No. 737,409. PATENTED AUG. 25, 1903.

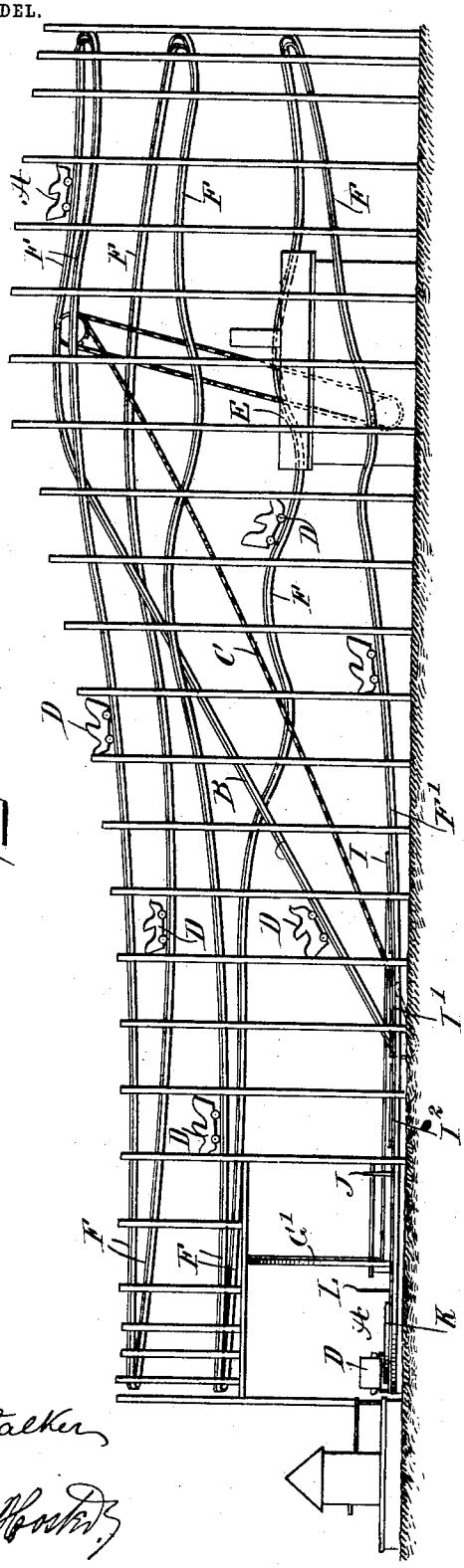
S. E. JACKMAN.

INCLINED RAILWAY.

APPLICATION FILED SEPT. 27, 1902.

NO MODEL. 7 SHEETS—SHEET 1.

Fig. 1.



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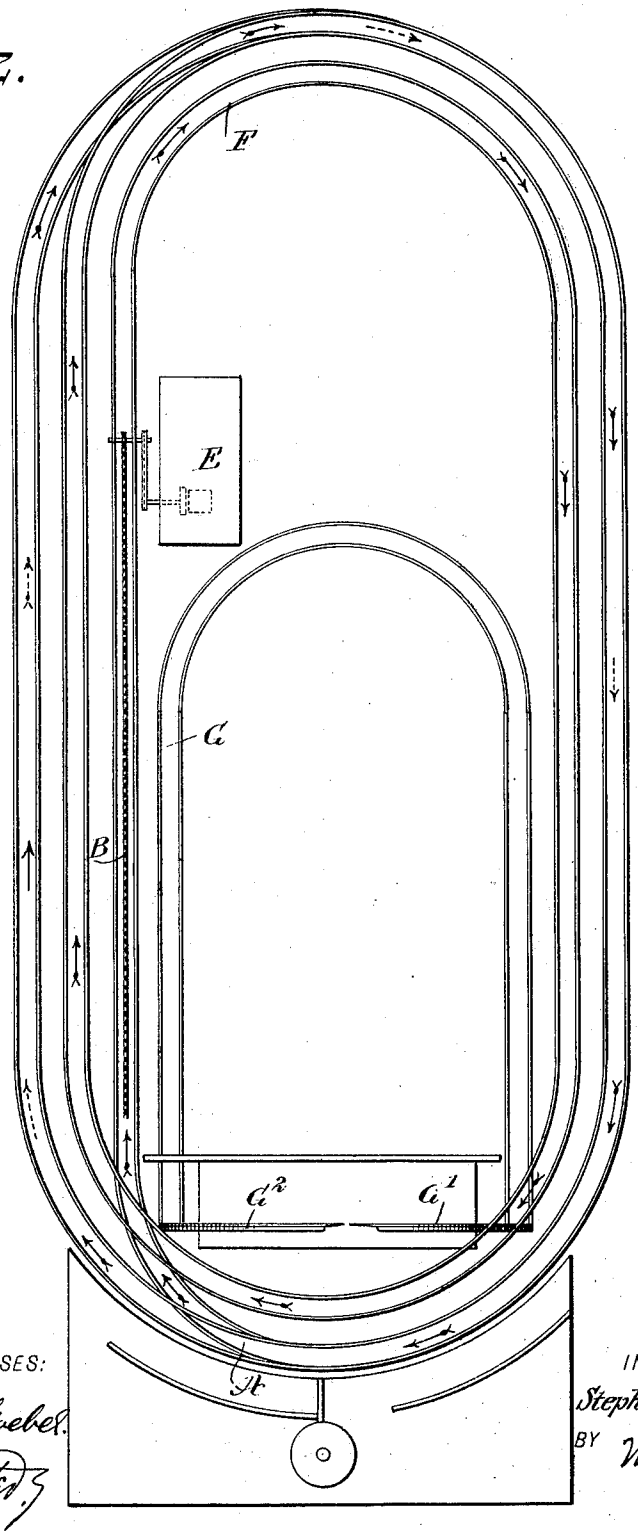
NO MODEL. 7 SHEETS—SHEET 2.

Fig. 2.



WITNESSES:

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NO MODEL. 7 SHEETS—SHEET 3.

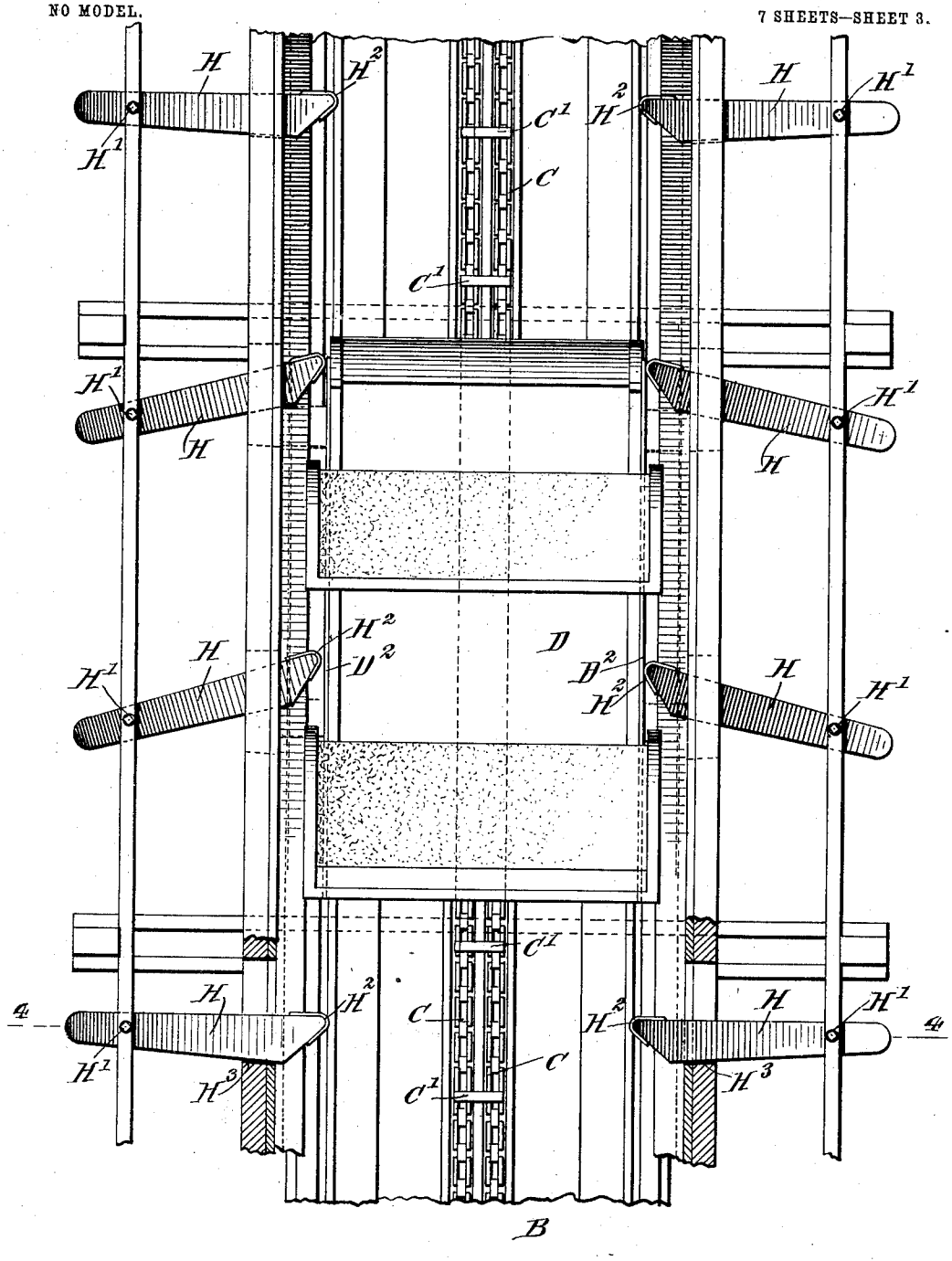

Fig. 3.

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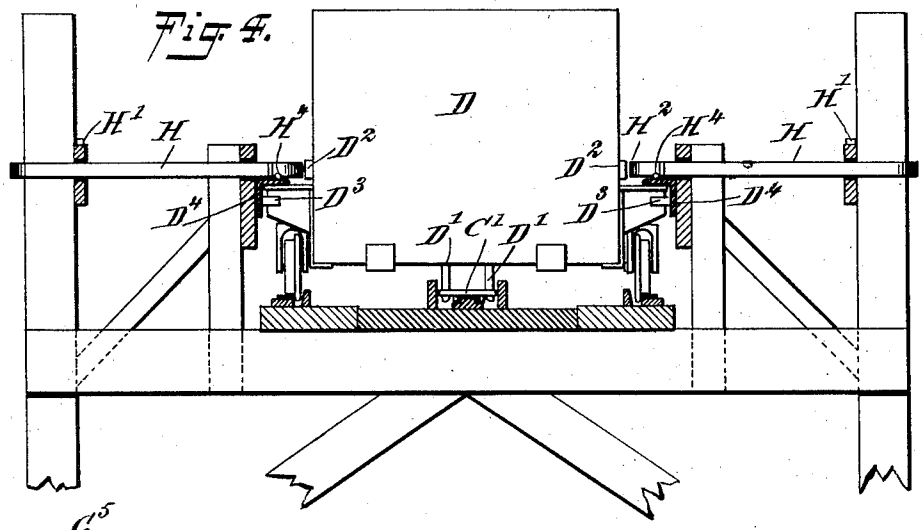
NO MODEL. 7 SHEETS—SHEET 4.

Fig. 4.



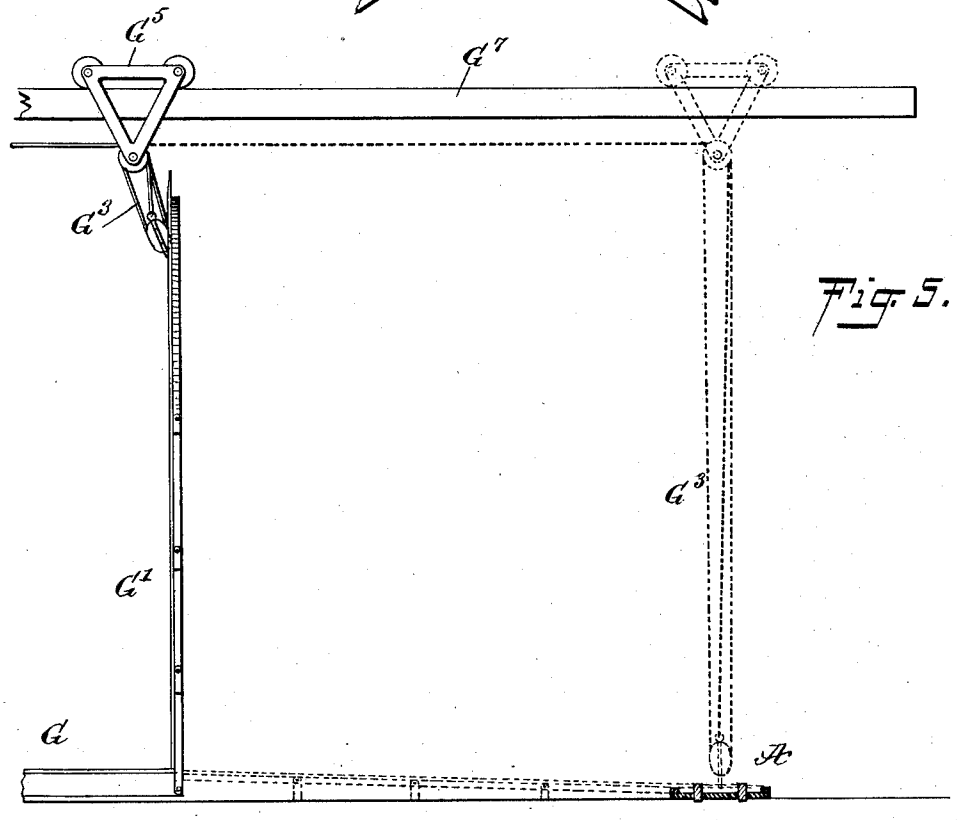
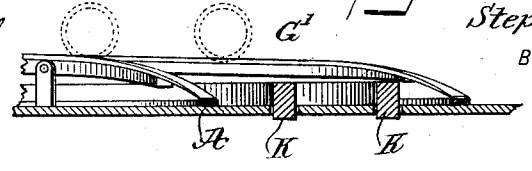


Fig. 5.

Fig. 6.



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No. 737,409. PATENTED AUG. 25, 1903.

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NO MODEL. 7 SHEETS—SHEET 5.

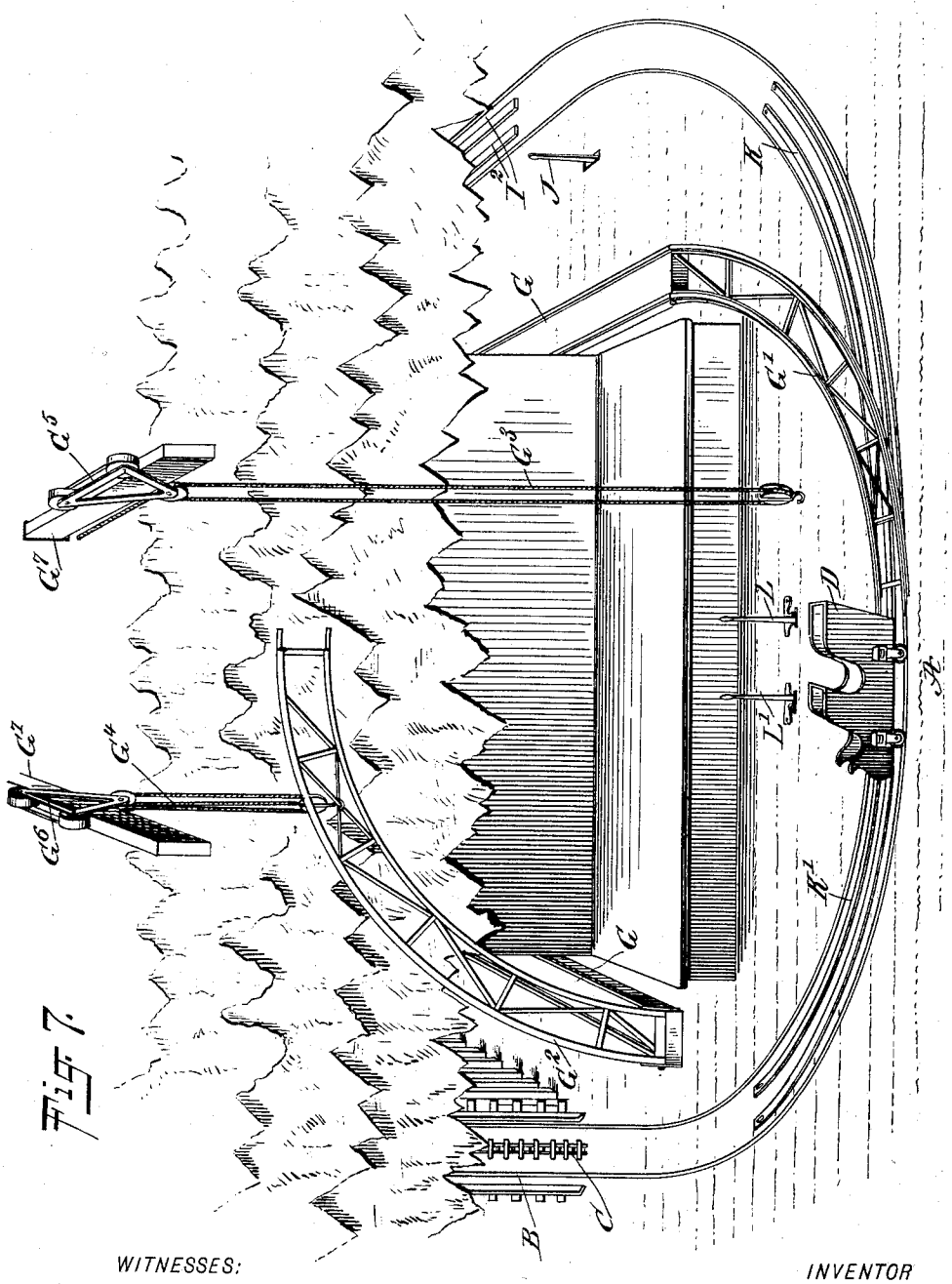

Fig. 7.

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APPLICATION FILED SEPT. 27, 1902.

NO MODEL. 7 SHEETS—SHEET 6.

Fig. 8.

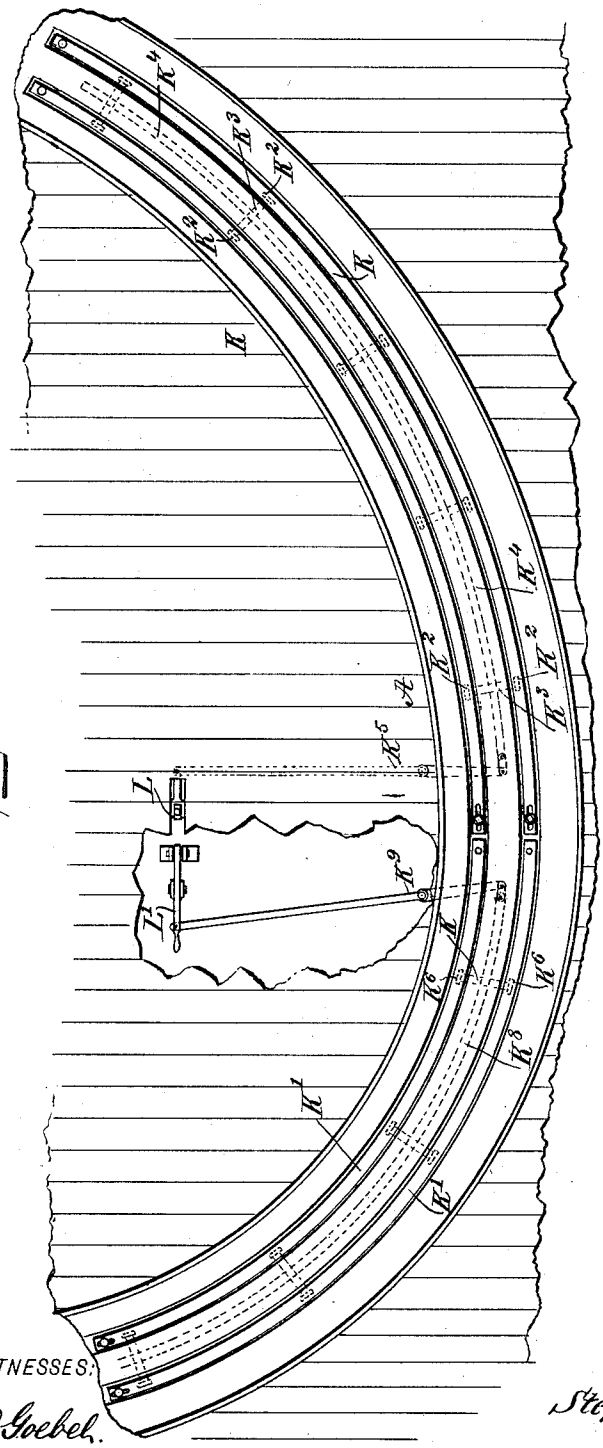
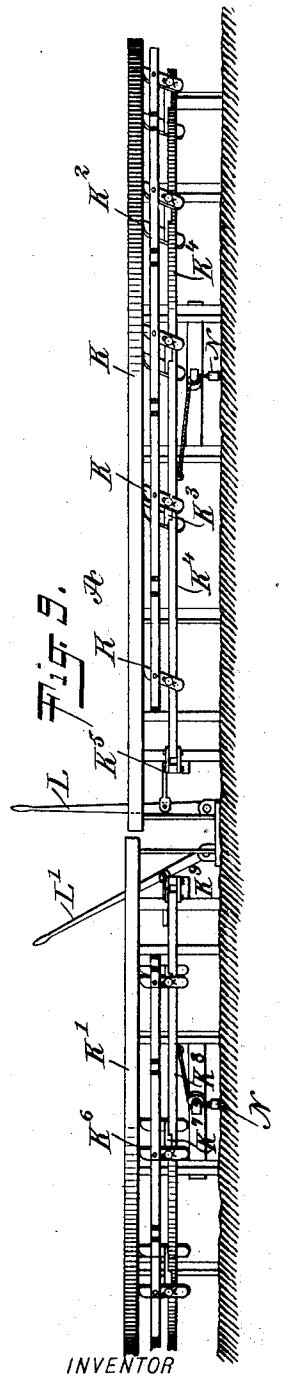


Fig. 9.



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APPLICATION FILED SEPT. 27, 1902.

NO MODEL. 7 SHEETS—SHEET 7.

Fig. 10.

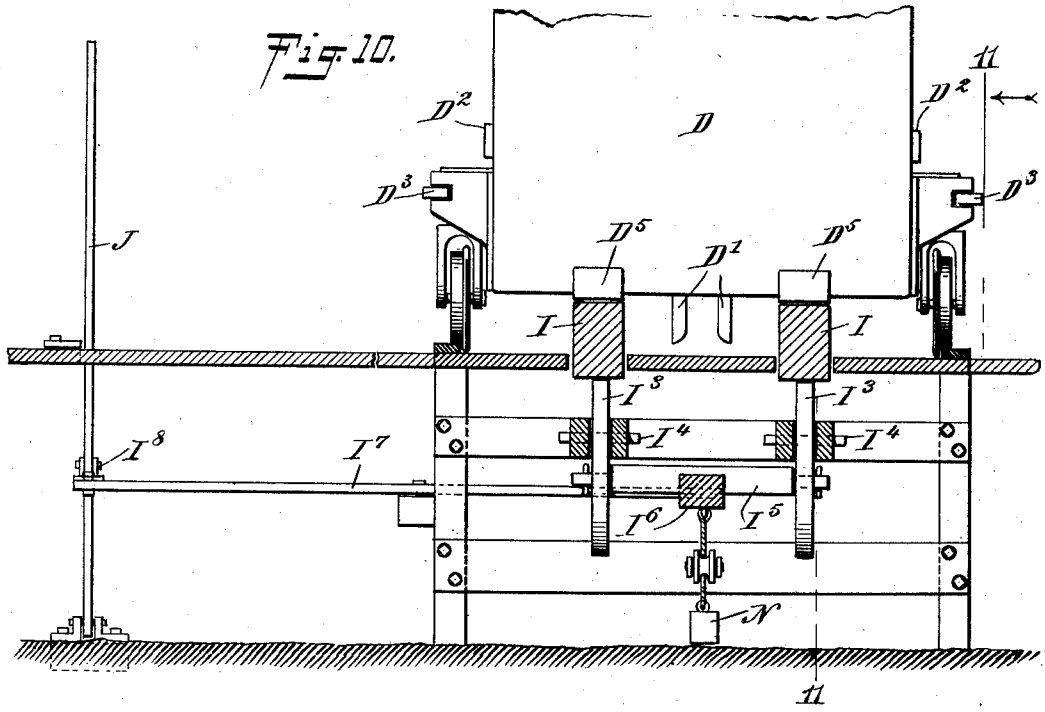
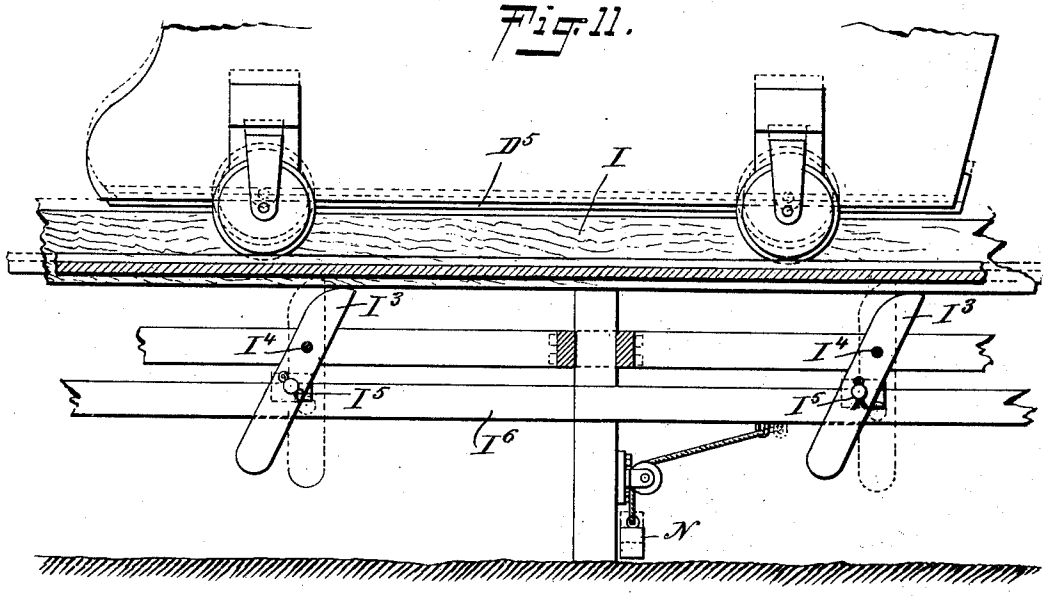


Fig. 11.



WITNESSES:

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ATTORNEYS.

No. 737,409. Patented August 25, 1903.

UNITED STATES PATENT OFFICE.

STEPHEN E. JACKMAN, OF BROOKLYN, NEW YORK.

INCLINED RAILWAY.

SPECIFICATION forming part of Letters Patent No. 737,409, dated August 25, 1903.

Application filed September 27, 1902. Serial No. 125,091. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN E. JACKMAN, a citizen of the United States, and a resident of the city of New York, (Coney Island, borough of Brooklyn,) in the county of Kings and State of New York, have invented a new and Improved Inclined Railway, of which the following is a full, clear, and exact description.

The invention relates to apparatus for use in pleasure resorts, exhibitions, and the like; and its object is to provide a new and improved inclined railway arranged to enable persons to enjoy a continuous ride over an inclined or switchback road back to the starting-point or station, and to allow the proprietor to readily switch the cars or vehicles in or out from the main continuous track to a siding, to completely control the vehicles during their journey on the continuous track, to avoid accidents, and render the travel of the passengers perfectly safe.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter, and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the improvement. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged plan view of part of the up-track and a car in position thereon. Fig. 4 is a transverse section of the same on the line 4 4 of Fig. 3. Fig. 5 is a transverse section of the main track and part of the siding and switch in elevation and shown disconnected from the main track. Fig. 6 is an enlarged cross-section of the same, showing the switch-rails in a closed position on the main track. Fig. 7 is an enlarged perspective view of the station end of the improvement, showing the delivery-switch of the siding connected with the main track for running a car from the siding onto the main track. Fig. 8 is a plan view of the station end of the improvement, parts being broken out. Fig. 9 is a front elevation of the same. Fig. 10 is an enlarged cross-section of the main track at the home stretch, a car being shown in position on the main track; and Fig. 11 is a longitudinal sectional elevation of the same on the line 11 11 of Fig. 10.

The improved inclined railway is provided with a single continuous track of an approximately oval shape and having a station portion A, approximately semicircular in shape and connecting at the forward end with the lower end of an up-track B, containing an endless propelling-chain C, having spaced cross-bars for engaging projections or arms D″, depending from the bottom of a car or vehicle D, adapted to travel over the continuous track, as hereinafter more fully described, the said endless chain C being driven by a suitable mechanism from a power-house E, preferably arranged within the track, as indicated in Figs. 1 and 2. The upper end of the up-track B leads to a down-slope F, having a plurality of windings to gradually reach a home stretch F′, leading to the rear end of the station portion A, the said windings being so arranged that the up-track B extends upwardly on the inside of the windings to allow continuous travel of the cars D over the continuous track without interfering one with the other and without the continuous track occupying more space than is absolutely necessary. It is understood that a car D is drawn up the up-track B by the chain C, and when it reaches the upper end of the said up-track it runs off onto the down-slope F by its own gravity and down the same until it finally reaches the station portion A of the track.

In order to accommodate more or less passengers desirous of making the journey along the continuous track, more or less cars are required, and in order to store the cars not in use at the time I provide a siding G, arranged within the continuous track, and preferably made U shape, as plainly indicated in Fig. 2, with the ends of the siding in close proximity to the inner sides of the station portion A. (See Fig. 7.) On the ends of the siding G are pivoted segmental switch-rails G′ and G², normally held in an uppermost position, as indicated to the left in Fig. 7, and adapted to be swung downward, so as to connect the corresponding end of the siding with the main track at the station portion A, as will be readily understood by reference to the right-hand side of Fig. 7, in which

the switch-rails G′ show the right-hand end of the siding G connected with the main track to allow of running a car from the siding G onto the main track. When it is desired to run a car or cars from the main track onto the siding, then the other switch-rails G^2 are swung down to connect with the main track at the station portion, and thereby allow of running a car or cars from the main track over the said switch-rails G^2 onto the siding G at the left-hand end thereof. Normally, however, the switch-rails G′ and G^2 are held in an uppermost position disconnected from the main-track rails to allow the cars D to travel continuously around the main or continuous track. The free ends of the switch-rails G′ and G^2 are adapted to be connected with tackles G^3 and G^4, respectively, supported from carriages G^5 and G^6, mounted to travel on guideways G^7, projecting overhead into the station portion A, as plainly illustrated in the drawings, the said tackles being under the control of the operator to swing the switch-rails G′ and G^2 upward into an elevated non-active position or to allow of lowering the said switch-rails for the purpose above described. The tackles G^3 and G^4 remain connected with the switch-rails G′ and G^2 when the latter are in an uppermost position to hold the same locked in this position; but after the switch-rails G′ and G^2 are swung downward for connection with the main-track rails then the tackles are temporarily disconnected to allow travel of the cars from the siding to the main track and from the latter back to the siding, as the case may be. By the arrangement described the proprietor of the apparatus can very conveniently and quickly run additional cars from the siding onto the main track without interfering seriously with the travel of the cars already on the track, and if the traffic lessens one or more cars can be quickly run off the track onto the siding G by the use of the switch-rails G^2 as soon as the cars have completed their journey.

In order to provide for the safety of the cars D while traveling up the up-track B, I provide arms H in the sides of the up-track and at right angles thereto, as plainly shown in Figs. 3 and 4, the said arms being preferably arranged in pairs on opposite sides, each arm being fulcrumed at H′, with the free end H^2 extending into the path of an approaching car D. The latter is provided on its sides with metallic pins D^2 for engagement with the free ends of the pivoted arms H, so that when a car travels upward on the up-track B it imparts an upward swinging motion to the said arms, so as to move the latter into the upwardly-inclined position (indicated by some of the arms in Fig. 3) to prevent a car from moving accidentally downward should the propelling mechanism get out of order. It is understood that the arms H as soon as their free ends leave the pins D^2 at the rear end of the car swing back to their normal right-angular position by their own gravity or by the aid of springs, if necessary, the said arms then resting against fixed stops H^3, formed in the sides of the up-track B. Now should a car D slide down the up-track B, past the inclined arms H at the time in engagement with the car, then the next lowermost right-angular arms H, projecting into the path of the back of the car, positively prevent further downward movement of the said car to prevent accident and injury to the passengers or occupants of the car. The free end of each arm H is preferably provided on its under side with a ball or roller bearing H^4, as indicated in Fig. 4, to insure the proper return movement of an arm after a car has passed.

Each of the cars D is provided on its sides with horizontally-disposed friction-rollers D^3, adapted to travel on guard-rails D^4, arranged in the continuous track at the sides thereof to prevent undue swaying of the car during its journey over the continuous track.

In order to control a car when it passes over the home stretch F′ back to the station portion A completely independent of the occupants and attendant of the car, I provide the following arrangement: In the home stretch F′ of the continuous track are arranged a plurality of brake mechanisms located one in front of the other, each consisting of pairs of longitudinally-extending beams I, I′, and I^2, mounted to slide up and down in the track lengthwise thereof to engage brake bands or shoes D^5, extending along the bottom of the car from one end to the other, as plainly indicated in Figs. 10 and 11. The brake-beams I, I′, and I^2 rest on the upper ends of arms I^3, fulcrumed at I^4 on the supporting structure of the main track, and the said arms I^3 are preferably arranged in pairs for the two beams I and the arms of each pair I^3 to be connected with each other by a cross-bar I^5, journaled in the said arms. The several cross-bars I^5 are connected with a longitudinally-extending link I^6, pivotally connected at the forward end by a lever I^7 and a link I^8 with a hand-lever J, arranged alongside the home stretch F′ and under the control of an operator. Now when a car swiftly moves down the down-slope F and finally reaches the home stretch F′ under considerable speed then the operator in charge of the lever J imparts a gradual swinging motion to the said lever to cause the link I^8 and lever I^7 to impart a longitudinal movement to the link I^6, which in turn by the cross-bars I^5 imparts a swinging motion to the several arms I^3 to move the beams I upward to engage the under side of the brake-shoes D^5, and consequently brake the car D as the same travels downward on the home stretch F′, the several pairs of brake-beams I, I′, and I^2 serving to reduce the speed of the car independent of any action on the part of the attendant of the car or the passengers therein.

It will be seen from the foregoing that if

necessary the operator in charge of the lever J can move the beams I to such an extent that the car D is lifted a sufficient distance to move its car-wheels off the rails of the main track to allow the car to slide over the said brake-beams to check the speed of the car. As soon as the car has left the lowermost brake-beams I the operator returns the lever J to its former position to allow the brake-beams to move back into a lowermost position with the arms I^3, so that the next following car can run over the brake-beams and be braked thereon by the operator correspondingly manipulating the lever J.

When a car reaches the station portion A under considerably-reduced speed, it is finally brought to a stop by brake-beams K, similar to the brake-beams I, I′, and I^2, but arranged in the segmental portion of the track at the station, the said beams K being under the control of an operator in charge of a hand-lever L, similar to the hand-lever J. It is necessary that the car be brought to a stop at the station for passengers to get off, and when this has been done the brake-beams K are lowered to release the car to allow the latter to continue forward on the track to another set of brake-beams K′ under the control of an operator in charge of a lever L′, arranged at the station to hold the car locked in place for new passengers to enter and seat themselves in the car D previous to beginning the journey. As soon as the passengers are seated in this car the operator releases the lever L′ to lower the brake-beams K′, so that the car can now run to the beginning of the up-track B, at which point the chain C takes hold of the car and draws the same up on the up-track B.

The connection between the brake-beams K and the lever L is similar to the one between the brake-beams I and the lever J—that is, the brake-beams K rest on pivoted arms K^2, connected with each other by cross-bars K^3, attached to a link K^4, having its forward end connected by links and levers K^5 with the hand-lever L. The other brake-beams K′ are also supported by arms K^6, connected with each other by cross-bars K^7, attached to a link K^8, having its forward end connected by links and levers K^9 with the lever L′, previously mentioned.

In practice one single operator is required for manipulating the levers L and L′; but another operator is employed for manipulating the lever J to insure perfect safety of the passengers.

In order to insure a quick downward or return movement of the brake-beams I I′ I^2 and K K′, I may provide counterweights N, having flexible connections with the links L^6, K^4, and K^8 or other suitable part of the brake mechanisms. (See Figs. 9 and 11.)

It is understood that the cars D may be and are preferably provided with special brake mechanisms under the control of an attendant of the car; but by having the brake mechanism described under the control of operators entirely independent of the car-attendant it is evident that cars are not liable to run into each other at the home stretch or station, and hence injury to passengers and damage to property are avoided. By having the separate car controlling or braking mechanisms at the station ingress and egress of the passengers to and from the cars are facilitated to such an extent that a large number of cars can be safely run at suitable intervals over the continuous course to render the apparatus very remunerative to the proprietor.

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

1. An apparatus of the class described, having a continuous main track, and a siding within the main track, provided at each end with a switch movable in and out of contact with the main track, one switch being used to run cars from the siding on the main track and the other for running cars from the main track onto the siding, as set forth.

2. An apparatus of the class described, having a continuous main track, a siding within the main track, provided at each end with a switch movable in and out of contact with the main track, one switch being used to run cars from the siding on the main track and the other for running cars from the main track on the siding, and means for swinging the switches independently one of the other in or out of engagement with the main track, as set forth.

3. An apparatus of the class described, provided with a single continuous track of an approximately oval shape, comprising a station, an up-incline provided with means for drawing cars up from the station to the top of the incline, and a down-slope leading from the said top to the said station, the said down-slope forming a plurality of windings and having its home stretch provided with braking means adapted to engage the cars, the said up-incline extending inside of the windings, as set forth.

4. An apparatus of the class described, provided with a single continuous track of an approximately oval shape, comprising a station, an up-incline provided with means for drawing cars up from the station to the top of the incline, and a down-slope leading from the said top to the said station, the said down-slope forming a plurality of windings having its home stretch provided with a series of braking devices adapted to successively engage the car, the said up-incline extending inside of the windings, and the said convolutions passing over the station at higher levels, as set forth.

5. An apparatus of the class described, provided with a single continuous track of an approximately oval shape, comprising a station, an up-incline provided with means for drawing cars up from the station to the top of the incline, and a down-slope leading

from the said top to the said station, the said down-slope forming a plurality of windings having its home stretch provided with braking means for the car, said means being under the control of the station-master, the said up-incline extending inside of the windings, and some of the windings running parallel one to the other but in different planes, as set forth.

6. An apparatus of the class described, provided with a continuous main track, comprising a station portion, an up-incline provided with means for drawing a car up, a down-slope leading in circuitous windings from the top of the incline back to the said station, a siding having its ends terminating at the inside of the track at the station, and segmental switches hinged to the ends of the siding and adapted to swing down upon the main track, to connect either end of the siding with the main track, as set forth.

7. An apparatus of the class described, provided with a continuous main track, comprising a station portion, an up-incline provided with means for drawing a car up, a down-slope leading in circuitous windings from the top of the incline back to the said station, a siding having its ends terminating at the inside of the track at the station, segmental switches hinged to the ends of the siding and adapted to swing down upon the main track, to connect either end of the siding with the main track, carriages mounted to travel overhead, and rope and tackle connections between the switches and the carriages, as set forth.

8. An apparatus of the class described, provided with a continuous main track having a segmental station portion, a U-shaped siding having its ends terminating near the main track at the station, and segmental switches pivoted to the ends of the siding and adapted to swing down into engagement with the main track, as set forth.

9. An apparatus of the class described, provided with a continuous main track having a segmental station portion, a U-shaped siding having its ends terminating near the main track at the station, segmental switches pivoted to the ends of the siding and adapted to swing down into engagement with the main track, and means for holding the switches independent of each other in an upright inactive position, or for swinging the switches into contact with the main track, as set forth.

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

STEPHEN E. JACKMAN.

Witnesses:

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