Aug. 15, 1939. N. BARTLETT 2,169,403

AMUSEMENT APPARATUS

Original Filed Dec. 15, 1934

Fig. 1.

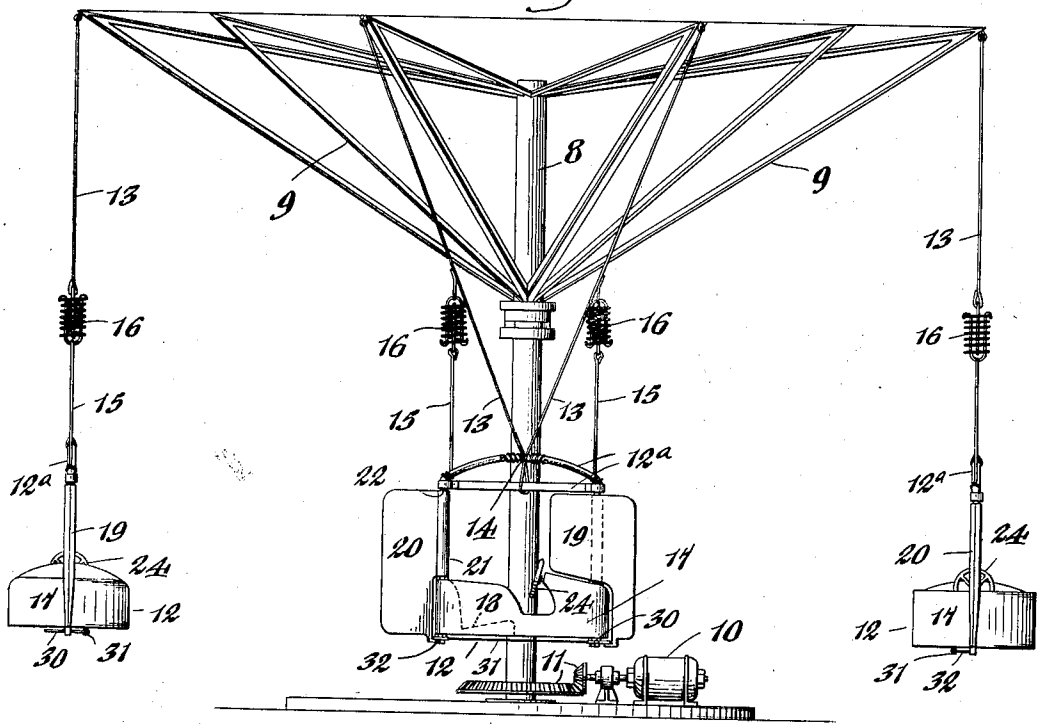


Fig. 2.

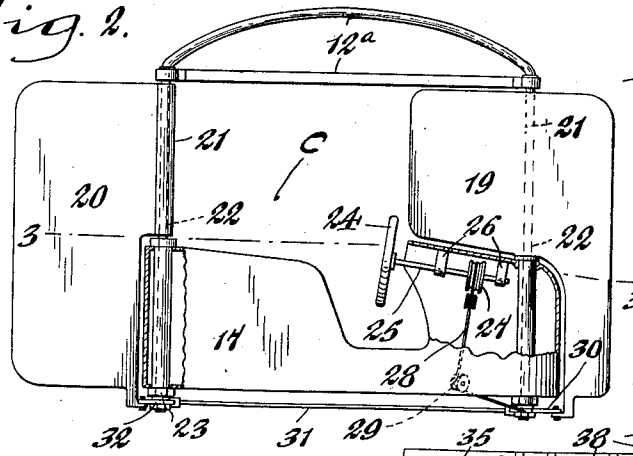


Fig. 4.

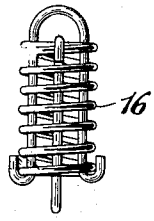


Fig. 6.

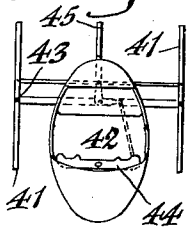


Fig. 5.

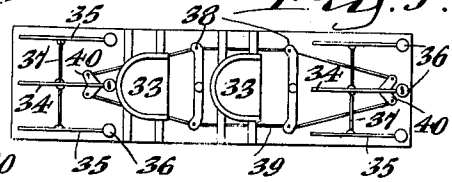
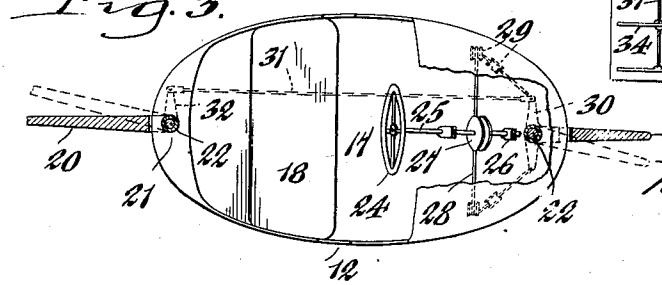


Fig. 3.



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UNITED STATES PATENT OFFICE

2,169,403

AMUSEMENT APPARATUS

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Original application December 15, 1934, Serial No. 757,687, now Patent No. 2,107,196, dated February 1, 1938. Divided and this application November 27, 1937, Serial No. 176,839

12 Claims. (Cl. 272—41)

This application is a division and continuation in part of my application Serial No. 757,687, now Patent No. 2,107,196, issued February 1, 1938.

This invention relates to amusement devices and has particular relation to devices wherein one or more passenger carriages are suspended by flexible means from an overhead support rotatable about a substantially vertical axis, in order that they may have swinging motions in vertical planes substantially radial of such vertical axis, superimposed upon their motion about the latter axis.

The present invention contemplates an improvement in such devices wherein the carriages are provided with airfoils controllable by passengers to effect oscillations or swinging movements of the carriages in the aforementioned substantially vertical planes, during the time when the carriages are moving in circular paths about the substantially vertical axis of the support.

The airfoils are arranged in spaced relation and preferably offset in opposite directions from the center of gravity of the loaded carriages, and are connected for movement together by simple control means operable by passengers in the carriages. By such arrangement the longitudinal axes of the carriages may be maintained in tangential relations to their path of motion about the vertical axis of the support, regardless of the operated position of the airfoils. When the carriages are moving, gravity and centrifugal forces are constantly acting upon them, and a passenger in a carriage, by manipulation of the airfoil control means, may bring into play air pressures upon the airfoils which will either oppose the force of gravity and supplement the centrifugal force or supplement the force of gravity and oppose the centrifugal force. In this way the passenger may set up and amplify, or damp out, as he desires, oscillations of the carriage in a vertical plane which may be conceived as extending radially of and rotating about the upright axis of the overhead support, the carriage swinging about the connection to the support.

Due to practical limitations of speed, and of size of airfoils, sufficient air forces cannot be exerted upon the latter to maintain the carriages in positions greatly different from those resulting from gravity and centrifugal forces, but by moving the airfoils between reversed operating positions at the terminal phases of oscillations of the carriages, swinging movements of large amplitude may be set up quickly in the carriages.

According to the present invention the desired combination of swinging action and motion in a circular path is obtained without appreciable twisting motions or oscillations of the carriages about axes vertical to them, which motions tend to twist the carriage supporting cables.

In order to further eliminate such twisting motions the carriages are supported by suspension members which are spaced at their points of connection to the overhead support, and have connections to the carriage at points spaced widely longitudinally thereof. By this arrangement gravity and centrifugal force cooperate with the airfoils in maintaining the longitudinal axes of the carriages in substantially tangential relation to their paths of travel about the axis of rotation of the overhead support.

The airfoils and control means arranged according to the present invention are effectively and easily operated by passengers having no previous experience, and thereby afford to them thrill and enjoyment not available in devices of the same class but not constructed in accordance with the present invention.

These and other objects and advantages will become apparent from the following description of the typical embodiments of the invention shown in the accompanying drawing, wherein—

Figure 1 is a side elevation of the amusement apparatus embodying my invention. Figure 2 is a side view of one of the carriages, partly in section, showing the passenger control means associated therewith. Figure 3 is a horizontal section taken in the plane of line 3—3, Figure 2. Figure 4 is an enlarged view of one of the suspension hangers. Figure 5 is a top plan view of a modified form of one of the carriages. Figure 6 is a top plan view of a modified arrangement of the body air impinging elements.

Referring now to Figures 1–4, the numeral 8 indicates an upright mast having a revolving overhead support or frame preferably composed of upwardly extending radial arms 9 from which the passenger-carrying bodies or carriages are suspended so as to revolve therewith and, caused by centrifugal force, to be carried outwardly of the structure in the manner common to circle swings. The revolving overhead support may be mounted and driven in any well known manner, that shown in the drawing, by way of example, consisting of a motor 10 and bevel gears 11.

The passenger-carriages, which are suspended in suitable spaced relation about the overhead support 9, are indicated generally by the numeral 12. The carriages are suspended from the overhead support by cables 13 whose upper ends are connected to adjacent arms 9 and whose lower

ends are looped, as indicated at 14, to engage midway of the top frame 12a of the carriage. To insure the carriages from turning bodily about, auxiliary cables 15 are connected at their upper ends to the cables 13 at a point approximately midway thereof, while their lower ends are connected to the top frame of the carriage. Cushion or shock-absorbing springs 16 are interposed in the cable 15 so that a certain resiliency of carriage mounting is obtained.

The carriage 12 consists of a body portion 17 having a seat 18 which may be designed to accommodate one or more passengers. At its front and rear ends the body 17 is provided with simultaneously-actuated, passenger-controlled means for producing a swaying or side swinging action of the carriage during its circular movement. Each of these means consists of airfoils or vanes 19, 20 disposed centrally and vertically of the carriages and pivoted at 21 to upright posts 22 depending from the carriage frame member 12a, as shown in Figure 2. This frame member is secured to the floor of the carriage-body in any convenient manner, as by nuts 23 screwed to the free ends of the posts 21, thus facilitating the ready dismemberment of the parts for shipping purposes. By preference the front vane 19 extends fore and aft of the pivot-post 21 and is of substantially the same face area as the rear vane 20.

Means are provided under the sole control of the passenger in the carriage for simultaneously actuating, in a corresponding direction, the front and rear vanes to control the swinging movements of the respective carriages. The means for accomplishing these results preferably consists of a hand-wheel 24 mounted on a shaft 25 journaled in bearings 26 secured to the body 17 of the carriage 12. Fixed to the shaft 25 is a pulley 27 about which is wound a cable 28 which passes outwardly and downwardly over idler pulleys 29 and is then connected to one end of a crank arm 30 fixed to the front vane 19 at its lower end. Connected to the other end of the arm 30 is a tie bar 31 extending rearwardly under the carriage and joined at its other end to a crank arm 32 secured to the lower end of the rear vane 20. It will be seen from the foregoing that the vanes or airfoils 19, 20 are simultaneously actuated in a corresponding direction whenever the hand-wheel 24 is actuated by the passenger to accordingly swing the carriage 12 either inwardly or outwardly or up or down from its normal riding position and thereby give the passenger the accompanying thrill of side-swinging or swaying the carriage out of its normal course defined by the revolving overhead support.

The swinging motion of the carriage may be greatly amplified by reversing the position of the airfoils at times corresponding with terminal phases of the oscillations, so that the air pressures may act upon the airfoils to supplement the rate of swinging motion previously set up. If the control wheel is held stationary the oscillations will gradually be damped out by air resistance. They may be quickly damped out by reversing the position of the airfoils at the terminal phases of the oscillations to cause the forces acting upon the airfoils to resist the phase of motion which is to follow.

As will be apparent from Fig. 2, the airfoils 19 and 20 are so spaced in relation to their areas and the center of gravity of the carriage (when the latter is carrying passengers), that the air forces acting upon them will constitute parallel forces tending to move the carriage laterally, without exerting any appreciable force tending to turn the carriage about an axis vertical to it.

The effective center of the total airfoil area (approximately at the point indicated at C in Fig. 2) is preferably in approximate alignment with the center of gravity of the carriage (when loaded with passengers) and a point midway between the two points of connection of the cables 13 to supporting arms 9, further reducing any tendency of the air forces acting on the airfoils to turn the carriage about an axis vertical to it.

In the modified form of the carriage shown in Figure 5, the seats 33 are arranged in tandem relation and the impinging members or vanes 34, 35 are disposed vertically in series or in the plane of the carriage and pivoted at 36 thereto for lateral swinging movement. Three of such vanes are disposed in parallel relation at each end of the carriage, the central vane 34 being joined by cross links 37 to the side vanes and foot levers 38 being provided at each seat station and connected by flexible members or cables 39 to lugs 40 radiating from the central vane. By this arrangement, when a foot lever is moved in one direction or the other, the front and rear sets of vanes are simultaneously actuated in a corresponding direction to control the swinging movements of the carriage.

In Figure 6 the air impinging elements 41 are disposed at opposite sides of the body 42 in vertical planes and pivoted at 43 to swing vertically and simultaneously in response to actuating the foot lever 44, the latter being connected to said elements in substantially the same way as in the previously-described construction. If desired, a central vane 45 may be applied to the rear end of the body for simultaneous actuation with the air-impinging elements 41.

It will be understood that the apparatus herein shown and described is merely illustrative of the principles of the invention, and in practice is capable of modification within the scope and spirit of the following claims.

I claim as my invention—

1. An amusement apparatus, comprising a revolving overhead support, passenger-carrying bodies suspended from said support to move therewith and swing outwardly therefrom by centrifugal force, and passenger-controlled airfoils pivotally mounted in spaced relation on said bodies and in planes vertical thereto for simultaneous movement at an angle to the bodies and in parallel relation to each other to produce a side-swinging action of the bodies during their circular, outwardly-disposed movement, and means for actuating said airfoils simultaneously either clockwise or counterclockwise about their respective pivots.

2. An amusement apparatus, comprising a traveling overhead support, passenger carrying bodies, suspension members connected at their upper ends to said support and at their lower ends to said bodies substantially centrally thereof, auxiliary means connecting said suspension members with the carriage adjacent its front and rear ends, passenger-actuated airfoils applied to the fore and aft ends of said bodies and pivoted vertically to swing at an angle to the bodies and to assume positions in parallel relation to each other to produce a side-swinging action of the bodies during their circular, outwardly-disposed movement.

3. An amusement apparatus comprising a traveling overhead support, passenger-carrying

bodies, including a frame member having a top portion and posts depending from the ends thereof, suspension members connected at their upper ends to said support and at their lower ends to the top portion of said frame, passenger-controlled airfoils pivotally mounted on said frame-posts to swing at an angle to the bodies to produce a side-swinging action of the bodies during their circular outwardly-disposed movement.

4. An amusement apparatus, comprising a traveling overhead support, passenger carrying bodies, suspension members connected at their upper ends to said support and at their lower ends to said bodies substantially centrally thereof, auxiliary means flexibly connecting said suspension members with the carriage bodies adjacent its front and rear ends, and passenger-actuated airfoils pivoted vertically thereto upon the front and rear ends of each carrying body to swing horizontally relatively thereto to produce a side-swinging action of the bodies during their circular, outwardly-disposed movement.

5. An amusement apparatus, comprising a traveling overhead support, a passenger carriage, a suspension cable connected at the upper end to said support and at its lower end to said carriage, airfoils pivoted on substantially upright axes at the front and rear ends of the carriage to swing simultaneously either clockwise or counterclockwise about their respective pivots to assume positions substantially parallel to each other, and a passenger-controlled means on the carriage for controlling the swinging of said air impinging members.

6. An amusement apparatus, comprising a revolving overhead support, passenger-carrying bodies suspended therefrom to move therewith and swing outwardly therefrom by centrifugal force, a plurality of parallel airfoils pivoted to the front and rear ends of each passenger-carrying body, and means controlled by the passengers for simultaneously actuating said members to a position to impart a side-swinging action to said bodies during their circular, outwardly-disposed movement, without imparting turning moments to said bodies.

7. An amusement apparatus, comprising a revolving overhead support, passenger-carrying bodies suspended from said support to move therewith and swing outwardly therefrom, airfoils of substantially equal area pivotally mounted in vertical planes and in spaced relation on each body, and means controlled by the passenger and operatively connected to the companion airfoils for simultaneously moving them in the same direction about their respective pivots to relatively parallel positions displaced at an angle to the longitudinal plane of the passenger body.

8. An amusement apparatus, comprising a traveling overhead support, passenger-carrying bodies including a top frame member, suspension members connected at their upper ends to said support and at their lower ends to the respective frame members of said bodies at a point intermediate the ends thereof, and auxiliary, suspension means connecting the ends of each body-frame-member with the companion first-named suspension members, said auxiliary suspension means including spring devices to yieldingly resist abnormal displacement of the suspended passenger bodies.

9. An amusement apparatus, comprising a revolving overhead support, passenger-carrying bodies suspended from said support to move therewith and swing outwardly therefrom, airfoils pivotally mounted in vertical planes and in spaced relation on each body, the major amount of total surface area of such airfoils being disposed rearwardly of their respective pivots, and means controlled by the passenger and operatively connected to the companion airfoils for simultaneously moving them about their respective pivots, to assume positions parallel to each other.

10. In amusement apparatus, a rotatable overhead support, a carriage suspended therefrom by flexible means whereby during rotation with the support the carriage may swing outwardly, said carriage having a plurality of substantially vertical airfoils pivoted thereto on spaced substantially vertical axes, and means for simultaneously moving said airfoils in the same direction either clockwise or counterclockwise about their respective pivotal axes.

11. In amusement apparatus, an assembly comprising an overhead support rotatable about a substantially vertical axis, a carriage and means suspending it from said overhead support for rotation with said support about said vertical axis and for swinging motion relative to the support in planes substantially radial of said vertical axis, and airfoils pivoted to said carriage for effecting such swinging motion when the assembly is rotating, said airfoils being spaced in oppositely disposed relation to the center of gravity of the carriage, and means operatively connecting said airfoils for maintaining them in substantially parallel relation during movement of them about their respective pivots.

12. In amusement apparatus, a rotatable overhead support, a carriage and flexible suspension means connecting it to said support whereby said carriage may move about a substantially horizontal axis substantially tangential to the path of motion of said overhead support, and airfoil means on said carriage for urging motion of the latter about said tangential axis as the carriage rotates with said support, said airfoil means being pivotally movable relative to the carriage to vary the direction and magnitude of the air pressure urging such motion about said tangential axis, and said airfoil means having the effective center of area thereof disposed substantially in alignment with the center of gravity of the carriage and the effective center of the connection between the flexible suspension means and overhead support so that there is a balanced air pressure upon the airfoil means tending to move the carriage about said tangential axis without causing twisting motions thereof.

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