No. 745,659. PATENTED DEC. 1, 1903.

R. PFAFFENBACH.

ROPE RAILWAY.

APPLICATION FILED NOV. 17, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

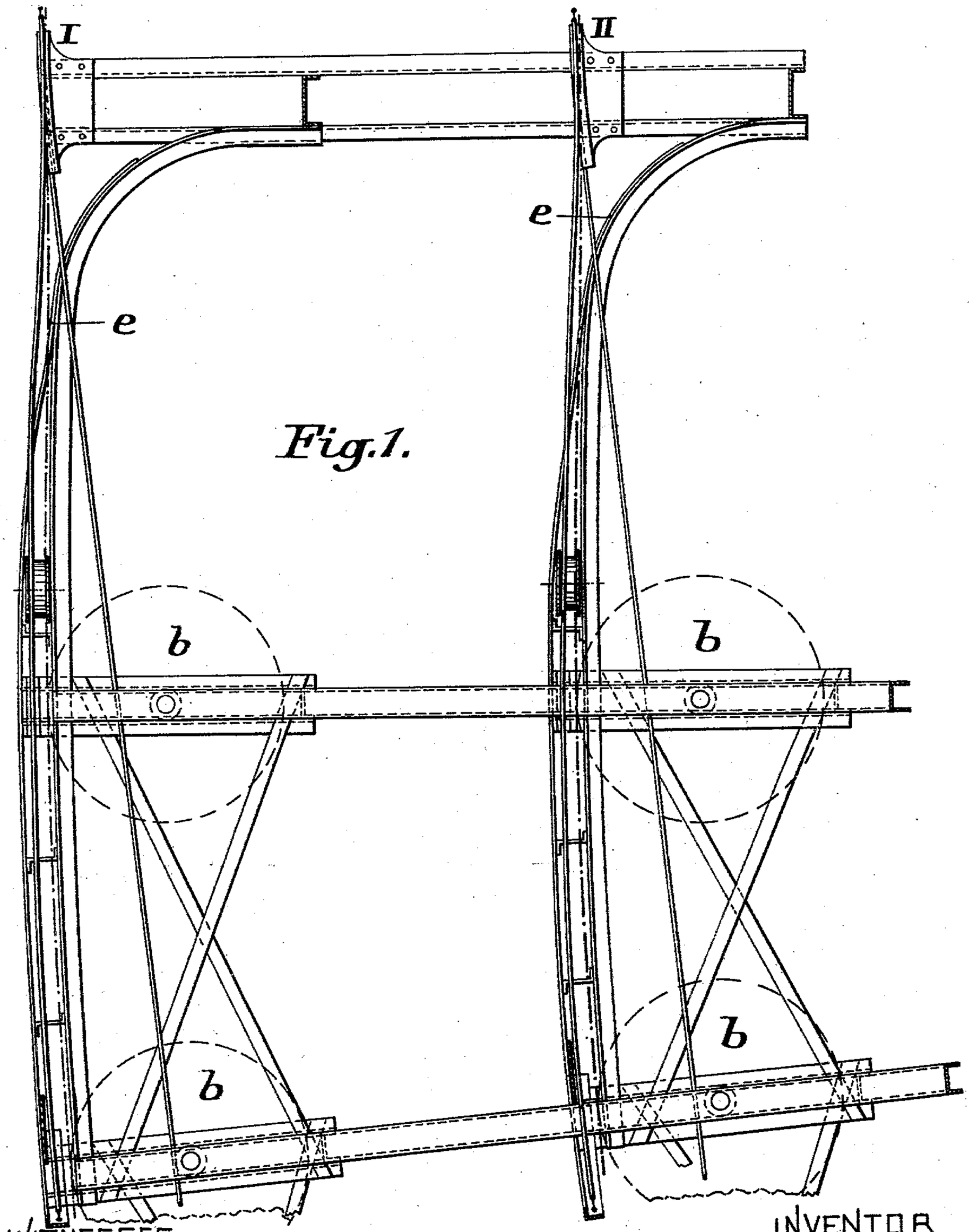

Fig. 1.

WITNESSES
E. C. Semple.
C. A. Seem.

INVENTOR
Rudolf Pfaffenbach
By Brown & Darby
ATTORNEYS

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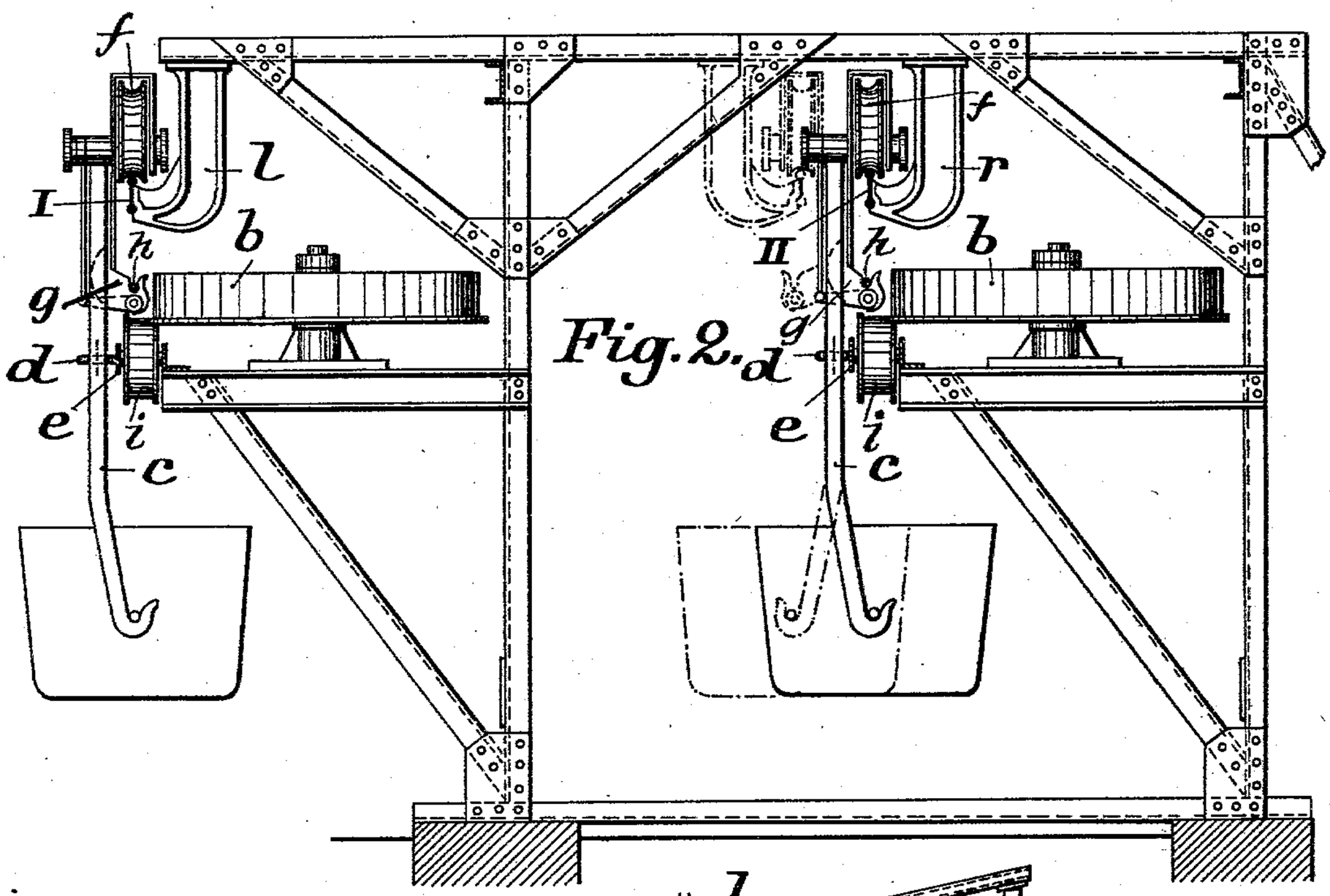

Fig. 2.

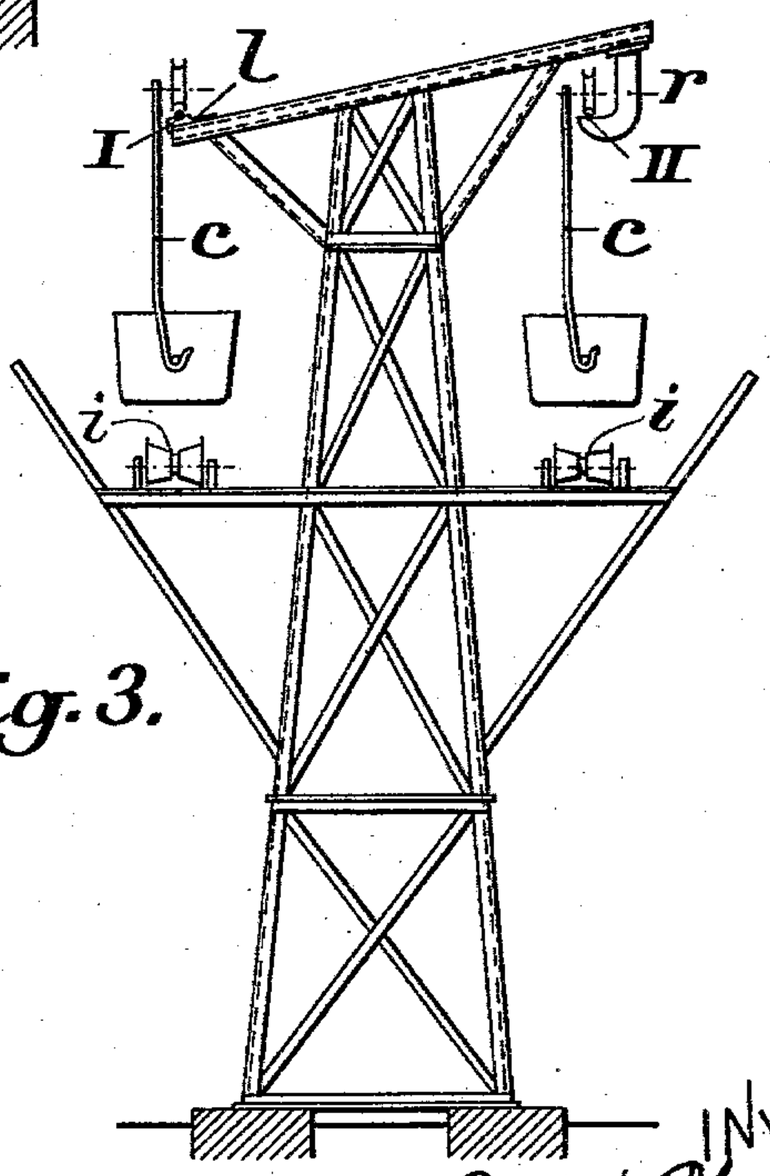

Fig. 3.

WITNESSES
E. C. Semple.
C. H. Seem.

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UNITED STATES PATENT OFFICE.

RUDOLF PFAFFENBACH, OF LEIPZIG, GERMANY, ASSIGNOR TO ADOLF BLEICHERT & CO., OF LEIPZIG-GOHLIS, GERMANY, A FIRM.

ROPE RAILWAY.

SPECIFICATION forming part of Letters Patent No. 745,659, dated December 1, 1903.

Application filed November 17, 1902. Serial No. 131,693. (No model.)

To all whom it may concern:

Be it known that I, RUDOLF PFAFFENBACH, manager, a subject of the King of Prussia, Emperor of Germany, residing at 34 Pfaffendorferstrasse, Leipzig, Germany, have invented a new and useful Improvement in Rope Railways; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in rope railways.

The object of my invention is to provide a device of this character which shall be simple in construction and efficient in operation.

A further object of the invention is to provide means by which the carriages may be drawn around curves by a simple and efficient means.

A further object of the invention is to provide a structure by which the carriages on either track take the curve in the same way and with equal facility.

A further object of the invention is to provide means by which carriages can be drawn around curves without the use of an overhead coupling.

Other objects of the invention will appear more fully hereinafter.

My invention consists, substantially, in the construction, combination, location, and arrangement of parts, as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally pointed out in the appended claims.

Referring to the accompanying drawings, and to the various views and reference-signs appearing thereon, Figure 1 is a top plan view showing a portion of a rope railway taken at a curve and embodying the principles of my invention. Fig. 2 is a view in transverse vertical section of the same. Fig. 3 is a similar view, on a smaller scale, taken on a straight part of the track and embodying the principles of my invention.

The same part is designated by the same reference-sign wherever it appears throughout the several views.

In the use of rope railways, which are generally employed for conveying coal and ore and other material from mines, &c., it is customary to stretch one or more steel cables between vertical frames or trestles, whereby the same act as trolleys for the carriages, which are provided with grooved wheels to run on said cables and depending buckets, which carry the ore and serve by gravity to maintain the carriages in vertical position upon the cables. The carriages are propelled by a traction-rope, which is secured thereto either above or below the stationary cable. If the track is straight throughout its length, the traction-rope is generally placed below the stationary cable for the reason that in this position it is better located with relation to the load. In other words, its line of pull is more nearly opposite the line of resistance.

If, however, the track contains curved portions, it becomes difficult or impossible to so connect the traction-rope for the reason that it is liable to fall on the outside of the depending portion of the carriage in rounding the curve, whereby its tension is exerted to bind or throw the carriage in a lateral or sidewise direction—that is, toward the center of curvature of the rounded portion of the track. This action does not occur if the traction-rope falls on the inside of the depending portion of the carriage with relation to the curve, since the lateral tension is then taken up by the usual horizontal guide-wheels, which are provided at the curved portions of the track. Accordingly by the usual arrangement of rope railways one of the tracks is correctly and the other incorrectly disposed for the purpose of carrying the carriages around a curve. This difficulty can be overcome by connecting the traction-rope to the carriage at a point above the fixed cable; but this is disadvantageous for the reason that it causes an improper application of the tractive force.

In accordance with the principles of my invention I provide an arrangement by which

the carriages on either track can be led around a curve by the use of a traction-rope and in such a manner that no lateral or binding strain is put upon the carriages of either track.

Referring to the drawings, the characters I and II designate the fixed cables or tracks of a rope railway. *l* designates the supporting frame or arm for the cable I, while *r* designates the corresponding support for the cable II. These may be disposed upon the usual trestle-frames in any desired manner and in suitable spaced relation. I have shown a convenient method of arranging these supports in Fig. 2, in which both are hung from a horizontal beam; but the supports *r* instead of being placed symmetrically with regard to the center line of the railway, as indicated by dotted lines in said figure, are placed in the same relation as the support *l*. In other words, both are on the same side of their respective tracks or cables.

f designates the grooved rollers of the carriage, and *c* indicates the respective hangers from the carriages upon which the usual buckets are hung. At the side of the hangers *c* are shown gripping-jaws *g*, arranged to grip and hold the traction-cables *h*.

i indicates a series of vertical grooved rollers which support the traction-ropes when the latter is not held up by the grippers. At the straight portions of the track these vertical rollers are alone sufficient to guide the traction-rope; but at the curves additional means are employed in order to resist the lateral strain. *b* designates rollers which may be employed for this purpose horizontally disposed opposite to the path of movement of the traction-rope on the inside of the curve. These rollers are preferably of comparatively large diameter and spaced around the curve at small angular intervals, as clearly indicated in Fig. 1. Accordingly at each curved portion of each track the bearing-rollers *b* lie on the inside of the curve of the traction-rope, while the hangers *c* lie on the outside. In this way the hangers are not bound or clamped between the traction-rope and the bearing-rollers *b* for either track.

The construction may be modified in many ways—for example, as shown in Fig. 3, which is particularly adapted to a straight portion of the track. The supports *l* and *r* are secured upon a diagonal frame-beam, by which means they are disposed in the same relative way as above described.

The operation of my improved railway will be understood from the preceding description. The carriages move upon the fixed cables I II, being drawn thereon by the traction-ropes *h*. When a curve in the track is reached, the carriages on both tracks pass readily around it, the hangers always falling on the convex side of the traction-rope, whereby they do not interfere with the bearing-rollers *b*. The road may have two curves or, in fact, any number of curves, provided they all are in the same direction, and the principles of my invention will be equally applicable thereto. It is merely necessary that all of the curves be uniformly either right or left handed.

It is obvious that many different ways may suggest themselves to persons skilled in the art for mounting the respective tracks or cables on their supporting-trestle for enabling the carriages on both tracks of a rope railway to properly round a curve. I do not desire, therefore, to be limited or restricted to the exact details shown and described; but,

Having now set forth the object and nature of my invention and a construction embodying the principles thereof, what I claim as new and useful and of my own invention, and desire to secure by Letters Patent, is—

1. In a rope railway having a curve, a series of frame structures, a plurality of fixed ropes or tracks extending around the curve and each supported by the frame structure exclusively from the concave side of said curve, carriages upon said ropes or tracks and having hangers, said hangers being disposed to fall on the convex side of the curves formed by the rope or track, and traction-ropes disposed below said tracks, as and for the purpose set forth.

2. In a rope railway having a curve, a series of frame structures, a plurality of fixed ropes or tracks extending around the curve and each supported by the frame structure exclusively from the concave side of said curve, carriages upon said ropes or tracks and having hangers, said hangers being disposed to fall on the convex side of the curves formed by the rope or track, a traction-rope below said track, and horizontally-disposed wheels to guide said traction-rope around the curve, as and for the purpose set forth.

3. In a rope railway having a curve, a fixed track following said curve, a carriage thereon having a hanger, a gripper on said hanger, and a traction-rope guided around said curve by horizontally-disposed wheels, said hangers falling on the convex side of the curve formed by said traction-rope, as and for the purpose set forth.

4. In a rope railway having a curve, a plurality of tracks following said curve, carriages thereon having hangers, grippers on said hangers, and traction-ropes guided around said curves by horizontally-disposed wheels, said hangers falling on the convex side of the curve formed by each traction-rope, as and for the purpose set forth.

5. In a rope railway having a curve, a frame-support for a double track comprising a diagonally-disposed beam, a track or rope mounted on the lower end thereof, a curved hanger on the opposite end thereof, and a

rope or track mounted on said hanger, as and for the purpose set forth.

6. In a rope railway having a curve, a frame-support for a double track comprising a diagonally-disposed beam, a track or rope mounted on the lower end thereof, a curved hanger on the opposite end thereof, a rope or track mounted on said hanger, and a traction-rope and means for guiding the same around the curve, as and for the purpose set forth.

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

RUDOLF PFAFFENBACH.

Witnesses:
RUDOLPH FRICKE,
R. P. C. DUNN.