4 Sheets—Sheet 1.

J. M. HANNAHS.

Elevated Railway.

No. 106,056. Patented Aug. 2, 1870.

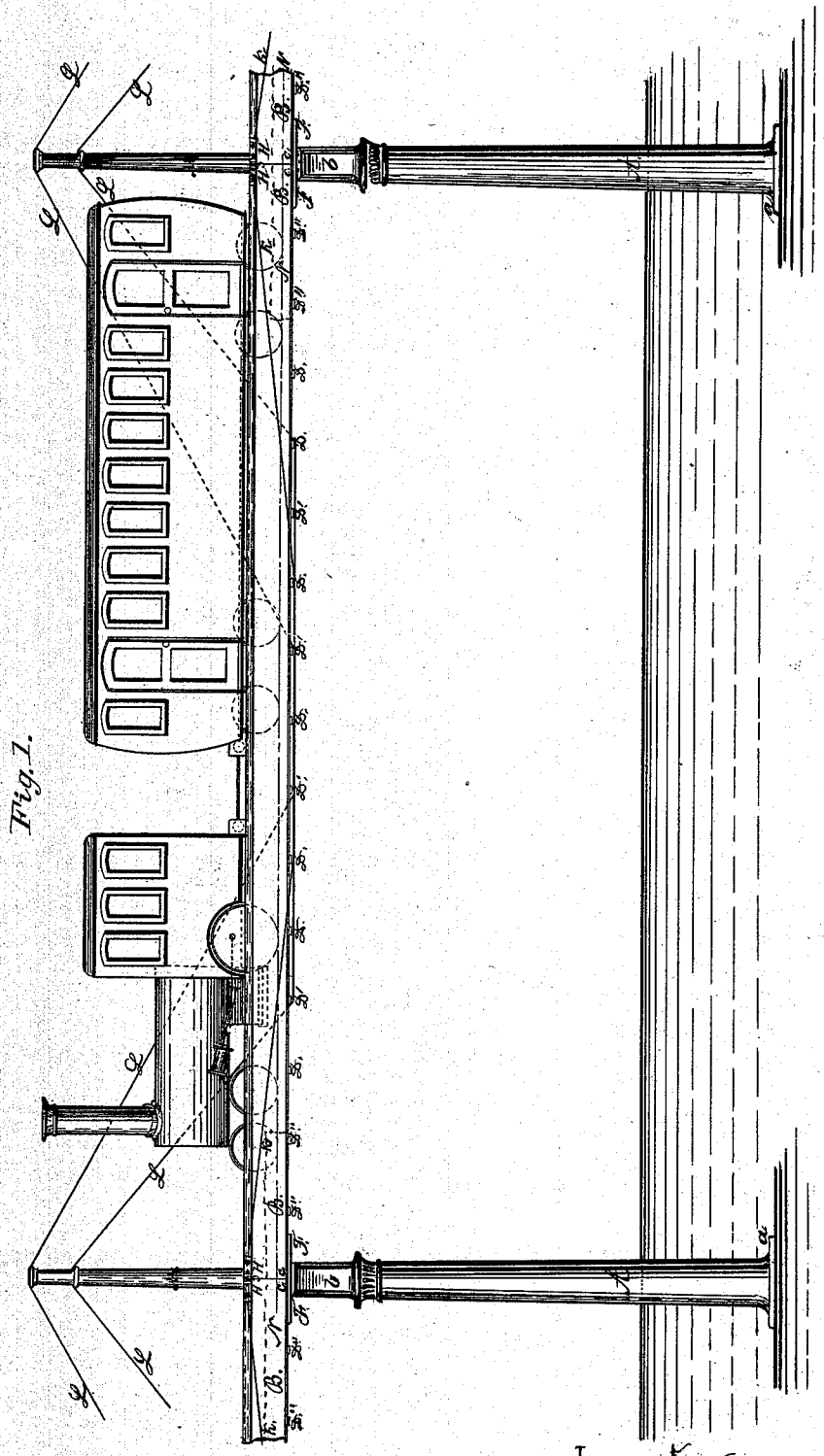

Fig. 1.

Witnesses:
F. W. Wolf.
Wm. H. Dewhirst

Inventor:
James M. Hannahs

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J. M. HANNAHS.

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No. 106,056. Patented Aug. 2, 1870.

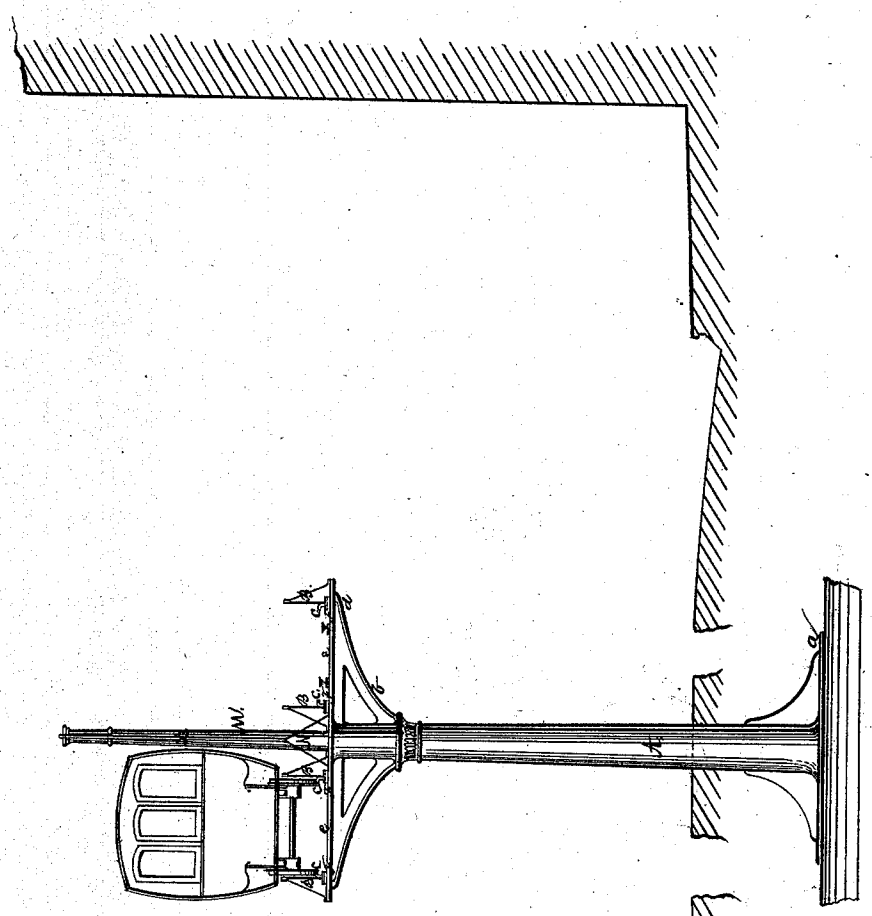

Fig. 2.

Witnesses
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Wm. H. Deubl

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4 Sheets—Sheet 3.

J. M. HANNAHS.

Elevated Railway.

No. 106,056. Patented Aug. 2, 1870.

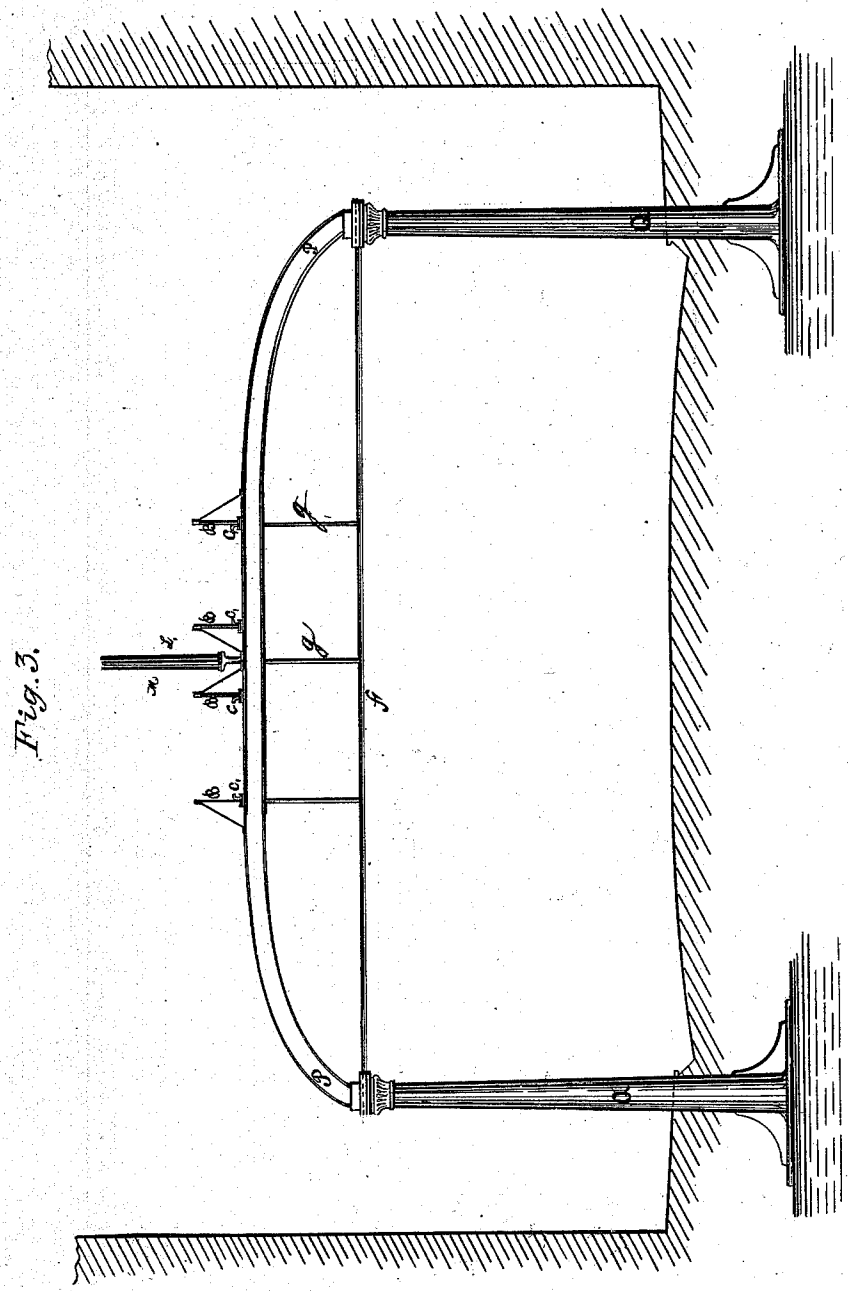

Fig. 3.

Witnesses:
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Wm. H. Diebel

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4 Sheets—Sheet 4.

J. M. HANNAHS.

Elevated Railway.

No. 106,056. Patented Aug. 2, 1870.

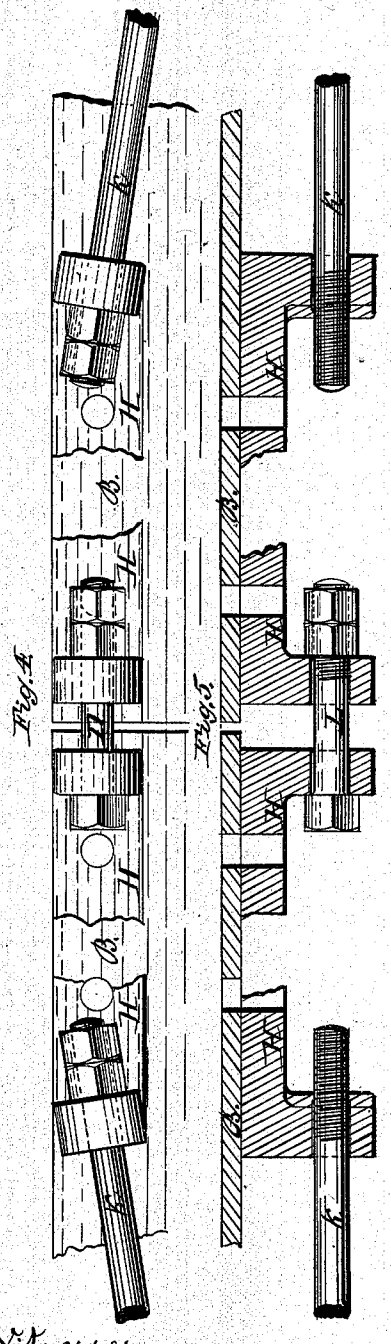

Fig. 4.

Fig. 5.

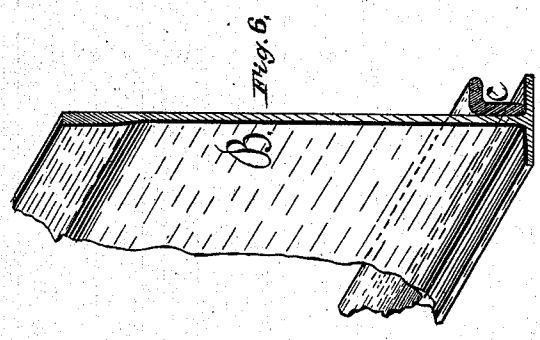

Fig. 6.

Witnesses:
Fk. W. Wolf
Wm. H. Drabel

Inventor:
James M. Hannahs

United States Patent Office.

JAMES M. HANNAHS, OF CHICAGO, ILLINOIS.

Letters Patent No. 106,056, *dated August* 2, 1870.

IMPROVEMENT IN ELEVATED RAILWAYS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JAMES M. HANNAHS, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Elevated Railways, of which the following is a specification, reference being had to the accompanying drawing.

My invention relates to elevated railways for towns, cities, parks, and like places, and consists of broad parallel girders, constructed, arranged, and supported, in connection with a railway-track, in a novel manner, upon a single or double row of metallic columns, as hereinafter explained.

In the drawing—

Figure 1 is a side elevation of my railway, mounted on a series of single columns;

Figure 2 is an end view of the same;

Figure 3 is an end view of my railway, mounted on two rows of columns; and

Figures 4, 5, and 6 are views of parts detached.

In the construction of this railway metallic columns A, of suitable size and strength, with a broad base, *a*, are placed on a stone or other firm foundation.

When a single row is used, as shown in figs. 1 and 2, each column is provided with horizontal arms *d*, extending at right angles to the line of the columns, and at a proper height from the street, so as not to be an obstruction.

They are made strong, and may be further strengthened by braces *b*, as shown in the same figures, and are also long enough to support a railway-track on each side of the column.

On each of these arms are fastened metallic plates F F, two on each arm, and at equal distances apart, by bolts, or in any secure manner, and upon them are arranged two parallel lines of girders B B, with their ends meeting on the plates, and firmly secured to them.

These girders have broad flanges on their under side, and are in height, on their sides, nearly equal to the diameter of the wheels of the cars, as clearly shown in fig. 1, their form being more clearly shown in Figure 8, and they are placed far enough apart to form an "iron inclosure" for a railway.

Cross-bars D D connect them together, which are placed at proper distance apart to support a floor, E.

To the inner sides of these girders are bolted rails C, with a flange turned inward, for the cars to run upon, as shown in figs. 2 and 8.

To support and strengthen these girders, I make a suspension truss, as follows, to wit:

Connecting-plates H H, provided with flanges, turned up, are bolted to the upper edge and ends of each girder, as shown in fig. 1, their form being more clearly shown in figs. 4 and 5.

They are then drawn together by bolts I passing through their flanges, as shown in figs. 4 and 5. As these bolts are tightened, they serve to connect the girders firmly, so as to form a rigid continuous line.

The plates on the two ends of each girder are then connected by truss-rods K passing under the cross-bars D D, and arranged as shown in fig. 1.

These rods may be provided with any of the ordinary means for tightening them.

As the girders are rigidly connected by the plates H H, it will be seen that, if one of the truss-rods breaks, the girder, which it is mainly designed to support, will still be held securely at its end by means of its connection, through the plates H H, with the next girder and truss-rod; or should a girder be broken or be disconnected from the plates H H, it would still be upheld by the truss-rods acting as a suspension-cable.

These girders are also supported by tension-rods or cables L L, stretched from or near the tops of columns M, which rise above the main columns A, to cross-bars D' under the girders, as shown in fig. 1.

They are further supported by bolsters N N, resting upon the top of the main column A, and extending on either side at right angles to it, and parallel with the girders, as shown in dotted lines *m*, fig. 1.

These bolsters have cross-bars D" D" bolted to the under sides of their ends, so as to extend under the main girders.

As the rails on which the cars are to run are placed either next to or very close to the inner sides of the girders, it is obvious that these girders, besides furnishing the immediate support of the railway, will also, by reason of their high sides, form an iron inclosure, so as to prevent the cars from running off on either side.

When desired for use in narrow streets, two rows of columns may be arranged, as shown in figs. 1 and 3.

In this case they are placed along the outer edge of the opposite sidewalks, the columns opposite each other being connected by an arched girder, P, and tie-rods *f* and *g*, as shown in fig. 3.

The girders B B, as above described, with the plates F, connecting-plates H H, truss-rods K, columns M, tension-rods or cables L, bolsters N, &c., are then arranged on these arches, as shown in fig. 3.

Having thus described my invention,

What I claim is—

1. An elevated railway, mounted on a single or a double row of columns, and consisting of the trussed girders B B, with the rail *c* attached, when constructed and arranged substantially as herein described.

2. In combination, the girders B B, connecting-plates H H, and the truss-rods K K, when constructed and arranged substantially as herein described, and for the purpose set forth.

JAMES M. HANNAHS.

Witnesses:

C. D. WIDMAN,

WM. H. H. GRAY.