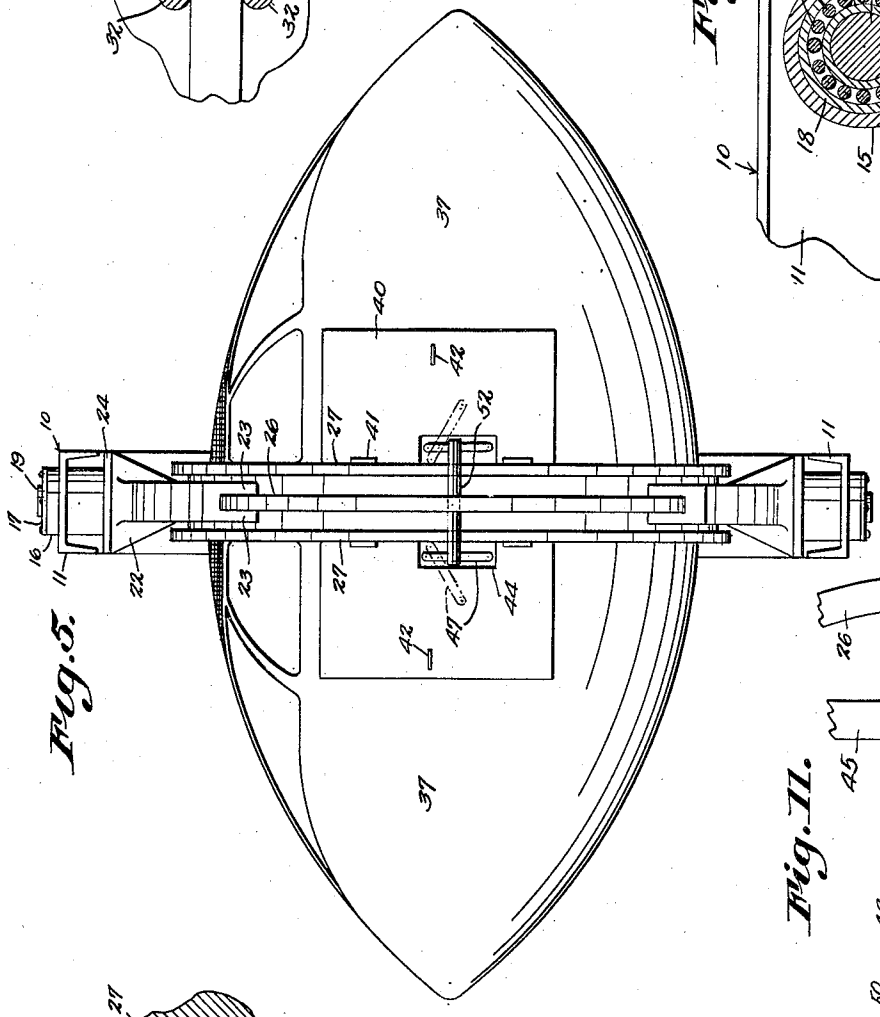

Fig. 5.

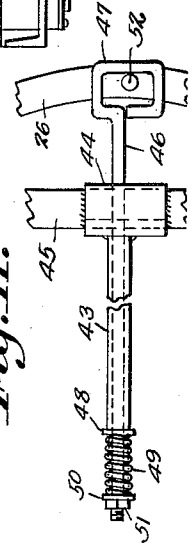

Fig. 11.

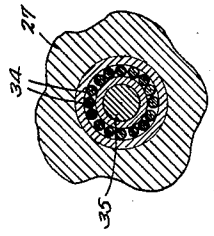

Fig. 8.

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Fig. 7.

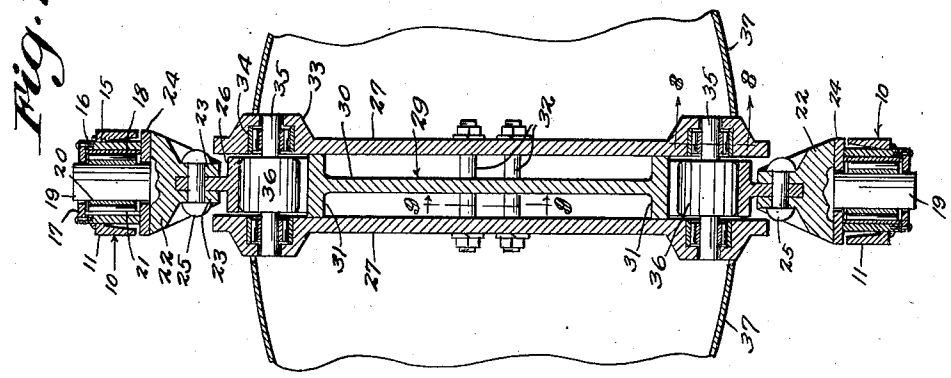
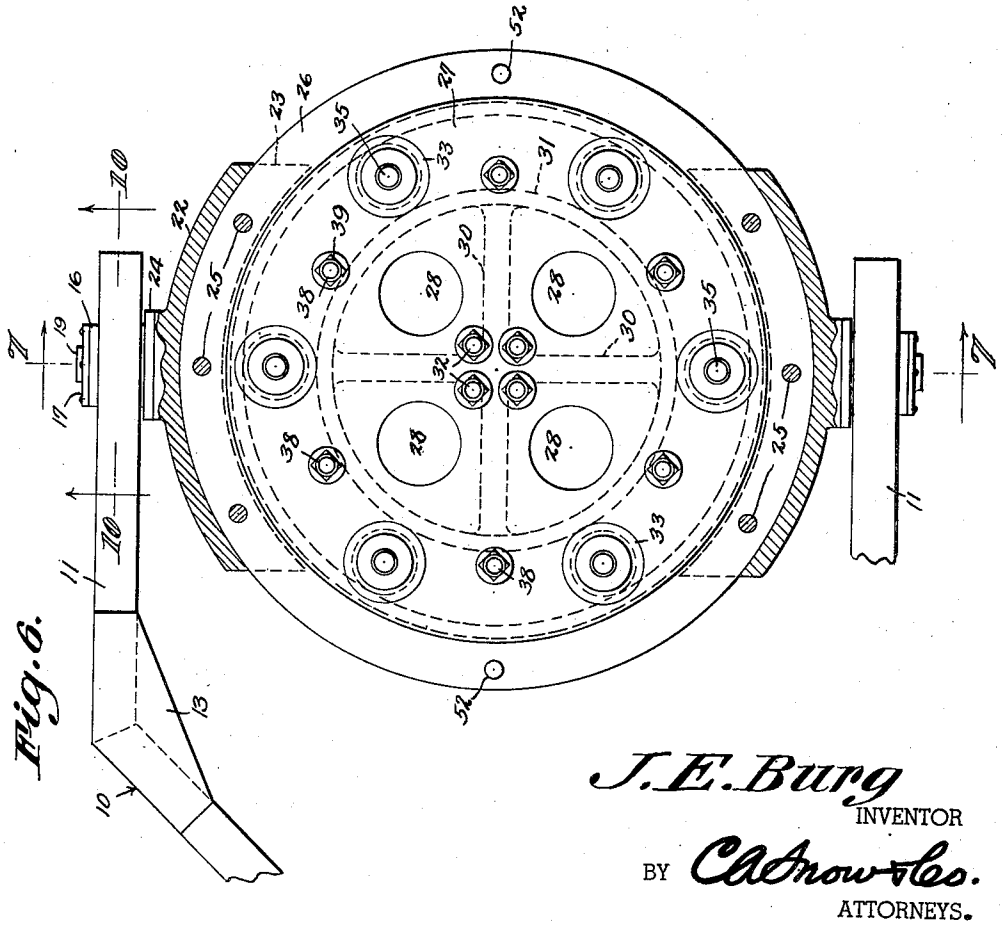


Fig. 6.



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MULTIPLANE ROTATING MOVEMENT FOR AERIAL AMUSEMENT RIDES

John E. Burg, Burlington, Iowa

Application April 6, 1948, Serial No. 19,219

2 Claims. (Cl. 272—51)

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This invention relates to an amusement riding device, such as is found in public amusement parks.

A main object of the invention is to provide a structure of the character described which will impart to cars carried thereby a combination of simultaneous movements designed to produce maximum thrills for the occupants.

Another main object is to provide an amusement riding device which will operate as stated above and will yet be wholly safe.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts, hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawings:

Figure 1 is a plan view of the rotatable car-supporting portion of the device, the base not being shown.

Figure 2 is a side elevation, one arm and car supported thereby not being shown.

Figure 3 is a side elevation of the car-supporting yoke of one of the arms, the car being shown in end elevation.

Figure 4 is a section on line 4—4 of Figure 3 showing the connection of the yoke to the arm.

Figure 5 is an end elevation of the yoke, the car being shown in side elevation.

Figure 6 is a view similar to Figure 3, the shell of the car being removed for the purpose of showing details of inner construction whereby the car is mounted for movement relative to the yoke, some parts being shown in section.

Figure 7 is a section on line 7—7 of Figure 6, end portions of the car shell being cut away.

Figure 8 is a detail section on line 8—8 of Figure 7.

Figure 9 is a detail section on line 9—9 of Figure 7.

Figure 10 is a detail section on line 10—10 of Figure 6.

Figure 11 is a side elevation of a locking means whereby the car is locked to the yoke to permit entry or departure of passengers portions of the device cooperating with the locking means being shown fragmentarily.

Referring to the drawings in detail, at 5 I have designated a fixed supporting structure or base, the upper end of which is formed as a platform 6 rigid with the base, and is inclined at an

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angle to the ground or other supporting surface. The degree of angularity can vary as desired.

Extended upwardly through the base 5 is a shaft 7, rotated by a motor through the medium of suitable gearing, and controllable as to speed by an operator. Rotation of shaft 7 is transmitted through angularly related meshing gears to an inclined shaft 8, projected through the platform 6 and disposed perpendicular thereto.

Rotated by shaft 8 is a turn-table 8' mounted on the platform 6, and a plurality of arms 9 are secured to and extend radially from the turntable, as best shown by Figure 1. The arms 9 may be in any desired number and are preferably formed from elongated I-beams, this construction being best shown by Figures 2 and 4.

From this point, the description will be confined to the construction of one arm and the parts supported thereby. It will be understood that the other arms and supported parts are constructed identically to that which will be described.

Secured to the free end of each arm 9 is a yoke designated generally by the reference numeral 10. In the present instance, yoke 10 comprises a pair of channel members 11 that converge toward their inner ends so as to embrace the outer end of arm 9 (Figure 4). The angles of the channel members are reinforced by gussets 12 and 13.

Registering openings are formed in arm 9 and channel members 11 and are threaded to receive studs 14, and lock nuts on the opposite ends of the respective studs secure the connection against any tendency to loosen.

Referring to Figures 2 and 3, the inner ends of the channel members 11 are of curved formation, so that the yoke 10 extends from the straight arm 9 at an angle. Thus, the yoke at the right of Figure 2 is disposed horizontally, being parallel and close to the ground or other supporting surface. When, however, the yoke is moved through 180°, it is positioned as shown at the left of Figure 2, and not only is no longer horizontal, but is disposed at a steep angle relative to the supporting surface.

In the free end of each channel member or yoke arm 11, I form an opening 15 (Figure 7) and welded or otherwise rigidly mounted in this opening is a bearing box 16, one end of which is closed by cover plate 17. Each of the opposed boxes provided in the yoke includes an outer bushing 18 (Figures 7 and 10). The bearings provided are for the purpose of permitting axial rotation of opposed stub shafts 19, each of which is

provided with an inner bushing 20. Roller bearings 21 are carried in the race provided between the bushings, and there are thus provided bearings permitting free rotation of each stub shaft 19 in either direction.

Integral with the inner ends of the respective stub shafts 19 are large arcuate clamps 22 each of which is formed with a thickened center portion from which extend arcuate clamping members 23. Washers 24 are interposed between the clamps and the bearings described above. Each clamp 22 is formed with a longitudinal slot receiving an annular trackway 26 which as best shown by Fig. 7 is T-shaped in cross section, the rib of the track being entered into the slot of each clamp and being secured to the clamp by fastening means 25.

The reference numeral 27 designates spaced outer disc sections, which may be formed with a plurality of openings 28 (Figure 6) for the purpose of decreasing their weight.

Between the disc sections 27 is interposed an inner section generally designated 29 that is cast with radial spokes 30 integral with a peripheral ring 31. Ring 31 is concentric with and spaced from track 26 (Figure 7). The outer disc sections 27 and inner disc section 29 are secured against relative rotation by the provision of a plurality of studs 32 threaded through openings formed in the outer disc sections and engaging the inner disc section at the intersection of its spokes 30 (Figure 9). Lock nuts secure the connection against a tendency to loosen.

Cast in the marginal portion of each outer disc section 27 is a plurality of recessed projections 33 that constitute journals for opposed trunnions 35 carried by rollers 36. Rotation of the rollers 36 relative to the outer disc sections is provided by roller bearings 34.

By reason of this construction, it is seen that the rollers 36 and parts immediately associated therewith provide combined rollers and bearings permitting rotation of the inner and outer disc sections relative to track 26, the rollers being interposed between track 26 and the ring 31.

Opposed shell sections 37 are secured to the respective outer disc sections 27 and to each other in any suitable manner. For example, longitudinal tubular braces 38 can be extended through the car provided for by the shell sections 37, these being threaded through the outer disc sections and secured in place by lock nuts 39. It is understood that the cars can vary in design, the elliptical shape illustrated being shown purely as an example of one suitable construction. It is understood further that the cars would be cross-braced as necessary so as to insure safety.

To provide access to the respective car sections 37, I provide the doors 40, hinged at 41 to its associated car section, each door being fitted with a suitable handle 42.

Referring to Fig. 11, means are provided for preventing rolling of the car in its annular trackway when passengers are being loaded or unloaded. To this end, a tube 43 is provided to the outer end of which is welded or otherwise rigidly secured a box 44 that is rigidly secured to one of the structural frame members of the car section, as for example a cross brace 45.

Slidable and rotatable in the tube 43 is a rod 46 the outer end of which is formed with an apertured locking handle 47.

On the inner end of the tube 43 is a collar 48, and surrounding the rod 46 and abutting at one end against the collar 48 is the spring 49, the other end of which abuts against a washer 50 held by nut 51 threaded on the inner end of the rod 46.

Projecting from opposite faces of the annular trackway 26 is a locking bar 52.

Normally, during operating of the riding device, the locking handle 47 is recessed in the box 44, being yieldably urged into the box by the spring 49. When, however, the riding device is stopped, and passengers are to be either loaded or unloaded, the operators of the device pull the locking handles 47 out of their respective lock boxes 44, and partially rotating them to the dotted line position shown in Fig. 5, position them over the locking bars 52. Then, the handles are partially rotated to the full line positions illustrated in Fig. 5, and in these positions will receive the locking bars 52 and will lock the car against movement relative to the annular trackway 26.

As to the operation of the amusement riding device, it is understood that the power means used would be such as would permit the operator to change the speed of movement of the main arms 9. Variable speed controls for structures of this type are well known in themselves.

When the amusement riding device is set in motion the radial arms 9 revolve around the inclined axis 8. Each yoke 11 and car carried thereby, accordingly, travels in an orbit around said inclined axis 8, and this travel of the yokes is in an inclined plane.

Each annular trackway 26, meanwhile, is mounted between the arms of a yoke for spinning movement. As a result, each car spins or rotates on its transverse axis so that each car in effect has tumbling, end-for-end movement.

There is another free movement of each car, wherein each car rolls freely on its longitudinal axis, by reason of being roller-mounted on its trackway 26.

As may be noted, no movement of a car is controlled by the car occupants. In other words, the trackway 26 is mounted for free spinning movement between the arms of each yoke, and the car carried by each track 26 is in turn mounted for free rotation within the track. In this connection, the angular relationship of each yoke 11 to its associated radial arm 9 will give, in most cases, irregular spinning movement to the track 26, and irregular rolling movement to the car carried by each track. This would be by reason of the generally irregular weight distribution of the passengers which would tend to persist in each car, accompanied by the continually changing angles of inclination of the transverse and longitudinal axes of the car during orbital movement of the car in its inclined plane on the end of an angularly related yoke and arm 9.

What is claimed is:

1. An amusement riding device including a base, arms mounted thereon for radial movement in an inclined plane, a yoke fixedly mounted on the outer end of each arm and inclined upwardly at an angle to said arm, an annular track mounted to spin freely between the arms of each yoke, and a car mounted on each track to roll freely within the track on an axis perpendicular to the axis of spin of the track.

2. An amusement riding device including a base, a tilted shaft mounted on the upper end of the base, means for driving the shaft, a plurality of radial arms fixed to the shaft and disposed perpendicular to the axis of the shaft for

radial movement of the arms in an inclined plane, a yoke fixedly secured to the outer end of each arm and inclined upwardly at an oblique angle to the arm, an annular trackway mounted for free spinning between the arms of each yoke, and a car carried by each trackway, each car including a center disc section concentric with and disposed within the trackway, rollers interposed between said center disc section and trackway, for free rotation of each disc section within and relative to the trackway, and shell sections secured to the disc sections for rotation therewith.

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