April 2, 1946. E. C. HALL 2,397,857

AMUSEMENT DEVICE

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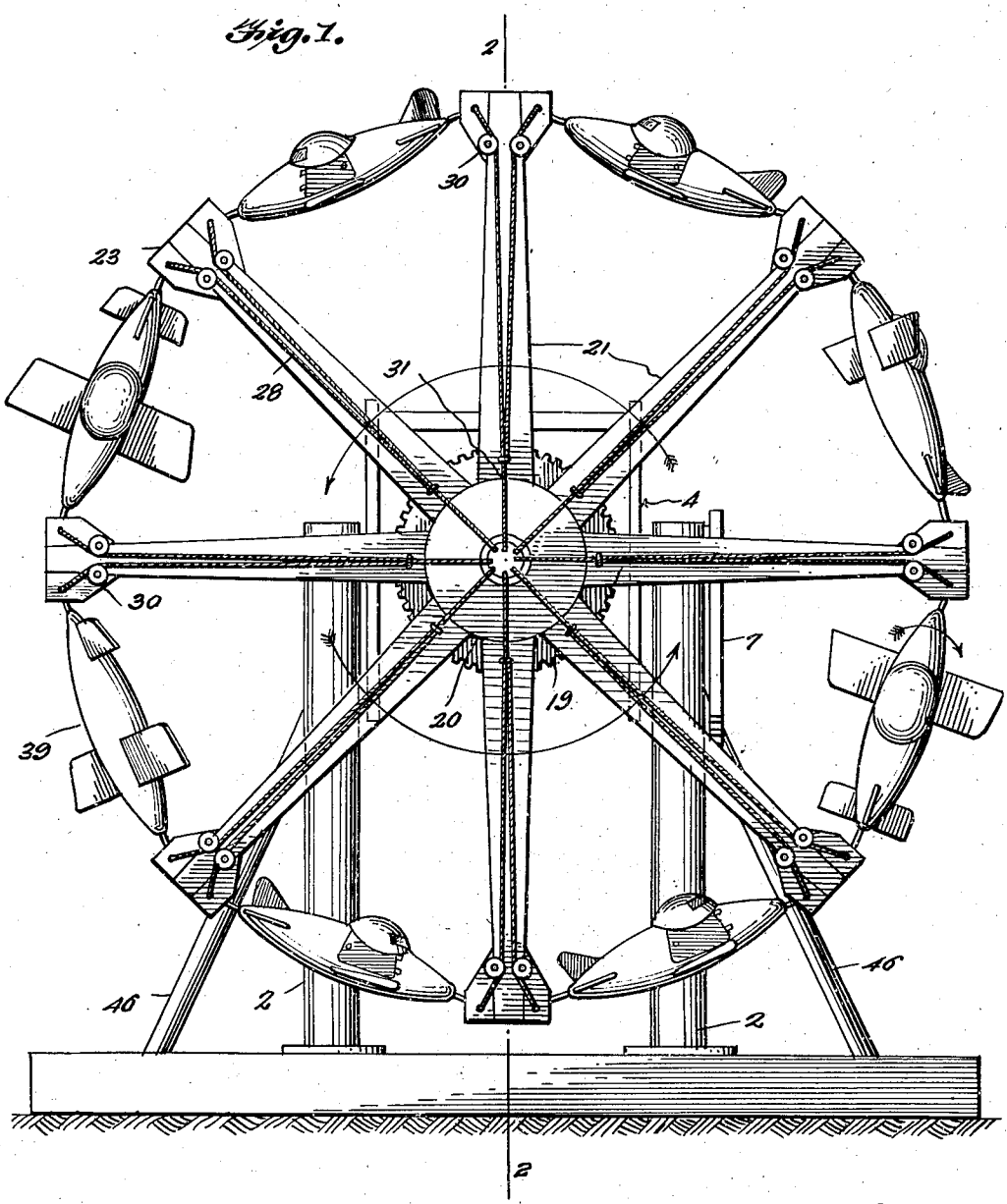
Fig. 1.



Inventor
ELLIS C. HALL

By Randolph & Beavers

Attorney

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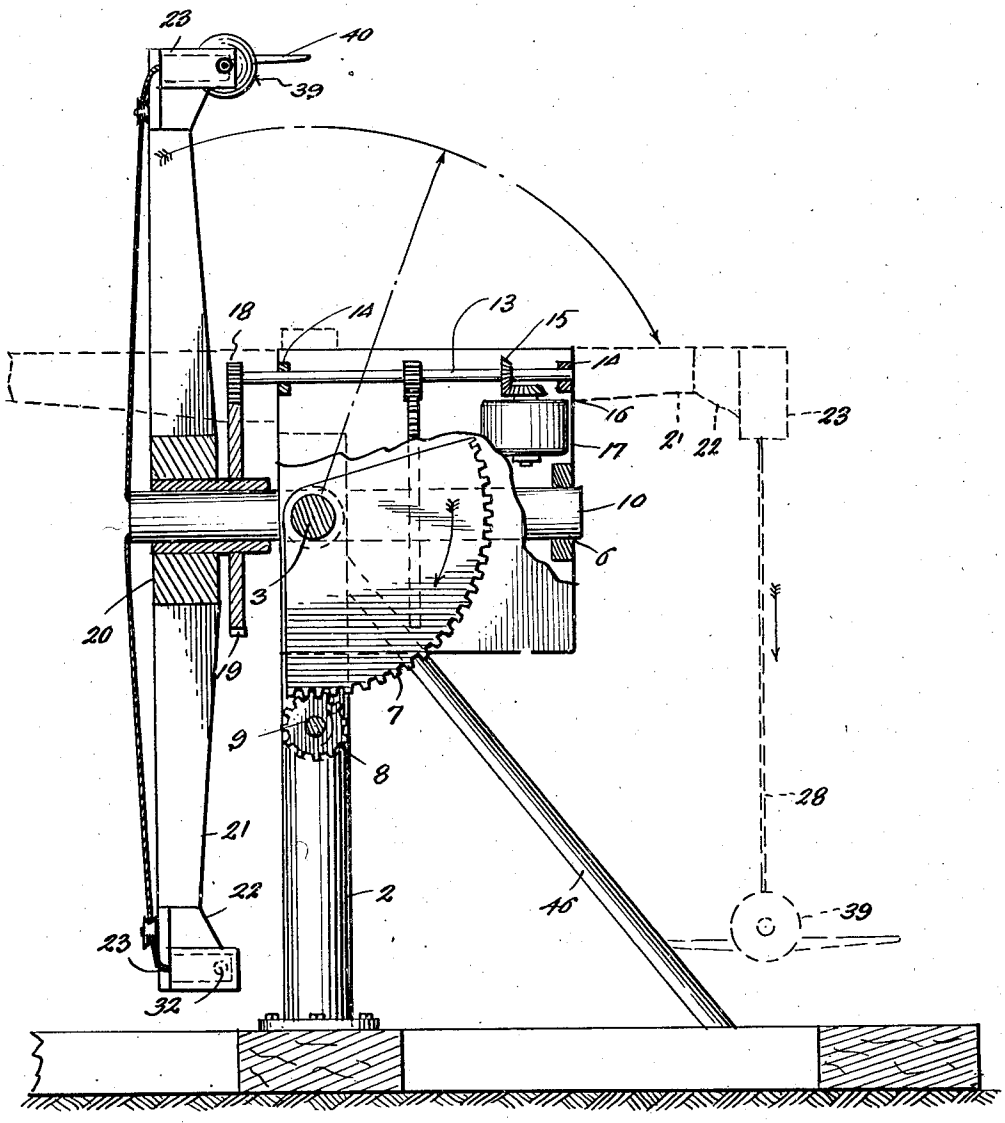
Fig. 2.



Inventor
ELLIS C. HALL

By Randolph & Beavers

Attorney

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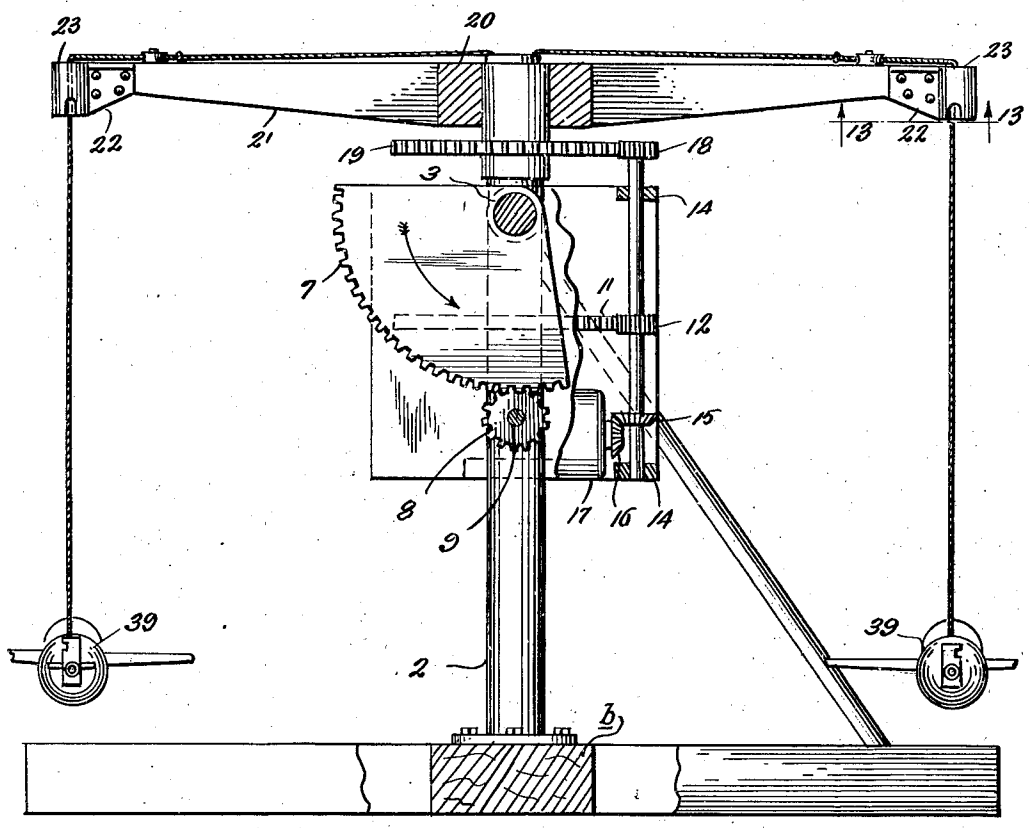
Fig. 3.



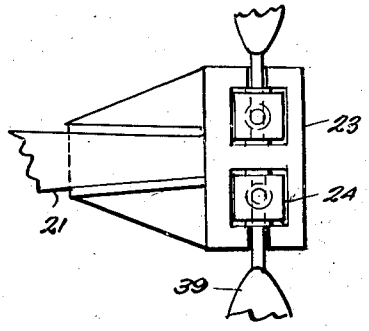


Fig. 13.

Inventor
ELLIS C. HALL

By Randolph & Beavers

Attorney

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Fig. 4.

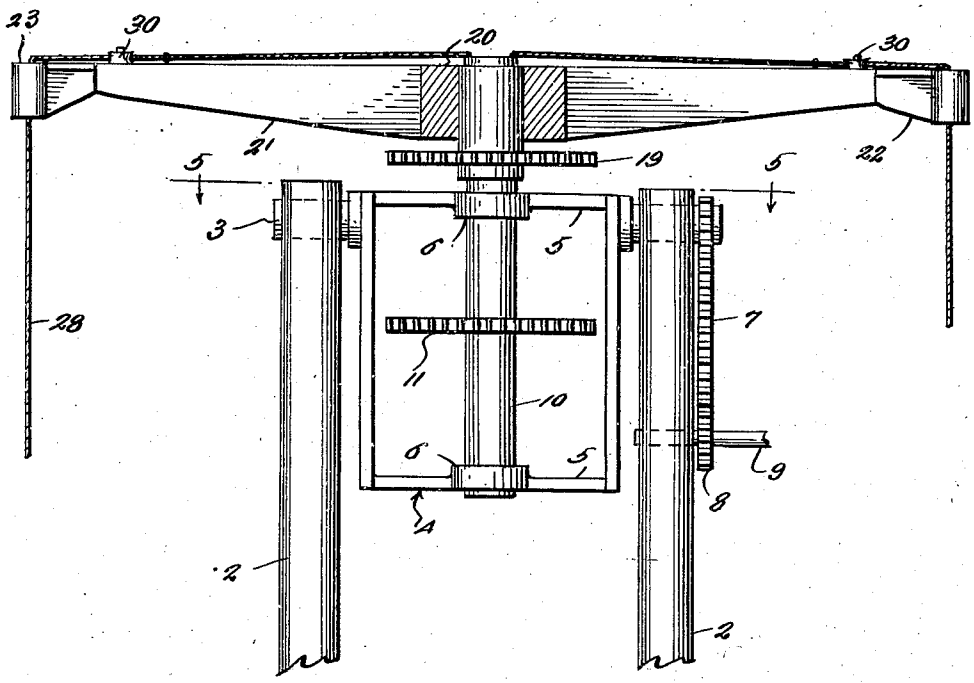
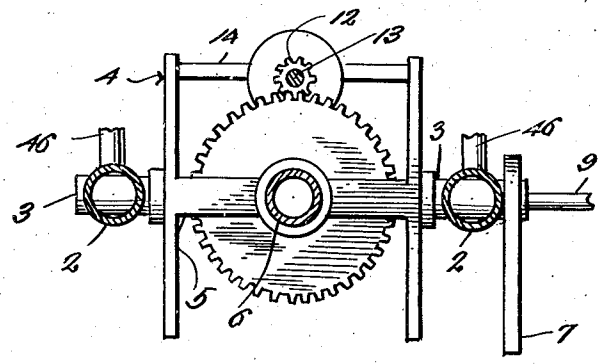


Fig. 5.



Inventor

ELLIS C. HALL

By Randolph & Beavers

Attorney

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Fig. 6.

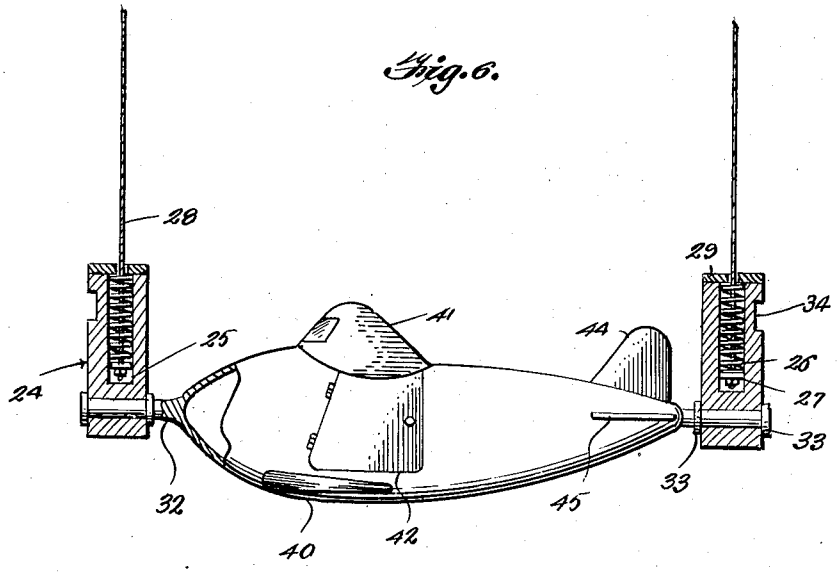
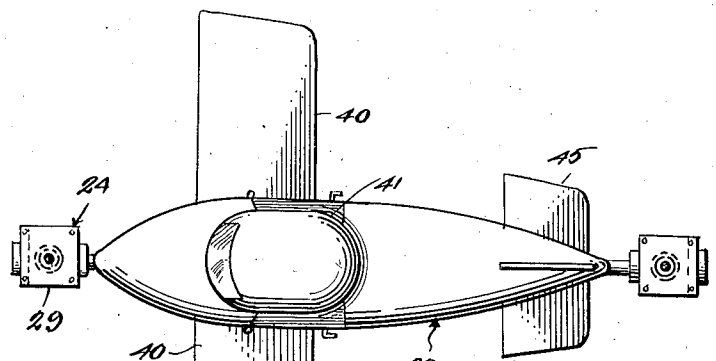


Fig. 7.



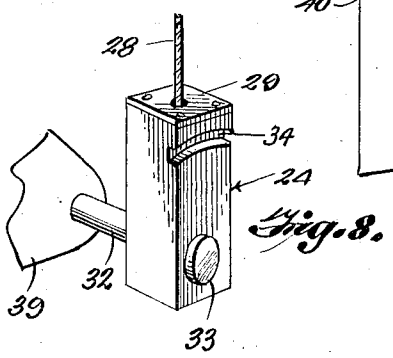


Fig. 8.

Inventor
ELLIS C. HALL

By Randolph & Beavers

Attorneys

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Fig. 9.

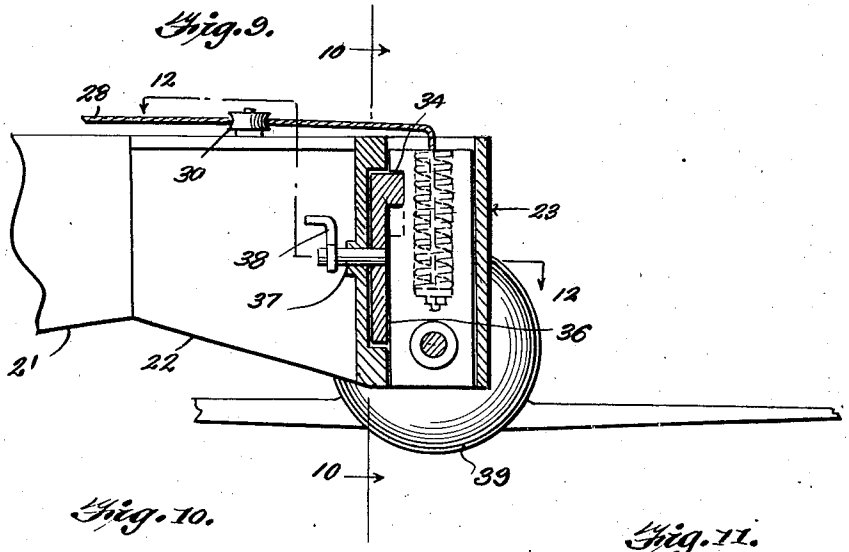

Fig. 10.

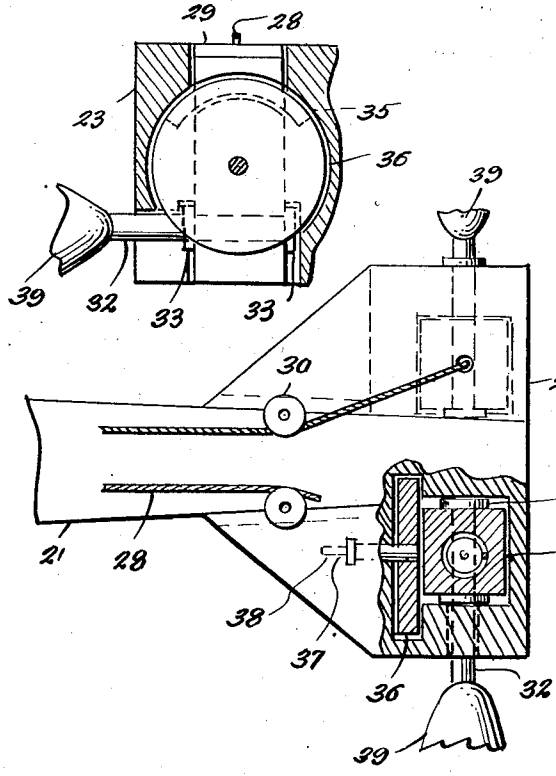

Fig. 11.

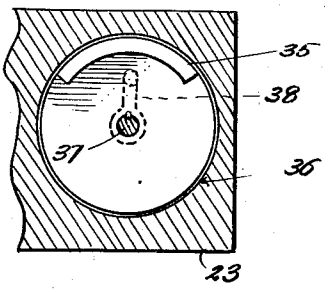

Fig. 12.

Inventor
ELLIS C. HALL

By Randolph & Beavers

Attorney

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UNITED STATES PATENT OFFICE

2,397,857

AMUSEMENT DEVICE

Ellis C. Hall, Jackson, Miss.

Application April 30, 1945, Serial No. 591,015

9 Claims. (Cl. 272—40)

This present invention relates to amusement devices and especially to those of the merry-go-round and Ferris wheel types in which the passenger cars have the appearance of airplanes and are so mounted on the wheel that a ride in them will give the passenger thrills similar to those experienced in an airplane.

In my improved construction a comparatively large wheel is provided to which is attached a plurality of cars of the appearance described and adapted to accommodate one or more passengers. The latter enter the cars lowered to the ground from the horizontally disposed wheel. These cars are raised and locked to the wheel which is then caused to rotate about its vertical axis. While the wheel is in rotation its vertically disposed shaft may be swung about a horizontal axis so that the wheel finally rotates in a vertical plane.

Other features of novelty and improvement will be made apparent from the following detailed description which should be read in connection with the accompanying drawings, forming a part of this specification, and wherein like reference characters refer to like or similar parts throughout the various views.

On the drawings:

Figure 1 is a side elevation of wheel rotatable in a vertical plane;

Figure 2 is a vertical, central section on line 2—2 of Figure 1;

Figure 3 is a vertical, central section through the wheel positioned for rotation in a horizontal plane, the remaining structure being shown in elevation;

Figure 4 is a section of the wheel as described in the brief description of Figure 3, the remaining structure being shown in elevation and viewed in a direction at right angles to that of Figure 3;

Figure 5 is a plane section on line 5—5 of Figure 4;

Figure 6 is a vertical detail section through the bolt connection between the ends of a vertically disposed cable and a plane or car supported thereby, the latter being shown in side elevation;

Figure 7 is a top plane view of such a plane and the supporting connections;

Figure 8 is a detail perspective of the connection referred to in the brief description of Figures 6—7;

Figure 9 is a vertical detail view of a plane pulled into engagement with the wheel disposed for rotation in a horizontal plane;

Figure 10 is a vertical detail section on line 10—10 of Figure 9;

Figure 11 is a vertical detail section on a line parallel to and to the right of line 10—10 in Figure 9;

Figure 12 is partially a detail top plan view and partially a plan section on line 12—12 of Figure 9;

Figure 13 is a detail bottom plan view looking from the opposite direction to Figure 12.

In the drawings in which like reference characters designate like or similar parts, 2 indicates either of a pair of spaced upright columns preferably in the form of pipes the lower portions of which are mounted on steel beams or mudsills *b*. In the upper end portions of these colums are formed transverse openings in registry with one another either of which functions as a journal for a trunnion 3. Each trunnion is attached at its inner enlarged end to the outside of the central part of the upper end of the vertical side 4*a* of a frame 4. The fragmentary top and bottom sides of the frame are formed by struts 5 connecting the central parts of the upper and lower end portions respectively of the lateral frame sides. The central part of each strut is enlarged and apertured to form a journal 6.

The outer end of the right-hand (Figure 4) trunnion 3 protruding beyond the outer side of the column in which the trunnion is journaled, carries a gear quadrant 7 which meshes with a pinion 8 on a shaft 9. The left-hand (Figure 4) end portion of such shaft 9 is journaled in the adjacent column. The shaft 9 is driven by means not shown.

In the journals 6 described is journaled a main shaft 10 which has secured to its intermediate portion a gear 11 meshing with a pinion 12 likewise fastened to the intermediate portion of a shaft 13 journaled at or near its end (Figure 2) in struts 14 forming the fragmentary rear wall of the rotatable frame 4. To the lower portion (Figure 2) of shaft 13 is secured a bevel gear 15 which meshed with bevel gear 16 on the shaft of a motor 17 supported on the bottom wall of the frame (Figure 3). The top end of the shaft 13 projecting above the top frame strut 14 carries a pinion 18 meshing with a large gear 19 fixed upon an enlarged portion of main shaft 10. To the top end of this shaft is secured a hub 20 from which radiate spokes 21. To the outer end of each of the spokes is secured by steel plates 22 a laterally and downwardly (Figures 9, 12, 13) enlarged locking heads 23 symmetrical with respect to the radial plane of the

spoke passing through the axis of the main shaft. On either side of the plane of symmetry is formed in the locking head a rectangular vertically extending opening for receiving a correspondingly shaped generally rectangular locking bolt 24. Each bolt has a central spring recess 25 extending longitudinally of its bolt and a depth equal to about two-thirds of the length of the bolt. In each recess is a coil spring 26 bearing with its lower end against a disc 27 centrally apertured for insertion of the end of cable 28 which has a knot or other enlargement on the outer side of the disc and of a size larger than the aperture. The cable passes through the spring and centrally arranged is the plate 29 which closes the top end of the spring recess and constitutes an abutment for the spring. Each cable passes over a roller 30 arranged upon the top surface of the spoke of its head and is connected to the other cable of the same head and to a single radial cable 31 which passes over the upper edge of the hollow main shaft and into the same where these cables are wound on means not shown.

The bolts have transverse apertures below the spring recesses for shafts 32 having flanges 33 bearing against the locking bolt surface surrounding the shaft opening. Each shaft is secured to the front or tail end of an aeroplane the details of which are described below.

The mechanism for locking the bolts in their heads will now be described. In the side of each bolt facing the main shaft 10 is an arcuate groove 34 adapted to receive an arcuate rib 35 formed on the outer face of a wheel 36, revolvable in a spoke head recess which communicates with a spring recess and rigid upon the end of a shaft 37 journaled in the spoke head and extending at right angles to the length of its bolt and carrying a crank handle 38 upon its rear end projecting from the head. When the wheel is turned by the handle to a position in which the rib is located in the arcuate bolt groove, the bolt is locked to the head and the load is taken entirely or to some extent from the cable to which the bolt is attached. In order to permit the bolt to be fully telescoped in its opening, notches 38*a* have been cut in the lower portion of the locking head in which the shaft 32 and its flanges 33 may be lodged (Figures 9, 10). This completes the description of the means for supporting and moving the cars which have the shapes of aeroplanes 39 equaling in number the number of eight spokes.

Each aeroplane having its center of gravity in loaded or unloaded condition below its horizontal trunnion axis of rotation defined by the shafts 32, at the ends, comprises a body equipped in its forward portion with laterally extending wings 40 and a cockpit 41 to which a door 42 affords access and in which a seat 43 is arranged. The body has an upstanding tail 44 and laterally extending tail fins 45.

In order to reinforce the base structure described, each column is connected at its upper end to an inclined brace 46 the lower end of which is secured to the mudsill *b*.

If the device is to be operated as a merry-go-round (Figures 3–5) the bolts are unlocked and the cables are unwound from drums (not shown) so that the aeroplanes are lowered to and within a short distance to the ground where they may be occupied by thrill-seeking persons. The cables are then pulled into the main shaft and the aeroplanes are raised until the bolts are retracted into their housings whereupon the bolts are locked by the turning of the crank handles of their locking wheels.

The motor in the revolvable frame is started and the wheel carrying the aeroplanes rotates at a certain speed. The centrifugal force developing acts outwardly or away from the main shaft through the center of gravity of each aeroplane and tilts the same about the axis of shafts 32 to a position in which its center of gravity lies outwardly of such axis.

By unlocking the bolts and unwinding the cables the aeroplanes may be lowered to the ground to discharge the passengers or the latter may be given the thrill of riding in a car pivoted between adjacent spokes of a so-called Ferris wheel. In the latter case the bolts are left in their locked condition and the shaft 9 is rotated in a direction to rotate the gear quadrant from the position of Figures 3, 4 to the position of Figure 2 in which the spokes of the wheel lie in a vertical plane.

This rotation of the wheel assembly and frame 4 about the axis of trunnions 3 may take place while the wheel assembly is rotating about the axis of the main shaft. The first rotation will cause the cars to swing towards and into the plane of the wheel assembly according to the position that a car occupies, i. e. the center of gravity of the four cars in the upper half of the wheel will be located in the plane of the wheel and within the periphery of the latter which the centers of the gravity of the cars in the lower half of the assembly will be located in the assembly plane but outside of the periphery of the wheel. The rotation of the latter about the axis of the main shaft will cause each car to reverse the location of its center of gravity as outlined in the preceding sentence as it passes from the lower half of the assembly to the upper half. This turning of the car as it passes the horizontal plane through the wheel is indicated by the arrow surrounding the upper car in the lower quadrant to the right (Figure 1).

The detailed above description of the preferred embodiment of my invention, illustrated in the accompanying drawings, should not be construed as a limitation of my invention and changes or modifications of these details of constructions may be resorted to without departing from the spirit and scope of my invention as outlined in the appended claims.

What I claim and desire to secure by Letters Patent is:

1. A combination merry-go-round and Ferris wheel device comprising a base, spaced uprights on said base including horizontally disposed bearings, a frame having trunnion shafts on opposite sides for rotation in the bearings, means on the base and frame for turning the latter on the trunnion, a wheel assembly journaled in the frame at right angles to the trunnions and including means for rotating the assembly in the frame, power means in the frame and geared to the means included in the assembly, and a plurality of aeroplane-like cars each having front and rear trunnions, an equal plurality of pairs of locking supports each having a journal for a car trunnion and including a locking portion, locking means on the assembly one for each locking support and adapted to lockingly engage the support portion, and extensible means on the assembly one for each locking support for carrying a support in unlocked condition.

2. A combination merry-go-round and Ferris wheel device comprising a base, spaced uprights on said base, a frame journaled for vertical rota-

tion in the uprights, means on the base and frame for turning the latter, a wheel assembly journaled in the frame at right angles to its pivotal connection to the uprights and including means for rotating the assembly in the frame, power means in the frame and geared to the means included in the assembly, a plurality of aeroplane-like cars each having front and rear trunnions, journaled on the assembly in the plane thereof, and extensible means for extending or retracting the cars relatively to the wheel assembly.

3. A combination merry-go-round and Ferris wheel device comprising a base, spaced uprights on said base including horizontally disposed bearings, a frame having trunnion shafts on opposite sides for rotation in the bearings, means on the base and frame for turning the latter on the trunnion, a wheel assembly journaled in the frame at right angles to the trunnions and including means for rotating the assembly in the frame, power means in the frame and geared to the means included in the assembly, and a plurality of aeroplane-like cars each having front and rear trunnions, an equal plurality of pairs of locking supports each having a journal for a car trunnion and including a locking portion, locking wheels on the assembly one for each locking support and having a recess for receiving in a certain position a locking portion to lock the support thereof to the assembly, and extensible and retractable lifting members one resiliently secured to each locking support and supported by the assembly.

4. A device of the class described, a base, a wheel, means for mounting the wheel on the base for rotation about the wheel axis and about an axis at right angles thereto, a plurality of aeroplane-like cars having front and rear trunnions defining an axis lying in the plane of symmetry of the cars, releasable means for mounting a car by its trunnions in the wheel, flexible means for resiliently supporting the releasable means after their release from the wheel, and separate and independent means for rotating the wheel about its own axis or about an axis at right angles thereto.

5. An amusement device comprising a pair of spaced, upright columns, bearing means on each column, a frame swingingly pivoted in the bearings and between the columns, means for swinging the frame, journal means in the frame disposed at right angles to the bearings recited, a wheel having an axle journaled in the journal means, aeroplane-like cars releasably journaled in the wheel, and means for lowering the released cars from the wheel and lifting the cars to the wheel.

6. An amusement device comprising a support including spaced uprights, a frame swingably supported between the uprights, means for swinging the frame, a wheel having an axle projecting from its hub and journaled in the frame at right angles to the pivotal support between the frame and uprights, a car releasably journaled on spokes of the wheel, and extensible and retractable supporting means for supporting the car in a plurality of positions relatively to the wheel.

7. An amusement device comprising a support including spaced uprights, a frame swingably supported between the uprights, means for swinging the frame, a wheel having an axle projecting from its hub and journaled in the frame at right angles to the pivotal support between the frame and uprights, a car releasably journaled on spokes of the wheel, and extensible and retractable supporting means for supporting the car in a plurality of positions relatively to the wheel, said car being mounted to revolve on its longitudinal axis and being constructed with the preponderance of its weight arranged to maintain the car in an upright position.

8. An amusement device comprising a support including spaced uprights, a frame swingably supported between the uprights, means for swinging the frame, a wheel having an axle projecting from its hub and journaled in the frame at right angles to the pivotal support between the frame and uprights, a car releasably journaled on spokes of the wheel, an extensible and retractable supporting means for supporting the car in a plurality of positions relatively to the wheel, said supporting means being resiliently connected to the car to yieldably support it.

9. An amusement device comprising a support including spaced uprights, a frame swingably supported between the uprights, means for swinging the frame, a wheel having an axle projecting from its hub and journaled in the frame at right angles to the pivotal support between the frame and uprights, a car releasably journaled on spokes of the wheel, and extensible and retractable supporting means for supporting the car in a plurality of positions relatively to the wheel, and locking means for locking the car in engagement with said wheel when the supporting means is in a retracted position.

ELLIS C. HALL.