



No. 609,164.

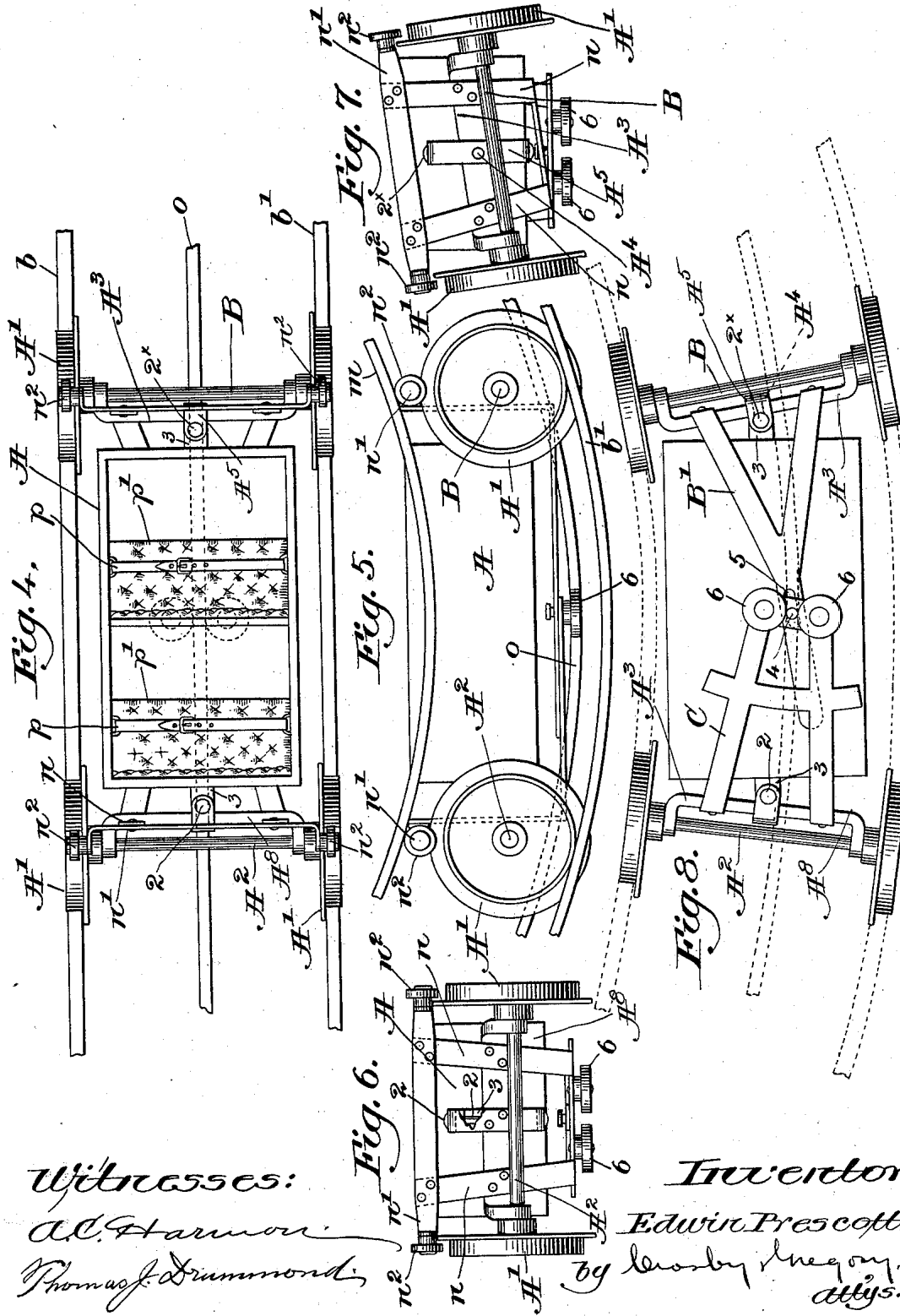
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E. PRESCOTT.  
ROLLER COASTER.

(Application filed Oct. 11, 1897.)

(No Model.)

2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

EDWIN PRESCOTT, OF ARLINGTON, MASSACHUSETTS.

## ROLLER-COASTER.

SPECIFICATION forming part of Letters Patent No. 609,164, dated August 16, 1898.

Application filed October 11, 1897. Serial No. 654,764. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN PRESCOTT, of Arlington, county of Middlesex, and State of Massachusetts, have invented an Improvement in Roller-Coasters, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object the production of a novel roller-coaster or railway chiefly for purposes of pleasure.

My improved roller-coaster presents parallel tracks laid with steep gradients and containing a circularly-arranged vertical loop or loops, the car moving at the lower end of a steep gradient partaking of a circular movement, said car for part of its course being inverted; but, due to centrifugal action, the contents of the car remains securely in place and the car follows the track. To, however, provide against the car leaving the track should it be possible from any unforeseen circumstances, I have provided the car with safety appliances, the said safety appliances being herein shown as a second track, it being arranged parallel to and perpendicular with relation to the circular part of the main track as well as to the gradients coming to and leaving the circular track. To further provide for the secure running of the car and insure means whereby when the car is changing from one part of the circular track onto another portion thereof having a spiral trend the wheels of the car may not leave the track, I have mounted one of the axles of the car upon the car-body so that it may turn slightly not only about a horizontal pivot, but also about a vertical pivot, with relation to said car, this being essential to always keep all the wheels of the car in firm bearing on the track; and to yet further insure the safety of the car and its maintenance on the track I have provided means whereby the car-axles may substantially at all times occupy a position radial to the center of the curves of the track, said devices being, however, shown as a third or intermediate rail substantially parallel to the main tracks, but more or less out of central relation thereto, that depending on the radius of the curve,

it being nearer the outer of the main rails the sharper the curve, and against this third track travels suitable wheels carried by arms connected with the axle-carrying parts of the car. Both axles are mounted on or with relation to the car on vertical pivots, so that their positions may be readily changed to adapt the wheels to the curvature of the tracks. The car-truck, with its frame, is provided with additional wheels, which form in this instance of my invention a part of the safety device, said wheels normally clearing the safety-track, and in case of any lack of centrifugal force which should carry the car quickly about the inner side of the circular part of the track these wheels will immediately take their bearing on the safety-track until gravity or centrifugal force again controls the car, when immediately the wheels of the truck bear on the main track, and also one wheel of each axle is loose to thereby lessen friction in going about a curve.

I have herein shown the track so arranged that a portion thereof passes through the open or central part of the circular track.

The apparatus may be provided with any usual or suitable means by which to take the car at its lower level and put it into starting position at its highest level, said means being herein shown as a chain elevator.

I have arranged within the boundary of the rails of the track a spectators' platform which is easily accessible from the ground by suitable steps or elevator, and the platform may also serve to steady the track-carrying frame.

Figure 1, in perspective, shows a roller-coaster embodying my invention. Fig. 2 is a diagram in plan view of the circular part of the track. Fig. 3 is a plan view of the switching device at the starting-point of the track. Fig. 4 is a plan view of the car resting on the track, looking at it in the position Fig. 1. Fig. 5 is a side view of the car and parts of the track. Fig. 6 is a rear or left-hand end view of the car, Fig. 1. Fig. 7 is a front or right-hand end view; and Fig. 8 is a bottom or plan view, the tracks being shown by dotted lines, as they would not appear in such view.

In making my improved roller-coaster I take suitable uprights *a* and connect them at

top and at suitable intervals by tie-pieces  $a'$ , and on said tie-pieces, they being erected at suitable points on the uprights, according to the level desired for the tracks, I mount the main tracks  $b b'$ , and between the main tracks I place a guide track or rail  $o$ . The main track starts, let it be supposed, from the right in Fig. 1 and descends by a steep incline or gradient down to about the point  $b^x$ , Fig. 1, when the said track is given a circular upward curve, the track being then bent to occupy a complete circle, and in its circle being carried spirally aside, as represented in Fig. 2, it finally ascending again, as represented at the left in Fig. 1, and curving around horizontally and declining somewhat it is extended through the central part of the circular track down a suitable incline to about the point  $b^4$ , where it may, if desired, ascend more or less and again pass through the circular part of the track to about the point  $b^5$ , when it will again be curved, descending to the passenger-station  $d$ . From this passenger-station the track is extended, say, to the right in Fig. 1 up to a suitable switch, as  $e$ , Figs. 1 and 3, upon which the car A, taken from the passenger-station  $d$  in any usual or suitable manner, as by an inclined elevator-chain  $g$ , may be placed.

The car having been placed on the switch, the switch will be turned in the direction of the arrow, Fig. 3, until the car has been reversed and the tracks of the switch are brought in line with the main tracks  $b$  and  $b'$ , on which the car originally descends. This invention is not, however, limited to bringing the car into starting position or to making it start by any particular mechanism, and instead I may employ any usual or suitable mechanism to elevate the car.

The car in its descent from the switch to the passenger-station traverses the circular loop referred to, it being designated by the letter  $h$ , and during such time the car rides in a vertical circle, and it completely reverses, but does not leave the track.

To make it certain that the car shall not under any circumstances leave the track, I have provided a safety appliance, which is composed, essentially, of tracks  $m$ , parallel to the tracks  $b b'$ , and said tracks  $m$  follow entirely about the circularly-arranged tracks  $b$  and  $b'$  and up and down outside the said circularly-arranged portion for any desired or suitable distance, the said tracks  $m$  being suitably supported or braced by braces  $m'$ . The braces  $m'$  constitute trusses, and connecting the tracks  $b$  and  $m$  substantially as represented in the drawings the whole structure forms a self-supporting circular loop which is very stiff and rigid.

The forward axle B is mounted in an axle-carrying frame  $A^3$ , pivotally mounted with relation to the body of the car A, and the rear axle  $A^2$  is mounted in an axle-carrying frame  $A^8$ . Each of these frames supports a

like framework, as  $n$ , (see Figs. 7 and 6,) which in turn supports arms  $n'$ , provided with suitable rollers or wheels  $n^2$ , said rollers or wheels constituting a part of the safety device hereinbefore referred to, they being so located with relation to the track  $m$  that in case of any accident or condition wherein the centrifugal force should fail to be fully effective to keep the wheels  $A'$  of the car on the tracks  $b$  and  $b'$  then in such condition the wheels  $n^2$  would immediately, they lying almost in contact with said track, contact with it, and thereafter the wheels  $n^2$  and tracks  $m$  would control the direction of movement of the car until the car again arrives at such position with relation to the circularly-arranged track that gravity or centrifugal action will have full sway of the car, at which time the wheels  $A'$  will again bear upon the tracks  $b$  and  $b'$ .

To insure that the wheels  $A'$  shall always remain upon the tracks  $b$  and  $b'$ , and especially while the said wheels are following the spiral trend of the circular part of the track, I have mounted the front-axle-carrying frame  $A^3$  on a horizontal pivot  $A^4$ , (shown best in Figs. 7 and 8,) extended from a yoke  $A^5$ , which is coupled by a vertical coupling-pin  $2^x$  with ears 3, extended from the car-body, so that said axle-carrying frame  $A^3$  is free to turn about the horizontally-arranged pivot  $A^4$ , and the yoke  $A^5$ , so pivoted, is also free to turn about the vertical coupling-pin  $2^x$ , thus making a sort of universal or gimbal joint. Mounting the front axle in this way insures that the wheels  $A'$  will always remain on the tracks  $b$  and  $b'$ , especially when passing the spiral trend. As herein shown, the rear-axle-carrying frame  $A^8$  is free to turn about a suitable like vertical coupling-pin 2. Each of these axle-carrying frames  $A^3$  and  $A^8$  have attached to them a suitable arm or frame, as  $B'$  and C, the arm C having a suitable pin 4, (see Fig. 8,) which enters a slot 5 in the arm  $B'$ , and the arm C is provided, as herein shown, with two suitable rollers 6, which cooperate with the opposite sides of the third or intermediate guiding-track or guide-rail  $o$ , it being arranged between the tracks  $b$  and  $b'$ ; but said track  $o$  may be arranged more or less to the side of the center of the space between said tracks  $b$  and  $b'$ , that depending upon the radius of the curve in which the tracks  $b$  and  $b'$  are laid, the track  $o$  being nearer the outside track of the curve the less the radius, such arrangement being represented at the extreme right and left in Fig. 1.

It will be observed that the rollers 6 6, running on the track  $o$ , by following that track causes the arms C and  $B'$  to be swung more or less, they in their movements turning the axle-carrying frames out of parallelism with relation to the ends of the car-body or placing them in lines radial to the center of curve of the track, and one of the wheels of each axle is preferably made loose to thereby avoid friction in passing curves.

In the manufacture of the car the body will in practice be brought as close to the main rails  $b$  and  $b'$  as possible, and I have also shown the car-body as provided with straps  $p$  to pass over the laps of the occupants of the car-seats  $p'$  to thereby retain them in their seats should they become frightened and seek to change their position.

The straps  $p$  form a securing means for the occupants of the car, and instead of the particular securing means herein represented I may employ any other well-known or usual or suitable means which would prevent the passengers in case they failed to keep their seats and sought to leave them from falling from the car when the same is overturned and while passing the upper part of the circular loop of the track—as, for instance, the car might have a canopy top made of strong wire-netting, or any other usual or suitable appliance might be devised.

The rail  $o$  may at times be arranged substantially at the level of the tracks  $b$  and  $b'$ , between which it is placed; but throughout the circular part or loop  $h$  of the track the said rail  $o$  is placed, and it occupies a smaller circle in order that the rollers  $6$  may contact with it, for it will be noticed, viewing Fig. 5, that said rollers  $6$  occupy a different level with relation to the tracks  $b$  and  $b'$  when on the circular part of the track than they do when on the inclined or curved part of the track.

Within the round or curved portions of the main track I have arranged a spectators' stand  $D$ , it being a platform sustained on a suitable firm pole or standard  $D'$  by suitable braces  $10$ , and this platform is braced to the ties  $a'$  by additional braces  $a''$ , only a few of said braces being herein shown to avoid confusion of the parts.

The spectators' platform  $D$  may be reached by a suitable staircase  $D^2$ , and this platform may contain seats or tables, &c., according to the particular use to which it is to be put, the persons occupying the platform being very considerably amused by watching the operation of the roller-coaster.

In Fig. 3 I have broken off about one-half of the turn-table to save space on the drawings. The pivot  $e^2$  of said turn-table is located substantially centrally with relation to its length, so that the car run onto one end of the table may, when the table has been rotated half-around, be run off the other end of said table, this plan enabling the car to be reversed, so that it can always be started down with the same end leading.

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

1. A roller-coasting apparatus, comprehending a track presenting steep gradients, a vertical circularly-arranged spiral loop between the said gradients; a car to follow said tracks and pass about the interior of the loop; and safety appliances whereby the car is pre-

vented from falling during its passage around within the circular loop, substantially as described.

2. In a roller-coasting apparatus, the following instrumentalities, viz: a main track composed of two substantially parallel rails presenting inclined portions connected by a vertically and spirally arranged loop; a guide-rail arranged between the said main rails and more closely to the outer one of said rails at the sharp curves of the track; a car having its axles mounted in pivoted frames, and having arms one of which has rollers to cooperate with said guide-rail, substantially as described.

3. In a roller-coasting apparatus, the following instrumentalities, viz: a car; main tracks  $b$  and  $b'$  presenting inclined portions, and between said inclines a vertically and spirally arranged circular portion; and a safety appliance composed essentially of additional safety-tracks  $m$  arranged in a smaller circle within the circularly-arranged main tracks; and rollers attached to the truck-frame and adapted under circumstances to contact with said safety-track, substantially as described.

4. In a roller-coaster, inclined main tracks  $b$  and  $b'$ , presenting inclined portions with vertically-arranged circular spiral portions between said inclines; a car-body having one of its wheel-carrying frames mounted to turn about a horizontal axle on said car-body, substantially as described.

5. In a roller-coaster, inclined main tracks  $b$  and  $b'$ , presenting inclined portions with vertically-arranged circular spiral portions between said inclines, combined with a car-body having one of its wheel-carrying frames mounted to turn about a horizontal and a vertical axle on said car-body, one of the wheels of each axle being loose thereon, substantially as described.

6. In a roller-coaster, main tracks presenting inclined portions and between said inclined portions vertically, circularly, and spirally arranged portions, and less inclined portions passing through the open center of the vertically and centrally arranged portions, substantially as described.

7. In a roller-coaster, a car; an inclined track followed by a circular spiral or loop portion, and a track leading from said circular spiral or loop portion on which the car runs, a guide-rail arranged between said tracks, and safety appliances whereby the car is prevented from falling during its coast around within the said circular spiral or loop, substantially as described.

8. A roller-coasting apparatus, comprehending a track presenting steep gradients, and a vertical circularly-arranged spiral loop between the said gradients; a car to follow said tracks and pass about the interior of the loop; safety appliances, whereby the car is prevented from falling during its passage around within the circular loop; and an ele-

vator to take the car from the passengers' platform to the switch, substantially as described.

9. In a roller-coasting apparatus, the following instrumentalities, viz: a main track composed of two substantially parallel rails; a guide-rail arranged between the said main rails and more closely to the outer one of said rails at the sharp curves of the track; a car having its axles mounted in pivoted frames, and having arms one of which has rollers to cooperate with said guide-rail, substantially as described.

10. In a roller-coaster, inclined main tracks *b* and *b'* presenting inclined portions with vertically-arranged circular spiral portions between said inclines, combined with a car-body having one of its wheel-carrying frames

mounted to turn about a horizontal and vertical axle on said car-body, substantially as described.

11. In a roller-coaster, a circular spiral track portion having track portions connecting with it from each side of such circular spiral portion, combined with a car-body having one of its wheel-carrying frames mounted to turn about a horizontal axle on said car-body, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN PRESCOTT.

Witnesses:

GEO. W. GREGORY,  
MARGARET A. DUNN.