

(No Model.)

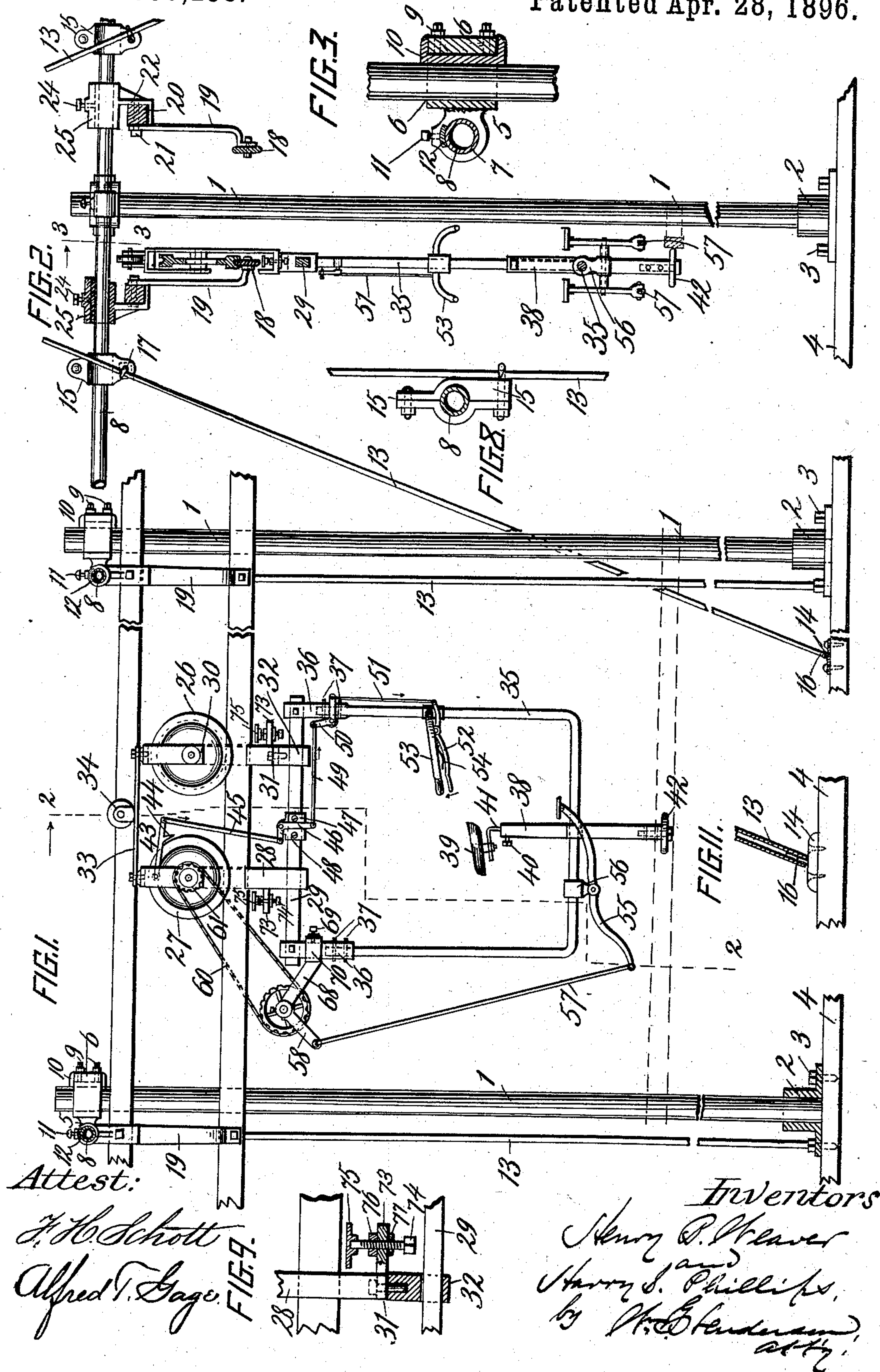
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OVERHEAD BICYCLE RAILWAY.

No. 559,238.

Patented Apr. 28, 1896.



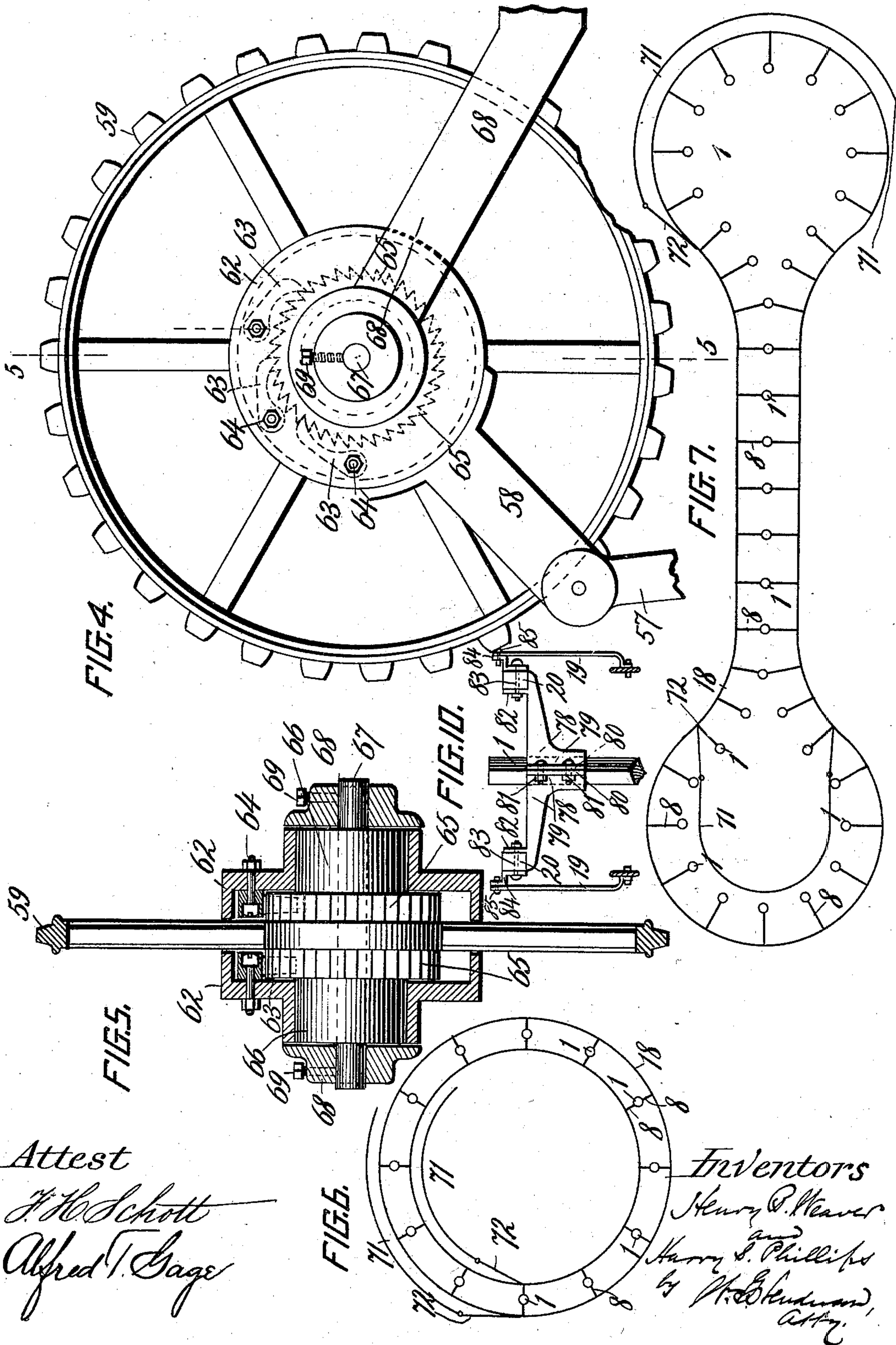
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# UNITED STATES PATENT OFFICE.

HENRY B. WEAVER AND HARRY S. PHILLIPS, OF BURLINGTON, NEW JERSEY; SAID PHILLIPS ASSIGNOR TO SAID WEAVER.

## OVERHEAD BICYCLE-RAILWAY.

SPECIFICATION forming part of Letters Patent No. 559,238, dated April 28, 1896.

Application filed January 26, 1893. Serial No. 459,837. (No model.)

*To all whom it may concern:*

Be it known that we, HENRY B. WEAVER and HARRY S. PHILLIPS, citizens of the United States, residing at Burlington, in the county of Burlington and State of New Jersey, have invented certain new and useful Improvements in Overhead Bicycle-Railways; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

Our invention relates to overhead bicycles or elevated railways and is designed to be used for establishing communication between different towns and cities, and also for the purpose of pleasure, in which event it may be erected within more confined limits than when used for communication between towns and cities.

It has for its object to improve generally the structure of the overhead railway in the particulars hereinafter fully described.

To the accomplishment of the foregoing and such other objects as may hereinafter appear, the invention consists in the several features hereinafter particularly described and then sought to be specifically defined by the claims, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is a side elevation of a portion of the track structure with the bicycle sustained therefrom. Fig. 2 is an end elevation on the line 2 2 of Fig. 1. Fig. 3 is a cross-section through one of the sustaining castings or brackets, showing a portion of one of the upright poles in full lines. Fig. 4 is a side view of the main sprocket-wheel and ratchet mechanism, from which power is transmitted to one of the wheels of the bicycle, on an enlarged scale. Fig. 5 is a cross-section on the line 5 5 of Fig. 4. Fig. 6 is a diagram of a circular track or way with storage-tracks and switches for transferring the bicycles thereon to and from the main track. Fig. 7 is a diagram of another form of track with a storage-track at one end and switches. Fig. 8 is an end view

showing the clamp that secures the brace-rod. Fig. 9 is a detail view, partly in section, of the device that prevents the bicycle jumping the track. Fig. 10 is a detail view of one form of upright post and laterally-extending arms. Fig. 11 is a detail, partly in section, of the lower end of one of the brace-rods.

In the drawings, the numeral 1 designates upright poles formed, preferably, of tubular piping, fitting at their lower ends in sockets 2, secured by screws 3 or other means to the base-timber 4. The upper ends of these poles are provided with castings or brackets 5, each of which is formed with a vertical opening 6, which adapts the brackets to fit upon the vertical poles, and with a transverse opening 7, adapted to receive a rod 8, extending laterally from the upright pole, which laterally-extending rod is preferably formed of tubular piping. This bracket or casting 5 is secured to the vertical pole by means of screws or bolts 9, passed through the bracket and at their inner ends acting upon gibs 10, fitted between the pole and the bracket, so that by adjusting the screws or bolts the gibs will be pressed against the pole so as to clamp the bracket to the pole.

The laterally-extending rod and the bracket are likewise clamped together by the screws or bolts 11, bearing against a gib 12 lying in the opening 7, so as to press against the outer surface of the rod 8. By this construction the ends of the screws or bolts are prevented from coming in contact with the pole and the rod, and by loosening the bolt or screws the bracket can be adjusted up or down on the pole and the lateral rod can be adjusted lengthwise through the bracket, so that the laterally-extending rod can be sustained at the height desired to compensate for the inequality in the lay of the land, and can be adjusted lengthwise to the extent desired to suit the conditions that may exist in constructing the road.

The laterally-extending rod is designed to support the overhead track, and it is braced by means of diagonally-extending brace-rods 13, which are preferably made of tubular piping, and are connected at their lower ends to plates 14, secured to the base-timber 4, and at their upper ends to clamps 15, secured to the laterally-extending rod 8.



It is preferred to form a stud or projection 16 on the plate 14, which will enter the tubular ends of the brace-rod to prevent the rod from slipping on the plate, as shown in Fig 11.

5 The clamp 15 is preferably made in two parts drawn together by bolts, so as to clamp it to the laterally-extending rod, the lower bolt 17 being formed with an open or hooked end fitting around the brace-rods, so as to  
10 draw the rod closely to the clamp and thus prevent it from slipping laterally or otherwise.

If a double track is used, as illustrated in Fig. 2 of the drawings, there will be one of these brace-rods on each side of the vertical  
15 post 1, as indicated in Fig. 2 of the drawings; but if only a single track is used, which may be the case, only one brace-rod adjacent to each pole may be employed, the brace-rod in that event being connected to the laterally-  
20 extending rod adjacent to its outer end. The track, which may consist of a rail 18, is sustained from the laterally-extending rod 8 by a hanger 19, to which the rail may be bolted, the upper end of the hanger being connected  
25 to a beam 20 by a bolt 21, which bolt will also secure the beam to the pendent arm 22 of a sleeve 23 encircling the laterally-extending rod 8 and secured thereto in the position desired by a bolt or set-screw 24 passing through  
30 the sleeve and bearing against a gib 25, (indicated by dotted lines in Fig. 2 of the drawings,) so as to press that gib against the rod and thus clamp the sleeve to the rod, the sleeve being adjustable on the rod by loosening the set-screw or bolt and slipping the  
35 sleeve to the position desired. By the general construction thus described a very strong and durable overhead way or track structure is formed, and in which the several parts can  
40 be readily set up and adjusted in an expeditious manner and without the necessity of employing skilled labor.

The bicycle for use in connection with this overhead way or track consists of the front  
45 and the rear wheels 26 and 27, respectively, formed with grooved peripheries to fit the upper edge of the track or rail 18, and the frame carried by said wheels and carrying the operating mechanism hereinafter described. The  
50 rear wheel 27 is journaled in frame 28, connected at its lower end to a bar 29, while the front wheel 26 is journaled in the frame 30, swiveled at its lower end by a bolt 31 to a casting or block 32, which is connected to the  
55 bar 29. The upper ends of the two frames 28 and 30 are connected together by a cross-bar 33, the connection of the bar to the frame 30 being such as will allow that frame to turn upon its swivel in running around curves.  
60 This connecting-bar 33 is provided with a roller 34, designed to bear against the under side of an inclined surface (not shown) at the end of the route or other point desired to stop the bicycle, so that by running against said  
65 inclined surface the bicycle may be stopped at the terminal of the line. From the bar 29 is suspended a frame 35, which may be of any

approved construction, but which is preferably formed by making its lower portion of piping bent into the shape shown, with its upper ends entering sockets in the hangers 36, connected to the bar 29, the tubular portion being held in said sockets by means of pins 37. This frame 35 carries a standard 38, which supports the seat 39 for the rider, which seat  
70 may be adjusted to the height desired by the set-screw 40, passing through the standard 38 and bearing against the lower extension 41 of the seat. This standard is extended below the frame 35 and at its lower end is provided  
80 with a roller 42, designed to bear against the side rail, as illustrated by dotted lines in Figs. 1 and 2, but which will be located at curves in the road, so that the bicycle will be steadied against lateral vibration while the roller 42  
85 bears against said side rail in turning the curves.

A brake for checking the speed of the bicycle when desired is provided, and may consist of an arm 43, pivoted to the inside of the  
90 gear-frame 28, having a shoe 44 to bear against the wheel and connected by a rod 45 to a bell-crank lever 46, fulcrumed on a casting 47, adjustably secured by set-screws 48 to the cross-bar 29. The long arm of the bell-crank lever  
95 is connected by a rod 49 to one arm of another bell-crank lever 50, which is fulcrumed to the forward hanger 36 and has its other arm connected by a rod 51 with a hand-lever 52, fulcrumed to the steering-handles 53, connected  
100 to the frame 35, a spring 54 serving to hold the brake mechanism in its normal position. By compressing the hand-lever 52 the brake will be thrown against the wheel and the bicycle checked or stopped in its movement.  
105

The power for propelling the bicycles is obtained in the following manner: Two foot-pedals 55 are independently fulcrumed on a shaft suspended by a bracket 56, sleeved to the lower part of the frame 35, and from the  
110 rear end of each of these foot-pedals a rod 57 extends and connects with the lower end of an arm 58, connecting, as shall presently be described, with the ratchet of a sprocket-wheel 59, from which a chain 60 transmits  
115 motion to a sprocket-wheel 61 on the shaft of the wheel 27, so as to propel the bicycle. The ratchet mechanism consists of two independently-mounted sections 62 of a shell or casing, from each of which sections extends  
120 one of the arms 58. These sections 62 are each provided with one or more pawls 63, attached thereto by bolts 64, or otherwise, so that the pawls will engage with ratchets 65, formed on opposite sides of the sprocket-  
125 wheel 59, next to the hub of said wheel. It is preferred to provide a series of pawls for each of the two ratchets, so as to insure the engagement of two or more of the pawls with each of the ratchets in each movement of  
130 the independently-operated foot-pedals, and these pawls will be so located as to operate as described. From the side of each of the ratchets extends a hub 66 of smaller diame-



ter than the ratchets, and on which each of the two sections 62 of the shell or case turn in each movement of the foot-pedals, so as to cause the pawls to act upon the ratchets to turn the sprocket-wheel to transmit motion to the driving-wheel of the bicycle, the sections of the shell and the pawls for the two ratchets operating in alternation, so as to maintain a continuous transmission of power. The shaft 67 of the sprocket-wheel 59 extends beyond the hubs 66 and is journaled in the two arms of the yoke 68, which is secured to the hanger 36 by a set-screw 69, passed through the sleeve 70 of the yoke which encircles the hanger 36, as indicated in Fig. 1 of the drawings.

The sprocket-wheel 59, as well as the ratchet 65 and hub 66, turn freely on the shaft 67, and this shaft is held against rotation and against longitudinal movement in the yoke 68 by the set-screws 69, which pass through the yoke and bear against the shaft 67, as indicated in Fig. 5 of the drawings. By the construction described the working parts of the combined sprocket and ratchet mechanism are protected from dust and from injury, and a most efficient device for transmitting power to the bicycle driving-wheel is obtained.

The particular construction and arrangement of each of the parts described is preferred, and is novel, and is believed to give the best results; but the invention is not to be confined to such details.

For the purpose of preventing the bicycle or traveling carriage from jumping the track an arm 73 is made to project laterally from one or both of the hangers 28 30, and through this arm is passed an adjusting screw or bolt 74, which will carry at its upper end beneath and in proximity to the rail 18 a plate 75, which preferably is secured to the upper end of the bolt 74 by the ends of the bolt being made angular and fitting into an angular recess in the plate. By adjusting this bolt or screw the plate can be brought nearer to or farther from the rail, as desired. For the purpose of holding the bolt to its adjustment nuts 76 and 77 may be employed, one fitting above and the other fitting below the arm 73, so that the two nuts will act as jam-nuts and prevent the screw from changing its position by jarring or otherwise of the carriage in its travel. Any other means may be employed for the purpose, or the nuts may be omitted, and the plate 75 may also be omitted, but it is an advantage to use it for the reason that it affords an extended bearing across the under side of the rail 18 and thus more positively insures the bearing of the plate against the under side of the rail when necessary to prevent the carriage from jumping the track.

The track may be circular, as illustrated in Fig. 6 of the drawings, or be of the form illustrated in Fig. 7 of the drawings, or other form desired.

For the purpose of storing a supply of the carriages or bicycles to be brought into use

as required, and for the purpose of running any one or more of the bicycles or carriages from the main track, so that when not in use the carriages or bicycles that may follow and be in use can have a free passage, one or more side tracks 71 may be employed, the same being brought into communication with the main track by means of switches 72 of any approved construction. It will be seen that from this arrangement any number of the carriages or bicycles may be stored on the side tracks ready for use as occasion may arise, and that if any particular carriage or bicycle is for the time out of use it may be switched onto the side track so as to leave the main track clear for the carriage or bicycle that may follow and be in use.

Instead of forming the upright poles 1 of tubes or piping they may be made of wood or other material, and instead of using tubing 8 for the laterally-extending arms the arms may consist of casting 78, which may extend from one or opposite sides of the pole, as desired. The inner ends of these arms are made in the form of a sleeve 79 to encircle the pole, the sleeve preferably being divided vertically, so as to form it in two parts, each part being formed with a flange 80 next to the meeting edges, so that bolts 81 may pass through the flanges for the purpose of clamping the sleeve and its arm to the pole. It will be observed that in this form, as well as in the form first described, the laterally-extending arms from which the rail is suspended are adjustable up and down on the pole, so as to permit the track to be leveled by adjusting the arms up or down as required. These arms will carry the beam 20, which may be bolted to the upright flange 82 by the bolt 83, and an arm 84 may be secured to the beam by the same bolt, to which arm the hanger 19 for suspending the rail may be secured by a bolt 85. When this construction is employed, the brace-rods 13 may under some conditions be omitted.

This invention is designed, primarily, for pleasure overhead railways, but is adapted for transportation purposes generally.

The preferred construction of the several parts has been illustrated and particularly described, but changes may be made in the details of the several parts without departing from the spirit of the invention.

The general construction of the traveling carriage and its arrangement with reference to the suspended track are such as to guard against vibration or swinging of the carriage with the view of reducing that evil or disadvantage to the minimum, so as to insure greater steadiness in the running of the carriage and so that a higher rate of speed may be attained in the propulsion of the carriage.

It is obvious that this elevated railway instead of being erected outside in the open air may be erected inside of a hall or inclosed room, and also that the rails may be supported from brackets or hangers secured to



the ceiling or to the walls of the hall, and the essentials of some parts of the invention be employed in such a construction.

By having the handle-bars or steering-levers connected to a portion of the suspended frame, between the upper and the lower portion of the frame, adjacent to the seat of the rider, the same may be used for the purpose of steadying the frame against swinging sidewise, as it is apparent that if the frame from any cause should tend to swing sidewise by applying pressure to the handle-bars in direction opposite to that in which the frame is disposed to swing the side movement of the frame may be counteracted and the frame thus steadied in its travel.

Having described our invention and set forth its merits, what we claim is—

1. In an elevated railway, the combination with the elevated track, of an open frame beneath the track, a carriage having a plurality of wheels journaled forward of each other in a frame, connections between said frame beneath the track and the carriage-frame which will transmit the weight of the lower frame to both wheels, a swivel connection intermediate of the frame beneath the track and at least one of said wheels, and mechanism for transmitting power to said wheels, substantially as and for the purposes described.

2. In an elevated railway, the combination with the elevated track, of the plurality of wheels to run on said track, the frame suspended beneath the track and having a rigid connection with one of said wheels and a swivel connection with the other of said wheels and sustained by both of the wheels, and the pedals carried by said frame and connected by power-transmitting mechanism with one of said wheels, substantially as and for the purposes described.

3. In an elevated railway, the combination with the elevated track, of a plurality of wheels to run upon the track, a frame in which each of the wheels is journaled, said frame extending below the track, a second frame having an upper horizontal bar con-

nected at front and rear with the frame in which the running wheels are journaled, a seat supported in the lower part of said second frame, foot-pedals sustained by said frame, and power-transmitting mechanism connecting said pedals with one of said wheels, substantially as and for the purposes described.

4. In an elevated railway, the combination with an elevated track, of a plurality of wheels to run upon said track and sustaining beneath the track a frame carrying foot-pedals connected by power-transmitting mechanism with one of said wheels, and adjustable stops movable with the frame and supported beneath and adjacent to the track for the purpose of bearing against the track to prevent the wheels jumping the track, substantially as and for the purposes described.

5. In an elevated railway, the combination with the elevated track, of the frame suspended beneath the track from wheels running upon the track, foot-pedals sustained by said frame, a sprocket-wheel and pawl-and-ratchet mechanism sustained by an arm from said frame, means connecting said pedals with said pawl-and-ratchet mechanism, and a sprocket-chain connecting said sprocket-wheel with a sprocket-wheel from which motion is transmitted to one of the wheels running upon the track, substantially as and for the purposes described.

6. The combination with the sprocket-wheel, of the ratchets formed on opposite sides thereof, the rotatable casings inclosing the ratchets and carrying the pawls adapted to engage with said ratchets, arms connected with said casings, foot-pedals, and means connecting said arms to said foot-pedals, substantially as and for the purposes described.

In testimony whereof we affix our signatures in presence of two witnesses.

HENRY B. WEAVER.  
HARRY S. PHILLIPS.

Witnesses:

HENRY S. PRICKETT,  
SAMUEL TYLER.