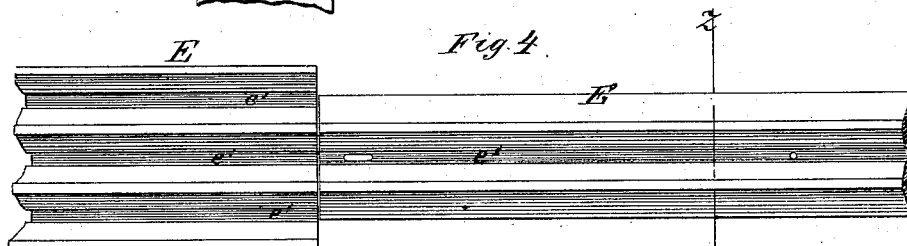
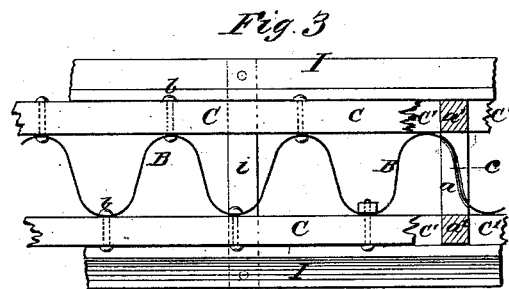
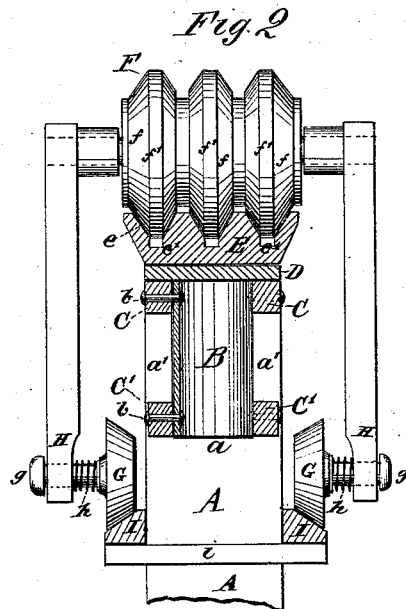
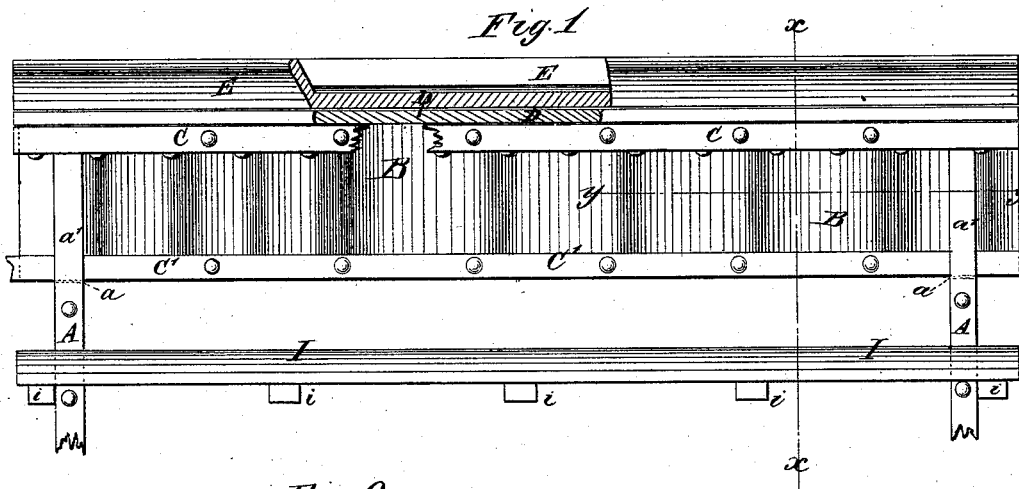


C. DONKERSLEY.
Elevated-Railway.

No. 219,392.

Patented Sept. 9, 1879.



Witnesses:
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Charles Gustafson

Inventor:
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Fig. 6.

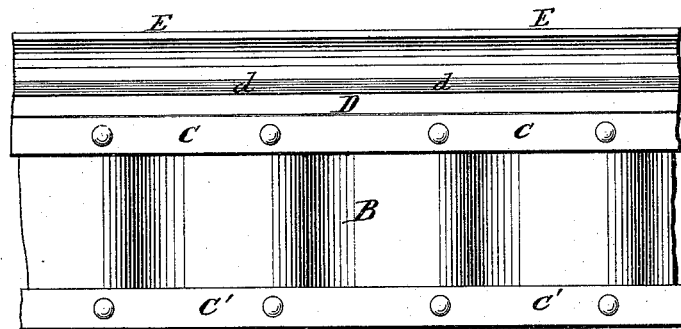
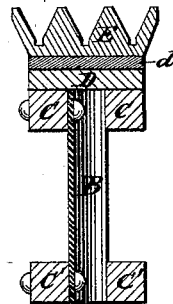


Fig 7.



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UNITED STATES PATENT OFFICE.

CORNELIUS DONKERSLEY, OF NEW YORK, N. Y.

IMPROVEMENT IN ELEVATED RAILWAYS.

Specification forming part of Letters Patent No. **219,392**, dated September 9, 1879; application filed April 9, 1879.

To all whom it may concern:

Be it known that I, CORNELIUS DONKERSLEY, of New York, in the county of New York and State of New York, have invented a new and useful Improvement in Elevated Railways, of which the following is a specification.

My invention relates to that class of elevated railways in which the cars are running by central wheels upon a single-rail track.

The object of the invention is to attain more rigidity and simplicity of construction of such railways, reduce their rattling noise, increase traction by increasing adhesion between the drive-wheel and rail, and to provide for the lateral steadying of the cars and for their safe support in case of accident by broken rail.

My invention consists in the construction and combination of the various parts, as will be hereinafter described and claimed.

In the accompanying drawings, in Sheet 1, Figure 1 represents a side elevation of a portion of my improved elevated single-rail railway, partly broken out. Fig. 2 is a vertical section of the same, taken on the line *xx* of Fig. 1, and showing the drive-wheel and side wheels in position as when in use. Fig. 3 is a horizontal section of the same, taken on the line *yy* of Fig. 1, and showing also a portion of the side bars for the stretcher. Fig. 4 is a plan view of a portion of the track, showing a single-grooved rail joining one having three grooves. Fig. 5 is a cross-section, on the line *zz*, of the single-grooved rail. In Sheet 2, Figs. 6 and 7 represent a side view and a cross-section, respectively, of a portion of my elevated railway, in which the stretcher is provided with two side bars on each side.

Similar letters of reference indicate the same parts in the different figures.

The track is supported upon standards or posts *A*, placed at suitable distances apart, and high enough above ground to prevent the blocking of a train by snow. These standards *A* have a deep recess or opening at their upper ends, so as to form a central horizontal surface, *a*, for the support of the stretcher, and two side posts, *a'*, for the support of bars, one on each side of the stretcher.

B is the said stretcher, and *C C'* the said side bars. The stretcher *B* is made of corrugated iron plate of thickness and height pro-

portioned to the requisite strength, and the side posts, *a'*, are shorter than the height of the stretcher by just the proper thickness of the side bars, *C C'*, so that when placed in the position shown in the drawings the plane of the upper surfaces of the bars *C* will coincide with the plane of the upper edge of the corrugated iron stretcher *B*, and the said bars and stretcher together form a continuous support for the rail.

The stretcher *B* is secured to the side bars, *C C'*, (at the points where the corrugations of the former come in contact with the inside edges of the latter,) by rivets or bolts *b* going through side bar, *C C'*, and stretcher-plate *B* simultaneously. The surface *a* in the standard *A* may be provided with a groove, as shown at *c* in Fig. 3, to receive and retain the lower edge of the stretcher *B*, if desired.

By this construction immense strength and rigidity are obtained to effectually resist vertical as well as lateral pressure. I have practically demonstrated that a stretcher thirty inches high, made of only five-sixteenths-inch iron plate, and resting on standards *A*, thirty feet apart, will support the heaviest locomotive.

D is a continuous plank placed upon the stretcher throughout the whole length of the road, and forming an unbroken bed for the rail to rest upon. The entire upper surface of the plank *D* is covered with a non-conducting material, *d*, (whose composition I will make the subject of a separate application for patent,) which, thus interposed between the rail and its bed throughout the entire length of the road, forms an excellent means of deadening the rattling noise of the railway, the plank itself being also conducive to that effect.

E is the rail, provided all along its surface with one or more continuous V-shaped grooves, *e*, and the drive-wheel *F* has annular V-shaped webs *f*, corresponding in number, size, and position with the said grooves *e*, so as to exactly fit the latter. The edge of each web *f* is faced off or turned down flat, as shown at *f'*, and the point of the angle at the bottom of the corresponding groove *e* is cut away by forming a square channel, *e'*, of the same width as the face *f'* of the corresponding web *f*, thus having a space under each face *f'* sufficiently

large to make sure that the weight of the locomotive shall exert a wedging pressure upon the sides only of the webs and grooves, and consequently produce a far greater adhesion to the rail than with rails of ordinary construction, and greatly increase the traction of the engine. This affords a controllable means of varying the traction in proportion to the requirements of the grade by simply varying the number of grooves in the rail—that is to say, by placing a single-grooved rail on a level part of the road, and continuing with a rail of several grooves, as shown in Fig. 4, where an up-grade occurs.

By the shape of cross-section of the single-grooved rail shown in Fig. 5, it will be seen that its bearing-surface comprises not only the sides of the central groove *e*, but also the outer bevel-surfaces, *e'*.

I lay, however, no claim to forming an annular flange upon the wheel working in a groove upon the rail, for that, I am aware, is old, an instance being shown in Patent No. 1,107 of 1839.

In order to steady the locomotive or car against lateral movement, such as is due to centrifugal force in passing a curve of the track, I provide smooth-faced conical side wheels, *G*, one or more, on each side of and at a distance below the rail *E*, said wheels being mounted on shafts or journals *g* in bearings *H*, attached directly or indirectly to the body or frame of the locomotive or car, and surround the shafts *g* with spiral springs *h*, acting to hold the wheels *G* in position to bring their conical surfaces in running contact with the beveled surfaces of two safety-rails, *I*, which latter I arrange continuous, one on each side of the track, as seen in the drawings, and secure them to the standards *A*, retaining them in position at the proper distance apart by cross-braces *i* at intervals.

The wheels *G* are not intended to support any portion of the weight, except to prevent accident in consequence of a broken rail or from other cause, in which case the safety-rails *I* receive the pressure, and the cars may be moved along on them by the wheels *G* until the defective place is passed over.

By the beveled form of the side wheels, *G*, and safety-rails *I*, the springs *h* act to relieve the effect of sudden pressure, whether vertical or lateral, and thus prevent damage by concussion between the said wheels and rails, as any setting or wobbling of the cars only causes the side wheels, *G*, to travel higher up or lower down upon the inclined faces of the safety-rails *I*, more or less varying the tension of the springs *h*, according to the force exerted.

I do not claim, broadly, the combination of side wheels and a central wheel, for that, I am aware, is old and has been variously used before, examples of which are shown in patent to N. Emmons, April 17, 1837, also Patent No. 173,240 of 1876, and others; nor do I claim, broadly, a continuous packing to muffle the sound, for such packing has been applied along

the vertical web of a T-rail, and packing has also been used underneath the rail at points where the same rests on the sleeper, as shown in Patent No. 208,880 of 1878; nor do I claim, broadly, a rail or beam having vertical corrugations, instances of such being shown in Patent No. 124,175 (for railroad-rail) and No. 101,015, (for beams and girders.)

It is evident that this my invention is well adapted also for use in towing canal-boats.

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

1. In an elevated railway, the stretcher, formed of corrugated metallic plate *B* and longitudinal side bars or braces, *C C'*, in combination with the grooved rail *E* and standards *A*, having suitable bearing-surfaces *a*, substantially as specified.

2. The standard *A*, having a recess or opening at its upper end to form the central surface *a*, and the side posts, *a'*, in combination with the corrugated stretcher *B* and the longitudinal side braces, *C C'*, substantially as hereinbefore set forth.

3. The continuous plank *D*, with or without a non-conductive covering, in combination with the corrugated stretcher *B* and the longitudinal side braces, *C C'*, to form a bed for supporting the grooved rail *E* upon the said stretcher, substantially as specified.

4. The rail *E*, provided with one or more V-grooves, *e*, having bottom channels *e'*, in combination with the drive-wheel *F*, having circumferential annular V-shaped webs *f*, provided with flattened faces *f'*, as and for the purpose set forth.

5. A railroad-rail, *E*, having one or more V-grooves, *e*, provided with central bottom channels, *e'*, substantially as and for the purpose set forth.

6. A single-rail elevated-railway track formed by the combination, with a single-grooved rail, of a rail having two or more similar grooves to increase traction on an ascending grade, substantially as set forth.

7. The spiral relief-spring *h*, arranged to push endwise upon the horizontal shaft *g* of the wheel *G*, in combination with the stationary bearing *H* and the beveled safety-rail *I*, as and for the purpose set forth.

8. In a single-rail elevated railway, the combination of the central wheel, *F*, with the smooth-faced bevel-wheels *G*, when the latter are arranged to run upon the bevel upper side of the safety side rails *I*, substantially as specified.

9. In an elevated railway, the combination of the rail *E*, having a bottom-channeled central groove, *e'*, the continuous plank *D*, and the supporting-standard *A*, substantially as set forth.

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Witnesses:

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