

**No. 633,145.**

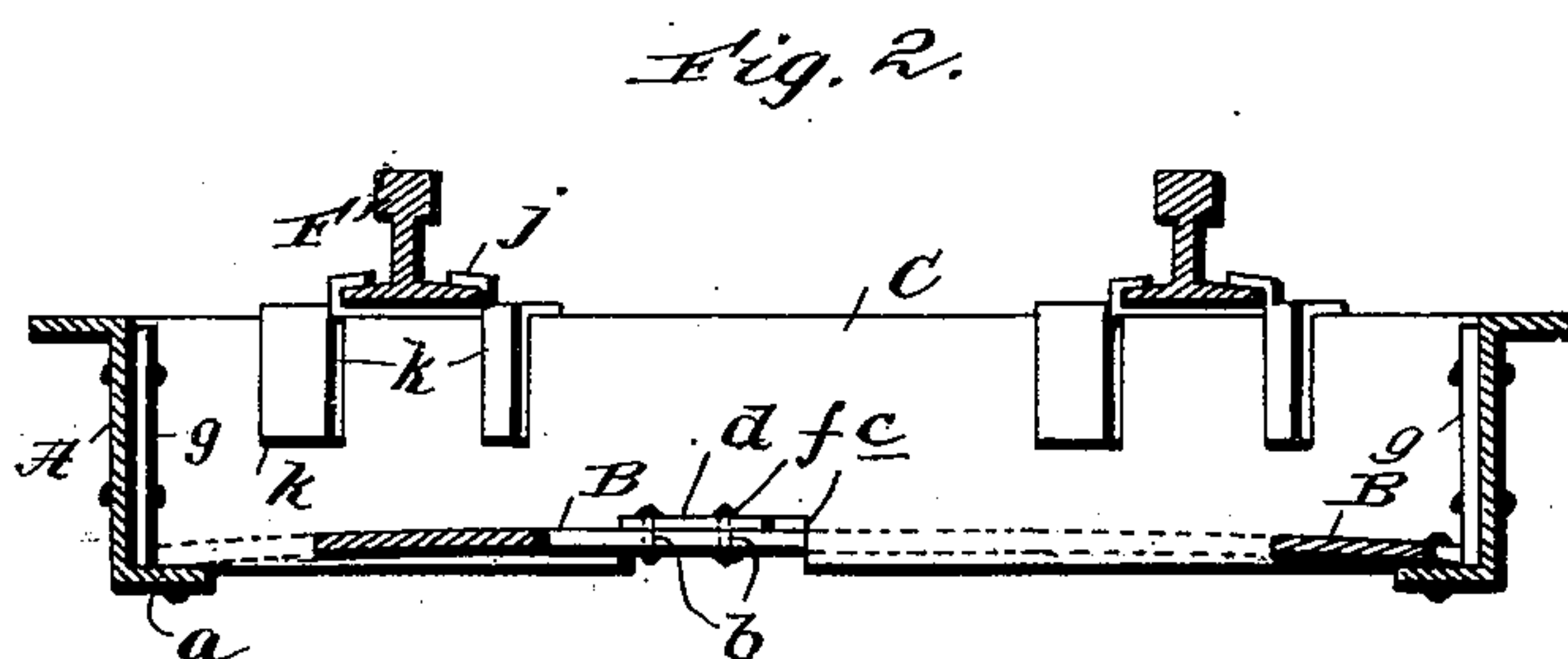
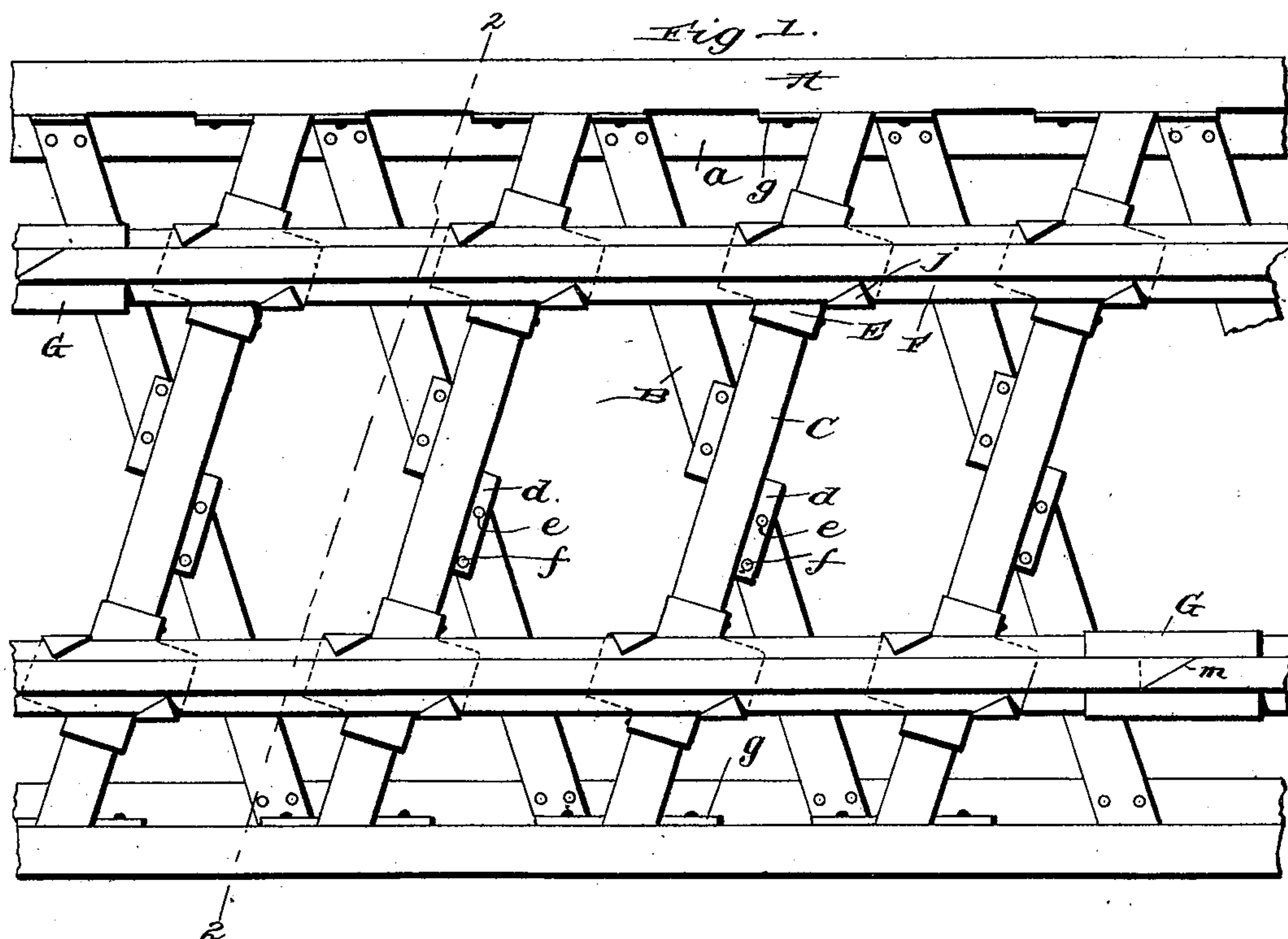
**Patented Sept. 19, 1899.**

**J. I. NEWBURG.**  
**ELEVATED RAILWAY.**

(Application filed Feb. 4, 1899.)

<sup>1</sup>(No Model.)

**2 Sheets—Sheet 1.**



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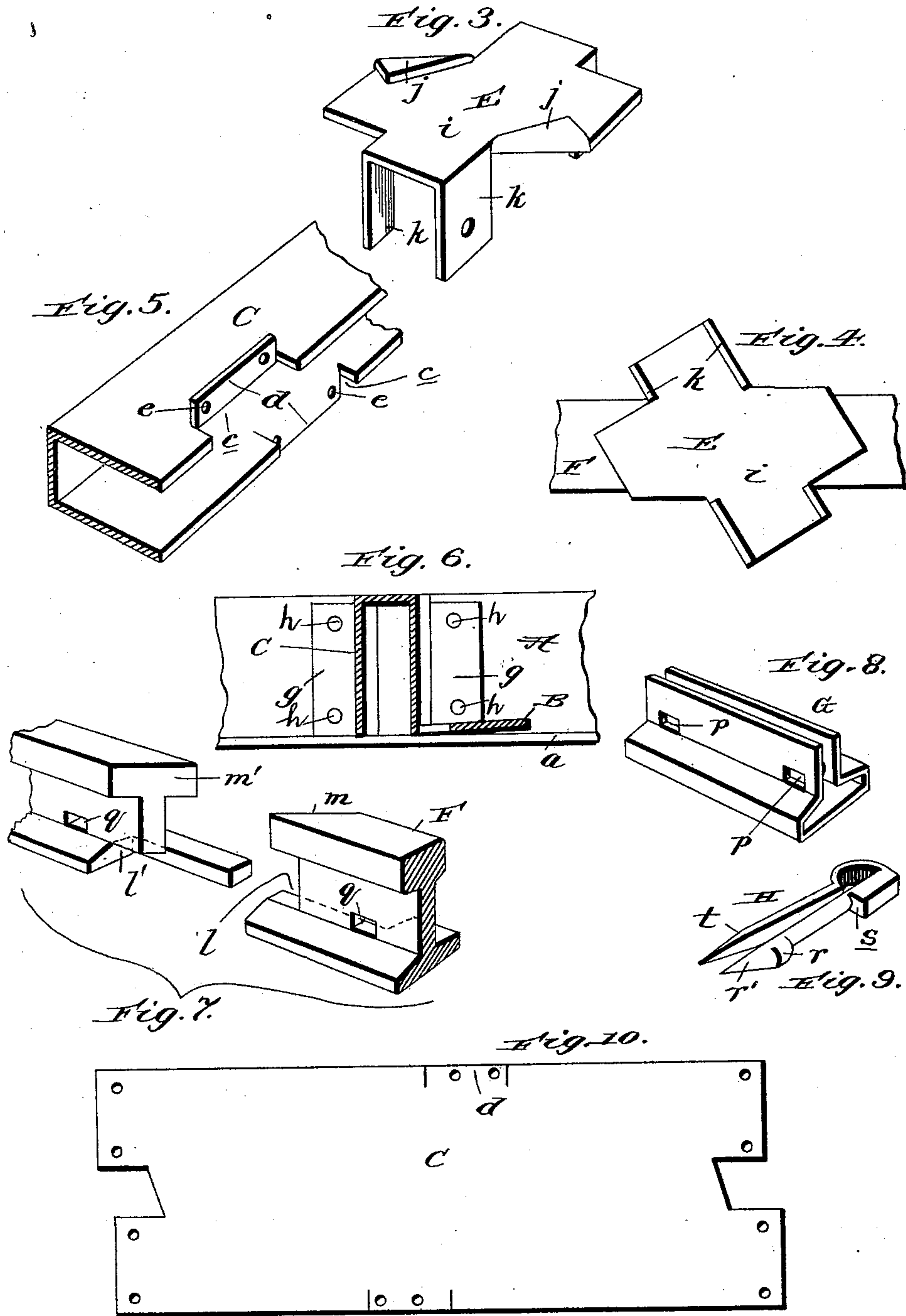
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2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

JOHN ISRAEL NEWBURG, OF VICKSBURG, MISSISSIPPI.

## ELEVATED RAILWAY.

SPECIFICATION forming part of Letters Patent No. 633,145, dated September 19, 1899.

Application filed February 4, 1899. Serial No. 704,523. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN ISRAEL NEWBURG, a citizen of the United States, residing at Vicksburg, in the county of Warren and State of Mississippi, have invented new and useful Improvements in Elevated Railways, of which the following is a specification.

My invention relates to the general structure of elevated railways, and contemplates the provision of an elevated railway constructed entirely of metal in such a manner as to admit of it being expeditiously built and render it light and yet strong and stable and capable of withstanding the great weights and strains which such structures are ordinarily subjected to.

The invention will be fully understood from the following description and claims when taken in conjunction with the annexed drawings, in which—

Figure 1 is a plan view of a portion of an electric railway constructed in accordance with my invention. Fig. 2 is a transverse section taken in the plane indicated by the line 2 2 of Fig. 1. Fig. 3 is a perspective view of one of the rail-chairs embraced in my improvements, the same being shown in its proper position on a beam illustrated by dotted lines. Fig. 4 is an inverted plan view of the chair and a rail therein. Fig. 5 is a broken perspective view of a portion of one of the cross-beams. Fig. 6 is a detail section illustrative of the manner in which the cross-beams are connected to the stringers of the structure. Fig. 7 comprises broken perspective views of the contiguous ends of two rails. Fig. 8 is a detail view of one of the rail-joints. Fig. 9 is a similar view, on an enlarged scale, of one of the keys employed to connect said joint to the contiguous ends of two rails. Fig. 10 is a plan view of one of the blanks of which the cross-beams are formed.

Referring by letter to said drawings, A are the parallel Z-bar stringers of my improved elevated-railway structure, the same being arranged with their upper flanges directed outwardly and their lower flanges directed inwardly.

B are cross-bars which are interposed between the stringers and are designed to serve as braces and prevent lateral motion of the road-bed, and C are cross-beams which serve

to connect the stringers and also as a bed for the rails presently described. The brace-bars are by preference slightly bowed upwardly in the direction of their length and are arranged parallel and disposed obliquely between the stringers, as best shown in Fig. 1. At their ends they rest on and are connected by bolts to the lower inwardly-directed flanges *a* of the stringers and are provided adjacent to their middles with apertures *b* for a purpose presently described. The cross-beams C, which are disposed in a plane above the bars B, are of inverted-U shape in cross-section and are each formed of a blank of sheet metal, such as shown in Fig. 10, the sheet metal being preferable because of its lightness and strength and also because of the facility with which the beams may be made. Said beams C are arranged parallel to each other and oblique to the stringers, and they are also disposed in a direction opposite to that of the bars B, so as to cross said bars at the longitudinal center of the railway. The lower edges of the side walls of the beams C rest in the same plane as the under side of the brace-bars B and are recessed, as indicated by *c*, for the passage of said brace-bars. The recesses *c* are formed by cutting the side walls of the beams and bending portions *d* laterally outward therefrom. These portions or ears *d* have apertures *e*, and they are designed when the bars B rest in the recesses *c* to rest above the said bars and be connected thereto by bolts *f*. At their ends the side walls of the beams C have outwardly-directed flanges *g*. These flanges *g* are interposed between the ends of the braces B and the vertically-disposed portions of the stringers A, whereby they are fixedly secured in position. Their lower ends rest on the lower flanges of the stringers A, and hence but two bolts *h* need be employed to connect each of them to the vertical portions of the stringers. The employment of a minimum number of bolts for the purpose stated is advantageous, because it contributes to the facility with which the parts may be connected and also because the few bolt-holes do not materially weaken the stringers or cross-beams. The cross-beams serve as sleepers to support the rails, and they also serve to connect the stringers and to brace the same. They are



necessarily arranged close together, and therefore must be made of light material in order not to render the road-bed unduly heavy. While they are light, it will be noticed that  
5 their depth renders them very strong and rigid.

The construction thus far described forms what may be properly termed the "bed" of my improved elevated railway. This bed, as  
10 will be appreciated from the foregoing, is susceptible of expeditious construction, and yet is exceedingly light and at the same time strong, durable, and stable, whereby it is rendered capable of withstanding the weights  
15 and strains incident to trains passing over it. Said bed may be supported in any approved manner; but as the said support is no part of my invention I have deemed it unnecessary to illustrate the same.

20 E are the rail-chairs of the railway, which are each formed of a single piece of sheet metal of such weight that it is susceptible of being readily bent, through the medium of the proper appliances. These chairs are similar  
25 in construction, and therefore a description of the one shown in Figs. 3 and 4 will suffice for all. The said chair E comprises a cruciform body *i*, having lips *j* on two opposite arms designed to engage the opposite sides of the  
30 base of a rail, as shown in Figs. 1 and 4, and also having depending lips *k* on the opposite edges of its other two arms, designed to rest at opposite sides of a cross-beam C after the manner shown in Fig. 3 and be connected to  
35 the vertical portions of said beam by bolts *k'*. The chairs E are made complete and of a size to snugly fit the rails and cross-beams. They are twisted on the rails at proper points, while said rails are supported in a plane above the  
40 cross-beams by blanks or the like interposed between their ends and certain of the cross-beams. When a sufficient number of chairs are thus placed on each rail, the blocks or supports are removed from beneath the ends  
45 of the rail, and the same is lowered, so as to rest on the cross-beams. The chairs being arranged at proper points on the rail, it follows that when said rail is lowered the lips *k* of the chairs will assume positions at oppo-  
50 site sides of the beams. It also follows that the rails may be placed and secured in position in the manner described very expeditiously. By reason of the oblique disposition of the cross-beams C and the chairs E, engaging the same, as described, the chairs are  
55 not liable to casual lateral movement, and, in fact, cannot be moved laterally or in the direction of the width of the railway. This is a highly important advantage, since it in-  
60 sures the rails removing at the standard distance apart. The bolts *k'* are not essential; but I prefer to employ them in order to hold the chairs down on the cross-beams. After two parallel rails have been placed and se-  
65 cured to the beams C at the standard distance apart no more measurements are needed, since the angular disposition of the cross-

beams and chairs insures the other rails resting at the standard distance apart. This is also true of turns in the railway, where it is  
70 necessary to use curved rails.

F are the rails of my improved railway. Each of these rails is provided at one end with a recess *l* in its base and has its web and head beveled, as indicated by *m*. Each rail is also  
75 provided at its opposite end, in its base, with a recess *l'* and has the end of its web and head beveled, as indicated by *m'*. The recess *l'* is disposed at the opposite side of the web with respect to the recess *l*, and the bevel *m'* at one  
80 end of the rail is parallel to the bevel *m* at the opposite end of the rail. By reason of this one end of a rail is enabled to fit in the complementary end of another rail, so as to break  
85 joints and greatly strengthen the connection between the two.

G are the rail-joints in which the meeting ends of the rails are seated. These joints are similar in construction, and therefore a description of the one shown in Fig. 8 will suffice for all. Said joint is shaped in cross-  
90 section in conformity to the bases and webs of the rails, which it is designed to snugly receive, and is provided in its upwardly-extending portions with apertures *p*. These aper-  
95 tures *p* are designed to coincide with apertures *q* in the webs of the rails and receive connecting-keys H, one of which is shown in Fig. 9. The said key comprises a body portion *r*, having a beveled head *r'* at one end  
100 and a shoulder *s* adjacent to its opposite end and a resilient arm *t*. The arm *t*, when the key is passed through the coincident apertures of a joint and rail, is designed to exert a pressure against the walls of said apertures,  
105 and thereby hold the head *r'* and shoulder *s* in engagement with opposite sides of the joint and render the employment of threaded bolts and nuts unnecessary. As will be readily ob-  
110 served, the keys of the construction described may be quickly and easily placed and secured in position to effect the connection stated.

By reason of the construction of my improved rail-joints, as above described, the  
115 upper sides of the rails are held flush, and the wheels of a train are prevented from striking the square ends of the rails. This overcomes the unpleasant jar which is generally incident to the wheels passing over the joints  
120 of rails such as at present in use, especially when the rails are subject to detraction.

It will be appreciated from the foregoing that all of the features of my improved railway contribute to the strength of the railway  
125 and its ability to withstand great weights and strains. It will also be noticed that all of the parts are constructed with a view of permitting the railway to be very quickly built, with but a minimum amount of labor, which is an  
130 important advantage.

When desirable, the rail-chairs forming parts of my improvements may be used to advantage in connecting rails to obliquely-dis-



posed beams of wood or other suitable material without departing from the scope of my invention.

Having thus described my invention, what I claim is—

1. In an elevated railway, the combination of stringers having inwardly-directed flanges, brace-bars arranged parallel to each other and oblique to the stringers and having their ends arranged upon and connected to the flanges of the stringers, and the sheet-metal cross-beams arranged parallel to each other and oblique with respect to the stringers, and also arranged above the brace-bars and extending in a direction opposite to the same; the said cross-beams being of inverted-U shape in cross-section and having the recesses *c* receiving and the lugs *d* connected to the brace-bars and also having outwardly-directed flanges at the ends of their vertical portions interposed between the ends of the brace-bars and the stringers and connected to the latter, substantially as specified.

2. In an elevated railway, the combination of stringers having inwardly-directed flanges, oblique brace-bars interposed between and connected to the stringers and resting on the flanges thereof, and oblique cross-beams arranged above and intersecting the brace-bars; the said cross-beams being of inverted-U shape in cross-section and being connected at their ends to the stringers and at intermediate points of their length to the brace-bars, substantially as specified.

3. In an elevated railway, the combination of stringers, obliquely-disposed sheet-metal cross-beams of inverted-U shape in cross-section interposed between and connected to the stringers, rails disposed longitudinally above the cross-beams, and sheet-metal rail-chairs; the said chairs being each formed in one piece and comprising a cruciform body, lips

at opposite sides of opposite arms of the body engaging the opposite edges of the base of a rail, and depending lips at opposite sides of two opposite arms resting at the sides of a cross-beam and connected thereto, substantially as specified.

4. In a railway structure, the combination of a rail having a recess *l* in its base and also having the end of its web and head beveled, a complementary rail having a recess *l'* in its base and also having the end of its web and head beveled, a joint receiving the said ends of the rails, and keys taking through coincident apertures of the rails and joints; the said keys each comprising a body having a head adapted to bear against one side of a joint and a shoulder adapted to bear against the opposite side of the joint, and a resilient arm connected to the body and arranged to bear against the walls of the apertures in the joint and rails and thereby hold the head and shoulder of the body in engagement with the joint, substantially as specified.

5. In a railway, the combination of obliquely-disposed cross-beams, rails disposed longitudinally above said cross-beams, and sheet-metal rail-chairs; said chairs being each formed in one piece and comprising a cruciform body, lips at opposite sides of opposite arms of the body engaging the opposite edges of the base of a rail, and depending lips at opposite sides of two opposite arms resting at the sides of a cross-beam, substantially as specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN ISRAEL NEWBURG.

Witnesses:

GUSTAV SIVA,  
REUBEN SIMON.