C. H. EWING.

INSULATED RAIL JOINT.

APPLICATION FILED JULY 8, 1911.

1,012,069.

Patented Dec. 19, 1911

3 SHEETS—SHEET 1.

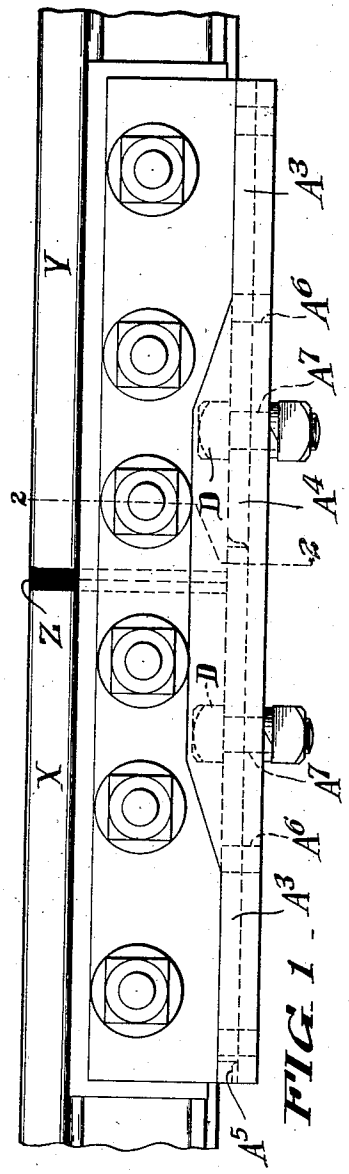


FIG. 1.

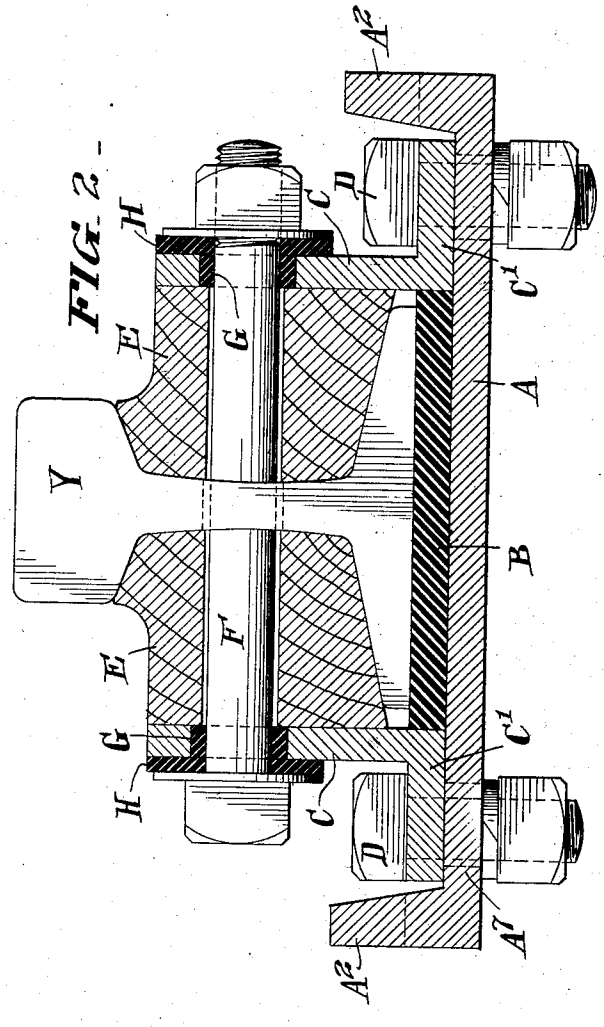


FIG. 2.

WITNESSES

Daniel Webster, Jr

S. Stuart

INVENTOR

Charles H. Ewing

BY Francis D. Chamberlin

ATTORNEY

C. H. EWING.

INSULATED RAIL JOINT.

APPLICATION FILED JULY 8, 1911.

1,012,069.

Patented Dec. 19, 1911.

3 SHEETS—SHEET 2.

FIG. 3.

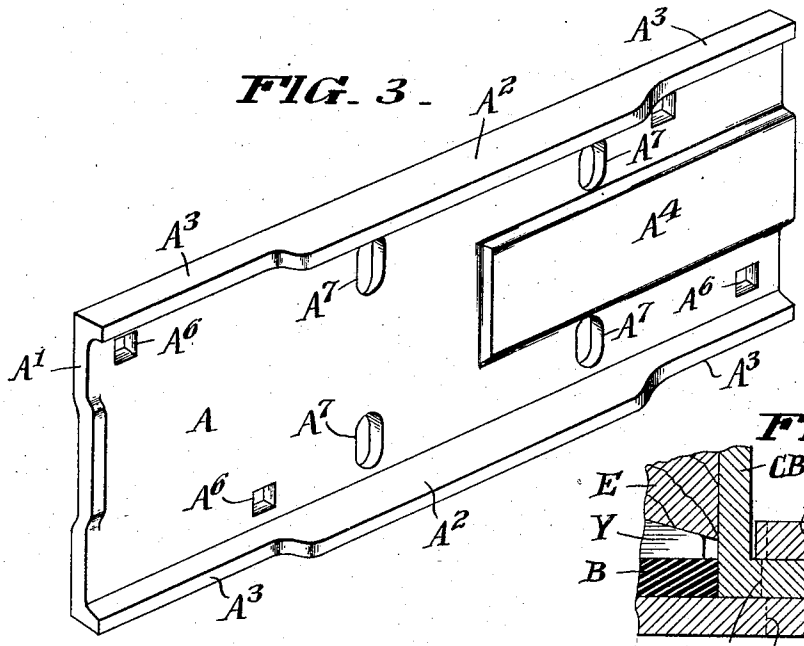
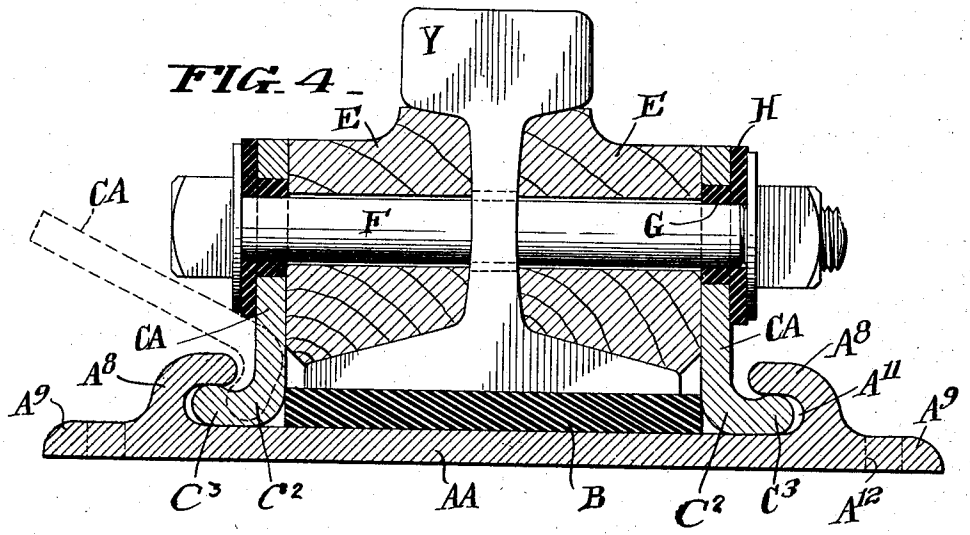


FIG. 5.

FIG. 4.



WITNESSES

Daniel Webster Jr.

J. Stewart

INVENTOR

Charles H. Ewing

BY Francis J. Chandler

his ATTORNEY

C. H. EWING.

INSULATED RAIL JOINT.

APPLICATION FILED JULY 8, 1911.

1,012,069.

Patented Dec. 19, 1911.

3 SHEETS—SHEET 3.

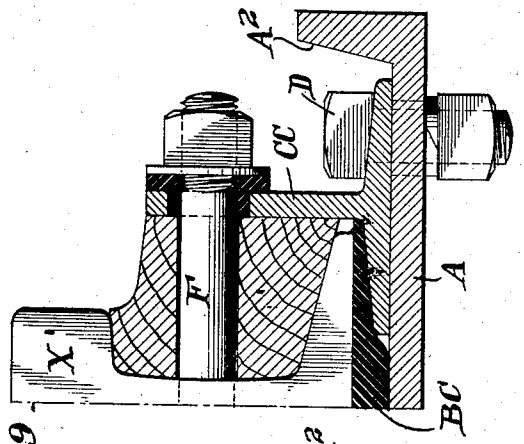


FIG. 9.

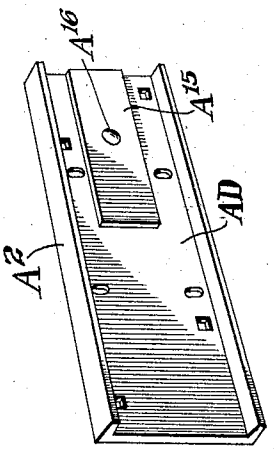


FIG. 10.

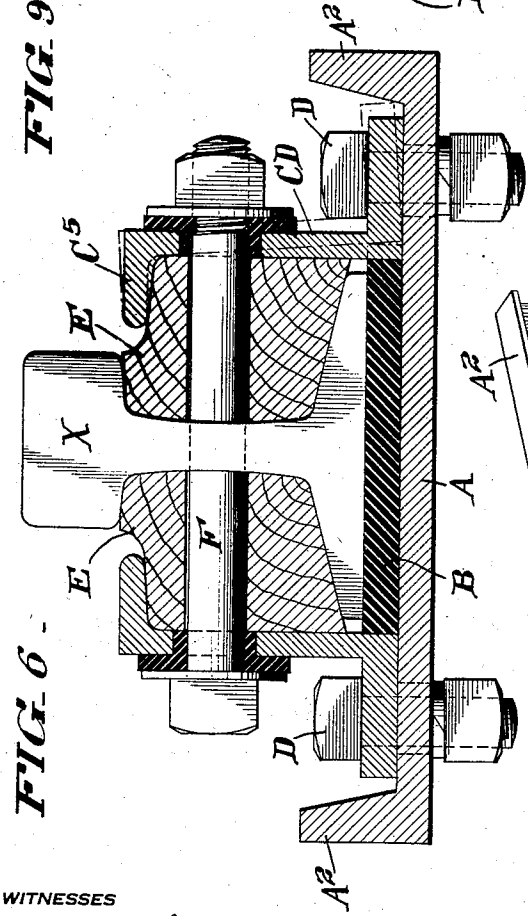


FIG. 6.

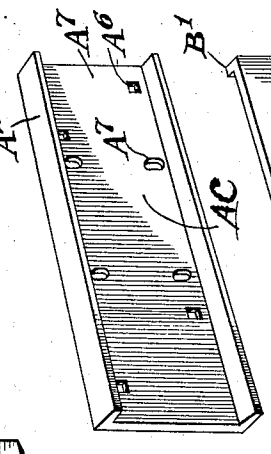


FIG. 7.

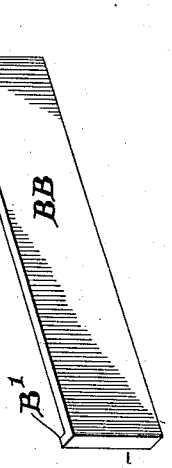


FIG. 8.

WITNESSES

Daniel Webster, Jr.

INVENTOR

Charles H. Ewing

BY Francis J. Chamberlin

ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES H. EWING, OF HADDON HEIGHTS, NEW JERSEY.

INSULATED RAIL-JOINT.

1,012,069. Specification of Letters Patent. Patented Dec. 19, 1911.

Application filed July 8, 1911 Serial No. 637,449.

To all whom it may concern:

Be it known that I, CHARLES H. EWING, a citizen of the United States of America, residing in Haddon Heights, county of Camden, in the State of New Jersey, have invented a certain new and useful Improvement in Insulated Rail-Joints, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My present invention consists in novel provisions for connecting and at the same time electrically insulating the adjacent ends of alined railway track rails, and has for its main object to provide a strong but simple construction for the purpose specified and one which will be durable in operation and comparatively inexpensive to manufacture and maintain.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, and the advantages possessed by it, reference should be had to the accompanying drawings and descriptive matter in which I have illustrated and described several of the forms in which the invention may be embodied.

Of the drawings, Figure 1 is a side elevation of an assembled rail joint. Fig. 2 is a section taken on the line 2—2 of Fig. 1. Fig. 3 is a perspective view of one form of base plate which I employ. Fig. 4 is a section taken similarly to Fig. 2 but showing a modified construction. Fig. 5 is a partial section taken similarly to Fig. 2 showing a third construction. Fig. 6 is a section taken similarly to Fig. 2 illustrating the use of a modified form of fish plate. Fig. 7 is a perspective view of another form of base plate. Fig. 8 is a perspective view of a bottom insulation piece which may be employed with the base plate of Fig. 6. Fig. 9 is a section taken similarly to Fig. 2 illustrating the use of another form of fish plate. Fig. 10 is a perspective view of still another form of base plate member.

In the drawings, and referring first to the construction shown in Figs. 1 to 3, A, represents the base plate member which comprises a bottom wall portion A′ and side flanges A^2, which may be cut away at the ends A^3. In Figs. 1 to 3, the bottom wall A′ of the base plate member is provided at one end with a central longitudinal raised portion A^4 which serves as a seat for one of the rail ends to be connected together. The bottom wall portion is provided also at its other end with another raised portion A^5, which, however, does not extend up from the bottom wall proper as high as does the portion A^4. In the construction illustrated in Figs. 1–3 the raised portions A^4 and A^5 are each formed integral with the base plate member proper by pressing up the body of the bottom wall of the member. I make the base plate member of wrought steel which may be given its shape entirely by rolling in suitable apparatus, or partly by rolling and partly by the operation of forging or pressing apparatus. The raised portions A^4 and A^5 of the base plate member form the end walls of a pocket receiving a block of insulating material B on which the second rail end is seated. In practice, I prefer that the block B of insulated material should extend beyond the end of the rail seated upon it for a slight distance under the end of the opposite rail and where the invention is used on double track railways, or wherever the conditions are such that the traffic is mainly or entirely in one direction along any particular pair of rails, I arrange the rail joint so that the raised metallic portion A^4, when used, directly supports the receiving rail. The two rails X and Y are connected to each other and to the base plate member through fish plate members C, provided with outturned flanges C′ which rest upon the bottom wall of the bed plate and are secured thereto in the construction shown in Figs. 1 and 2 and 3 by means of bolts D passing through suitable transverse elongated apertures A^7 in the base plate and registering apertures in the flanges C′. The fish plate members C form the side walls of the pocket receiving the insulation block B. Interposed between the fish plate member and the rails X and Y proper are suitable heavy bodies E of insulating material. The rails X and Y, blocks of insulating material E and fish plates C are connected by suitable transverse bolts F, and these bolts are insulated from the fish plates C by the bushings G and washers H. The adjacent ends of the rails X and Y are insulated by interposed posts or plate like pieces of insulating material Z conforming in shape to the cross

sections of the rails. The insulated parts employed may be of any suitable material, for instance, the blocks E may advantageously be made of wood, the posts Z and bushings G and washers H may well be made of vulcanized fibe , and the blocks B may well be made eithe of vulcanized fiber or of wood. It will be observed that the blocks E are of such thickness that the sides of the fish plate members C are separated from the edges of the base flanges of the connected track rails X and Y by appreciable distances. Apertures A^6 are formed in the base plate member and apertures registering therewith and preferably elongated in the direction transverse to the rails, are formed in the base flanges of the fish plate members C to receive the spikes by which the joints are secured to the track ties. It is for convenience in inserting and removing these spikes as well as to effect a slight economy in the weight of material employed that the side flange may be cut away at A^8.

Instead of securing the fish plate members to the base plate member by bolts, as in the construction shown in Figs. 1 and 2, I consider it advantageous in many cases, to form these members with interlocking surfaces which make bolts corresponding to the bolts D unnecessary. In a preferred construction illustrated in Fig. 4, the base member A A differs from the base plate member A, in that the side flanges A^8 are inturned to provide lateral channels A^{11} opening toward each other. The base plate member A A, in this construction is provided with horizontal extensions or flanges A^9 at the side edges formed with apertures or notches A^{12} to receive the spikes for securing the structure to the track ties. In the construction shown in Fig. 4, the fish plate members have their base flanges C^2 terminating in enlarged rounded ribs C^3 of a diameter such that they fit snugly in the channels A^{11} with a capacity for horizontal but not vertical movement therein. The flanges A^9 and the flanges C^2 and ribs C^3 are so proportioned that the ribs C^3 may be inserted or removed from the channels when the bolts F are removed by rocking the fish plate members as indicated by dotted lines in Fig. 4 and moving them laterally without the necessity for any relative longitudinal movement between the fish plate members and the base plate member.

In the construction shown in Fig. 5, the base plate member A B is essentially the same in form as the base plate member A A of Fig. 4 except that as shown, the extensions A^9 are omitted. In this form the fish plate members C B are similar to the fish plate members C. In this construction the fish plate members C are ordinarily inserted and removed by sliding them longitudinally with respect to the base plate. Registering spike apertures A^{13}, A^{14} and C^4 are formed in the upper and lower walls of the channels A^{11} and in the flanges C'.

The construction shown in Fig. 6 differs from that shown in Fig. 1, in that the shape of the fish plate member C D, shown in Fig. 6, is of Z-section, the upper flange C^5 bearing on the top of the corresponding insulation block E to thereby increase the stiffness of the joint.

While I consider it advantageous, in many cases, to provide a raised metallic seat for one of the rail ends, such as is formed by the integral portion A^4 of the base plate shown in Figs. 1 to 3, this elongated metallic seat is not an essential characteristic of my invention in its broader aspects, nor is it essential in all cases, to provide projections on the bottom of the base plate to restrain endwise movement of the insulation by which one or both of the connected rail ends are insulated from the bottom wall of the base plate, and in Fig. 7, I have shown a base plate member A C in the form of a section of a standard rolled channel. It will be understood, of course, that the fact that the edges of the vertical flanges of the member A C are not trimmed as in the base plate member of Figs. 1–3 is not a necessary incident of the omission or presence of the projections A^4 and A^5. When the latter are omitted, I consider it desirable in some cases to provide other means for interlocking the insulation beneath the rails against endwise movement. One way in which this may be accomplished is illustrated in Fig. 8 which shows a body B B of insulating material such as wood or compressed fiber formed on the underside of its ends with lugs B' which abut at their adjacent sides against the ends of the bottom wall of the base member A C, the body B B being enough longer than the member A C to permit this. I do not consider it essential in all cases, however, to directly and positively interlock the insulation pieces beneath the rail end or ends with the metallic parts of the rail joint. The tendency of this insulation piece to work in the direction of its length is ordinarily not very great, and in practice, I prefer to so proportion the parts that the insulation beneath the rails is gripped between the metallic fish plate members. By making the insulation piece B slightly wider than the distance between the remote sides of the insulation blocks E, E, in the assembled joint, the fish plate members will firmly grip the side edges of the insulation piece when the clamping bolts of the joint are tightened. This is particularly true of the forms of joints in which the fish plate members are secured to the base plate member by bolts. In the practical use of such construction I prefer to first tighten the bolts F, F.

This has a tendency to set the fish plate members with their bottom flanges at an angle to the bottom of the base plate member, as indicated in an exaggerated manner by dotted lines in Fig. 6. When thereafter the bolts are tightened up, the metallic fish plate members exert a powerful leverage on the base insulation tending to compress the latter and very effectively hold it in place.

In the construction shown in Fig. 9, the fish plate members C C, are in the form of inverted T rails, one flange of the head of each of which extends under the base of the rails X Y and the insulation B C, which is beveled at its edges for this purpose. This construction also tends to stiffen the joint.

In the construction shown in Fig. 10, the base member A D differs from the base member A of Figs. 1–3 in that the integral raised portion A^4 of the member A is replaced in the member A D by a separate plate A^{15} secured in place by a rivet A^{16}.

The provisions shown in Figs. 4 and 5, herein, of overlapping flanges on the base plate and fish plate members, and the projection or projections formed on the bottom wall of the base plate member to restrain endwise movement of the rail supporting block of insulation or to serve as a metallic seat for one of the rails connected, are not specifically claimed herein, but are so claimed in my copending application, Serial No. 620,976, filed April 14, 1911. That application while of earlier date than this case is subordinate to this and the constructions disclosed therein are intended to be covered by the claims of this case except as to the features to which reference has just been made.

While in accordance with the provisions of the statutes I have illustrated and described the best forms of my invention now known to me it will be apparent to those skilled in the art that changes may be made in the form of the apparatus disclosed without departing from the spirit of my invention, and that certain features of the invention may sometimes be used with advantage without a corresponding use of other features.

Having now described my invention what I claim as new and desire to secure by Letters Patent, is:

1. An insulated rail joint construction comprising in combination a metal base plate formed with uprising side flanges, metal fish plate members formed with flanges seating on the bottom wall of said base member between said side flanges whereby a rail supporting block of insulation mounted on the bottom wall of said base plate may be held against sidewise displacement by said fish plate members and means for securing said base plate and fish plate members together.

2. An insulated rail joint construction comprising in combination a metal base plate formed with uprising side flanges, metal fish plate members formed with flanges seating on the bottom wall of said base member between said side flanges, a rail supporting block of insulation mounted on the bottom wall of said base plate member between said fish plate members, and means for securing said base plate and fish plate members together, said base plate and insulating block being provided with interlocking provisions preventing endwise displacement of said insulation block.

3. An insulated rail joint construction comprising in combination a metal base plate formed with uprising side flanges, metal fish plate members formed with flanges seating on the bottom wall of said base member between said side flanges, a rail supporting block of insulation mounted on the bottom wall of said base plate between said fish plate members, means for securing said base plate and fish plate members together and positive provisions for preventing endwise displacement of said insulating block.

4. An insulated rail joint construction comprising in combination a metal base plate formed with uprising side flanges, metal fish plate members formed with flanges seating on the bottom wall of said base member between said side flanges, a rail supporting block of insulation mounted on the bottom wall of said base plate between said fish plate members and formed at its ends with projections bearing against the end surfaces of said base plate to prevent relative endwise movement between said block and base plate, and means for securing said base plate and fish plate members together.

5. An insulated rail joint construction comprising in combination with the rails to be coupled together, a metal base plate formed with uprising side flanges, a rail supporting block of insulation mounted on the bottom wall of said base plate, metal fish plate members formed with outturned flanges seating on the bottom wall of said base plate between said side flanges and at opposite sides of said rail supporting block, means for securing said base plate and fish plate members together, blocks of insulation interposed between said fish plate members and said rails, and means for securing said last mentioned blocks and the rails and fish plate members together.

6. An insulated rail joint construction comprising in combination with the rails to be coupled together, a metal base plate formed with uprising side flanges, a rail supporting block of insulation mounted on the bottom wall of said base plate, metal fish plate members formed with outturned flanges seating on the bottom wall of said base plate between said side flanges and at opposite sides of said rail supporting block, means for securing said base plate and fish

plate members together, blocks of insulation interposed between said fish plate members and said rails, and means for securing said last mentioned blocks and the rails and fish plate members together with said supporting block of insulation clamped between said fish plate members.

7. An insulated rail joint construction comprising in combination with the rails to be coupled together, a metal base plate formed with uprising side flanges, a rail supporting block of insulation mounted on the bottom wall of said base plate, metal fish plate members formed with outturned flanges seating on the bottom wall of said base plate between said side flanges and at opposite sides of said rail supporting block, means for securing said base plate and fish plate members together, blocks of insulation interposed between said fish plate members and said rails, and means for securing said last mentioned blocks and the rails and fish plate members together, said fish plate members being formed also with inturned flanges, the inturned flange of each fish plate member and the base flanges of the connected rails overlapping but being separated by one of said insulating blocks.

8. An insulated rail joint construction comprising in combination with the rails to be coupled together, a metal base plate formed with uprising side flanges, a rail supporting block of insulation mounted on the bottom wall of said base plate, metal fish plate members formed with outturned flanges seating on the bottom wall of said base plate between said side flanges and at opposite sides of said rail supporting block, means for securing said base plate and fish plate members together, blocks of insulation interposed between said fish plate members and said rails and means for securing said last mentioned blocks and the rails and fish plate members together, each fish plate member having an inturned flange at its upper edge which bears against the upper side of the corresponding one of the last mentioned blocks of insulation.

CHARLES H. EWING.

Witnesses:
ARNOLD KATZ,
D. STEWART.