Sept. 14, 1926.

C. BAUER

1,599,982

AMUSEMENT APPARATUS

Filed Jan. 27, 1925

3 Sheets-Sheet 1

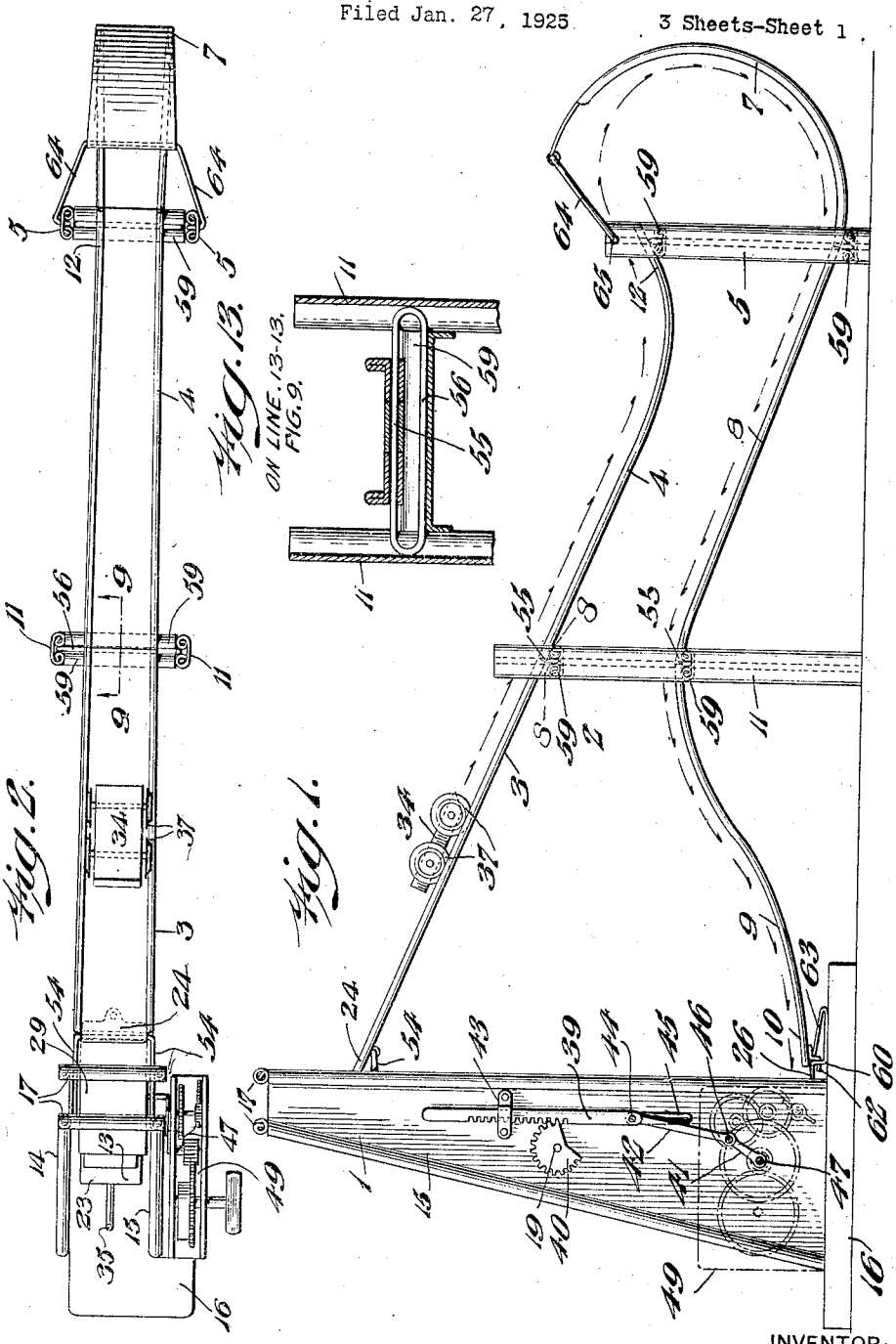


Fig. 2.

Fig. 13. ON LINE 13-13, FIG. 9.

Fig. 1.

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Fig. 3.

ON LINE 3-3. FIG. 4.

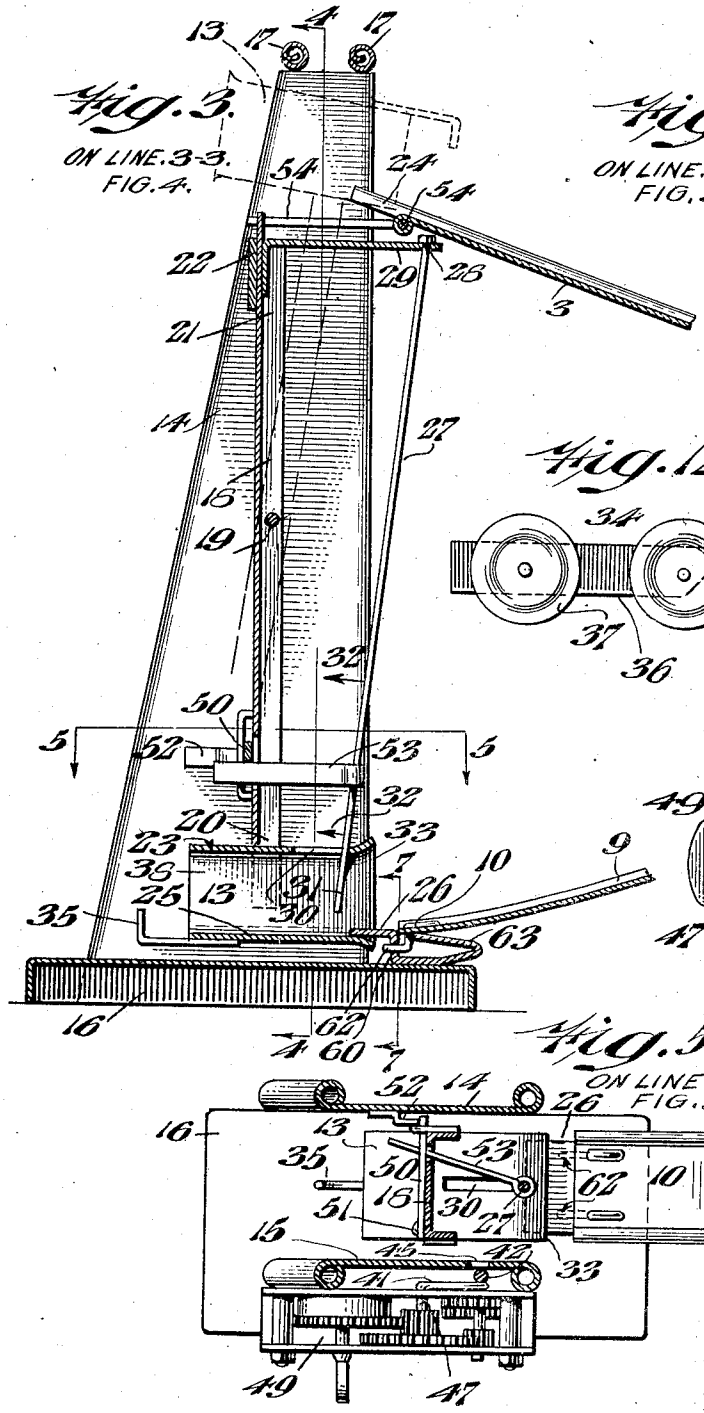


Fig. 4.

ON LINE 4-4 FIG. 3.

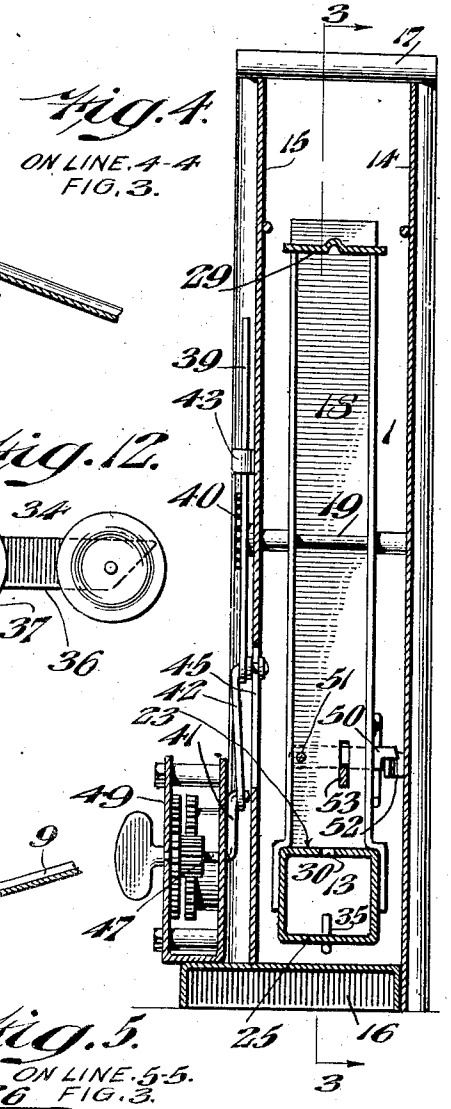


Fig. 12.

Fig. 5.

ON LINE 5-5. FIG. 3.

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Fig. 11.

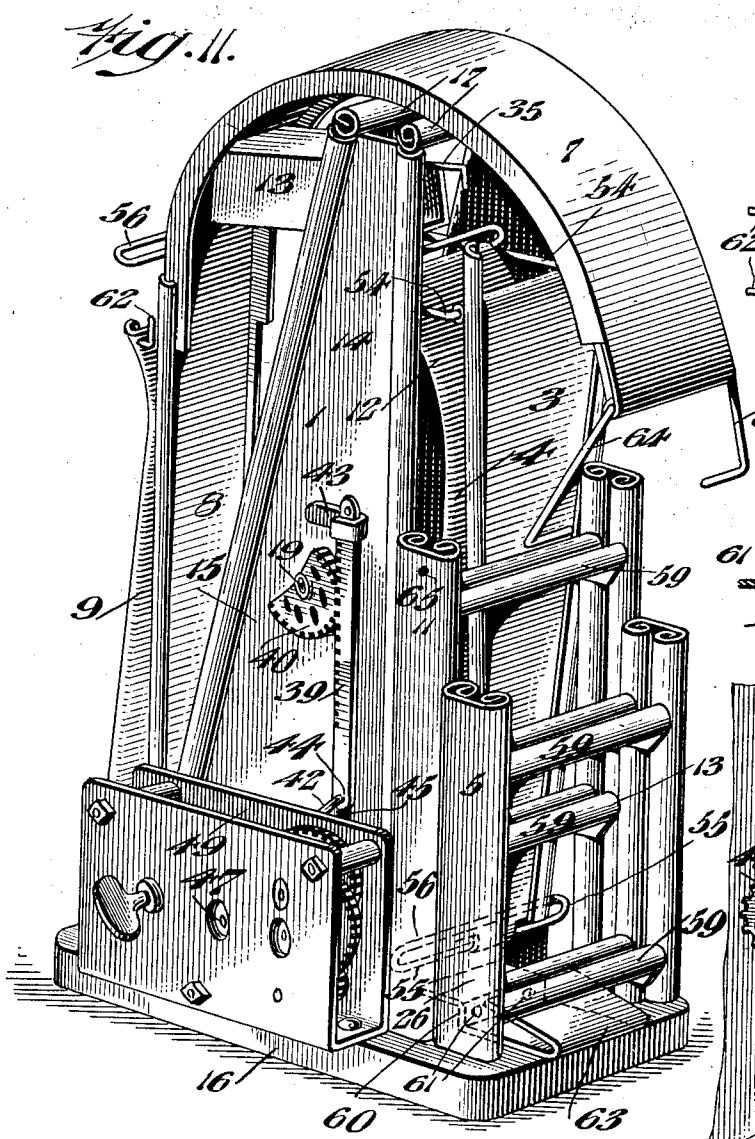


Fig. 6.

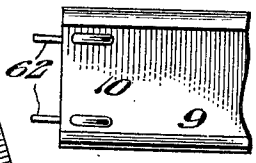


Fig. 7.

ON LINE 7-7. FIG. 3.

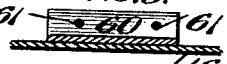


Fig. 10.

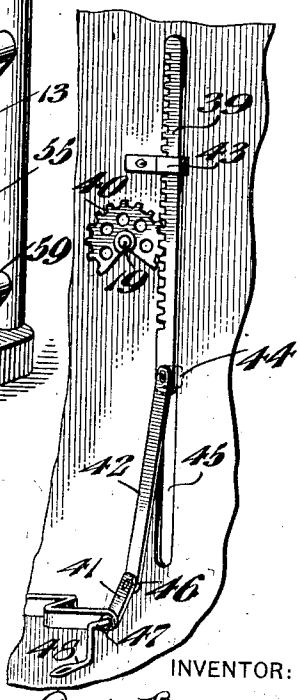


Fig. 3.

ON LINE 8-8. FIG. 1.

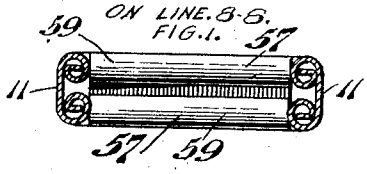
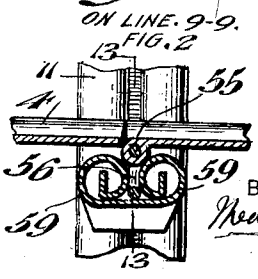


Fig. 9.

ON LINE 9-9. FIG. 2



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Patented Sept. 14, 1926. 1,599,982

UNITED STATES PATENT OFFICE.

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AMUSEMENT APPARATUS.

Application filed January 27, 1925. Serial No. 5,031.

My invention relates to a new and useful amusement apparatus or toy, including an inclined railway, a car adapted to travel thereon, and a lifting tower; wherein the car is automatically raised to the high level of a railway and is then allowed to descend to the low level by gravity.

My invention further relates to the novel combination of an inclined track or railway and an automatic lifting tower; the ends of said railway terminating in the top and bottom of the tower respectively.

My invention further relates to an inclined railway and lifting tower of the character stated, which may be readily dismantled and folded up compactly so as to facilitate the wrapping, shipping and storage of the same, thereby greatly diminishing the cost of packing and handling.

With the above ends in view, my invention consists of a tower, an inclined railway or track extending from the top of the tower to the bottom thereof in any desired path, and may be either continuous or discontinuous. Thus the track or railway may extend from the top of the tower in a spiral path terminating at the bottom of the tower, or as in the particular embodiment of my invention herein shown and described, the railway extends from the top of the tower in a downwardly inclined path, is broken in mid-air, and the path is then taken up by a looped track section and a second track section terminating at the bottom of the tower.

My invention further consists of a novel lifting device within said tower pivotally mounted approximately mid way of the height thereof, and adapted to oscillate on said pivot, a cage or other receptacle carried by one end of said lifting device adapted to receive a car or other suitable mobile object at one end thereof and to discharge the same at the other end thereof.

My invention further consists of certain novel retaining, locking and releasing mechanisms, co-operating with said cage or other suitable receptacle, so as to lock said cage or receptacle in a receiving position, retain the car or other suitable mobile object within the said cage in its travel from the bottom of the tower to the top thereof, and to release the car through the opposite end of the cage at the top of the tower; and certain novel means to actuate said lifting device.

For the purpose of illustrating my invention I have shown in the accompanying drawings forms thereof which are at present preferred by me, since they have been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

In the drawings in which like reference characters indicate like parts.

Fig. 1 represents a side elevation of a novel inclined railway and automatic lifting tower embodying my invention.

Fig. 2 represents a plan view of the same.

Fig. 3 represents on a larger scale a section of the lifting tower on line 3—3 of Fig. 4.

Fig. 4 represents a section on line 4—4 of of Fig. 3.

Fig. 5 represents a section on line 5—5 of Fig. 3.

Fig. 6 represents a plan view of the lower terminal of the railway.

Fig. 7 represents a section on line 7—7 of Fig. 3.

Fig. 8 represents the section on line 8—8 of Fig. 1.

Fig. 9 represents a section on line 9—9 of Fig. 2.

Fig. 10 represents a perspective view of a portion of the lifting tower, showing a modified form of my novel construction.

Fig. 11 represents a perspective view of my novel amusement apparatus or toy, showing the same folded for wrapping and shipping.

Fig. 12 represents a side elevation of the car on an enlarged scale.

Fig. 13 represents a section on line 13—13 of Fig. 9.

Referring to the drawings, 1 designates a lifting tower, of any suitable height, depending upon the size of the apparatus or toy, and depending more particularly upon the length of track or railway desired. 2 designates the inclined railway of my novel construction consisting of the downwardly inclined track sections 3 and 4, extending from the top of the tower 1 to the trestle 5, and the lower track sections including the loop or vertical curve portion 7, the upwardly inclined track section 8, and the downwardly inclined section 9 terminating at 10, at the

bottom of the tower 1. The upper inclined track sections 3 and 4, as well as the lower track sections 8 and 9, are supported by a central trestle 11, and are also secured to the end trestle 5 as shown in Figs. 1 and 2. Thus a car or other mobile object released at the top of the tower, onto the railway 2, will be projected, due to the velocity of the car, from the slightly turned up end 12 of the track section 4, in an arcuate path against the curved loop section 7, and will be retained against said curved section and caused to follow said curved section onto the upwardly inclined section 8 of the lower track, by the centrifugal force imparted to the car by the curved path. By properly proportioning the length of the track sections with respect to the height of the tower, as well as with respect to the friction encountered by the car, the car is made to rise on the upwardly inclined section 8 on the lower track to the high point of said track section, then to descend to the bottom of the tower 1, with sufficient velocity to enter the cage 13.

Referring to Figs. 1 to 5 inclusive, it will be seen that the tower consists of two side frame members 14 and 15, supported on the base 16, and braced as well as spaced at their upper ends by the cross members 17. The lifting is accomplished by means of an arm 18, secured to a pivot pin 19, which is rotatably mounted in suitable bearing openings in the side frame members 14 and 15, thus allowing said lifting arm 18 to oscillate to and fro, about the pivot pin as a center. The cage 13 is rigidly carried by the end 20 of the lifting arm, and is suitably counterbalanced at the other end 21 of the lifting arm 18, by the weight 22, thus reducing the amount of force required to oscillate the arm. The length of the lower portion 20 of the arm 18 is so fixed, that when the arm 18 is oscillated so as to bring the cage 18 to the upper end of the tower, as indicated in dotted lines in Fig. 3, the upper wall 23 of the cage 13, will be in alignment with the upper terminal end 24 of the track section 3; while in the lower or bottom wall 25, is in alignment with the receiving plate or platform 26, in the lower receiving position of the cage.

In order to retain the car within the cage as it enters the same, and to retain the car while the cage is being lifted to the top of the tower; and in order to release the car at the top of the tower onto the track section 3, I provide a novel construction in a stop and latch mechanism shown particularly in Figs. 3 to 5 inclusive. Thus I provide a pendant rod 27 suspended freely through the opening 28 in an extension 29 of the lifting arm 18, which pendant rod 27 extends into the cage 13 to a desired depth, through the elongated guide opening 30 in the top wall 23 of said cage. Thus the car, upon entering the cage 13 encounters the lower end 31 of the rod 27, forcing the same ahead of it in the direction of the arrow 32, until it has passed the rod and is clear of the same, when the rod will drop back behind the car, into its normal position shown in Fig. 3, thereby preventing the retreat of the car through the entrance end 33, when the cage is subsequently raised and inverted. In order to stop the car 34 within the cage as the same enters, I provide an upwardly projecting stop 35 of suitable height so as to rise above the bottom 36 of the car 34, thereby causing the front end thereof to encounter the stop. The car 34 and the cage 13 are so proportioned with respect to each other, that there is a certain amount of vertical play between the top and bottom walls 23 and 25, and the wheels 37 of the car. Thus, as the cage 13 is swung from the bottom of the tower to the top thereof in an arcuate path, and as the cage is thus inverted, the car 34 drops from the bottom wall 25 of the cage, onto the top wall 23 thereof, thereby causing the bottom 36 of said car to clear the projecting stop 35, so as then to permit the exit of the car 34 through the exit end or opening 38 of the cage 13, and thus to discharge the same onto the upper terminal 24 of the railway 2, in an inverted position.

It is thus seen that in the particular embodiment of my invention, the car 34 is inverted as it is raised from the bottom of the tower to the top, and is again inverted by the railway 2, as it passes the loop 7, so as to cause the car always to enter the cage 13 in an upright position. Since the car 34 thus travels part of the way with its bottom side up, it is so designed that the wheels 37 are of a diameter large enough to clear the body of the car both at the top and bottom and thus provide a suitable set of rolling contact points at the top as well as at the bottom of the car. It is to be noted here however, that this double set of rolling contact points may be produced by other means besides the larger diameter wheels therein shown and described; as for instance by merely duplicating the wheels both on top and bottom of the car, thus providing eight small wheels instead of the four large wheels.

In order to oscillate the lifting arm 18, so as to bring the cage 13 alternately in alignment with the lower and upper terminal of the railway, I provide a novel actuating device comprising a rack and pinion 39 and 40, and the crank arm 41 and connecting rod 42. Thus the pinion 40 is rigidly secured to the end of the pivot pin 19, and is in operative engagement at all times with the rack 39, which is slidably mounted and carried by the guide 43, and the pivot pin 44 guided within the guide opening 45 in the side frame member 15 of the tower. The rack

39 is in turn actuated by the crank arm 41 through the connecting rod 42, which is pivotally connected to the lower end of the rack 39, by means of the pivot pin 44, and is similarly connected to the crank arm 41, by the crank pin 46. Thus by rotating the crank shaft 47, the rack 39 is caused to reciprocate vertically, and the pinion 40 and hence the arm 18, are caused to oscillate to and fro a corresponding amount. By the proper proportioning of the crank arm 41 and the diameter of the pinion 40, the lifting arm 18 is caused to oscillate a sufficient amount between the proper limits, so as to cause the cage 13 to be positioned alternately at the bottom and the top of the tower 1. The crank shaft 47 may be revolved or actuated either manually by means of the crank handle 48 as shown in Fig. 10 or it may be driven as shown in Figs. 1 to 5 inclusive, and by any suitable motor, such as the spring motor 49.

In order that the car may be received, retained, and discharged by the cage, and that the cage and lifting arm may be locked in, and released from the receiving position entirely automatically, and in proper synchronism, I provide a novel lift controlling means, whereby the cage 13 is normally locked in its lower or receiving position, against the force of the motor 49 tending to lift or raise the same, and thereby the cage and lifting arm are released by the car, upon entering the cage, in the proper cycle of events in the course of its travel. Thus I provide on the lifting arm 18, a latch 50, pivotally mounted on the pivot 51; and a stop 52 rigidly secured to the side frame member 14 of the tower 1, in operative alignment with the free end of said latch 50, so as to engage the latch 50 when the latter is down; in order to retain the lifting arm 18 and hence the cage 13, in the lower or receiving position thereof by such engagement with the latch 50. There is also provided the trip or lift bar 53 rigidly carried by the rod 27, and extending under the latch 50, so as to lift the latch 50 above and clear of the stop 52, as the rod 27 and trip bar 53 are forced forward in the direction of the arrow 32 by the car 34 entering the cage 13. Thus it will be seen that the latch 50 retains the lifting arm 18 and hence the cage 13, in its lowermost or receiving position normally, and releases the same as the car 34 enters the cage 13, after completing its travel down the railway 2, propelled by gravity. The pendant rod 27 thus serves both to release the lifting arm 18 and cage 13, after the latter has received the car 34 from the railway 2; as well as to retain said car within said cage in its upward travel to the top of the tower, when the cage and car are inverted. Thus by means of my novel latch and release mechanism the car may continue in its travel indefinitely, so long as power is supplied to the crank shaft 47, without any further manipulation on the part of the operator. It is only necessary to place the car at the top or upper terminal 24 of the railway 2, to start the mechanism. The car descends the railway to the bottom of the tower, enters the cage 13, and in so doing encounters the lower end 31 of the rod 27, and forces the same, as well as the trip bar 53 forward, thereby releasing the lifting arm 18 and cage 13; the motor 49 then lifts the cage from the lower position to the top of the tower as shown in dotted lines in Fig. 3, and there discharge the car onto the upper terminal of the railway. Once started this cycle of events is repeated uninterruptedly until the motor is stopped or the lifting arm 18 is stopped in its lower position and retained by the latch 50.

In order that the toy may be dismantled readily, and in order that it may be wrapped more compactly, I provide certain novel fastening and locking means on the rails or track sections, and the trestles therefor; as well as on the terminals of the rails where the latter engage the tower 1. Thus the upper track sections 3 and 4 are hingedly secured to each other as well as to the tower 1, at the upper terminal end 24 as shown in Figs. 2 and 3. Thus the hinge pin 54 is bent back and secured to the top of the tower 1, while the hinge pin 55 is bent back on itself to form a loop 56 which is removably secured to the transverse trestle members 59, in a manner shown in Figs. 8 and 9. Similarly the lower track sections 8 and 9 are also hingedly joined in the trestle 11. The track sections are also removably, secured to the trestles 11 and 5, by means of the novel spring clamps shown particularly in Figs. 8 and 9, consisting of the wire loops 56 carried by the rail sections and the two spiral spring tubular members 57, and the central web 58 forming the transverse trestle members 59. Thus as the wire loop 56 is forced down between the two spiral tubular portions or members 57, the latter spring back into the loop, retaining the same rigidly between the spiral spring cheeks 57, in a removable manner.

In order to attach the lower terminal 10 of the railway 2 to the bottom of the tower, in a removable manner, so as always to align said lower terminal 10 with the receiving plate or platform 26, I provide in the wall 60, a number of apertures 61, and corresponding pins 62 fixed to the end or terminal 10 of the rail, as shown particularly in Figs. 1, 3, 5, 6 and 7, which pins 62 are adapted to enter the openings 61 so as to hold said terminal 10 of the rail, in alignment with the receiving plate or platform, as well as in alignment with the cage 13. In order to retain said terminal 10, against

any lateral movement with respect to the tower, that is to prevent the same from pulling free from the tower, and pulling the pins 62 out of the openings 61, I provide a flat spring 63, preferably integral with and a continuation of the wall 60, as shown particularly in Figs. 1 and 3, which spring 63 snaps into the position shown in Figs. 1 and 3 after the pins are inserted, thereby retaining the pins in said openings. In order to remove the pins 62 from the opening 61, and hence to detach the track section 9 from the bottom of the tower 1, it is only necessary to depress the spring 63, and withdraw the track section 9, and the pins 62, from the opening 61.

Thus in order to dismantle the toy, and to wrap the same compactly, it is only necessary to detach the rail sections from the trestles 5 and 11, to detach the rail section 9 from the bottom of the tower 1, and then to fold the top and bottom rail sections 3 and 4 and 8 and 9 respectively, about the hinge pins 55, into the position shown in Fig. 11. The trestles 5 and 11 may then be placed up against the folded up sections as shown in Fig. 11, so as to produce a neat and compact assemblage of parts. By this means it is possible to wrap and ship the toy at a considerably smaller package, thereby lessening the cost of handling at the same time reducing the risk or damage, in handling and shipping.

I may also provide the hooks 64, carried by the end of the loop 7 and adapted to engage the trestle 5 in a manner shown in Figures 1 and 2, by insertion into the openings 65 in the upper ends of the upright trestle members 5, so as always to retain the loop section 7 in the desired alignment with the end 12 of the inclined rail section 4. This provides a rigid and yet detachable support for the end of the loop 7.

It will now be apparent that I have devised a novel and useful construction of amusement apparatus, which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have, in the present instance, shown and described preferred embodiments thereof which will give in practice satisfactory and reliable results, it is to be understood that the same are susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

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

1. The combination of an inclined railway, a mobile object adapted to travel on said railway, a spring propelled lifting device common to the two terminals of said railway, adapted to receive said mobile object from the lower terminal and to discharge the same onto the upper terminal of said railway, and means controlled by said mobile object for locking and releasing said lifting device in the receiving position.

2. In a device of the character stated, an inclined railway comprising sections having their terminals in substantially vertical alignment, a car adapted to travel on said railway and spring propelled means common to and intermediate of the terminals of said railway for automatically raising the car from the lower to the upper terminal of said railway.

3. In a device of the character stated, a tower, a railway extending from the top of the tower and returning to the bottom thereof, a car adapted to travel on said railway and an automatic spring propelled lifting device within said tower adapted to raise the car from the bottom to the top of the tower.

4. In a device of the character stated, a tower, a railway extending from the top of the tower and returning to the bottom thereof, a mobile object adapted to travel upon said railway and a spring propelled lifting device within said tower, controlled by said object and adapted to raise said car from the bottom of the tower to the top thereof.

5. In a device of the character stated, a tower, an inclined railway having its terminals positioned at different levels of said tower and spring propelled means automatically to raise the car from the lower to the higher level and to discharge the same onto the upper terminal of the railway.

6. In a device of the character stated, a tower, an inclined railway terminating at different levels of the tower, a car adapted to travel on said railway, a lifting device within said tower, controlled by said car and adapted automatically to raise said car from the lower to the upper terminal of the railway.

7. In a device of the character stated, a tower, an inclined railway terminating at different levels of said tower, said railway being discontinuous and including a reversing loop, a mobile object adapted to travel on said railway, a spring propelled lifting device supported within said tower and adapted to raise said car from the lower to the upper terminal of the railway, and means associated with said lifting device and cooperating with said car for locking and releasing said device in proper sequence.

8. In a device of the character stated, an inclined railway, having its terminals in substantially vertical alignment, a car adapted to travel on said railway, a reversing loop forming a part of said railway, and adapted to invert said car in its travel thereover, means common to said railway terminals for automatically raising said car from the lower to the upper terminal and discharging the

same at the latter terminal in a right side up position.

9. In a device of the character stated, an inclined runway having its terminals spaced apart and in substantial vertical alignment with each other, a mobile object adapted to travel on said runway and spring propelled means common to and intermediate of the terminals of said runway for automatically raising the car from the lower to the upper terminal of said runway.

10. In a device of the character stated, a pivotally mounted lifting arm, a lift carrier carried by said arm, means to oscillate said carrier between upper and lower limits, an inclined railway extending from the upper to the lower limits of travel of said carrier, and a mobile object adapted to travel on said railway and to be received and discharged by said carrier.

11. In a device of the character stated, a pivotally mounted lifting arm, means to oscillate said lifting arm between a lower and an upper position thereof, an inclined runway having its terminals in proximity to the lower and upper positions of the end of said arm, a mobile object adapted to travel on said runway, and means carried by said arm for receiving from, and discharging onto, the lower and upper terminals respectively of said runway, said mobile object.

12. In a device of the character stated, a lifting tower, a lifting arm pivotally mounted in said tower, means tending to oscillate said arm from a lower to an upper position thereof, a locking latch adapted to retain said arm in the lower position, means carried by said arm for receiving and discharging a mobile object, and means co-operating with said locking latch to release said lifting arm from the lower position thereof upon the receipt of the mobile object.

13. A lifting tower including a pivotally mounted lifting arm, means to oscillate said lifting arm, about its pivot between lower and upper limits, a carrier carried by said arm for receiving and discharging a suitable mobile object, a latch adapted automatically to lock said arm in the lower receiving position thereof and means actuated by said mobile object for disengaging said latch, and releasing said lifting arm so as to permit the same to oscillate.

14. In a device of the character stated, a carrier adapted to receive a mobile object, means to oscillate said carrier between a lower receiving and an upper discharging position thereof, a latch automatically to lock and retain said carrier in its lower receiving position a mobile object adapted to be carried by said carrier, a locking device adapted to retain said mobile object in said carrier, and a latch releasing trip co-operating with said locking device and with said latch, adapted to release said latch and to set said carrier free to oscillate, when said locking device is encountered and displaced by said mobile object.

15. In a device of the character stated, a lift cage, means to oscillate said cage between a lower receiving and an upper discharging position thereof, a car adapted to be received and discharged by said car, a latch automatically to lock and retain said cage in its lower receiving position, a car retaining rod in the path of said car adapted to retain said car in said cage, and a latch trip carried by said car retaining rod adapted to release said latch and to set said cage free to oscillate when said retaining rod is displaced by said car.

16. In a device of the character stated, a tower, a runway formed of sections, hinged intermediately of its ends, an end of said runway being hinged to said tower, a trestle detachably connected to said runway in proximity to its intermediate hinge, and means for enabling said runway sections upon the disconnection of said trestle to be folded against each other and against said tower.

17. In a device of the character described, a tower, a runway formed of sections hinged intermediate of its ends, an end of said runway being detachably secured to said tower, a trestle detachably connected to said runway in proximity to its hinge, and means for enabling said runway sections upon the disconnection of said trestle to be folded against each other.

18. In a device of the character described, a tower, an upper inclined runway formed of sections hinged intermediate of its ends, an end of said runway being hinged to said tower, a lower runway formed of sections hinged intermediate of its ends, and including a reversing loop, an end of said runway being detachably secured to said tower, a trestle detachably connected to each of said runways in proximity to their hinges and means for positioning and retaining said loop in spaced relation and in tangential alignment with the lower end of said upper runway.

19. In a device of the character stated, a tower, an inclined sectional, knock down runway extending from the top of said tower to the bottom thereof; said runway being composed of upper runway sections hingedly secured to each other and to the top of the tower, and adapted to be folded up against said tower when knocked down, and lower runway sections hingedly secured to each other and adapted to be also knocked down and folded up against and over said tower, and detachable trestles for said runway adapted to lock the latter, when in operative and unfolded position.

20. In a detachable aligning terminal connection for railways, runways and the like,

a terminal plate having a horizontal aligning aperture therein, a runway, a dowel pin extending from the end of said runway and rigidly carried thereby, and adapted to be inserted into said aligning aperture, and a yieldable lock adapted to retain said dowel pin in said aperture when inserted thereinto.

21. In a device of the character stated, a runway, a transverse anchoring rod extending across the bottom side thereof, a support for said runway having a transverse member, spring jaws carried by said transverse supporting member adapted to receive said anchoring rod, and to lock the same therebetween in a removable manner.

22. In a device of the character stated, a carrier, means to oscillate said carrier between a lower and an upper position thereof, a car adapted to be received and discharged by said carrier in the lower and upper positions thereof respectively, a stop to limit said car within said carrier in the receiving position of the latter and adapted to permit the discharge of said car in the upper position thereof.

23. In a device of the character stated, a cage, means to oscillate and invert said cage in an arcuate path between a lower receiving and upper discharging position thereof, a car adapted to be received and discharged by said cage, a stop carried by said cage adapted to close the exit opening thereof in the receiving position of the cage and to permit the discharge of the car through said exit opening however in the inverted or discharging position of the same.

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