Aug. 30, 1938. D. MENA 2,128,492

OBSERVATION TOWER

Filed April 26, 1937 3 Sheets-Sheet 1

FIG. 2

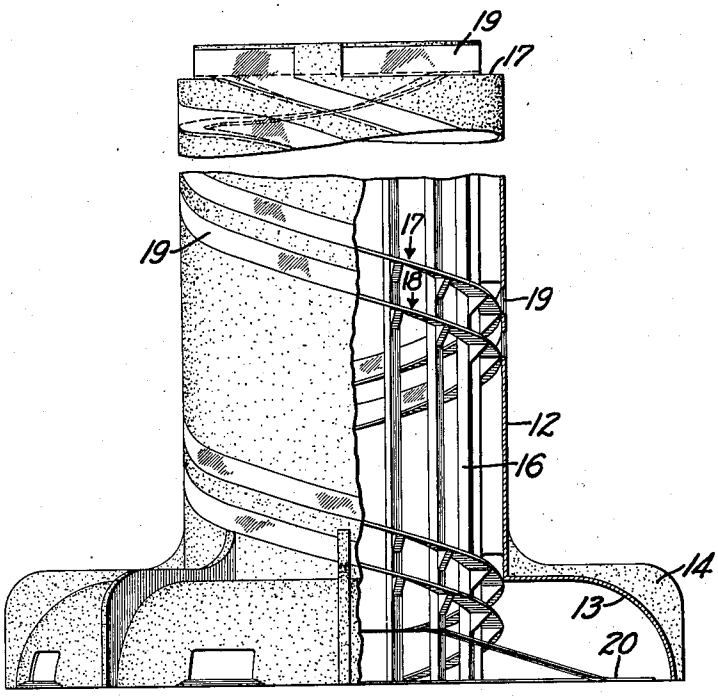


FIG. 1

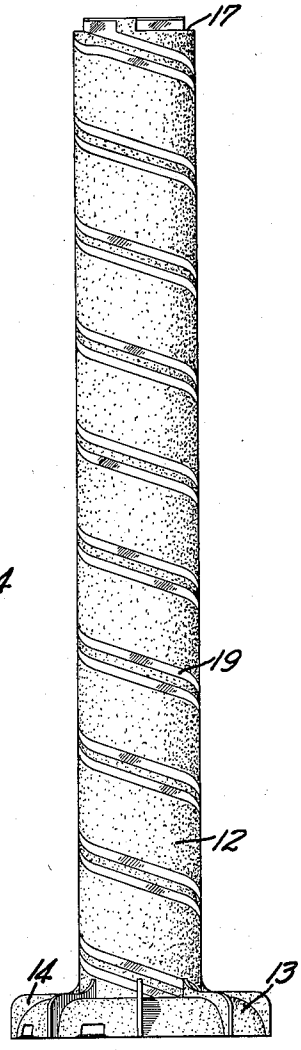
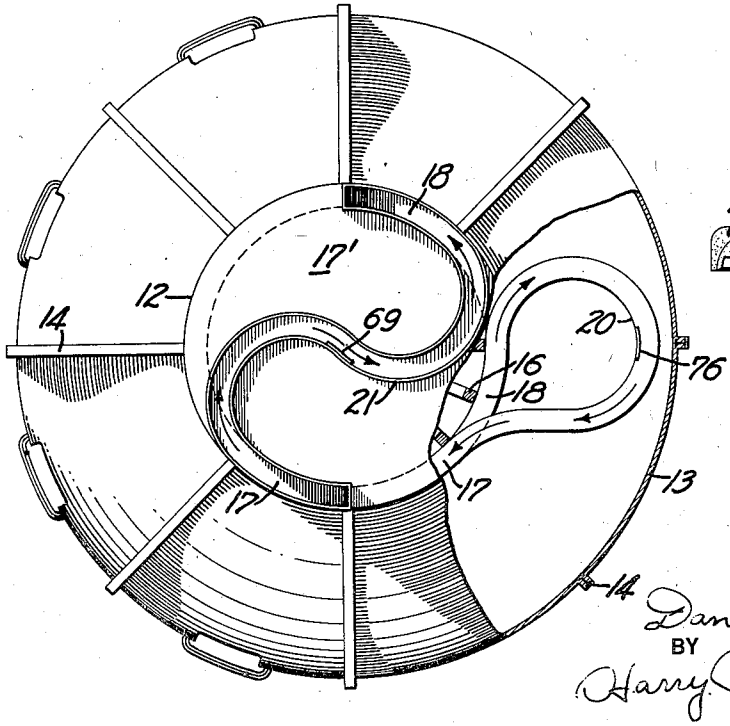


FIG. 3



INVENTOR
Dan Mena
BY
Harry P. Schroeder
ATTORNEY

Aug. 30, 1938. D. MENA 2,128,492

OBSERVATION TOWER

Filed April 26, 1937 3 Sheets-Sheet 2

FIG. 4

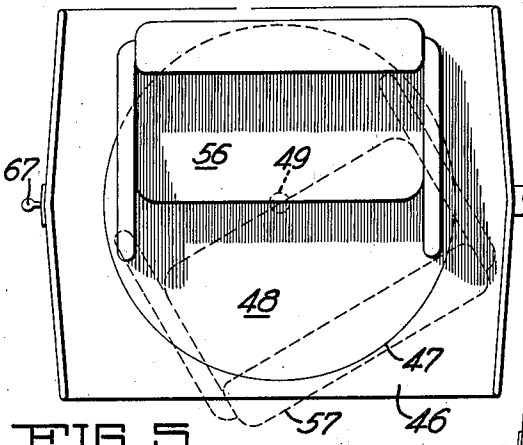


FIG. 5

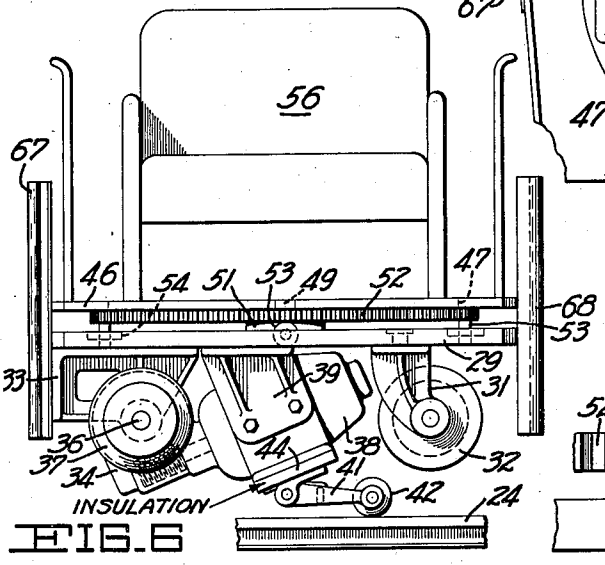


FIG. 6

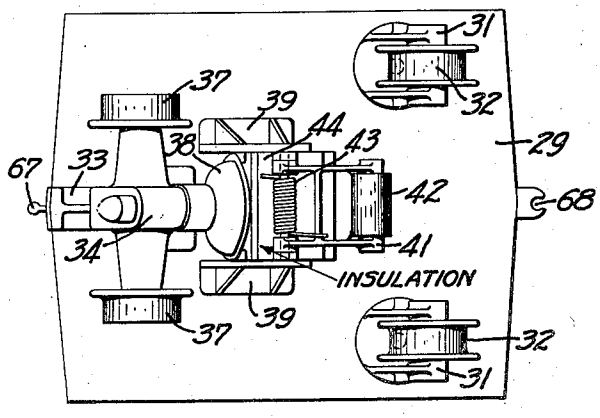


FIG. 7

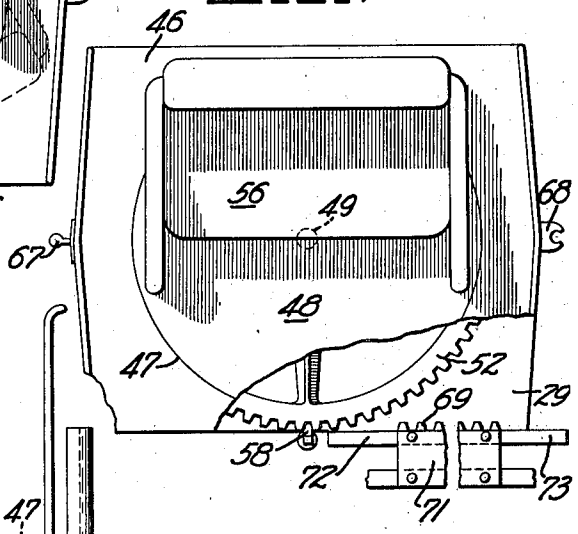
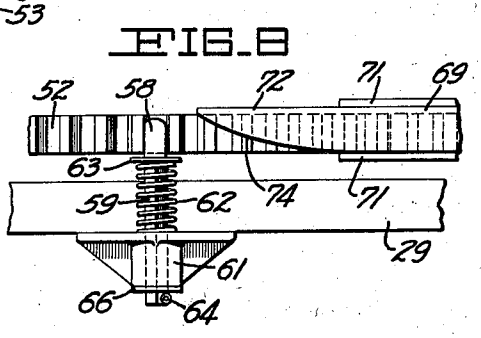


FIG. 8



INVENTOR

Dan Mena

BY

Harry Schroeder

ATTORNEY

Aug. 30, 1938. D. MENA 2,128,492

OBSERVATION TOWER

Filed April 26, 1937 3 Sheets-Sheet 3

FIG. 9a

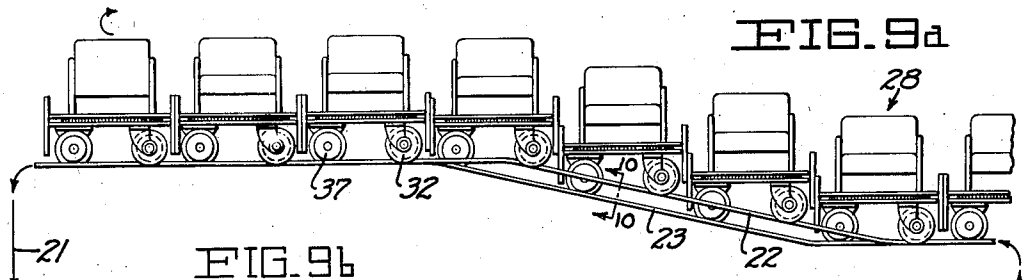


FIG. 9b

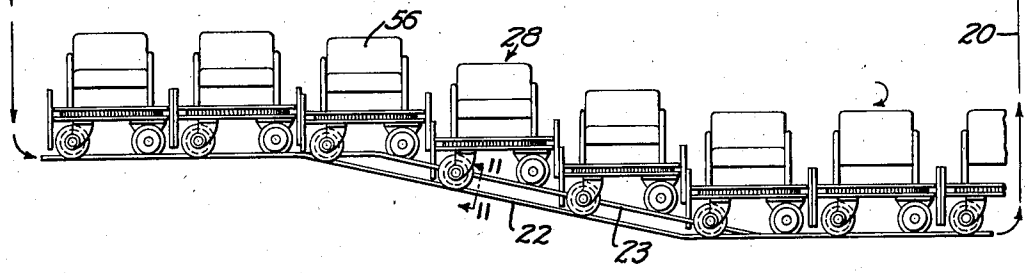


FIG. 11

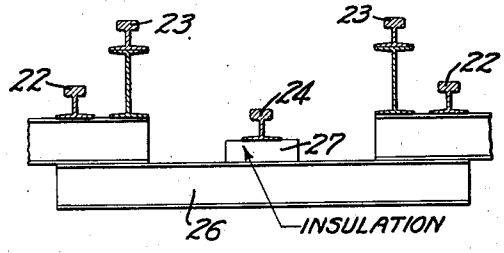
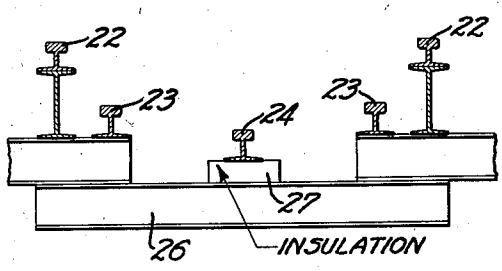


FIG. 10



INVENTOR

Dan Mena

BY

Harry C. Schroeder

ATTORNEY

Patented Aug. 30, 1938 2,128,492

UNITED STATES PATENT OFFICE

2,128,492

OBSERVATION TOWER

Dan Mena, Oakland, Calif.

Application April 26, 1937, Serial No. 138,984

6 Claims. (Cl. 104—56)

This invention relates to amusement devices for elevating sightseers above the surrounding terrain.

It is an object of the invention to provide a device of the character described which occupies a minimum of ground area yet is capable of elevating persons to considerable heights above the ground.

Another object of the invention is to provide a novel track arrangement for such a device.

A further object of the invention is to provide a novel car for use in amusement devices of the class described.

The invention possesses other objects and features of value some of which, together with the foregoing, will be specifically set forth in the detailed description of the invention which follows. It is to be understood that the invention is not to be limited to the particular species thereof shown and described as various other embodiments thereof may be employed within the scope of the appended claims:

Referring to the drawings:

Figure 1 is a side elevational view of the observation tower.

Figure 2 is a side elevational view, partly in section and having portions broken away so as to shorten the view, of the tower.

Figure 3 is a top plan view of the tower. A portion of the view is broken away so as to more clearly disclose the interior construction.

Figure 4 is a top plan view of one of the cars.

Figure 5 is a side elevational view of one of the cars.

Figure 6 is a bottom plan view of one of the cars.

Figure 7 is a top plan view, similar to Figure 4 but broken away to more clearly disclose the underlying structure, of one of the cars.

Figure 8 is a fragmental front elevational view, to an enlarged scale, showing the seat rotating mechanism of each of the cars.

Figure 9*a* is a view, diagrammatic in character, showing a portion of the train of cars and the ascending track.

Figure 9*b* is a view, similar to Figure 9*a*, showing a portion of the train of cars and the descending track. The arrows joining the figures together indicate that the train of cars and the tracks are each endless.

Figure 10 is a vertical sectional view of the ascending track. The plane of section is indicated by the line 10—10 of Figure 9*a*.

Figure 11 is a vertical sectional view of the descending track. The plane of section is indicated by the line 11—11 of Figure 9*b*.

In detail, the tower comprises an outer cylindrical shell 12, preferably of reinforced concrete construction, which rises from a base housing 13 suitably constructed and provided with ribs 14 to assist in stabilizing the tower. Arranged within the shell 12, and spaced from the inner surface thereof is a cylindrical frame comprising a plurality of vertically disposed pillars 16 which are connected to and support the shell. The tower is provided with a closed flat top 17'.

Secured to the pillars 16, and arranged to wind helically upwardly therearound, is a pair of tracks along which an endless train of observation cars, which will presently be described, may pass, the upper track being hereinafter referred to as the ascending track 17 and the lower track being hereinafter termed the descending track 18, and a continuous window 19 formed in the shell 12 follows the spiral of the tracks. As is shown in Figure 3, the tracks at their lower ends are connected together by a loop 20 and at their upper ends, on the top of the tower, by an S-shaped loop 21. Figures 10 and 11 show respectively, in detail, the ascending and descending tracks. Each track, it will be observed, consists of a pair of outer rails 22, a pair of inner rails 23, and a central, current-carrying rail 24 which is supported on the frame members 26, forming part of the frame 16, by insulating blocks 27. It will be also observed that in the ascending track of Figure 10 the outer rails 22 are elevated above the inner rails 23 while in the descending track of Figure 11 just the opposite is true, the inner rails being elevated above the outer rails. This is done so that the cars, generally indicated by the numeral 28 of Figure 9*a*, will remain level as they ascend and descend along the sloping tracks.

The train of cars, shown in Figure 9*a*, is power driven along the tracks, and while the usual forms of rack and pinion or cable drive may be employed it is preferred to simplify the car and track construction by providing spaced cars in the train, depending on the slope of the track grade, with individual drives. One of the power cars is detailed in Figures 4 to 7 inclusive and comprises a main frame 29 adjacent one end of which is pivotally mounted a pair of caster brackets 31 each journalling a double-flanged wheel 32 which is adapted to engage one of the outer rails 22. The opposite end of the frame supports a bracket 33 which carries a reduction gear housing 34, enclosing a suitable worm or

spur gear speed reduction mechanism, from which extends a driven shaft 36 to which is attached a pair of flanged drive wheels 37 adapted to engage the inner rails 23 of the track. A motor 38, secured to the frame by brackets 39, has its shaft connected with the reduction gear to drive the latter and a trolley 41, having a roller 42 which is urged into contact with the current carrying rail 24 by the spring 43, is provided, mounted on the motor by the insulating block 44, for conducting current from the rail 24 to the motor. A platform 46 is mounted above and in spaced relation with the main frame 29 and has in the center thereof a circular aperture 47 which receives a turntable 48 carried by a pivot pin 49 journaled in a bearing 51 secured to the main frame. A large spur gear 52 is secured to the underside of the turntable and is supported on rollers 53 which are journaled on pins 54 secured in the main frame. It will be seen that both the gear 52 and the turntable 48 may rotate about the axis of the pivot pin 49. The turntable carries a chair 56 in which the passengers may sit and this chair may be moved, as indicated by the dotted lines 57 of Figure 4, from a position facing one side of the car to a position facing the other side thereof. For maintaining the turntable and chair in either of the aforementioned positions a latch is provided comprising a bolt having a head portion 58, which is adapted to lodge in the space between two of the teeth of the gear 52 so as to prevent the latter from turning, and a square shank portion 59 which is slidably supported by a bracket 61 secured to the main frame 29. A coil spring 62 surrounds the shank 59 and is confined between a washer 63 secured to the shank and the top of the bracket. This spring urges the head 58 upwardly into engagement with the gear teeth, the degree of this engagement being governed by a stop pin 64 and washer 66 which are secured to the lower end of the shank and engage the bottom of the bracket 61 when the shank is at the limit of its upward movement. Each of the cars carries at opposite ends thereof coupling elements, the lug element 67 at one end of the car being engageable with the socket element 68 at the end of the adjoining car to secure the cars together and to allow pivotal movement in the coupling. It will be observed that the coupling elements are extended above and below the main frame. This is done to permit considerable relative longitudinal movement of the coupling elements, without releasing their engagement, when as will be seen in Figures 9*a* and 9*b*, the relative elevations of the cars differ when the latter are ascending or descending the inclined track.

Means is provided for reversing the position of the chair 56 relative to the car at the top and bottom ends of the track, preferably at the loops 20 and 21. It will be seen that as the cars proceed upwardly along the upper or ascending track 17 the chairs and the occupants thereof will be facing away from the axis of the tower and looking through the upper window 19. When the cars reach the top 17 of the tower, if there were no means for reversing the chairs, to face the passengers toward the opposite side of the car, the passengers upon starting down the descending track would be facing toward the axis of the tower. This will be clearly seen upon reference to Figure 3. In order to reverse the chairs on each car as it reaches the top of the tower a section of rack 69 is secured to the framework at the side of the track and is adapted to engage the gear 52 of each car to rotate the gear through 180 degrees. This mechanism is shown in greater detail in Figures 7 and 8. The rack 69 is positioned, by the brackets 71, to lie in the path of the teeth of the gear 52 as the cars move by and the extreme end portions 72 and 73 of the rack are devoid of teeth and have their bottom faces 74 curved and directly in line with the head 58 of the latch. In Figure 8 it will be seen that as the car approaches the rack the latch 58 will first contact the curved surface 74 of the rack and will be depressed thereby freeing the gear 52 whose teeth will then move into mesh with the rack teeth causing the gear and the chair 56 to rotate. The length of the rack is just sufficient so that the gear will be rotated one-half revolution, whereupon the gear teeth will pass out of mesh with the rack teeth and the latch 58 in passing under the upwardly curving surface 74 at the opposite end of the rack will be allowed to rise from its depressed position to again engage the teeth of the gear 52 and prevent the latter from rotating. This rotation of the chair 56 faces the latter and the occupants thereof away from the axis of the tower when the cars are passing downwardly along the descending track 18. A similar reversal of the chairs is necessary when the latter reach the lower track loop 20 and therefore a reversing rack 76 similar to the mechanism just described is provided at the lower loop to position the chairs correctly for the following ascent.

The observation tower of my invention just described may be used as a sightseeing device at any place of scenic interest where panoramic views may be had from a considerable elevation such as parks, expositions, places of natural beauty and the like. The principal features which make the tower desirable when installed at these places is its ability to furnish the sightseer with a continuous panorama of the surrounding terrain without requiring him to as much as turn his head; its lack of bulk which makes it less conspicuous; and the small amount of ground area which it occupies which minimizes the cost of maintenance when it is installed on rented ground.

I claim:

1. An observation tower comprising a vertical, substantially cylindrical supporting frame, a shell surrounding and spaced from said supporting frame, a track disposed helically around and ascending along said frame from the bottom to the top thereof, said ascending track comprising a pair of spaced inner rails and a pair of spaced outer rails elevated above the level of said inner rails, a track disposed helically around and descending along said frame from the top to the bottom thereof, said descending track comprising a pair of spaced outer rails and a pair of spaced inner rails elevated above the level of said outer rails, said ascending and descending tracks being connected together at the top and bottom of said frame by looped track sections each comprising pairs of inner and outer rails spaced similarly to the rails of said ascending and descending tracks, joined therewith, and each being in planar alinement, an endless train of cars movable along said ascending and descending tracks, each of said cars having separate pairs of wheels spaced to conform, respectively, with the spacing of the inner and outer rails of said tracks, one pair of said wheels engaging the elevated outer rails of said ascending track when passing along said latter track and engaging the lower outer rails of said descending track when passing along the descending track,

and the other pair of wheels engaging the inner rails of said ascending track when passing along said latter track and engaging the elevated inner rails of said descending track when passing along the descending track, and means carried by one or more of said cars for moving said cars along said endless track.

2. In an amusement device having a track, a carriage movable along said track, a gear rotatably mounted on said carriage, a seat connected and rotatable with said gear, a latch carried by said carriage and engaging said gear to limit the rotation thereof, a fixed rack having teeth thereon engageable with the teeth of said gear as the carriage moves along said track to rotate said gear and its connected seat, and means carried by said rack for disengaging said latch prior to the engagement of the teeth of the rack with those of said gear.

3. In an amusement device, a track comprising separate pairs of weight-supporting rails and a current-carrying rail insulated from said weight-carrying rails, a carriage having a gear rotatably mounted thereon, a seat carried by and rotatably mounted thereon, a seat carried by and rotatable with said gear, a pair of caster brackets pivotally mounted on said carriage, wheels journaled in each of said caster brackets and engageable with a pair of said weight-supporting rails, an electric motor mounted on said carriage, a geared speed-reduction unit connected to be driven by said motor, said speed-reduction unit having a driven shaft extending therefrom, a pair of drive wheels fixed to said driven shaft for rotation therewith, said drive wheels engaging a second pair of said weight-supporting rails, a latch element slidably mounted on said carriage and having a head portion engaged with said gear between two of the teeth thereof, a fixed rack having a row of teeth disposed in tangential alinement with the pitch circle of said gear and engageable with said gear teeth during movement of the carriage along said track, said rack also being positioned in the path of movement of said latch as the carriage moves along the track and having a sloping surface thereon engageable with said latch to depress the latter and move the head portion thereof out of engagement with the teeth of said gear, a trolley pivotally mounted on said carriage and contacting said current-carrying rail for conducting current from said rail to the electric motor, and means for resiliently urging said trolley into contact with said current-carrying rail.

4. An observation tower comprising a vertical frame, an upwardly sloping track comprising a group of rails secured to said frame and rising from the bottom to the top thereof, a downwardly sloping track comprising a group of rails secured to said frame and extending from the top to the bottom thereof in parallel relation to the upwardly sloping track, certain of the rails of said upwardly sloping track group being elevated with respect to other rails of said group to lie in plane-parallel relation thereto, equivalent rails of said downwardly sloping track group being depressed with respect to others of the rails of the latter group to lie in plane-parallel relation thereto, and said groups of rails being joined together at their respective ends to provide an endless track loop, a train of cars movable along said track loop, each of said cars being provided with spaced, horizontally alined, pairs of supporting wheels engageable respectively when said cars are traversing said upwardly sloping track, with said elevated and said other rails thereof and, when said cars are traversing said downwardly sloping track, with said other and said depressed rails thereof whereby said cars are maintained horizontal at all times during movement along said track loop, and means for moving said cars along said track loop.

5. An observation tower comprising a vertical frame, an upwardly sloping track comprising a group of rails secured to said frame and rising from the bottom to the top thereof, a downwardly sloping track comprising a group of rails secured to said frame and extending from the top to the bottom thereof in parallel relation to the upwardly sloping track, certain of the rails of said upwardly sloping track group being elevated with respect to other rails of said group to lie in plane-parallel relation thereto, equivalent rails of said downwardly sloping track group being depressed with respect to others of the rails of the latter group to lie in plane-parallel relation thereto, and said groups of rails being joined together at their respective ends with horizontal groups of rails to provide an endless track loop, a train of cars movable along said track loop, each of said cars being provided with spaced, horizontally alined, pairs of supporting wheels engageable respectively when said cars are traversing said upwardly sloping track, with said elevated and said other rails thereof, and, when said cars are traversing said downwardly sloping track, with said other and said depressed rails thereof whereby said cars are maintained horizontal at all times during traversals of said upwardly and downwardly sloping tracks and during passage from said sloping to said horizontal tracks, and means for moving said cars along said track loop.

6. An observation tower comprising a vertical frame, an upwardly sloping track comprising a group of rails secured to said frame and rising from the bottom to the top thereof, a downwardly sloping track comprising a group of rails secured to said frame and extending from the top to the bottom thereof in parallel relation to the upwardly sloping track, certain of the rails of said upwardly sloping track group being elevated with respect to other rails of said group to lie in plane-parallel relation thereto, equivalent rails of said downwardly sloping track group being depressed with respect to others of the rails of the latter group to lie in plane-parallel relation thereto, and said groups of rails being joined together at their respective ends with groups of rails arranged horizontally to provide an endless track loop having spaced horizontal lands, a train of cars movable along said track loop, each of said cars having a seat pivotally mounted thereon and provided with spaced, horizontally alined, pairs of supporting wheels engageable respectively when said cars are traversing said upwardly sloping track with said elevated and said other rails thereof and, when said cars are traversing said downwardly sloping track, with said other and said depressed rails thereof whereby said cars are maintained horizontal at all times during traversals of said upwardly and downwardly sloping tracks and during passage from said sloping tracks to said horizontal track lands, means disposed at said horizontal track lands for effecting pivotal movement of said seats on said cars, and means for moving cars along said track loop.

DAN MENA.