

(No Model.)

F. H. HEATH.

RAIL CHAIR, TIE PLATE, TRUSS JOINT, AND JOINT FASTENING.

No. 474,127.

Patented May 3, 1892.

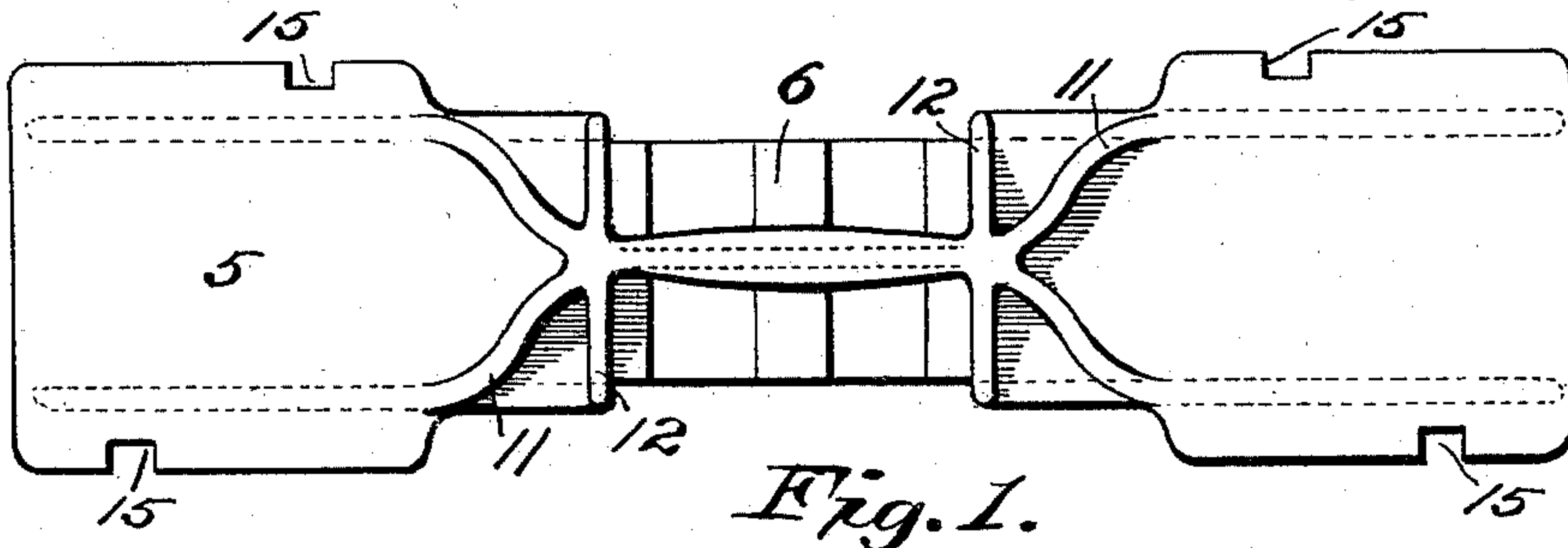


Fig. 1.

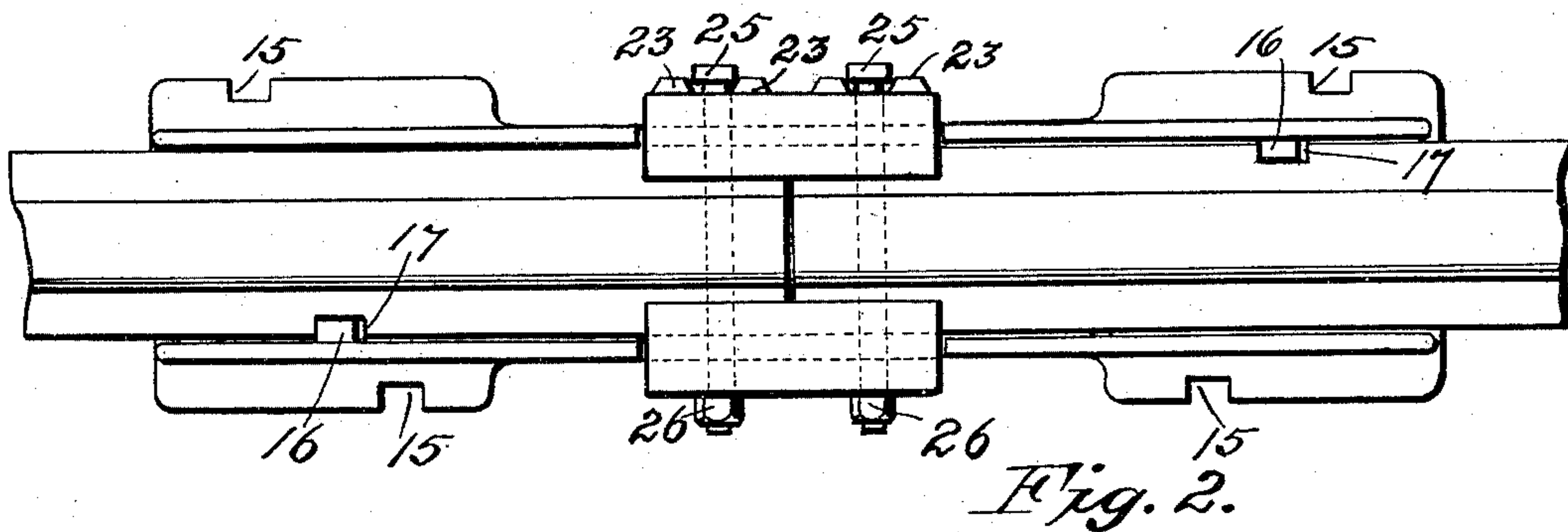


Fig. 2.

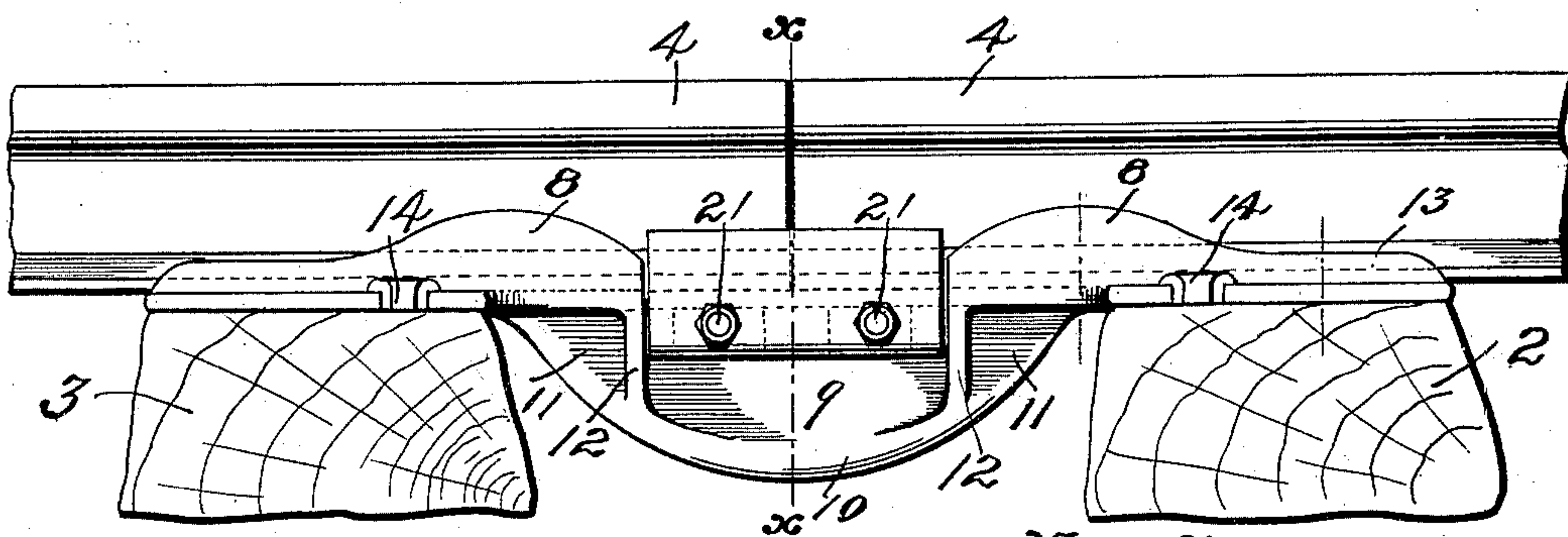


Fig. 3.



Fig. 5.



Fig. 6.

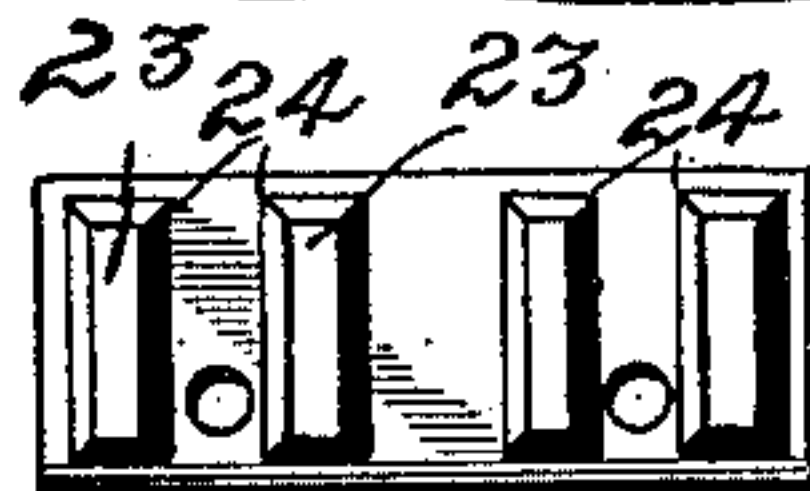


Fig. 7.

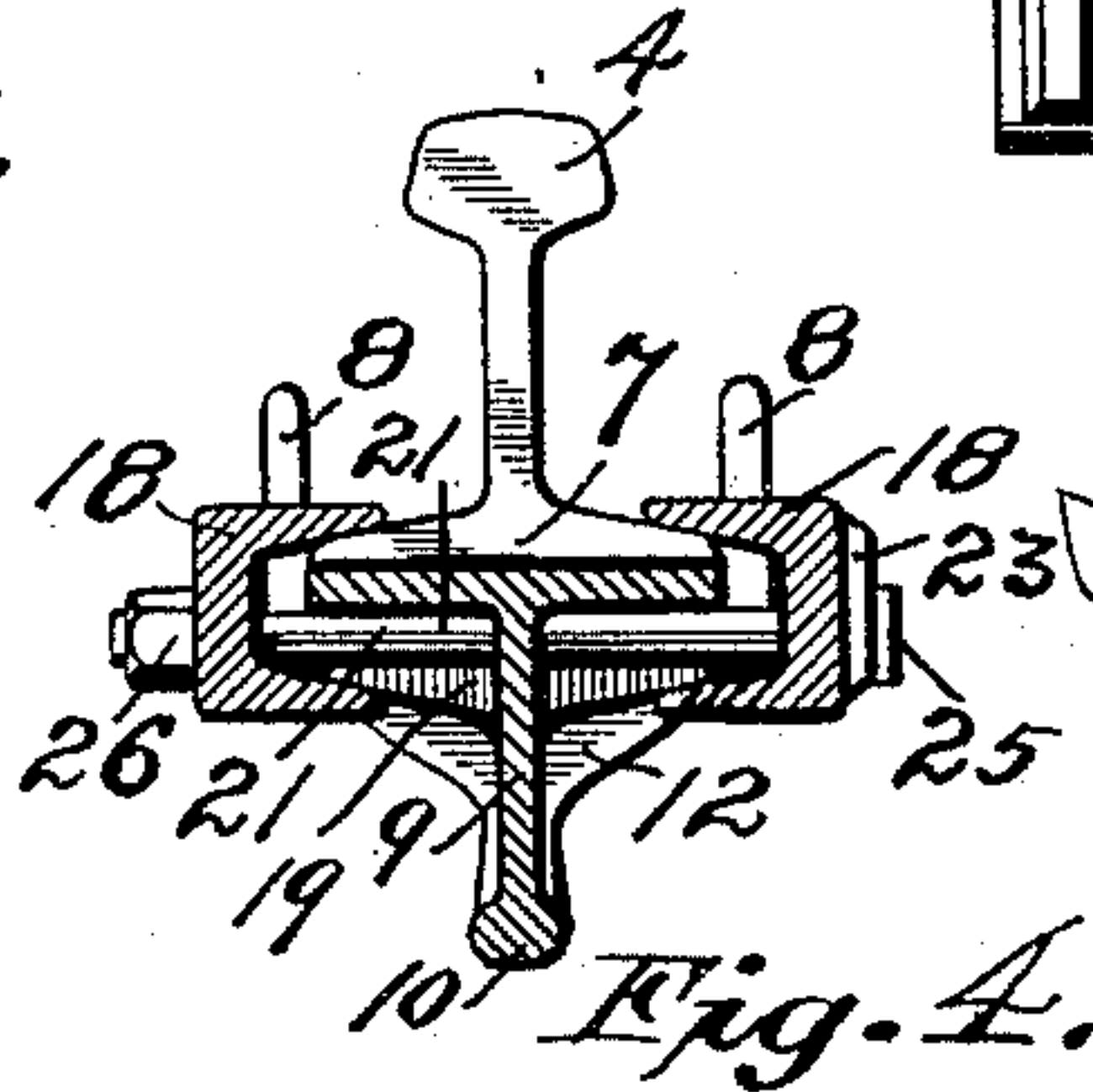


Fig. 4.

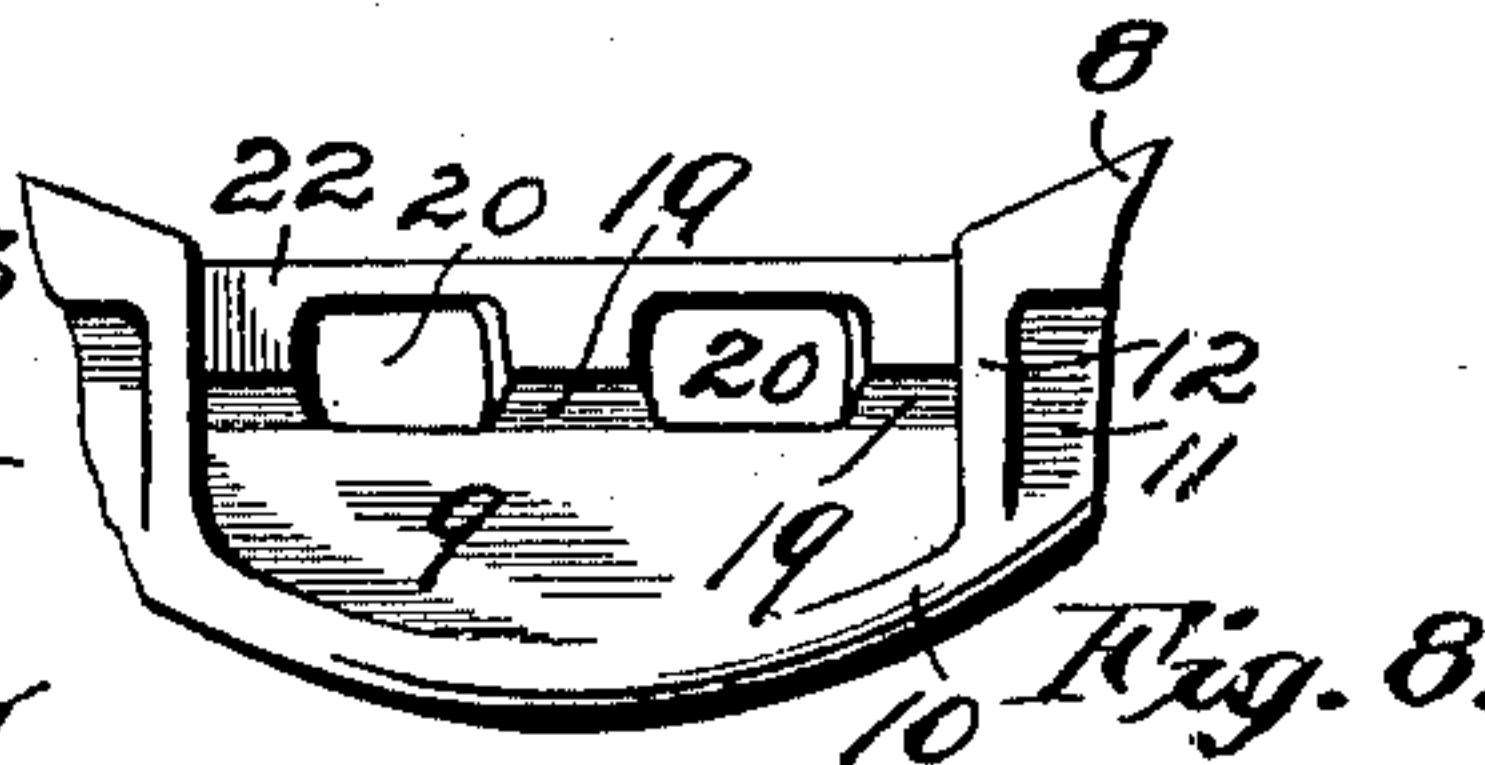


Fig. 8.

Witnesses.  
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By Paul Merwin, Atty.



# UNITED STATES PATENT OFFICE.

FREDERICK H. HEATH, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE  
HEATH RAIL JOINT COMPANY, OF WATERLOO, IOWA.

RAIL-CHAIR, TIE-PLATE, TRUSS-JOINT, AND JOINT-FASTENING.

SPECIFICATION forming part of Letters Patent No. 474,127, dated May 3, 1892.

Application filed July 25, 1891. Serial No. 400,712. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK H. HEATH, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain Improvements in a Combined Rail-Chair, Tie-Plate, Truss-Joint, and Joint-Fastening, of which the following is a specification.

My invention relates to means for joining, supporting, and fastening railway-rails; and the object of the invention is to provide a tie-plate which shall be adapted to extend over and across two ties and which shall also have and constitute the rail-chairs; also, a truss-strengthening plate, and thereby adapting it to firmly support the meeting ends of two rails, and, further, to provide fastenings by which the rails may be secured on the plate without the necessity of drilling holes through the rails, as is usual with other fastenings, and, further, to provide a device of the class described which, while capable of fulfilling all of the purposes for which it is designed, will, owing to its construction and the arrangement of its integral trusses, be adapted for embodiment within a minimum size and weight.

My invention consists in general in a rail-joint strengthened by trusses of a novel construction and arrangement and a particular fastening therefor, whereby the rails are secured upon the plate, all substantially as hereinafter described, and particularly pointed out in the claims.

My invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is an under side view of my improved rail device. Fig. 2 is a plan view of the same. Fig. 3 is a side elevation of the same. Fig. 4 is a transverse section on the line  $xx$  of Fig. 3. Figs. 5, 6, 7, and 8 are details.

As shown in the drawings, the principal part of the device is the thin tie-plate, which extends between and over the tops of the two ties 2 and 3. This plate sets down directly on top of the ties and has a plane continuous upper surface adapted to receive the ends of the rails 4, the extreme ends of which meet at a point about midway between the ties. I increase the width of the tie-plate at the ends

to form the broad chairs 5 of such a large area that the rail is prevented from tilting and the edges thereof cutting into the ties. The center portion 6 of the rail-joint is substantially the same width as the rail-base 7. It will be seen that a simple tie-plate of the thickness shown would not be sufficient to support the meeting ends of the rails, so as to prevent sagging and the depression of the rails at the joint. I therefore provide a truss in and on the plate formed integrally therewith, and having the parts 8 formed on the top of the plate and spreading out to embrace the sides or edges of the rail-bases and the lower part dipping or extending below the plate and between the ties. This lower part of the truss is divided into or rather formed of the middle web 9, the rib 10 thereof, and the diagonal and transverse parts or brackets 11 and 12, respectively.

It will be seen that the main part of the brace or truss is the part 9, having the strengthening-rib 10. The diagonal and transverse brackets or trusses form extensions of this main part and terminate in the top trusses 8 which, it will be seen, extend inward through the line of the transverse trusses. The diagonal trusses are preferably curved and at their outer ends are brought as near as possible into line with the top truss-extensions. The ribs 13 form continuations of the trusses 8, and make the sides of the rail-chairs to prevent the sidewise movement of the rail. As shown, the greatest height of each top truss 8 is just above the point where the diagonal braces meet the tie-plate, thereby greatly strengthening the tie-plate at the point above the edge of the railroad-tie and preventing the bending of the tie-plate at such points.

The use of the top trusses makes possible the employment of the very short lower truss, thereby allowing the ties to be brought closer together, and hence greatly increasing the stability of the rail-joints. The object of the transverse trusses 12 is to prevent the bending of the plate on a line to the diagonal brace, or, in other words, the twisting of the tie-plate. The tie-plate is secured upon the ties by the spikes 14, driven down in the notches 15, provided in the extended sides of the



rail-chair parts of the plate. A longitudinal movement of the rails is prevented by use of the lugs 16, provided in diagonally-opposite position on the plate. The rails are provided  
 5 with the notches 17 of a greater length than the width of the lug, as shown, and adapted to receive the same. The difference between the size of the notches and the lugs is sufficient allowance for expansion and contraction.  
 10 The rails are held securely upon the tie-plates by the clamping-boxes 18, arranged one on each side, as shown, and provided with the inclined or wedge-shaped inner sides adapted to engage the inclined top of the rail-  
 15 base and the oppositely-inclined surfaces 19 of the middle part of the plate between the transverse trusses. The openings 20 are provided through this part of the plate and are adapted to admit the bolts 21, passing through  
 20 the same and through the clamping-blocks 18, wherein said bolts are secured. The distance between the outer corners of the rib is greater than the widest bolt-head employed, and the distance between the lower edges of the ribs  
 25 is less than the smaller. Hence it will be seen that the bolt-heads 25 will rest upon the inclined sides 24 of adjoining ribs and can never touch the side of the clamping-block. Hence the rotary movement of the bolt, which would  
 30 act to loosen the nut 26, is wholly prevented. It is obvious that any sized bolt may be employed for tightening the clamping-blocks and holding the same in place. It will be seen that by this means I provide a truss-  
 35 fastening that is simple and inexpensive in construction, that securely supports the rail at the joint, and that does not require the making of any holes through the rail for the purpose of securing them. If it is necessary  
 40 to cut off a rail or to use a short piece thereof, it is not necessary to incur the expense of drilling holes through the rail.

All that is necessary to do to the rail to adapt it to be used with this fastening is to  
 45 cut a notch or recess in the base for the purpose of interlocking it with the projection or lug 16.

Having thus described my invention, I claim as new and desire to secure by Letters  
 50 Patent—

1. A truss-fastening for rail-joints, comprising, in combination with the rails, a plate having a truss formed integrally therewith and arranged centrally on the under side thereof,  
 55 with diagonal trusses also formed integrally with said plate and extending from the ends of said central truss toward the edges of the plate, and means for securing the meeting ends of the rails to said plate, substantially  
 60 as described.

2. A truss-fastening for rail-joints, comprising, in combination with the rails, a plate having a truss formed integrally therewith and arranged centrally on the under side of said  
 65 plate, and transverse trusses also formed integrally with said plate and the central truss and extending from the ends of said central

truss toward the edges of said plate, substantially as described.

3. The combination of the plate provided  
 70 with the truss formed integrally and centrally with said plate and arranged on its under surface with the transverse trusses or brackets, and the diagonal trusses or brackets also  
 75 formed integrally with said plate and the central truss, top truss-extensions on the upper surface of said plate formed integrally therewith and between which the rails are adapted to fit, and means for securing the meeting  
 80 ends of the rails to said plate.

4. The combination, with the plate provided at its ends with the chairs adapted to rest upon and be secured to the ties and with the vertical trusses 8, projecting from its upper  
 85 surface and between which the ends of the rails are adapted to rest, of the central depending truss formed integrally with said plate, the transverse trusses and the diagonal trusses also formed integrally with said plate,  
 90 and means for securing the ends of the rails to said plate.

5. A truss-fastening for rail-joints, comprising, in combination with the rails, a plate having a truss formed integrally therewith and arranged centrally on the under side thereof,  
 95 with diagonal trusses also formed integrally with said plate and extending from the ends of said central truss toward the edges of the plate, top truss-extensions on the upper surface of said plate formed integrally therewith and between which the rails are adapted  
 100 to rest, and means for securing the meeting ends of said rails to said plate, substantially as described.

6. A truss-fastening for rail-joints, comprising, in combination with the rails, a plate having a central depending truss and top truss-extensions 8, projecting vertically from the  
 105 edges of the plate, said extensions being four in number and having their inner ends overlapping the upper ends of the depending truss, all of said parts formed integrally, whereby the plate is strengthened and bending at the  
 110 junctions with the ties avoided, substantially as described.

7. A truss-fastening for rail-joints, comprising, in combination with the rails, a plate having a truss formed integrally therewith and arranged centrally on the under side thereof,  
 115 with transverse trusses or brackets, also formed integrally with said plate and extending from the ends of said central truss toward the edges of the plate, top truss-extensions on the upper surface of said plate formed integrally therewith and between which the rails are adapted  
 120 to rest, and means for securing the meeting ends of said rails to said plate, substantially as described.

8. The combination, in a device of the class described, of a plane tie-plate having ends  
 125 adapted to rest upon the ties, a depending truss formed with a strengthening-rib and provided with diagonal and transverse trusses or brackets 11 and 12, respectively, and trusses



8, integral therewith and with the plate and provided with extensions 13, substantially as described.

9. The combination, in a device of the class described, of the plate having the rail-chair portions 5, the depending truss, the upper extension 8 thereof, the openings 20, arranged in the plate and beneath the upper surface thereof, clamping-blocks 18, the inclined surface 19 on the plate, and bolts for fastening said clamping-blocks, as described.

10. The combination, in a device of the class described, of the plate having the plane upper surface and the rail-chair portions 5 of a greater width than the other portions of the plate, an integral truss for strengthening said plate, said truss having upper and lower extensions, the lower one adapted to extend down between the ties, lugs or projections 16, formed on the plate and adapted to extend into notches provided in the rail-bases, means for securing said plate upon the ties, and means for securing the rails upon said plate, substantially as described.

11. The combination, in a device of the class described, of the plate having the inclined surface 19, with the clamping-blocks 18, having inner surfaces corresponding therewith and with the angles of the surface of the rail-base, bolts for securing said clamping-plates, and ribs 23, having inclined sides 24 for securing the heads of said bolts, substantially as described.

12. The combination, with the tie-plates, of means for securing the rails thereon, a truss for said tie-plate formed integrally therewith

and consisting in the depending portion 9, provided with the rib 10, the transverse and diagonal trusses 12 and 11, and the upper extension 8, formed in the top of the plate, as and for the purpose specified.

13. A combined rail-joint and brace comprising a plate to extend across the ties and whereon the rails are adapted to rest and arch trusses arranged vertically on the upper surface of said plate and over the junctions thereof with the ties and between which the rail base or bases are adapted to fit, substantially as described.

14. The combination, with the rail or rails, of a plate for the same to rest upon, said plate extending across and between adjoining ties, a depending truss arranged centrally on said plate and having laterally-extended ends, arch trusses arranged on the upper surface of the plate and adapted to retain the rail base or bases, blocks for clamping the same on the plate and secured by bolts passing beneath the plate, said arch trusses having their ends extended to meet the ends of said blocks, the highest points of said arch trusses being above the junctions of the plate and ties, the outer ends of the trusses being thence slanted downwardly, and means for fastening the whole upon the ties, substantially as described.

In testimony whereof I have hereunto set my hand this 21st day of July, 1891.

FREDERICK H. HEATH.

In presence of—

C. G. HAWLEY,

F. S. LYON.