

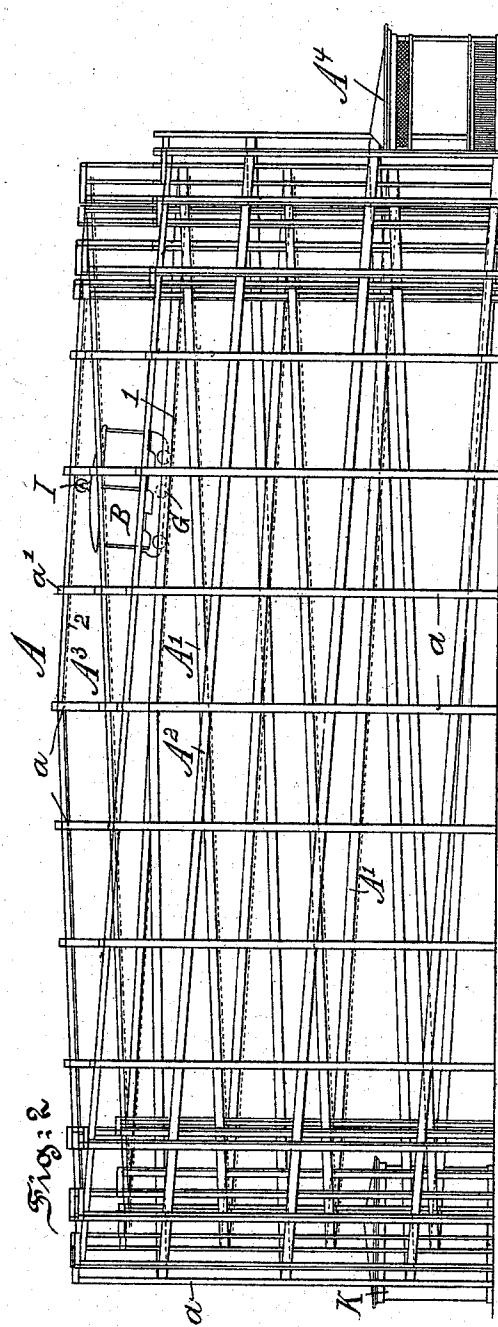
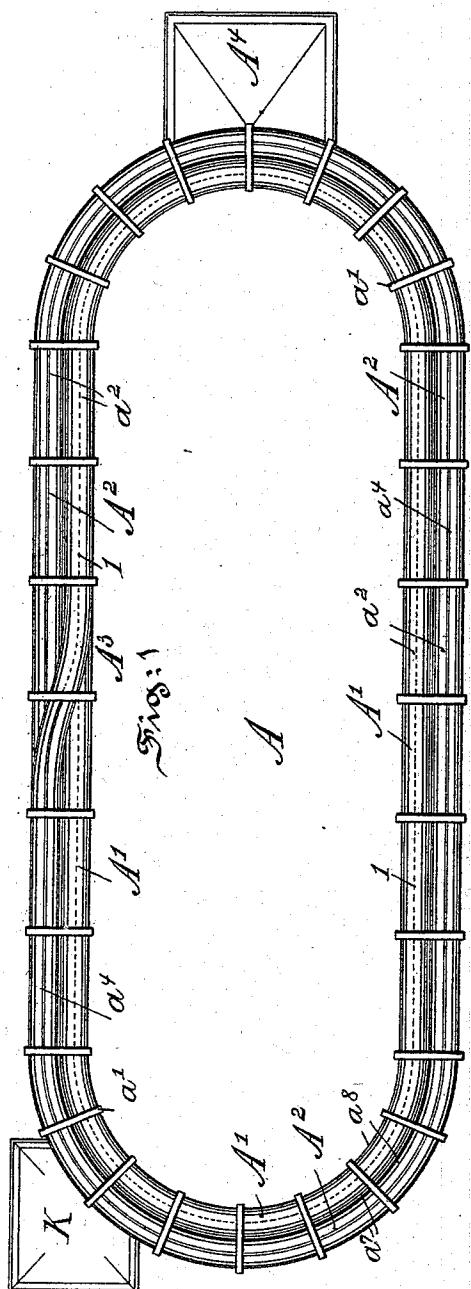
(No Model.)

4 Sheets—Sheet 1.

C. A. IDLER.  
ELECTRIC AND GRAVITY PLEASURE RAILWAY.

No. 527,990.

Patented Oct. 23, 1894.



Witnesses:

Richard C. Maxwell.  
Thomas M. Smith.

Inventor.  
Charles A. Idler,  
By J. Walter Blylass,  
attorney.

(No Model.)

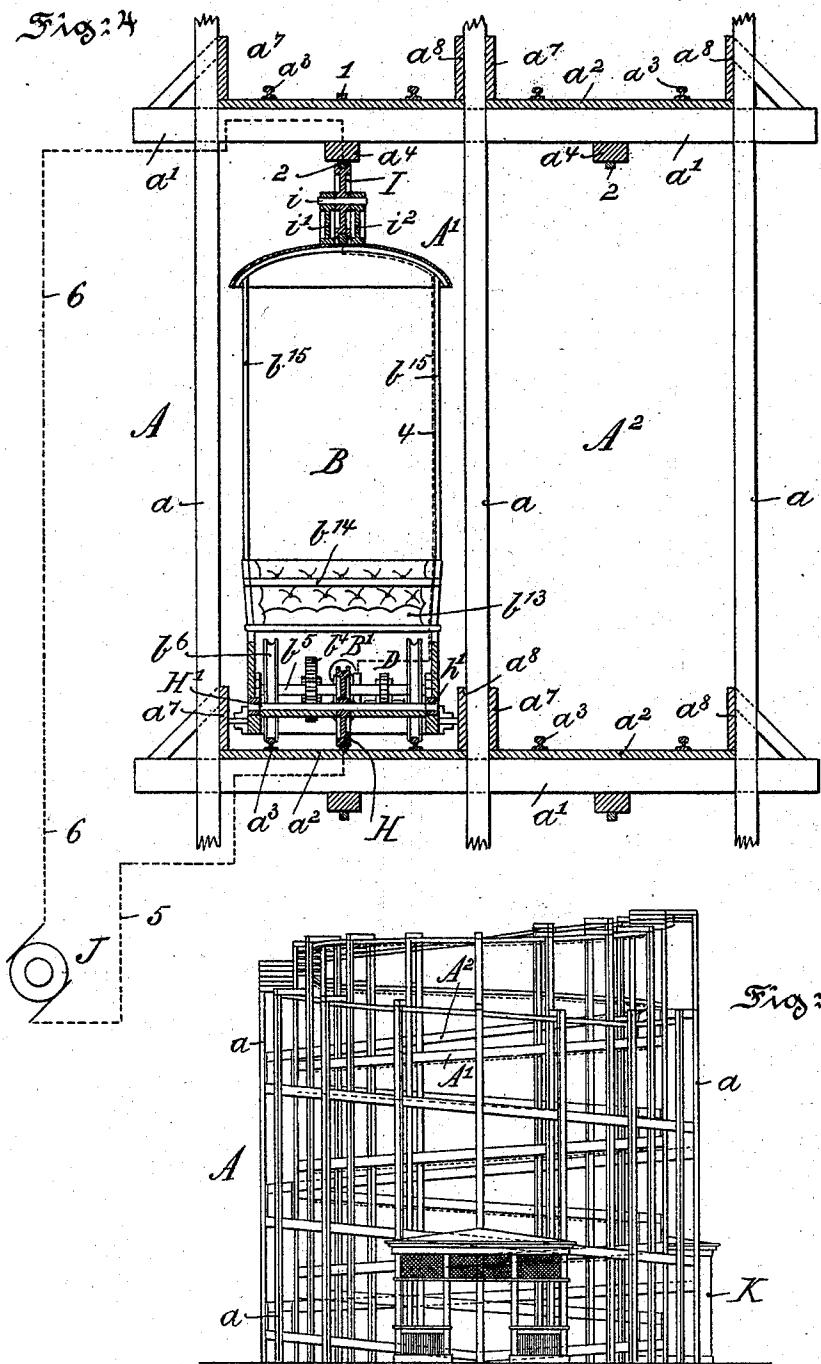
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Fig: 4



Witnesses:

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Inventor.

Schaefer & Adler

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(No Model.)

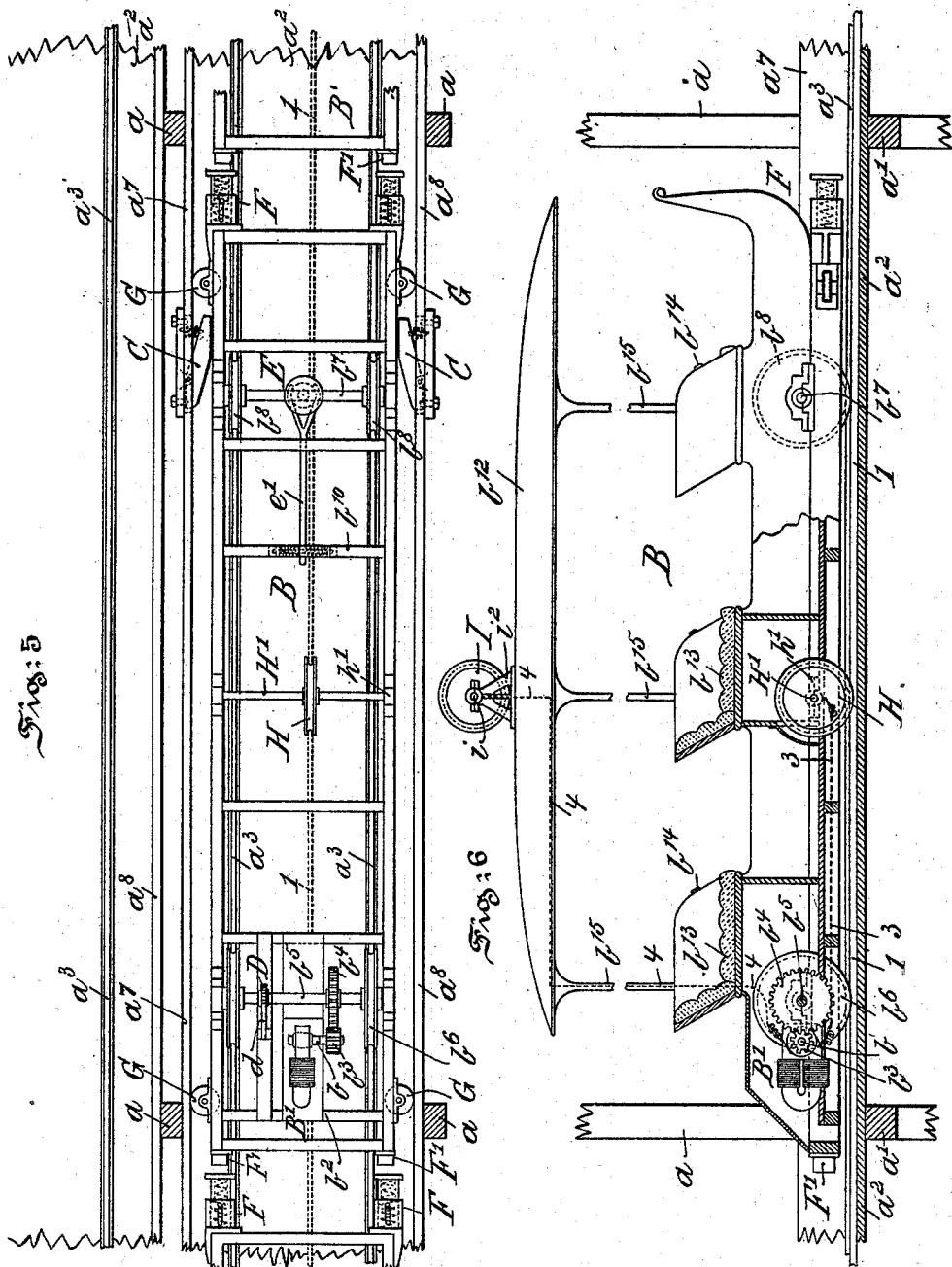
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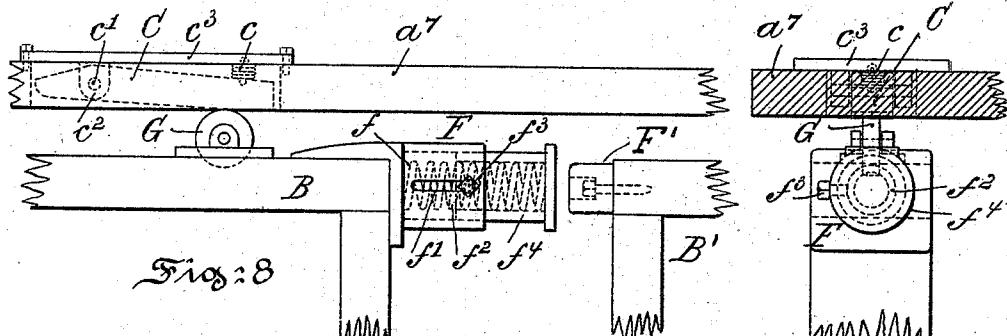


Fig. 8

Fig: 9

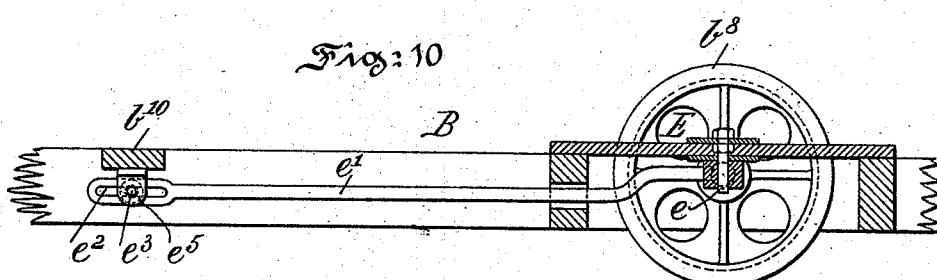


Fig: 10

Fig: 11

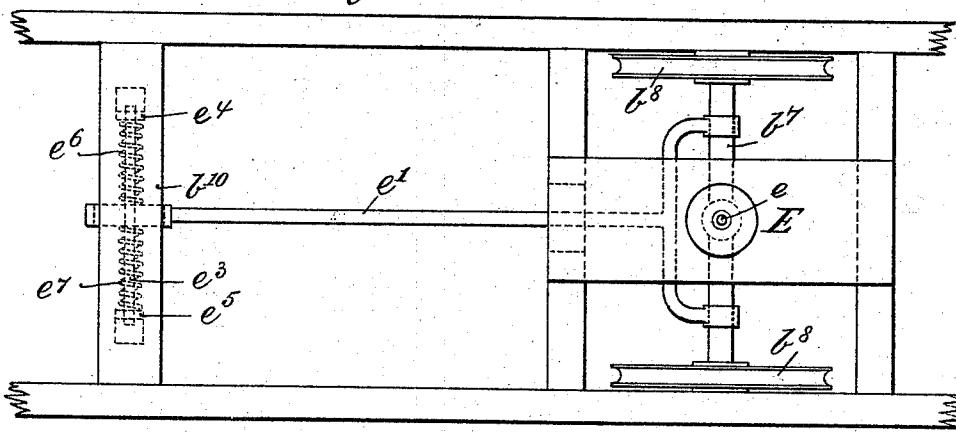
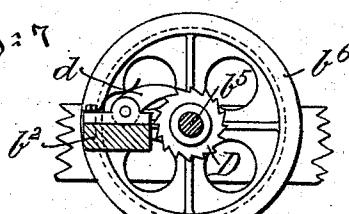


Fig: 7



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# UNITED STATES PATENT OFFICE.

CHARLES A. IDLER, OF ATLANTIC CITY, NEW JERSEY.

## ELECTRIC AND GRAVITY PLEASURE-RAILWAY.

SPECIFICATION forming part of Letters Patent No. 527,990, dated October 28, 1894.

Application filed June 28, 1894. Serial No. 515,745. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. IDLER, a citizen of the United States, residing at Atlantic City, in the county of Atlantic and State of New Jersey, have invented certain new and useful Improvements in Electric and Gravity Pleasure-Railways, of which the following is a specification.

My invention relates to improvements in pleasure railways for sea-side, summer and other resorts; and it also relates to electrically propelled cars adapted for use on such a railway and to means for insuring the safe operation thereof.

The principal objects of my invention are, first, to provide a compact and comparatively inexpensive pleasure railway structure of spiral or serpentine form, comprising down-grade spiral circles and up-grade spiral circles and the circles being united at their summit with a terminal station common to both of them; second, to provide such a pleasure railway so arranged as to afford a longer and more diversified ride from the starting point over the serpentine courses thereof to the terminal point than has hitherto been obtained in such pleasure railway structures; third, to provide such a structure of preferably serpentine form and so arranged as that a car adapted to travel over the same is propelled electrically from the terminal or starting station to the summit of the structure, whereat the car is permitted to descend again by gravity to the starting or terminal station of the structure for another trip; fourth, to provide an electrically propelled car for such a structure with certain means connected therewith and controlling the same for insuring absolute safety in the operation of such car over the structure; fifth, to provide an electrically operated car provided with a guide-wheel or wheels adapted to contact with guide rails of the structure and said car adapted to be so propelled over certain portions of the structure and spring controlled pivotal devices connected with the structure for retarding the speed of the car in its approach to the starting and terminal station; sixth, to provide an electrically propelled car adapted to travel over the incline serpentine courses of said structure having the pitch or inclination of the up-grade circle thereof less than that

of the down-grade circle concentrically arranged with respect to each other and connected together at their common summit and having spring controlled friction devices for permitting the cars in their passage around the curves of the structure to be guided with an ease of movement as well as at their approach to the starting and terminal station, whereby is afforded not only greater safety but derailment of the cars is rendered impossible over the courses of the structure; seventh, to provide a pleasure railway structure and an electrically propelled car provided with pawl-and-ratchet brake-mechanism for preventing retrograde movement thereof; and, eighth, to provide a pleasure railway structure with an electrically propelled car or cars adapted to be elevated thereby over the inclined courses thereof and of descending by gravity to the terminal and starting station and with simple and effective means to insure ease of movement of the car or cars, as well as absolute safety in the travel of the same over the courses of the structure and against shock and accidental retrograde movement.

My invention consists of an electric and gravity pleasure railway constructed and arranged in substantially the manner herein-after described and claimed.

The nature and characteristic features of my invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof; and in which—

Figure 1, is a plan view of a pleasure railway structure embodying some of the features of my invention, and also the electric power starting and terminal stations. Fig. 2, is a side elevational view, showing an electrically propelled car in transit over one of the inclined serpentine courses of the structure. Fig. 3, is an end elevational view of Fig. 1, showing the starting and terminal station. Fig. 4, is a vertical central section through one of the electrically propelled cars, illustrating the manner in which the trolley wheels connected with the car conduct the current from the source of energy to the motor by means of conductors, as illustrated therein. Fig. 5, is a view partly in plan and partly in section through the truck of a car, showing the gen-

eral arrangement thereof, the fifth wheel and its accessories, pawl-and-ratchet brake mechanism, and means connected with the structure for retarding the movement of the car 5 and also showing the spring controlled buffers located at the respective ends of a car and the complementary buffers of the other car, for lessening the shock or impact of the two cars against each other coupled together in 10 the travel thereof over the courses of the structure. Fig. 6, is a view partly in side elevation and partly in section of an electrically propelled car of my invention, showing the motor and its accessories. Fig. 7, is a 15 detail view of the pawl-and-ratchet brake-mechanism of the motor car. Fig. 8, is a plan view of the spring controlled friction devices of the structure adapted to engage the side guide wheels of the car for retarding the 20 speed thereof and the respective buffers located at the ends of the cars coupled together. Fig. 9, is a detail view in elevation of the friction device of Fig. 8. Fig. 10, is a side 25 elevational view in detail of the spring controlled fifth wheel of the car; and Fig. 11, is a plan view of Fig. 10, showing how the forked lever of the fifth wheel under the influence of the spiral springs is controlled for effecting a back and forth movement of said 30 wheel.

Referring to the drawings A, represents the structure comprising the up-grade spiral circle A', and the down grade spiral circle A<sup>2</sup>, in preferably spiral form having the pitch or 35 inclination of the up-grade circle less than that of the down-grade circle and the respective circles being concentric to each other and meeting at a common summit A<sup>3</sup>.

The structure A, is provided with uprights 40 a, and cross-pieces a', as fully illustrated in Figs. 1, 2, 3 and 4. The cross pieces a', support flooring a<sup>2</sup>, upon which are mounted rails a<sup>3</sup>, for a car or cars B, electrically propelled to travel over in a manner to be hereinafter 45 fully explained. Between the rails a<sup>3</sup>, of the ascending grades of the structure A, on the flooring a<sup>2</sup>, thereof and properly insulated therefrom is secured a conductor 1. On the under side of the cross-pieces a', is secured 50 an insulating strip a<sup>4</sup>, to which is attached the conductor 2, as illustrated in Fig. 4. The strip a<sup>4</sup>, is connected with the cross-pieces a', throughout the structure A, and this strip serves a two-fold purpose, as will be presently 55 fully explained. The conductor 2, is connected with the strip a<sup>4</sup>, from the beginning of the ascending grade A', to the summit A<sup>3</sup>, of the structure, and from which point thereof to the terminal or starting station A<sup>4</sup>, 60 the strip a<sup>4</sup>, serves as a guide for one of the trolley wheels for preventing displacement thereof and of the car or cars being derailed, while so engaged therewith.

a<sup>7</sup> and a<sup>8</sup>, are guide strips or rails secured 65 to the uprights a.

Near the terminal and starting station A<sup>4</sup>, of

the descending grades thereof is provided on each side of the structure in connection with the guard strips or rails a<sup>7</sup> and a<sup>8</sup>, friction devices C, each of which is provided with a spiral 70 spring c. These devices C, are each pivoted at c', to a forked bearing c<sup>2</sup>, of a plate or board c<sup>3</sup>, which latter is secured to each of the guard strips or rails a<sup>7</sup> and a<sup>8</sup>, as illustrated in Fig. 5. The spiral springs c, thereof normally maintain 75 one portion of each friction device extended, at an angle to the plane of the guard rails or strips and so as to present an obstacle to the guide wheels G, of the car or cars and thus to retard the speed of the same in their approach to the terminal and starting station A<sup>4</sup>. These friction devices C, may be located adjacent to the curved portions of the structure, in order to slightly retard the speed of the cars in passing the curves and thus to prevent 80 any accidental derailment of the cars.

The car B, is provided at one end with a motor B', which is so arranged as to permit of the rotation of a cross-shaft b, connected with the truck frame b<sup>2</sup>, of the car. This shaft 90 b, has mounted thereon a gear-wheel b<sup>3</sup>, which meshes with a gear-wheel b<sup>4</sup>, secured to the rear axle b<sup>5</sup>, provided with one set of the track wheels b<sup>6</sup>.

D, is a ratchet-wheel secured to the axle 95 b<sup>5</sup>. d, is a spring controlled pawl pivotally attached to the truck frame b<sup>2</sup>, and normally engaging with the ratchet wheel D. This mechanism is adapted to prevent retrograde movement of the car in the ascent of the same 100 over the up-grade courses of the structure A. On the axle b<sup>7</sup>, carrying the other set of track-wheels b<sup>8</sup>, is provided a fifth wheel E, which by means of a king bolt e, is pivoted to the bottom of the car B. Connected with the 105 axle b<sup>7</sup>, is a forked lever-arm e', the free extremity of which is provided with an oblong slot e<sup>2</sup>, through which is inserted a rod e<sup>3</sup>, which is journaled to bearings e<sup>4</sup> and e<sup>5</sup>, secured to a cross-strip or bar b<sup>10</sup>. e<sup>6</sup> and e<sup>7</sup>, 110 are spiral springs coiled around said rod e<sup>3</sup>, and respectively abutting against the forked lever arm e', and said bearings e<sup>4</sup> and e<sup>5</sup>, and adapted to support the said lever-arm e', under spring tension so as to permit the track-wheels to take to the curves of the roadway 115 of the structure with an ease of movement and with friction on the movable members of the car reduced to a minimum; and moreover, to prevent in the rapid movements of 120 the car or cars around the curved portions of the structure any tendency of the wheels to leave the track-rails of the structure A.

It may be here further remarked that in the rounding of the curves of the structure 125 the forked lever arm e', will compress the springs e<sup>6</sup>, and expand the spring e<sup>7</sup>, and thus allow the track-wheels of the front axle of the car B, to accommodate itself to the curves and beyond the curves the said springs 130 will cause the said axle with its wheels to again assume a normal position and afford a

safe and easy movement of the car over the courses of the structure to the next curved portion or portions thereof.

At the forward end of each motor car B, 5 are provided spring buffers F, consisting in the present instance of tubular socket bearings f, bolted to the sides and front of the car. The sockets of the said devices are each provided with oblong slots f'. f<sup>2</sup>, are springs 10 mounted in said bearings f, and f<sup>3</sup>, are pins engaging through said slots with the movable bumpers f<sup>4</sup>, the arrangement being such as to maintain by means of said springs the bumpers f<sup>4</sup>, in such position normally as to 15 contact with stationary rubber or other bumpers F', secured to the opposite end of a car B', coupled to the car B, as illustrated in Figs. 5 and 6, which may be a motor car or a "trailer," so termed to distinguish the same 20 from a car having propelling mechanism connected therewith, whereby collision of the cars coupled to one another in such manner is prevented, as well as jar or shock of the two coupled together appreciably lessened in 25 the operation thereof and especially when the cars are employed in train for the passage of persons over the ascending and descending grades of the structure.

G, are guide-wheels located on each side of 30 the truck-frame of a car and preferably at or near the respective corners thereof, as illustrated in Figs. 4, 5 and 6, for preventing derailment thereof, as well as directing the cars in their courses over the structure.

35 These wheels contact with the guard rails or strips a<sup>7</sup> and a<sup>8</sup>, as clearly illustrated in Fig. 5.

H, is a grooved trolley wheel mounted on a shaft H', which is journaled in bearings h', secured to the truck-frame of the motor car 40 B. This trolley wheel H, is adapted to normally contact with the conductor 1, of the ascending grades of the structure, insulated from and supported above the flooring a<sup>2</sup>, of the structure, the current therefrom being 45 led by a wire 3, to the electric motor B'.

I, is a grooved trolley wheel mounted on a shaft i, which is journaled in bearings of hangers i' and i<sup>2</sup>, located above the car top b<sup>12</sup>, and suitably secured thereto. The current therefrom is by a conductor 4, to the motor B', and by conductors 5 and 6, the circuit is established from a dynamo J, located at a power station K, as illustrated in 50 Figs. 1 and 4.

55 b<sup>13</sup>, are upholstered seats of the car B, and arranged at suitable distances apart in cross-wise rows thereof.

b<sup>14</sup>, are straps detachably engaging the front arms of the respective seats so as to 60 prevent persons seated in the car from being thrown forward or outward during travel of the cars over the curved courses thereof.

65 b<sup>15</sup>, are supports secured to the floor of the car and supporting the top b<sup>12</sup>, and through one of which supports the conductor 4, from the wheel I, is led to the motor B', of the car.

The mode of operation of the hereinbefore

described pleasure railway, is as follows:— The passengers enter at the starting and terminal station A<sup>4</sup>, of the structure, and then 70 enter the car or cars B, standing at or about the same for their reception. When the required complement of passengers for the trip has been secured, the circuit from the source of energy located at the power house K, and 75 connected with the motor B', of the car or cars is established in any preferred manner through means connected with the motor car, which at once cause the same with its trailers 80 coupled thereto to be elevated over the ascending spiral serpentine courses of the structure A, until the summit A<sup>3</sup>, is reached, whereat the conductor 1, of the flooring a<sup>2</sup>, terminates and the circuit through the motor of the car is then broken by the trolley wheel 85 H, located beneath the car, leaving the conductor 1, thereat. From the summit A<sup>3</sup>, of the structure, as will be readily understood from Figs. 1, 2, 3 and 4, of the drawings, the car will travel around the series of descending 90 spiral grades and of substantially serpentine form by gravity to the terminal and starting station A<sup>4</sup>, for permitting the passengers to alight from the cars and to afford others an opportunity to enter for another 95 trip.

It may be remarked that should from any cause the trolley wheels H and I, be disconnected from the conductors 1 and 2, the car 100 B, will be prevented from taking a retrograde movement by means of the pawl-and-ratchet brake mechanism connected with the rear of the car by the spring controlled pawl d, firmly engaging with the ratchet D, and thus to quickly stop the car. While ascending 105 and descending the courses of the structure A, the pawl d, is arranged so as to ride the teeth of the ratchet-wheel D, as will be seen from Fig. 7.

The cars may be employed singly or in train, 110 one of them being provided with a motor for the electric propulsion thereof and in the manner hereinbefore described. When rounding curves of the ascending and descending grades of the structure, the forward wheels 115 of each car, will be enabled thereby to take to such curves under the control of the fifth wheel E, and the forked lever-arm e', thereof by means of the coiled springs e<sup>6</sup> and e<sup>7</sup>, will control the position of the said arm in such 120 manner as to permit said rod to slightly turn to the right or to the left under the tension of said springs as occasion may require, to insure an ease of movement of said cars around the curves without shock and undue 125 jar to passengers seated therein and also prevent accidental derailment of the cars in their travel over the series of up and down-grade courses of the structure A. At or near the terminal station A<sup>4</sup>, on both sides of the 130 structure A, and connected with the guide rails or strips thereof, the pivotally supported and spring controlled friction devices engage the respective guide wheels of the

cars in such manner as to retard the speed thereof in their approach to the terminal station A<sup>4</sup>.

In Fig. 5, two cars B, are shown coupled together and with respectively end spring and rubber bumpers F and F', adapted to engage each other so as to lessen shock in the contact of one end with the other of the coupled cars.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A pleasure railway, comprising a structure having down and up-grade circles and a terminal and starting station common to both, top and bottom intermediate rails, an electrically propelled car having grooved wheels engaging said rails and automatically establishing and breaking a circuit through said car with a source of energy in the travel of the same over certain of said circles and serving as a means for preventing derailment of the car in its travel over certain of the other circles of the structure, substantially as described.

2. A pleasure railway provided with top and bottom intermediate rails, an electric motor car provided with grooved traveler wheels engaging said rails and automatically establishing a circuit from a source of energy through said car in its travel over certain portions of the structure and means for preventing derailment of the car in its travel by gravity over certain other portions of said structure and a pawl-and-ratchet brake mechanism connected with one end of the car for preventing retrograde movement thereof, substantially as described.

3. A pleasure railway provided with top and bottom rails, an electro-motor car provided with grooved traveler wheels adapted

to engage said rails and to establish a circuit from a source of energy with the motor of said car over certain courses thereof and a means for preventing derailment over certain other courses of the structure, a spring controlled fifth-wheel connected with said car having guide-wheels extending therefrom and adapted to travel in engagement with spring controlled friction devices adapted to retard the speed of the car in its approach to the terminal or starting station of the structure, substantially as and for the purposes described.

4. In an electric and gravity pleasure railway, a motor-car provided with a fifth-wheel controlled by a spring actuated forked lever-arm, substantially as and for the purposes described.

5. In an electric and gravity pleasure railway, a motor-car provided with traveler guide wheels on both sides thereof, and a spring controlled friction device connected with the structure and adapted to be brought into the path of said guide-wheels for retarding the movement of the car, substantially as and for the purposes described.

6. In an electric and gravity pleasure railway, an electric motor car having a fifth-wheel connected with the front axle of the car and provided with a forked lever-arm having an oblong slot, a cross-rod inserted therethrough and carrying springs, said rod journaled in bearings of a strip of the truck-frame of the car, substantially as described.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

CHARLES A. IDLER.

Witnesses:

THOMAS M. SMITH,  
LOUIS WINTERBERGER.