J. C. WELCH.

AMUSEMENT DEVICE.

APPLICATION FILED MAR. 9, 1920.

1,406,705.

Patented Feb. 14, 1922.

5 SHEETS—SHEET 1.

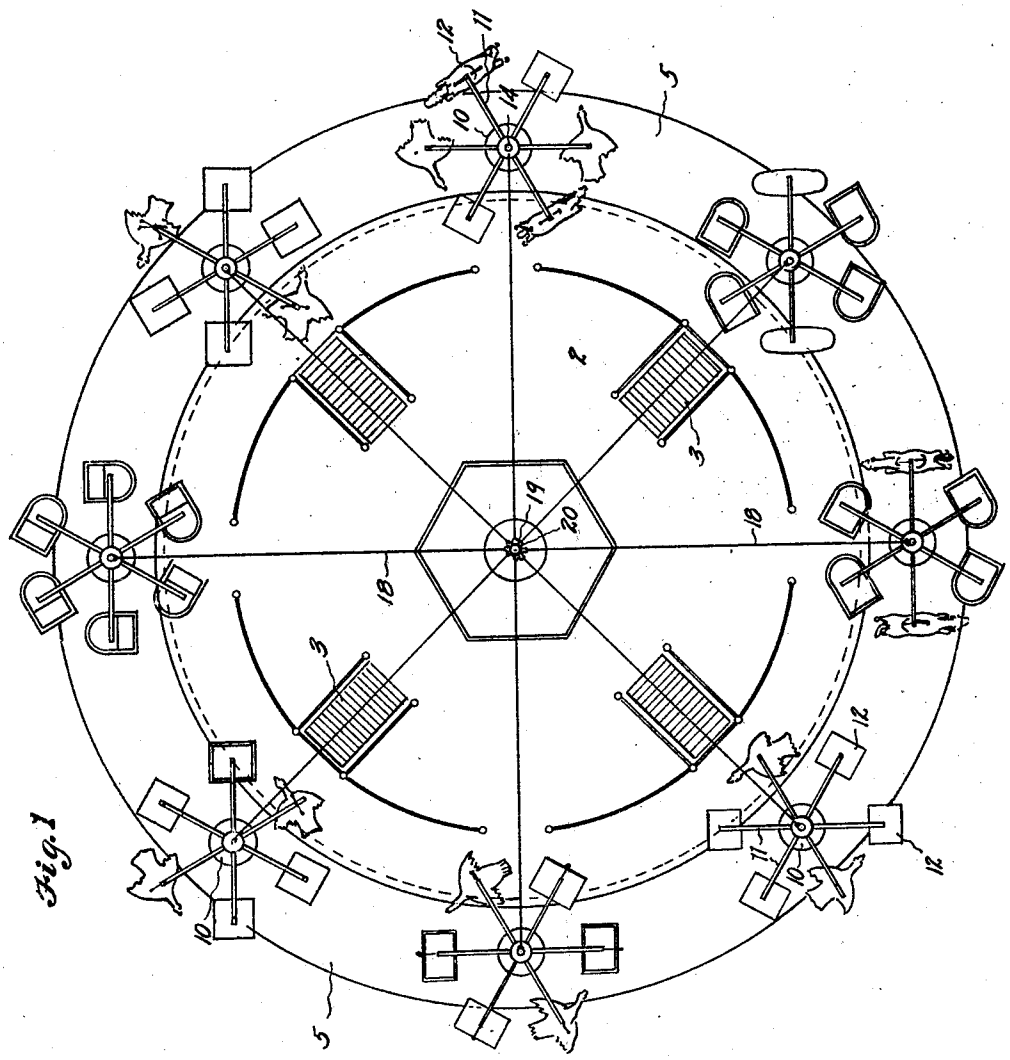

Fig. 1

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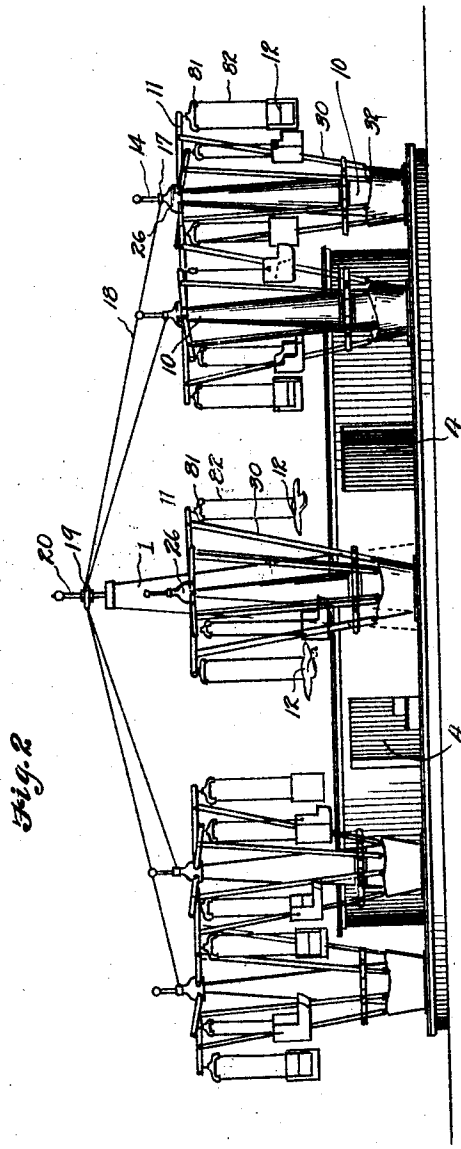

Fig. 2

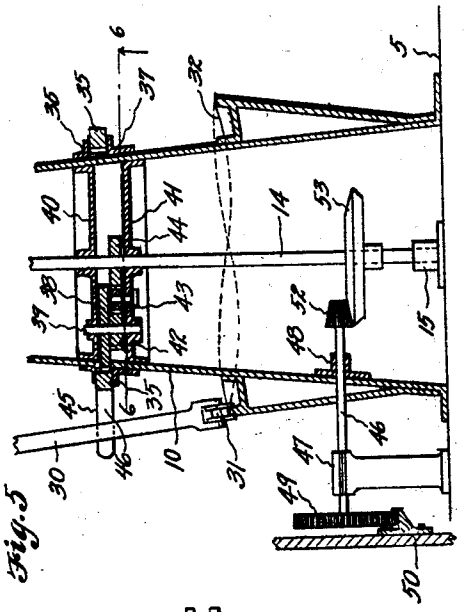

Fig. 5

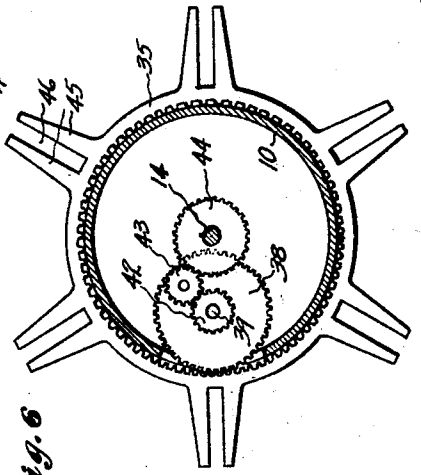

Fig. 6

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5 SHEETS—SHEET 3.

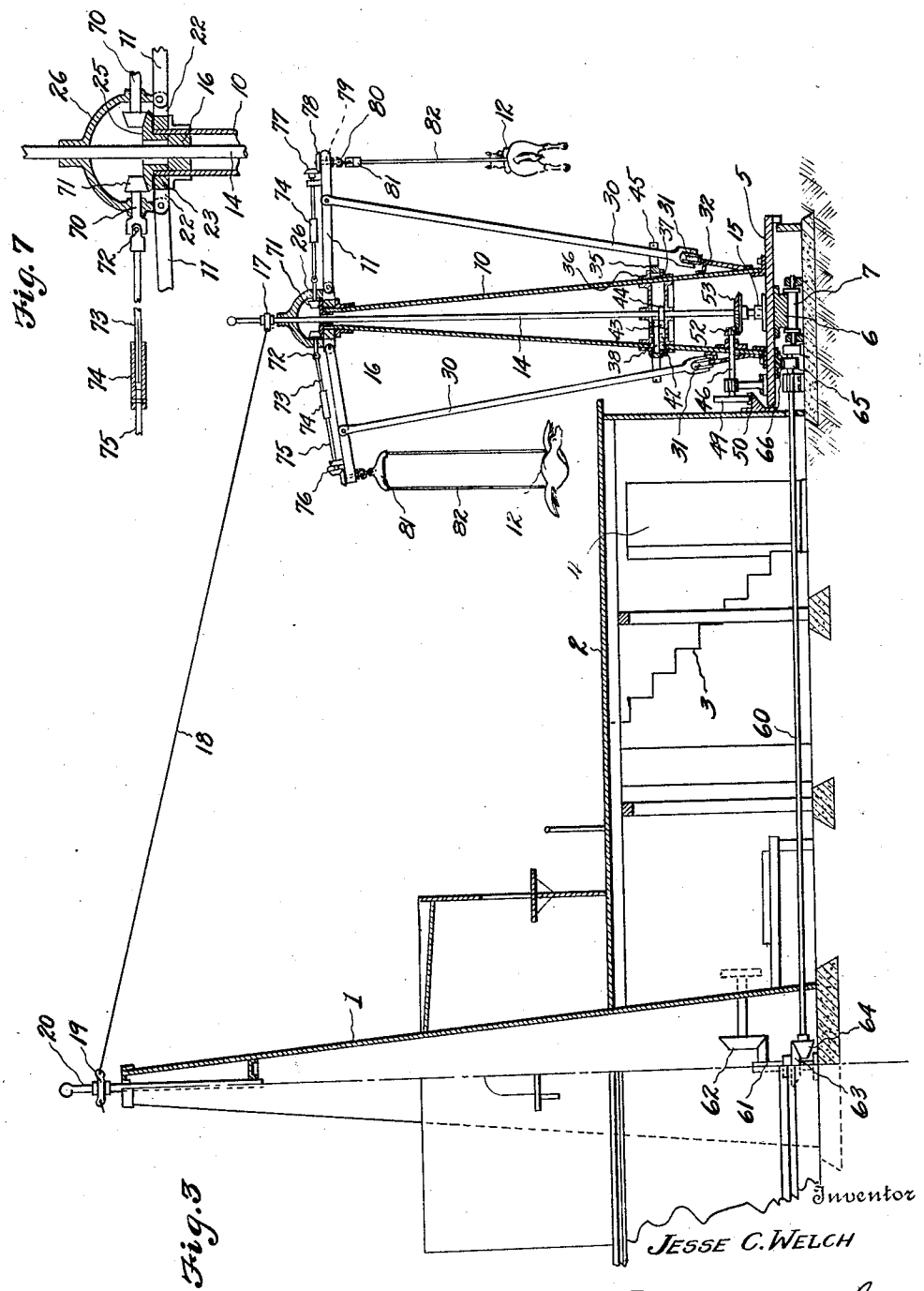

Fig. 7

Fig. 3

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5 SHEETS—SHEET 4.

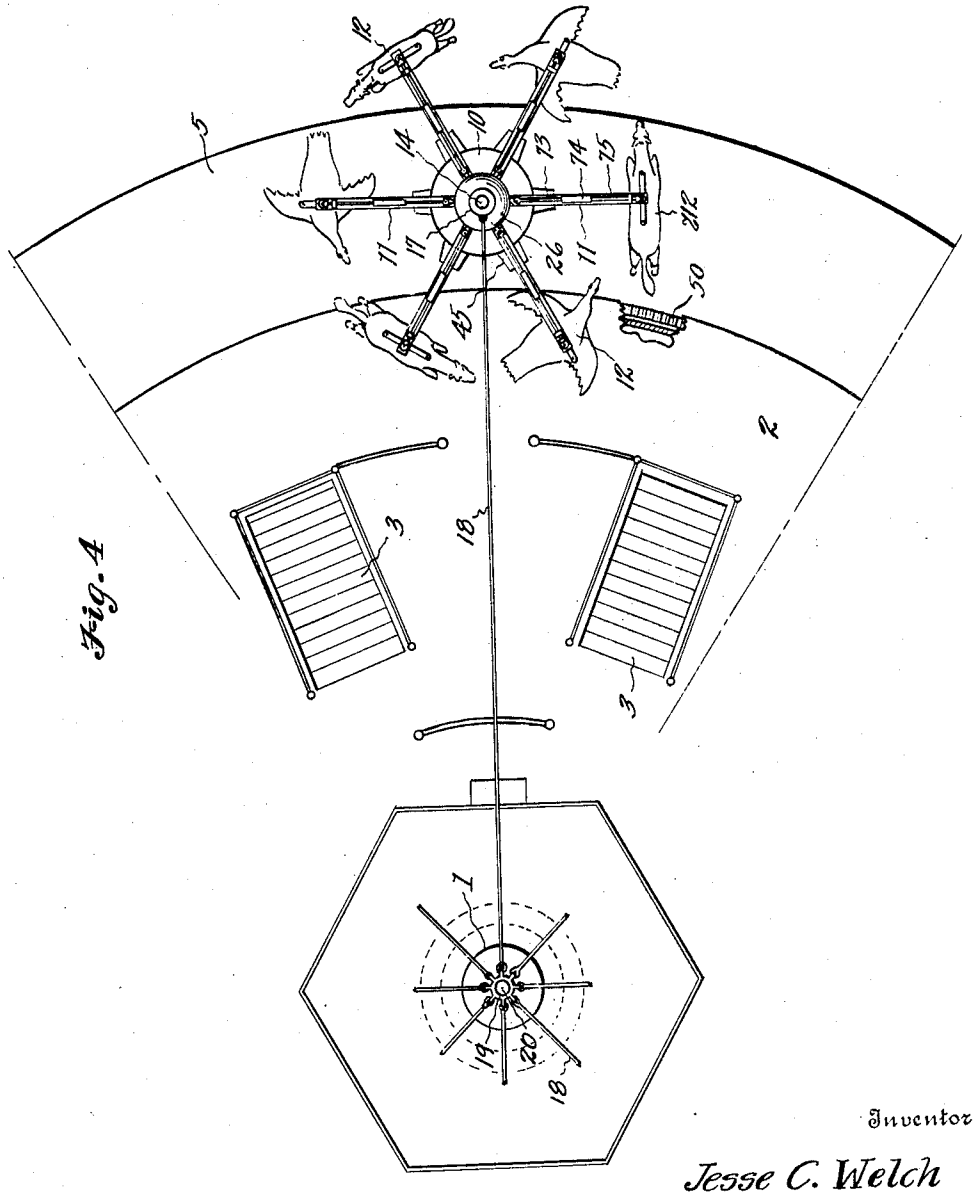

Fig. 4

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5 SHEETS—SHEET 5.

Fig. 9

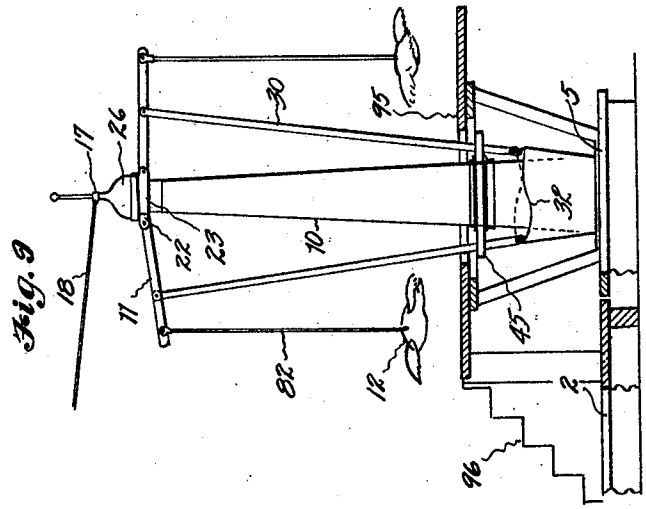
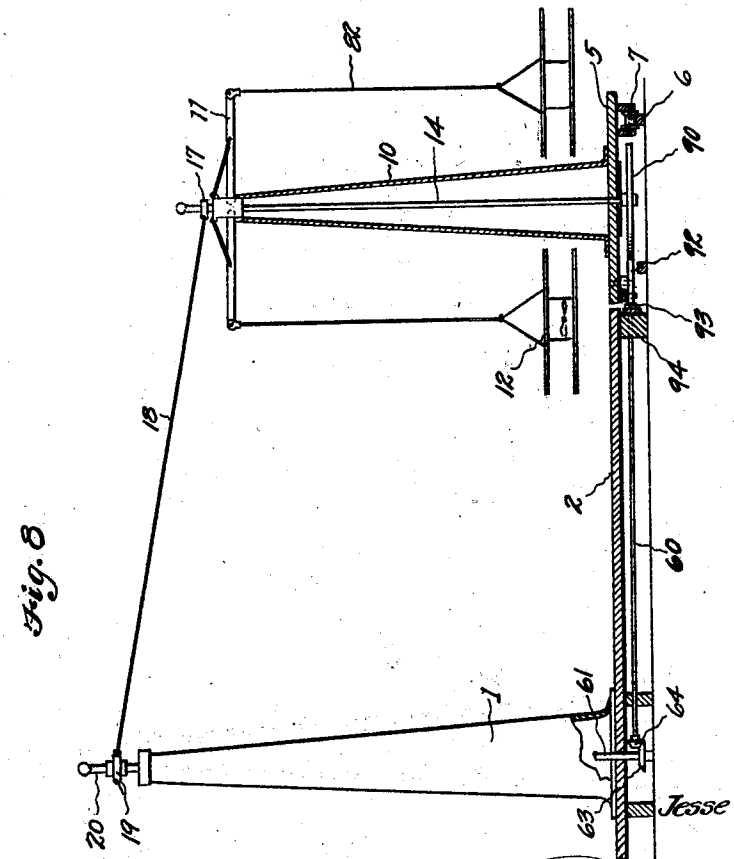


Fig. 8



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UNITED STATES PATENT OFFICE.

JESSE C. WELCH, OF TACOMA, WASHINGTON.

AMUSEMENT DEVICE.

1,406,705. Specification of Letters Patent. **Patented Feb. 14, 1922.**

Application filed March 9, 1920. Serial No. 364,416.

To all whom it may concern:

Be it known that I, JESSE C. WELCH, a citizen of the United States, and resident of the city of Tacoma, county of Pierce and State of Washington, have invented certain new and useful Improvements in Amusement Devices, of which the following is a specification.

This invention relates to amusement devices such as are used in pleasure resorts, exhibition grounds, parks and like places, and more particularly to improvements in that character of amusement apparatus wherein a ring shaped platform is mounted so as to move in a horizontal plane about a central loading platform and a plurality of supporting towers are mounted at spaced intervals thereon, each of which is equipped with a plurality of radially extending arms wherefrom carriages, seats, or mounts of various forms, whereon people may ride, are suspended.

It is the principal object of the invention to provide a novel device comprising means whereby the tower supporting platfrom may be driven and means through which its revolving will rotate and reciprocate the radially extending arms.

It is a further object to provide for the individual revolving of carriages through their suspending members while they are revolved about their supporting towers.

In accomplishing these and other objects of the invention, I have provided the improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view of an amusement device constructed according to the present invention.

Figure 2 is a side elevation of the same.

Figure 3 is an enlarged, sectional view taken vertically through the central tower of the device, the loading and revolving platform, and a carriage supporting tower, particularly illustrating the driving mechanism of the several parts.

Figure 4 is a plan view of the parts particularly illustrated in Figure 3.

Figure 5 is a detail, sectional view of the lower end of one of the carriage supporting towers, showing the mechanism for rotating and oscillating the radial arms, and mechanism for moving the oscillating members along undulatory tracks about the towers.

Figure 6 is a sectional view, on the line 6—6 of Figure 5, illustrating the mechanism for revolving a ring which moves the oscillating braces.

Figure 7 is an enlarged, detail view of the driving mechanism at the upper end of a supporting tower for rotating the arms, and revolving the suspended carriages or seats.

Figure 8 is a sectional, detail view of a modified construction, wherein the loading and revolving platform are in the same horizontal plane and the carriage suspending arms are not oscillated.

Figure 9 is a detail sectional view of another modified construction, wherein there is an elevated loading platform for each tower.

Referring more in detail to the several views of the drawings, wherein like reference characters designate like parts, 1 designates a central tower about which a circular, elevated platform 2 is built; the latter being of substantial construction, so that it may serve as a platform whereon people may gather to be loaded onto the carriages of the several towers, as is presently described, and is provided with a plurality of stairways, or inclines, 3, leading thereto from the ground level, as is particularly illustrated in Figures 1 and 3, whereby access is had to and from the loading places; access to these stairways being had through openings 4 in the side walls which support the platform.

Revolubly supported, to move in a horizontal plane considerably below the plane of the platform 2, and concentrically about the tower 1 and loading platform, is a ring-like platform 5, provided on its underside with a substantial circular track 6 whereby it is supported on a plurality of rollers 7 arranged at closely spaced intervals, radially and circumferentially about the central platform and tower.

Mounted at regularly spaced intervals about the platform 5, are towers 10 each of which at its upper end supports a plurality of radially extending arms 11, wherefrom carriages, seats or mounts, 12, of various kinds, whereon people may ride, are suspended, and since the construction of each of the towers and the parts associated therewith is identical, only one unit will be described in detail, with the understanding that the description relates equally to all.

Extending centrally and vertically within the tower 10 is a shaft 14 which is revolubly mounted at its lower end and adjacent its upper end, respectively, in bearings 15 and

16; the bearing 15 being fixed to the platform 5, while the bearing 16 is fixed within the upper end of the tower. The shaft 14 is extended from the upper end of the tower and has a collar 17 revoluble thereon to which the outer end of a cable 18 is attached, to resist centrifugal force that might tend to throw the tower outwardly while the device was in operation; the inner end of the cable being fixed to a collar 19 that is likewise revoluble on a shaft 20 that extends vertically from the upper end of the central tower 1.

The arms 11 are pivotally mounted, so that they may move vertically at their outer ends, between arms 22 that extend outwardly in pairs from a ring 23 that is revoluble on the upper end of the tower 10; the ring being retained between a flanged supporting ring 24 and the periphery of a horizontally disposed bevel gear wheel 25 fixed in the upper end of the tower. This ring 23 is revolved on its mounting through a connection with the shaft 14, consisting of a cap 26 that is securely fixed to the shaft and has peripheral connection with the ring in such manner that rotation of the shaft 14 will cause the arms 11 to be revolved as the spokes of a wheel about their supporting tower.

The means provided for supporting the arms 11 in extended position and for transmitting the oscillatory motion thereto consists of a series of inclined brace members 30, which, at their upper ends, are pivotally fixed to the outer ends of the arms 11, and at their lower ends are provided with grooved rollers 31 which are adapted to follow an undulatory track 32 which encircles the base of the tower.

In order that the lower ends of these brace members may be moved along the track 32 in accordance with the movement of the arms 11, I have mounted an internally toothed ring 35 about the tower slightly above the track 32, which is adapted to rotate between guide flanges 36 and 37, secured to the tower. Meshing with this ring is a gear wheel 38 that is fixed on a vertical shaft 39 extending revolubly between cross heads 40 and 41, within the tower, and fixed on the shaft to turn with the gear 38 is a smaller gear wheel 42 that is driven through the intermediacy of an idler gear wheel 43 by means of a gear wheel 44 that is keyed onto the shaft 14. Extending outwardly in pairs from the ring 35 are spaced apart arms 45, forming guideways 46 wherein the lower ends of the braces 30 are slidably retained and are maintained in properly spaced relation.

The relative proportions of the ring 35 and gear wheels 38, 42, 43, and 44 are such that the ring 35 will turn in the same direction and at the same angular speed as the shaft 14, so that they will at all times be maintained in vertical planes with respect to the arms which they support.

The shaft 14 is driven through connection with a shaft 46 that is mounted in bearings 47 and 48, secured respectively to the platform 5 and tower 10. At one end this shaft has a gear wheel 49 fixed thereon, which travels in mesh with a geared band 50 that is fixed to and encircles the vertical circumferential wall 51 of the platform 2, and at its opposite end has a bevel pinion 52 thereon which runs in mesh with an upwardly facing bevel geared wheel 53 that is keyed to the shaft 14.

The platform 5 is revolved by means of a plurality of driving shafts 60 which extend radially from a central driving shaft 61, mounted vertically at the center of the device and driven by any suitable driving mechanism, not shown, through the gearing indicated at 62.

The shaft 61 has a bevel gear wheel 63 fixed thereon which meshes with pinions 64 at the inner ends of the shafts 60, and these several shafts 60 have gear wheels 65 at their outer ends which follow a toothed ring 66 secured to the under side of the platform 5 concentric therewith.

With the driving mechanism so constructed it will be seen that rotation of the shaft 61 will rotate the shafts 60 to revolve the platform 5 on the rollers 7, and as the said platform revolves, the several towers 10 are carried therewith about the central tower 1.

It is also apparent that revolving of the platform 5 causes the gear wheels 49 to move along the geared track or ring 50 which revolves the shaft 46 to likewise revolve the shaft 14 to rotate the arms 11 from which the carriages or seats 12 are suspended.

I have also provided for rotating the individual carriages as they are revolved about the towers, through their suspending members. This is accomplished in the following manner. Mounted revolubly in the cap 26 to extend radially with respect to the shaft 14, are short shaft sections 70, each of which has a bevel gear 71 at its inner end traveling in mesh with the bevel gear 25 that is fixed in the upper end of the tower, and at their outer ends are connected through universal joint connections 72 with the inner end of shafts 73, which are telescopically connected at their outer ends with sleeves 74 that are fixed to shafts 75. The latter shafts extend along the arms 11 and are revoluble in bearings 76 adjacent the ends of said arms, and have bevel gears 77 at their ends meshing with bevel gears 78 at the upper ends of shafts 79 extending vertically through and revolubly fixed in the outer ends of the arms 11.

At the lower ends of these shafts 79 are universal joints 80 whereby connection is

made with horizontal cross heads 81 wherefrom two rods 82 are suspended, the latter having some form of carriage or mount 12 attached thereto at their lower ends.

Since the gear wheel 25 is not revoluble with respect to the tower 10 and the cap 26 is revolved by the shaft 14, it is apparent that revolving of the cap will cause the shaft sections 70 to be revolved to rotate the carriages as they revolve about their respective towers and the towers 10 likewise revolve about the central tower 1.

In Figure 8 I have illustrated a modified construction, which is substantially the same as that already described, except that the outer platform 5 is located in the same plane as the loading platform and the radially extending arms are not oscillated.

In this construction the shaft 14 is driven by means of a gear wheel 90 which is fixed to its lower end and runs in mesh with a smaller idler gear 92 fixed on the under side of the platform to follow a geared ring 93 that is fixed to the foundation 94 of the platform 2.

In Figure 9 I have illustrated another modified construction, wherein loading platforms 95 are built about each of the towers 10 to move therewith and which are elevated above the range of bystanders and are reached by stairways, as shown at 96.

By the mechanism described, it will be seen that the platform 5 may be actuated to move the several towers 10 revolubly about the central tower 1, the arms of each tower will be rotated and reciprocated, and the individual carriages will be revolved through their suspending members and will swing outwardly by centrifugal force as they are revolved.

While the principal construction shows mechanism for simultaneously producing all these motions, it is apparent that in devices where several towers 10 are used, some may be equipped only as the construction as in Figure 8, and some as in Figure 9, where the carriages are not revolved through their suspending bars; it being the intention to provide for more or less motion according to the likes of the individuals using the device.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. An amusement device of the character described, comprising a circular central platform, an annular platform mounted to revolve in a horizontal plane about the said central platform, a plurality of towers erected on the said annular platform to move therewith, a plurality of arms extended radially from the upper ends of said towers, carriages swingingly suspended from the said arms to adjacent the central platform, means for revolving the annular platform and means operable by the revolving of said platform for revolving the said arms at the upper ends of the towers.

2. An amusement device of the character described, comprising a central loading platform, rollers arranged radially and circumferentially about the central platform, an annular platform having a circular track on its under side mounted to revolve about the central platform on said rollers, carriages mounted on said annular platform accessible from the central platform and means for revolving the said annular platform about the said central platform.

3. An amusement device of the character described, comprising an elevated circular platform, rollers arranged radially and circumferentially about said central platform, an annular platform mounted to revolve on said rollers about the said elevated platform in a horizontal plane below the plane of the latter, a plurality of towers erected on said revoluble platform, a plurality of arms extending radially from the said towers, carriages suspended from said arms accessible only from the elevated platform, means for revolving the annular platform and means operable by revolving of said annular platform for actuating the radial arms and carriages revolubly about the towers.

4. An amusement device of the character described, comprising an elevated circular platform, an annular platform mounted to revolve about said circular platform, a plurality of towers erected on said annular platform to move therewith, caps mounted revolubly on the upper ends of said towers, arms extending radially from the said caps, carriages swingingly suspended from the outer ends of said arms to pass adjacent the elevated platform, means for revolving said annular platform, means operable by the revolving of said platform for revolving said caps to revolve the radial arms and carriages about their supporting towers, and means for oscillating the arms vertically as they revolve.

5. An amusement device of the character described, comprising a circular central platform, an annular platform mounted to revolve about said central platform, a plurality of towers erected on the annular platform to move therewith, a plurality of arms extended radially from the said towers, carriages suspended from the outer ends of said arms, means for revolving the annular platform, means operable by the revolving of the annular platform for rotating the arms about the towers and means operable by the rotating of said arms for revolving each of the carriages individually through its suspending member.

6. An amusement device of the character described, comprising a circular central platform, an annular platform mounted to revolve about the said central platform, a plu-

rality of towers erected at equally spaced intervals about the said annular platform to move therewith, caps mounted revolubly at the upper ends of said towers, arms extending radially from said caps, carriages swingingly suspended from the outer ends of said arms, means for revolving the annular platform, means operable by the revolving of said platform for rotating the tower caps to revolve the arms and carriages, means for oscillating the outer ends of the radial arms vertically as they revolve and means for revolving each of the carriages individually through its suspending member.

7. An amusement device of the character described, comprising a circular central platform, an annular platform mounted to revolve about the central platform, a plurality of towers erected at regular intervals about the annular platform to move therewith, caps revoluble on the upper ends of said towers, a plurality of arms pivotally fixed to said caps and extending radially therefrom, carriages suspended from said arms to move adjacent the central platform, an undulatory track encircling each of the said towers, supporting braces for each of the radial arms pivotally attached to the said arms at their upper end and having guide rollers at their lower ends adapted to follow the said tracks, means for revolving the annular platform, means operable by the revolving of the annular platform for rotating the caps on the towers to rotate the arms and carriages about the towers and means for actuating the brace members along the undulatory tracks as the arms rotate to oscillate the arms vertically at their outer ends.

8. An amusement device of the character described, comprising a circular platform supported in an elevated manner by means of a circular vertical wall, an annular platform mounted to revolve about said elevated platform, towers erected on said annular platform, arms extending radially from said towers, carriages suspended from said arms adapted to swing to loading position adjacent the elevated platform; the said platform supporting wall having openings therein and stairways leading from said openings to the elevated platform for the passage of people onto and from the loading platform.

9. An amusement device of the character described, comprising a central circular loading platform, an annular platform adapted to revolve in a horizontal plane on rollers arranged radially and circumferentially about said central platform and having carriages mounted thereon accessible from the loading platform, a vertical drive shaft mounted centrally within the loading platform, an annular geared ring fixed to the annular platform, shafts extending radially from the central drive shaft having geared driving connections at their inner and outer ends with the driving shaft and said annular ring, and means for driving the central shaft.

10. An amusement device of the character described comprising a circular central loading platform supported in an elevated position by means of a circular vertical wall, rollers arranged radially and circumferentially about the said wall, an annular platform mounted on said rollers to revolve about the central platform in a horizontal plane at a lower level than the plane of said central platform, an annular geared ring fixed about the said supporting wall, a plurality of towers erected on said annular platform, caps revolubly fixed on the said towers, arms extended radially from said caps, carriages suspended from said arms to swing to loading position adjacent the central platform, shafts fixed at their upper ends to said caps and extending downwardly within the towers, bevel geared wheels fixed on the said shafts, shafts mounted horizontally on the annular platform in radial alinement having geared connection at their outer ends with the said bevel gears of the vertical shafts and at their inner ends having gearing connection with the annular geared ring whereby revolving of the annular platform will revolve the radial arms about the towers.

11. An amusement device of the character described, comprising a central loading platform, an annular platform adapted to revolve about the central platform at a substantially lower horizontal level, towers supported at spaced intervals about the annular platform, a cap revolubly mounted at the upper end of each tower, arms pivotally attached to the caps and extending radially therefrom, carriages swingingly suspended from the outer ends of said arms adapted to move to loading position adjacent the loading platform, an undulatory track encircling the base of each tower, brace arms pivotally fixed at their upper ends to the radial arms and having rollers at their lower ends supported upon said tracks, a ring mounted to revolve upon the towers adjacent the said tracks, shafts extending vertically within the said towers fixed at their upper ends to the said revoluble caps and having driving connection with the said rings whereby the latter will be revolved in accordance with the revolving of the caps and said rings having guide arms extending radially therefrom to advance the lower ends of the brace members along the undulatory tracks accordingly as their upper ends move with the radially extending arms.

12. An amusement device of the character described, comprising a circular central loading platform, an annular platform adapted to be revolved in a horizontal plane about the said central platform, towers mounted on the

said annular platform, caps revolubly mounted at the upper ends of said columns, drive shafts fixed to said caps and extending vertically within the towers, arms pivotally fixed to the said caps and extending radially therefrom, carriages swingingly suspended from the outer ends of said arms to move adjacent and above the loading platform, undulatory tracks mounted about the towers, supporting braces for the radial arms pivotally fixed at their upper ends to the said arms and having rollers at their lower ends movable along the said tracks, internally geared rings mounted to revolve about the towers adjacent the said tracks having guide arms extending therefrom to advance the lower ends of the supporting braces, gears fixed to the vertical shaft within the towers and intermediate gears connecting the said gears with the internally geared ring whereby the latter are rotated accordingly as are the caps and the vertical braces are maintained in vertical alinement with the arms which they support, and means operable by the revolving of the annular platform for revolving the vertical shafts.

13. In an amusement device of the character described, a carriage supporting tower, a cap revolubly mounted upon said tower, arms extending horizontally and radially from said cap, a drive shaft for the cap extending vertically within the tower, a bevel gear wheel fixed horizontally upon the tower centrally within the cap, carriages suspended from the outer ends of said arms by means of shafts extending vertically and revolubly through the said arms, shafts revolubly mounted and extending longitudinally along the arms and operatively connected at their opposite ends by means of gearing with said horizontal bevel gear and with the carriage supporting shafts and means for rotating the drive shaft for the purpose set forth.

14. An amusement device of the character described, comprising a supporting tower, a cap revolubly mounted upon said tower, a plurality of arms pivotally fixed to the said cap, and extending radially therefrom, a drive shaft for the cap extending centrally within the tower, a bevel gear wheel fixed within the tower and concentrically within the cap, short shafts revolubly mounted and extending radially from the cap, gear wheels fixed to the inner ends of said shafts to operate in mesh with the horizontal gear, carriage suspending shafts revolubly mounted and extending vertically through the outer ends of said arms, cross heads fixed by universal connections to the lower ends of said vertical shafts, carriages suspended from said cross heads, telescopically connected shaft sections mounted longitudinally along the said arms; the inner sections having universal joint connection with the shafts mounted by said cap and the outer sections having bevel gearing connection with the carriage suspending shafts, means for rotating the drive shaft to rotate the cap and arms and means for oscillating the arms as they rotate.

Signed at Seattle, Washington, this 27th day of February, 1920.

JESSE C. WELCH.