

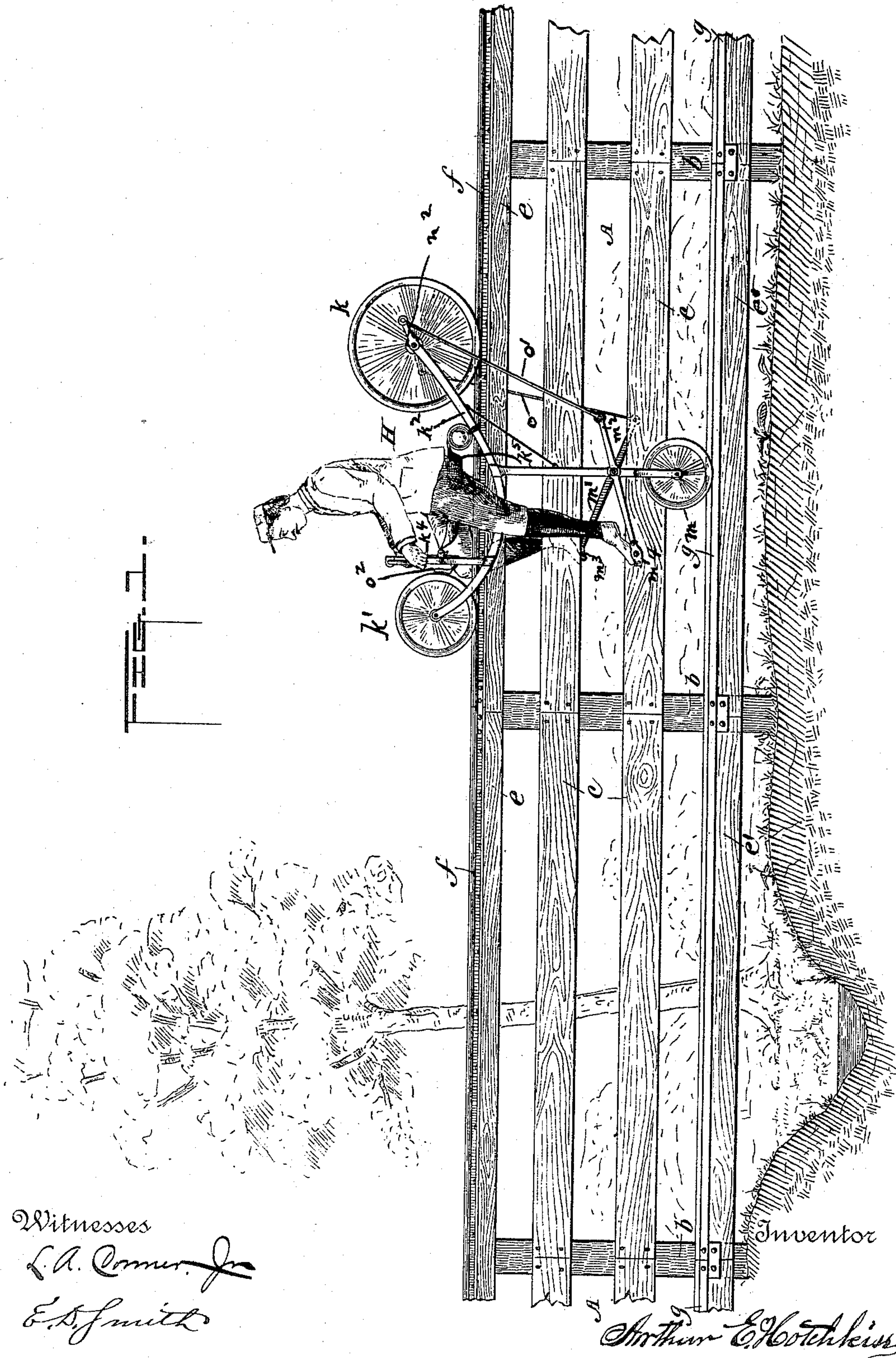
(No Model.)

2 Sheets—Sheet 1.

A. E. HOTCHKISS.
ELEVATED RAILWAY.

No. 488,200.

Patented Dec. 20, 1892.



Witnesses
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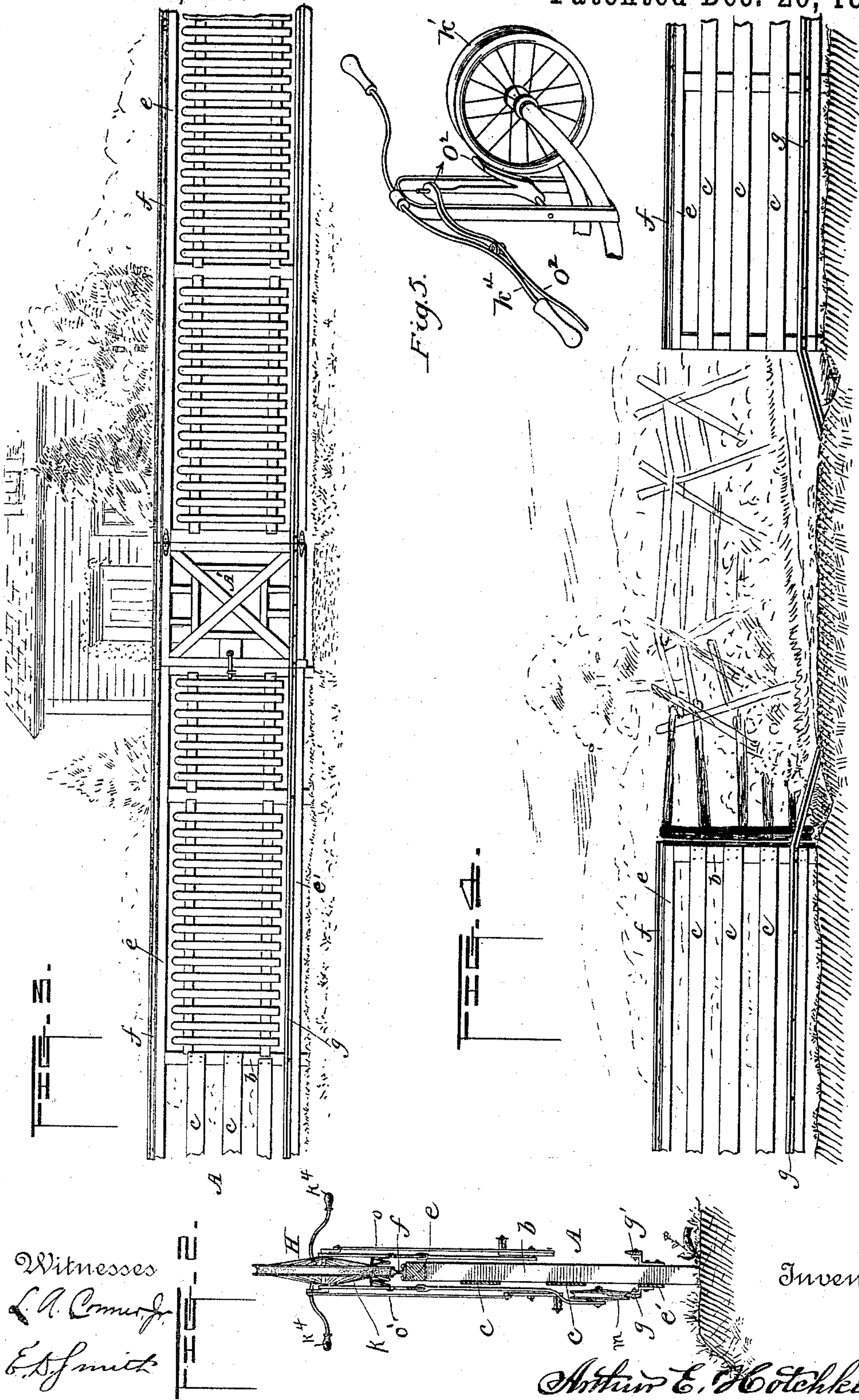
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UNITED STATES PATENT OFFICE.

ARTHUR E. HOTCHKISS, OF CHESHIRE, CONNECTICUT.

ELEVATED RAILWAY.

SPECIFICATION forming part of Letters Patent No. 488,200, dated December 20, 1892.

Application filed November 28, 1888. Serial No. 292,114. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR E. HOTCHKISS, a citizen of the United States, residing at Cheshire, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Elevated-Railway Systems, of which the following is a specification.

My invention relates to a novel elevated railway system.

The principal object of my invention is to provide a novel elevated system for the conveyance of passengers or merchandise from point to point which shall be perfectly safe and reliable and at the same time free from the dangers heretofore attending over-head or elevated railway systems.

My invention consists of a railway system constructed, arranged and operating substantially in the manner hereinafter described and particularly pointed out in the claims.

The nature of the invention will be more fully understood taken in connection with the accompanying drawings which illustrate one of the ways in which it may be conveniently carried into effect; and in which

Figure 1 is a side elevation of a supporting structure provided with a track adapted to permit of a car, carriage or other vehicle to travel over the same and the said view illustrating one of the ways in which my invention may be carried out. Fig. 2 is a vertical section through said structure with a vehicle mounted thereon and adapted to run over the course. Fig. 3 is a side elevation of the supporting track structure for the vehicle to travel over, arranged in this instance, adjacent to a building in order to illustrate how the same may be provided with gates having a section of track secured thereto and at the same time serve as a supporting track structure for the vehicle to travel over. Fig. 4 is a side elevation of the supporting track structure showing a gap in the course between cross-roads; and Fig. 5 is a perspective view of the front portion of a vehicle such as illustrated in Fig. 1, showing the pilot-wheel and handle-bar with brake-mechanism shown in application and adapted to be brought into engagement with the surface of the pilot-wheel for stopping or retarding the movement of the vehicle as required.

Referring to the drawings *e* and *e'* are the longitudinal stringers secured in any preferred manner to vertical supports *b*, held firmly in this instance in the ground. These longitudinal stringers may be provided with intermediate stringers secured to the vertical supports *b*, for increasing the strength or solidity of the supporting structure of the railway course and for other purposes hereinafter enumerated. The upper longitudinal stringer *e*, is provided with a rail *f*, of any preferred form or shape and the longitudinal stringer *e'*, has attached thereto in any preferred manner rails *g* and *g'* to serve as guide rails to be hereinafter more fully described.

It is a vehicle which may be of any preferred construction, but I have however, found a vehicle constructed and arranged substantially in the manner illustrated in Fig. 1, as well adapted for the purposes of my invention. This vehicle may be provided with two traction wheels *k* and *k'* of different diameters and which I have designated in this instance as "driving" and "pilot" wheels and connected from the respective hubs of the wheels with each other by back-bones *k²* and *k³*, which are provided with a vertical arm *k¹⁰* to which is suitably attached or secured a handle-bar *k⁴* and a seat or spring actuated saddle *k⁵*, having the front extremity thereof connected with the vertical arm *k¹⁰* and depending bars *l* and *l'* to which is journaled a guide wheel or wheels *m*. The rear extremity of the seat or saddle *k⁵*, is attached to a spring *k¹¹*, which is suitably clipped at *k¹²*, to the backbones or frames *k²* and *k³*. The driving wheel *k*, is constructed of a greater diameter than the pilot wheel *k'*, in order that a high speed may be readily obtained by the rider of the vehicle without the employment of complicated or expensive gearing; and moreover, by making said pilot-wheel smaller than the driving-wheel, the rider has at all times afforded him an unobstructed view in advance of the vehicle.

To the depending bars *l* and *l'*, are pivotally attached levers *m'* and *m²*, provided with pedals *m³* and *m⁴*. These levers *m'* and *m²* are pivotally connected with cranks *n* and *n'* attached to the hub of the driving wheel *k*, by means of the connecting-rods *o* and *o'*, whereby the person seated on the saddle of the ve-

hicle with the legs straddling the supporting track structure and the feet in engagement with the pedals of the levers m' and m^2 and the hands in engagement with the handle-bar k^4 , of the said vehicle, may readily propel the vehicle over the course without undue exertion.

The handle-bar k^4 , is provided with suitable means for actuating a brake-shoe o^2 , caused to contact with the peripheral surface of the pilot-wheel of the vehicle and thereby permitting the rider to retard its movement or stop the same, *ad libitum*, as may be required.

The peripheral surface of the guide-wheel m , may be made of any preferred form or shape, for example, it may be flanged to conform to the shape or form of the guide rail or rails, as shown in Fig. 2.

The vehicle may if preferred be provided with double wheels, that is to say, so as to engage with and travel over flanged guide rails disposed on opposite sides of the supporting track structure.

By providing the vehicle with a guide wheel or wheels to contact with and travel over the guide rail or rails the vehicle is maintained in its proper upright or vertical position; and moreover, by arranging the saddle or seat of the vehicle below the axes of the driving and pilot wheels greater certainty of action is afforded and greater security from accident or danger insured. Furthermore by supporting the levers below the general plane of the trackway and on opposite sides thereof in such manner as to permit the rider to occupy a position in or on the vehicle astride the supporting track structure, the weight of the rider will fall in a vertical line or approximately a vertical plane to the structure and thus avoid undue friction at the point or points of contact of the guide wheel or wheels against or with the guide rails, thereby avoiding any retarding effect which otherwise might be occasioned and serve to increase the amount of labor or power required for propelling the vehicle over the course.

A further advantage of arranging the guide-wheels below the treadles or pedals of the vehicle, is that in passing over gaps in the supporting track structure, the guide wheel or wheels in such instances become the carrying wheels of the vehicle for permitting of the rolling of the same over the ground.

The arrangement of the driving and pilot wheels of the vehicle in advance of one another and of the connecting of them with one another by means of frames of suitable form or shape and having a seat or spring actuated saddle supported by said frames, the same occupies a position above the track-way of the course and in such close proximity thereto, as to afford the most beneficial results both in ease of movement of the vehicle and safety; and at the same time with the depending frames carrying the pedal or treadle levers and guide wheel or wheels there is afforded absolute freedom from accident or derailment

of the vehicle in operation for as will be observed from Fig. 1, if the driving or the pilot wheel should from any cause leave the track the depending frames of the vehicle will hug against the sides of the supporting track structure and thereby prevent the precipitation of the vehicle to the ground.

By the arrangement of the vehicle as shown for instance in Fig. 1, it will be seen that the propelling means is substantially concentrated in the rear wheel of the vehicle and thus the rider is not subjected to the annoyances which might be experienced if they were connected mainly with the front or pilot wheel thereof; yet, nevertheless, the propelling mechanism as hereinbefore described may be connected with the front wheel and the vehicle propelled quite as effectually and still be within the spirit of my invention.

The combining of a spring actuated saddle with a bicycle adapted to run on my elevated railway adds greatly to the ease and pleasure of riding especially when going over sudden rises or depressions in an undulating trackway constructed for pleasure parks, for which my system is well adapted.

I will now call attention to some of the uses of the additional boards c or their equivalents in my elevated railway system. It will be seen that only the top and bottom boards or stringers e, e' , are utilized in securing the rails of the trackway to the posts or supports and so far as I know only such stringers or their equivalents have hitherto been employed in the construction of elevated railway systems but I have found it of great advantage in my improved railway to introduce one or more additional stringers c, c in-as-much as they greatly aid the rider or passenger in mounting the vehicle and at the same time serve as a safe guard against collision with the posts, in case the passenger should fall from the bicycle while in motion. Another advantage gained by the use of the additional boards c, c is preventing individuals from exposing themselves to injury by attempting to get through the fence when the bicycle or vehicle is approaching and still further such a railway structure is adapted not only to support the rails forming a trackway for a vehicle to travel upon but is equally well adapted as a fence, *i. e.*, a fence as a barrier or dividing wall or partition between two adjacent pieces of ground, which I regard as a very important feature of my improvement. While my elevated railway system is especially adapted to permit of a vehicle in the nature of a bicycle as hereinbefore described to travel over, it is obvious that other types of vehicles or modified forms of bicycles may be effectually used in lieu of the one described without departing from the spirit of my invention; and moreover that the supporting structure may be modified without departing from the invention. Furthermore I do not wish to limit myself to the particular means connected with the vehicle for propelling the same as it is obvious than an electric

motor or other motive power may be employed as propelling means and yet retain the relative arrangement of the parts of the vehicle other than the pedals or treadles as shown in Fig. 1, of the drawings. Moreover, it will be obvious that the vertically disposed guide wheel or wheels as hereinbefore described, arranged and adapted to travel along the guide rail or rails, may be omitted and a horizontal guide wheel or wheels journaled in the lower part of the frame on one or both sides of the track supporting structure employed and adapted to run on boards or stringers provided therefor, without in any way or manner departing from the scope of my invention.

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

1. The combination with a single supported rail, of a vehicle provided with a frame depending below and on both sides of said rail and having a saddle located above and treadles below said rail and brake mechanism connected with said vehicle, substantially as and for the purposes described.

2. The combination with a supported track, of a vehicle having a seat or saddle arranged and adapted to carry the rider astride the track, treadles located below the track and brake mechanism connected with the vehicle, substantially as and for the purposes described.

3. The combination with an elevated structure provided with a single rail, of a vehicle provided with a saddle or seat arranged and adapted to carry the rider astride said structure and treadles located below and on opposite sides thereof and adapted to be operated by the feet of the rider, substantially as and for the purposes described.

4. The combination with an elevated supporting structure provided with a single rail, of a vehicle provided with a saddle or seat arranged and adapted to carry the rider astride said structure and with treadles located below and on opposite sides of the structure and adapted to be operated by the feet of the rider, a driving wheel adapted to run on the rail and means whereby the driving wheel is connected with the treadles, substantially as and for the purposes described.

5. In an elevated railway system, the combination of the frame of a bicycle or similar vehicle extending below and on opposite sides of the structure and provided with a seat arranged between the supporting wheels and adapted to carry the rider astride thereof and below the axes of the supporting wheels of the vehicle, substantially as and for the purposes described.

6. In an elevated railway system, a vehicle provided with a frame depending below a supporting rail and having a saddle above said rail and a handle-bar arranged and supported in front of said saddle and propelling mechanism connected with a driving-wheel, said driving-wheel and propelling mechanism

being located substantially in rear of the rider, substantially as and for the purposes described.

7. The combination, in an elevated railway system, of a track, a bicycle mounted thereon, a bar or bars connecting the axles or journals of the wheels thereof, depending bars and treadles pivotally supported by the depending bars above a lower guide wheel or wheels, substantially as and for the purposes described.

8. In an elevated railway system, a vehicle provided with an upright arm arranged above the track rail and supporting a handle-bar and the front end of a saddle and propelling means located below the plane of said supporting rail, substantially as described.

9. In an elevated railway system, the combination with a structure supporting a single rail, of a vehicle provided with a saddle disposed above the track supporting structure, propelling treadles arranged below the same, means connecting the treadles with a driving wheel, and a guide wheel or wheels supported by the frame of the vehicle on one or both sides of the track structure and serving to maintain the vehicle in an upright position, substantially as described.

10. In an elevated railway system, the combination with the elevated track, of a vehicle provided with a double frame connected with the axles of wheels supported on said track and having a vertical arm to sustain the front end of said saddle and means to secure the rear end of the saddle spring to said double frame, substantially as described.

11. In an elevated railway system, the combination with a track supporting structure, of a vehicle provided with a spring actuated saddle, a handle-bar and brake mechanism arranged and supported above the track rail by the frame of the vehicle, and said frame connected with the axles of the supporting wheels and supporting treadles below said track or rail, substantially as described.

12. The combination with an elevated track, of a vehicle provided with two wheels arranged one in advance of the other and a bar or bars connected with the axles or journals of said wheels and provided with a spring actuated saddle located between the wheels and above the track rail and substantially below the axes of said wheels substantially as described.

13. The combination with an elevated track, of a vehicle provided with two wheels arranged one in advance of the other and a bar or bars connected with the axles or journals of said wheels and provided with a spring actuated saddle arranged above the track rail and substantially below the axes of the said wheels and a stationary hand-bar connected with forward part of said vehicle, substantially as described.

14. The combination with an elevated track, of a vehicle provided with two wheels arranged one in advance of the other and a bar or bars

connected with the journals of said wheels and provided with a saddle, brake mechanism arranged above said track, and a part of the vehicle extending downward and supporting the
5 treadles, substantially as described.

15. The combination with an elevated track, of a vehicle provided with wheels arranged one in advance of the other and a bar or bars connected with the axles of said wheels and
10 carrying a spring actuated and adjustable saddle, handle-bar and brake mechanism and depending arms supporting treadles and said treadles connected with the cranks of one of the wheels of said vehicle, substantially as de-
15 scribed.

16. The combination with an elevated track, of a vehicle provided with two wheels arranged one in advance of the other and a bar or bars connected with the axles of said wheels and
20 provided with a seat adapted to carry the rider astride said bar or bars, depending arms supporting propelling treadles and one of said depending arms elongated and provided with a guide-wheel, substantially as and for the
25 purposes described.

17. The combination with an elevated structure provided with a single top supporting rail and one or more lower guide rails, of a vehicle provided with wheels supported and adapted
30 to run over said rails, a seat located substantially above said top rail and below the axes of the supporting wheels and said vehicle being provided with a handle-bar, brake mechanism, and propelling treadles, substan-
35 tially as described.

18. The combination with an elevated supporting structure provided with a traction rail and guide rail or rails, of a vehicle provided with a seat adapted to carry the rider
40 astride the elevated supporting structure, with propelling means arranged below and on opposite sides of the traction rail, and a guide-wheel or wheels adapted to engage with guide rail or rails, substantially as described and for
45 the purposes set forth.

19. The combination with an elevated track supporting structure, of a two wheeled vehicle provided with a saddle adapted to carry the rider astride said structure, and propelling
50 treadles and a handle-bar, substantially as and for the purposes set forth.

20. In combination with an elevated track supporting structure, of a vehicle provided with a seat adapted to carry the rider astride
55 said structure, propelling means, a handle-bar and a depending frame embracing said structure, substantially as and for the purposes described.

21. In combination with an elevated supporting structure provided with traction and guide rails, of a vehicle provided with trac-
60 tion and guide wheels adapted to engage with said rails, a seat adapted to carry the rider astride said structure, a handle-bar, a frame connected with said wheels and depending on both sides of said structure and provided with
65 means for actuating one of said traction-

wheels, substantially as and for the purposes described.

22. The combination with an elevated rail- 70 way structure, of a vehicle provided with a vertical guide wheel journaled in the lower part of the frame of said vehicle below the propelling treadles, and substantially in a vertical line below a seat or saddle arranged
75 between the supporting wheels, substantially as and for the purposes described.

23. The combination with an elevated rail- way structure, of a vehicle provided with two supporting wheels adapted to run upon the
80 track or rail of said structure, and a vertical arm supporting a handle-bar, brake mechanism and the front end of a seat or saddle, substantially as described.

24. The combination with an elevated rail- 85 way structure, of the frame of a bicycle extending below the traction rail and on opposite sides thereof and provided with a saddle adapted to carry the rider astride the structure, a handle-bar and brake mechanism suit-
90 ably connected with the frame of said bicycle, substantially as and for the purposes described.

25. In an elevated railway system, the combination with a traction-rail, of a vehicle 95 adapted to travel thereon and provided with a saddle and one or more guide wheels, substantially as described.

26. The combination with an elevated track supporting structure, of the frame of a bicycle 100 disposed below the track and on opposite sides thereof and provided with a saddle adapted to carry the rider astride the structure, substantially as and for the purposes de-
105 scribed.

27. The combination with a supported rail, of a vehicle provided with a frame connected with the axles or journals of driving and pilot wheels and the axle or journal of a guide wheel or wheels located below the plane of
110 said track and carrying a seat above the plane of the track and provided with a handle-bar and brake mechanism arranged in front of the rider and adapted to engage the pilot or front supporting wheel, substantially as de-
115 scribed.

28. The combination with a supported rail, of a vehicle provided with a frame connected with the axles or journals of the driving and pilot wheels and the axle or journal of a guide 120 wheel and carrying a seat above the plane of the track rail and supporting propelling treadle-levers below the plane of said track rail and provided with a handle-bar and brake-mechanism arranged in front of the
125 rider and adapted to engage the pilot or front supporting wheel, substantially as and for the purposes described.

29. In an elevated railway system, a vehicle provided with a seat above the top support- 130 ing rail, a driving wheel adapted to run on said rail, treadles located below said rail and on opposite sides thereof, means interposed between and connected with said driving-

5 wheel and treadles to effect the actuation of said vehicle thereby and an arm extending below the plane of the treadles and supporting a guide wheel, substantially as and for the purposes described.

10 30. In an elevated railway system, a bicycle or similar vehicle provided with a seat located above the track or rail, a driving-wheel adapted to run on said track or rail, treadles located below said track or rail and on opposite sides thereof, means connected with said driving-wheel and treadles to effect the actuation of the vehicle thereby and an upright arm supporting the front end of the saddle or seat, 15 substantially as and for the purposes described.

20 31. In an elevated railway system, the combination with vertical supports of one or more longitudinal stringers with rail secured thereto to form a track-way and one or more intermediate stringers tying or binding said vertical supports, of a bicycle adapted to engage with said rails and said vehicle provided with a saddle located above the top rail and below 25 the axes of said supporting wheels and adapted to be operated by the rider straddling said vehicle, substantially as described.

30 32. The combination of an elevated track, a vehicle provided with two wheels arranged one in advance of the other and adapted to travel over said track and a bar or bars connected with the axles or journals of said wheels and provided with a vertical arm supporting the front end of a spring actuated 35 saddle arranged and adjusted to carry the rider astride said elevated track, substantially as described.

40 33. An elevated railway structure provided with one or more guide rails and a bicycle or similar vehicle provided with a saddle and one or more guide wheels, substantially as described.

45 34. The combination with a supporting rail, of a vehicle provided with wheels supported and adapted to run on said rail, a saddle located above said rail and in proximity to the axes of the supporting wheels, a frame connected with the axles of the supporting wheels and provided with an upward extending arm 50 supporting the front end of the saddle and a downward extending arm supporting a guide-wheel, substantially as described.

55 35. The combination with a supported rail, of a vehicle provided with wheels supported and adapted to run on said rail, a seat located above said rail and substantially below the axes of the supporting wheels and arranged and adapted to carry the rider astride said supported rail and said vehicle provided with 60 a handle-bar, propelling treadles, a driving-wheel connected with said treadles and a depending guide-wheel, substantially as and for the purposes described.

65 36. The combination with a supporting track structure provided with a single top supporting rail, of a vehicle having a depending frame on both sides of said track structure

and provided with wheels supported and adapted to run on said supporting rail, one of said wheels being of larger diameter than the 70 other, and connected with treadles journaled in the depending frame below the plane of the top rail, substantially as and for the purposes described.

75 37. The combination with an elevated track structure provided with one or more guide-rails, of a bicycle or similar vehicle provided with two supporting wheels and a guide wheel or wheels, one of which supporting wheels is of relatively smaller diameter than the other, 80 and said smaller wheel arranged in front of the rider and brake mechanism adapted to be brought into engagement with the periphery of said wheel, substantially as and for the purposes described. 85

38. The combination of an elevated track structure provided with a single top rail, of a bicycle provided with a saddle arranged above the bottom line of the supporting wheels thereof, propelling treadles arranged below 90 the bottom line of said supporting wheels and one or more depending guide wheels adapted to engage with guide rails to maintain said vehicle in an upright position in its passage over the structure, substantially as described. 95

39. In an elevated railway system, the combination of a post and rail structure with a rail arranged on one of its stringers, a vehicle provided with wheels supported and adapted to travel over said rail, a divided 100 frame extending downward on opposite sides of said structure and a spring supported saddle connected with said vehicle and arranged to carry the rider astride said structure with the feet in engagement with the propelling 105 mechanism of the vehicle, substantially as shown and described.

40. In an elevated railway system, the combination with a fence having a track rail, a guide rail, and one or more intermediate 110 stringers, of a vehicle adapted to be supported and guided on said rails, a seat and a stationary handle-bar, substantially as shown and described.

41. In an elevated railway system, the combination with a fence or similar structure having a supporting rail, a lower guide rail or rails and one or more intermediate stringers, 115 of a vehicle adapted to be supported and guided on or over said rails and provided with a seat adapted to permit of the rider straddling the frame, a stationary handle-bar and brake mechanism connected with said vehicle, substantially as described. 120

42. The combination in a railway system, 125 of a fence having a track-rail secured to its top stringer, a guide-rail secured to a lower stringer and one or more interposed stringers, a vehicle adapted to be supported and guided by said rails and provided with a handle-bar, 130 brake and propelling mechanisms, substantially as described.

43. The combination with a post and rail structure having a rail pinned to the top

stringer, a guide-rail secured to the lower stringer and one or more interposed stringers, of a vehicle adapted to and capable of being guided on said rail and provided with a spring actuated seat and adapted to carry the rider astride them, a driving wheel and propelling treadles connected with said driving-wheel, substantially as described.

44. The combination with a post and rail structure having a track rail arranged on its top stringer, a guide-rail arranged on its lower stringer and interposed stringers, of a vehicle guided on said track rail and provided with a seat adapted to carry the rider astride thereof, propelling treadles and a guide-wheel located below said treadles, substantially as and for the purposes described.

45. The combination of a post and rail structure having a track-rail arranged on its top stringer, a guide-rail arranged on its lower stringer and one or more interposed stringers, of a vehicle provided with a frame extending downward on opposite sides of the fence and supporting propelling treadles and a lower guide-wheel on one side of the fence in engagement with the guide-rail of the lower stringer, substantially as described.

46. The combination with a post and rail structure having a track secured to its top stringer, a guide-rail arranged on its lower stringer and with one or more interposed stringers, of a vehicle provided with a wheel supporting frame arranged astride the post or rail structure and adapted to carry the rider substantially between said supporting wheels and above a guide-wheel caused to engage with said guide-rail, substantially as described.

47. The combination with a post and rail structure having a track secured thereto and guide rails arranged on opposite sides of said post and rail structure, of a vehicle having wheels supported and adapted to run upon the top rail and a lower guide-wheel arranged

to extend below interposed stringers of said structure and to engage with the guide rail on either side of the lower stringer of said structure, as described.

48. The combination with an elevated structure provided with a track rail and one or more guide rails located below said track rail, of a vehicle provided with a double frame and a saddle, handle-bar, propelling treadles and means for connecting said treadles with a driving wheel, said vehicle being arranged and adapted to straddle said track structure and supported in a vertical position by the wheels of the vehicle engaging with the supporting and guide rails, and said vehicle and track structure arranged to carry the rider on said saddle with the hands resting on the handle-bar and feet resting upon the treadles while working the propelling treadles located below the plane of the supporting rail, substantially as described.

49. The combination with an elevated structure provided with a track rail and one or more guide rails located below said track rail, of a vehicle provided with a double frame and a saddle, propelling treadles, and means for connecting said treadles with a driving wheel, said vehicle being arranged and adapted to straddle said track structure and supported in a vertical position by the wheels of the vehicle engaging with the supporting and guide rails, and said vehicle and track structure arranged to carry the rider on said saddle with the feet resting upon the treadles while working the propelling treadles located below the plane of the supporting rail, substantially as described.

In testimony whereof I have affixed set my signature in presence of two witnesses.

ARTHUR E. HOTCHKISS.

Witnesses:

L. A. CONNER, Jr.,
E. R. CONNER