

No. 703,979.

Patented July 8, 1902.

W. J. AUSTIN.  
RAILWAY RAIL JOINT.  
(Application filed Nov. 12, 1900.)

(No Model.)

Fig. 1.

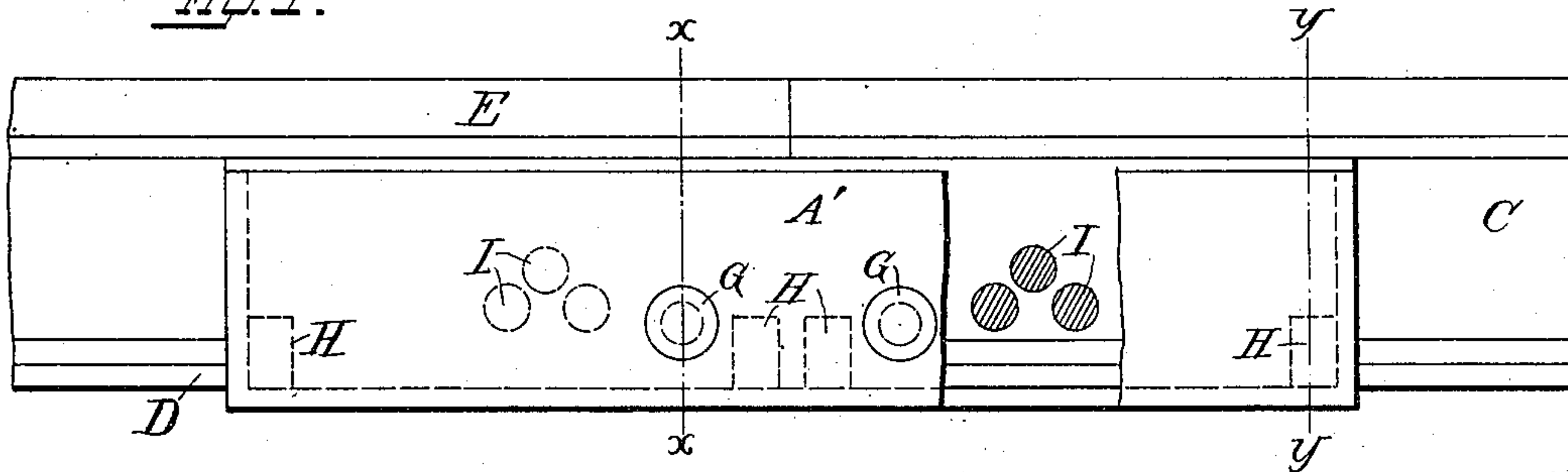


Fig. 2.

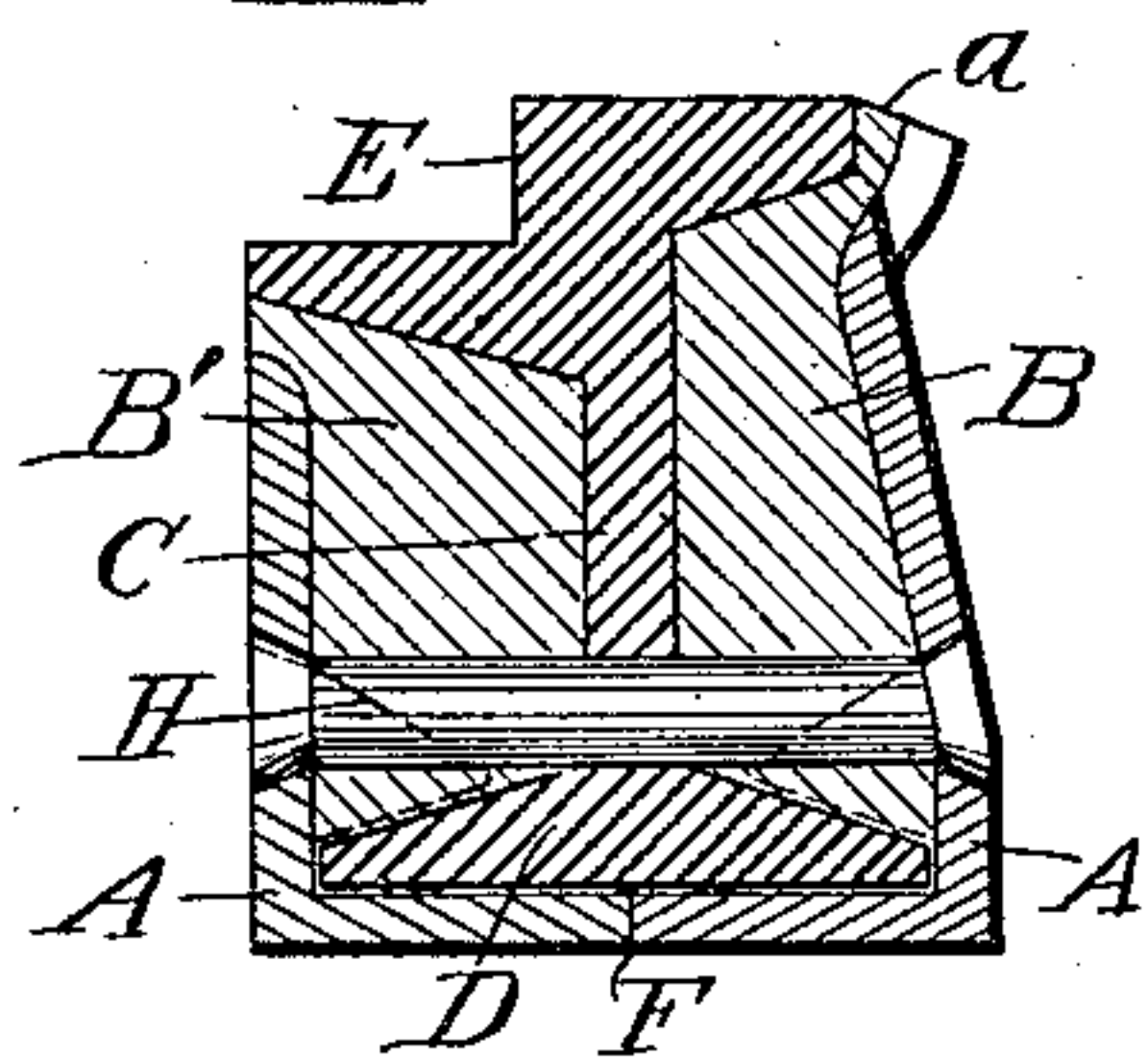


Fig. 3.

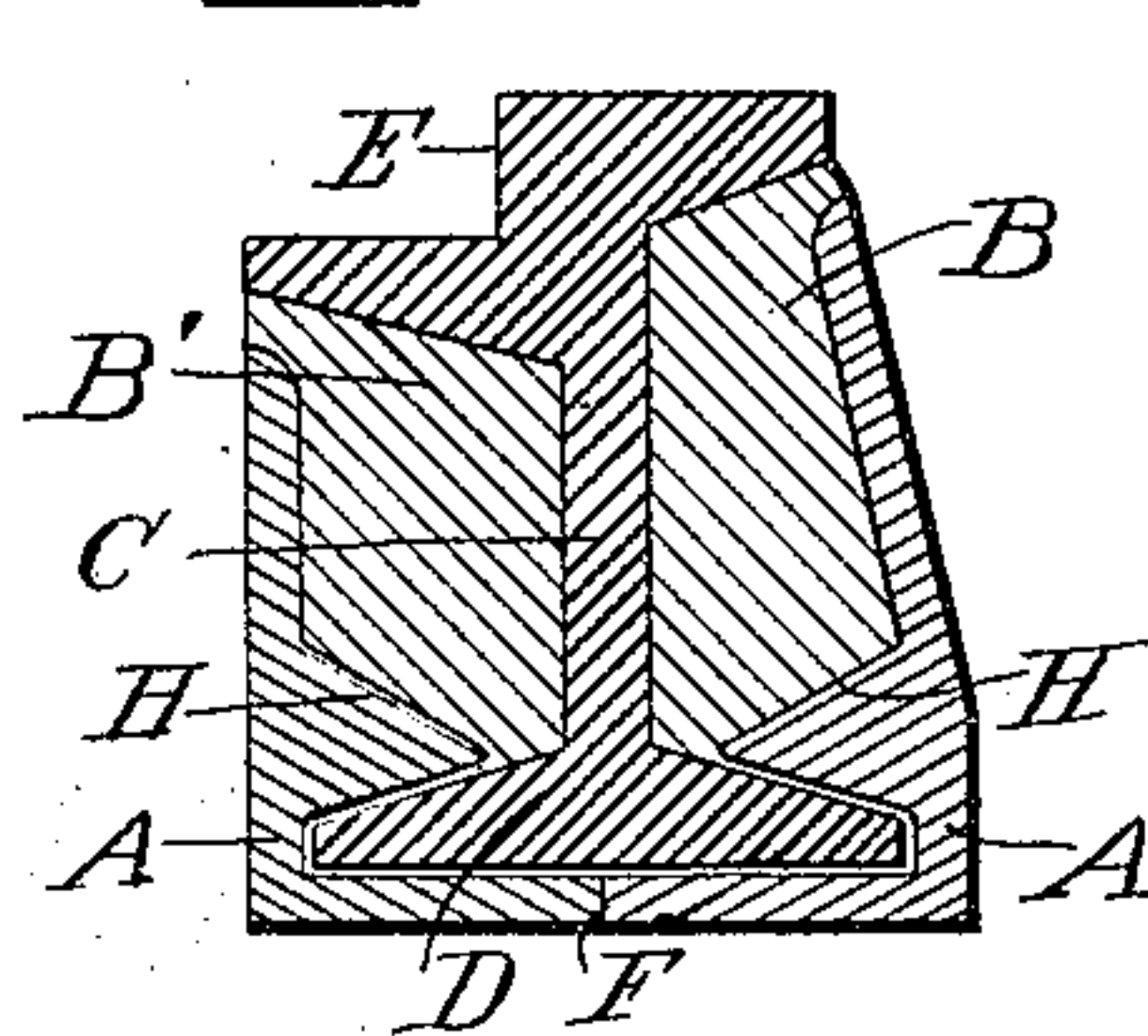


Fig. 4.

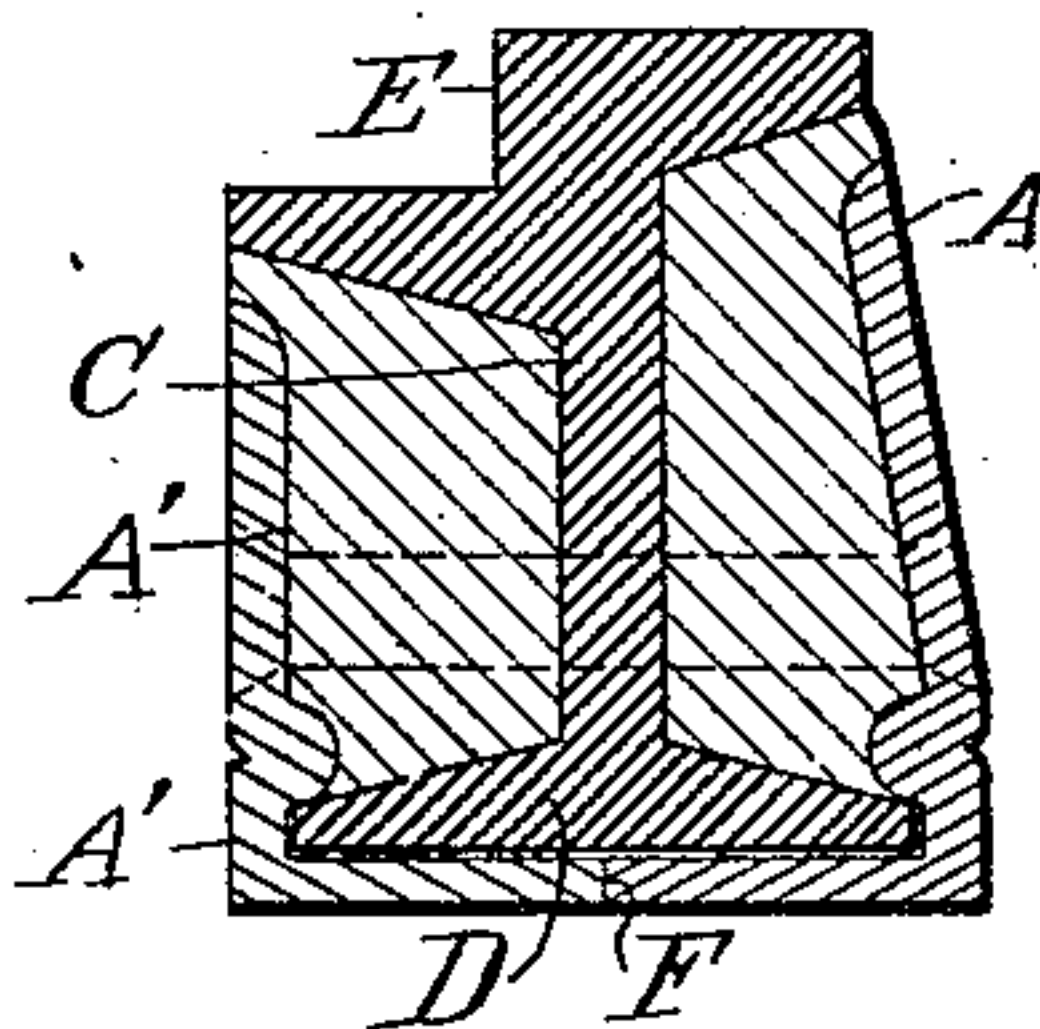
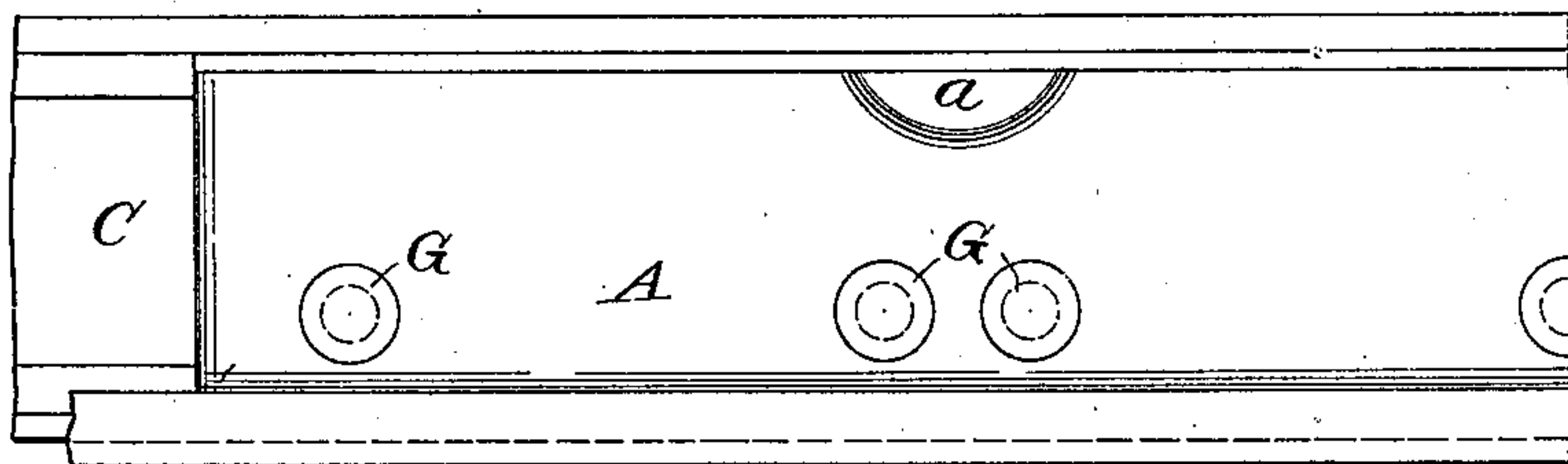


Fig. 5.



WITNESSES:  
*F. C. [Signature]*  
*C. L. Roesch.*

INVENTOR  
*William J. Austin*  
By *Erwin & Wheeler*  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

WILLIAM J. AUSTIN, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO  
PERMILLIA J. AUSTIN.

## RAILWAY-RAIL JOINT.

SPECIFICATION forming part of Letters Patent No. 703,979, dated July 8, 1902.

Original application filed March 3, 1898, Serial No. 672,422. Divided and this application filed November 12, 1900. Serial No. 36,211. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM J. AUSTIN, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Railway-Rail Joints, of which the following is a specification.

My invention consists in improvements in railway-rail joints, as hereinafter set forth, the invention being in the nature of a modification of or improvement upon that set forth in Letters Patent No. 593,345, granted to me under date of November 9, 1897, and being also a division of a former application, Serial No. 672,422, filed March 3, 1898, for Letters Patent for method and means for forming railway-joints.

The present invention contemplates fusion of the faces of the rails and the inner walls or faces of the sleeve or coupling by and with the molten metal poured into the space between them under all working conditions and the consequent formation of an exceedingly strong and perfect joint well adapted to constitute an electrical bond between the rail-sections. The improved construction also permits of ready application or use of the invention in connection with rails already in position without detaching them from their ties, yokes, or other supports.

In the accompanying drawings, Figure 1 is a side elevation of the meeting or proximate ends of a pair of rails, showing my invention applied thereto, a portion of the sleeve being broken away to show certain openings formed in the web of the rail; Fig. 2, a transverse sectional view on the line  $x x$  of Fig. 1; Fig. 3, a similar transverse section on the line  $y y$  of Fig. 1; Fig. 4, a transverse sectional view showing a modified form of a sleeve which may conveniently be made of rolled steel or other metal; Fig. 5, a side elevation of the same.

The same reference-letters are used throughout the following description to indicate like parts.

Briefly stated, the joint or coupling comprises the meeting ends of two rails, a sleeve or coupling member extending a suitable dis-

tance lengthwise of said ends in each direction from the joint or line of meeting and encompassing the base and sides of the rails to or about to the level of the under side of the tread portion E, and a filling of metal poured into the sleeve or coupling, filling the space within the same and uniting with the metal of the rails and with that of the sleeve or coupling by fusion of the meeting surfaces followed by solidification or congealment.

So far as I am aware the idea of uniting the rails and an outside sleeve or coupling member by an intervening body of molten metal which first fuses the surfaces with which it comes into contact and later cools and unites the several parts to form an integral body is new and original with me. This constitutes the leading feature of my invention; but incidental thereto are other features, which will be more fully explained in the course of the following description.

Referring first to Figs. 1, 2, and 3, I will describe an embodiment of my invention well adapted to be carried out through the aid of cast-metal sleeves or coupling members. In these figures, A and A' indicate two angular metal sections of like length and of substantially like form, which being placed with their lower flanges in edge contact, as at F, constitute a sleeve or coupling member, the base-flanges of the members A and A' being of such width as jointly to extend across the underfaces of the rail-bases or bottom flanges. When formed of cast metal, and, if desired, when formed of any other metal or alloy, the end portions of the members A and A' may be made to conform to the contour of the rails, so as to fit closely over the base-flanges and against the vertical webs thereof. The parts so made and applied may be tied together in any convenient manner, either by clamps or, as is preferred, by means of bolts or rivets G passing through the members A A' and through the web of the rail and headed or provided with nuts, as found expedient. In Figs. 1, 2, and 3 the fastenings are represented as in the form of rivets.

The member A is formed with an outwardly-bent lip or edge to constitute a pour-



ing-mouth *a*, through which to introduce molten metal to form the filling B B'. In practice it is deemed advisable to form perforations in the webs C, so that the molten metal poured in through the pouring-mouth *a* may fill the space between the web C and the member A of the sleeve or coupling and passing through the perforations fill also the space between the web C and the member A'; but obviously the two sides may be separately poured, if desired. When the perforations are provided, uniting bodies I, of metal, connect the two bodies B and B', of cast metal, and fusing the walls of the perforations and uniting therewith they insure a more perfect electrical bond than would be in all cases obtainable without such perforations. This is because the metal, so long as hot enough to find its way through the openings, will be able to fuse the exposed edges of the relatively thin web, where it might not be hot enough to fuse the flat faces of the web or to do so perfectly and efficiently.

As shown in Fig. 3, the members A and A' of the sleeve or coupling are formed with lugs or projections H, extending inward therefrom and designed to bear upon or overhang the base flange D, thereby preventing the members A and A' from dropping below their proper level or from rising.

It will readily be seen that the sleeve, consisting of the parts A and A', applied to the rails and held in place by the lugs or projections H and the bolts or rivets G, constitutes in itself a quite strong and firm connection between the rail-sections, which connection is vastly strengthened by the cast-metal body introduced between the rail and the sleeve and united by fusion to both. The electrical conducting capacity of the joint so formed is very great, and there is, in fact, no increase of resistance offered by them over that of the rails themselves.

Figs. 4 and 5 represent a construction in all material respects the same as that of Figs. 1, 2, and 3 except that the members A and A' are somewhat lighter and have projections H formed in them by rolling, said projections taking under such construction the form of a continuous rib or bead. This embodiment of the invention is more particularly designed with reference to the use of wrought metal, as rolled steel or iron.

As shown in Fig. 5, the vertical wall of each member A and A' may be cut or severed along the line of the bead and bent inward to bear against the web of the rail to form a closure for the end of the sleeve or coupling. This will of course be done before the parts are assembled, and the inturned portion will be cut or fashioned to conform more or less closely to the contour of the web and base. Obviously, however, temporary closing blocks or plugs may be employed and the inturning of the ends dispensed with.

I deem it preferable to employ ordinarily

the divided sleeve or coupling, for the reason that it may be readily applied to rails in position and while fastened to their ties, yokes, or other supports without other disturbance than the mere lifting of the rails to a height of about a half an inch or sufficient to permit the lower flanges of the sleeve-sections to be passed beneath the bases of the rails. I do not, however, limit my invention to the use of a divided sleeve.

Two sections will be sufficient for all ordinary purposes; but I do not mean to restrict myself to making the sleeve of only two parts, since it may be further divided, if for any reason it seems desirable to do so.

It is obvious that the form and dimensions of the sleeve or coupling may vary considerably without departing from the scope or spirit of my invention, which, as before stated, consists, primarily, in uniting the rail-sections and the sleeve or coupling by an intervening body of cast metal fused to both.

The rivets of the fastenings by which the members A and A' of the sleeve or coupling are held together may be permanent or temporary, as preferred, and when the integral sleeve is employed they may be wholly omitted. Rolled-steel sleeves are found admirably suited to the purposes of the present invention; but cast metal, alloys, or other substances possessing the requisite strength and conducting capacity may be made use of.

In the drawings I have represented the upright walls of the sleeve or coupling as set some distance away from the web C on both sides; but this is a matter of option, the space on either side or on both sides being made greater or less, as shall be found expedient in any given case.

The fusion of the faces of the sleeve and web by the introduced metal effects a perfect and exceedingly strong joint or connection, which enables me to dispense with bolts, rivets, or even interlocking shoulders to be engaged by the filling, though it is preferred to make use of the through connections I as a means for better insuring a firm and indestructible joint.

Since the mode of manipulating molds, the use of fluxes, and like matters incident to fusion and casting of metals are within the common knowledge of founders and metallurgists, it is perhaps unnecessary after stating that fusion is in all cases to be effected to add that in cold or damp weather or when the metal is not sufficiently heated or when the sleeve or coupling contains so great a mass as to unduly chill the poured metal the sleeve or coupling may be heated to advantage, and suitable flux may be employed to facilitate the union of the contacting surfaces by fusion. The heating is in some cases effected by placing the sleeve directly in a heating-chamber before setting it in position, and in other cases it is heated by causing the molten metal to overrun sufficiently for the purpose.



It is frequently unnecessary to perform the heating of the sleeve, however, and hence I do not confine myself thereto.

Having thus described my invention, what I claim is—

1. A rail-joint comprising the proximate ends of two rail lengths; a sleeve partially encompassing said ends; and a filling of metal between the sleeve and the rails, and united to both by fusion.

2. A rail-joint comprising the proximate ends of two rails; a sleeve or coupling partially encompassing said rail ends; and a body of cast metal filling the space between the rails and the sleeve, passing through the webs of the rails, and united by fusion both to the rails and to the sleeve.

3. In combination with the proximate ends of two railway-rails; a longitudinally-divided sleeve or coupling applied to and partially encompassing said rail ends; and a filling of cast metal within the sleeve and united to the sleeve and the rails by fusion.

4. In combination with two rails; a sleeve or coupling comprising members A and A' overlapping the meeting-point of said rails;

fastenings G applied to the sections A, A' and serving to hold them together; and a filling of cast metal between the sleeve and the rails and fused to both.

5. In combination with the proximate ends of two rails; a longitudinally-divided sleeve extending beneath and upward beside said ends; projections extending inward from the members of the sleeve toward the webs of the rails; and a filling of metal introduced within the sleeve and united by fusion to the sleeve and rails.

6. The combination of a pair of rail ends; a jacket adjusted to the rail ends; adjusting-bolts passing transversely through openings in the webs of the rail-sections and through the sides of the jacket; and a body of metal molded in the jacket, and adhering to said jacket and to the rail ends.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLIAM J. AUSTIN.

Witnesses:

JAS. B. ERWIN,  
WM. W. GILLESPIE.