No. 817,156. PATENTED APR. 10, 1906.

C. A. CARLSON & D. H. HAYWOOD.

AMUSEMENT APPARATUS.

APPLICATION FILED JAN. 6, 1906.

4 SHEETS—SHEET 1.

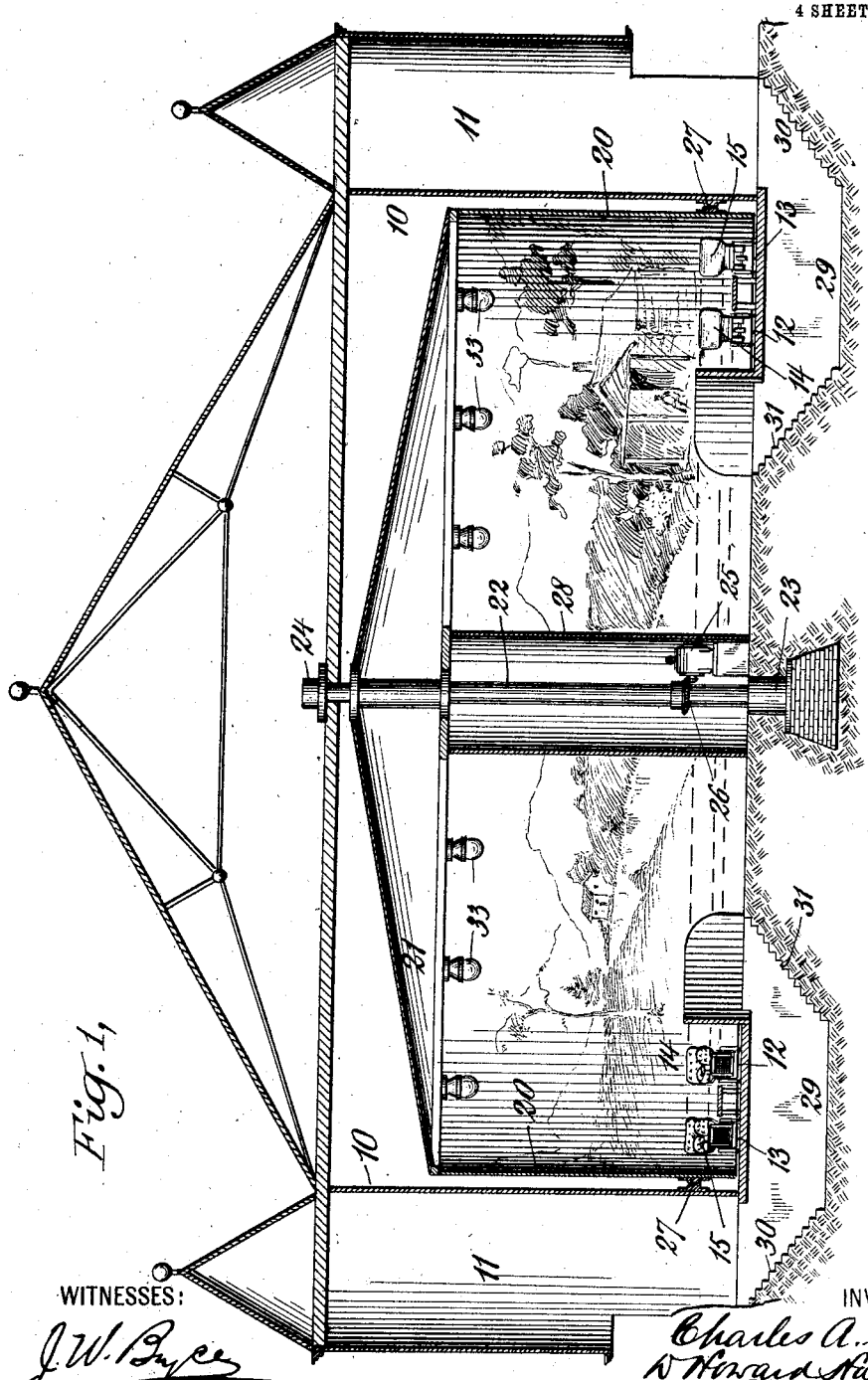


Fig. 1.

WITNESSES:

J. W. Boyce

Harry P. Goss

INVENTORS

Charles A. Carlson

D. Howard Haywood

BY

Chapin & Haywood

their ATTORNEYS

No. 817,156. PATENTED APR. 10, 1906.

C. A. CARLSON & D. H. HAYWOOD.

AMUSEMENT APPARATUS.

APPLICATION FILED JAN. 6, 1906.

4 SHEETS—SHEET 2.

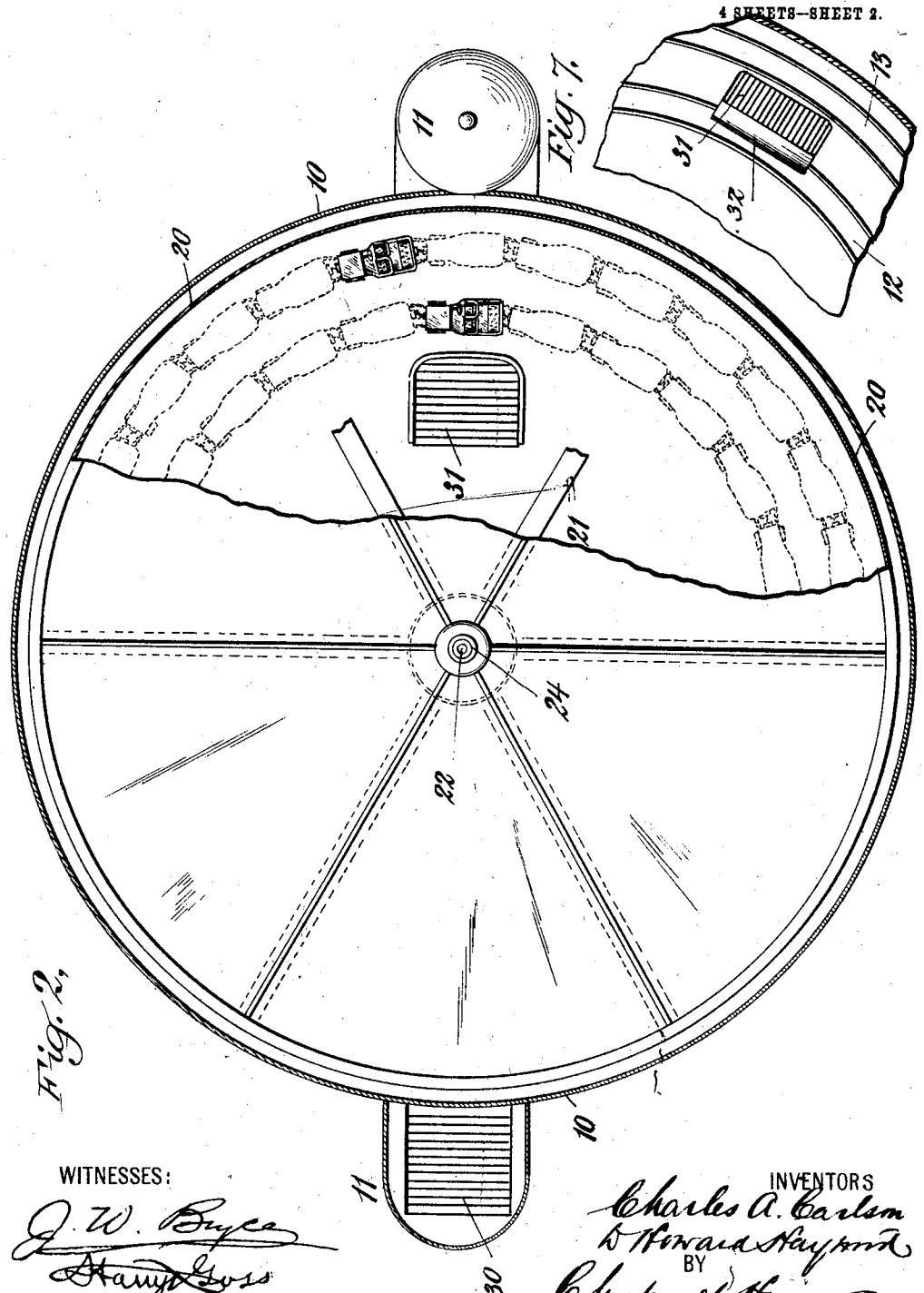


Fig. 2.

Fig. 7.

WITNESSES:

J. W. Boyce

Harry Goss

INVENTORS

Charles A. Carlson

D. Howard Haywood

BY

Chapin & Haywood

their ATTORNEYS

No. 817,156

PATENTED APR. 10, 1906.

C. A. CARLSON & D. H. HAYWOOD.

AMUSEMENT APPARATUS.

APPLICATION FILED JAN. 6, 1906.

4 SHEETS—SHEET 3.

Fig. 3.

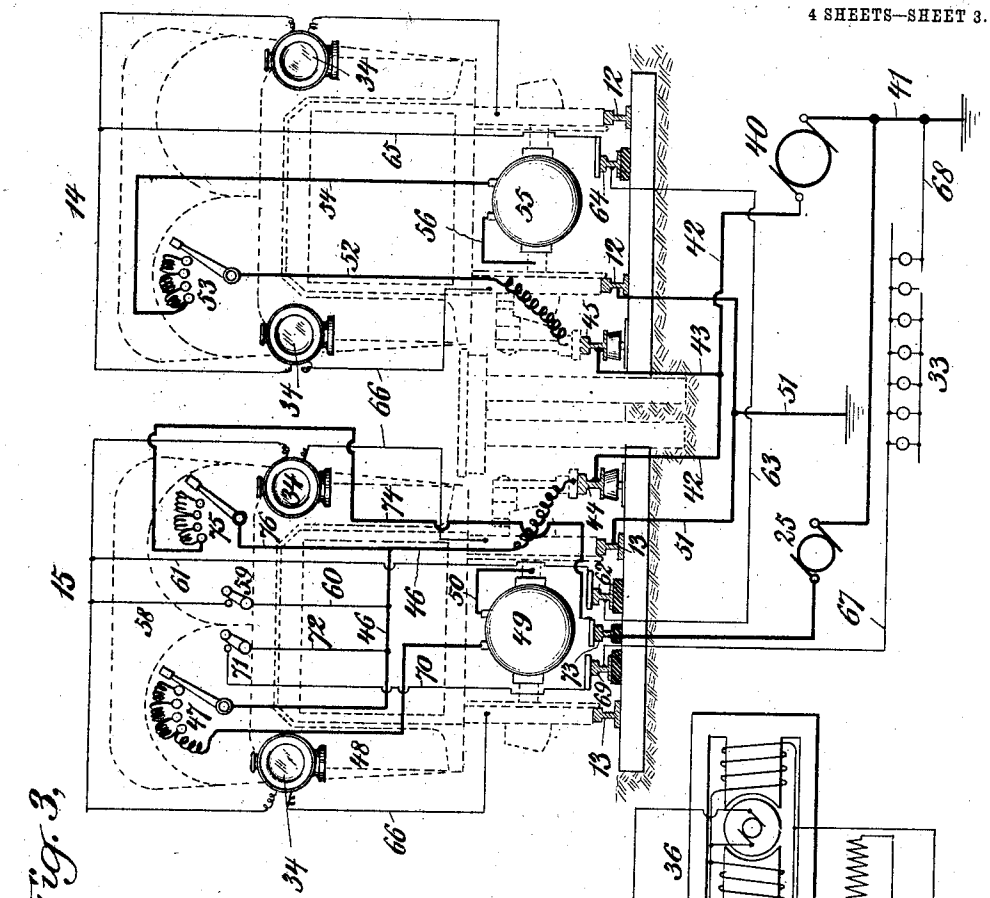
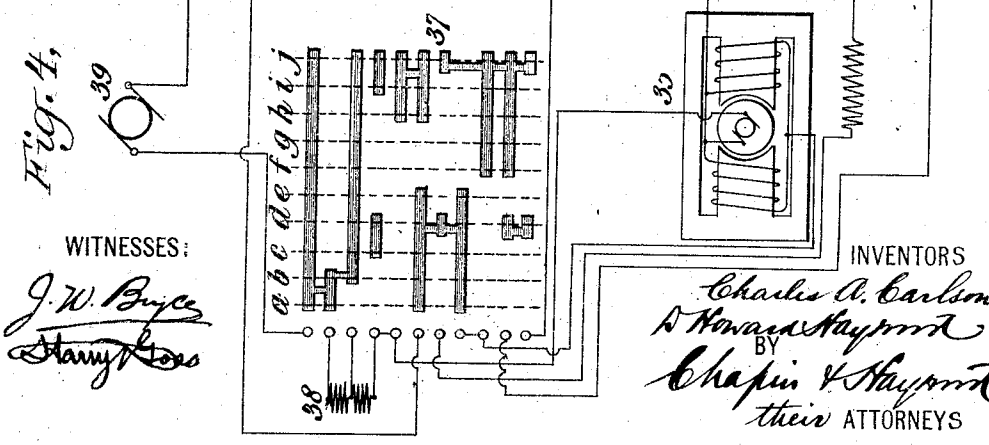


Fig. 4.



WITNESSES:

J. W. Bryce

Harry Goss

INVENTORS

Charles A. Carlson

D. Howard Hayworth

BY

Chapin & Hayworth

their ATTORNEYS

No. 817,156. PATENTED APR. 10, 1906.

C. A. CARLSON & D. H. HAYWOOD.

AMUSEMENT APPARATUS.

APPLICATION FILED JAN. 6, 1906.

4 SHEETS—SHEET 4.

Fig. 6.

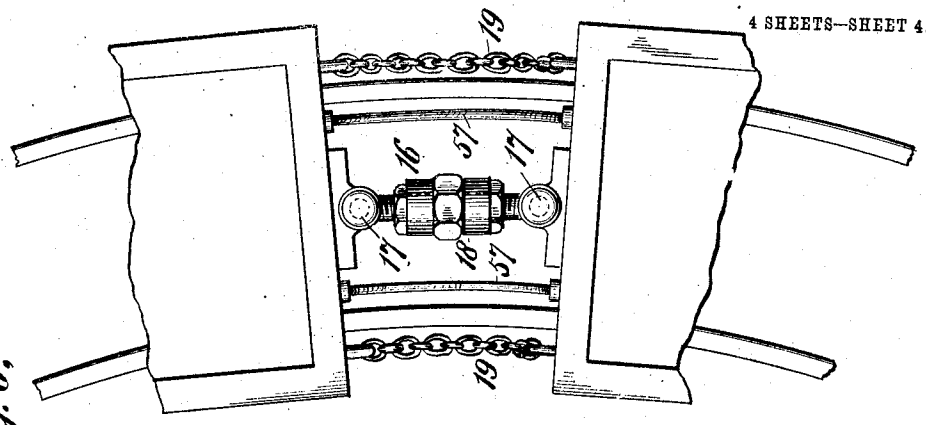
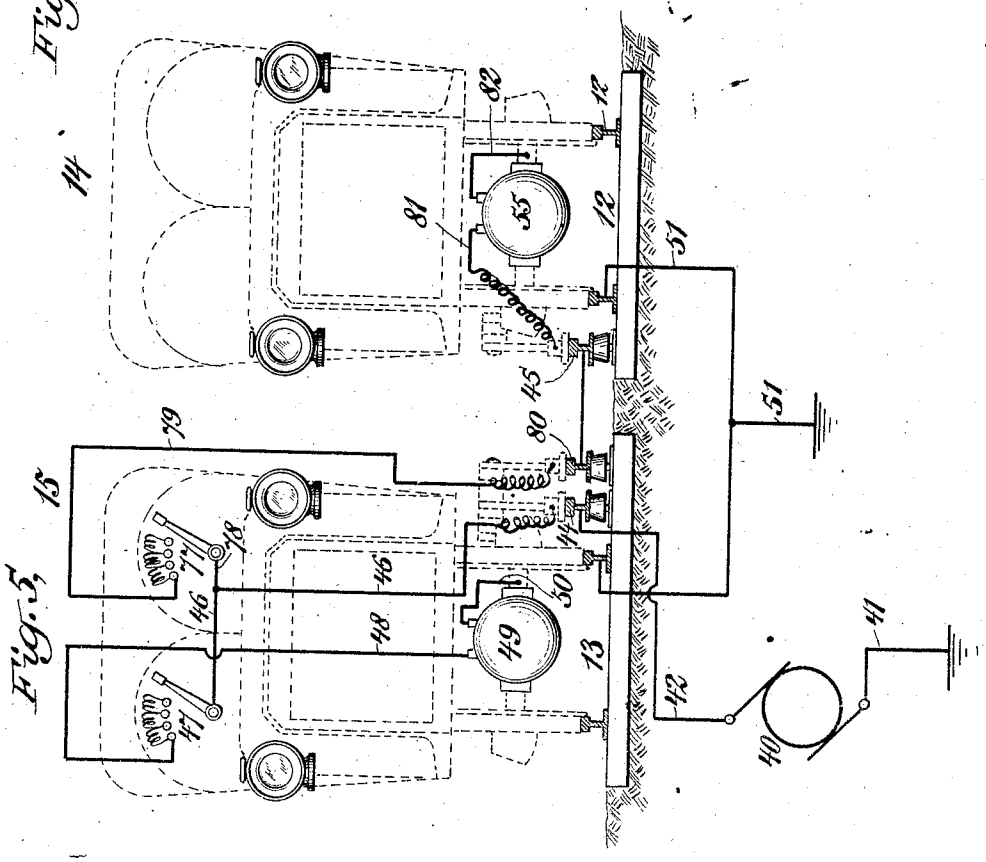


Fig. 5.



WITNESSES:

J. W. Boyce

Harry Dorr

INVENTORS

Charles A. Carlson

D. Howard Hayward

BY

Chapin & Hayward

their ATTORNEYS.

UNITED STATES PATENT OFFICE.

CHARLES A. CARLSON AND DANIEL HOWARD HAYWOOD, OF NEW YORK, N. Y., SAID HAYWOOD ASSIGNOR TO SAID CARLSON.

AMUSEMENT APPARATUS.

No. 817,156. Specification of Letters Patent. Patented April 10, 1906.

Application filed January 6, 1906. Serial No 294,874.

To all whom it may concern:

Be it known that we, CHARLES A. CARLSON, a resident of the borough of Brooklyn, city of New York, county of Kings, and DANIEL HOWARD HAYWOOD, a resident of the city and county of New York, State of New York, citizens of the United States of America, have invented certain new and useful Improvements in Amusement Apparatus, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

Our invention relates to improvements in amusement apparatus, and particularly to amusement apparatus including cars arranged to carry passengers and to be driven at a high rate of speed.

Our invention also relates to certain illusion means employed in connection with the foregoing, as will presently appear.

The main objects of our invention are, first, to give passengers a ride at a high rate of speed in self-driven vehicles of the automobile type with perfect safety; second, to produce the illusion of a still higher rate of speed, and, third, to provide for racing between a plurality of such vehicles.

In order that our invention may be fully understood, we will now proceed to describe an embodiment thereof with reference to the accompanying drawings, illustrating same, and will then point out the novel features in claims.

In the drawings, Figure 1 shows a view in central vertical section through an apparatus constructed in accordance with our invention. Fig. 2 is a view in horizontal section therethrough, with certain parts broken away. Fig. 3 is a general diagram showing the controlling-circuits for the cars and for the scenery-motor in their simplest form and showing also the lighting-circuits. Fig. 4 is a diagrammatic view showing the preferred form of circuits for the motor controls. Fig. 5 is a diagrammatic view showing the two sets of cars under the control of a single operator in one of the cars. Fig. 6 is a detail view of a coupling employed. Fig. 7 is a fragmentary view showing a modified means for obtaining access to the cars.

In the embodiment of our invention herein we have shown a building comprising a main central circular structure 10, with two projecting porticos or vestibules 11. Arranged within the circular structure 10 are two concentric circular endless tracks 12 and 13. A plurality of passenger-cars 14 15 are arranged to run on the said tracks, the cars of each series being connected together by coupling devices 16. The coupling devices comprise ball-and-socket joints 17, giving universal relative movements of the parts, and adjustable members 18, by which the distance between the ball-and-socket joints 17 and 17 may be increased or decreased to adjust the relative positions of the cars. The cars of each set are connected up and the couplings then tightened until the whole train of cars in the series is held positively in a complete ring, whereby there will be no possibility of outward movement of the cars due to centrifugal force when the cars are running at a high rate of speed. With the cars so connected together there will be no undue wear on the flanges of the outer wheels nor will there be any necessity for raising the outer tracks, for all the centrifugal force generated will be taken care of by the positive connection above set forth. Safety-chains 19 are preferably provided as safeguards in case anything should happen to the couplers.

Surrounding the tracks and cars thereon and between the said tracks and cars and the stationary circular wall of the building 10 is another cylindrical wall 20, concentrically arranged with the tracks and arranged to be rotated. Scenery may be represented upon this wall, as is shown in Fig. 1. The wall 20 is suspended from a superstructure 21, supported by a central vertical shaft 22. This shaft 22 is provided with a suitable step-bearing 23 and with an upper bearing 24, as will be readily understood. This shaft is arranged to be driven by means of a motor 25, the said motor connected thereto by suitable gearing 26. Upon rotation of the shaft the cylindrical wall 20 will be rotated, a side bearing 27 being provided between the movable wall 20 and the stationary wall of the building 10, such bearing being conveniently a ball-bearing or other anti-friction device. A tube 28 surrounds the motor 25, gearing 26, and shaft 22, so as to conceal them from the passengers in the cars 14 and 15.

For the purpose of ingress and egress to and from the interior of the structure we provide tunnels 29 beneath the tracks 12 and 13, the said tunnels connecting by stairways 30

with the vestibules or porticos 11 and by other stairways 31 with the interior of the building. One of the tunnels 29 may be conveniently employed for admitting passengers to the interior of the structure and the other for permitting egress therefrom. Instead of the inner stairways 31 connecting with the interior of the building within the inner circular track 12 the stairway may connect with a space between the tracks 12 and 13, as shown in the modification, Fig. 7, and a trap-door 32 may be provided, so as to completely close the opening to the stairway when the cars are running.

The revolving structure is preferably provided with suitable electric lights 33, by which the interior of the structure is illuminated, and, further, the cars themselves may be provided with electric lights in the form of headlights 34, as will be seen more particularly in Figs. 3 and 5.

The cars are driven by self-contained motors, one or more motors being employed for each of the series 14 and 15. The preferable control for the motors is shown in Fig. 4, the diagram in such figure representing what is known as "general electric" control. In this figure two motors are shown, 35 and 36, 37 designating the controller-commutator, 38 resistance, and 39 the dynamo or other source of current. There are ten points of contact in the commutator, represented by the characters *a b c d e f g h i j*. With the commutator at *a* the motors are in series with each other and with all the resistance 38, at *b* half the resistance is cut out, at *c* all the resistance is cut out, at *d* the fields are shunted, at *e* the motors are still in series with one another and with half the resistance, but the fields are at full strength, at *f* and *g* one motor is in series with half the resistance and the other motor is cut out, at *h* the two motors are in parallel in series with half the resistance, at *i* the motors are in parallel with all the resistance cut out, and at *j* the motors are in parallel, all the resistance is cut out, and the fields shunted.

Of course other forms of control may be employed than the foregoing; but the foregoing is particularly applicable to the present invention, because it will start the heavily-loaded train of cars quietly, easily, and with great power, the connections being gradually shifted as the speed increases to give the maximum efficiency at the various speeds right up to the highest speed attainable.

In Fig. 3 we have shown a simple form of motor control comprising but a single wire to the motor employed in order to simplify the circuits and at the same time have shown the circuits for operating the headlights, the building-lights, and the scenery-motor. Referring now more particularly to this figure, a generator 40 is shown as supplying the current for all purposes, the said generator being grounded through a wire 41 on one side and connecting on the other side by means of a wire 42 and a branch 43 with third rails 44 45. The third rail 44 supplies current for the train of cars 15 on the track 13, while the third rail 45 supplies current to the train of cars 14 on the track 12. The current is picked up from the third rail 44 by means of a suitable brush at the end of a wire 46, said wire 46 connecting with the controlling-arm of a controller 47. Another wire 48 leads from the controller 47 to a motor 49 on the car, the current passing thence through the wire 50 to the axle of the car back to earth through the track 13 to a grounded wire 51. For the train of cars on the track 12 a wire 52, similar to the wire 46, picks up current from the third rail 45, connecting with a controller 53 on one of the cars 14, the second wire 54 from the controller connecting with a motor 55, the return-wire 56 from the motor connecting with the axle of the car, thence through the track 12 to the grounded wire 51. The cars 14 and 15 of each set may include many motors and as many trailers as is desired, electrical connection being maintained between the cars through ordinary cables 57, (see Fig. 6,) as will be well understood by those skilled in the art of electrical propulsion. An operator seated in one of the cars 15 and another operator seated in one of the cars 14 will then by the manipulation of the controllers 47 and 53, respectively, control the whole of the two series of cars, so as to stop and start same and to regulate the speed thereof. In this way racing may take place between the two sets of cars, the relative power of the two sets of cars being preferably arranged to be substantially balanced under ordinary conditions, so that theoretically the speed of the two sets of cars will be equal. Running conditions, however, being constantly variable in accordance with the load and the disposition of the load, there will be more or less uncertainty in the speed of running, as will be desirable, whereby racing conditions are possible.

We have arranged that the operator in the set of cars 15 in addition to controlling the cars upon the track 13 shall also control the headlights 34, the building-lights 33, and building-motor 25. For this purpose suitable switches have been provided in the same car in which the controller 47 is arranged and circuits therefrom, as follows: The headlights 34 of all the cars are arranged in parallel with a line-wire 58, connected at one end to a switch 59, a wire 60, leading out from the switch to the power-line 46, connecting with the third rail 44. A branch wire 61 connects the lights of the series of cars 14 with the line-wire 58 through a brush and third rail 62, a connecting-wire 63, another third rail 64, and a branch 65. The return from the headlights is made through return-wires 66, which go to

the axle of the cars, thence to ground and back to generator. The building-lights 33 are arranged in parallel between line-wires 67 and 68, the wire 68 connecting with the wire 41 on one side of the generator 40 and the wire 67 connecting with a third rail 69, thence through a brush and wire 70 to one point of a switch 71, through the switch and a wire 72 to the conductor 46, thence through the power third rail 44, back through wire 42 to the generator 40. The scenery-motor 25 is connected on one side with the wire 41 and on the other side with a third rail 73, up through a wire 74 to the controller 75, out from the controller through a wire 76, which connects through the wire 46 with the third rail 44, thence back to the generator 40. It will thus be seen that by manipulating the several controllers and switches 47, 75, 71, and 59 the operator in one of the cars 15 is enabled to control his own car, the headlights on all of the cars, the building-lights, and the scenery-motor.

While it is usually desirable to permit the two series of cars to be governed by separate operators, one controlling each series, both of the series may, if desired, be governed by the operator in the car 15, and in Fig. 5 we have shown the circuits so arranged. In this diagram the circuits for the motor 49 are similar to the circuits in Fig. 3; but the circuit for the motor or motors 55 in the cars 14 are controlled by a controller 77, specially provided in the car 15, said controller connecting through a branch wire 78 on one side with the power-wire 46 and on the other side through a wire 79 with a third rail 80. The third rail 80 is in constant electrical communication with the third rail 45, a wire 81 carrying current from this third rail to the motor 55, which is connected on the other side through a return-wire 82 with the car-axle, the current passing thence to ground and back through the grounded wire 51. By this arrangement the operator in the cars 15 may control both series of cars, and thus produce ordinary racing conditions by proper manipulation of the controllers 47 and 77.

To safely operate this apparatus at a very high rate of speed and at the same time produce the illusion of a still higher rate of speed, the following order of events and mode of operation may be observed: We will assume, to start with, that all the parts are at rest and that the building-lights are switched on. The passengers from a previous ride will be given exit through one of the tunnels 29, while the passengers for the next ride will be admitted through the other one of the said tunnels. The incoming passengers will be permitted to take their places in the cars of the series 14 and 15, occupying all the seats therein, if there are sufficient passengers to fill them, except the seats reserved for the operators. In the form shown in the main figures the passengers will have to pass through the cars 14 to get to the cars 15, while in the modification shown in Fig. 7 the passengers coming up between the cars may directly enter both sets of cars 14 and 15. No more passengers will be allowed to enter the building at one time than can be taken care of in the cars, no one being allowed to stand in the center of the building during the operation of the cars. When the cars have been loaded and everything is ready to start, the exit and entrance doors will be closed, and if trap-doors are employed to close the entrance from the building to the stairways these trap-doors will also be closed. The operator or operators will then start the two series of cars 14 and 15, gradually increasing the speed of the cars by proper manipulation of the controllers. An exceedingly high rate of speed may safely be attained, because by coupling the cars properly together with the tension-couplers 16 centrifugal force is not permitted to throw the cars outward in a direction toward the outer rail. We estimate that the cars may easily attain a speed of sixty miles an hour, because the power will be all utilized to the best advantage and resistance reduced to a minimum. After the cars have attained a maximum speed and some racing, if desired, has taken place between the two series of cars the building-lights may be gradually lowered and the headlights of the cars only employed. These lights being rapidly moving will of course flicker considerably and not giving such a steady light as the lights of the building will tend to increase the illusion of speed. At about this time the scenery motor 25 may be brought into action by proper manipulation of the controller 75, the scenery-wall 20 being started in motion in a direction the reverse of the direction of movement of the cars. This scenery may be easily revolved at a very high rate of speed, because there is substantially no resistance to its movement and any noise made by its movement will be more than drowned by the noise of the cars in their movements. If the scenery is moved round with a surface speed of sixty miles an hour in a reverse direction to the movement of the cars, such cars going at a speed of sixty miles an hour, the effect to the passengers will be a ride at the rate of two miles a minute, and as there is substantially nothing to gage speed by in the cars except the scenery, which is itself moving, the illusion will be practically perfect. After both scenery and cars have been running at their maximum speed for a short time the headlights of the cars may be switched off and the entire place left in darkness. During this time the speed of the cars may be very slightly slackened and the scenery brought entirely to a standstill. Then as the lights are gradually switched on (including, if desired, the building-lights) the cars may be

gradually brought to rest and there will be no possible way of telling that the scenery has ever moved.

The cars, it will be noticed, are free and independent of any central rotating device, having no connection with anything but each other, and that only through the adjustable couplers above set forth.

It is impossible to tell from the exterior of the building that there is any moving scenery, so that the illusion of speed may be absolutely maintained. It will also be seen that the device may be operated with a minimum of danger to the passengers and a minimum of liability to accident.

What we claim is—

1. In an apparatus of the class described, the combination with an endless track, and an endless train of cars thereon, the driving means for the cars being self-contained therein, of couplers for the cars, and means for adjusting the length of the couplers to adjust the circumferential length of the ring of cars with respect to the track upon which they are run.

2. In an apparatus of the class described, the combination with an endless track, and an endless train of free and independent cars thereon, of couplers for the cars, and means for adjusting the length of the couplers to adjust the circumferential length of the ring of cars with respect to the track upon which they are run.

3. In an apparatus of the class described, the combination with an endless track and an endless train of free and independent cars thereon, of couplers for the cars comprising universal joints and adjustable members, and means for adjusting the length of the couplers to adjust the circumferential length of the ring of cars with respect to the track upon which they are run.

4. In an apparatus of the class described, the combination with a circular track, and a complete ring of free and independent cars thereon, of couplers for the cars, and means for adjusting the same to vary the distance between the cars, thereby adjusting the circumferential length of the ring of cars with respect to the track upon which they run.

5. In an apparatus of the class described, the combination with a plurality of endless tracks arranged one within the other, of endless trains of free and independent cars upon the tracks, couplers for the cars, and means for adjusting the length of the couplers to adjust the circumferential length of the rings of cars with respect to the tracks upon which they run.

6. In an apparatus of the class described, the combination with a plurality of concentric circular tracks, and endless trains of cars upon the said tracks, of couplings for the cars of each train, and means for adjusting the length of the couplings to adjust the circumferential length of each train of cars with respect to the track upon which they run.

7. In an apparatus of the class described, the combination of a stationary endless track, an endless train of free and independent cars thereon arranged to travel upon said track in one direction, a movable wall surrounding the said track and cars thereon, and means for imparting movements to the wall in a direction opposite to the direction of movement of the cars.

8. In an apparatus of the class described, the combination of a stationary circular track and an endless ring of free and independent cars thereon arranged to travel upon said track in one direction, a cylindrical rotatable wall surrounding the said track and cars thereon, and means for rotating the wall in a direction opposite to the direction of movement of the cars.

9. In an apparatus of the class described, the combination of an endless track, an endless train of cars thereon arranged to travel in one direction, a movable wall surrounding the said track and cars thereon, a central shaft and overhead connections therefrom to the said movable wall, a motor for driving the shaft, and thereby rotating the wall, and a concentric tube surrounding the motor and shaft.

10. In an apparatus of the class described, the combination of a plurality of concentric stationary circular tracks, and endless trains of free and independent cars upon the tracks arranged to travel upon said tracks in one direction, the two said trains being also independent of each other, a movable wall surrounding the said tracks and cars thereon, and means for rotating the wall in a direction opposite to the direction of movement of the cars.

11. In an apparatus of the class described, the combination with an endless track of a movable wall surrounding same, a stationary wall surrounding the movable wall, and a passage beneath the stationary and movable walls from the exterior to the interior thereof.

12. In an apparatus of the class described, the combination with a circular track, of a cylindrical wall surrounding same, means for rotating the wall, a stationary wall surrounding the movable wall, and a passage beneath the stationary and movable walls from the exterior to the interior thereof.

13. In an apparatus of the class described, the combination with a plurality of concentric circular tracks, of a movable wall surrounding same, means for rotating the wall, a stationary wall surrounding the movable wall, and a passage beneath the stationary and movable walls leading from the exterior to the interior thereof.

14. In an apparatus of the class described, the combination with an endless track, and an endless train of cars thereon arranged to

travel in one direction, of a movable wall surrounding the said track and cars thereon, means for imparting movements to the wall in a direction opposite to the direction of movement of the cars, a stationary wall surrounding the movable wall, and a passage beneath the stationary and movable walls leading from the exterior to the interior thereof.

15. In an apparatus of the class described, the combination with an endless track, and a train of cars thereon, of a movable wall surrounding same, a motor for the train of cars, a motor for the movable wall, and means for controlling both the motors from the train of cars.

16. In an apparatus of the class described, the combination with an endless track, and an endless train of cars thereon, of a movable wall surrounding same, a motor for driving the train of cars in one direction, a motor for rotating the movable wall in the opposite direction, and means for controlling both the motors from the train of cars.

17. In an apparatus of the class described, the combination with an endless track, a car thereon, a movable wall entirely surrounding the track, means for rotating the car in one direction and the wall in the other direction, and controlling means for both said driving means arranged upon the car.

18. In an apparatus of the class described, the combination with an endless track, and a car thereon, of a movable wall surrounding same, illuminating means carried by the wall, means for rotating the car in one direction and the wall in the other, and controlling means for the illuminating means, arranged upon the car.

19. In an apparatus of the class described, the combination with an endless track and a car thereon, of a movable wall surrounding the same, illuminating means carried by the wall, a motor for the car, a motor for the movable wall, and means for controlling both the motor and the illuminating means from the car.

20. In an apparatus of the class described, the combination with a plurality of concentric circular tracks, and endless trains of cars upon the tracks, of a concentric circular wall surrounding same, motors for operating the two trains of cars independently of each other, a motor for rotating the movable wall, illuminating means carried by the movable wall, and means for controlling the illuminating means from one of the cars.

21. In an apparatus of the class described, the combination with a plurality of concentric tracks, and endless trains of cars thereon, of a concentric circular wall surrounding the tracks, motors for the trains of cars carried thereby, a motor for the movable wall, and means for controlling the motor for the movable wall from one of the cars.

22. In an apparatus of the class described, the combination with a plurality of concentric circular tracks, and endless trains of cars thereon, of a rotatable circular wall surrounding same, illuminating means carried by the wall, driving means for the trains of cars, a motor for the movable wall, and means for controlling the said motor and the illuminating means from one of the cars.

23. In an apparatus of the class described, the combination with a plurality of endless tracks, and cars thereon for independently driving the cars on the different tracks, of means for controlling the cars on all the tracks from a car on one of the tracks.

24. In an apparatus of the class described, the combination with a plurality of endless tracks, and endless trains of cars thereon, of driving means for driving the several trains independently of each other, and means for controlling the driving means from one of the trains of cars.

25. In an apparatus of the class described, the combination with a plurality of concentric circular tracks, and cars with self-contained motors arranged to run upon the tracks, of controlling means arranged in one of the cars, for controlling the motors of the cars upon the several tracks.

26. In an apparatus of the class described, the combination with a plurality of concentric endless tracks, cars upon the several tracks, and a movable wall surrounding same, of means for driving the cars upon one track independently of the cars upon another track, controlling means upon one of the cars for controlling the cars upon the several tracks, a motor for rotating the movable wall, and controlling means upon one of the cars for controlling the motor of the movable wall.

27. In an apparatus of the class described, the combination with a plurality of concentric endless tracks, cars upon the tracks, and a movable wall surrounding same, of motors for the cars arranged to drive the cars on one track independently of the cars upon another track, a motor for rotating the movable wall, illuminating means carried by the movable wall, controlling means arranged upon one of the cars for controlling the motors of the cars on the several tracks, controlling means on one of the cars for controlling the illuminating means, and controlling means upon one of the cars for controlling the wall-motor.

Witness my hand this 3d day of January, 1906.

CHARLES A. CARLSON.

Witnesses:
U. C. SCHLÜCHTNER,
CLARENCE B. SMITH.

Witness my hand this 5th day of January, 1906.

DANIEL HOWARD HAYWOOD.

Witnesses:
C. F. CARRINGTON,
LYMAN S. ANDREWS, Jr.