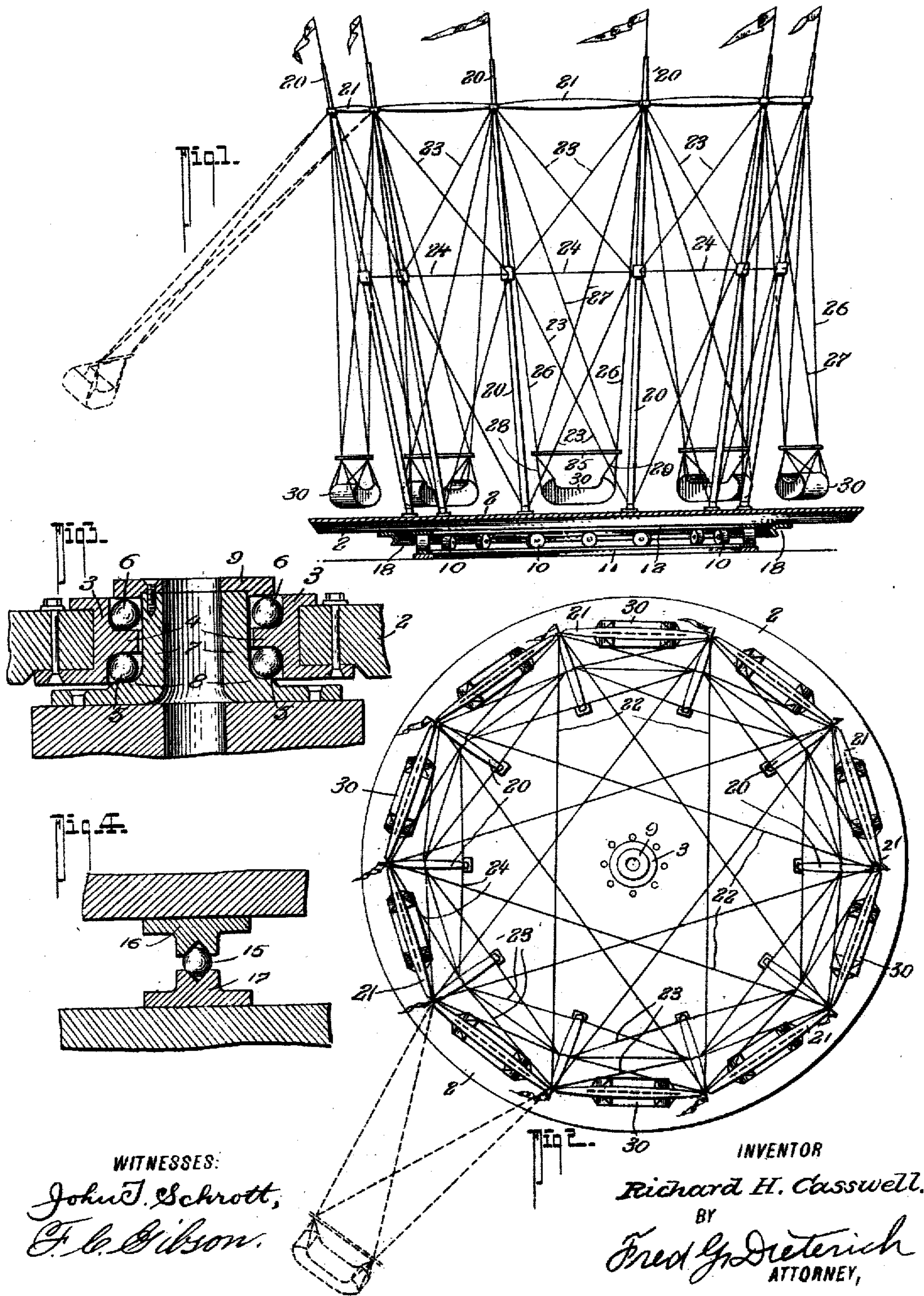


No. 822,852.

PATENTED JUNE 5, 1906.

R. H. CASSWELL.  
CENTRIFUGAL SWING.  
APPLICATION FILED APR. 28, 1905.





# UNITED STATES PATENT OFFICE.

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## CENTRIFUGAL SWING.

No. 822,852.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed April 28, 1905. Serial No. 257,931.

*To all whom it may concern:*

Be it known that I, RICHARD H. CASSWELL, a citizen of the Dominion of Canada, residing at Vancouver, in the Province of British Columbia, Canada, have invented a new and useful Improvement in Centrifugal Swings, of which the following is a specification.

My invention relates to a centrifugal swing designed as an attraction for fairs, &c., and belongs to that class wherein a series of passenger-cars are freely suspended from a rotatable framework, so that as the frame is rotated the cars will swing outward and upward by the centrifugal force of such rotation; and the invention is directed to the improvement in the structure of the platform and the means for supporting it without dependence on a central pivot, so that the principal support is immediately beneath the load.

The improvement is also in the construction of the frame which supports the swing elements and in the design of such swing elements to withstand the strains due to acceleration or retardation of rotational speed.

These improvements have been introduced with a general simplification of structure, which is fully described in the following specification and illustrated in the drawings which accompany it, in which—

Figure 1 is a vertical section through the swing, showing the structural framework in elevation, the central support being removed to show in elevation the peripheral support-wheels; Fig. 2, a plan of the same; Fig. 3, a detail of the central axial support of the platform. Fig. 4 shows in cross-section an alternative annular support for the platform, which support is located about the base of the masts.

The device consists of a circular platform 2, the frames of which radiate from a center piece 3, as from the hub of a wheel, and this center piece 3 is mounted on a hollow axial support 7, which is designed to sustain the weight of the center portion of the platform 2 and to maintain the platform in its axis of rotation. The open center of 3 is provided with an annular inward projection 4 about the middle of its depth, which annular projection rests upon a series of balls 5, carried on the base-flange 8 of the hollow axial support 7, while a second series of balls 6 rests on the upper side of the annular projection 4. With

this construction the weight of the center part of the platform 2 is supported from the foundation by the ring of balls 5 under the annular projection 4, while the rings of balls 5 and 6 afford a bearing between the outer side of 7 and the inner side of 3 to maintain the platform in its axis of rotation. A cover plate 9, secured to the support 7, protects the ball-bearings from dirt and provides a check against any tendency of the platform to lift.

Through the hollow axial support 7 may be led the wires for lighting the swing or the lead of any means of power transmission, if it should be found desirable to rotate the swing by a motor on the platform.

The main weight of the platform and its superstructure is sustained toward the outer circumference of the platform, preferably on a series of small wheels 10 or rollers, as shown in Fig. 1, which are designed to roll round between a track 11 on the foundation and a corresponding track 12 on the under side of the platform 2. If preferred, the weight of the outer platform may be supported, as illustrated in Fig. 4, on balls 15 between V-shaped races 16 and 17 on the foundation and platform, respectively.

Round the outer part of the platform, approximately over the annular support-rollers, is a series of masts 20, each of which is stepped into a socket provided at positions equidistant from the center of the platform and from one another. These masts are inclined outward at their upper ends and are there tied and braced together circumferentially by members 21, capable of receiving compression as well as tensile strains. The upper ends of the masts are also stayed by wire ropes 22, two of which extend from each mast to the upper ends of two masts, two spaces apart, on the opposite side of the circle. These stays 22 from the several masts will therefore cross one another at a considerable distance from the center of the structure and will be clamped to one another at selected points of such intersections, so as to produce a system of cross-staying which will impart stability and rigidity to the structure and which will resist radial strains. Each mast is stayed against lateral bending at the middle by wire ropes 23, which extend from toward the upper end of each mast to a band encircling each adjacent mast toward its middle length, and these stays 23 are



thereafter secured to the foot of the mast they start from. These stays thus form an efficient system of diagonal cross-bracing between the adjacent masts. The masts are stayed against outward bending at the middle by stays 24, which extend between the masts at the position of mid attachment of the diagonal stays, and tie the whole series together. These stays 24 may also be made to act as compression members. An open framework is thus provided, stayed and braced together in an efficient and simple manner, which framework affords the support for the swing elements which are suspended between the adjacent masts.

Each swing element consists of a cross-bar 25, suspended at each end by wire ropes 26 to the adjacent masts, so as to hang between them, and diagonal wire-rope stays 27 are carried from each end of the cross-bars 25 to the upper end of the other mast of the pair. From this cross-bar 25 the passenger cars 30 are suspended in any appropriate manner that will permit of the free movement of the car outward under the action of centrifugal force.

The manner in which I prefer to suspend the cars is illustrated in the drawings, a stay 28 being carried from each outer corner of the car to the adjacent ends of the cross-bar 25 and stays 29 from the sides of the car intermediate to the ends. This construction not only more effectually sustains the weight of the car, but also by the diagonal character of the stays 29 of the car-support and the stays 27 of the swing elements will maintain the cars steady under the effect of an acceleration or retardation of the rotational effort on the swing, and the free suspension of the car structure to the swing will permit the car to take its true position under centrifugal force, and thus afford a more natural support to the passengers who may occupy the cars. Attention is drawn to this feature because in swings of this character, which have been previously invented, an attempt has been made to maintain the bottom of the cars in a horizontal position, which is an incorrect and unnatural one, for the passengers in the cars are also under the influence of centrifugal force and require some measure of support against the outward tendency.

The platform 2 with its superstructure may be rotated by any suitable means, either by mechanism on the platform itself or from an exterior source of power. The means of rotation employed is not material to this application; but in the drawings the platform is shown as rotatable by a rope around a V-groove sheave 18, secured to the under side of the platform-frame.

I am aware that centrifugal swings have previously been used and patented, wherein the swing elements have been suspended from a rotatable framework; but such has

either been accomplished by elevating the rotatable platform to which the swing elements were attached on a structure high enough to afford the length of swing desired or the swings have been suspended from a framed structure of sufficient height, dependent on a center mast about which the structure turned as on a pivot. Either of these structures is open to objection on the ground of the expense of building and because neither of them are convenient to take down and pack for transportation, whereas by careful consideration of imposed strains and the adaptation of the design and material to the requirements of such I have produced a swing which is as cheap as practicable commensurate with the requirements of strength, and the design is also especially fitted for rapid construction and convenient transport.

The particular manner of connecting the various parts is not revealed in this application; but they are designed to facilitate the transport and erection referred to.

Having now particularly described the construction of my invention, I hereby declare that what I claim as new, and desire to be protected in by Letters Patent, is—

1. In a centrifugal swing, a rotatable platform, an upwardly-projecting annular frame near the periphery thereof, swing elements suspended from the upper portion of said frame, an annular rolling support for the platform approximately under the base of the upwardly-projecting annular frame, substantially as shown and described.

2. In a centrifugal swing, a rotatable platform, an upwardly-projecting annular frame near the outer edge thereof, swing elements suspended from the upper portion of said frame, a central support for the platform to maintain it in its axis of rotation and an annular rolling support for the platform approximately under the upwardly-projecting annular frame, substantially as shown and described.

3. In a centrifugal swing, a rotatable base-platform, an upwardly-projecting annular frame toward the outer edge thereof, said frame composed of a series of uprights, suitably braced and stayed together, swing elements suspended between the upper ends of the said uprights, a central ball-bearing to support the central portion of the platform and maintain it in its axis of rotation and a series of rolling supports approximately under the upwardly-projecting annular frame substantially as shown and described.

4. In a centrifugal swing; a rotatable platform supported toward its center on a ball-bearing which will support a portion of its weight and maintain it in its axis of rotation, an annular rolling support toward its outer edge and an upwardly-projecting frame approximately over the annular rolling support, such frame consisting of uprights inclined



outward at their upper ends and suitably braced and stayed together, swing elements suspended between the upper ends of the up-  
rights, such swing elements consisting of  
ropes from each upright to the opposite ends  
of a bar suspended between them, a car sus-  
pended from the ends of said bar.

5. In a centrifugal swing; the combination  
with a rotatable base-platform having a cen-  
tral ball-bearing designed to sustain the  
weight of the center portion of the platform  
and maintain it in its axis of rotation, of  
means for sustaining the weight of the plat-  
form toward its circumference, of an open  
framework approximately over this outer  
circumferential support, such framework  
consisting of a series of masts stepped into  
the platform the upper ends of which masts  
are maintained in position by a series of strut  
members between the upper ends of the  
masts and cross-tied by wire-rope stays ex-  
tending from each mast to two masts on the  
opposite side of the circle, of a series of wire-  
rope stays extending diagonally from toward  
the upper end of each mast to bands encir-  
cling the adjacent mast on each side and back  
to the base of each mast, of a series of stays  
between the masts at the point of attachment  
of the aforementioned diagonal stays, of  
swing elements designed to suspend cars be-  
tween each pair of masts, such swing ele-  
ments comprising a cross-bar each end of  
which is connected by a wire rope to each of  
the masts between which it is hung, and  
means for freely suspending a car to the ends  
of the suspended cross-bar.

6. In a centrifugal swing; the combination  
with a rotatable base-platform, of a central  
support designed to sustain the weight of the  
center portion of the platform and maintain  
it in its axis of rotation, means for sustaining  
the weight of the outer portion of the plat-  
form, an upwardly-extending open frame-  
work, such open framework consisting of a  
series of masts stepped into the platform ap-  
proximately over the outer circumferential  
support of such, means for affording mutual  
support to the upper ends of the masts, such  
means comprising compression members be-  
tween the upper ends of each pair of masts,  
and two wire-rope stays extending from the  
upper end of each mast to a similar position  
on masts on the opposite side of the circle, of

means for staying the masts against bending  
at the middle comprising wire-rope stays ex-  
tending diagonally from the upper end of the  
mast to the middle of the adjacent mast on  
each side and thereafter back to the base of  
the mast, stays between the masts at or  
about the midconnection of the diagonal  
stays thereof, and means for suspending a  
car between each pair of masts in a manner  
to allow it to fly freely outward as the plat-  
form is rotated.

7. In a centrifugal swing, a rotatable plat-  
form, an upwardly-projecting annular frame  
secured to said platform near the periphery  
thereof to rotate therewith, swing elements  
suspended from said frame, and a support  
for said platform arranged to permit the ro-  
tation thereof, substantially as shown and  
described.

8. In a centrifugal swing, a rotatable plat-  
form, an upwardly-extending annular frame  
secured to the platform near the periphery  
thereof, swing elements suspended from the  
upper portion of the frame, and a rolling sup-  
port for the platform, substantially as shown  
and described.

9. In a centrifugal swing, a rotatable plat-  
form, an upwardly-extending annular frame  
secured to the platform near the periphery  
thereof, swing elements suspended from the  
upper portion of the frame, and an annular  
rolling support for the platform arranged ap-  
proximately under the base of the upwardly-  
projecting annular frame substantially as  
shown and described.

10. In a centrifugal swing, a rotatable  
platform, an upwardly-extending annular  
frame secured to the platform near the pe-  
riphery thereof, swing elements suspended  
from the upper portion of the frame, and an  
annular rolling support for the platform ar-  
ranged approximately under the base of the  
upwardly-projecting annular frame, and a  
central antifriction-support for the platform,  
substantially as shown and described.

In testimony whereof I have signed my  
name to this specification in the presence of  
two subscribing witnesses.

RICHARD H. CASSWELL.

Witnesses:

M. O'NEIL,

HARRISON G. PLATT.