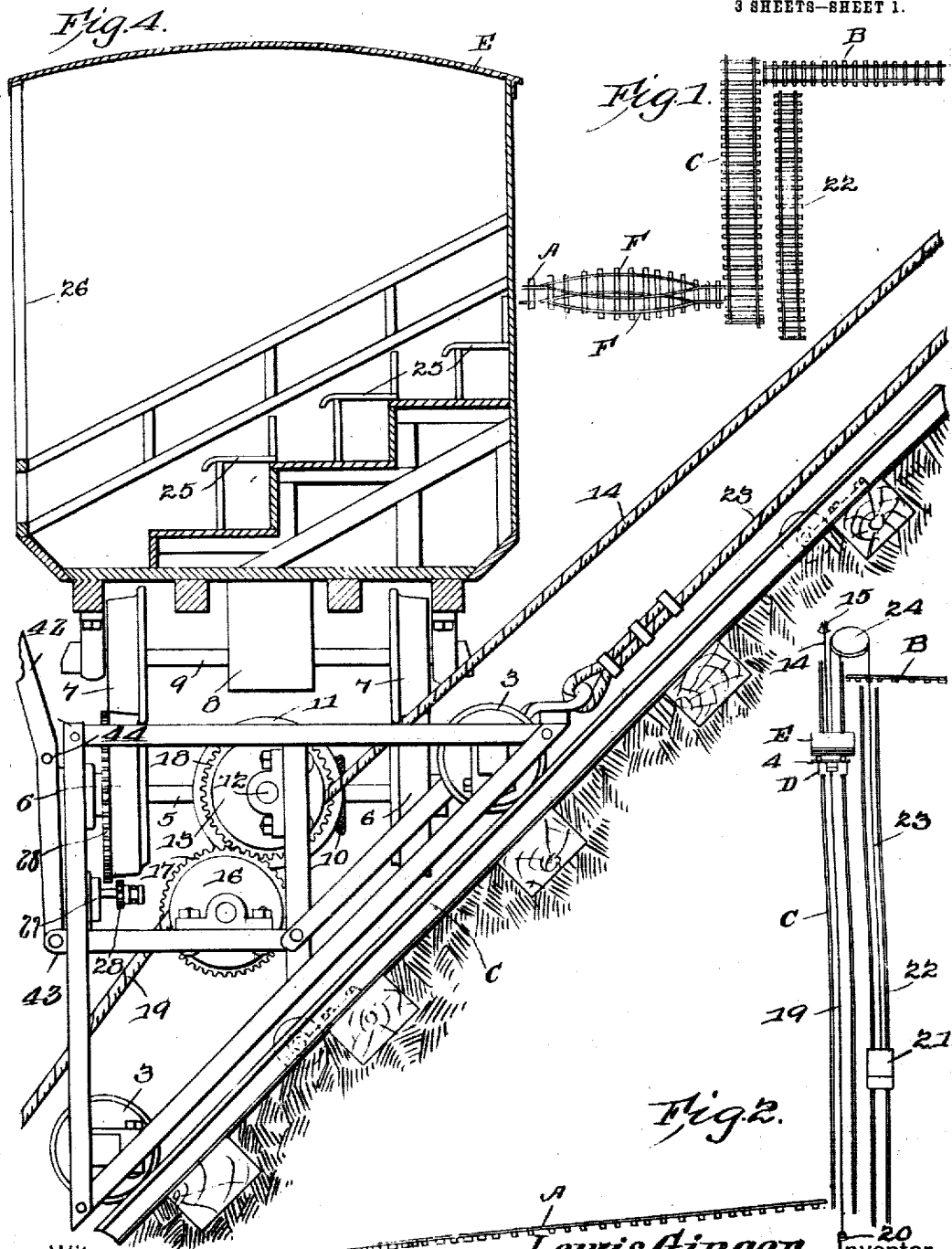


L. GINGER.
RAILWAY.

APPLICATION FILED NOV. 17, 1905.

3 SHEETS—SHEET 1.



Witnesses
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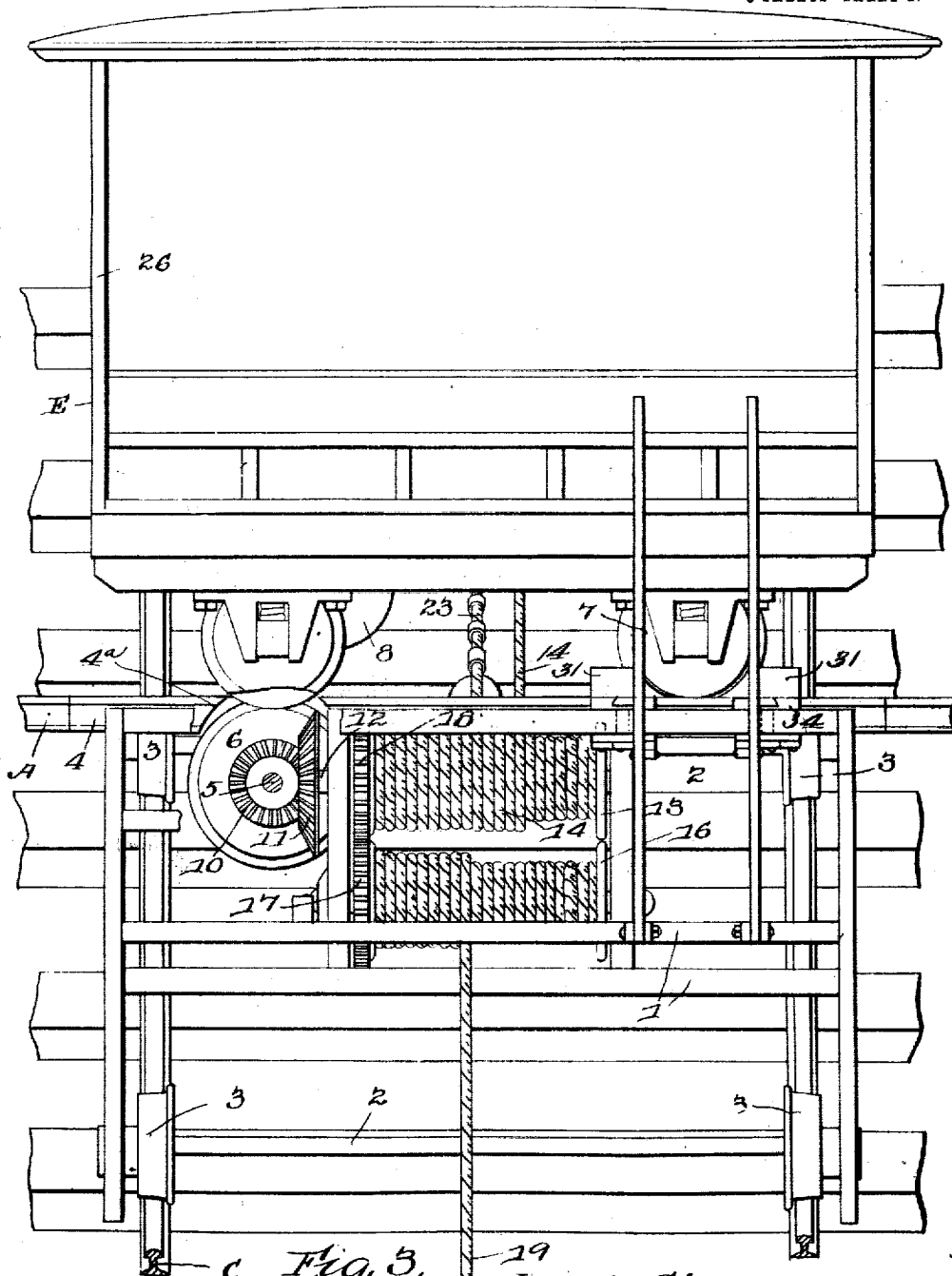
PATENTED FEB. 27, 1906.

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3 SHEETS—SHEET 2.



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Fig. 3.

19

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3 SHEETS—SHEET 3.

Fig. 5.

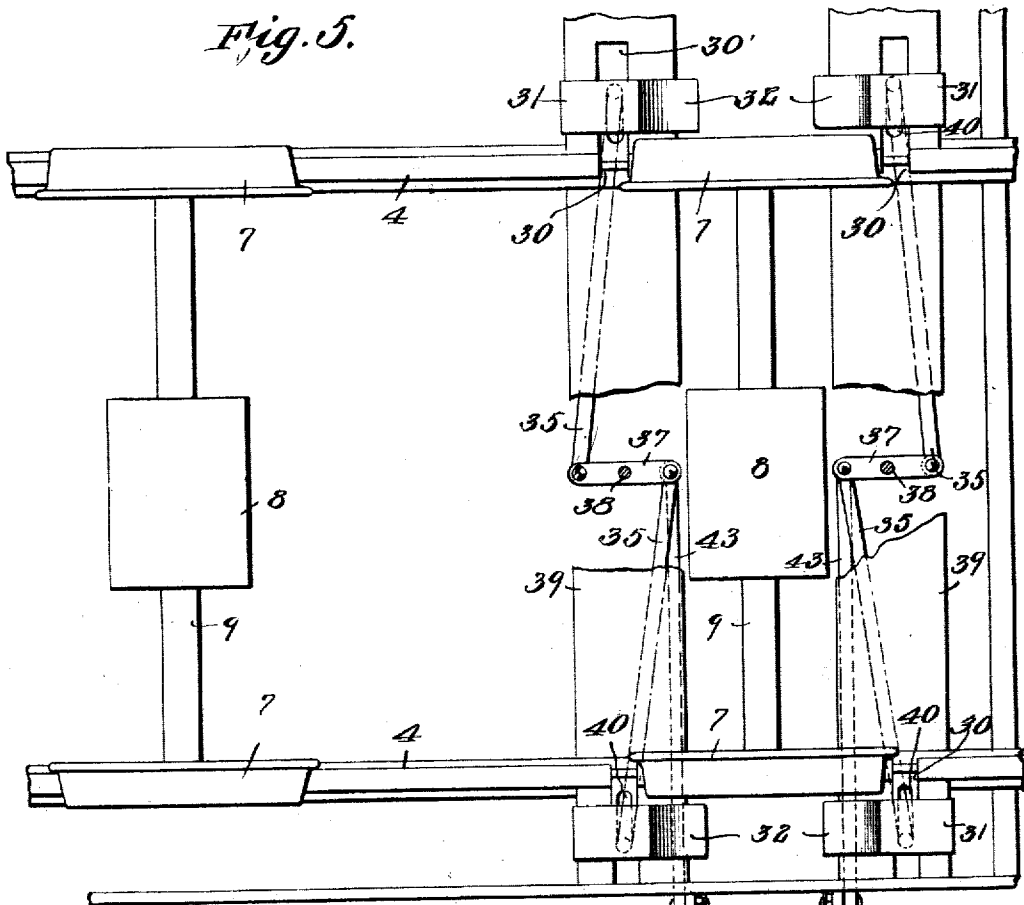


Fig. 7.

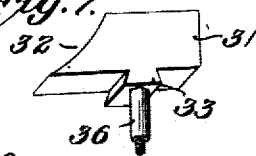


Fig. 8.

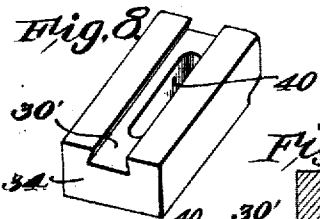


Fig. 6.

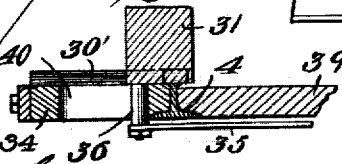


Fig. 9.



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UNITED STATES PATENT OFFICE.

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RAILWAY.

No. 813,416.

Specification of Letters Patent.

Patented Feb. 27, 1906.

Application filed November 17, 1905. Serial No. 287,880.

To all whom it may concern:

Be it known that I, LEWIS GINGER, a citizen of the United States, residing at Colorado Springs, in the county of El Paso and State of Colorado, have invented a new and useful Railway, of which the following is a specification.

This invention relates to railways, and has for its object to provide a novel track arrangement for convenience in ascending steep inclines—such, for instance, as the sides of mountains. In this connection it is proposed to have the track divided into a series of main sections located at different elevations, adjacent track-sections being connected by an abruptly-inclined supplemental-track section, along which the train or car is designed to be carried by elevating mechanism. It is furthermore designed to have the car self-propelled upon each supplemental-track portion, as well as upon the main-track sections and to insure the prompt and positive ascent or descent of the car upon the abruptly-inclined track portions.

While the invention is capable of general use, it is particularly designed as a scenic railway and is arranged to give the passengers a clear view of the scenery when ascending and descending a mountain.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a diagrammatic view of a railway of the present invention, including adjacent main-track sections and a supplemental inclined track portion connecting the main sections. Fig. 2 is a diagrammatic side view illustrating the manner of counterbalancing the truck which is designed to carry the car upon the supplemental-track portion. Fig. 3 is an enlarged elevation looking at the face of a supplemental-track portion and including an elevating-truck with a car thereon, portions of the truck being broken away to illustrate the hoisting mechanism thereon. Fig. 4 is an end view of Fig. 3 with the car in section. Fig. 5 is an enlarged detail plan view of a

portion of the elevating-truck, showing the clutches for engagement with the car-wheels to prevent the car from running off the truck. Fig. 6 is an enlarged detail sectional view taken through one of the clutches. Fig. 7 is a detail perspective view of one of the clutches. Fig. 8 is a detail perspective view of a guide for one of the clutches. Fig. 9 is a fragmentary side view of one of the rails on the elevating-truck, showing the grooves therein for the clutches.

Like characters of reference designate corresponding parts in all of the figures of the drawings.

Referring at first more particularly to Figs. 1 and 2 of the drawings, it will be explained that A designates a main-track section, which may be level or slightly inclined and disposed at a lower elevation than the adjacent main-track section B, the two main-track sections being connected by an abruptly-inclined supplemental-track portion C, disposed transversely of the main-track section. It is proposed to have the train or car self-propelled upon the main-track section by steam, electricity, or other motive power and to provide for elevating the car upon the abruptly-inclined supplemental-track portion by means of an elevator including a truck D, upon which the car E is adapted to be run from the main-track section.

As clearly indicated in Figs. 3 and 4, it will be noted that each end of the truck D is in the form of a right-angle triangle, which is disposed with its hypotenuse in parallelism with the inclined supplemental-track portion C. The ends of the truck are preferably in the nature of open frames, which are connected by suitable cross-bars 1, and at opposite ends of the bottom of the truck are axles 2, equipped with flanged wheels 3, running upon the rails of the supplemental track. The top of the truck is horizontal and provided with rails 4 for the support of the wheels of the car E and are disposed at substantially right angles to the rails of the supplemental track, and therefore in position to come into alignment with the rails of the respective main-track sections at opposite limits of the movement of the truck.

Suitably journaled upon the truck, beneath the top thereof, is a drive-shaft 5, which is disposed at right angles to the rails 4 and is equipped at opposite ends with friction-wheels 6, designed to be engaged and driven by the car-wheels 7, each rail 4 being cut

away or interrupted, as at 4^a, to permit of the car-wheels 7 engaging the wheels 6. It will here be explained that the car-wheels 7 are drivers and may be driven in any suitable manner—for instance, by means of an electric motor 8, carried by the car and connected to the axle 9, upon which the wheels 7 are mounted. Upon the drive-shaft 5 is a beveled gear 10, which meshes with another beveled gear 11 upon a counter-shaft 12, which carries a drum 13, having a hoisting-cable 14 wound upon the drum with its other end suitably anchored at the upper end of the supplemental-track portion, as indicated at 15 in Fig. 2. Beneath and in substantial parallelism with the drum 13 is another drum 16, having a gear 17 in mesh with a gear 18 upon the drum 13. A cable 19 has one end connected to and wound upon the drum 16, while its lower end is suitably anchored at the bottom of the supplemental-track portion, as shown at 20 in Fig. 2.

For counterbalancing the truck there is provided a counterweight 21, running upon a track or guideway 22 in parallelism with the supplemental track C, there being a cable 23, having one end connected to the counterweight and its other end connected to the truck, with its intermediate portion running around an idle drum or pulley 24, mounted at the upper end of the supplemental-track portion.

In practice a car E is run upon the truck or elevator from one of the lower main-track sections, with its driving-wheels in engagement with the friction-wheels 6. When the motor or engine of the car is thrown into operation, the drivers 7 rotate without advancing the car, while the friction-wheels 6 are rotated and in turn drive the drum 13, which winds the hoisting-cable 14 thereon, and thereby elevates the truck with the car thereon along the supplemental track C until the truck or elevator reaches the top of the incline with its rails 4 in alinement with the adjacent upper main-track section B, whereupon the car will run off upon the main-track section and continue thereon to the next abruptly-inclined supplemental-track portion, where it will again be elevated in the manner hereinbefore described. It will of course be understood that when the drum 13 is winding the drum 16 is unwinding, and when the car is descending the drum 13 is driven so as to unwind and the drum 16 is driven to wind the cable 19 thereon, and thereby draw the truck or elevator downwardly against the resistance of the counterweight 21.

Each straight track-section is of course a single track and is provided with one or more switches F, as shown in Fig. 1, whereby the cars may pass one another upon the main-track sections.

By preference the cars are scheduled to meet one another at one end of the abruptly-

inclined supplemental-track portion, one of the cars being side-tracked or switched to permit of the passing of the other car along the main track.

From the foregoing description it will be understood that each supplemental inclined track section is provided with an elevator, which is entirely independent of the other elevators, and each elevator is actuated by the driving-wheels of the car which is supported thereon, whereby the car is self-propelled throughout the supplemental-track portions as well as when upon the main-track sections.

While any form of self-propelled car may be used in connection with the present railway, said railway is especially designed to give a good view of the scenery when ascending a mountain, wherefore it is proposed to have the seats 25 run lengthwise of the car and arranged in tiers facing the open side of the car, so as to give the passengers an unrestricted view.

In order that the truck may be moved independently of the car, a motor 27, preferably electric, is mounted upon the truck and provided with a gear 28, adapted to be thrown into and out of mesh with a gear 29 upon the shaft 5, whereby the hoisting mechanism may be actuated to raise and lower the truck when the latter is not occupied by a car.

It is of course necessary to prevent the car from running off of the truck when the latter is in movement, and to accomplish this feature I employ clutch mechanism to engage one pair of the car-wheels, as best indicated in Figs. 3 and 5 of the drawings. In carrying out this feature each rail 4 of the truck has a pair of dovetailed or undercut grooves 30, formed across the tread thereof at a distance from the cut-away portion 4^a of the rail, so as to lie at opposite sides of the rear car-wheels when the car-wheels on the other axle are engaging the friction-wheels 6. Each of these grooves or guideways is designed to direct the movement of a clutch member 31, which has one end concaved, as at 32, to form a shoe for frictionally embracing the tread of the car-wheel, there being a dovetailed or wedge-shaped shoulder or boss 33 upon the under side of the clutch to slide in the groove or guideway 30, which guideway is continued at the outer side of the rail in a block or bar 34, as indicated at 30', whereby the clutch member may be slid beyond the outer side of the track, so as not to obstruct the latter. A guide member 34 is supported upon the frame of the truck in any suitable manner between the rail and the outer edge of the truck.

It is proposed to simultaneously actuate corresponding clutch members at opposite sides of the truck, and therefore they are connected by means of links 35, each of which has its outer end pivotally connected to a pin

36, depending from the boss or shoulder 33 adjacent the outer side of the clutch member, the inner end of the link being pivoted to one end of a lever 37, which is fulcrumed midway of its ends, as at 38, upon a suitable frame-bar 39. The guide member 34 is of course provided with a slot 40 for the slidable reception of the pin 36, and the pin 36 is located at the outer side of the clutch member in order that the latter may be drawn inwardly, so as to lie upon the top of the rail to engage the periphery of the car-wheel. At the outer side of the truck there are two upstanding levers 41 and 42, one for each pair of clutch members. Each of these levers is fulcrumed at its lower end, as at 43, and a connecting-rod 44 has its outer end pivotally connected to the adjacent lever, as at 45, with its inner end pivoted to the inner end of the lever 37 upon the pivotal connection between the link 35 and the lever 37. When the levers 41 and 42 are drawn inwardly, the clutches will be drawn into engagement with the car-wheels, so as to prevent rotation thereof to hold the car against running off of the truck. The car-wheels may be released by throwing the levers 41 and 42 outwardly, so as to draw the clutches away from the wheels to the outer sides of the track.

In practice when the car is running onto a truck from the clutch end thereof the motor on the front axle is thrown out of operation, and when the front wheels have passed the clutches the conductor or other attendant throws the lever 41 inwardly, so as to bring the inner set of clutches into the path of the rear wheels, and when the rear wheels strike these clutches the other lever 42 is manipulated to throw the outer set of clutches into engagement with the rear sides of the wheels, whereby the latter are held against rotation, and the car is prevented from running off of the truck. The motor on the rear axle is of course thrown out of operation when the rear wheels strike the inner set of clutches. After the rear car-wheels have been engaged with the clutches the motor upon the front axle is thrown into operation, thereby rotating the front wheels which drives the car, and thus actuates the hoisting mechanism to raise and lower the truck. When the truck reaches either limit of its movement, the motor which has been running is thrown out of operation, the clutches are released from the other car-wheels and the other motor is thrown into operation, whereby the car will be run off of the truck and onto the main track. It will here be explained that as the car is open throughout that side which is at the outer side of the truck the levers 41 and 42 are accessible from the car, wherefore the conductor or other attendant need not alight from the car to manipulate the levers.

Having thus described the invention, what is claimed is—

1. A railway made up of separate main-track sections at different elevations, a supplemental inclined track section connecting main-track sections, and car-actuated means for raising and lowering cars along the inclined sections.

2. A railway made up of separate main-track sections at different elevations, a supplemental inclined track section connecting main-track sections, and car-operated means operating at the inclined section only for moving cars thereon.

3. A railway made up of separate main-track sections at different elevations, a supplemental-track section connecting main-track sections, an elevator running upon the supplemental-track section and provided with means to be actuated by the driving mechanism of the car for running the elevator.

4. A railway made up of separate main-track sections at different elevations, a supplemental-track section connecting adjacent main-track sections, a truck running upon the supplemental-track section, a hoisting-drum carried by the truck, an elevating-cable wound upon the drum and anchored independently of the truck, and drum-operating means carried by the truck and disposed for operation by the driving-wheels of a car to be elevated by the truck.

5. A railway made up of separate main-track sections at different elevations, a supplemental-track section connecting the main-track sections, truck-driving means carried by the truck, track-rails provided upon the truck, and friction-wheels mounted upon the truck in operative relation with the truck-driving means, the track-rails having spaces therein through which the friction-wheels project into position for engagement by the driving-wheels of a car upon the truck.

6. A railway made up of separate main-track sections at different elevations, a supplemental-track section connecting adjacent main-track sections, an elevator running upon the supplemental-track section and provided with means actuated by the driving mechanism of the car for running the elevator, and a clutch mechanism carried by the elevator for engagement with the car-wheels to prevent the car from running off of the elevator.

7. The combination of an inclined track, an elevator running thereon and provided with rails having corresponding portions removed, elevator-actuating mechanism carried by the elevator and provided with drive-wheels working in the space provided in the rails and exposed to the drive-wheels of a car upon the rails, and clutches carried by the elevator for engagement with the other

car-wheels to prevent the car from running off of the truck when the latter is in motion.

8. The combination of an elevator having a track for the support of a motor-car, elevator-actuating mechanism carried by the elevator and provided with friction-wheels exposed for engagement with the power-wheels of a car upon the track, each rail of the track being provided with a pair of transverse grooves, grooved guideways leading outwardly from the grooves of the rails, wheel-engaging clutches working in the grooves and guideways, means connecting the corresponding clutches at opposite sides of the track for simultaneous movements in opposite directions, and controlling-levers for the respective sets of clutches.

9. The combination of an inclined track, a truck running thereon, rails upon the truck, one of the rails having a vertical opening therein, and truck-operating means having a drive-wheel working in the opening of the rail and exposed through the top thereof to the driven wheel of a car supported upon the rails.

10. The combination of an inclined track, a truck running thereon and adapted to carry

a car, truck-actuating means having a drive element disposed for engagement by one of the drive-wheels of a car upon the truck, and means to prevent the car from running off of the truck when the latter is in motion.

11. An elevator having track-rails, a guideway intersecting one of the rails, and a clutch working in the guideway for engagement with a car-wheel and capable of being shifted to one side of the rail to prevent the passage of car-wheels.

12. An elevator having track-rails, one of the rails having a transverse groove intersecting its tread, and a clutch shiftable into and out of the groove to engage a car-wheel and prevent movement thereof on the rail.

13. An elevator provided with means for driving the same which is controlled by a car supported upon the elevator.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

LEWIS GINGER.

Witnesses:

W. S. MORRIS,
J. C. OCKENGA.