

(No Model.)

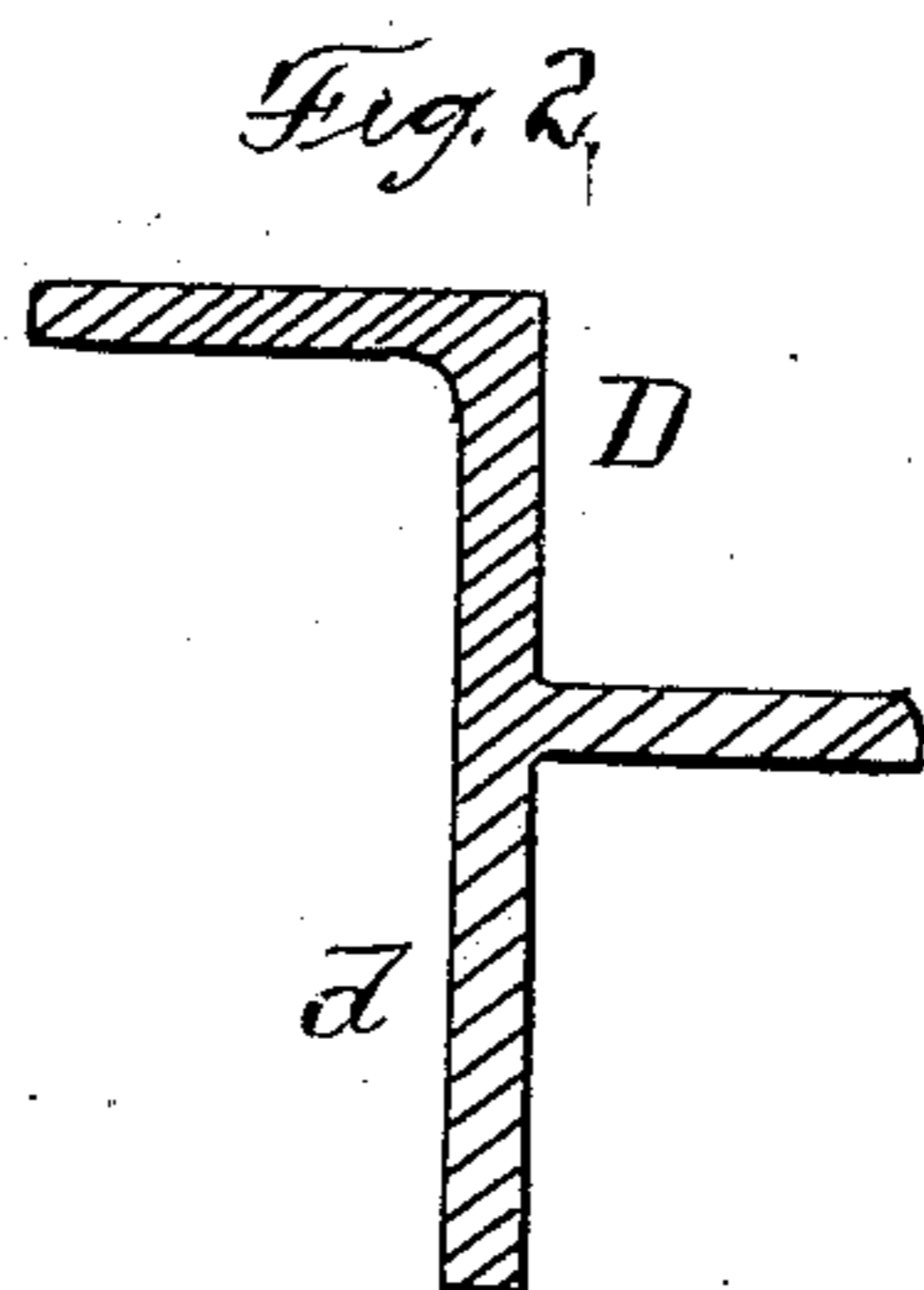
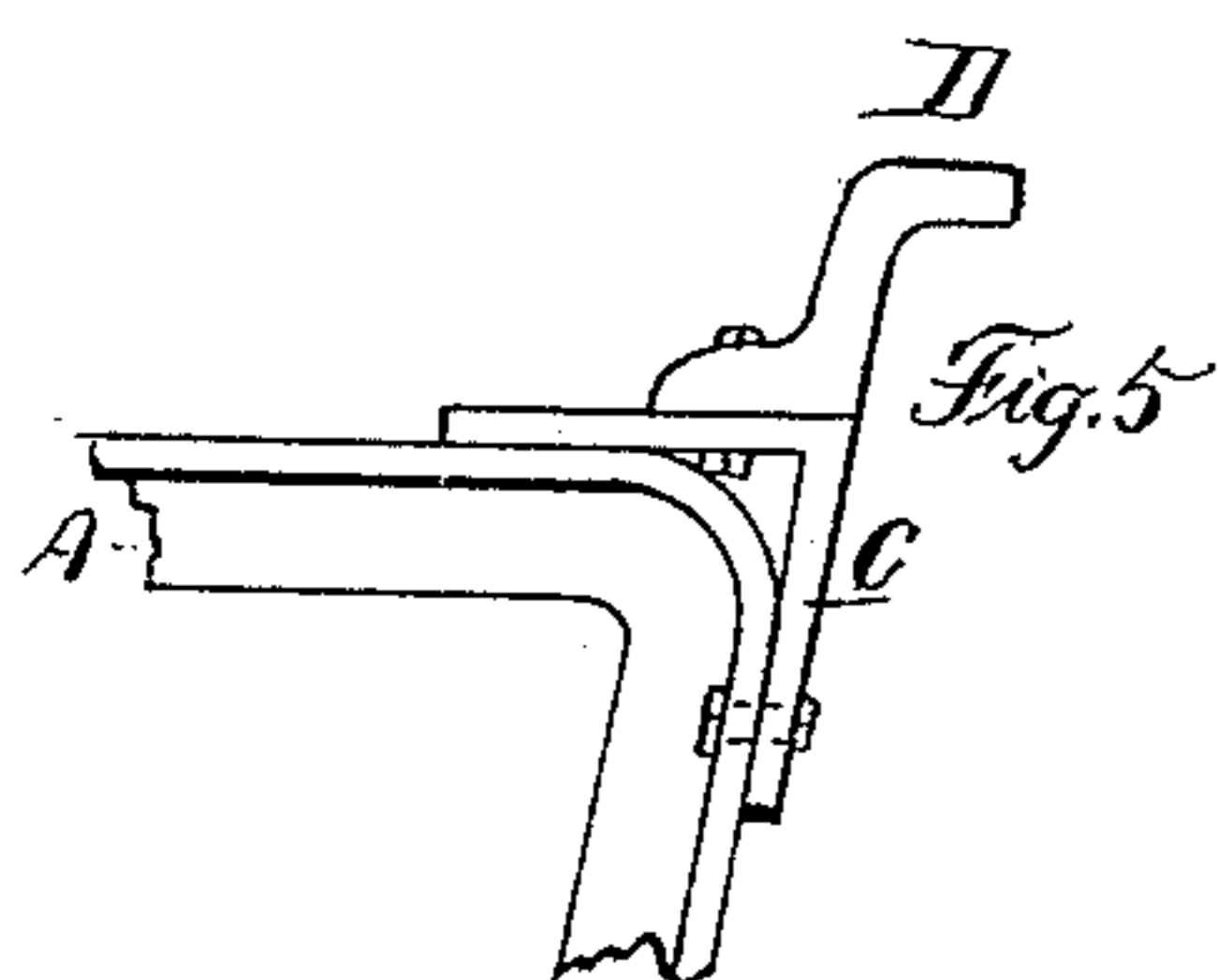
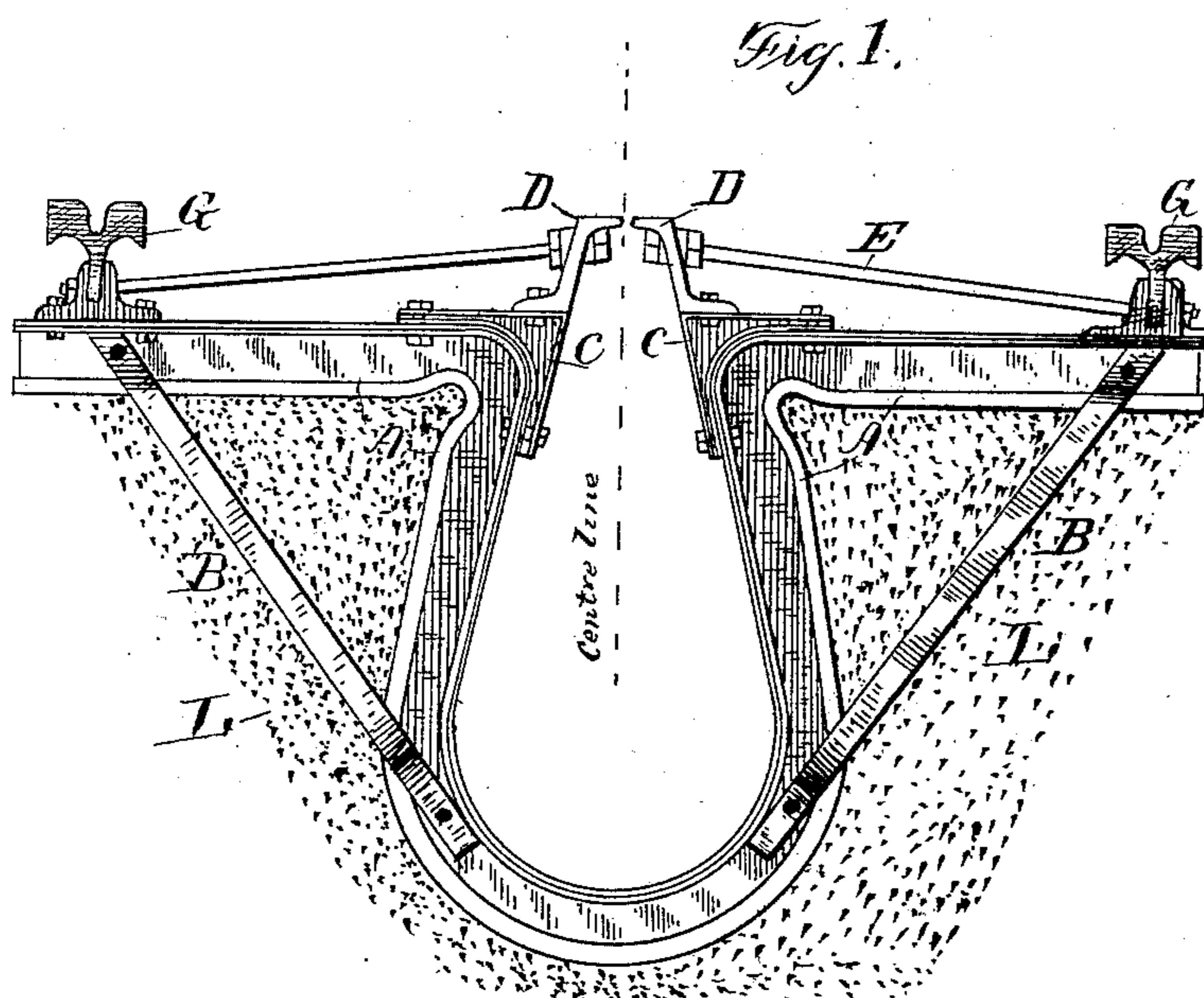
3 Sheets—Sheet 1.

Z. P. BOYER.

CABLE RAILWAY CONSTRUCTION.

No. 354,531.

Patented Dec. 21, 1886.



Witnesses:
G. W. H. Brown,
Geo. M. Roads.

Inventor:
Zacchariah Boyer

(No Model.)

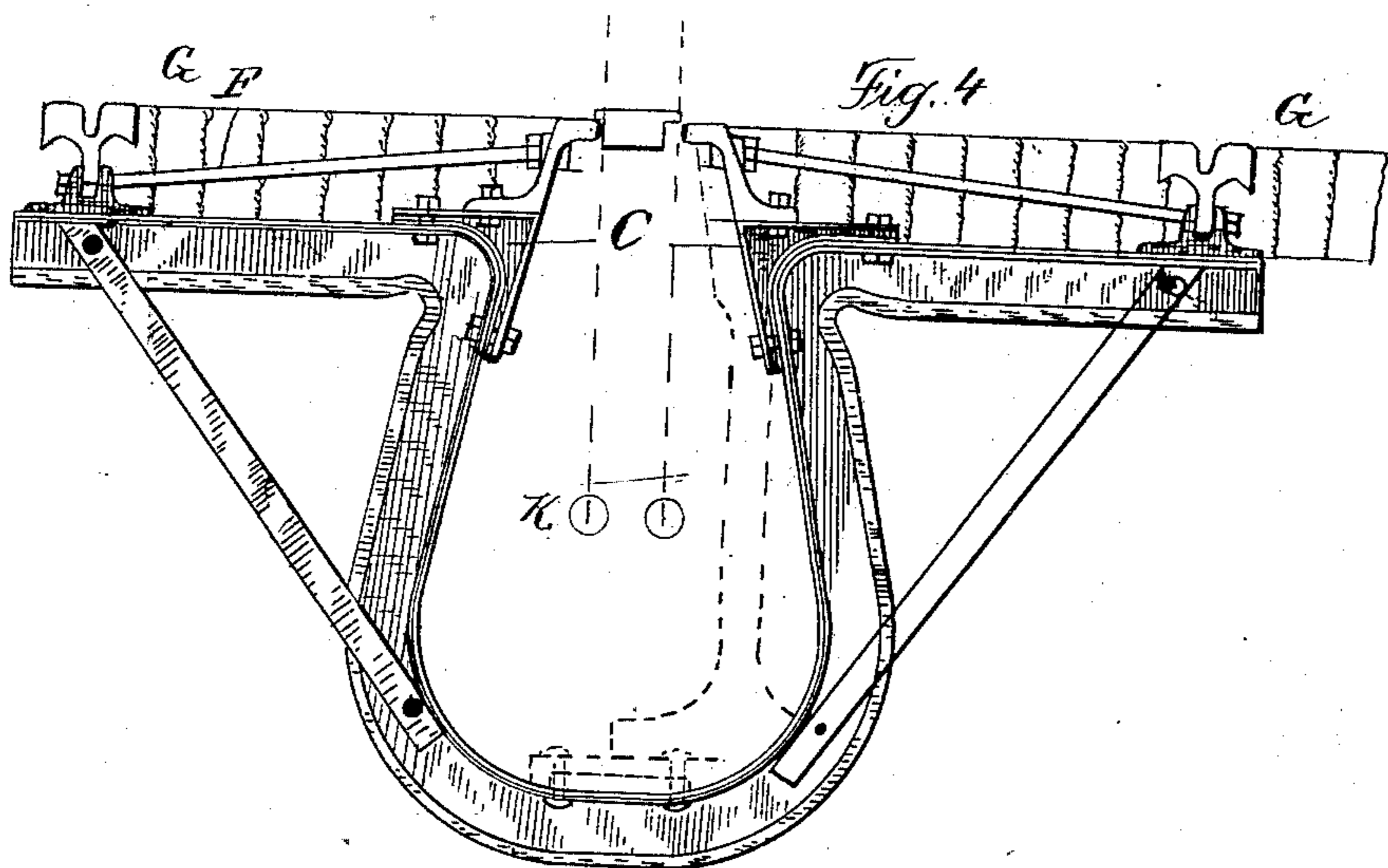
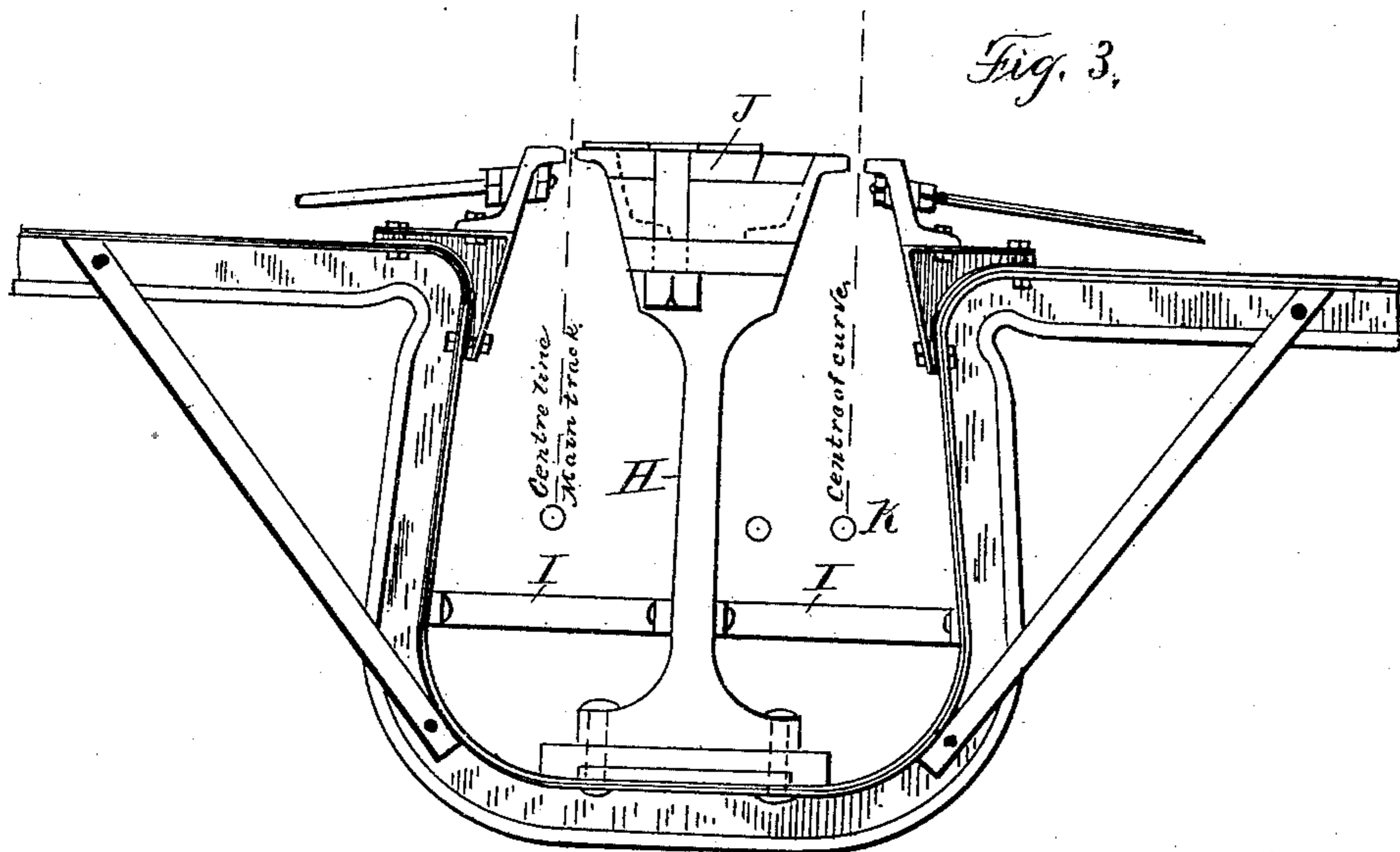
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G. W. H. Moore,
Geo. M. Roads.

Inventor:
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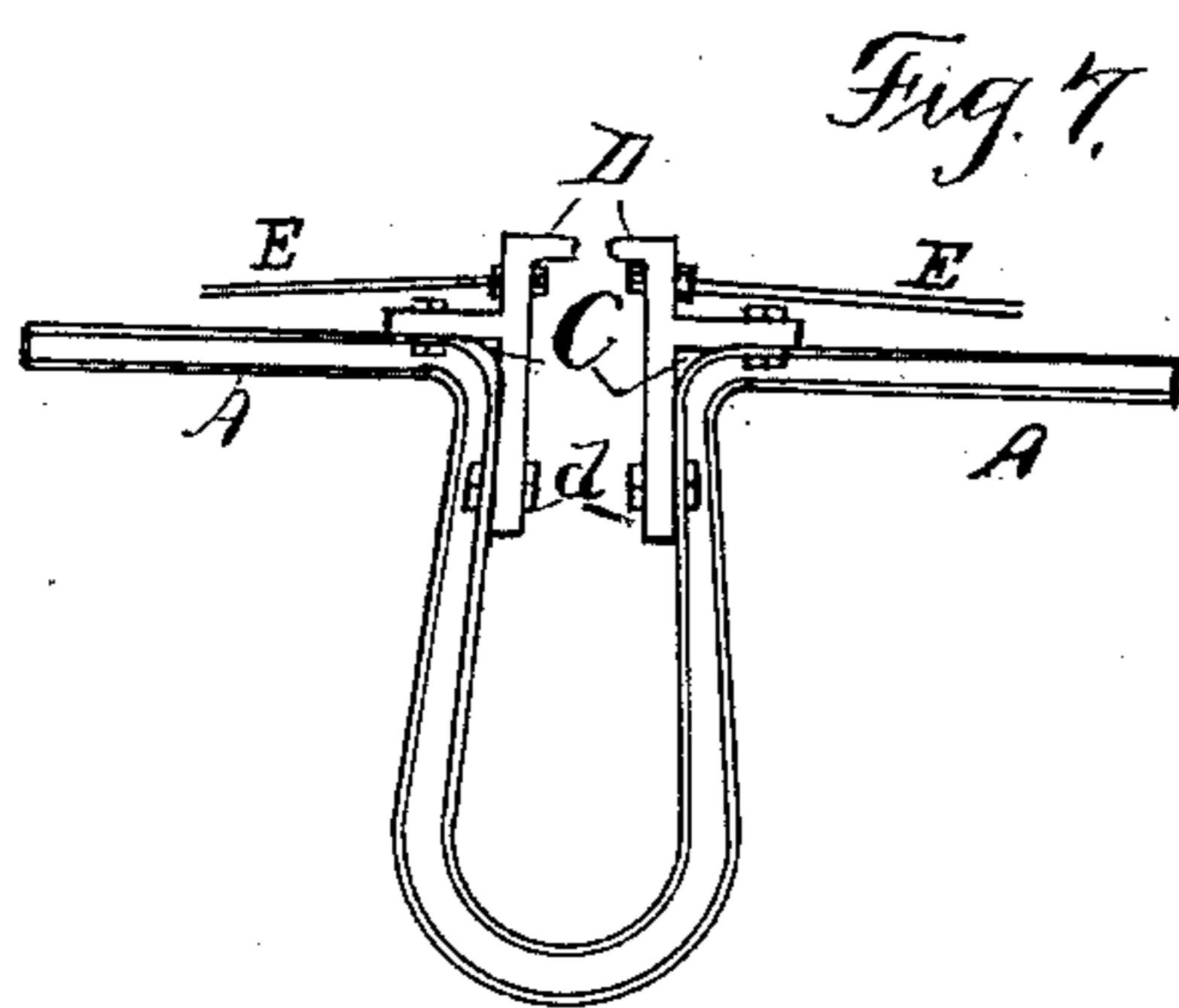
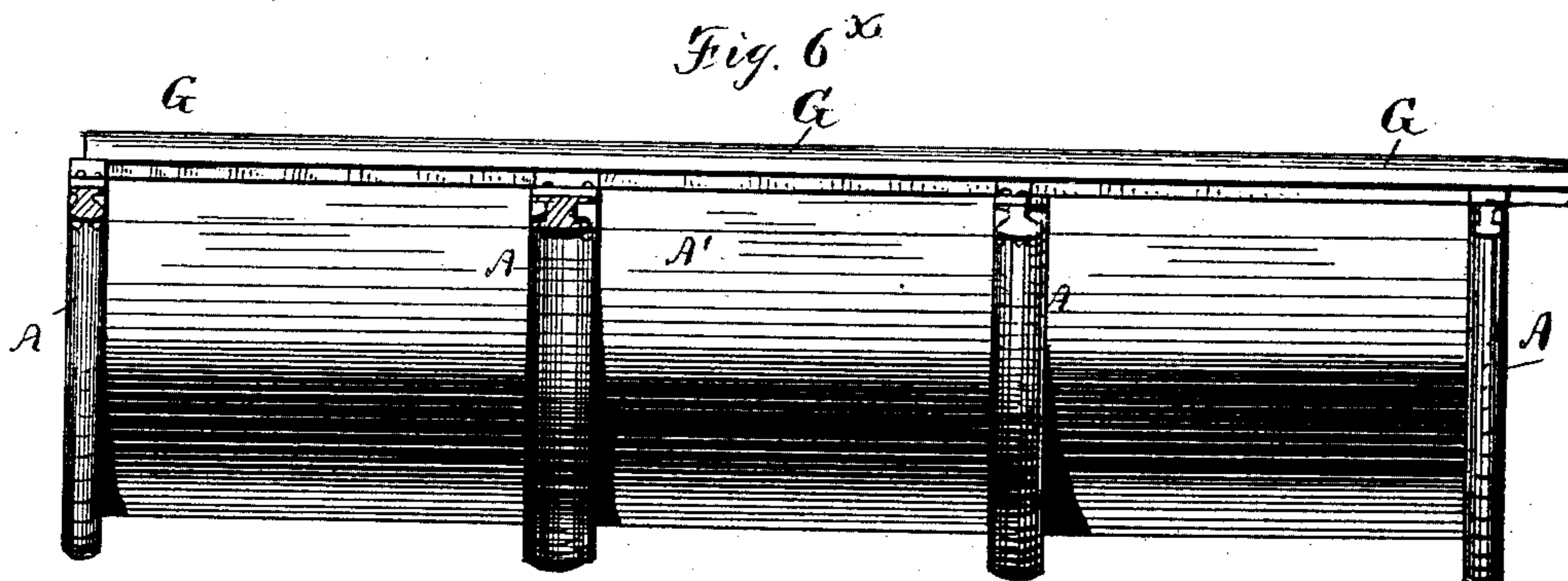
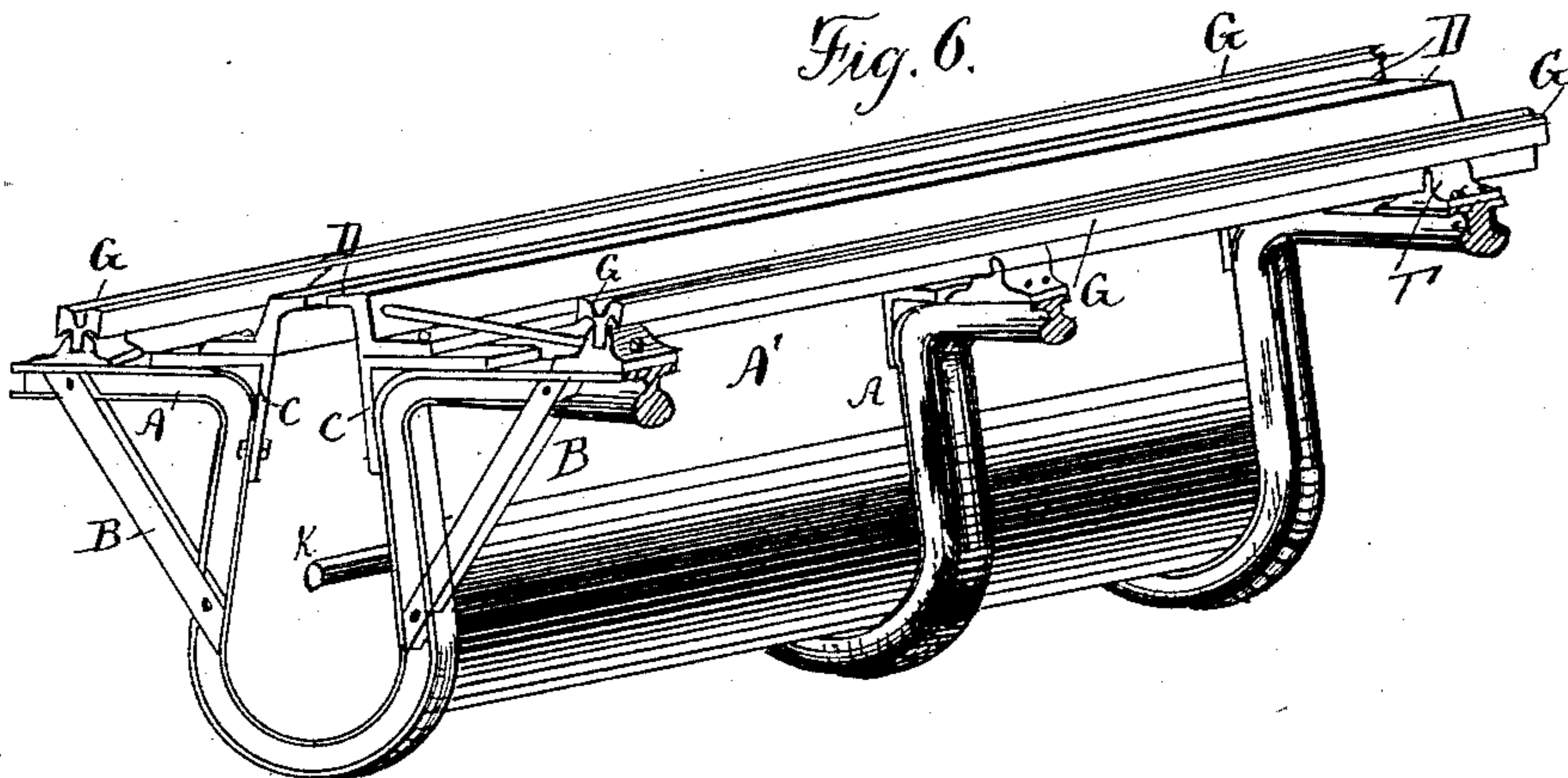
3 Sheets—Sheet 3.

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No. 354,531.

Patented Dec. 21, 1886.



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Inventor:
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UNITED STATES PATENT OFFICE.

ZACCUR PRALL BOYER, OF PHILADELPHIA, PENNSYLVANIA.

CABLE-RAILWAY CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 354,531, dated December 21, 1886.

Application filed May 15, 1886. Serial No. 802,306. (No model.)

To all whom it may concern:

Be it known that I, ZACCUR PRALL BOYER, a citizen of the United States, residing at Philadelphia, Pennsylvania, have invented new and useful Improvements in Cable-Railway Construction, of which the following is a specification.

My invention relates to improvements upon my former Patents No. 296,667, April 8, 1884, and No. 298,819, May 20, 1884; and it consists in various features of construction, which I will proceed to describe, and then point out in the claims.

One feature of my invention is the formation of the sides of the yokes represented in my former patents more nearly vertical than heretofore.

Another feature relates to the manner of securing the slot-rails to the yokes by means of knee-blocks, angle-blocks, or brackets, whereby a very secure and convenient attachment is provided. These blocks or brackets may be of angle-iron or flat bar conformed to the curve or shoulders of the yoke; or they may be made of flat bar-iron bent at about right angles, or of cast-iron, one arm to be bolted to the top of the yoke and the other or vertical arm secured to the vertical part of the yoke.

Another feature is the supporting of the outer end of the yoke by a diagonal brace, which extends inward and downward therefrom to the lower portion of the yoke, where it is secured.

Still another feature of the invention relates to providing the slot-iron with a downward-projecting vertical flange, which extends below the horizontal portion thereof, which is secured to the block or bracket.

Another part of the invention relates to the construction of completed sections of the framework or skeleton of the cable-railway system, whereby the sections can be shipped in proper lengths with the track-rails attached and ready to be placed in position in the excavation along the line or construction.

Referring to the accompanying drawings, Figure 1 represents one of the yokes with the slot-irons, their supporting-blocks, track-rails, diagonal braces, and adjusting-rods for the slot-rails. Fig. 2 represents a cross-section of a modified form of slot-rail. Fig. 3 represents a yoke and its several attachments near where

two lines of tracks diverge. Fig. 4 represents a yoke at a point near where the two tracks merge into one. Fig. 5 shows a modification of the angle-block or bracket for securing the slot-rail. Fig. 6 shows a section of the framework or skeleton complete ready for shipment, and in condition to be placed in the excavation ready to receive the concrete bed. Fig. 6* is a side elevation of the construction shown in Fig. 6. Fig. 7 is an end view of the slot-rail when made in form as shown in Fig. 2 attached to the yoke.

Similar reference-letters refer to corresponding parts in the drawings.

A represents the yoke, which may be made of railway-rails bent by suitable machinery into substantially the forms shown. These are similar to those in my patents referred to, except that the sides are more nearly perpendicular and are substantially straight from a point near their lower portion to the beginning of the curve at the upper portions, where the horizontal wings branch off. (See more particularly Figs. 3 and 7.)

A' represents the sheet-metal portion or body of the conduit, which is of rolled metal properly secured to the yokes. Of course, it is understood that the well-known cable-pulleys are secured to the yokes at suitable distances apart in the well-known manner.

B indicates the braces, which are secured near the bottom of the yoke and extend thence outward and upward, and are secured to the horizontal wings at or about a point under the track-rails, thus effectually bracing the wings.

C are the angle-blocks or brackets secured to the yokes, and to which the slot-rails D are fastened. These slot-rails may be of the Z form, as shown in Figs. 1, 3, and 4, or of that shown in Fig. 2. In the latter case it will be understood that the angle-blocks or brackets will be so formed as to have perpendicular sides, to which the flanges *d* will be secured by bolts, as is customary. Said portions *d* of said flanges may also extend below the block or bracket and may be bolted to the vertical part of the yoke as well as to the block, as shown in Fig. 7.

E are the brace-rods extending from the slot-irons to the chairs of the track-rails, and which are provided with nuts or suitable devices, whereby ready adjustment of the slot-irons can

be had. If desirable, these rods may pass through the webs of the rails and the chairs also, or through either, as preferred.

The brackets C may be made of angle or double T iron, or of cast-iron; but this is not essential, as they may be made of flat bar and bent at about right angles, one arm to be bolted to the top of the yoke and the other or vertical arm to be secured to the vertical part of the yoke, as shown in Fig. 5.

F represents chairs, of any approved construction, secured near the ends of the yokes, in which are secured the track-rails G.

H represents a support or stand in the conduit, located near where two tracks meet, and which sustains the track-structure between the slots, and also supports the movable slot-tongue. Lateral braces I extend from the support H to the yoke-irons, being secured to both. The base of said support is securely bolted to the bottom of the yoke, thus forming a very secure and rigid support for the movable slot-tongue J. This tongue J is of the well-known description, and need not be further particularly referred to.

K represents the propelling-cables.

L represents the concrete or other bed of well-known construction, in which the structure is bedded.

In cable-railway construction experience has proved that it is very desirable to have as little manipulation and handling of the parts in the street as is possible; hence I construct my skeleton or frame work in sections, of, say, thirty-six feet (more or less.) in length, all properly bolted and secured together and ready for shipment to the place of destination. The track-rails at one end of each section will be projected beyond the last yoke at that end, so as to rest upon the first yoke of the next section. The track-rails at the other end of the section will project to about the middle of the end yoke of the section, thereby leaving a support for the overlapping rail ends of the next abutting section. This construction saves materially time and expense in the construction of this system of railways.

Of course it is understood that the track and slot rails will be properly fished or spliced. These sections when completed and ready for shipment embrace each two or more yokes, sections of slot-iron, sections of track-rail, and the conduit sheet lining or body, all these parts being rigidly secured together ready to be placed in the excavation in the line of construction, ready for the concrete or other bed to be placed about them.

Referring to Fig. 7, it will be observed that the slot-rails are extended downward far enough to be bolted directly to the flanges of the yoke below the bottom of the knees or brackets; but it is also intended when desirable to bolt them through the lower part of the bracket and yoke-flange with the same bolt which secures the said knee and yoke. It will be apparent that the employment of the slot-rails shown in Fig. 7 will necessitate

a slight change in the angle of the outer faces of the knees or brackets to adapt them to the vertical position of said slot-rails.

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

1. A made-up skeleton section of underground cable-railway conduit and track structure, comprising two or more yokes, sections of slot-iron, and sections of track-rails, all secured together by suitable fastenings, whereby the same may be constructed in the shop and transported to the place of use and placed in position with much less impediment to ordinary street traffic, as set forth.

2. A made-up skeleton section of underground cable-railway conduit and track structure, comprising several yokes, sections of slot-iron, sections of track-rail, slot-iron adjusting-rods, braces, and sheet-metal lining, all secured together by appropriate fastenings, whereby the same is constructed in the shop and transported to the place of use ready to be located in place to receive the concrete bed, all substantially as set forth.

3. A made-up skeleton section of underground cable-railway conduit and track structure, consisting of several yokes, sections of track-rail, and sections of slot-iron and sheet-metal lining or casement, all secured together by suitable fastenings, the track-rails at one end of the section projecting beyond the last yoke thereof far enough to rest upon the first yoke of the adjacent section, and the rail ends at the other end of the section extending about half the width of the yoke thereat, leaving space for the support of the rail ends of the adjoining section at that end, as set forth.

4. In a cable-railway structure, the combination, with yokes formed from a single bar or rail having substantially straight and vertical sides, of angle blocks or brackets secured on said yokes, and slot-irons secured to said blocks or brackets, all substantially as shown and described.

5. In a cable-railway structure, the combination of the yokes A, angle blocks or brackets C, and slot-irons D, having extended flanges *d*, all substantially as shown and described.

6. In a cable-railway structure, the combination of the yokes A, blocks or brackets C, slot-irons D, and adjusting-rods E, substantially as shown and described.

7. The combination, in a cable-railway structure, of the yokes A, the brackets C, slot-irons D, and braces B, substantially as shown and described.

8. The combination, with the yoke of a cable-conduit, of a stand or support secured thereto at its base and having lateral braces and a pivoted slot-tongue, substantially as shown and described.

In witness whereof I have set my hand.

ZACCUR PRALL BOYER.

In presence of—

MORGAN R. ROSS,
GEO. M. ROADS.