

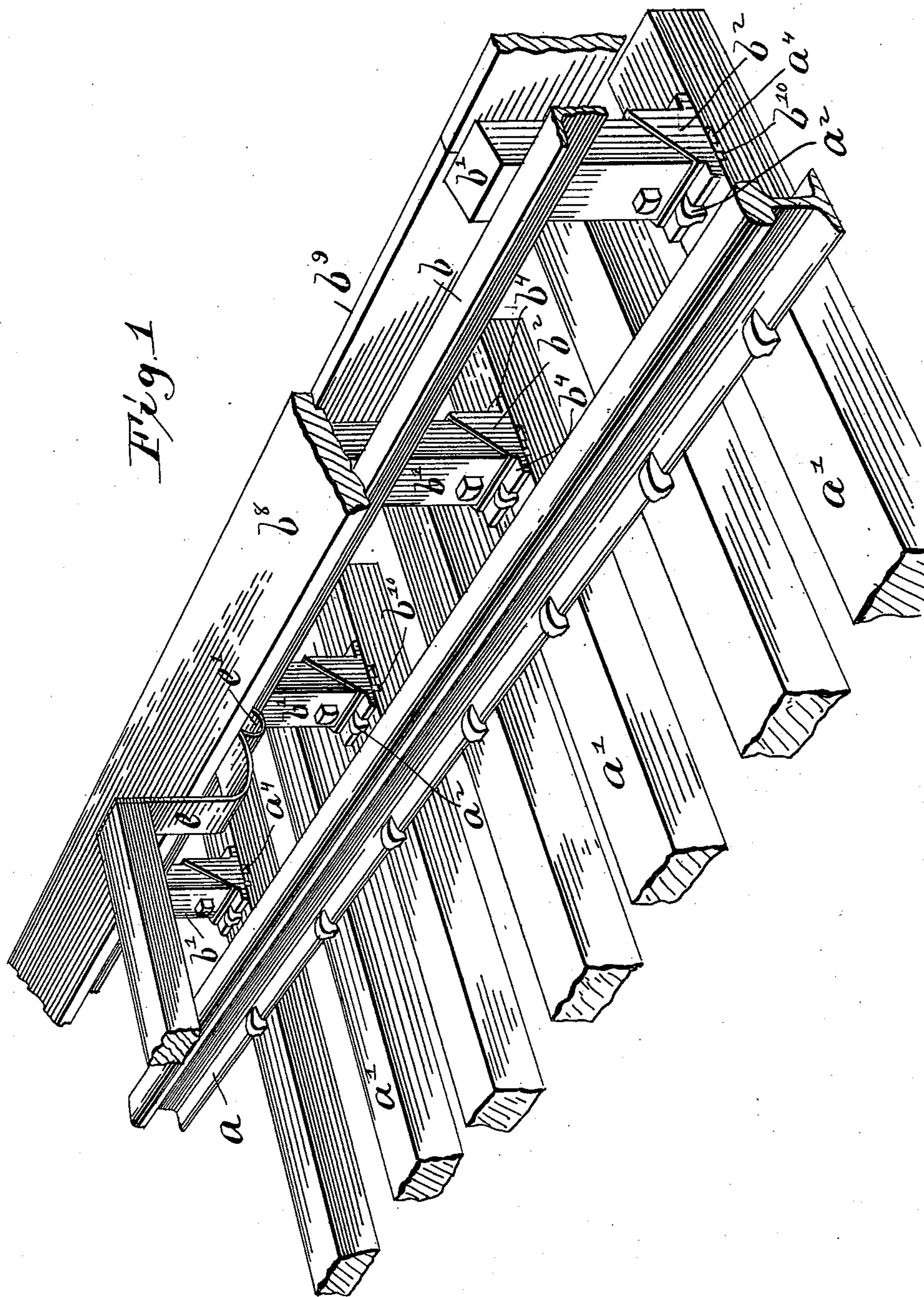
(No Model.)

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A. S. KROTZ, W. P. ALLEN & O. S. KELLY.
CONDUCTOR AND CONTACT DEVICE FOR ELECTRIC RAILWAYS.

No. 602,336.

Patented Apr. 12, 1898.



Witnesses
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Inventors
A. S. Krotz
W. P. Allen
O. S. Kelly
By their Attorney
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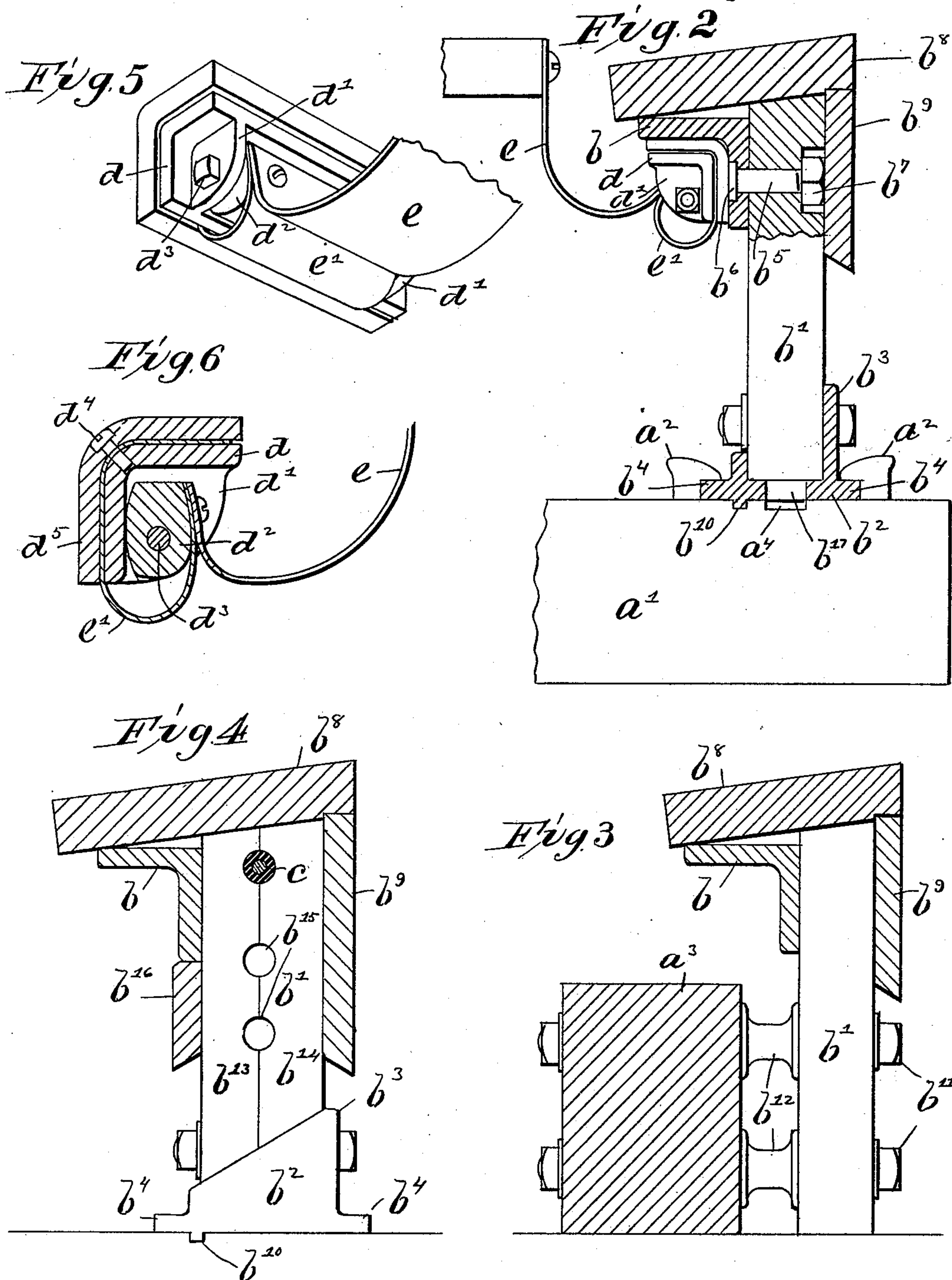
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Inventors
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UNITED STATES PATENT OFFICE.

ALVARO S. KROTZ, OF SPRINGFIELD, OHIO, WILLIAM P. ALLEN, OF CHICAGO, ILLINOIS, AND OLIVER S. KELLY, OF SPRINGFIELD, OHIO.

CONDUCTOR AND CONTACT DEVICE FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 602,336, dated April 12, 1898.

Application filed May 28, 1897. Serial No. 638,647. (No model.)

To all whom it may concern:

Be it known that we, ALVARO S. KROTZ, of Springfield, Clark county, Ohio, WILLIAM P. ALLEN, of Chicago, Cook county, Illinois, and OLIVER S. KELLY, of Springfield, Clark county, Ohio, citizens of the United States, have invented certain new and useful Improvements in Conductors and Contacting Devices for Electric Railways, of which the following is a specification.

Our invention relates to improvements in conductors and contacting devices for conveying electric current to movable vehicles; and it relates particularly to that class of conductors and contacting devices used in what has been known as the "third-rail" system.

The invention will first be hereinafter more particularly described, with reference to the accompanying drawings, which form a part of this specification, and then pointed out in the claims at the end of the description.

In the drawings, Figure 1 is a perspective view showing one side of the railway-track and illustrating the constructions employed by us in applying our improved devices to an ordinary railroad and the cars thereon. Fig. 2 is a sectional elevation of a portion of the same, with the contacting devices shown in end elevation. Fig. 3 is an end elevation of a modification in our conductor, showing the same adapted for elevated railroads. Fig. 4 is a similar view of a further modification. Figs. 5 and 6 are respectively a perspective and sectional elevation of the contacting device in detail.

Like parts are represented by similar letters of reference in the several views.

Referring to the drawings, *a* represents a track-rail of an ordinary railroad, which is mounted on the ties *a'* in the usual manner. Along the line of this track-rail and parallel thereto we place an angle-rail *b*, the vertical wing of which preferably stands wholly above the top of the track-rail. This angle-rail, forming a working-conductor rail, may be constructed of iron or steel, preferably the latter, and it is mounted upon and supported at suitable intervals by standards *b'*, which are supported by the ties *a'*, which support the track-rail *a*. In the ordinary track con-

struction these supports *b'* are mounted in sockets or chairs *b²*, each of which has a projecting web or flange *b³*, to which the standards are bolted, said sockets being further provided with laterally-projecting flanges *b⁴*, which rest on the ties *a'* and are adapted to be secured thereto by the usual spikes *a²* which are employed for securing the track-rails to the ties.

The working-conductor or angle rail *b* is preferably secured to the standards *b'* by bolts *b⁵*, the heads *b⁶* of which are countersunk in the vertical wing of the angle-rail *b*, the nuts *b⁷* of these bolts being countersunk in the posts or standards *b'*.

To provide for protecting the working conductor and its connections and supports, we form the standards *b'* at an angle at the top and place thereon a shield or cover *b⁸*, which extends the entire length of the working conductor. This shield or cover *b⁸* is placed at such an angle on the top of the standards that the outer or projecting edge thereof extends along the horizontal wing of the working conductor, with the lower edge of the shield or cover resting on the upper corner of the working conductor, so that the water or moisture is carried by said shield to a point beyond the working conductor and discharged at a point removed therefrom. As a further protection for the working conductor, its connections and supports, we provide at the rear of the working conductor a side shield *b⁹*, also of a length equal to the length of the conductor. This side shield *b⁹* is preferably formed square at its upper edge and projects on the inside slightly above the standard *b'* and is gained into the upper shield or cover *b⁸*, as shown, so as to form a tight joint to prevent the moisture from entering at this point. The standards *b'*, cover *b⁸*, and side shield *b⁹* are also preferably formed of insulating material, preferably wood, which may be properly treated to resist the elements in any well-known manner—such, for instance, as by boiling in oil or paraffin or painting with weatherproof paint.

To provide for placing the standards, and therefore the working conductor, in proper alinement with the track-rail, we preferably

employ on the bottom of the socket-pieces b^2 a rib or projection b^{10} , adapted to fit into a corresponding groove or recess in the tie a' . In practice the slots for this projection may
 5 be formed by a suitable tool which is gaged from the track-rail, thus furnishing the means of placing the socket-pieces in line at a uniform distance from the track-rail and holding the same against lateral movement while be-
 10 ing spiked in position.

In Fig. 3 we have shown the constructions slightly modified. In this case the standards b' are supported by bolts b^{11} , which extend through suitable spacing-blocks b^{12} and connect the standards b' with a guard-rail a^3 ,
 15 which is employed in elevated track construction, this guard-rail consisting of an ordinary beam or timber which is bolted to the ties in the usual manner.

In Fig. 4 a further modification is employed. In this case the standards b' are preferably made in two parts b^{13} and b^{14} , and they are further perforated in the line of the working conductor, so as to form receiving-openings b^{15}
 25 to support feeding-conductors c . In this case the feeding-conductors between the standards may be further protected by an additional longitudinal shield b^{16} , placed below the working conductor and on the inside of the stand-
 30 ards and of a similar material to said standards and the other shields and covers. These shields and covers may be secured to the standards by any suitable means—that is, by screws, bolts, nails, or any proper and suit-
 35 able fastening devices. By having the standards in two parts means are provided by which the standards may be replaced or renewed without severing the feeding-conduc-
 40 tors.

When the supporting-standards b' are supported at the bottom by socket-pieces b^2 , we preferably form the said socket-pieces with a bottom opening b^{17} under the standard b' and form the tie or support a' with a groove
 45 or notch a^4 , so that any water or moisture which finds its way into the socket may pass out through said opening and find an exit through the slot a^4 .

In connection with the working conductor
 50 b , formed with the vertical and horizontal wings, as described, we employ a contacting device of a similar cross-section and adapted to fit into the angle formed by the horizontal and vertical wings. This contacting device
 55 is constructed, essentially, as follows: A supporting-frame d is provided at or near each end with ribs or flanges d' , which connect the horizontal and vertical wings, and between these ribs and flanges there is supported a
 60 pivoted block d^2 , preferably by means of a bolt d^3 , which extends through said block and through said ribs or flanges d' . This block is made of such a shape that it may have a limited movement upon its pivotal support,
 65 so that it may adjust itself to different positions with reference to the frame d . Secured to this frame, preferably by means of suitable

fastening devices d^4 , which extend through the corner thereof, is a shoe d^5 , which forms the contact proper. This shoe d^5 is construct-
 70 ed of a size and shape to fit into the angle formed by the wings of the working conductor b . The block d^2 forms a support for the frame and its shoe and is connected to the moving vehicle by means of a yielding and
 75 flexible supporting-strip e , which extends downwardly and outwardly from said block, thence upwardly and outwardly to the point of attachment, so that the tension of the
 80 yielding strip acts as a spring to force the contacting shoe into the angle of the working conductor.

In order to secure a perfect connection and at the same time permit the shoe to adjust itself with reference to the block d^2 , we pref-
 85 erably employ a flexible strip of copper e' , which is connected to the block and in contact with the spring-support e by the same screws or fastening devices e^2 which fasten
 90 said strip to said block. This copper strip e' passes between the shoe d^5 and the supporting-frame d and is held firmly in contact with the shoe by the screws or other fastening
 95 devices d^4 which clamp the parts together. This flexible connecting-strip e' serves the double purpose of forming a direct electrical connection of the shoe d^5 to the supporting-
 100 spring e and also by the slight resilience which there is in the metal composing the same of holding the block and supporting-frame in a normal but yielding adjustment with reference to each other.

It will be seen from the above description that we provide a contacting device and a working conductor which are especially adapt-
 105 ed and applicable to all kinds of electrical railroads employing the track construction such as is now already in general use. The parts are simple and can be applied at the minimum
 110 cost. The arrangement of the supporting-standards, the angle-shaped working conductor, and the protecting parts is such that the upper cover is partially supported by the working conductor, and at the same time said
 115 working conductor is wholly protected by the inclined cover and the vertical shield. At the same time the conductors are thoroughly protected both against the elements and against accidental contact with the live or
 120 working conductors.

Having thus described our invention, we claim—

1. In a third-rail electric-railway system, the combination of insulating-standards erected alongside the track, a working conductor sup-
 125 ported by said standards on the inner side thereof at an elevation above the track, but below the upper ends of the standards, the said conductor projecting horizontally from the standard, and a transversely inclined or
 130 sloping cover resting on the tops of the standards and on the extreme edge of the horizontal portion of the conductor, substantially as described.

2. A contacting device for third-rail electric-railway systems, the same comprising a suitably-formed body portion or frame having a shoe, a block pivoted thereto, and a resilient supporting-piece connected with said block, substantially as described.

3. The combination with the contacting shoe and supporting-frame, a pivoted block in said frame, and a flexible supporting-strip connected to said block, substantially as and for the purpose specified.

4. The combination with the contacting shoe, the supporting-frame, the adjustable block pivoted in said frame, the connecting-strip from said block to said shoe, and a supporting-strip extending from said block in contact with said connecting strip, substantially as specified.

5. The combination with the angularly-shaped contacting shoe and the supporting-frame, angular in cross-section, a pivoted block in said frame, a connecting-strip extending between said shoe and frame and connected to said block, and a supporting-strip connected to said block and in contact with said connecting-strip, substantially as specified.

6. The combination with the angle-shaped

working conductor, the supporting-standards therefor, the inclined cover and vertical shield for protecting said standards and conductor, said standards being formed in parts and perforated by openings extending substantially parallel with said conductor, substantially as and for the purpose specified.

7. The combination with the standards, the angle-shaped conductor secured thereto, the vertical shield and inclined cover, said shield being projected slightly above said standards and gained into said cover, said cover being supported by said shield, substantially as specified.

In testimony whereof we have hereunto set our hands this 11th day of May, A. D. 1897.

ALVARO S. KROTZ.
WILLIAM P. ALLEN.
OLIVER S. KELLY.

Witnesses to the signatures of Alvaro S. Krotz and Oliver S. Kelly:

CHAS. I. WELCH,
G. M. GRIDLEY.

Witnesses to the signature of William P. Allen:

JOHN B. PERRY,
WILBER C. GOODALE.