W. L. DE REMER.

INSULATED RAIL JOINT.

APPLICATION FILED SEPT. 28, 1908.

991,488. Patented May 9, 1911.

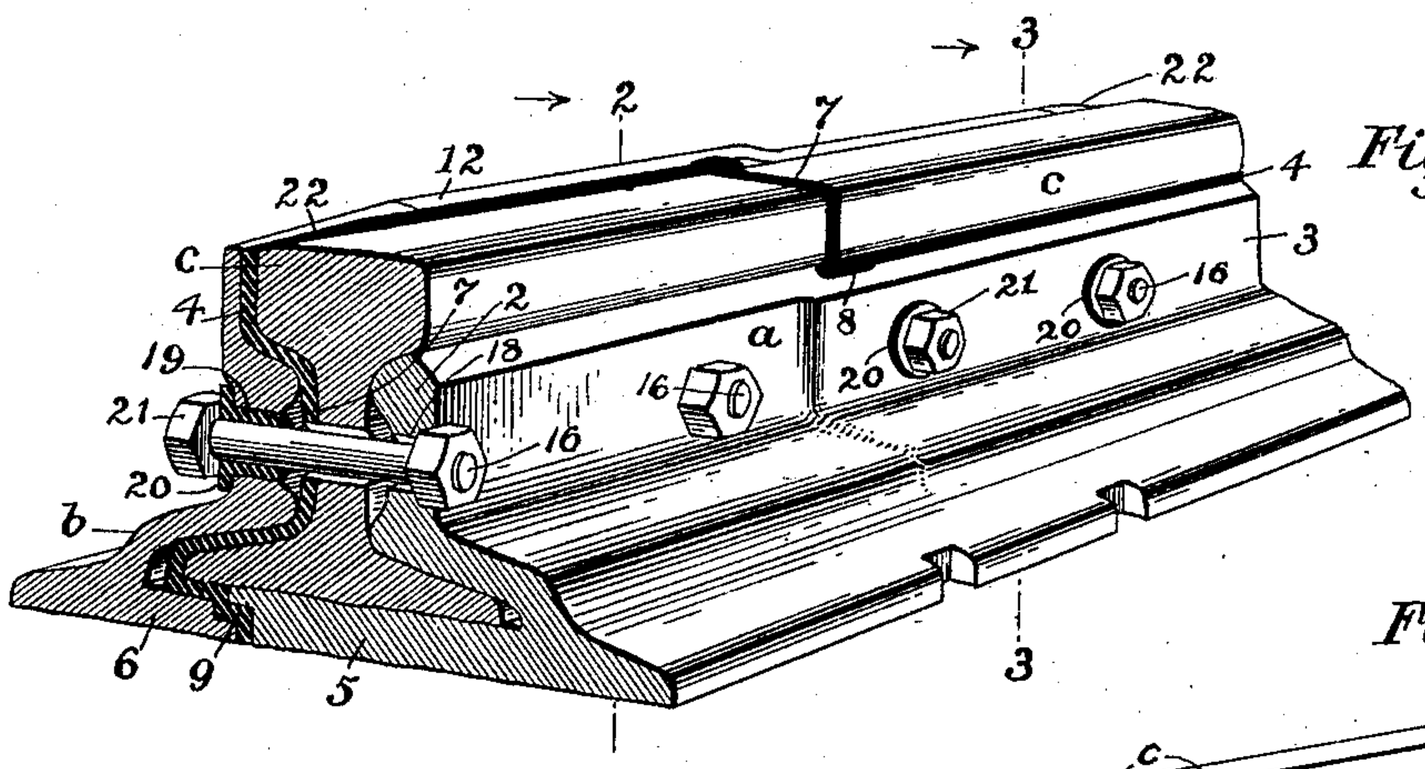


Fig. 1.

Fig. 6.

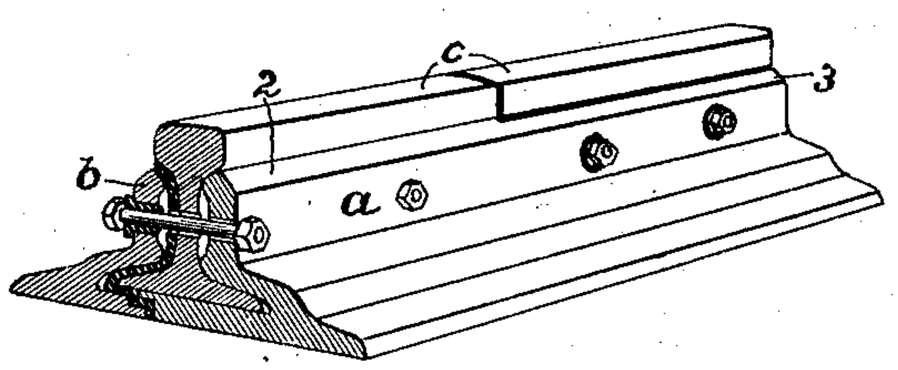


Fig. 2.

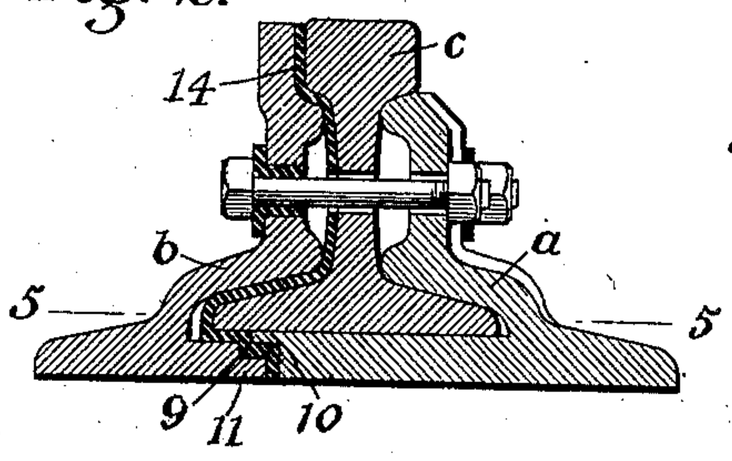


Fig. 3.

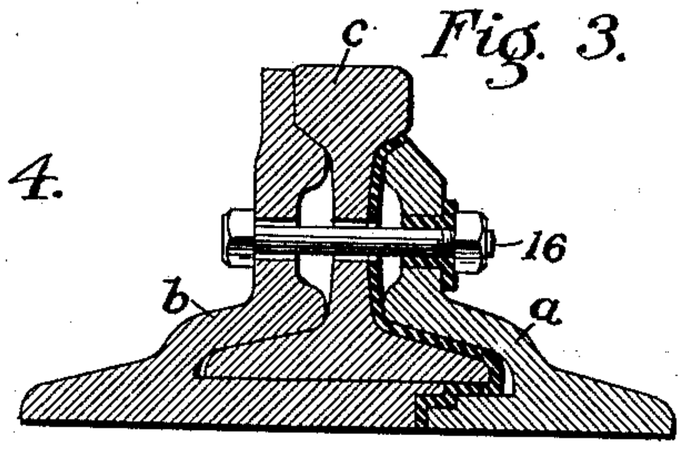
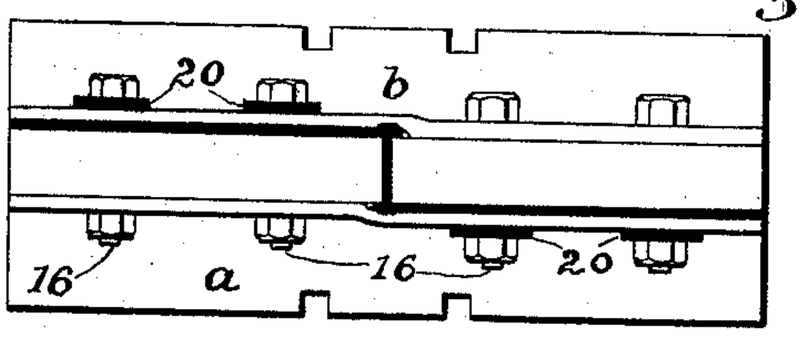


Fig. 4.



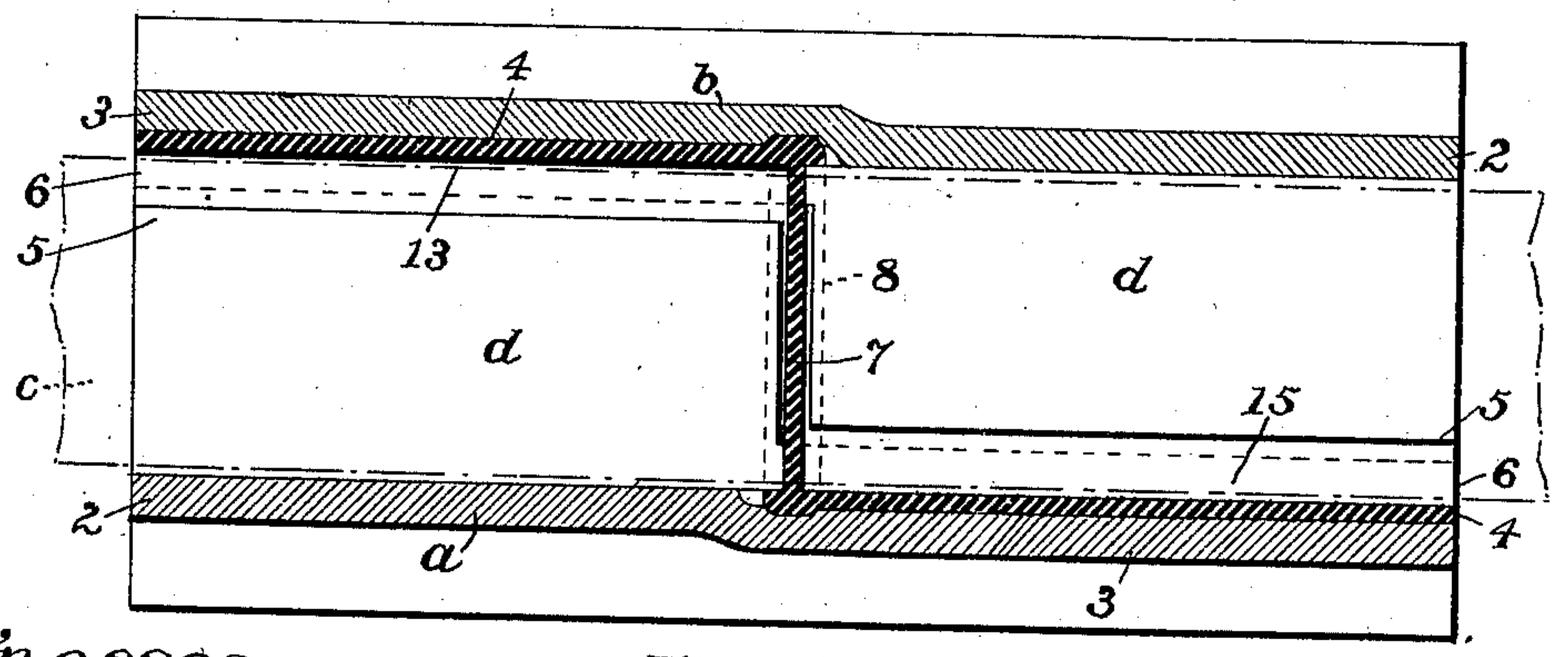


Fig. 5.

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INSULATED RAIL-JOINT.

991,488. Specification of Letters Patent. **Patented May 9, 1911.**

Application filed September 28, 1908. Serial No. 455,161.

To all whom it may concern:

Be it known that I, WILLIAM L. DE REMER, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Insulated Rail-Joints, of which the following is a specification.

This invention relates to that class of insulated rail joints having connecting plates each provided with a base-plate or bottom portion which extends beneath the bases of both rails, in actual contact and supporting engagement with one rail base at a point directly beneath and on both sides of its longitudinal center and insulated from the other rail, each connecting plate being also in actual contact with the rail head of one rail and insulated from the other plate and rail.

The principal object of the invention is to provide a simple, economical and efficient insulated rail joint for railways.

A further object of the invention is to provide an insulated rail joint having, to as great an extent as possible, the strength, stability, economy of construction, durability, and efficiency in operation of a non-insulated joint, and adapted to provide a metallic support for the load and for both rail-ends connected thereby and relieve the insulation of all stresses and strains so far as possible and prevent it from being worn away so as to cause a short circuit; and to provide a rail joint having an outer connecting plate on the outside of the rails or track, insulated from one rail and adapted to support a large portion of the load or resist the side thrusts to which the rail having the outer insulation would otherwise be subjected, and to prevent so far as possible the flattening, indenting, depressing or distorting of the upper surface or tread of the rails and the loosening or weakening of the connections due to the wearing away of the insulating material or other causes.

Other and further objects of the invention will appear from an examination of the drawings and the following description and claims.

The invention consists principally in an insulated rail joint having metallic connecting plates each having a side portion in contact and supporting engagement with the head of one rail and an integral base plate portion which extends beneath the rail bases of both rails in contact and supporting engagement with one of the rail bases but beneath and insulated from the other, all so constructed and arranged that the end of each rail has a metallic base-plate portion of a connecting plate directly beneath and on both sides of the longitudinal center and base of the rail, and each connecting plate has an insulated base-plate portion beneath the base of a rail, all adapted to form a rigid connection, provide a metallic support for both rail ends, insulate the rails and plates from each other and relieve the insulating material of the weight of the load—particularly the insulation on the outer side of the rail.

It consists further in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings Figure 1 is a perspective view of an insulated rail joint constructed in accordance with my improvements, and showing the preferred form of connecting plates and arrangement of insulating material; Fig. 2, a vertical transverse sectional view, taken on line 2 of Fig. 1, looking in the direction of the arrow; Fig. 3, a similar view in vertical transverse section, taken on line 3 of Fig. 1, looking in the direction of the arrow; Fig. 4, a plan view of the rail joint shown in Fig. 1; Fig. 5, a horizontal sectional view, taken on line 5 of Fig. 2, with rails removed, and Fig. 6, a perspective view of a modified form of rail joint constructed in accordance with my improvements.

In constructing an insulated rail-joint in accordance with my improvements, I provide a pair of metallic connecting plates *a* and *b* arranged on the inner and outer sides respectively of track rails *c* to be connected thereby. Each connecting plate has an upright side portion, one end 2 of which extends upward and inward in contact with the under side of the rail head of one rail, and the opposite end 3 of which is offset at a point near the center of the plate where the rail ends rest, so as to be out of engagement with the rail and permit the interposed lining of insulating material 4 to lie between the connecting plate and the rail from the end of the plate to its longitudinal center and the end of the rail which is to be insulated therefrom. Each of the connecting plates is also provided with a base-plate portion *d* integral with the side portion of the

plate and extending beneath the ends and bases of both track rails, in contact with the base of one rail base beneath and on opposite sides of its longitudinal center and forming a metallic support therefor, and beneath and out of contact and insulated from the base of the other rail. The portion 5 of the base-plate of each connecting plate, where it is in contact and supporting engagement with the rail is relatively wide and thick so that its upper surface is above the level of the upper surface of the relatively narrow and thin portion 6 of the same plate and of the adjacent plate. The relatively narrow and thin portion of each plate thus has its upper surface below the level of the upper surface of the relatively wide portion of the same and the adjacent plate a sufficient distance to admit the lining of insulating material between it and the base of the rail.

An insulation 7 is interposed between the adjacent ends of the track rails. And the side insulations 4 are reinforced at the points where they extend beneath the adjacent parts or edges of the rails or between adjacent edges of the connecting plates where the greatest wear is liable to occur due to unavoidable play of the parts between which the insulating material is interposed. The reinforced or relatively thick portion of the insulation near the ends of the rails is indicated by the reference numeral 8, and that adjacent to the edges of the base plates beneath the rail bases is indicated by the reference numeral 9. The adjacent edges of the base plates, where they extend longitudinally beneath the bases of the respective rails, preferably overlap each other—the relatively wide base-plate portion of each connecting plate having an overlapping portion or flange 10 beneath which the lower edge or flange 11 of the relatively narrow portion of the adjacent base-plate extends. The lining of insulating material preferably extends between the overlapping portions of the base-plates, so as to exclude water and other substances and insure proper insulation of the connecting plates with respect to each other. The outer connecting plate is provided, preferably, with an upwardly extending reinforce or upright flange 12 the upper surface of which is flush with the upper surfaces or tread of the rails. This reinforce should extend alongside of and out of contact with the rail which has the lining of insulating material on its outer side, and the insulating material should preferably fill the space between said reinforce or upper flange and the side of the rail head.

The insulation for one rail comprises a lining of insulating material between the outer side of the rail and the outer connecting plate, including a lower strip or insulating portion 13 which is beneath the outer portion of the base of the rail and between said rail base and the relatively narrow base-plate portion 6 of said outer connecting plate, and also preferably including an upper insulating portion 14 which extends between the uppermost portion of the outer connecting plate and the rail head upward to the level of the top surface of the rail and the outer reinforcing portion 12. The insulation for the other rail comprises a lining of insulating material between the inner side of the rail and the inner connecting plate, and includes a lower strip or insulating portion 15 which is beneath the inner portion of the base of the rail and the relatively narrow base-plate portion 6 of said inner connecting plate. The bottom strips 13 and 15 of insulating material are thus substantially identical but on opposite sides of the longitudinal center of the rails, extending in opposite directions from the insulating strip 7 between the ends of the rails. The insulations for the respective rails and the respective connecting plates are thus in staggered relation, each connecting plate being insulated from the other and from the rail with which the other connecting plate is in actual contact and supporting engagement.

Bolts 16 extend through perforations 7 in the upright webs of the respective rails and through bolt holes 18 in the connecting plates and are properly insulated by means of sleeves or collars 19 of insulating material in the openings in the insulated portions of the respective connecting plates, each of said sleeves having an annular collar or flange 20 between the nut 21 or bolt head of the bolt encircled by said flange, and the adjacent side of the connecting plate. The opposite ends of the respective bolts, need not be insulated from the connecting plate through which they extend, and a strong and efficient connection is thus afforded between the respective members of the joint and the track rails.

The upwardly extending load-supporting portion or reinforce 12 of the outer connecting plate has its upper surface flush with the top surface of the rail, as stated, so that the outer connecting plate serves not only to connect the rails and support one rail base upon a metallic base-plate, but it also serves to support the load to which the other outwardly insulated rail would be subjected, to the extent of coming into actual and supporting contact with the wheels of the engines and cars passing over the joint or track rails. It thus braces the rail which, by reason of its having its insulating lining necessarily on the outer side of the rail where it is subjected to side thrusts, is most likely to require bracing from the outside, but also actually supports a portion of the

load and directly resists the side thrusts to which the rail would otherwise be subjected in use. This upper portion or reinforce is preferably gradually tapered or inclined downward and toward the respective ends of the plate at the points indicated by the reference numeral 22, and extends from the end of the plate which is adjacent to the outwardly insulated rail past the rail ends and the insulation 7, and preferably inward into contact with the rail head which is without insulation on its outer side. The reinforce may extend from end to end of the outer connecting plate, if desired.

The relatively narrow base-plate portion 6 of each of the connecting plates, by extending under the rail base, and also by extending under the longitudinally flanged or overlapping portion 10 of the relatively wide base-plate portion adds greatly to the strength, efficiency and security of the joint and the connections between the respective members. Being integral with the relatively wide and thick base-plate portion of the connecting plate, of which it forms a part it not only strengthens the connecting plate, but, by extending under the base of the rail it forms a supporting base for that portion of the load which rests upon the upper reinforce 12, and serves to hold the bottoms or bases of the rails and the base plates of the respective connecting plates in proper position with respect to each other. These relatively narrow and thin portions 6 of the base-plates therefore add to the efficiency of the joint whether the connecting plates or either of them have a reinforce or upwardly extending portion above the level of the bottom of the rail head or not. With both connecting plates made identical, in the form of the inner plate *a*, (see Fig. 6) or without the reinforce 12, but having the relatively narrow and thin insulated base-plate portions extending beneath the bases of the respective rails, either with or without overlapping flanges 10 and 11, the joint being in all other respects unchanged, will be efficient, but I prefer the construction shown, especially in cases where the greatest strength is desired and interchangeability of the connecting plates is of less importance than the advantages which result from making the outer plate of greater height than the inner one.

I contemplate employing such modifications as are within the scope of my invention and do not limit myself except as set forth in the claims.

I claim:—

1. In an insulated rail joint, the combination of track rails each having a rail-head and a rail-base portion, a pair of connecting plates each in engagement with a rail-head and each having a base-plate portion extending beneath both rail bases in contact and supporting engagement with one rail-base directly beneath its longitudinal center and out of contact with the other rail-base and connecting plate, and insulating material between each rail-base and one of the connecting plates.

2. In an insulated rail joint, the combination of track rails each having a rail-head and a rail base portion, a pair of connecting plates each having a side portion in engagement with a rail-head and each provided with an integral base-plate portion extending beneath both rails, in contact and supporting engagement with one rail base on both sides of its longitudinal center and out of contact with the other rail-base and connecting plate, insulating material between each rail and one of the connecting plates, and means for securing the connecting plates in operative position.

3. In an insulated rail joint, the combination of track-rails each having a rail-head and a rail-base portion, a pair of metallic connecting plates each having a side portion in engagement with a rail-head and each having an integral base-plate portion extending beneath both rails in contact and supporting engagement with one rail-base on both sides of its longitudinal center and out of contact with the other rail, insulating material between each rail-base and the connecting plate with which said rail-base is out of contact, the upper edge of the outer connecting plate being above the level of the inner connecting plate and level with the top of the track rails, and means for securing the parts in position.

4. In an insulated rail joint, the combination of track rails each having a rail-head and a rail-base portion, insulating material between the ends of said track rails, a pair of metallic connecting plates each having a side portion in engagement with a rail-head and each having an integral base-plate portion extending beneath the bases of both rails in contact and supporting engagement with one rail base on both sides of its longitudinal center and out of contact with the other rail, and a lining of insulating material extending between each rail-base and the connecting plate with which said rail-base is out of contact and between the head of said rail and said connecting plate.

5. In an insulated rail joint, the combination of track rails each having a rail-head and a rail-base portion, insulating material between the ends of said track rails, a pair of metallic connecting plates each having a side portion in contact with a rail-head and each having an integral base-plate portion extending beneath the bases of both rails in contact and supporting engagement with the central portion of one rail-base and out of contact with the other rail, a lining of in-

sulating material extending between each rail-base and the connecting plate with which said rail-base is out of contact and between the head of said rail and said connecting plate, the upper edge of the outer connecting plate extending upward to the level of the upper surface of the track rails, and means for securing the connecting plates and track rails in position.

6. In an insulated rail joint, the combination with track rails each having a rail-head and rail-base portion and provided with insulating material between said track rails for insulating them from each other, of a pair of metallic connecting plates each having a side portion in engagement with a rail-head and each provided with an integral base-plate portion extending beneath the bases of the rails, the upper edge of the outer connecting plate being on a level with the upper surface of the track rails, and a lining of insulating material between the connecting plates and rails.

7. In an insulated rail joint, the combination of track-rails each having rail-head and base-portions, insulating material between the ends of the track rails, a pair of connecting plates each having a side portion in engagement with a rail-head and each provided with an integral base-plate having a relatively wide and thick portion in contact and supporting engagement with the base of one rail and a relatively narrow and thin integral base-plate portion extending beneath and out of contact with the base of the other rail, the upper edge of the outer connecting plate being on a level with the upper surface of the track rails, and a lining of insulating material extending between the relatively narrow and thin base-plate portion of each connecting plate and the adjacent bottom surface of the rail-base.

8. In an insulated rail joint, the combination of track rails each having rail-head and rail-base portions, a pair of connecting plates each having a side portion in engagement with a rail-head, and each provided with an integral base-plate portion extending beneath both rails in contact and supporting engagement with one rail-base on both sides of its longitudinal center and out of contact with the other rail-base and connecting plate, each of the base-plates having an inner edge overlapping the adjacent edge of the base-plate of the other connecting plate, and a lining of insulating material between the overlapping edges of said connecting plates and between the track rails and connecting plates respectively.

9. In an insulated rail-joint, the combination of track rails each having a rail-head and a rail-base portion, insulating material between the ends of the track rails, a pair of connecting plates each having a side portion in contact with a rail-head and each provided with an integral base-plate having a relatively wide and thick portion in contact and supporting engagement with the base of one rail and a relatively narrow and thin integral base-plate portion beneath and out of contact with the base of the other rail, the upper edge of the outer connecting plate being on a level with the upper surface of the track rails, and a lining of insulating material extending between each rail-base and the connecting plate with which said rail base is out of contact and between the inner edges of the respective connecting plates.

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