Jan. 2, 1923.

C. G. FEUCHT.
ROLLER COASTER RUNNING GEAR.
FILED JUNE 14, 1922.

1,440,588

2 SHEETS-SHEET 1

Fig. 3.

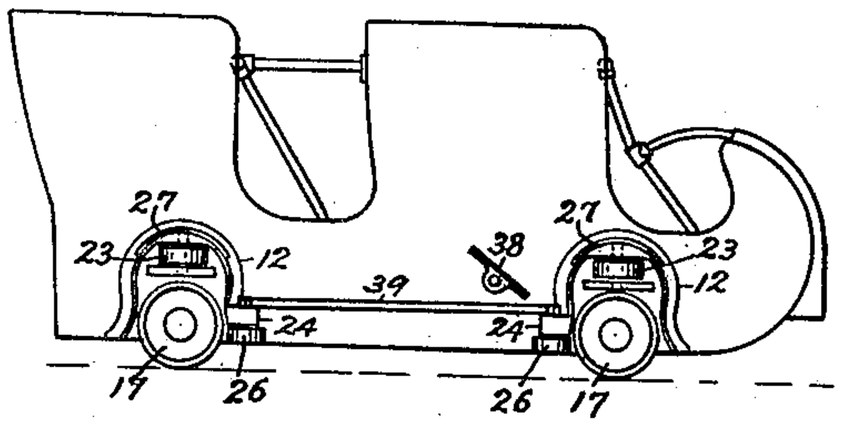

Fig. 1.

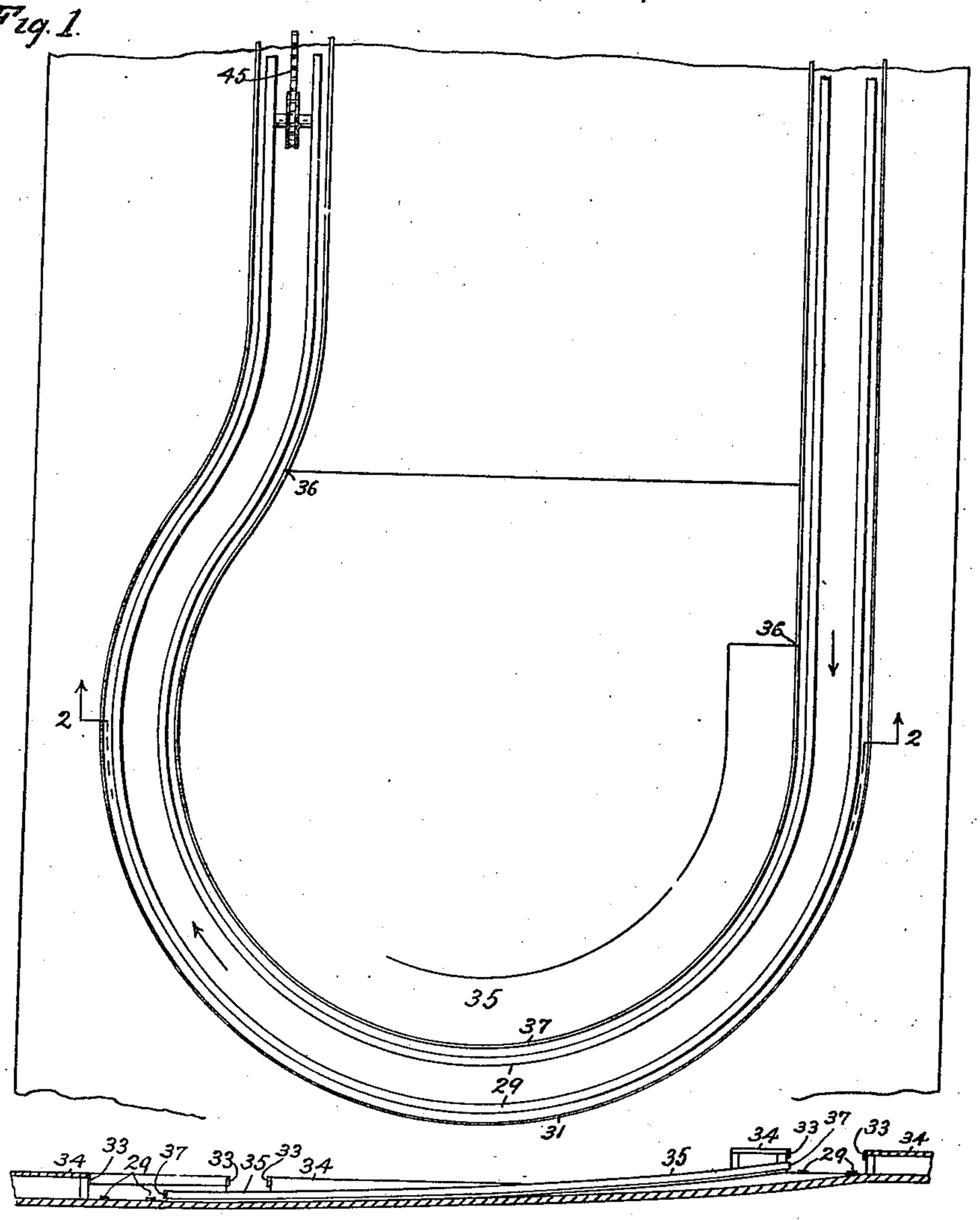

Fig. 2.

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2 SHEETS-SHEET 2

Fig. 6.

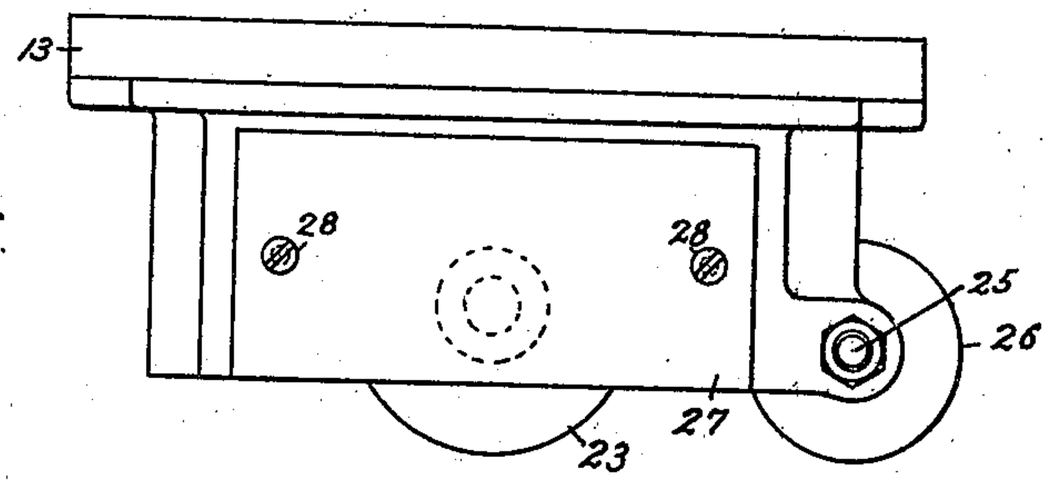


Fig. 5

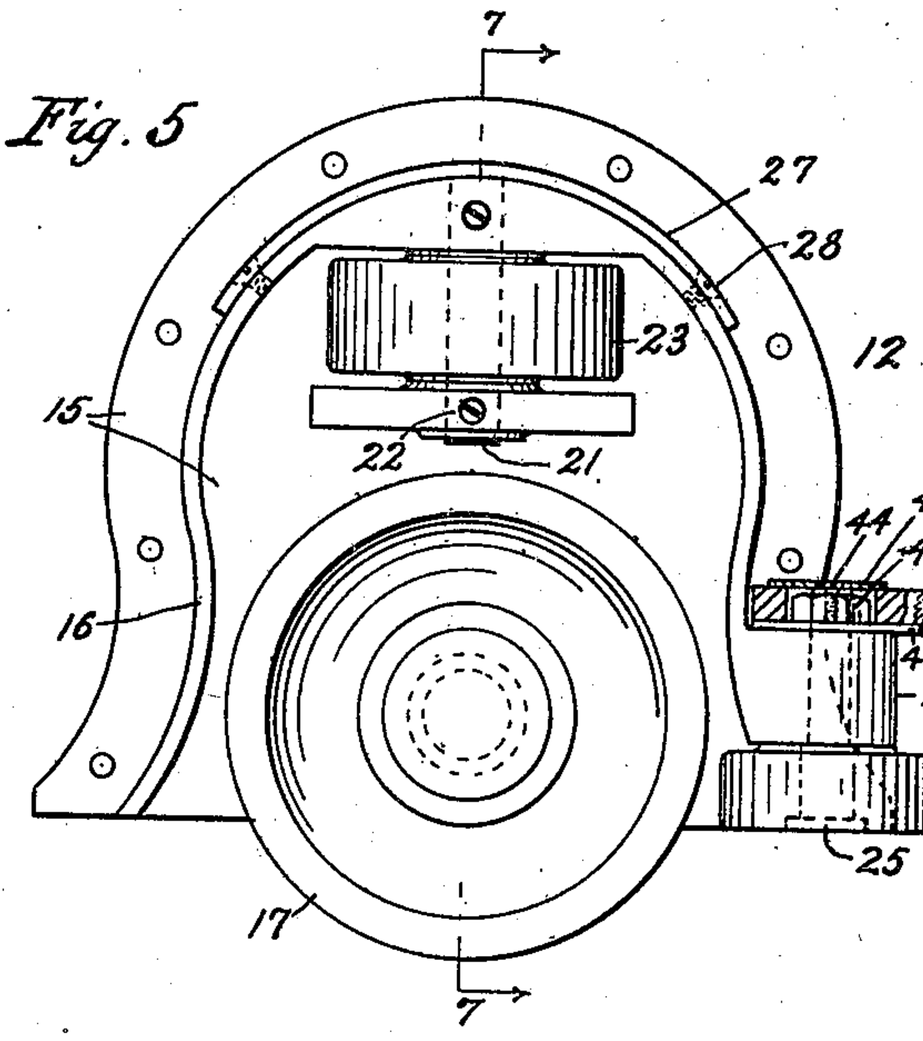


Fig. 7.

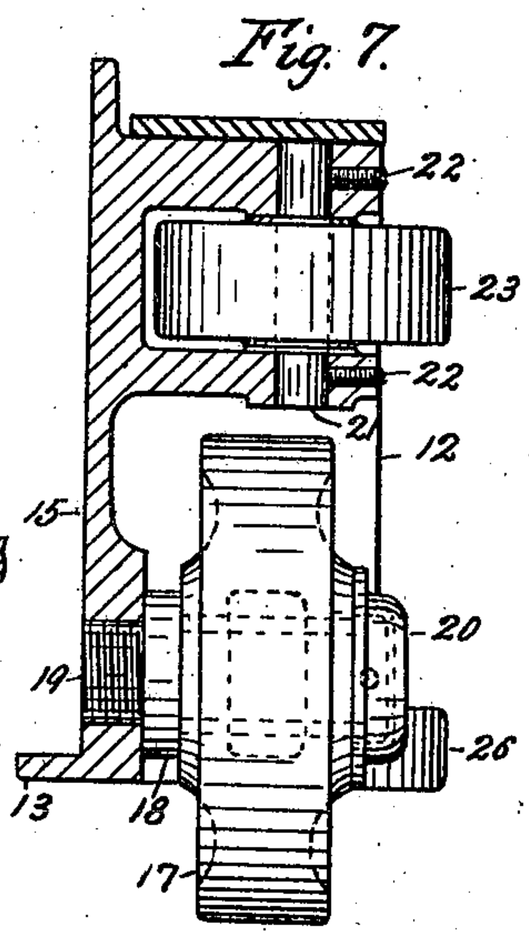
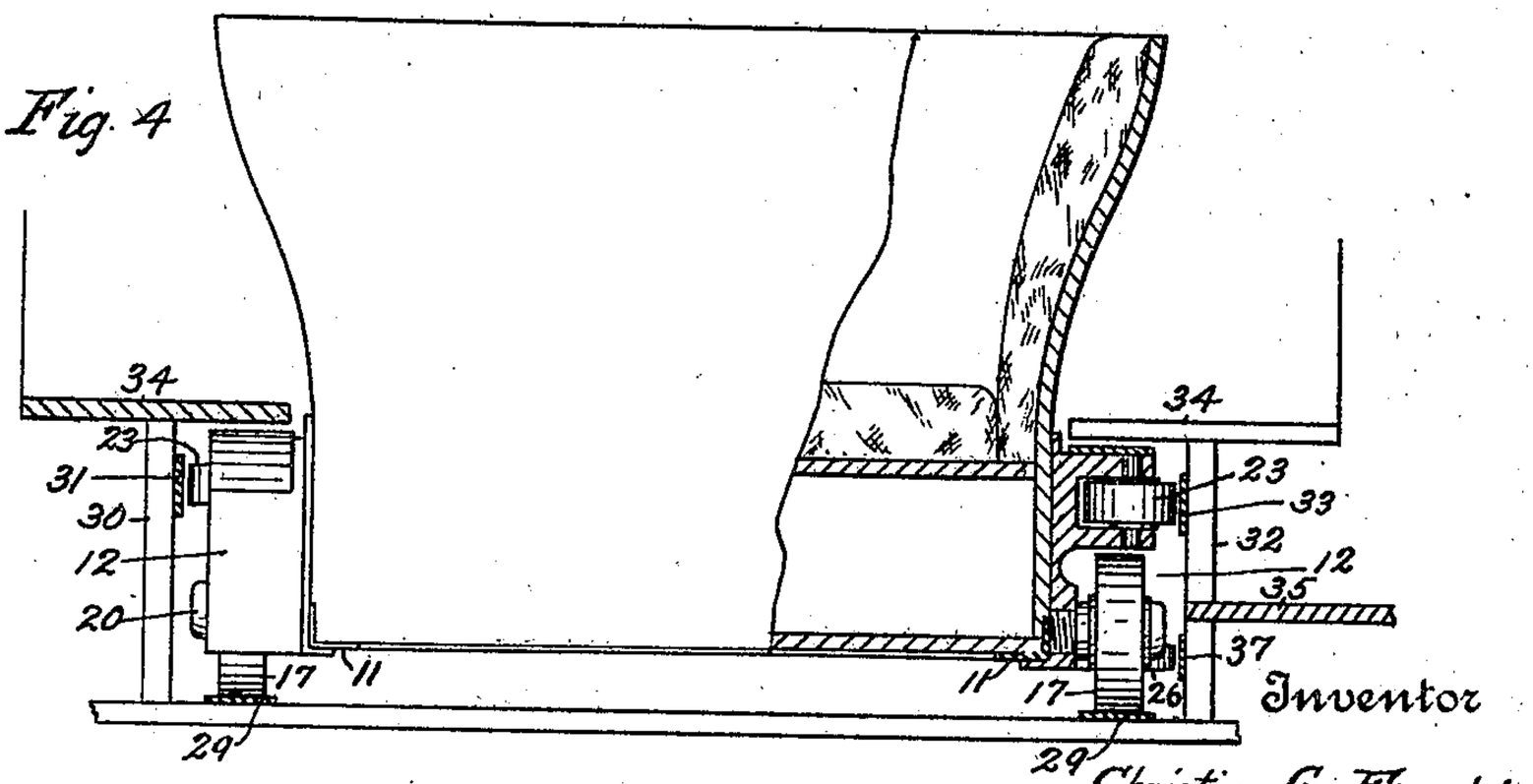


Fig. 4



Inventor
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Patented Jan. 2, 1923. 1,440,588

UNITED STATES PATENT OFFICE.

CHRISTIAN G. FEUCHT, OF BROOKLYN, NEW YORK.

ROLLER-COASTER RUNNING GEAR.

Application filed June 14, 1922. Serial No. 568,185.

To all whom it may concern:

Be it known that I, CHRISTIAN G. FEUCHT, a citizen of the United States, and resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Roller-Coaster Running Gears, of which the following is a specification.

The invention relates to roller coaster running gears of the class in which the cars are arranged to run by gravity over a track comprising a series of horizontally and vertically curved sections, the former giving centrifugal or outward thrusts upon the cars and the latter downward and upward movements, the chief attraction or popularity in rides of this kind residing in the sensations or thrills occasioned by the velocity of the several movements.

The object of the present invention is to provide a suitably constructed running gear or combination of wheels and track structure to safely support the cars upon the track whereby a substantially increased velocity may be made both in the outward swinging action of the cars and in the downward and upward falling and rising movements thereof.

A further object is to provide means automatically controlled by the running gear for maintaining a substantially uniform trip period for the several trains of cars running over the track at the same time, thus overcoming the common tendency of relative speed variation occasioned either by differences in load or in running gear construction.

A further object is to provide means for more effectively stabilizing the cars in their normal rapidly changing paths of movement by applying resistance directly at the points of greatest loads or thrusts.

A further object is to provide a track structure in connection with the car running gear whereby the latter may be covered or protected throughout its movements, and at the loading and unloading section of the track the gear may be partially uncovered to afford means for operating the car gates; the construction and operation of said gates being fully shown and described in my co-pending application, Serial No. 561,091, filed May 15, 1922.

For further comprehension of the invention, and of the objects and advantages thereof, reference is had to the following description and accompanying drawings, and to the appended claims in which the various features of the invention are more particularly pointed out.

Figure 1 of the drawings is a plan view of the track structure formed in accordance with the present invention and showing more particularly the loading and unloading portion of the track section.

Figure 2 is a transverse section of the track structure taken along the broken lines 2—2, Fig. 1.

Figure 3 is a side elevation of a car shown in connection with the running gear and foot-treadle for operating the gates.

Figure 4 is an end view of the car shown on larger scale, partially in section, and in connection with the running gear and track structure.

Figure 5 is a detail side view of the wheel-frame with the wheels mounted thereon.

Figure 6 is a plan view of the latter.

Figure 7 is a transverse section of the wheel-frame along the broken line 7—7, Fig. 5, the wheels being shown in position.

As indicated in the drawings numeral 10 indicates a car-body, provided along its lower side edges with the corner binding angles 11, extending the full length of the car and around the forward curved portion thereof. Fixed to the opposite side walls of the car are the wheel-frames 12, having bottom flanges 13 adapted to engage the corner binders 11 and receive the weight of the car in connection with fastening bolts passing through the holes 14 of the frames, the latter comprising a back plate or member 15, from which projects a guard flange or yoke 16. Traction or gravity wheels 17 are mounted on said frames within the yoke by means of the studs 18 provided with a reduced end 19 having threaded engagement with the back member 15. The wheels are loosely mounted on the studs in any approved manner, and provided with a dust-cap 20. Within the yoke of the several frames is mounted a stub shaft 21 fixed by the set screws 22, and upon the shaft is loosely mounted a friction wheel 23. The wheel-frames disposed on the operating side of the car are further provided at their lower end with a hub 24 having a stud 25, on which is loosely mounted a friction wheel 26. Also fixed to the upper ends of the several wheel-frames is a friction sur-

face comprising a curved plate 27 detachably retained in position by the screws 28.

Co-operating with the several wheels is a track structure provided with main track plates 29 adapted to be engaged by the gravity wheels 17, the structure also being provided at opposite sides of the car with upright parts 30 and 32, the former parts being adjacent the rear side of the car and extending over the entire course of the main track and provided throughout its full length with the side thrust plates 31 adapted to be engaged by the upper level friction wheels 23. Also, with the exception of a portion around the loading and unloading station, the upright parts 32, adjacent the front or operating side of the car, extend over the entire course and are provided the full length thereof with the side thrust plates 33 adapted to be engaged by the upper level friction wheels 23. Adjacently disposed above the latter friction wheels at opposite sides of the car are upper level platforms 34 extending the full length of the respective upright parts 30 and 32, and covering the wheel-frames 12, as clearly shown in Fig. 4. The loading and unloading station comprises a low level platform 35 disposed with a curved outer edge adjacent the front or operating side of the cars, and extending on a downward grade between the opposite ends, indicated at the points 36, of the upper level platform 34. Fixed to the outer edge of this platform is a correspondingly curved side thrust plate 37 adapted to be engaged by the lower friction wheels 26, the lower thrust plate 37 being preferably disposed in vertical alinement with the upper thrust plates 33.

In the operation of the cars around the low-level or operating platform 35, the opposite side thrust plates 31 and 37 are engaged by their respective friction wheels to maintain the lateral position of the cars upon the track, the said position being held throughout the remainder of the track by the friction wheels 23 engaging the opposite upper side thrust plates 31 and 33. The relatively low position of the operating platform affords access for operating the gates of the several cars or trains by means of the foot-treadle 38, which, in this position of the track, is uncovered and free to be operated by an attendant. For operating convenience, a running board 39 is fixed to the car between the wheel-frames 12, below the foot-treadle 38, and substantially on a level with the operating platform 35. The ends of the running-board are provided with anchor-plates 40 connected by the screws 41, and the anchor-plates in turn are secured to the upper side of the hubs 24 of the wheel-frames by the studs 25 and nuts 42, the latter being covered by the washer 43 fixed to the stud by the screw 44. As thus arranged an attendant may readily stand upon either the running-board or the operating platform or pass from one to the other in manually advancing the cars, operating the gate foot-treadle, or collecting fares. As the cars enter upon the operating platform in the direction shown by the arrow, they are brought to rest by suitably arranged braking mechanism, not shown, and the gates are then opened for discharging the passengers. Upon reloading, the gates are locked and the train manually advanced to the power driven carrier chain 45, which elevates the cars up the main incline for the beginning of the trip.

In their running operation the cars are commonly arranged in the form of a plurality of trains operating under comparatively close headway, and in order to maintain a substantially uniform headway, and thus avoid operating confusion, the speed controlling friction surfaces 27 are provided upon the several wheel-frames. Under ordinary conditions in which the cars are left free to run over the tracks by gravity alone, it is found in practice that some trains or cars will make the trip over the several dips and rises more quickly than others, the more rapidly moving ones lifting themselves under centrifugal action considerably off the track-plates at such points along the line. For overcoming this accelerated movement of the cars the friction surfaces 27 are arranged to engage the lower surface of the superposed platforms 34 and act thereby under the lifting action of the car to frictionally arrest the increase of speed, the necessary frictional resistance at the desired points along the line being obtained by varying the space between the friction surface on the car and the bottom surface of the platform. The platforms also serve to prevent articles such as wearing apparel or bundles that may fall or be mischievously thrown out of the car from landing among the running gear and tracks and interfering with the regular operation of the train. Also, the provision of the guard or yoke 16 upon the wheel-frame 12, not only prevents miscellaneous articles from becoming entangled among the enclosed wheels, but also confines and overcomes the scattering of lubricating oils applied upon the bearings of the wheels or of the rainwater picked up by the latter. Furthermore the arrangement of the wheel-frames upon the cars serves to directly receive the operating lateral thrusts thereof and transmit them to the fixed side thrust plates.

While I have shown and described the preferred construction and arrangement of the several devices, it is to be understood that detail changes may be made therein without departing from the general principle of the invention.

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

1. In combination, a car-body, wheel-frames fixed to the opposite sides of said car-body, gravity wheels mounted in said wheel-frames, side friction wheels mounted on said wheel-frames at a common level on one side of said car-body, side friction wheels mounted on said wheel-frames at different levels on the opposite side of said car-body, and a track structure disposed to resist the thrusts of said wheels.

2. In combination, a car-body, a wheel-frame fixed to said body, a gravity wheel mounted on said wheel-frame, a side friction wheel mounted on said frame above said gravity wheel and disposed substantially on a level with the seats in said car-body, a second side friction wheel mounted on said wheel-frame and disposed substantially on a level with the centre of said gravity wheel, and a track structure disposed to support the thrusts of said several wheels.

3. In combination, a car-body, a wheel-frame comprising a back plate member secured to said car-body and provided with an outwardly extending guard flange or yoke, a gravity wheel mounted on said wheel-frame within the yoke, side friction wheels mounted at different levels on said wheel-frame independently of said gravity wheel, and a track structure disposed to resist the thrusts of said wheels.

4. In combination, a car-body, a wheel-frame comprising a back plate member secured to said car-body and provided with an outwardly extending guard flange or yoke, a gravity wheel mounted on said wheel-frame within said yoke, a side friction wheel mounted on said wheel-frame within said yoke and disposed substantially on a level with the seats in said car, a second side friction wheel mounted on said whele-frame and disposed substantially on a level with the center of said gravity wheel, and a track structure disposed to support the thrusts of said several wheels.

5. In combination, a car-body, a wheel-frame fixed to said body, a gravity wheel mounted on said wheel-frame, a side friction wheel mounted on said wheel-frame and disposed substantially on a level with the seats in said car, a friction surface carried by said wheel-frame, and a track structure disposed to support the thrusts of said wheels and said friction surface.

6. In combination, a car-body, wheel-frames fixed to the opposite sides of said car-body, gravity wheels mounted on said opposite wheel-frames, side friction wheels mounted on said opposite wheel-frames and disposed substantially on a level with the seats in said car, friction surfaces carried by said opposite wheel-frames, and a track structure arranged on opposite sides of said car and disposed to resist the thrusts of said wheels and said friction surfaces.

7. In combination, a car-body, a wheel-frame comprising a back plate member secured to said car-body and provided with an outwardly extending guard flange or yoke, a gravity wheel mounted on said wheel-frame within said yoke and disposed substantially on a level with the seats in said car, a detachable friction plate mounted on said guard flange at the upper end thereof, and a track structure disposed to resist the thrusts of said wheels and said friction plate.

8. In combination, a car having a gate operated by a foot-treadle extending exteriorly of said car, a wheel-frame fixed to the body of said car, a gravity wheel mounted on said wheel-frame, a pair of side friction wheels mounted at different levels on said wheel-frame, and a track structure disposed at different levels and arranged to resist the thrusts of said wheels, the upper of said structure levels covering said wheel-frame and foot-treadle and a lower of said structure levels being disposed below the level of the foot-treadle to afford means for operating the latter.

9. In combination, a car having a gate operated by a foot treadle extending exteriorly of said car, wheel-frames fixed to the opposite sides of said car, gravity wheels mounted on said opposite wheel-frames, side friction wheels mounted on said opposite wheel-frames above the level of the foot-treadle, and a track structure disposed at different levels on opposite sides of said car and adapted to resist the thrusts of said wheels, the upper of said structure levels being arranged to cover said wheel-frame, wheels and foot-treadle.

10. In combination, a car having a gate operated by a foot-treadle extending exteriorly of said car, wheel-frames fixed to the opposite sides of said car, gravity wheels mounted on said opposite wheel-frames, side friction wheels mounted on said opposite wheel-frames above the level of the foot-treadle, side friction wheels mounted on said wheel-frame on one side of said car below the level of the foot-treadle, and a track structure disposed at different levels on opposite sides of said car, the upper level of said structure being adapted to resist the thrusts of said upper friction wheels on both sides of said car and to cover said wheel-frames and wheels, and a lower level of said structure being adapted to resist the thrusts of said lower friction wheels on one side of said car, said latter structure being disposed below the level of said foot-treadle.

11. In combination, a car, a gate mounted within said car and having locking means operated by a foot-treadle disposed exteri-

orly of said car, gravity for said car, side friction wheels mounted at a common level on one side of said car, side friction wheels mounted at different levels on the opposite side of said car adjacent the foot-treadle locking means, a track structure disposed to resist the thrusts of said wheels, and a running board secured to the side of said car below the foot-treadle.

12. In combination, a car, a gate mounted within said car and having locking means operated by a foot-treadle disposed exteriorly of said car, a friction wheel mounted on the side of said car below the level of the foot treadle, a second friction wheel mounted on the side of said car above the level of the foot treadle, and a track structure for said car including platforms disposed at different levels to resist the side thrusts of said friction wheels, the lower of said platforms affording means for operating said foot-treadle and the upper of said platforms serving to cover said foot-treadle and friction wheels.

13. In combination, a car, a gate mounted within said car and having locking means operated by a foot-treadle disposed exteriorly of said car, gravity wheels mounted on the opposite sides of said car, friction wheels mounted on the opposite sides of said car above the level of the foot-treadle, friction wheels mounted on one side of said car below the level of the foot-treadle, and a track structure arranged on opposite sides of said car at different levels, the upper level thereof being disposed to cover and to resist the thrusts of said upper friction wheels, and a lower level of said track structure being adapted to resist the thrusts of said lower friction wheels and afford means for operating said foot-treadle.

14. In combination, a car mounted for gravity movement along a track, a track structure including a fixed member, and a friction device carried by said car and adapted by the displacement of the latter under excessive speed to effect a variable frictional engagement with the fixed member of said track structure to control the movement of the car.

15. In combination, a car, a gate mounted within said car and having locking means operated by a foot-treadle disposed exteriorly of said car, a pair of wheel-frames fixed to the side of said car, side friction wheels mounted on said wheel-frames below the level of the foot-treadle, a track structure for said car including a platform disposed to resist the side thrust of said friction wheels, and a running board fixed to said car between said wheel frames and below the foot-treadle.

16. In combination, a car provided with gravity wheels adapted to run on the main track, a gate for said car having locking means operated by a foot-treadle disposed exteriorly of said car, an operating platform arranged above the level of the main track and adapted to laterally guide the movement of said car, and a running board fixed to the side of said car below the foot-treadle and substantially on a line with said operating platform.

17. In combination, a car, a pair of wheel-frames fixed to the side of said car and provided with hubs having studs extending therethrough, side friction wheels mounted on the bottom of the hubs of said wheel-frame by the studs, a track structure disposed to resist the thrust of said side friction wheels and constituting an operating platform, and a running board fixed between said wheel-frames upon the hubs of said wheel-frames by the studs, said running board being substantially on a level with said operating platform.

Signed at Brooklyn, in the county of Kings, and State of New York, this 10th day of June, A. D. 1922.

CHRISTIAN G. FEUCHT.