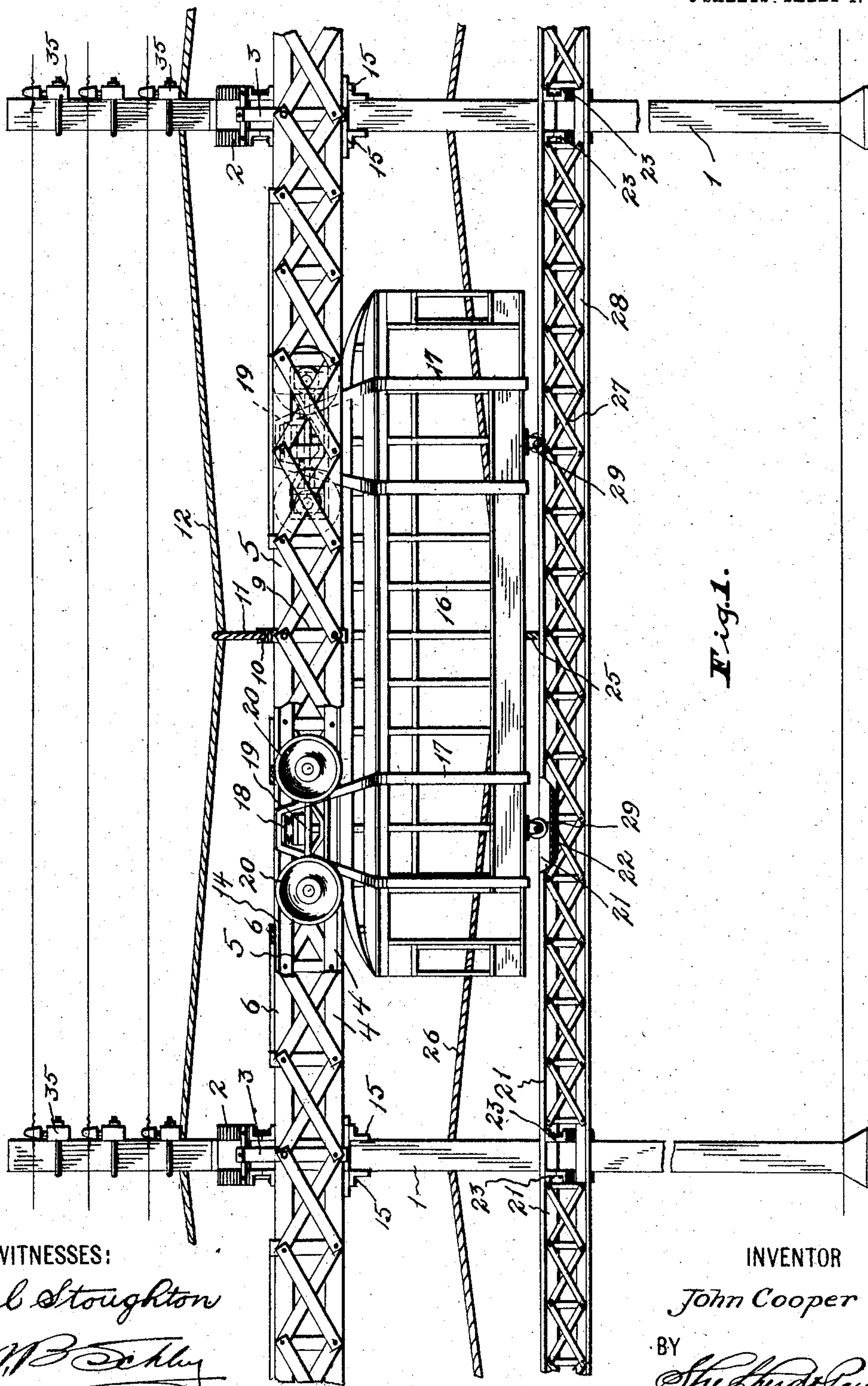


No. 786,874.

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ELEVATED RAILROAD.  
APPLICATION FILED DEC. 21, 1904.

3 SHEETS—SHEET 1.



**WITNESSES:**

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3 SHEETS—SHEET 2.

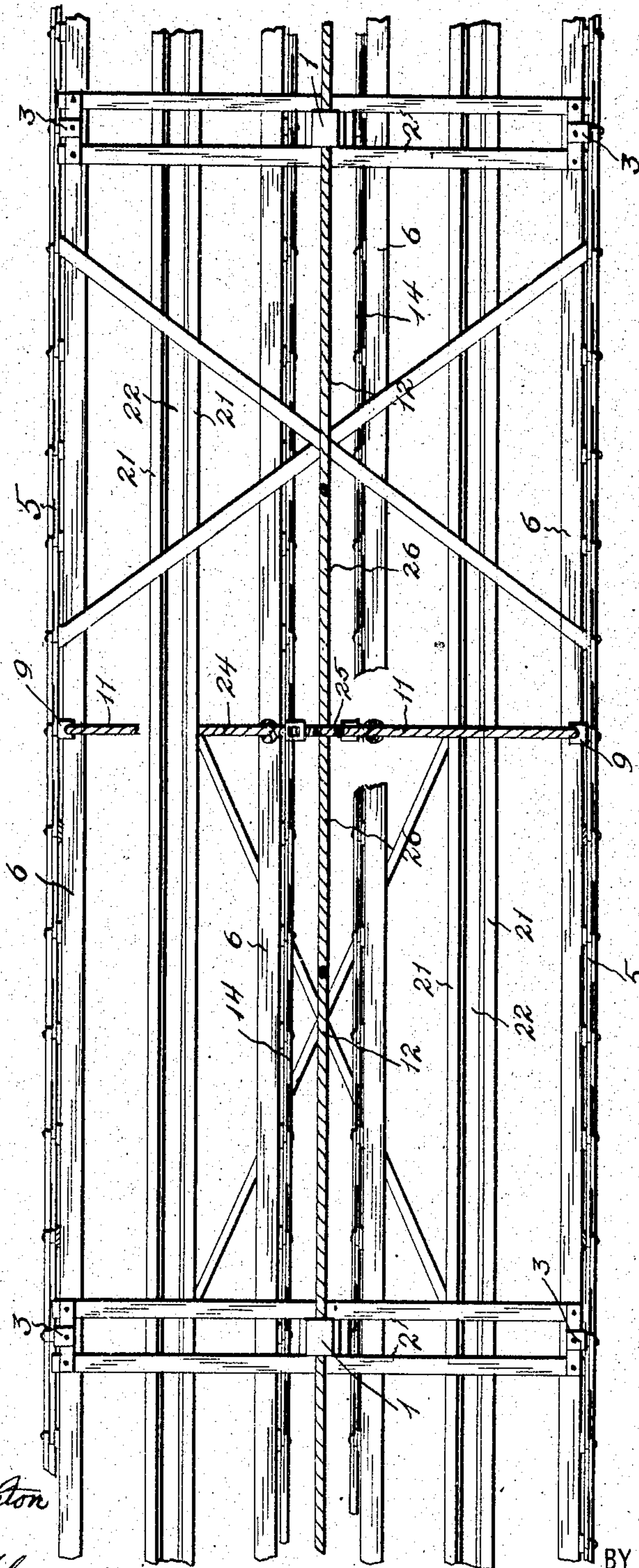


Fig. 2.

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3 SHEETS—SHEET 3.

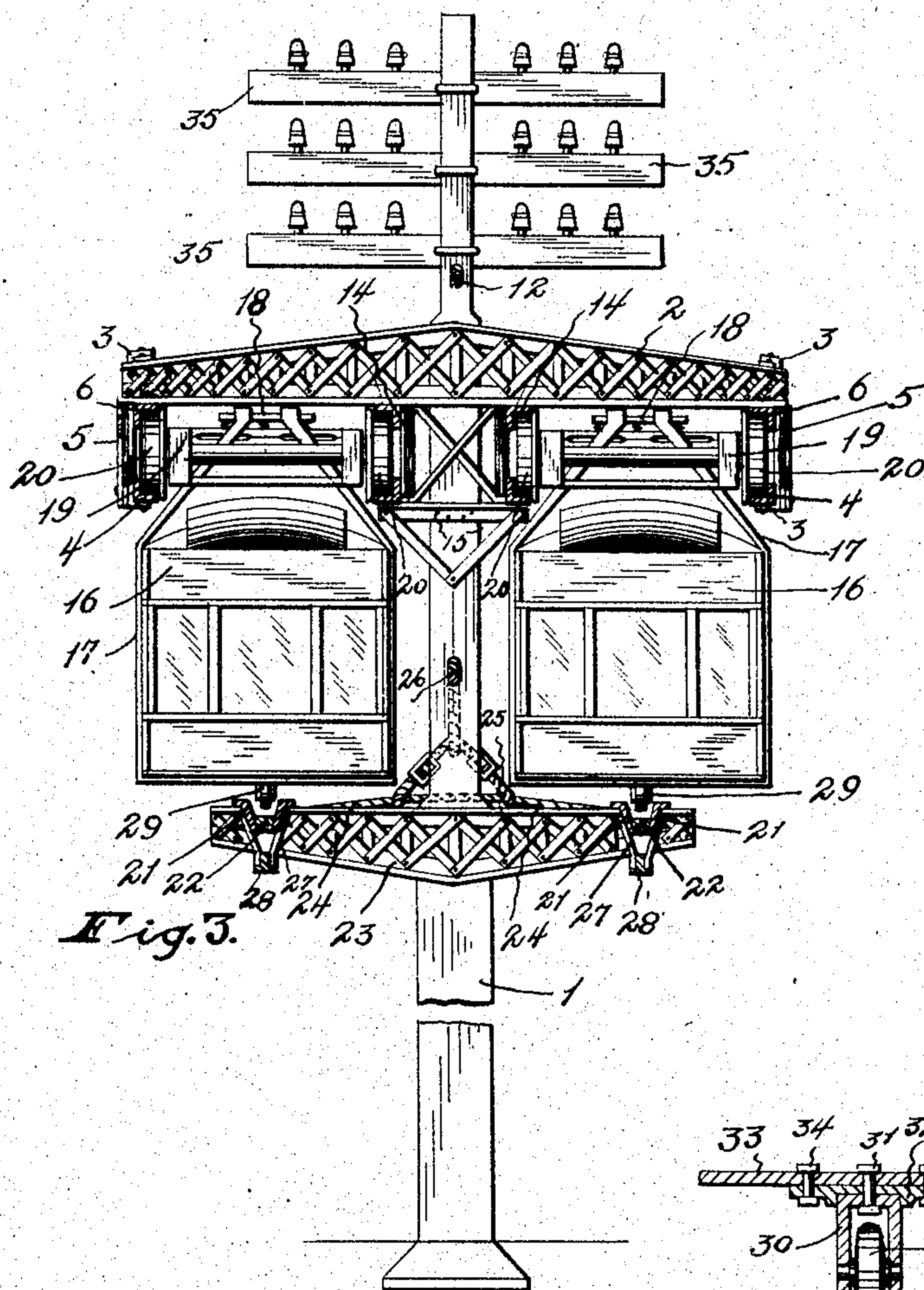


Fig. 3.

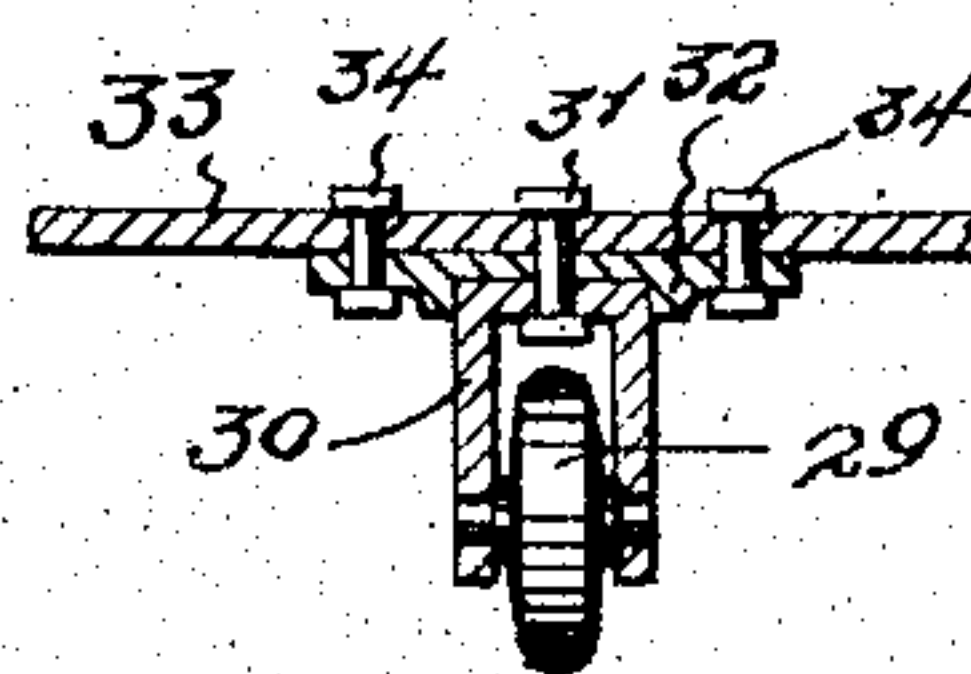


Fig. 5.

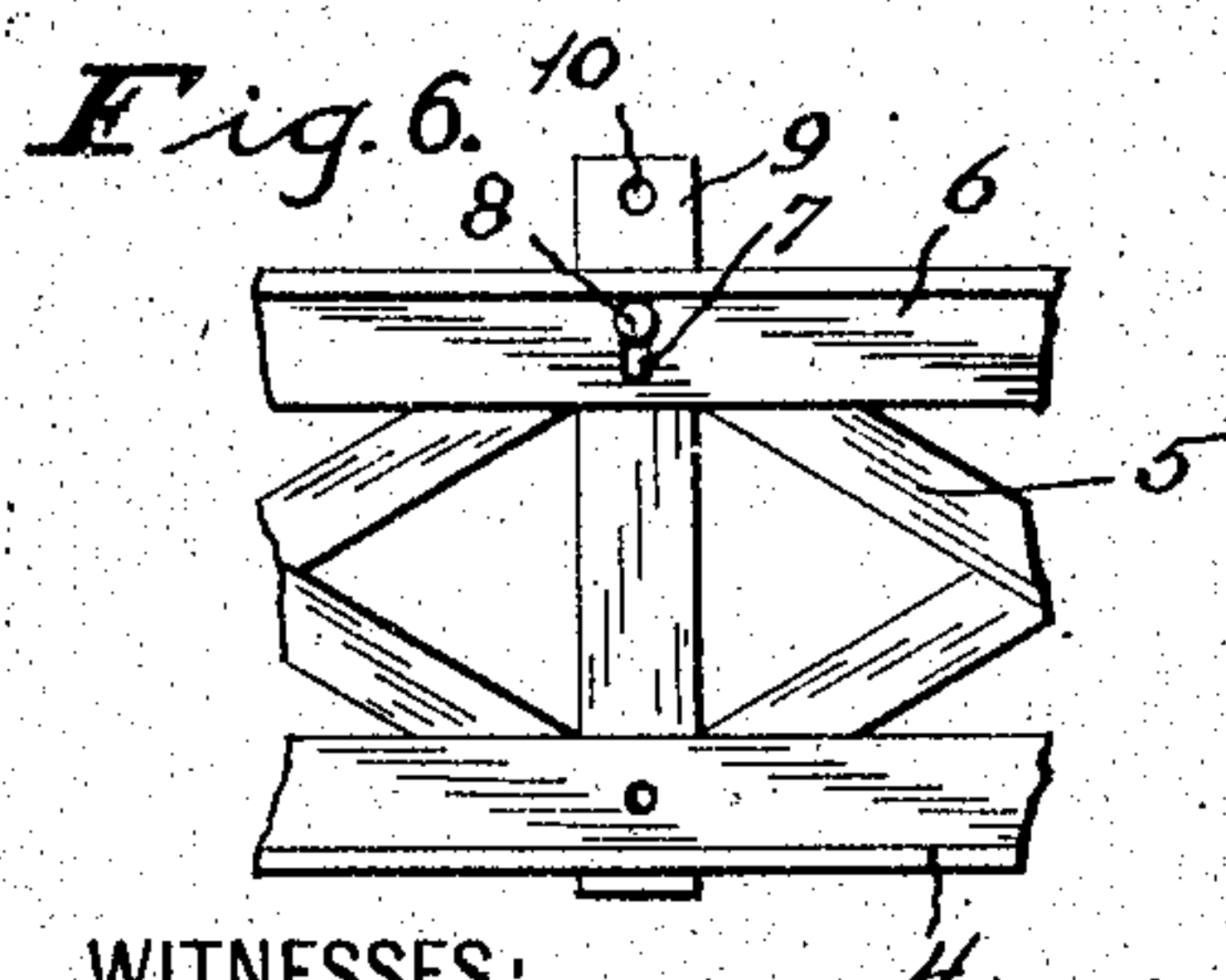


Fig. 6.

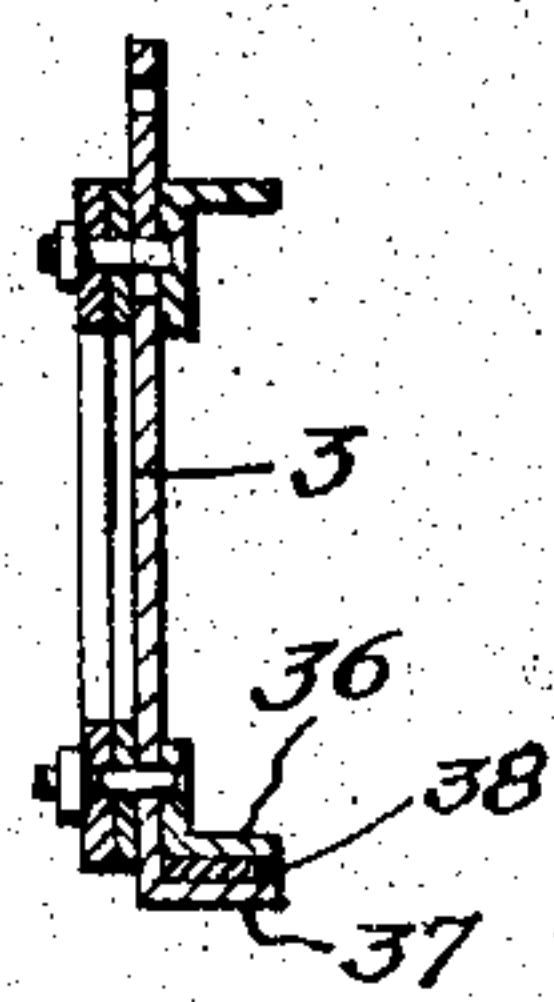


Fig. 4.

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# UNITED STATES PATENT OFFICE.

JOHN COOPER, OF MOUNT VERNON, OHIO.

## ELEVATED RAILROAD.

SPECIFICATION forming part of Letters Patent No. 786,874, dated April 11, 1905.

Application filed December 21, 1904. Serial No. 237,746.

*To all whom it may concern:*

Be it known that I, JOHN COOPER, a citizen of the United States, residing at Mount Vernon, in the county of Knox and State of Ohio, have invented certain new and useful Improvements in Elevated Railways, of which the following is a specification.

My invention relates to a new and useful improvement in elevated railways.

The object of the invention is to provide a simple structure of superior construction whereby cars may be safely suspended and operated overhead, thus obviating the usual interference with traffic on the ground-level and producing a general advantageous arrangement.

Another feature resides in a safety-track which normally prevents swaying of the car and affords a substantial and efficacious support in case of an accident to the suspending means.

Finally, the object of the invention is to provide a device of the character described that will be strong, durable, efficient, simple, and comparatively inexpensive to construct, and one in which the number of parts are reduced to a minimum and which parts will not be liable to get out of working order.

With the above and other objects in view the invention consists of the novel details of construction and operation, a preferable embodiment of which is described in the specification and illustrated in the accompanying drawings, wherein—

Figure 1 is an elevation of a portion of my improved railway construction, showing a car suspended therefrom and a portion of one of the outer tracks broken away to show one of the car-trucks. Fig. 2 is a plan view of the track with the cars and the cross-arms removed and broken away, so as to show the supporting-cables and their connection. Fig. 3 is an end elevation of the parts shown in Fig. 1. Fig. 4 is a transverse vertical sectional view of a modified form of track constructed to deaden the sound made by the car-wheels. Fig. 5 is a transverse vertical sectional view of one of the safety-wheels and its supporting means, and Fig. 6 is a partial elevation of the inner side of one of the tracks.

In the drawings the numeral 1 designates the supporting posts or columns, which may be constructed in any suitable manner and arranged and applied as desired by the constructor of the railway. It is to be understood that while in the drawings I have shown the posts 1 as disposed centrally of the railway and acting as the only ground support I may use other forms of supporting construction or a greater number of posts or columns. Across the upper portion of each column 1 I arrange truss-beams 2, which carry at their outer ends strap-irons 3, the latter being bent inward at each end, so as to be securely fastened to the beams at their upper ends and to support at their lower ends angle-irons 4. The angle-irons 4 form the supporting portion or tread of the tracks 5, which are preferably constructed of trussed strap-iron, as shown, although they may be otherwise constructed. An upper angle-iron or retaining-rail 6 is formed with vertical slots 7, through which are passed bolts 8, engaging with the supporting strap-irons 3 and intermediate vertical supporting strap-irons 9. The car-wheels travel between the rails 4 and 6, and it is obvious that the upper rail 6 may be adjusted so as to prevent vertical play of the car-wheels. The intermediate strap-irons 9, which are formed with an eye 10, in which are secured the ends of a cross-cable 11, which is supported centrally by an upper longitudinal cable 12, extending between the posts 1 and supported thereby. It is apparent that the outer tracks are supported from the cross-beams 2 at each post by the strap-irons 3 and between the posts by the cables 11 and 12 and the strap-iron 9. The inner tracks 14 are constructed similar to the outer tracks 5 and are supported by a trussed framework 15, secured upon each post, as clearly set forth in Fig. 2.

Any number of cars 16 of any suitable construction may be employed, and each car is preferably supported near each end in cradles or hangers 17, which are bent inward toward each other over the top of the car and secured upon the spring-bolsters 18 of suitably-constructed trucks 19. The cradles or hangers 17 may be constructed each of a single piece



of metal passing entirely around and under the car, thus forming a strong and compact support therefor. The trucks 19 are each provided with the usual wheels 20, which engage the tracks 5 and 14, as clearly set forth in the drawings. It is apparent that the wheels 20 being flanged and fitting snugly within the tracks lateral displacement of the trucks is almost impossible and the liability of the trucks becoming disengaged from the tracks is reduced to a minimum.

For the purpose of additional supporting the cars and to prevent them from falling to the ground should one of the trucks give way I provide safety-tracks, one disposed under each car. The safety-tracks comprise diverging side plates 21, which are connected at their lower ends by channel-irons 22 and which are supported at each post by trussed cross-beams 23 and intermediate the posts by cross-cables 24, suitably connected at each end to the inner side plates 21. The cross-cables 24 are supported centrally by adjustable loops, as 25, which in turn are supported by lower longitudinal cables 26, extending between the posts and secured thereto. By the adjustable loops 25 slack may be taken up and the supporting-cables drawn taut. It is obvious that the upper supporting-cables may also be provided with adjusting means whereby slack may be taken up. The safety-tracks are preferably constructed of trussed strap-irons 27, similar to the tracks 5 and 14, which strap-irons are connected at their upper ends to the side plates 21 and connected together at their lower ends by the longitudinal T-irons 28. It will be observed that the safety-tracks form grooves or channels, of which the channel-irons 22 form the bottom.

Arranged at each end of the car and secured to the bottom thereof beneath the center of each truck is a safety-wheel 29, which comprises a yoke or hanger 30, supported from a pivot or king bolt 31, passing through the bottom 33 of the car and a recessed wear-plate 32, which latter is secured to the under side of the car bottom or floor 33 by bolts 34. By this construction the wheels 29 are pivotally supported, so as to allow them to turn as the car rounds a curve, the recessed wear-plate 32 bracing the yoke 30 and taking the strain off the pivot-bolt 31. These safety-wheels 29 travel in the grooves or channels formed by the safety-track normally above the channel-irons 22 and out of contact therewith and the side plates 21, but projecting into the safety-tracks a sufficient distance to impinge the said plates when the car swings laterally and prevent swaying of the same.

Suitable cross-arms 35 may be secured upon the upper ends of the posts 1 for supporting cables and telephone or telegraph wires, thus obviating the necessity of placing extra poles for the same along the sidewalks.

In Fig. 4 I have illustrated another form

of track, in which the lower rail (indicated at 36) is bolted to the strap-iron 3 above the upper surface of the intumed supporting portion 37 of the strap-iron 3 to allow the insertion of a strip of non-conducting material 38 to be interposed between the parts, as shown in Fig. 4. By non-conducting material I mean a material capable of deadening sound, and thus to some extent producing a noiseless railway.

It is obvious that any form of motive power for propelling the cars may be employed and that the necessary apparatus may be applied to the cars and the railway.

The safety-wheels 29 being normally supported above the channel-irons 22, it is obvious that as the load in the car increases the latter will settle down and cause the wheels to travel on the channel-irons, which steadies and supports the car and relieves the upper tracks and structure of the additional strain.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an elevated railway, the combination with a car, trucks for supporting the same and the wheels of the trucks, of supporting means, angular tracks arranged on the supporting means and supporting and confining the truck-wheels therebetween, and a safety-track projected from the supporting means beneath the car.

2. In an elevated railway, the combination with a car, overhead trucks and the truck-wheels, of supporting means, suspending means projecting from the supporting means, tracks supported from the suspending means comprising opposed angular rails confining the truck-wheels therebetween, and means for connecting the rails of each track.

3. In an elevated railway, the combination with a car, overhead trucks supporting the car and the truck-wheels, of supporting means, tracks suspended from the supporting means engaged with the truck-wheels for supporting the same, a safety-track suspended from the supporting means so as to lie beneath the car and centrally of its line of travel, and a safety-wheel carried upon the car in juxtaposition to the safety-track but normally out of contact therewith.

4. In an elevated railway, the combination with a car, supporting means and means for suspending the car from the supporting means, of a safety-track supported from the supporting means beneath the car comprising side plates and a channel-iron for connecting the side plates, and safety-wheels pivotally mounted upon the car projecting within the safety-track but normally out of contact with the side plates and channel-iron thereof.

5. An elevated railway comprising a line of single posts, an upper and a lower cross-beam supported from each post, car-tracks supported by the upper beams, safety-tracks supported by the lower beams, a cable extend-

ing between the posts and connected to the  
car-tracks intermediate of the former, and a  
second cable extending between the posts and  
connected to the safety-tracks intermediate of  
5 the former.

6. In an elevated railway, the combination  
with a car, means for supporting the car and  
a safety-track arranged beneath the car, of a

pivoted safety-wheel carried by the car and  
disposed in juxtaposition to the safety-track. 10

In testimony whereof I affix my signature in  
presence of two witnesses.

JOHN COOPER.

Witnesses:

A. L. PHELPS,

M. B. SCHLEY.