

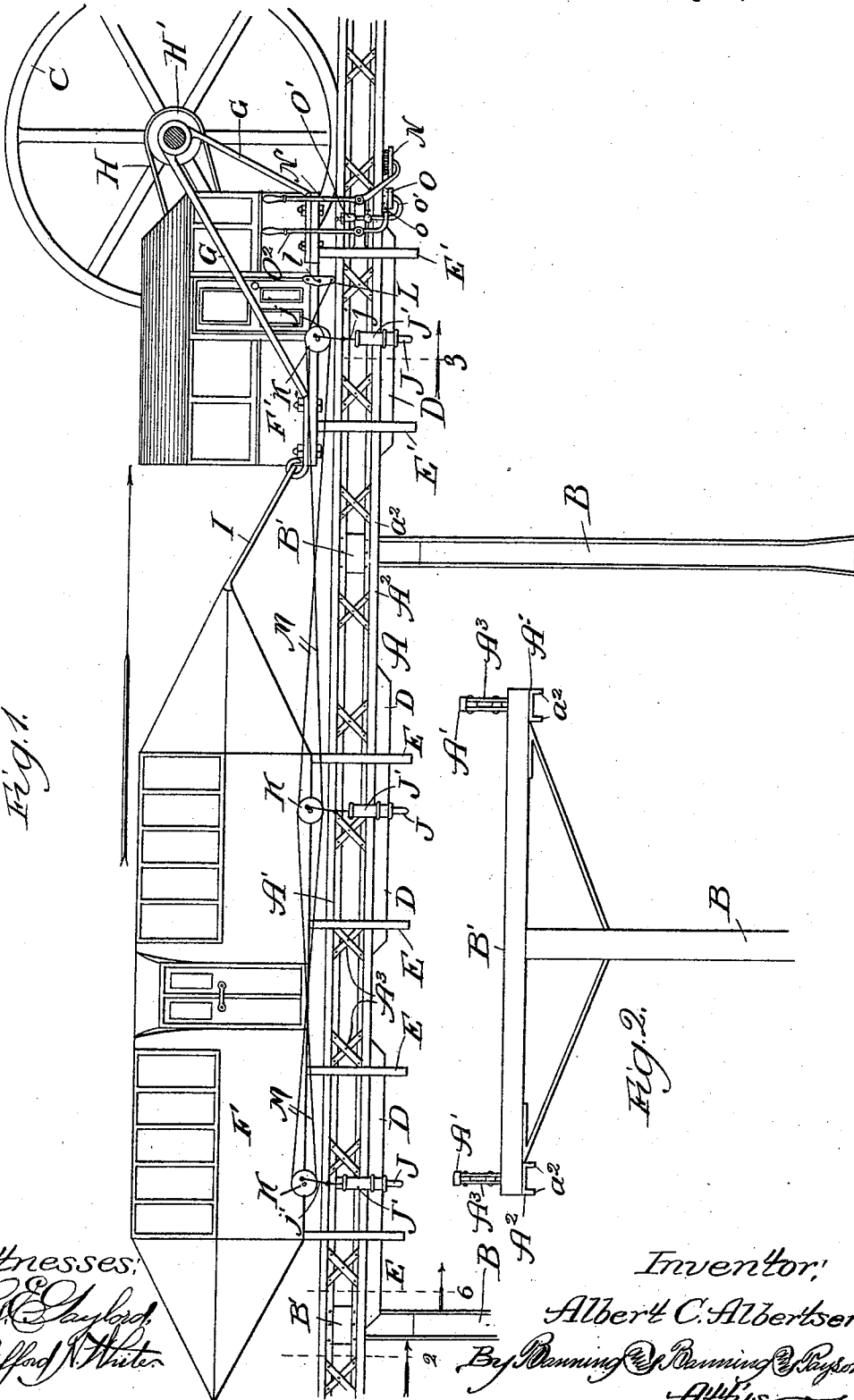
(No Model.)

2 Sheets—Sheet 1.

A. C. ALBERTSEN.  
ELEVATED RAILWAY.

No. 496,505.

Patented May 2, 1893.



Witnesses:  
Carl E. Chyler,  
Clifford White.

Inventor:  
Albert C. Albertsen,  
By *Running & Running* Payson,  
Attys.

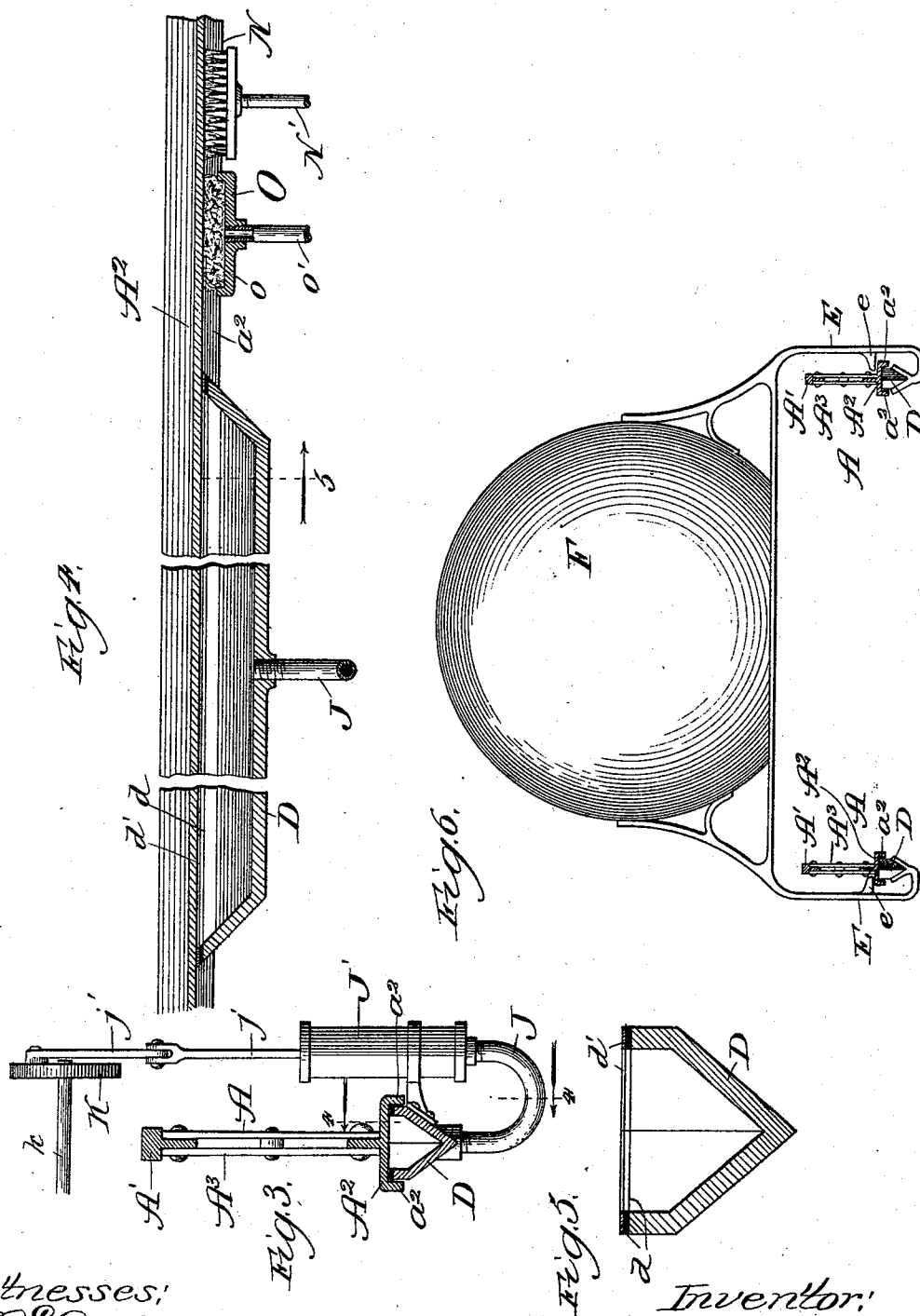
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ELEVATED RAILWAY.

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Witnesses:  
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# UNITED STATES PATENT OFFICE.

ALBERT C. ALBERTSEN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO  
LOUIS H. OWEN, OF SAME PLACE.

## ELEVATED RAILWAY.

SPECIFICATION forming part of Letters Patent No. 496,505, dated May 2, 1893.

Application filed May 31, 1892. Serial No. 434,896. (No model.)

### *To all whom it may concern:*

Be it known that I, ALBERT C. ALBERTSEN, residing at Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Railways, of which the following is a specification.

My invention relates more particularly to what are known as elevated railways, supported above the streets or roadways, and it has for its object the construction of a railway wherein the resistance normally offered by friction shall be eliminated to the greatest possible extent, thereby rendering it practicable to develop the highest rate of speed. In order to accomplish the desired results, I employ the principle of vacuums and atmospheric pressure, and, stating my invention in general terms and without any intention to unduly limit myself thereby, I may say that I make use of a system or series of vacuum boxes or receptacles, adapted to travel along a suitable track or way, and employed for supporting the cars, vehicles, &c., used for transportation. In addition to devising means for carrying out the general principle upon which the operation of my invention depends, I have also devised modifications and improvements in various parts of what might be termed the minor components of the structure—as, for example, suitable means for maintaining the vacuum when it has once been established, an improved track, means for oiling and cleaning the same, and various other details, the construction and operation of which will be made manifest as I proceed with the detailed description of my invention, which said invention therefore consists in the features, details of construction and combinations hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of a section of my improved railway, with a motor and passenger car supported thereon; Fig. 2 a section on line 2 of Fig. 1 illustrating the method of supporting the track; Fig. 3 a section on line 3 of Fig. 1; Fig. 4 a section on line 4 of Fig. 3; Fig. 5 a section on line 5 of Fig. 4; and Fig. 6 a section on line 6 of Fig. 1, all these sections being taken in the direction indicated by the respective arrows, the last four figures being upon an enlarged scale.

The compound rails, A, forming part of my invention, are supported upon posts or columns B in any desired manner, as by means of arms or cross beams B', as shown in Fig. 2. The preferred form of compound rail is shown more particularly in Fig. 3. When in this form it consists of an upper rail A', and a lower rail A<sup>2</sup>, connected by means of truss work A<sup>3</sup>. On the upper rail, which may be of any desired shape, travel the wheels C, which, as shown, are made of great diameter for the purpose of more readily obtaining great speed. The lower rail is of any suitable breadth and is provided with downwardly depending flanges a<sup>2</sup>.

I next construct what I term "vacuum boxes" D, made preferably, though not necessarily in the shape shown more particularly in Figs. 4 and 5. These boxes are made of a breadth sufficient to adapt them to readily slide between the depending flanges a<sup>2</sup>, and of any length and depth which may be desired or found necessary in operation. These boxes are open at the top, as shown, and around the upper edge I preferably place a strip of rubber or other suitable elastic material d, and above this a strip of steel d'. The air being exhausted from these boxes, they will be forced upward by the pressure of the atmosphere in the direction of the rail A<sup>2</sup>. It should be understood that I prefer to use two compound rails to form a track as shown in Fig. 6, with a set of boxes sliding under each, and that I have only described one rail, since the other would be made in precisely the same manner. Attached to the vacuum boxes in any desired manner are arms E E', which are preferably secured to the bottom of the boxes, then curve and rise upward as shown. The arms E are fastened to, and support a car F, made of any desired dimensions and material, preferably, though not necessarily, cylindrical in form, and made with pointed or tapering ends to diminish friction. This car is shown as provided with doors at the center of the sides, but any other method of construction may be followed as desired. The arms E' support a cab or house F', in which is supported the motor used in running the device, and which may be any of the desired forms of steam, gas, electric, or other motor, and which, forming in itself no part of

my invention, requires no further description. The axle of the wheels C, which travel upon the rails A', is connected to this cab by means of arms G, which are loosely mounted  
 5 on the axle, and bolted or otherwise firmly secured to the platform supporting the cab. A belt H runs from a drum H' rigidly mounted on the axle into the cab, where it is driven by the motor. The cab and car are linked  
 10 together by means of a rod I, or other suitable connection, and, when a train of cars is used, each car should be connected to the one adjacent in any suitable manner. From this construction it will be seen that the vacuum boxes support the car and operator's cab,  
 15 the parts being so proportioned that the pressure of the atmosphere upon the boxes will be somewhat in excess of the contrary pressure upon such boxes due to the weight  
 20 of the cars, &c., but the difference between them may be comparatively slight, as, for example, with a car weighing nine thousand pounds, the atmospheric pressure on the boxes due to the vacuum may be fixed at ten thousand,  
 25 in which case the only friction would be that caused by the pressure of one thousand pounds, or the difference between two opposing forces, which friction would amount to so little as to be of no real importance. It is  
 30 possible, however, that in the operation of the railroad, air may leak into the boxes, destroying the vacuum to such an extent as to interfere with the efficient running of the road, and to prevent this I provide means for  
 35 constantly maintaining the desired vacuum, which consists in the following devices. A pipe J connects at one end with any suitable point of each of the vacuum boxes, as shown more particularly in Fig. 3, and at the other  
 40 end with an air pump J', of any suitable construction. The piston rod j of this air pump is connected by a link j' to a wheel K, mounted on a shaft k, which shaft is journaled suitably on the car or cab, as the case may be.  
 45 To operate these wheels and the air pump connected thereto, I provide a rocking lever L, mounted on a shaft l, adapted to be rocked back and forth by means of the motor. A cord or belt M, attached at its lower ends to  
 50 this lever, passes over and engages with the wheels, whereby as the lever is rocked the wheels will be oscillated back and forth, raising and lowering the pistons of the air pumps, and acting to exhaust air from the boxes to  
 55 maintain the desired vacuum. Since, however, some accident might prevent the operation of these devices, I prefer to provide the arms E with lugs e (Fig. 6), which are adapted to extend over the rails A<sup>2</sup> and normally out  
 60 of contact with such rails, so that in event of the cars falling, these lugs will engage with the rails and support the cars, thereby preventing accident.

In order to clean the track from time to  
 65 time, I provide a brush N, supported upon a pivoted lever N', in such position that, as the lever is operated, the brush will be brought

up against the under side of the flanged rail to thoroughly remove any extraneous matter therefrom. I also provide a lubricating device  
 70 for the purpose of oiling this track, which consists of a cup or receptacle O, in which is placed a sponge o. This receptacle connects, by means of a tube o', with an oil cup O' located above the receptacle, so that when oil is  
 75 poured into this cup it will rise through the tube and saturate the sponge. This lubricating device is supported by means of a pivoted lever O<sup>2</sup>, extending like the lever N within reach of the operator in the cab, whereby the  
 80 sponge can be brought into contact with the rail A<sup>2</sup> to oil the same, or withdrawn therefrom. I have shown these two levers as placed outside of the cab, but this is merely for the sake of ease in illustration, as ordi-  
 85 narily they would be placed within the cab.

While I have described more or less precise means, it is not my intention to limit myself thereto; but I contemplate such changes in form, proportion, and substitution of equivalent members, as may be rendered desirable  
 90 or necessary in the operation of my device, so long as the main principle thereof is adhered to. For example, while I prefer to use two of these compound rails to form a track,  
 95 I do not intend to limit myself to such number, since my invention is fully capable of being applied to a single track or to a track composed of more than two rails. These single rail tracks are already well known in various constructions, and the changes which it  
 100 would be necessary to make would, I think, be perfectly obvious, the arms E in that case, extending up from both sides of the boxes to the car, so that the car would be supported  
 105 by a single set of boxes instead of half the arms being attached to one set of boxes and the other half to another set.

I claim—

1. The combination of a track, vacuum  
 110 boxes traveling along such track, and a car or cars supported by such boxes, substantially as described.

2. The combination of a compound rail, vacuum boxes traveling along the lower rail  
 115 thereof, a car or cars supported by such boxes, wheels traveling upon the upper member of the compound rail, and means for revolving such wheels to impart motion to car and boxes, substantially as described.  
 120

3. In a railway, a compound rail composed of an upper rail, a lower rail provided with two downwardly depending flanges, and truss work connecting such rails, substantially as described.  
 125

4. The combination of a track comprising upper rails and lower flanged rails, vacuum boxes open at their upper sides resting against and traveling along the lower rails between the flanges thereof, a car or cars supported  
 130 by such boxes, wheels traveling upon the upper rail, and means for imparting revolution to such wheels, substantially as described.

5. The combination of a track, vacuum

boxes traveling along such track, and means for maintaining the vacuum in such boxes, substantially as described.

5 6. The combination of a track comprising upper rails and lower flanged rails, vacuum boxes traveling along such lower rails between the flanges, a car or cars supported by such boxes, wheels traveling upon the upper rails, air pumps connected with the vacuum  
10 boxes, and means for revolving the wheels and operating the air pumps, substantially as described.

15 7. The combination of a flanged rail, and a vacuum box traveling along such rail, such box being open at its top and provided with an elastic upper edge, substantially as described.

8. The combination of a track provided with flanges, vacuum boxes traveling between such flanges, a car or cars supported by such boxes, 20 means for imparting motion to the boxes or cars, and means for cleaning and oiling the track, substantially as described.

9. The combination of a track, a receptacle containing a lubricating medium, an oil cup 25 connected with such receptacle, and a pivoted lever for operating the devices, whereby the lubricating medium can be brought into contact with the track and removed therefrom, substantially as described.

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