(No Model.)

LA MARCUS A. THOMPSON.

GRAVITY SWITCH BACK RAILWAY.

No. 332,762. Patented Dec. 22, 1885.

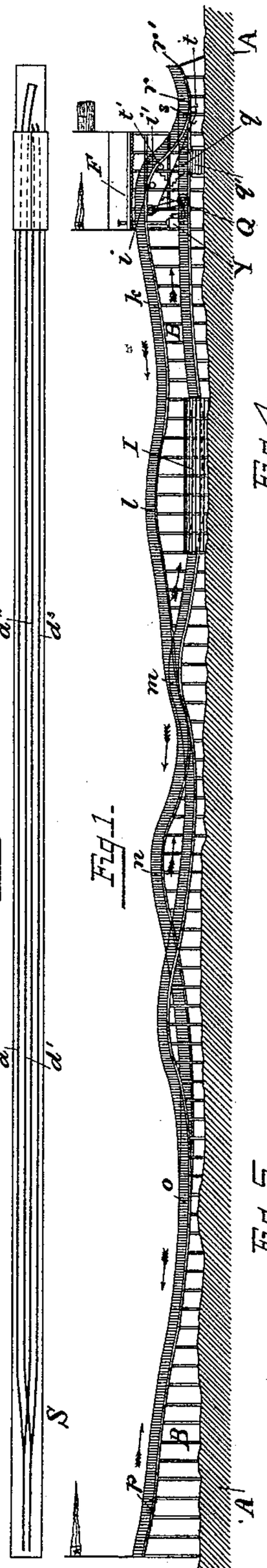

Fig. 2.

Fig. 1.

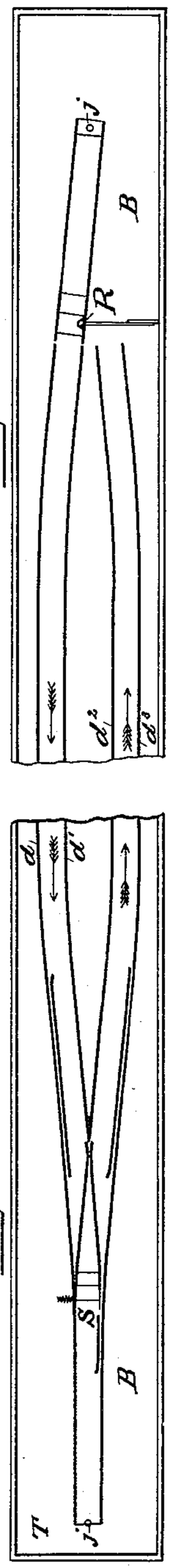

Fig. 4.

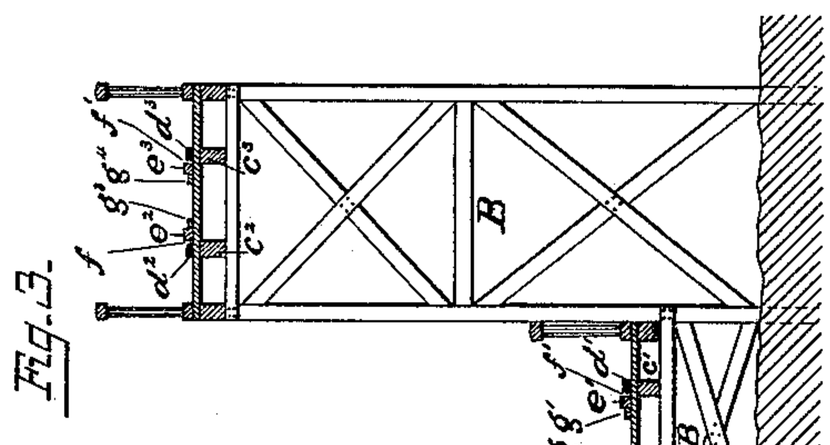

Fig. 3.

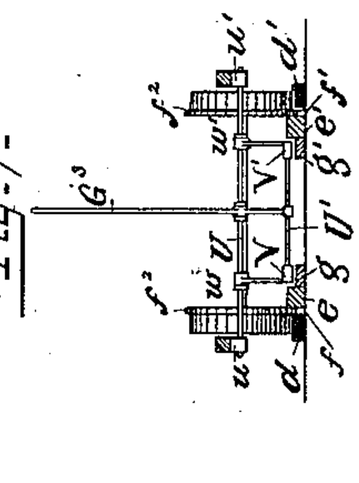

Fig. 7.

Fig. 5.

Fig. 6.

Fig. 8.

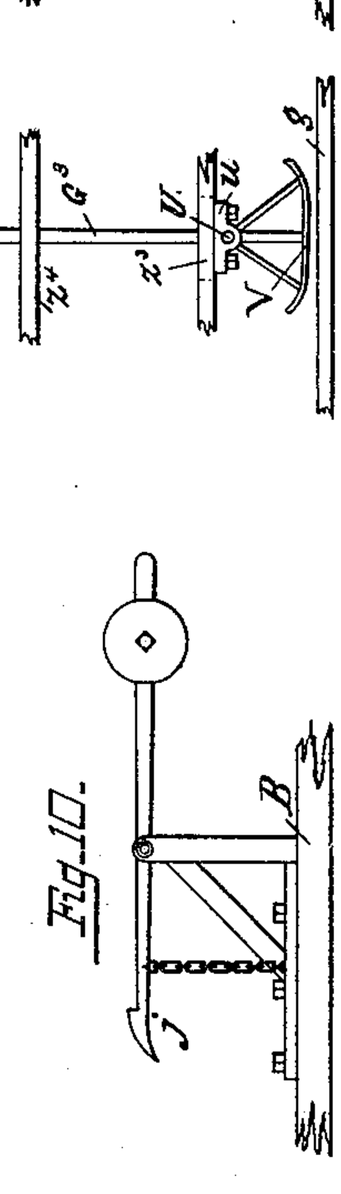

Fig. 10.

Fig. 9.

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LA MARCUS A. THOMPSON, OF PHILADELPHIA, PENNSYLVANIA.

GRAVITY SWITCH-BACK RAILWAY.

SPECIFICATION forming part of Letters Patent No. 332,762, dated December 22, 1885.

Application filed September 10, 1885. Serial No. 176,653. (No model.)

To all whom it may concern:

Be it known that I, LA MARCUS A. THOMPSON, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Gravity Switch-Back Railways, of which improvements the following is a specification, reference being had to the accompanying drawings, forming part hereof, in which—

Figure 1 is a side elevation of my improved switch-back railway, showing the series of descending and ascending planes, the tunnel, and the starting and terminal points within a pavilion. Fig. 2 is a top or plan view of the same. Fig. 3 is a transverse section on an enlarged scale. Figs. 4 and 5 are respectively top or plan views, showing the automatic and sliding switches and sections of rails at the respective ends of the railway-course. Fig. 6 is a side elevation of a car in position, and such as has been found well adapted for such purposes. Fig. 7 is a cross-section of the car, showing the peculiar construction of brake and mechanism for operating the same. Figs. 8 and 9 are respectively side elevations showing the brake in both its normal and operative positions; and Fig. 10 is a side elevation of the locking-dog for holding the car when not in use or while shifting it on the switches.

My invention relates to a gravity double-track switch-back railway to be used as a source or means of pleasure and amusement; and it consists of certain new and novel features, to be hereinafter more fully described, whereby passengers may be carried from a certain starting-point at any convenient or suitable elevation in a vehicle or car over a series of descending and ascending longitudinal planes by the gravity momentum acquired by the car in its passage over the planes to the opposite end of the course, and thence to the terminal point, located within a pavilion or other suitable structure, but, however, at a lower elevation than that of the starting-point therein, thereby obviating all necessity for changing cars on the round trip, lessening the time for making the trip, insuring greater safety to passengers riding thereupon, and entirely obviating many serious and annoying features existing in such structures as they have been heretofore constructed. The car from the terminal point within the pavilion is elevated to the starting-point therein by certain means and mechanisms, to be hereinafter fully described.

A further feature of my invention is a novel construction of vehicle or car for use in this connection, with mechanism for controlling the speed and for stopping the car *ad libitum*.

Referring to the drawings, A represents the ground or foundation upon which the trestle-work B rests, preferably constructed of wood, but, if deemed best for the purpose, may be constructed of iron, and in form irregular or undulating, or consisting of a series of descending and ascending longitudinal planes. Upon the top of this trestle-work, forming the road-bed, are stringers c, c', c^2, and c^3 for the reception of the rails d, d', d^2, and d^3, upon which the cars travel. Rigidly secured to the road-bed of the trestle-work B, and just inside of each pair of rail-stringers and in juxtaposition thereto, are the guard-stringers e e' and e^2 and e^3, made of any suitable material, but slightly higher than the rail-stringers, with narrow spaces f f' between the respective stringers for the reception of the inside projecting flanges, f^2, of the car-wheels. These guard stringers prevent the car-wheels in their passage over the series of descending and ascending planes from jumping the tracks. Immediately inside of the guard stringers e and e' and e^2 and e^3, and contiguous thereto, are the brake-stringers g and g', g^2 and g^3, made, preferably, of wood, for the car-brakes or shoes V and V′ to slide upon, and for aiding in the stoppage of the vehicle or car at any desired point or part of the course or railway.

F is a pavilion, either inclosed or open, of any suitable construction, and of such height or elevation as may be desired, access to the elevated starting-point i therein being had by a staircase, i', from the ground A. The passengers, having reached the elevated starting-point i within the pavilion F, are seated in the car D. The car is then started down a slight descending plane, k, to the summit l, passing over the same to the point m, and collecting in its passage sufficient velocity or gravity momentum to carry to and over the summit n, to descend with increased velocity over the plane o, and thence mounting the ascending plane p through an automatically-working switch, S, to the end of the course, and when the car is released

from the locking-dog *j* at this end of the course T it passes down over the tracks *d* and *d'* of the descending and ascending planes, through a structure so constructed as to represent a tunnel, I, to the terminal point *q* within the pavilion, but at a lower elevation than that of the starting-point, discharging the passengers opposite to or aside of the staircase *g'*, leading to the ground A. The car is then carried in any convenient manner up the short ascending plane *r*, where it is held at the summit *r'* by a locking-dog, *j*, rigidly secured to the trestle-work B, while shifting the car on the sliding switch R, as shown in Fig. 4, to the tracks leading to the starting-point *i* within the pavilion F. The car, being released from the locking-dog *j*, rushes down the inclined plane *r* far enough for the secondary cross-arm U' upon the under side of the car to engage with a belt or chain, Q, carrying thereupon a series of hooks, *t*, which chain or belt passes over a series of pulleys, *t'*, having motion imparted to them by gearing located in any convenient part of the structure or pavilion and propelled by a steam-engine, Y, located either inside or outside of the structure. The car, being elevated to the starting-point *i* from the point *s* by means of the belt or chain Q, is released by the attendant in charge of the brake-lever, and the car D is at once in position for the reception of passengers for the next trip.

The car D—such as shown in Fig. 6 of the drawings—is constructed of strong or stout material, preferably wood, with a series of seats, D', which may be either reversible or rigid ones, having sides D^2, made of similar material, with openings W between the respective seats, for the admission of passengers. Upon the tops of the sides D^2 are hand-grips D^3, securely fastened thereto. The front and back ends of the car are provided with dash-boards G and G', projecting outwardly therefrom. Immediately above the back dash-board G' of the car is a seat, G^2, for the attendant in charge of the lever G^3, actuating the brake-shoes V V', having an arm, g^4, projecting downward and rigidly secured to the floor of the car D. Beneath the car D, beyond the back wheels, is a cross-arm or shaft, U, held in bearings *u u'*, rigidly attached to the under side of the floor of the car. This cross-arm U has projecting from each side thereof the brake-shoes V V', which brake-shoes are loosely secured to the cross-arm U by collars *w* and *w'*. To the interior sides of these brakes is riveted a secondary cross-arm, U'. By means of collars or sleeves *z* and *z'* upon the cross-arms U and U' is secured the lever G^3, for actuating the brake-shoes V V'. This lever passes up through an oblong slot or opening, z^3, in the floor of the car, and then through guides z^4 and z^5, fastened in any suitable manner to the under side of the attendant's seat and the seat of the car nearest thereto, for insuring the free movement of the lever actuating the brake-shoes and for effecting the stoppage of the car at any desired point, and if at any time occasion should arise for decreasing the speed or gravity momentum acquired by the car in riding over the series of descending and ascending planes of the course or railway.

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

1. In a gravity switch-back railway, the combination, with the trestle-work so constructed as to form a series of descending and ascending planes, of the longitudinal stringers for the reception of the rails, the guard-ways or stringers for preventing the cars from jumping the tracks, and the brake-sliding ways or stringers, substantially as and for the purposes described.

2. In a gravity switch-back railway, the combination, with the undulating trestle-work having thereon the longitudinal trackways and rails, of the guard-stringers and brake-slide stringers contiguous thereto, of a car having brake-shoes which engage with said brake-stringers through the operation of a lever, substantially as and for the purposes set forth.

3. In a gravity switch-back railway, the combination, with the undulating trestle-work of the trackways and rails, of the guard stringers, of brake-slide stringers, of the car-brakes actuated by a hand-lever, of the automatic and sliding switches, of dogs for holding the cars, and mechanism, substantially as described, for elevating the car from the plane *r* to the starting-point, substantially as and for the purposes set forth.

4. The combination, with a gravity switch-back railway having starting and terminal points at different altitudes, of the car D, provided with brake mechanism consisting of shoes V V', cross-arms U U', and lever G^3, arranged and operating substantially as described.

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