(No Model.) 2 Sheets—Sheet 1.

C. WISE.

CABLE RAILWAY.

No. 357,162. Patented Feb. 1, 1887.

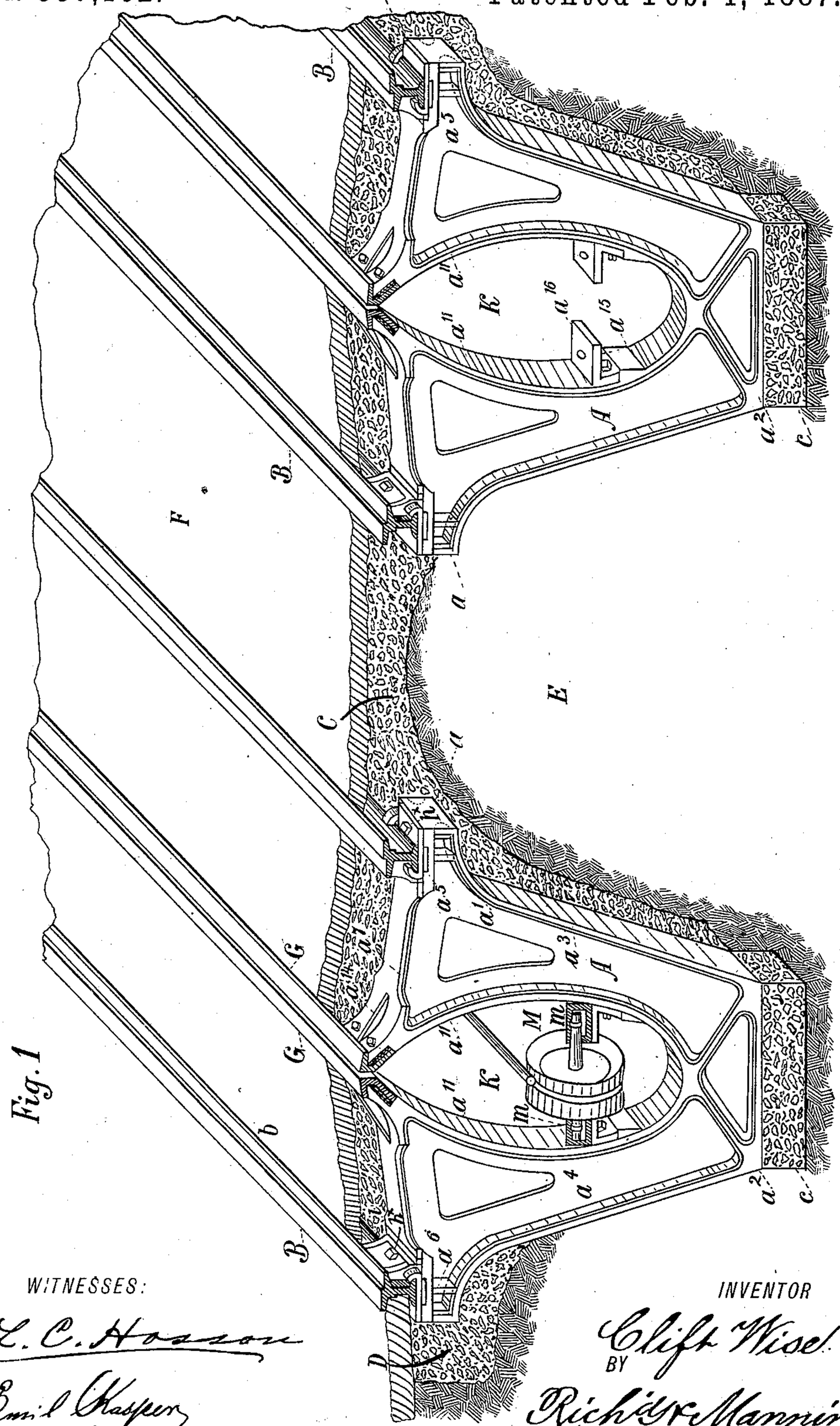

Fig. 1

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(No Model.) 2 Sheets—Sheet 2.

C. WISE.

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Fig. 2

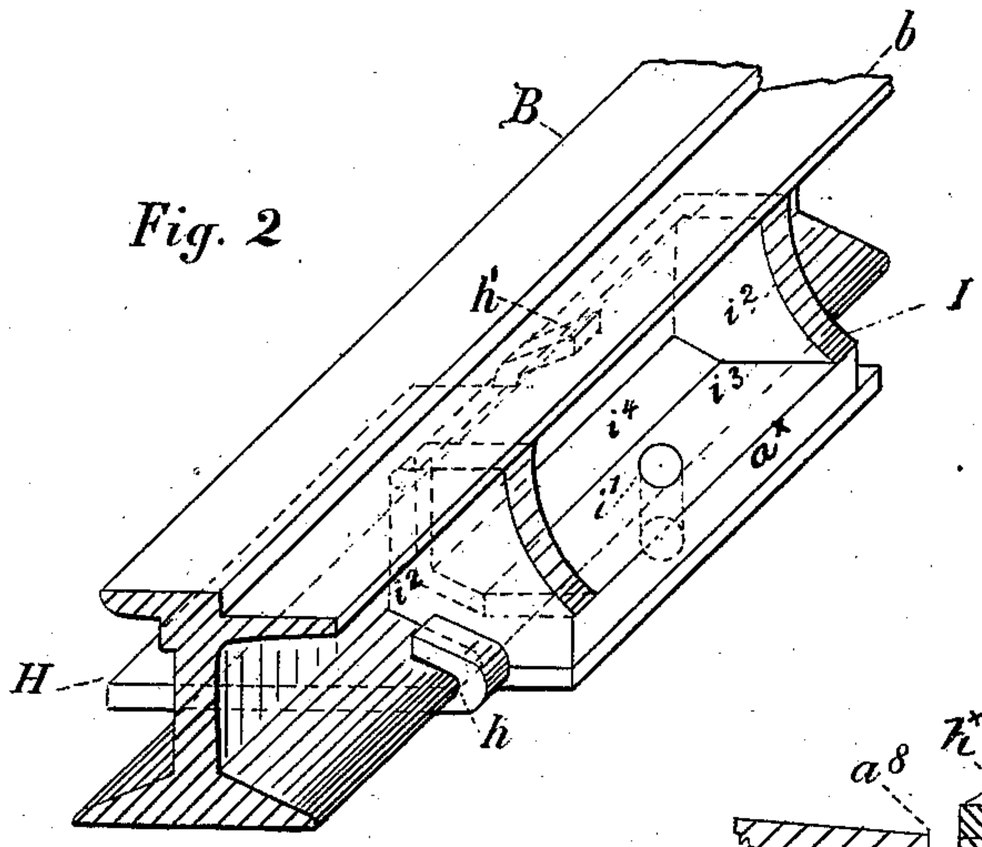


Fig. 3

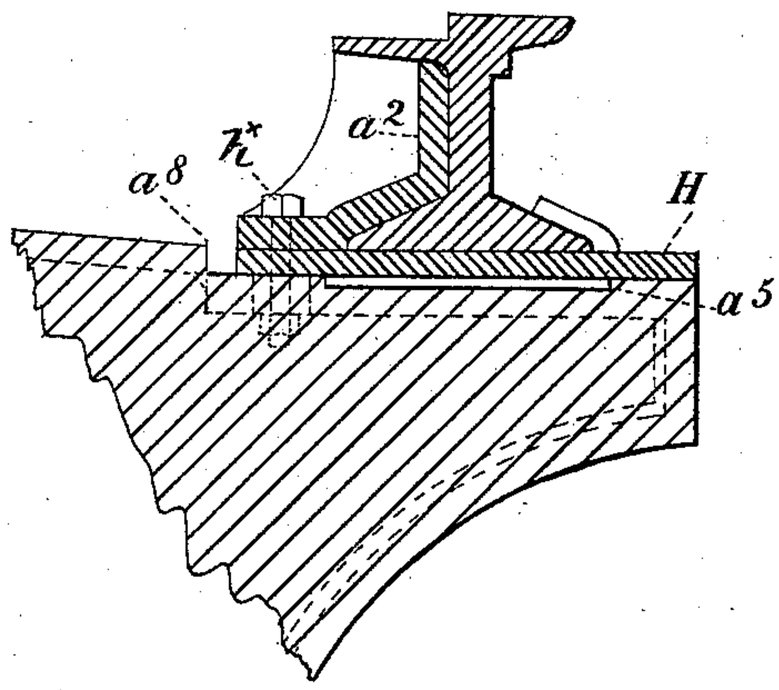


Fig. 4

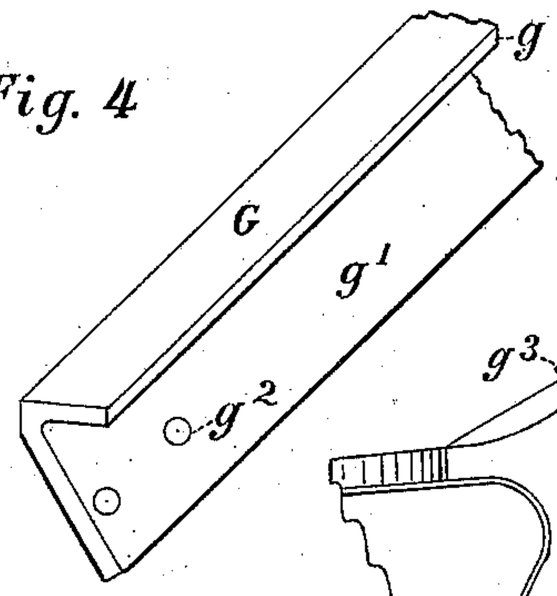


Fig. 5

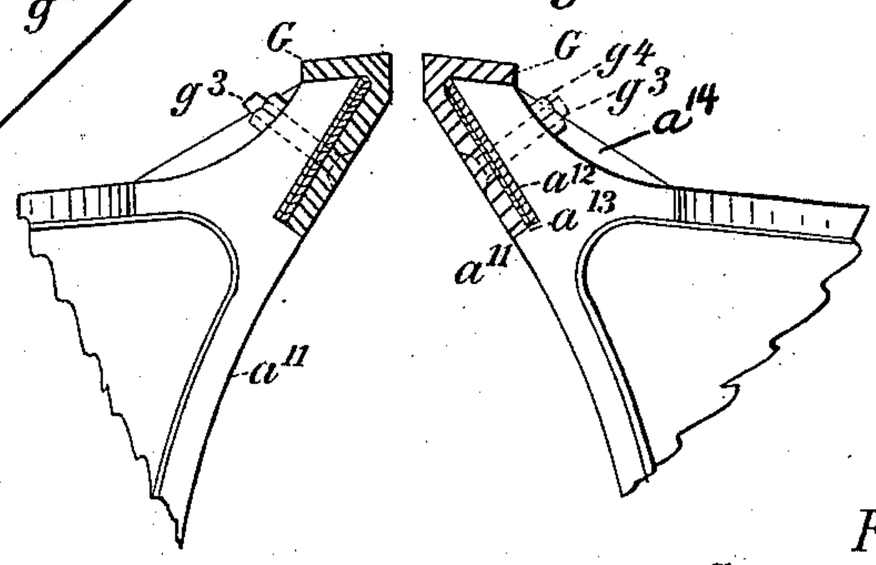


Fig. 6ª

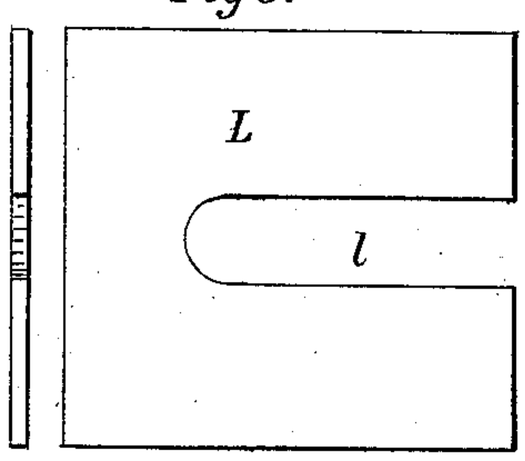
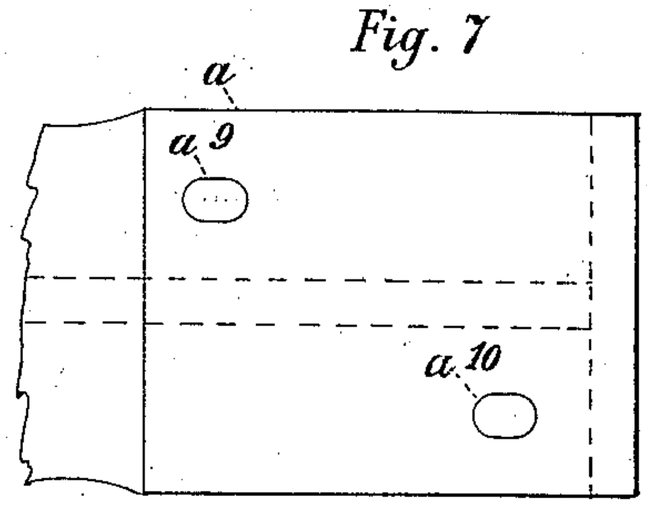


Fig 6.

Fig. 7



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UNITED STATES PATENT OFFICE.

CLIFT WISE, OF KANSAS CITY, MISSOURI.

CABLE RAILWAY.

SPECIFICATION forming part of Letters Patent No. 357,162, dated February 1, 1887.

Application filed May 14, 1886. Serial No. 202,141. (No model.)

To all whom it may concern:

Be it known that I, CLIFT WISE, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Cable Railways; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to construct and use the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention has for its object to afford in cable railways more convenient and expeditious means for adjusting the slot-rails and regulating the width of the said slot between said slot-rails, and also to enable the track-rails to be secured adjustably to the arms of the yoke; and it consists in the novel construction and combination of parts, hereinafter fully described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a perspective view of a double-track cable-railway bed, showing the yokes in position supporting the rails and the manner of constructing the arches for supporting the end of yoke. Fig. 2 is a detail view of the vibrating plate and a portion of the track-rail, and showing the means for preventing canting of the said rails. Fig. 3 is a transverse sectional view taken through the longitudinal portion of the arm of the yoke, and showing the vibrating plate and track-rail secured thereto. Fig. 4 is a perspective view of a portion of the slot-rail. Fig. 5 is a detail side view of the portions of the yoke which support the slot-rails, showing the adjusting-plates. Fig. 6 is a plan view of the adjusting-plates for the slot-rails. Fig. 6ª is an end view of the adjusting-plate, showing its relative thickness. Fig. 7 is a top view of the arm of the yoke, showing the chamber in the arm and slotted perforations to receive the vibrating-plate bolts.

In carrying out the details of my invention, and in constructing the road-bed for the reception of the yokes which support the track-rails and the continuous tube united to said yokes, I excavate in the ground in the direction of the roadway a trench of the exact width of the cable-yoke A, the opposite sides of which trench are graded and sloped by degrees away from the tube and yoke, and in such a manner that the surface of the ground above the bottom of the trench on either side of the tube and yoke will lie below a horizontal line drawn across and under the arms *a a* of the yoke A. I then excavate a trench running parallel with the first in the roadway, and a suitable distance to one side, for the reception of the yokes and tube for a parallel track, and spring an arch, C, of masonry—such as concrete—from the side a^3 of the yoke and beneath the arm *a* of said yoke, so as to bear in the direction of the curve formed by the curved side and arm in one trench of the road-bed and the side and arm *a* of an opposite yoke in an opposite parallel road-bed, the concrete extending nearly to or uniting with the base of the yoke, which is placed in the trench and upon a suitable foundation, *c*, of concrete. Thus it will be seen that upon the hardening of the concrete an arch, C, extending from one to an opposite parallel trench or road-bed, is brought beneath and against the arm *a* of the yoke A.

In the construction of my yoke A, I extend the arms *a a*, which support the track-rails B B, laterally the required distance, corresponding to the width of the track. From the extreme end of said arms *a a*, which are of the proper thickness, the lateral width of the yoke is contracted in degrees toward and made smaller at the base a^2, and from the said extreme ends of the arms *a a* and beneath the said ends, which are extended on either side of and beyond the web a^4, the web is made to describe a re-entrant curve or arch, *a'*, extending a portion of the length of said sides, and is then continued at an oblique angle to the base. Thus it will be seen that the arch-shaped side of the yoke rests directly upon the crown of the arch C of concrete, and the frequent breaking of the arms of the yoke, now common, is effectually obviated.

In forming a single road-bed and trench, when it may be inconvenient to make the arch C continuous to a base in the relative horizontal plane, I make an abutment, D, by excavating so far back in a vertical relation as is necessary to obtain the full service of the crown of the arch. In these excavations the earth E is made the support for the construction

of the arch C; but I may use a form instead, and thus accomplish the results desired, and the abutment D for the crown of the arch I have designed to be wood, stone, or iron, as the occasion may require, and the arch itself may be made of brick, if preferred. Upon the concrete I lay the sheet asphalt F, which fills up the space between the concrete and the under side of track and slot rails.

For the purpose of relieving the arms *a a* of the yoke from direct concussion, I make in the upper portion of and extending transversely across said arms *a a* a deep recess or chamber, a^5, Fig. 3, which, when the concrete is filled in around the arms of the yoke, is inclosed upon the sides opening in the longitudinal direction of the track-rails. The top portion, a^7, of the yoke A is extended beyond and from the sides of the web a^4 of the yoke in a horizontal direction, and from the extreme end of the arms *a a* to the slot-rails G G. I then plane down or make a suitable depression in the top portion of the ends of the arms *a a* of the yoke in a horizontal relation, extending from the extreme end of the arm toward the slot-rails, which leaves a shoulder, a^8, in said ends. I then make from a sheet of metal of medium thickness a plate corresponding in size to the width of the upper portion of the arms *a a* of the yoke, and extending from the end of said arms *a a* to within a short distance of the shoulder a^8 in said arms *a a*. I then make a cut in a transverse relation to and part way in one side of said plate H at right angles to the longitudinal direction of the slot-rails from the end of the arm *a a* and a suitable distance from the edge of the plate to afford a locking-strip, *h*, and upon the opposite side of the plate I make a similar cut, extending part way of the plate H in a transverse relation thereto, and form a locking-strip, *h'*.

To prevent canting of the track-rail B from the weight brought to bear upon the inner flange, *b*, of said rail B in the transit of the car, I arrange beneath said flange *b*, and resting upon the plate H, a chair, I. Said chair I is made with a bottom, $a^\times$, sides i^2 i^2, and back a^2. The said chair I is made to extend in length a distance upon the plate H equal to that lying in the longitudinal direction of the rails B between the locking-strips *h* and *h'*, and extends upwardly from said plate H to within a slight distance of the under side of the inner flange, *b*, of rail B, to afford a slight vibration of the plate H, and is cut away laterally on the lower end of the sides i^2 i^2, to fit the top of the lower flange of track-rail. The plate H and the chair I are secured to the arms *a a* of the yoke A by means of the nut-bolts $h^\times$, the position of said bolt $h^\times$ being shown clearly in Fig. 1.

For the purpose of enabling the plate H to be adjusted on the arms *a a* toward the shoulder a^8 on said arms, and thereby lessen the gage of the track, I make in the arms *a a* of the yoke A, and extending in a vertical relation through and on opposite sides of web a^4 of said upper portion of the arms *a a* as receives and is covered by the plate I, the slots a^9 a^{10}, which are elongated in a transverse relation to the track-rails B. The plate H is then arranged over the chamber a^5 on the arms *a a* and the chair I placed in position thereon a suitable distance from the end of arm *a*, and perforated vertically at *i'*, the perforation extending through the plate H and to one side of said plate, and registering with the slot a^9 in the arms *a a* on one side of the web a^4, and the said plate and chair are secured to the said arm by the nut-bolt $h^\times$. The opposite end portion of the plate H nearest the extreme end of the arm *a a*, I also perforate vertically, the said perforation registering with the slot a^{10} in the arm *a* and the nut-bolt inserted therein. The track-rail B is then placed in position on the plate H, and the strips *h h'* are bent up and over upon the lowest flange of the said rail, locking said rail to said plate.

In my construction of the yoke A and in the formation of the tube-opening K the parts a^{11} a^{11} of said yoke, which form the opposite sides of said opening, are extended a suitable height above the top portion, a^7, of the yoke in the line of curvature described by the sides a^{11} a^{11} of said opening K. I then cut away transversely a portion of the opposite sides a^{11} a^{11} of the opening K, extending from the upper ends downwardly the proper distance in the opening K and nearly corresponding with the curve formed by said sides a^{11} a^{11}, and in depth exceeding the thickness of the slot-rails G, forming a recess, a^{12}, and shoulder a^{13}. The portions a^{11} a^{11} of the tube K extending above the top plate, a^7, I strengthen by casting a web, a^{14}, extending from the said portion a^{11} to the top plate, a^7, from the outside.

The slot-rails G G made for the yoke A are constructed with a horizontal surface portion, *g*, of the proper width, which fits upon the terminal portion of the sides a^{11} a^{11} of the tube-opening K, and is then given a flattened vertical portion, which forms the sides to the slot, and is then bent at an oblique angle at *g'* in the direction of the horizontal portion *g*, and which portion *g'* enters the recess a^{12} and rests upon the shoulder a^{13} in the sides a^{11} a^{11} of the tube-opening. I then make perforations g^2 through the oblique portion *g'* of the slot-rails G, and also through the sides a^{11} a^{11} of the tube-opening K between the shoulder a^{13} and the upper terminal portion of the said sides, and insert the bolts from the inside of the tube-opening through said perforation and countersink the rail *g'* around said perforations g^2, so that the heads of the bolts may be brought flush with the rail. I then fit the nuts g^4 to the said bolts g^3 from the outside, and thus secure the slot-rails to the sides of the tube-opening.

For the purpose of adjusting the width of slot between the slot-rails I make a flat plate, L, which is slotted centrally part way and from the end in a transverse relation, as at *l*. Said plate L may be made of varying thick-

ness, and is made the proper width to be introduced in and fit the recess a^{12} between the slot-rail and the side a^{11} of the tube-opening, the slot l enabling said plate to pass the bolts g^3. Thus it will be seen that upon releasing the bolts g^3 the lateral adjustment of the slot-rails may be accomplished in the most expeditious manner and without the necessitating of removing any part of the pavement.

In my construction of the continuous tube for the passage of the cable I aim to dispense with the transverse pits which divide the roadbed into sections and are commonly used as a conduit for water, and also are the receptacles in which the cable-pulleys are mounted, and I attach the pulleys directly to the yoke, thus dispensing with the service of a large number of yokes, which are customarily placed on opposite sides of the said transverse pits and converting the continuous tube into a receptacle or conduit for passage of the water.

In attaching the pulleys M to the yoke A, I form upon the opposite sides a^{11} a^{11} of the tube-opening K, in said yoke, near the bottom, the lugs a^{15}. I then bolt to the sides a^{11} a^{11} of the tube-opening K the angle-irons a^{16}, one portion of said angle-iron resting on said lug a^{15} and the opposite end projecting horizontally therefrom, forming a table, and upon said horizontal portion I attach by suitable bolts the journal-boxes m m, in which I mount the pulley M. In this manner I economize the cost of constructing tube-pits and combine the pulley with the yoke.

In my system of construction of the roadbed I employ the arch continuously and intervening between parallel trenches, which facilitates the construction of the latter in excavating in light soil.

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

1. The combination, in railways, with the track-rails and the lower flange of said rail, of a transverse arm or arms adapted to support said track-rails, an elastic plate attached to said arms, and locking-strips separated partially from said elastic plate and adapted to be turned over and upon said lower flange, for the purpose specified.

2. The combination, with the supporting-arms for the track-rails provided with suitable slots, of a plate attached to said rails and upon said arms and adjustable laterally with said rails, for the purpose specified.

3. The combination, with the supporting-arms for the track-rails having slots, as described, of a plate removably attached to said arm and suitable adjusting-bolts, for the purpose specified.

4. The combination, with the yoke provided with arms and suitable slots in said arms, and a chamber formed in said arms, of an elastic plate having locking-strips, the track-rails, and suitable securing-bolts, whereby the said plate and rails may be adjusted laterally over said chamber, as described.

5. In railways, the combination, with the track-rails and the flanges of said rails, of supporting-arms for said rails provided with suitable slots and an adjustable plate attached to and beneath said rails, and a chair upon said plate adapted to support one of said flanges and adjustable laterally with said rails, as described.

6. The combination, with the yoke having a tube-opening in said yoke and the sides of said opening, of the slot-rails and an intermediate adjusting-plate, as and for the purpose specified.

7. The combination, with the yoke having a tube-opening in said yoke and the sides of said opening, of the slot-rails, as described, a recess in said sides of the tube-opening for said slot-rails, and an intermediate adjusting-plate in said recess, as described.

8. The combination, with a yoke for cable railways, having a suitable tube-opening and the sides of said opening recessed, as described, of a hook-shaped slot-rail, one portion of which enters said recess, an intermediate slotted adjusting-plate, and a securing-bolt extending laterally through said rail and through said slotted plate, as shown and described.

9. The combination, with the yoke having suitable tube-opening and the opposite sides of said opening, of a lug upon the said sides of said opening, an angle-iron adapted to form a table, a journal-box, and a pulley journaled therein, all arranged as described.

CLIFT WISE.

Witnesses:
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A. G. HOLMES.