No. 782,398. PATENTED FEB. 14, 1905.

C. H. HOWARD.

RAILROAD.

APPLICATION FILED NOV. 5, 1904.

Fig. 1.

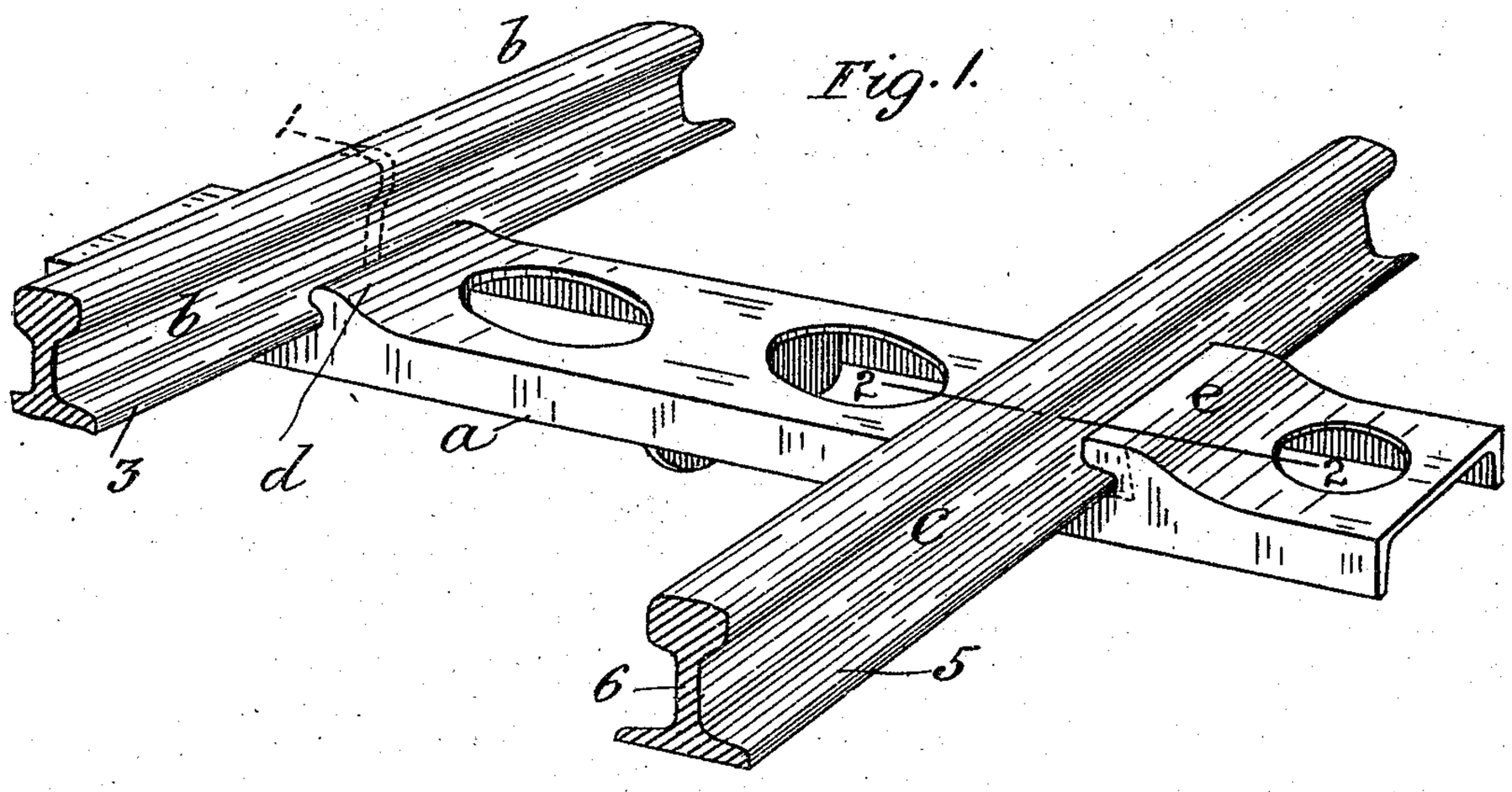


Fig. 2.

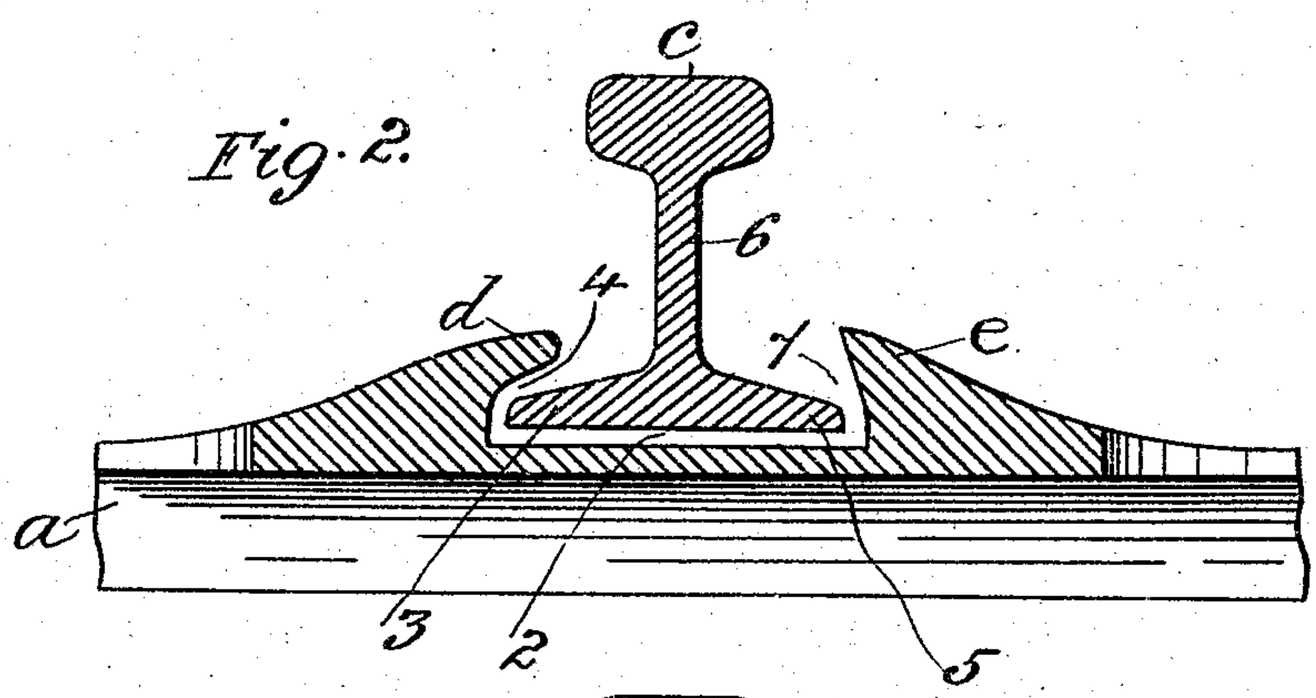
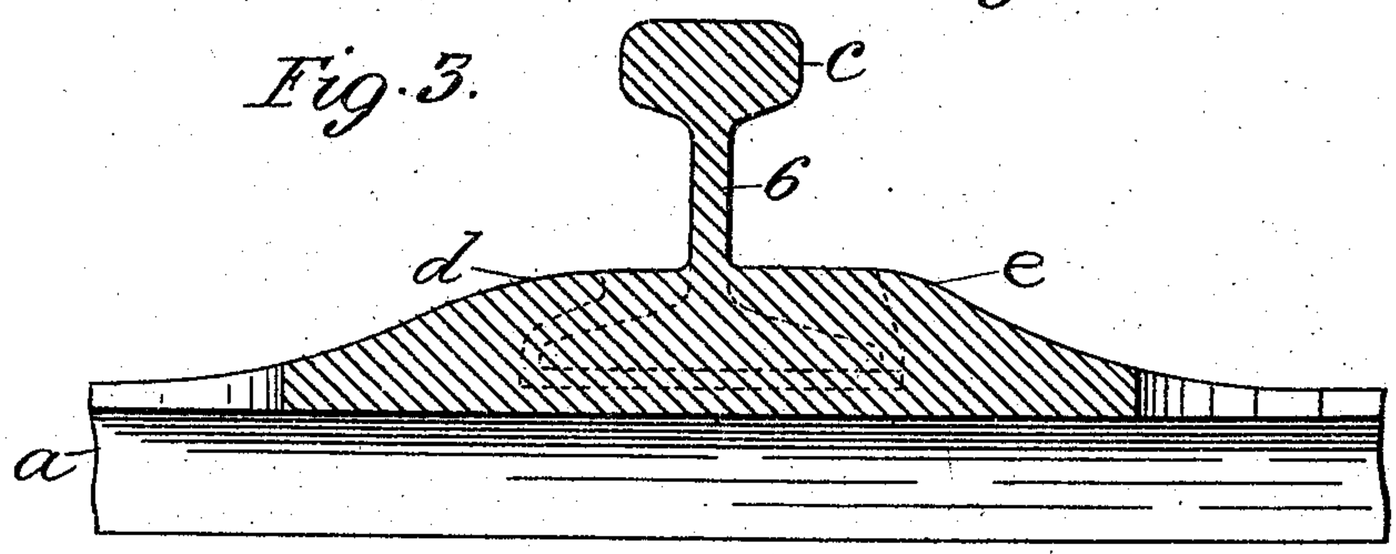


Fig. 3.



WITNESSES
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No. 782,398. Patented February 14, 1905.

UNITED STATES PATENT OFFICE.

CLARENCE H. HOWARD, OF ST. LOUIS, MISSOURI.

RAILROAD.

SPECIFICATION forming part of Letters Patent No. 782,398, dated February 14, 1905.

Application filed November 5, 1904. Serial No. 231,575.

To all whom it may concern:

Be it known that I, CLARENCE H. HOWARD, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented a new and useful Improvement in Railroads, of which the following is a specification.

My invention relates to a railroad, and has for its object to dispense with the fastenings ordinarily used for securing the rails to the ties to prevent the rails from spreading and to maintain their alinement, continuity, and rigidity at the joints.

The invention consists in features of novelty, as hereinafter described and claimed, reference being had to the accompanying drawings, forming part of this specification, whereon—

Figure 1 is a perspective view of the end portions of two adjoining rails and the body portion of an opposite rail combined with a metallic tie and forming therewith a part of my improved railroad-track; Fig. 2, a longitudinal section to enlarged scale through a portion of the tie and a cross-section through the corresponding part of one of the rails on line 2 2 in Fig. 1, showing the rail in position before being secured to the tie; and Fig. 3 a similar view to Fig. 2, showing the rail and tie fastened together or combined in one piece.

Like letters and numerals of reference denote like parts in all the figures.

a represents a metal railroad-tie which is composed, preferably, of cast-steel integral throughout and may be of any desired cross-section and configuration. On or immediately above the tie *a* at one side are placed the end portions of two adjoining rails *b*, between the ends of which a space 1 is left, as indicated by broken lines in Fig. 1. On the other side of the tie *a* is placed the body portion of a rail *c*, a space 2 being preferably left between the base of the rails *b c* and the tie, as hereinafter more particularly referred to. The tie *a* is preferably formed for its entire width on the inside of the rails *b* and *c*, respectively, with a lug *d*, which is integral with the body of the tie *a* and overhangs the inside flange 3 of the rails *b* and *c*, so as to leave a space 4 between the under side of the lug *d* and the flange 3, as shown. The tie *a* is preferably formed on the outside of the rails *b* and *c*, respectively, with a lug *e*, which is integral with the body of the tie *a* and located opposite to the outside flange 5 of the rails *b* and *c* and to the adjacent lower portion of the web 6 at a suitable distance therefrom, the face of the lug *e* being preferably inclined upward from its junction with the tie *a* toward the web 6, so as to form a space 7 between the said face and the web 6 and flange 5 of the rails *b* and *c*. By this construction of the lugs *d* and *e* the rails *b* and *c* are readily placed and adjusted to their proper position onto (or immediately above) the tie *a* between the lugs *d* and *e*, and when in this position they are welded to the tie *a* (and in the case of the rails *b* to each other at the ends) by any suitable process, such as that known as the "thermit" process, which consists in cleaning the surfaces to be united, placing the pieces at a suitable distance apart, forming a suitable mold about the same, igniting a mixture of a metal compound and aluminium, removing the alumina resulting from the reaction taking place, and casting the highly-heated metal between the joint-surfaces, which fuses and incorporates the metal of the rails *b* and *c* and the tie *a* at and adjacent to their joint-surfaces with the welding metal and with each other, and thereby renders the whole integral, the welding metal filling the space 1 between the ends of the rails *b* and the spaces 2, 4, and 7 between the rails *b* and *c* and the tie *a*, respectively, the metal within the spaces 7 forming lateral bracing to the rails *b* and *c*.

If desired, the lugs *d* and *e* may be dispensed with and the rails *b* and *c* welded directly to the tie *a* by the welding metal, which fills the spaces 2 between the base of the rails *b c* and the tie *a*, or when the lugs *d* and *e* are used the spaces 2 may be dispensed with and the rails *b c* supported directly on the tie *a* and welded to the lugs *d* and *e*.

By this invention the rails are rigidly secured to the ties without fastenings, and thereby held in constant alinement and gage.

I do not claim the particular method above described of welding the rails to each other and to the metallic ties, as the welding may be

effected by any well-known process for welding metal pieces together; but

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of two opposite series of rails supported and held in parallel alinement to each other by a series of metallic ties, the rails of each series being welded to each other and to the said ties, and forming with the said ties an integral railroad-track, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CLARENCE H. HOWARD.

Witnesses:

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EDWARD W. FURRELL.