June 11, 1940. S. W. SHEPHERD 2,203,971

AMUSEMENT DEVICE

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FIG. 1

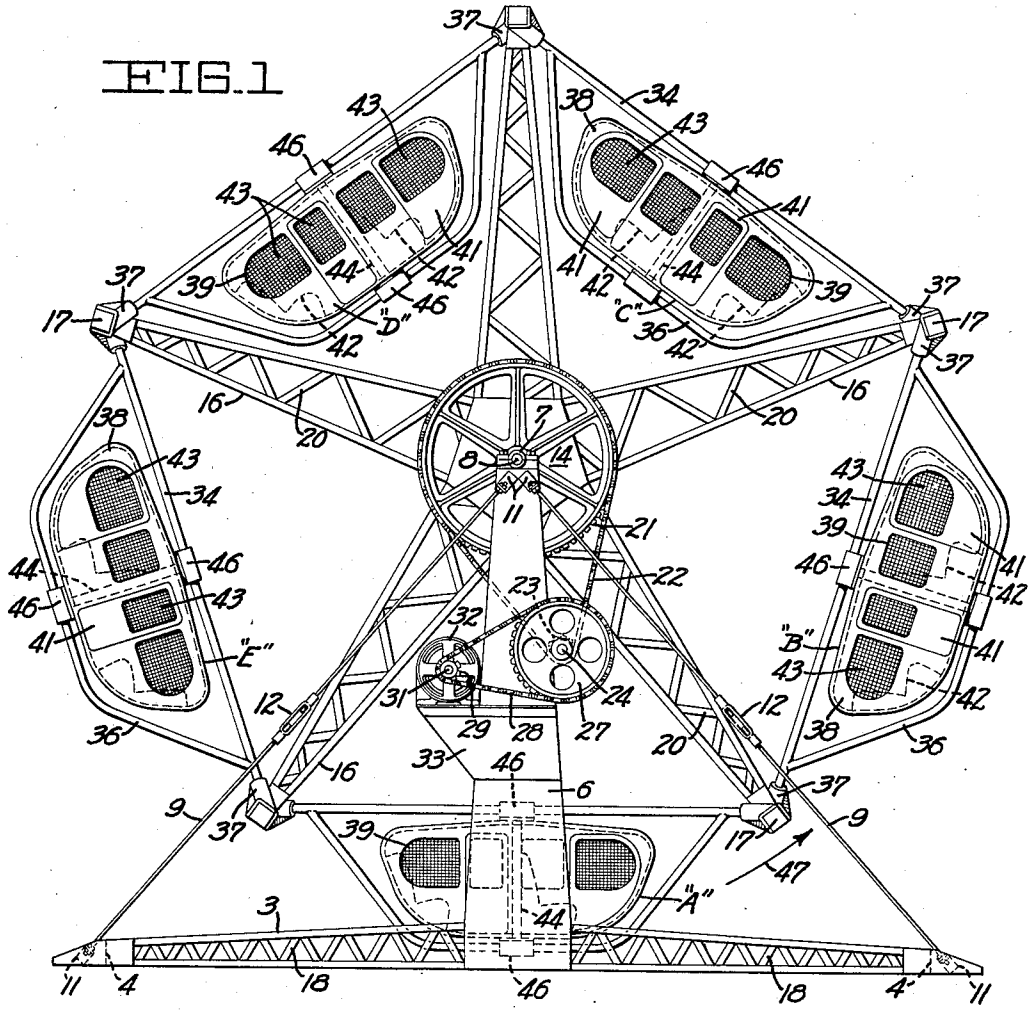


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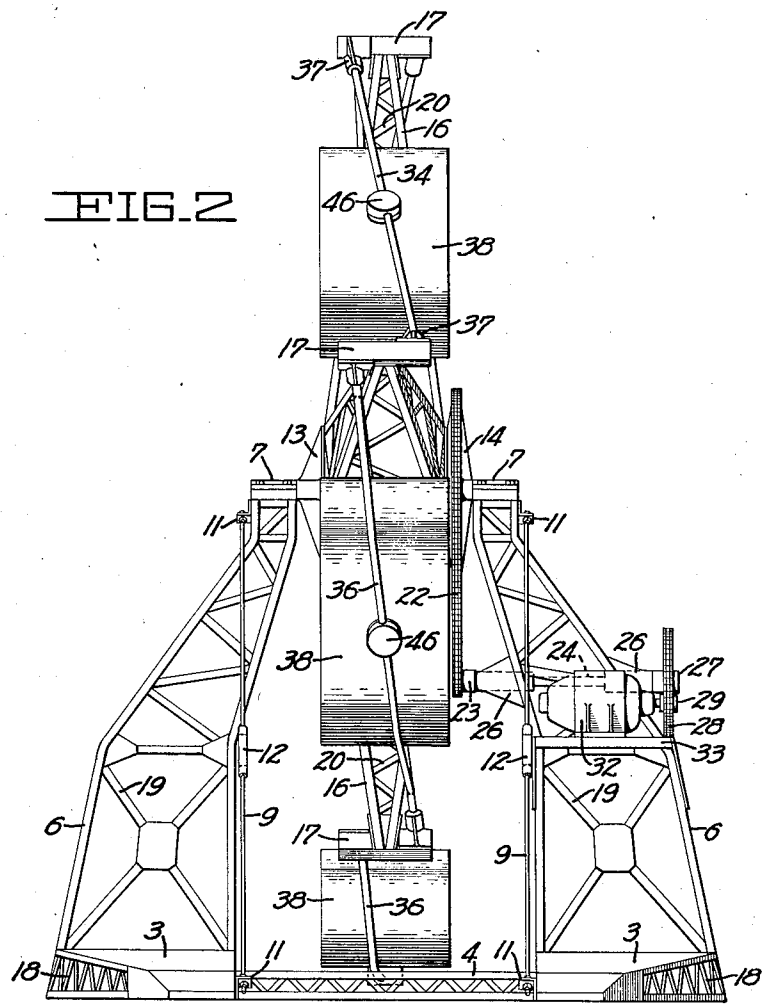
FIG. 2

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# UNITED STATES PATENT OFFICE

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## AMUSEMENT DEVICE

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Application February 11, 1939, Serial No. 255,907

3 Claims. (Cl. 272—36)

This invention relates to amusement devices of the aerial ride type.

It is an object of the invention to provide an amusement device in which one or more cars may be moved in a vertical plane along a circular orbit, the cars being also capable of movement in more than one additional orbit and in different planes.

Another object of the invention is to provide an amusement device of the type referred to in which the passenger-carrying cars are movable in at least three definitely prescribed planes.

A further object of the invention is to provide an amusement device of the character described in which the passenger-carrying cars are movable by power in an an orbital path in one plane and are movable by the force of gravity in more than one additional and different planes.

In the drawings, in which like characters of reference are applied to like parts:

Figure 1 is a side elevational view of the amusement device.

Figure 2 is an end elevational view thereof.

In detail, the device comprises a substantially rectangular ground-engaging foundation consisting of a pair of spaced parallel base members 3 which are joined together adjacent their opposite ends by transverse cross-members 4. Mounted on and rising from the base members 3, substantially medially of their ends, is a spaced pair of masts 6 each of which, at its upper end, is provided with a bearing 7 in which a shaft 8 is journaled for rotation. Suitable two-piece guy rods 9, secured by clips 11 to the base members 3 and to the upper end of the masts 6, are provided for stabilizing the masts and each guy rod is fitted with a turnbuckle 12 by means of which the tension of the guy rods may be adjustably varied. Fixed on and for rotation with the shaft 8 is a pair of rotor hub members 13 and 14 to which are secured the inner ends of a plurality of radially extending rotor arms 16, each of the latter being provided at its distal end with a transverse head 17 lying parallel with respect to the axis of the shaft 8. Both the foundation, the vertical masts 6 and the arms 16 of the rotor are constructed of light structural bars and plates and are fitted with suitable bracing members 18, 19 and 20 which provide the desired degree of rigidity in the structure.

Means is provided for revolving the rotor in a vertical plane about the axis of the shaft 8. Formed on the circular periphery of the rotor hub member 14 is a plurality of sprocket teeth 21, meshing with a continuous drive chain 22 which also meshes with a sprocket 23 fixed on the inner end of an intermediate drive shaft 24 journaled for rotation in suitable bearings 26 secured to one of the masts 6. The outer end of the shaft 24 is fitted with a sprocket 27 with which is meshed a drive chain 28, the latter being also in mesh with the teeth of a sprocket pinion 29 fixed on the shaft 31 of a motor 32 which is carried by a suitable support bracket 33 attached to one of the masts 6. It will be seen that when the motor is energized from a suitable source of current, not shown, rotation will be transmitted through the chains 22 and 28 and their connected sprockets to the rotor so that the arms of the latter will move in a vertical plane and along a circular orbit. Although it is not shown, it is evident that the motor may be controlled by a variable resistance so that a preferred range of different rotational speeds of the rotor may be obtained. It is also obvious that the same result may be obtained by using a constant speed motor and interposing between the motor shaft and the intermediate shaft 24 a selective gear or friction speed-change device.

Means is provided for supporting passenger-carrying cars between the ends of adjacent rotor arms and means are also provided for journaling these cars for rotational movement in at least two circular orbits which are different from and intersect the vertical plane of rotation of the rotor. Disposed in each space, between adjacent pairs of rotor arms 16, is a car-supporting frame comprising an upper bar 34 and a U-shaped lower bar 36 which is spaced from the upper bar and welded or otherwise secured at its ends to the latter bar. Each end of the upper bar of each frame is journaled in suitable bearings 37 mounted adjacent the outer ends of the rotor arm heads 17 and, as is best shown in Figure 2, the bar 34 of each frame extends from the bearing at the end of one rotor arm head diagonally across the space between the arms to the bearing carried by the opposite end of the adjacent rotor arm head. The weight of the frames is thus distributed equally on either side of a vertical plane passing medially through the rotor. The frames are of course mounted for rotational movement about the axis of the upper bar 34 thereof. Disposed in the opening between the spaced upper and lower bars 34 and 36, respectively, of each frame is a passenger-carrying car 38 constructed of light structural bars and plates and provided with window openings 39 and closable entrance doors 41 in each of forward and rear compartments, each of the latter being fitted with seats 42. The window and door openings are shown covered with wire screening 43 but it will be obvious of course that shatter-proof glass or other such material may be substituted therefor. The cars 38 are mounted for rotational movement on the frames by means of a pivot shaft 44 which is attached to and passes vertically through each car at the center thereof and is journaled in suitable bearings 46 fixed medially of the ends of the

bars 34 and 36. It will be seen that the cars 38 are thus movable in three separate and distinct orbits, the first being the vertical plane in which the rotor moves, the second having its axis, which is the axis of each frame bar 34, lying tangentially with respect to the orbit of the rotor, and the third having its axis, which is the agis of each pivot shaft 44, lying in a plane which extends transversely through the axis of the bar 34. It is important that the seats 42 be placed in the cars in a certain relationship. In the drawings it will be observed that the forward seat is placed as closely as possible to the pivot shaft 44 while the rear seat is located as closely to the rear end of the car as possible.

In making a circuit around the orbit of the rotor, the lowermost car shown in Figure 1, after being loaded with passengers, starts from the position A and moves, for example, with the rotor counter-clockwise in the direction of the arrow 47. Until reaching and passing through the position B, the passengers in the car will be travelling in an upwardly curving arc and will be facing in the direction of motion, the car-supporting frame will be in a position extending beyond the ends of the rotor arms 16, and the cars 38 will be travelling forward end foremost. As soon as the bar 34 of the car-supporting frame reaches and passes through an axially vertical position, however, gravity will act on the frame and car and will swing them 180 degrees about the axis of the bar 34 into the position shown at C, which position of the car will obtain until the latter reaches a horizontal position at the top of the rotor orbit. As soon as the car passes beyond this horizontal position and starts its downward motion along the rotor orbit, the overbalancing weight of the passengers in the rear seat will swing the car through an arc of 180 degrees about the axis of the pivot shaft 44 until the car assumes the position shown at D wherein it will be descending rear end foremost with respect to the direction of rotation of the rotor. As the rotor continues to revolve and the car-supporting frame bar 34 reaches and passes through an axially vertical position, the combined weights of the supporting frame, the car, and the occupants of the latter, will cause the supporting frame to swing radially of the rotor and through an arc of 180 degrees until the car assumes the position shown at E. Both the car and the supporting frame will maintain this position, under the influence of gravity, until the starting position A is reached. The car, however, it will be noted, will have rotated 180 degrees about the axis of the pivot shaft 44 when it returns to its starting point and it may be left in this position to start the second circuit about the rotor orbit or, when new passengers enter the car, it may be rotated manually by the attendant so that upon starting the circuit the passengers will be facing in the direction of motion of the car.

It will be noted that, while the car is moving along substantially the lower half of the rotor orbit, the car is located a maximum distance from the rotor center while, during a greater part of the upper half of the orbit, the car is positioned much closer to the rotor center. Thus, if the rotor is driven at constant speed, the passengers will experience a deceleration and acceleration of motion through the air.

While I have chosen to illustrate my invention as incorporated in a rather small device, it will be obvious that a greater number of cars may be used by employing a larger rotor and correspondingly increasing the relative sizes of the other parts of the structure. However, as a device of this nature finds its greatest field of use in travelling carnivals or road shows, it is preferable to employ a device which is not too large and cumbersome or which will occupy an excess of ground area and which may be rapidly erected and disassembled.

I claim:

1. In an amusement device, a rotor having a plurality of spaced radially extending arms and mounted for movement in a vertical plane, frames each having a bar extending between and journaled at the ends of adjacent rotor arms, said frames being rotatable about the axis of said journaled bars thereof, a pivot shaft rotatably mounted on each of said frames and disposed perpendicularly with respect to the axis of said journaled frame bar, and a passenger-carrying device immovably fixed to and rotatable with each pivot shaft.

2. In an amusement device, a rotor having a plurality of spaced radially extending arms and mounted for movement in a vertical plane, frames each having a bar extending between and journaled at the ends of adjacent rotor arms, said frames being rotatable about the axis of said journaled bars thereof, a pivot shaft rotatably mounted on each of said frames and disposed perpendicularly with respect to the axis of said journaled frame bar, a passenger-carrying car secured to and rotatable with each pivot shaft, said pivot shaft passing substantially medially through said car, and seats in said car, one of said seats being disposed closely adjacent to and on one side of said pivot shaft, and another of said seats being materially spaced from and on an opposite side of said pivot shaft.

3. In an amusement device, a support comprising a base having a pair of spaced vertically extending masts rising therefrom, a shaft extending horizontally between and journaled at the upper ends of said masts, a rotor journaled on said shaft, said rotor having a plurality of circumferentially spaced arms extending radially therefrom, each of said arms having at its outer end a transversely extending head paralleling the axis of said shaft, means for rotating said rotor to move said arms along a circular orbit in a vertical plane, a plurality of frames disposed in the spaces between adjacent arms, each of said frames comprising an upper bar disposed diagonally, with respect to said vertical plane of the rotor, across the space between adjacent rotor arms, said upper frame bar being journaled for rotation at one end adjacent an end of the head of one rotor arm and similarly journaled adjacent the opposite end of an adjacent rotor arm, and a lower U-shaped frame bar secured at its ends to said upper frame bar, journals on said upper and lower frame bars substantially medially of the ends thereof, a pivot shaft having its ends engaged in the respective journals, and a passenger-carrying car secured to and rotatable with said pivot shaft.

SOLOMON W. SHEPHERD.