July 10, 1951 I. F. HOWARD 2,559,768

VERTICAL AND HORIZONTAL AXES ROUNDABOUT

Filed April 30, 1948 5 Sheets-Sheet 1

Fig. 1.

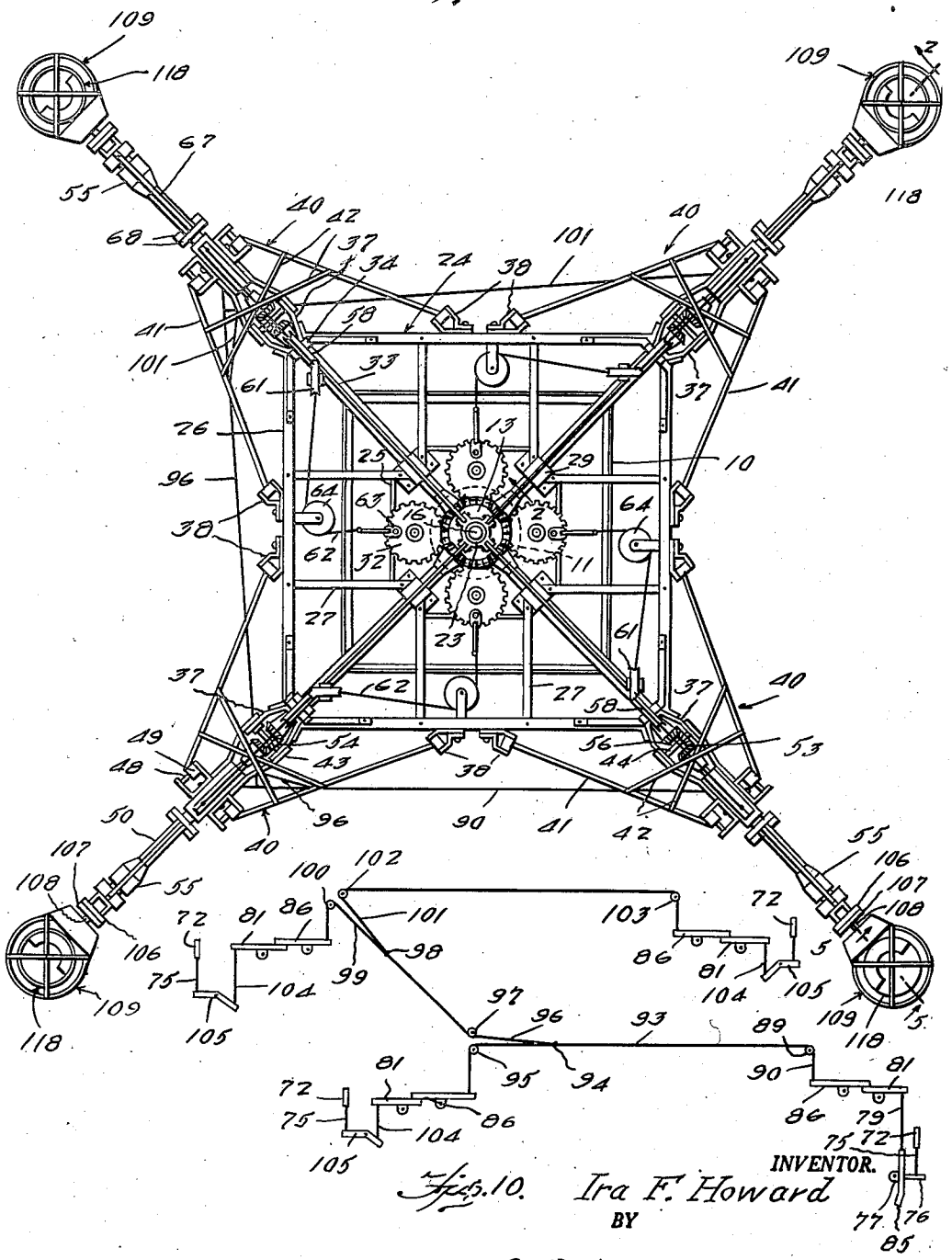

Fig. 10.

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VERTICAL AND HORIZONTAL AXES ROUNDABOUT

Filed April 30, 1948 5 Sheets-Sheet 2

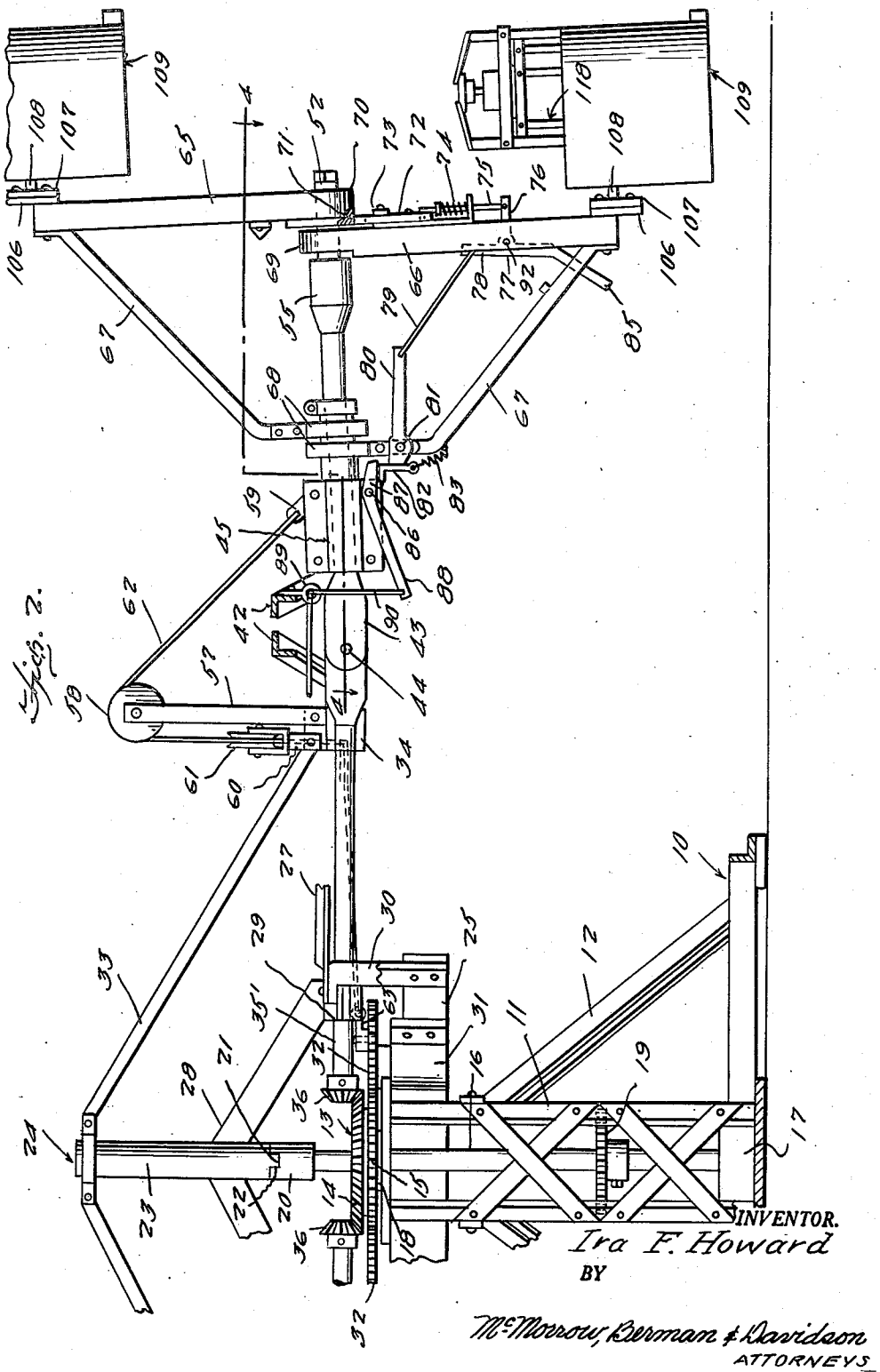

Fig. 2.

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VERTICAL AND HORIZONTAL AXES ROUNDABOUT

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Fig. 3.

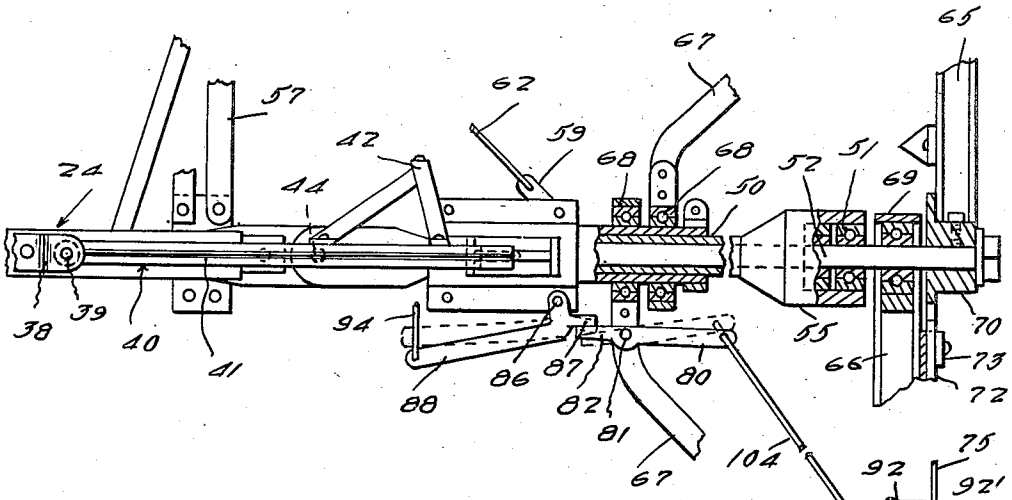
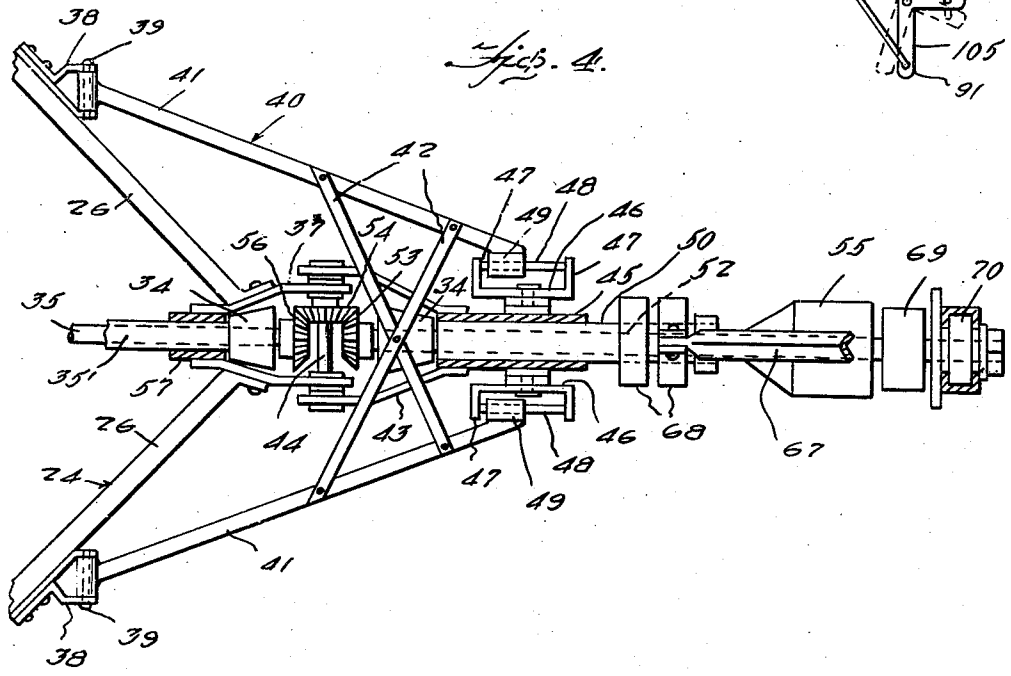


Fig. 4.



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VERTICAL AND HORIZONTAL AXES ROUNDABOUT

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Fig. 5.

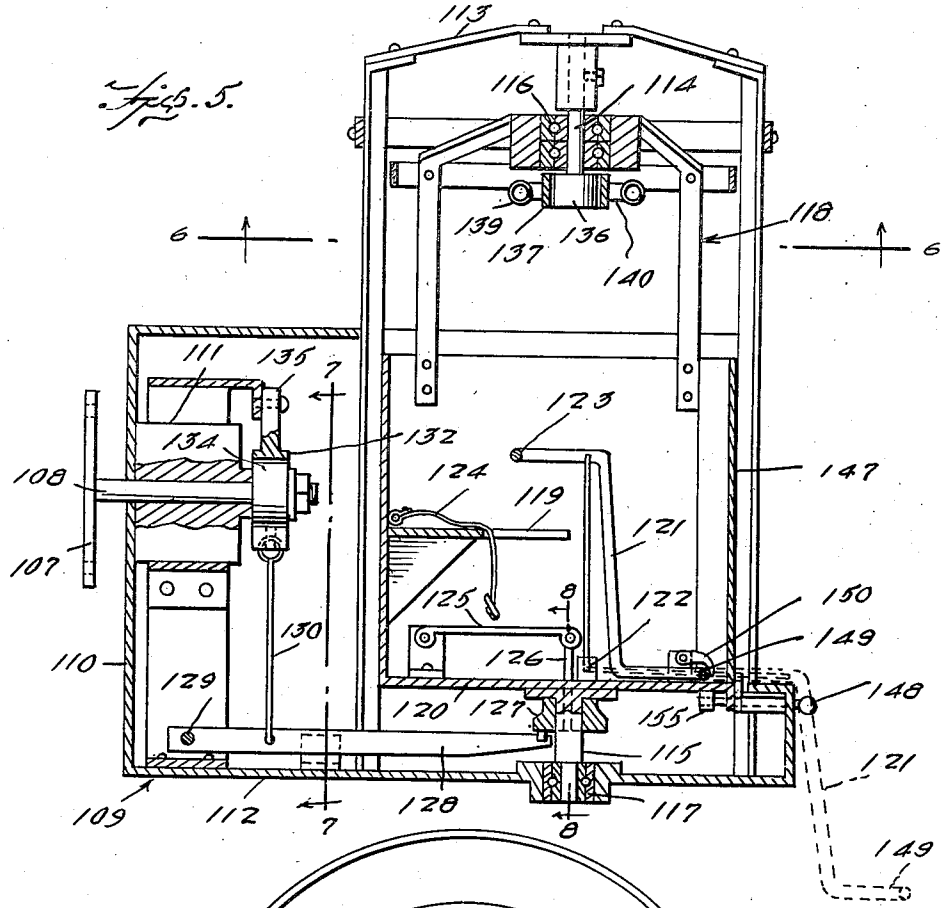
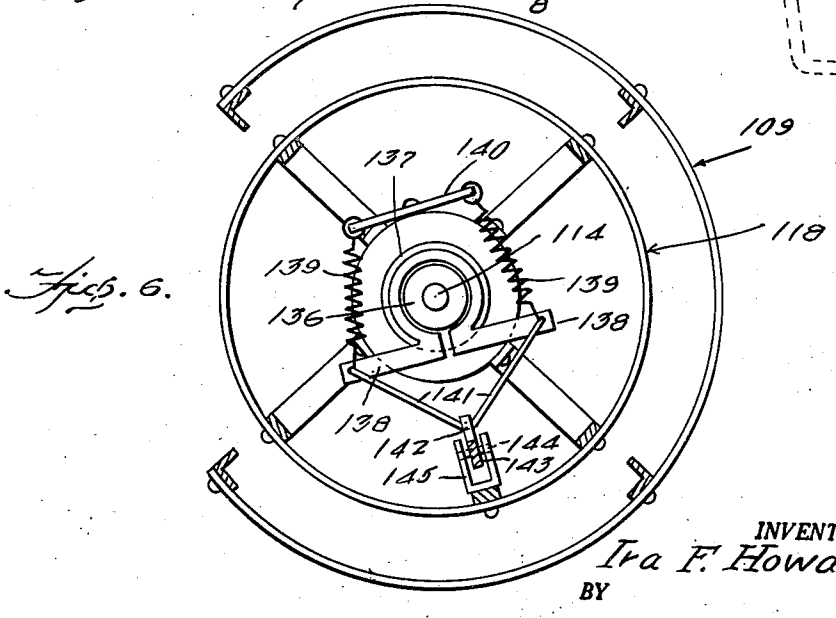


Fig. 6.



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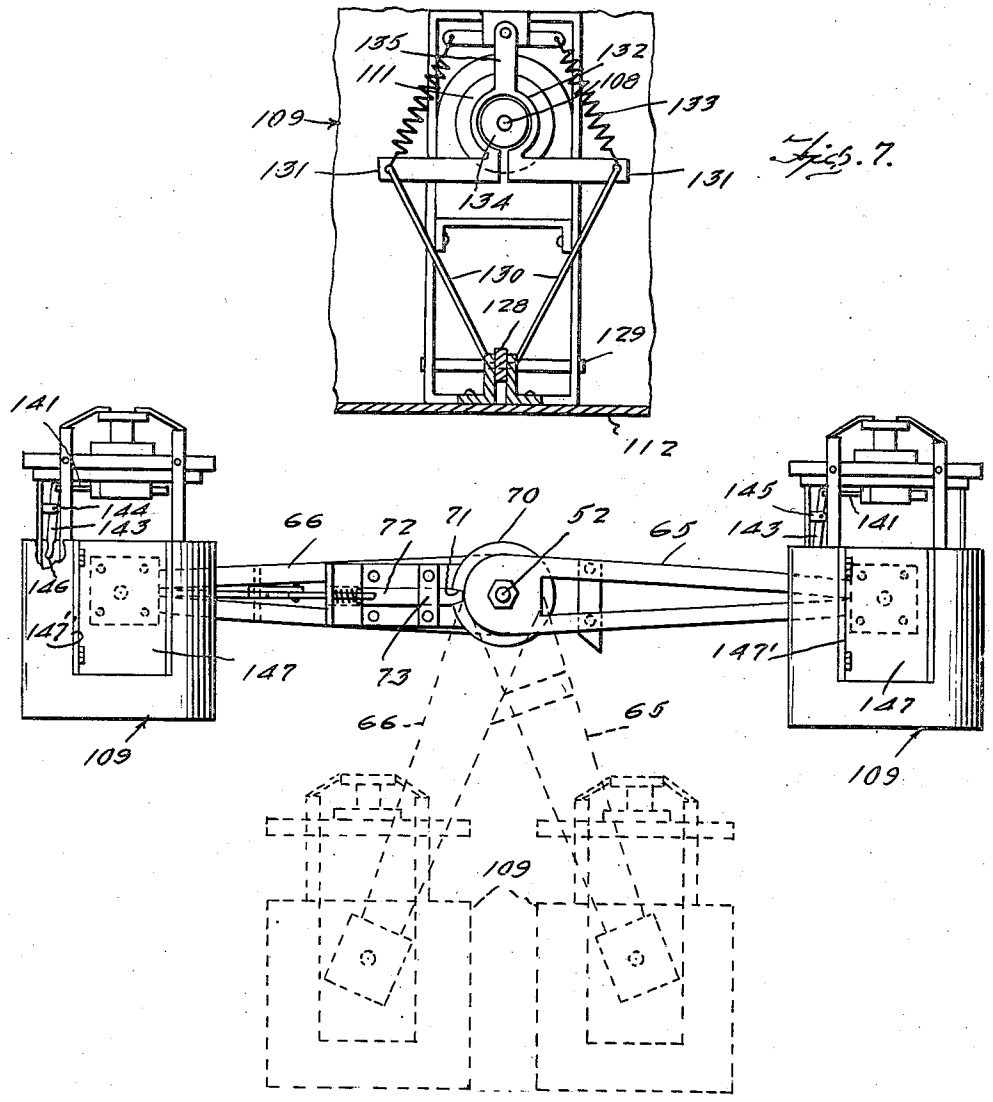

Fig. 7.

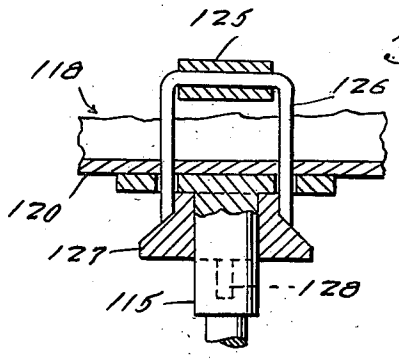

Fig. 9.

Fig. 8.

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Patented July 10, 1951

2,559,768

UNITED STATES PATENT OFFICE

2,559,768

VERTICAL AND HORIZONTAL AXES ROUNDABOUT

Ira F. Howard, Marco, Fla., assignor of one-third to Roy Rimes and one-third to Ira Howard, both of Marco, Fla.

Application April 30, 1948, Serial No. 24,357

19 Claims. (Cl. 272—36)

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My invention relates to amusement devices, and more particularly to a device adapted to be used by an amusement park. More particularly, my invention relates to an amusement device of the same general character as that disclosed in my prior Patent No. 2,368,989, dated February 6, 1945, wherein one or more means providing a seat is whirled about an axis.

With the foregoing in view, it is an object of my invention to provide an improved amusement device of the class described.

A further object is to provide an improved amusement device wherein at least one substantially radially-directed arm is rotated about an axis, an auxiliary arm is hingedly connected to the first-named arm, and wherein driven means reciprocates said auxiliary arm as the same is whirled about with the first-named arm.

A further object is to provide in an amusement device such as that last described driven and auxiliary shafts universally coupled together and carried respectively by said arm and said auxiliary arm for rotation as said arms are whirled about.

A further object is to provide an improved amusement device which includes at least one driven shaft adapted to be rotated on its axis as it is whirled about a second and angularly-disposed axis, a pair of arms carried by said auxiliary shaft and extending substantially radially thereof, means for moving said arms relative to each other on said auxiliary shaft to and from an operative position wherein cars carried by said arms are remotely disposed relative to each other, and a loading position wherein said arms and cars are juxtaposed.

A further object is to provide an improved amusement device which includes a driven shaft adapted to be rotated on its axis while being whirled about the second and angularly-disposed axis, at least one arm carried by said driven shaft and extending substantially radially thereof, a car carried by said arm, means pivotally coupling said car to said arm on an axis angularly disposed relative to said arm, and means for locking said car to said arm against rotation relative thereto.

A further object is to provide in an improved amusement device such as that last described a seat carried by said car, means mounting said seat in said car for rotation about an axis angularly disposed relative to the pivotal axis of said car.

A further object is to provide an improved amusement device which includes a driven shaft adapted to be rotated about its axis as it is whirled

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about a second and angularly-disposed axis, at least one arm carried by said driven shaft and extending substantially radially thereof, a seat, means providing a gimbal operatively coupling said seat to said arm, means associated with said seat and adapted to be operated by an occupant of said seat for locking the same against rotation about either or both axes of said gimbal.

Other objects and advantages reside in the particular structure of the invention as a whole, the structures of the several elements comprising the same, combinations and subcombinations of said elements, and will be readily understood by those skilled in the art upon reference to the attached drawings in connection with the following specification, wherein the invention is shown, described and claimed.

In the drawings:

Figure 1 is a plan view of a preferred embodiment of the amusement device of the invention;

Figure 2 is an enlarged fragmentary elevation looking in the direction of the line 2—2 of Figure 1, parts being broken away and shown in transverse vertical section;

Figure 3 is a fragmentary elevation of a portion of Figure 2, parts being broken away and shown in longitudinal vertical section;

Figure 4 is a fragmentary horizontal section taken substantially on the planes of the lines 4—4 of Figure 2;

Figure 5 is a transverse vertical section on an enlarged scale and taken substantially on the plane of the line 5—5 of Figure 1;

Figure 6 is a transverse horizontal section taken substantially on the plane of the line 6—6 of Figure 5;

Figure 7 is a fragmentary transverse vertical sectional view taken substantially on the plane of the line 7—7 of Figure 5;

Figure 8 is an enlarged fragmentary transverse vertical sectional view taken substantially on the plane of the line 8—8 of Figure 5;

Figure 9 is an end elevation looking from the right of Figure 2, but showing certain of the parts in a different position, and with parts being omitted for clarity;

Figure 10 is a diagrammatic view showing a control system for a portion of the invention.

Referring specifically to the drawings, wherein like reference characters have been used throughout the several views to designate like parts, and referring at first to Figures 1 and 2, 10 designates generally any suitable supporting base for the device according to the invention. Such base 10 includes a vertically-disposed pedestal 11 which

may be reinforced by suitable struts 12. The upper end of the pedestal 11 has fixed thereto a crown gear 13 which comprises upwardly-directed bevel teeth 14 and subjacent laterally-directed spur teeth 15. As best seen in Figure 2, the pedestal 10 has journaled therein a drive shaft 16 which is disposed vertically and is coaxial with the crown gear 13. The lower end of the shaft 16 is journaled in a suitable thrust bearing 17 fixed to the base 10 and an intermediate portion of the shaft is journaled in a bearing 18 concentrically disposed within the crown gear 13. The shaft 16 has fixed thereon between the bearings 17 and 18 a suitable gear or the like 19 which is adapted to be operatively connected to any suitable source of power, not shown, whereby the shaft 16 may be rotated. The upper end of the shaft 16 extends vertically above the crown gear 13 and may be enlarged, as at 20, with the upper end formed to provide a clutch 21 which receives the complementary clutch portion 22 of a core portion 23 of a main frame 24. Thus, the main frame 24 is rotatable with the drive shaft 16 as a unit, but may be readily disconnected therefrom for the purpose of storage and/or shipment.

The core 23 of the main frame is provided with a plurality of radially outwardly and downwardly-directed arms 28, the lower outer ends of which are formed to provide the upper portions of a conventional split journal 29 providing a substantially radially-directed bearing. Hangers 30 depend from the flanges of the journal 29 and the lower ends have fixed thereto inner frame members 25 which extend substantially concentrically about the pedestal 11. The inner surfaces of the inner frame members 25 have fixed thereon suitable bearings 31 in which the stub shafts of planetary gears 32 are journaled. The planetary gears 32 have radially-directed spur teeth enmeshed with the teeth of the fixed spur gear 15 which comprises a sun gear. The flanges of the journals 29 likewise have secured thereto outwardly-directed horizontal frame members 27, the outer ends of which are connected in any suitable manner to outer horizontally-disposed frame members 26 which are concentrically disposed about the inner frame members 25 in outwardly and upwardly-spaced relation relative thereto. The core 23 of the main frame 24 is provided with a plurality of radially-outwardly- and downwardly-directed struts 33, the outer ends of which are connected in any suitable manner to the adjacent ends of adjacent outer frame members 26 and form therewith the suitable journal or bearing 34 which is radially aligned with the previously described journal 29. Such journals or bearings 29 and 34 rotatably mount driven shafts 35, the inner ends of which have bevel gears 36 fixed thereto in mesh with the bevel gear 14 of the crown gear 13. It is thus apparent that as the drive shaft 16 is rotated, the main frame 24 is rotated therewith and that the planetary gears 32 are driven by the sun gear portion 15 of the crown gear, while the driven shafts 35 are rotated by the bevel teeth 14 of the crown gear.

Each bearing or journal 34 is formed with a pair of laterally outwardly-directed spaced ears 37, the purpose of which will be described later. Likewise, each outer horizontal frame member 26 is provided in the region of each bearing 34 with any suitable means 38 for mounting a horizontally-disposed pintle 39 whereby to secure the laterally outwardly-directed legs 41 of an auxiliary frame 40 to the main frame 24. The legs 41 straddle the bearings 34 and may be cross-braced by suitable cross-braces 42 spanning such legs. Preferably, as shown, the cross-braces 42 are arched upwardly to clear the subjacent structure to be described presently. The auxiliary frame 40 includes the pair of laterally-spaced ears 43 between each pair of legs 41 which straddle the ears 37 of the main frame 24. A pintle 44 extends through the aligned ears 37 and 43 to hingedly connect the same together. In this connection, it should be noted that the pintles 44 and the related or associated pintles 39 are parallel and lie in a substantially horizontal plane normal to the axis of the shafts 35. The auxiliary frame 40 also includes a plurality of collars 45, each of which has mounted a pair of laterally oppositely-directed brackets 46, each including a pair of longitudinally-spaced ears 47 mounting slide rods 48 therebetween. The outer ends of each pair of legs 41 are formed to provide tubular guides slidable on the slide rods 48. The structure thus described permits the auxiliary frame 40 to be reciprocated vertically on the pintles 44 and 39 by means to be described. Inasmuch as the pintles 39 and 44 are offset, the slidable connection with legs 41 on the rods 48 is necessary to comprise a differential action, when the auxiliary frame 40 is swung upwardly and downwardly relative to the main frame 24.

The collar 45 is concentrically disposed about a tubular auxiliary frame arm 50 and is fixed thereto to provide part of the auxiliary frame. The tube 50 has opposite ends extending outwardly of both ends of the collar 45 and is enlarged, as at 55, to provide means mounting bearings 51 on the shaft 52. The inner end of the shaft 52 extends between the ears 43 and has fixed thereon a bevel pinion 53. The bevel pinion 53 is operatively connected to the bevel pinion 56 fixed on the outer end of each shaft 35 aforesaid by an idler pinion 54 fixed or journaled on the spindle 44. Thus, the idler pinion 54 comprises in effect a universal joint providing a driving connection between the shafts 35 and the auxiliary shafts 52 for rotation of the latter with the former irrespective of the vertical position of the auxiliary frame 40 relative to the main frame 24.

The main frame 24 is provided in the region of each bearing 34 with an upstanding mast 57 providing a bracket for a pulley 58. Likewise, there is provided an adjacent bracket 60 for a pulley 61. Each auxiliary frame is provided with an upwardly-directed rigid lever arm 59 to which is connected a drag link-providing flexible member 62. Each link 62 is passed over the pulleys 58 and 61, thence over a horizontally-disposed pulley 64 carried by an outer frame member 26 intermediate the ends thereof and is thereafter operatively connected to a crank-providing means such as a crank pin 63, Figure 1, carried by each planetary gear 32 eccentrically thereof. Thus, as the main frames and auxiliary frames are rotated about the drive shaft 16, the crank means 63 and the drag link-providing member 62 are effective to raise and lower the auxiliary frames 40 on their hinge connections with the main frame.

The auxiliary shaft 52 has mounted on the outer free end thereof a pair of arms 65 and 66 which extend radially of such shaft. Such arms 65 and 66 may be provided with a pair of radially-inwardly-directed struts 67, the inner ends of which are formed to provide collars 68 mount-

ing suitable bearings whereby such collars 68 are journaled on the tubular arm 50 for rotation relative thereto. Each arm 66 is provided with a hub 69 formed with a suitable bearing, whereby the arm 66 is freely rotatable on the shaft 52. On the other hand, the arm 65 is provided with a hub 70 which is fixed to the shaft 52 for rotation therewith at all times. As best seen in Figures 2 and 9, and to some extent in Figure 3, the arms 65 and 66 normally extend from the shaft 52 in diametrically opposite directions to provide operative positions of such arms. To maintain the arms in such operative position, the hub 70 of the arm 65 is formed with a detent notch 71 which extends radially of the hub and is adapted to receive the latch dog 72 which is slidably mounted on the arm 66 in any suitable manner, as by the keeper 73. Thus, with the latch dog 72 engaged in the detent notch 71, the arms 65 and 66 are locked in the operative position and rotate with the shaft 52 as a unit. However, when the latch dog 72 is retracted from the latch detent 71, it is obvious that the arm 66 is freely rotatable on the shaft 52 relative to the arm 65. As best seen in Figure 9, when it is desirable to load passengers onto the cars to be described later, which are carried by the arms 65 and 66, the arm 66 is positioned adjacent the ground with the arm 65 extending vertically upwardly relative thereto. The latch dog 72 is now retracted and the drive shaft 16 rotated a short distance, whereby to drive the auxiliary driven shaft 52 in a manner previously described. Such driving of the auxiliary shaft 52 rotates the arm 65 to the broken line position, Figure 9, where it is juxtaposed to the arm 66 and adjacent the ground. A spring 74 is carried by the arm 66 and loads the latch dog 72 for movement in a detent-engaging direction. Then, as the shaft 52 is again rotated, the arm 66 will remain pendent substantially in the broken line position, Figure 9, but the arm 65 will rotate with the shaft 52 until the detent 71 is opposite the latch dog 72, at which time the spring 74 will cause the latch dog to engage the detent and lock the arms 65 and 66 in diametrically-opposite relation for rotation as a unit with the shaft 52.

To retract the latch dog 72, a link 75 connects the same to one arm 76 of a bell crank 77 pivoted on the arm 66. A handle 85 rearwardly of the arm 66 is provided to rotate the bell crank 77 in a clockwise direction to retract the latch dog 72. However, it is highly desirable to permit all of the arms 66 to be simultaneously unlatched from their related arms 65 by a single attendant. For this reason, a second arm 78 is provided on the bell crank 77 and connected pivotally by a drag link 79 to an arm 80 of a second bell crank 81. The second bell crank 81 is pivoted on a strut 67 extending from each arm 66 and includes a second arm 82 extending rearwardly thereof below the adjacent collar 45 of the auxiliary frame 40. Such collar 45 has pivoted thereon a third bell crank 86, one arm of which extends over a second arm 82 on the bell crank 81. A second spring 83 is operatively connected to the bell crank arm 82 and to the adjacent strut 67 whereby to load the parts in a latch dog-engaging direction. The third bell crank 86 is pivotally mounted intermediate its ends on a collar 45 and includes a radially inwardly directed arm 88 which is adapted to be depressed as the arm 87 is elevated by the second bell crank 81, the bell crank 81 being adapted to bear against the arm 87 of the bell crank 86 upon rotary movement in a clockwise direction.

Figures 2 and 10 illustrate the main control for all of the arms 65 and 66, whereby they may be released simultaneously. To accomplish this end, the free end of the bell crank arm 88 of the third bell crank 86 is connected to a suitable flexible member 90 which extends over a suitable system of pulleys 89 for connection to each of the other latch dogs 72 in a manner now to be described. Thus, Figure 3 represents one of the other arms of the auxiliary frames. When a pull is exerted on the flexible member 90, the third bell crank lever 86 of such frame is elevated or rocked in a clockwise direction whereby the inner lever arm 88 is elevated to the broken line position. This depresses the outer lever arm 87 and the associated lever arm 82 of the second bell crank 81. This action raises the outer bell crank arm 80 of the latter and likewise elevates a drag link 104 which corresponds to the drag link 79 except that it is connected to a bell crank lever 105 below the fulcrum 92 thereof. This connection causes the outwardly-directed bell crank arm 92' to be depressed, whereby the link 75 actuates the latch dog 72 in a detent-disengaging direction. Thus, it is only necessary for the operator of the device to stop the control arm of the auxiliary frame adjacent the attendant whereby he may simultaneously actuate the control handle 85 and simultaneously unlock all of the arms 66 from their shafts 52. By providing the latches and actuating means therefor on the arms 66, there is no danger of their being positioned in any other than a pendent position when the device is stopped and the arms 66 unlocked. Thus, there is no danger of such arms falling rapidly from an elevated position to a pendent position and possibly injuring some of the passengers thereon. At the same time, the arms 66 are unlocked with a minimum of delay whereby the slight continued rotation of the parts as aforesaid is sufficient to juxtapose the arms 65 and 66 as indicated in broken lines, Figure 9.

Thus, it is only necessary for the operator of the machine to stop the machine with the mounting handle 85 adjacent a single attendant. The lever linkage hook-up between the arms 66 and their associated latches 72 is such that the actuation of such operating handle 85 radially inwardly toward the drive shaft 16 is effective to release all of the latches 72 simultaneously.

As best seen in Figure 10, an operative hook-up from the control lever 5 to the latches 72 on the other auxiliary frame arms 40 is disclosed. As there shown, the flexible connector 90 passes over a pulley 89 carried by the first auxiliary frame arm and extends laterally along the outer frame member 26 outwardly of the same. Such wire 90 is connected by any suitable detachable connections 93 to a pair of wires or cables 94 and 96. The cable 94 is directed downwardly over a pulley 95 to a bell crank lever 86 carried by the second auxiliary frame arm 40. Such lever 86 is connected as aforesaid to a second bell crank lever 81 which in turn is connected by a drag link 104 to a bell crank lever 105. The other arm is connected by a drag link 75 to a latch 72. The second cable 96 extends over a pulley 97 toward the third auxiliary frame arm 40. Such cable 96 is connected by any suitable detachable connection 98 to a further pair of cables 99 and 101. The cable 99 extends over a pulley 100 and is connected to the bell cranks 86, 81, drag link 104, bell crank 105 and drag link 75 to the third latch 72. The cable 101

extends around a pulley 102 to the fourth auxiliary frame arm 40 and is connected to the latch 72 thereof by bing extended downwardly over a pulley 103 and operatively connected to the bell crank lever 86, thence, through the bell crank lever 81, drag link 104, bell crank lever 105 and drag link 75 to the latch 72. A feature of this arrangement is that it permits the auxiliary frames 40 to be reciprocated vertically as aforesaid, without breaking or slacking the flexible connectors or cables 90, 94, 96, 99 and 101. While the particular construction shown is operative at only a single auxiliary frame arm, that which mounts the actuating lever 77, it is contemplated that the invention very well may include an arrangement whereby all of the latches 72 may be simultaneously released from any of the arms 66.

As mentioned aforesaid, each of the arms 65 and 66 has mounted on the free end thereof a car including a seat for the carrying of passengers. Such cars and seats are best seen in Figures 2 and 5 to 9, inclusive. Each arm 65 and 66 may have formed on the free end thereof a mounting plate 106 to which is detachably connected by bolts or the like mounting plates 107. Such plates 107 have fixed thereto outwardly-directed stub shafts 108 which comprise one axis of a gimbal. Each stub shaft 108 has journaled thereon for free rotation about such shaft a car 109. As best seen in Figure 5, each car 109 includes a casing 110 which includes a suitable bearing 111 in which the shaft 108 is journaled, a floor 112 and a top frame portion 113. The floor 112 and top frame portion 113 include respectively aligned stub shafts 115 and 114 comprising the axes for a seat 118. Thus, while the stub shaft 108 provides one axis for a gimbal, the aligned stub shafts 115 and 114 provide the other axis for the gimbal. The stub shafts 114 and 115 are journaled respectively in suitable bearings 116 and 117 carried respectively by the seat 118 and the floor 112 of the car. The seat 118 will be described more fully later, but it is to be understood now that the seat is intended to be sufficiently large to accommodate at least two persons. Moreover, means now to be described are provided whereby the occupant or occupants of the seat 118 may control the relative rotation of the seat 118 within the car 109 on the stub shafts 115 and 114, or the rotation of the car on the stub shaft 108 or both.

Referring now to Figures 5, 7 and 8, the seat 118 includes a bench 119 and a floor 120. A suitable safety bar 121 may be pivoted to the floor 120, as at 122, and may include an offset portion 123 adapted to extend over the laps of the passengers seated on the bench 119 to cooperate with safety straps 124 to secure the passengers onto the bench 119. A pedal 125 is pivoted to the floor 120 below the bench 119 and is adapted to be depressed by the foot of one of the occupants. The forward end of the pedal 125 is in the region of the shaft 115 and is pivoted to a yoke 126, Figure 8, the legs of which straddle the shaft 115 and extend slidably downwardly through the floor 120 of the seat. The lower ends of the legs of the yoke 126 are fixed to a collar 127 which is slidable on the shaft 115. An under surface of the collar 127 rests atop the forward free end of a lever 128, the rear end of which is fulcrumed to the floor 112 of the car, as at 129. A drag link 130 is pivoted to the lever 128 between the fulcrum and the free end thereof and extends upwardly below the stub shaft 108. In practice, the drag link 130 comprises the upwardly and outwardly-directed arms of a yoke, the bight of which is pivoted to the lever 128. The upper ends of the arms 130 are pivoted to the outer ends of lever extensions 131 of a brake-providing split ring 132. The split ring 132 encircles a brake drum 134 fixed to the stub shaft 108. The split ring 132 is supported by any suitable hanger 135 carried by the car 109. Springs 133 have their upper ends connected to the car 109 and their lower ends to the lever arms 131 whereby to load the latter in directions to spread the slit ring 132 and permit free relative rotation of the car 109 on the stub shaft 108. However, it is obvious from an inspection of Figure 5 that depression of the pedal 125 will depress the lever 128 whereby the yoke arms 130 are operative to swing the arms 131 downwardly and cause the split ring 132 to tightly grip the brake drum 134 and lock the car 109 to the stub shaft 108 against rotation thereon. As shown in Figure 9, with the braking ring 132 released, the weight of the occupants of the seats 118 will maintain the cars 109 in a horizontal position relative to the arms 65 and 66 as the latter rotate with the shafts 52. Thus, the occupants of the seats 118 remain upright at all times if they so desire. However, if the occupants wish to be turned upside down as the arms 65 and 66 rotate, it is only necessary to depress the pedal 125 and the cars will be locked to the shaft 108 and will remain so locked during rotation of the arms 66. Thus, the occupants may lock the cars in any position relative to the arms 65 and 66 which they desire. Likewise, the occupants may restore the car to a horizontal position merely by releasing the pedal 125 to permit gravity to bring the car to a horizontal position.

Referring now to Figure 5 in connection with Figure 6, there is disclosed means actuated by the occupants of the seats 118 for locking such seats against rotation relative to the cars 109 on the stub shafts 114 and 115. Thus, the stub shaft 114 may be provided with a free inner end formed to provide a brake drum 136. The brake drum 136 is encircled by a split ring 137 providing a brake. The forward ends of the split ring 137 are provided with oppositely outwardly-directed lever arms 138, the free ends of which are connected by springs 139 to a support 140 carried by each seat 118. The springs 139 load the split ring 137 in a direction to spread the same and permit free rotation of the seat 118 on the stub shaft 114. The free ends of the lever arms 139 are likewise connected by yoke arms 141 and the bight 142 of the yoke to an actuating lever 143 which is fulcrumed as at 144 in suitable brackets 145 carried by the seat 118. This structure is seen in Figure 9, as well as in Figure 6. The actuating handle 146 comprising the free lower end of the lever 143 is conveniently located in the car 118 so that it may be readily grasped and controlled by an occupant. Thus, with the brake 137 released, the seat 118 is free to pivot and/or rotate on the stub shafts 115 and 114. However, then an occupant wishes to lock the seat to the car against rotation relative thereto, it is only necessary to rock the actuating lever 143 in a radially inwardly direction which will actuate the yoke arms 141 in a direction to cause the split ring 137 to grasp the brake drum 136 tightly whereby the seat 118 is locked to the car 109. Obviously, release of the actuating lever 143 again permits free rotation of the seat in the car.

As best seen in Figure 9, in conjunction with

Figure 5, each car 109 is provided with a door opening 147' which is located oppositely to the stub shaft 106. Each seat 118 is provided with a door 147 alignable with openings 147', and may be locked in a closed position by any suitable latch or lock 148. Preferably, the latch or lock 148 is located outwardly of the seat 118 and is adapted to be controlled by an operator of the entire device and not by the occupants. Also, the guard 121 includes a step-providing portion 149 which is locked in a guard-providing position by a latch 150 which is normally operable only by an attendant for the machine. With the door 147 open, the attendant unlatches the guard 121 and swings the same to the broken line position, Figure 5, where the portion 123 rests on the floor 120 of the seat and is engaged by the latch 150 to retain the same in the step-providing position. With the foregoing arrangement, it is readily apparent that once the occupants of the seat 118 are secured in place by the guard bar 121 and/or by the safety belts 124, they cannot get out of the car until released by the attendant. Thus, they are protected against injury when and if through panic they attempt to leave the seats 118 before the device has ceased operation.

While I have shown and described what is now thought to be a preferred embodiment of the invention, it is to be understood that the same is susceptible of other forms and expressions. Consequently, I do not limit myself to the precise structure shown and described hereinabove except as hereinafter claimed.

I claim:

1. In an amusement device including a stationary vertical base, a vertical drive shaft journaled in said base, a horizontal main frame fixed to said drive shaft for rotation therewith, at least one driven shaft journaled in said frame substantially radially of said drive shaft and means for rotating said driven shaft about its axis upon rotation of said drive shaft, the improvement comprising an auxiliary frame, means hingedly connecting said auxiliary frame to said main frame for swinging movement in vertical directions, an auxiliary shaft journaled in said auxiliary frame in end-to-end relation with said driven shaft, a universal joint operatively coupling said driven and auxiliary shafts together, a sun gear fixed to said base concentrically of said drive shaft, a planetary gear journaled on said main frame in mesh with said sun gear, crank means on said planetary gear, a vertically-extending lever arm fixed to said auxiliary frame, drag link-providing means operatively connecting said crank means and lever arm together whereby to swing said auxiliary frame vertically while said auxiliary shaft is rotating on its axis and being rotated about said axis of said drive shaft, and at least one car operatively connected to said auxiliary shaft for vertical swinging and rotation therewith.

2. In an amusement device including a stationary vertical base, a vertical drive shaft journaled in said base, a horizontal main frame fixed to said drive shaft for rotation therewith, at least one driven shaft journaled in said frame substantially radially of said drive shaft, and means for rotating said driven shaft about its axis upon rotation of said drive shaft, the improvement comprising a pair of arms mounted on said driven shaft and extending radially thereof, a car carried by each arm, means mounting one of said arms on said driven shaft for pivotal movement therearound relative to the other arm to and from an operative position diametrically opposite the other arm and a loading position adjacent the other arm, and means for moving said first-named arm relative to the other arm to and from said operative and loading positions.

3. In an amusement device including a stationary vertical base, a vertical drive shaft journaled in said base, a horizontal main frame fixed to said drive shaft for rotation therewith, at least one driven shaft journaled in said frame substantially radially of said drive shaft, and means for rotating said driven shaft about its axis upon rotation of said drive shaft, the improvement comprising a pair of arms mounted on said driven shaft and extending radially thereof, a car carried by each arm, one of said arms being fixed to said driven shaft, the other arm being freely rotatable on said driven shaft, means locking said last-named arm to said driven shaft in an operative position in diametrically opposite relation to said first-named arm, and means for releasing said other arm from said driven shaft for relative movement therearound to a loading position adjacent said first-named arm.

4. In an amusement device including a base, a substantially horizontal main frame journaled in said base on a substantially vertical axis, at least one laterally outwardly-directed driven shaft journaled in said main frame, and means for simultaneously rotating said driven shaft and main frame, the improvement comprising an auxiliary shaft, a universal joint operatively coupling said driven and auxiliary shafts together, means operative to swing said auxiliary shaft vertically while the same is rotating with said driven shaft, a pair of arms mounted on said auxiliary shaft and extending radially thereof, a car carried by each arm, means mounting one of said arms on said auxiliary shaft for pivoted movement therearound relative to the other arm, and means for moving said first-named arm relative to the other arm to and from an operative position with said arms and cars diametrically oppositely disposed relative to said auxiliary shaft and a loading position with said arms and cars juxtaposed.

5. In an amusement device including a base, a substantially horizontal main frame journaled in said base on a substantially vertical axis, at least one laterally outwardly-directed driven shaft journaled in said main frame, and means for simultaneously rotating said driven shaft and main frame, the improvement comprising an auxiliary shaft, a universal joint operatively coupling said driven and auxiliary shafts together, means operative to swing said auxiliary shaft vertically while the same is rotating with said driven shaft, a pair of arms mounted on said auxiliary shaft and extending radially thereof, said arms each including a free outer end, a car carried by each of said free outer ends, one of said arms being fixed to said auxiliary shaft, means mounting the other arm on said auxiliary shaft for free rotation relative thereto, a latch locking said last-named arm to said first-named arm for rotation therewith with said cars thereof located remotely of each other in operative positions, and means for unlatching said latch to permit relative movement of said arms and cars to and from said operative positions and loading positions with said arms and cars juxtaposed.

6. In an amusement device including a base, a

substantially horizontal main frame journaled in said base on a substantially vertical axis, at least one laterally outwardly-directed driven shaft journaled in said main frame, and means for simultaneously rotating said driven shaft and main frame, the improvement comprising an auxiliary shaft, a universal joint operatively coupling said driven and auxiliary shafts together, means operative to swing said auxiliary shaft vertically while the same is rotating with said driven shaft, a pair of arms mounted on said auxiliary shaft and extending radially thereof, said arms each including a free outer end, a car carried by each free outer end, pivot-providing means coupling said free outer ends to said cars for free pivotal movement of said cars about axes angularly disposed to said arms, means for selectively locking said arms to said cars to prevent pivotal movement of the latter, one of said arms being fixed to said auxiliary shaft, means mounting the other arm on said auxiliary shaft for free rotation relative thereto, a latch locking said last-named arm to said first-named arm for rotation therewith with said cars thereof located remotely of each other in operative positions, and means for unlatching said latch to permit relative movement of said arms and cars to and from said operative positions and loading positions with said arms and cars juxtaposed.

7. In an amusement device including a base, a substantially horizontal main frame journaled in said base on a substantially vertical axis, at least one laterally outwardly-directed driven shaft journaled in said main frame, and means for simultaneously rotating said driven shaft and main frame, the improvement comprising an auxiliary shaft, a universal joint operatively coupling said driven and auxiliary shafts together, means operative to swing said auxiliary shaft vertically while the same is rotating with said driven shaft, a pair of arms mounted on said auxiliary shaft and extending radially thereof, said arms each including a free outer end, a car carried by each free outer end, pivot-providing means coupling said free outer ends to said cars for free pivotal movement of said cars about axes angularly disposed to said arms, means for selectively locking said arms to said cars to prevent pivotal movement of the latter, a seat in each car, means mounting each seat in each car for free rotation about axes angularly disposed relative to the axes of said pivot-providing means, means for selectively locking said cars and seats together to prevent rotation of said seats in said cars, one of said arms being fixed to said auxiliary shaft, means mounting the other arm on said auxiliary shaft for free rotation relative thereto, a latch locking said last-named arm to said first-named arm for rotation therewith with said cars thereof located remotely of each other in operative positions, and means for unlatching said latch to permit relative movement of said arms and cars to and from said operative positions and loading positions with said arms and cars juxtaposed.

8. In an amusement device including a base, a substantially horizontal main frame journaled in said base on a substantially vertical axis, at least one laterally outwardly-directed driven shaft journaled in said main frame, and means for simultaneously rotating said driven shaft and main frame, the improvement comprising an auxiliary shaft, a universal joint operatively coupling said driven and auxiliary shafts together, means operative to swing said auxiliary shaft vertically while the same is rotating with said driven shaft, a pair of arms mounted on said auxiliary shaft and extending radially thereof, a car carried by each arm, means mounting said cars on said arms for free rotation about axes laterally disposed relative to said arms, and means for selectively locking said arms to said cars to prevent rotation of the latter relative to said arms.

9. In an amusement device including a base, a substantially horizontal main frame journaled in said base on a substantially vertical axis, at least one laterally outwardly-directed driven shaft journaled in said main frame, and means for simultaneously rotating said driven shaft and main frame, the improvement comprising an auxiliary shaft, a universal joint operatively coupling said driven and auxiliary shafts together, means operative to swing said auxiliary shaft vertically while the same is rotating with said driven shaft, a pair of arms mounted on said auxiliary shaft and extending radially thereof, said arms each including a free end, a car carried by each free outer end, pivot-providing means coupling said free outer ends to said cars for free pivotal movement of said cars about axes angularly disposed to said arms, means for selectively locking said arms to said cars to prevent pivotal movement of the latter, a seat in each car, means mounting each seat in each car for free rotation about axes angularly disposed relative to the axes of said pivot-providing means, and means for selectively locking said cars and seats together to prevent rotation of said seats in said cars.

10. In an amusement device including a base, a substantially horizontal main frame journaled in said base on a substantially vertical axis, at least one laterally outwardly-directed driven shaft journaled in said main frame, and means for simultaneously rotating said driven shaft and main frame, the improvement comprising an auxiliary shaft, a universal joint operatively coupling said driven and auxiliary shafts together, means operative to swing said auxiliary shaft vertically while the same is rotating with said driven shaft, a pair of arms mounted on said auxiliary shaft and extending radially thereof, said arms each including a free outer end, a car carried by each free outer end, pivot-providing means coupling said free outer ends to said cars for free pivotal movement of said cars about axes angularly disposed to said arms, and means for selectively locking said arms to said cars to prevent pivotal movement of the latter.

11. In an amusement device including a stationary vertical base, a vertical drive shaft journaled in said base, a horizontal main frame fixed to said drive shaft for rotation therewith, at least one driven shaft journaled in said frame substantially radially of said drive shaft and means for rotating said driven shaft about its axis upon rotation of said drive shaft, the improvement comprising an auxiliary frame, means hingedly connecting said auxiliary frame to said main frame for swinging movement in vertical directions, an auxiliary shaft journaled in said auxiliary frame in end-to-end relation with said driven shaft, a universal joint operatively coupling said driven and auxiliary shafts together, a sun gear fixed to said base concentrically of said drive shaft, a planetary gear journaled on said main frame in mesh with said sun gear, crank means on said planetary gear, drag link-providing means including opposite ends, means op-

eratively connecting said opposite ends of said drag link-providing means to said crank means and auxiliary frame respectively whereby to swing said auxiliary frame vertically while said auxiliary shaft is rotating on its axis and being rotated about said axis of said drive shaft, and at least one car operatively connected to said auxiliary shaft for vertical swinging and rotation therewith.

12. In an amusement device including a stationary vertical base, a vertical drive shaft journaled in said base, a horizontal main frame fixed to said drive shaft for rotation therewith, at least one driven shaft journaled in said frame substantially radially of said drive shaft and means for rotating said driven shaft about its axis upon rotation of said drive shaft, a sun gear fixed to said base concentrically of said vertical axis, a planetary gear journaled on said main frame and in mesh with said sun gear so as to be rotated thereby relative to said main frame upon rotation of the latter, crank means on said planetary gear, drag link-providing means operatively connecting said crank means and said auxiliary frame for swinging the latter vertically while the same is rotating with said driven shaft, a pair of arms mounted on said auxiliary shaft and extending radially thereof, said arms each including a free outer end, a car carried by each of said free outer ends, one of said arms being fixed to said auxiliary shaft, means mounting the other arm on said auxiliary shaft for free rotation relative thereto, a latch locking said last-named arm to said first-named arm for rotation therewith with said cars thereof located remotely of each other in operative positions, and means for unlatching said latch to permit relative movement of said arms and cars to and from said operative positions and loading positions with said arms and cars juxtaposed.

13. In an amusement device including a base, a substantially horizontal main frame journaled in said base on a substantially vertical axis, at least one laterally outwardly-directed driven shaft journaled in said main frame, and means for simultaneously rotating said driven shaft and main frame, the improvement comprising an auxiliary shaft, a universal joint operatively coupling said driven and auxiliary shafts together, a sun gear fixed to said base concentrically on said vertical axis, a planetary gear journaled in said main frame and enmeshed with said sun gear for rotation thereby, crank means on said planetary gear, drag link-providing means operatively connecting said crank means to said auxiliary frame for swinging the latter vertically while the same is rotating with said driven shaft, a pair of arms mounted on said auxiliary shaft and extending radially thereof, said arms each including a free outer end, a car carried by each free outer end, pivot-providing means coupling said free outer ends to said cars for free pivotal movement of said cars about axes angularly disposed to said arms, means for selectively locking said arms to said cars to prevent pivotal movement of the latter, one of said arms being fixed to said auxiliary shaft, means mounting the other arm on said auxiliary shaft for free rotation relative thereto, a latch locking said last-named arm to said first-named arm for rotation therewith with said arms thereof located remotely of each other in operative positions, and means for unlatching said latch to permit relative movement of said arms and cars to and from said operative positions and loading positions with said arms and cars juxtaposed.

14. In an amusement device including a base, a substantially horizontal main frame journaled in said base on a substantially vertical axis, at least one laterally outwardly-directed driven shaft journaled in said main frame, and means for simultaneously rotating said driven shaft and main frame, the improvement comprising an auxiliary shaft, a universal joint operatively coupling said driven and auxiliary shafts together, a sun gear fixed to said base concentrically of said vertical axis thereof, a planetary gear journaled in said main frame in meshing engagement with said sun gear for rotation thereby, crank means on said planetary gear, drag link-providing means operatively connecting said crank means to said auxiliary shaft for swinging the latter vertically while the same is rotating with said driven shaft, a pair of arms carried by said auxiliary shaft and extending radially thereof, said arms each including a free outer end, a car carried by each free outer end, pivot-providing means coupling said free outer ends to said cars for free pivotal movement of said cars about axes angularly disposed to said arms, means for selectively locking said arms to said cars to prevent pivotal movement of the latter, a seat in each car, means mounting each seat in each car for free rotation about axes angularly disposed relative to the axes of said pivot-providing means, means for selectively locking said cars and seats together to prevent rotation of said seats in said cars, one of said arms being fixed to said auxiliary shaft, means mounting the other arm on said auxiliary shaft for free rotation relative thereto, a latch locking said last-named arm to said first-named arm for rotation therewith with said cars thereof located remotely of each other in operative positions, and means for unlatching said latch to permit relative movement of said arms and cars to and from said operative positions and loading positions with said arms and cars juxtaposed.

15. In an amusement device including a base, a substantially horizontal main frame journaled in said base on a substantially vertical axis, at least one laterally outwardly-directed driven shaft journaled in said main frame, and means for simultaneously rotating said driven shaft and main frame, the improvement comprising an auxiliary shaft, a universal joint operatively coupling said driven and auxiliary shafts together, a sun gear fixed to said base concentrically of said vertical axis thereof, a planetary gear journaled in said main frame in meshing engagement with said sun gear for rotation thereby, crank means on said planetary gear, drag link-providing means operatively connecting said crank means to said auxiliary shaft for swinging the latter vertically while the same is rotating with said driven shaft, a pair of arms carried by said auxiliary shaft and extending radially thereof, said arms each including a free outer end, a car carried by each free outer end, pivot-providing means coupling said free outer ends to said cars for free pivotal movement of said cars about axes angularly disposed to said arms, means for selectively locking said arms to said cars to prevent pivotal movement of the latter, a seat in each car, means mounting each seat in each car for free rotation about axes angularly disposed relative to the axes of said pivot-providing means, and means for selectively locking said

cars and seats together to prevent rotation of said seats in said cars.

16. In an amusement device including a base, a substantially horizontal main frame journaled in said base on a substantially vertical axis, at least one laterally outwardly-directed driven shaft journaled in said main frame, and means for simultaneously rotating said driven shaft and main frame, the improvement comprising an auxiliary shaft, a universal joint operatively coupling said driven and auxiliary shafts together, a sun gear fixed to said base concentrically of said vertical axis thereof, while the same is rotating with said driven shaft, a pair of arms carried by said auxiliary shaft and extending radially thereof, a planetary gear journaled in said main frame in meshing engagement with said sun gear for rotation thereby, crank means on said planetary gear, drag link-providing means operatively connecting said crank means to said auxiliary shaft for swinging the latter vertically, said arms each including a free outer end, a car carried by each free outer end, pivot-providing means coupling said free outer ends to said cars for free pivotal movement of said cars about axes angularly disposed to said arms, and means for selectively locking said arms to said cars to prevent pivotal movement of the latter.

17. In an amusement device including a stationary vertical base, a vertical drive shaft journaled in said base, a horizontal main frame fixed to said drive shaft for rotation therewith, at least one driven shaft journaled in said frame substantially radially of said drive shaft, and means for rotating said driven shaft about its axis upon rotation of said drive shaft, the improvement comprising a pair of arms mounted on said driven shaft and extending radially thereof, a car carried by each arm, one of said arms being fixed to said driven shaft, the other arm being freely rotatable on said driven shaft, latch means locking said last-named arm to said driven shaft for rotation therewith with the cars of said arms remote from each other in operative positions, means for unlatching said latch means to permit relative movement of said arms to and from said operative positions and pendant positions wherein said cars are juxtaposed in loading positions.

18. In an amusement device including a base, a substantially horizontal main frame journaled in said base on a substantially vertical axis, at least one laterally outwardly-directed driven shaft journaled in said main frame, and means for simultaneously rotating said driven shaft and main frame, the improvement comprising an auxiliary shaft, a universal joint operatively coupling said driven and auxiliary shafts together, means operative to swing said auxiliary shaft vertically while the same is rotating with said driven shaft, a pair of arms mounted on said auxiliary shaft and extending radially thereof, said arms each including a free outer end, a car carried by each of said free outer ends, one of said arms being fixed to said auxiliary shaft, means mounting the other arm on said auxiliary shaft for free rotation relative thereto, means locking said last-named arm to said auxiliary shaft in an operative position in remotely disposed relation to said first-named arm, and means for releasing said other arm from said auxiliary shaft for relative movement thereabout to a loading position adjacent said first-named arm.

19. In an amusement device including a stationary vertical base, a vertical drive shaft journaled in said base, a horizontal main frame fixed to said drive shaft for rotation therewith, at least one driven shaft journaled in said frame substantially radially of said drive shaft, and means for rotating said driven shaft about its axis upon rotation of said drive shaft, the improvement comprising a pair of arms mounted on said driven shaft and extending radially thereof, a car carried by each arm, one of said arms being fixed to said driven shaft, the other arm being freely rotatable on said driven shaft, means locking said last-named arm to said driven shaft in an operative position in remotely disposed relation to said first-named arm, and means for releasing said other arm from said driven shaft for relative movement therearound to a loading position adjacent said first-named arm.

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