E. W. BOYLE.

RAILROAD RAIL JOINT.

APPLICATION FILED JULY 28, 1911.

1,012,510.

Patented Dec. 19, 1911.

2 SHEETS—SHEET 1.

Fig. 1

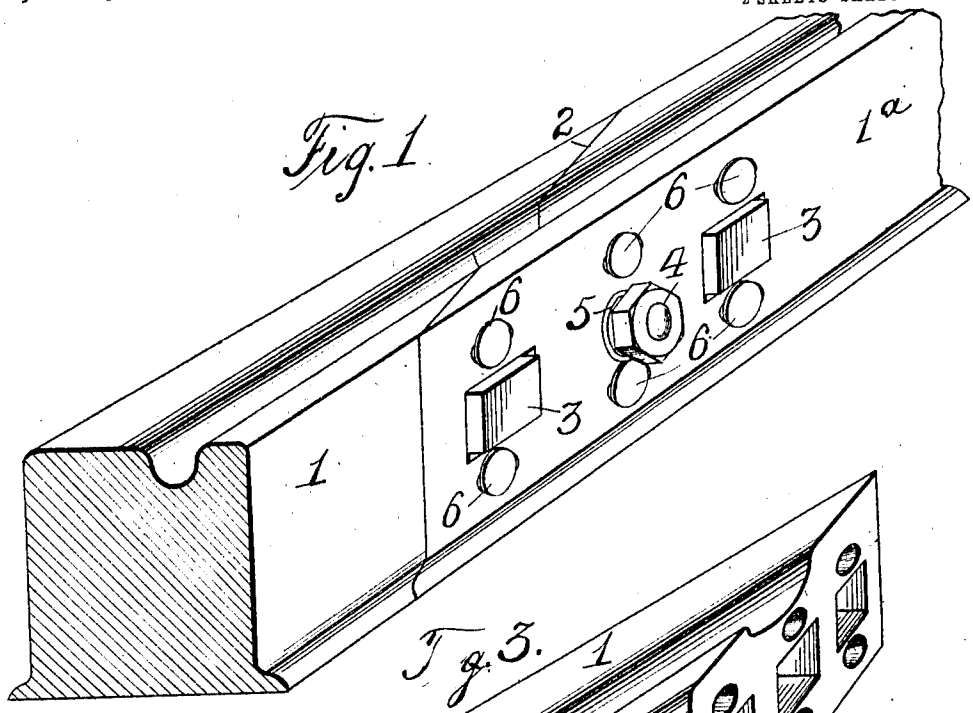

Fig. 3.

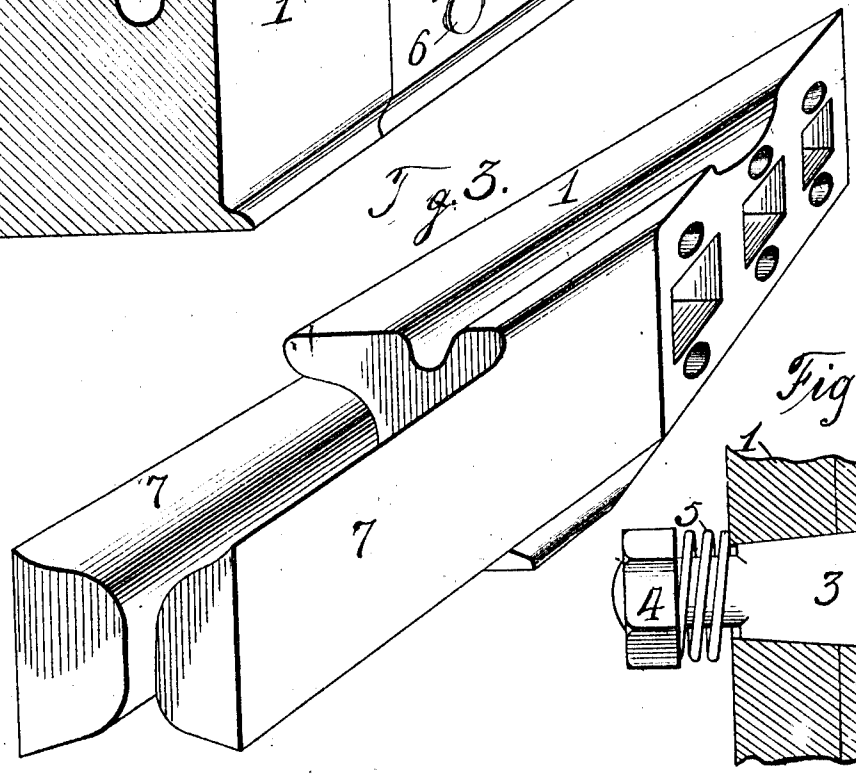

Fig 2a

WITNESSES:

E. F. Boyle

J. M. Wyckoff.

INVENTOR

BY Edgar W. Boyle

Knight Bros

Attorneys

E. W. BOYLE.

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2 SHEETS—SHEET 2.

Fig. 4.

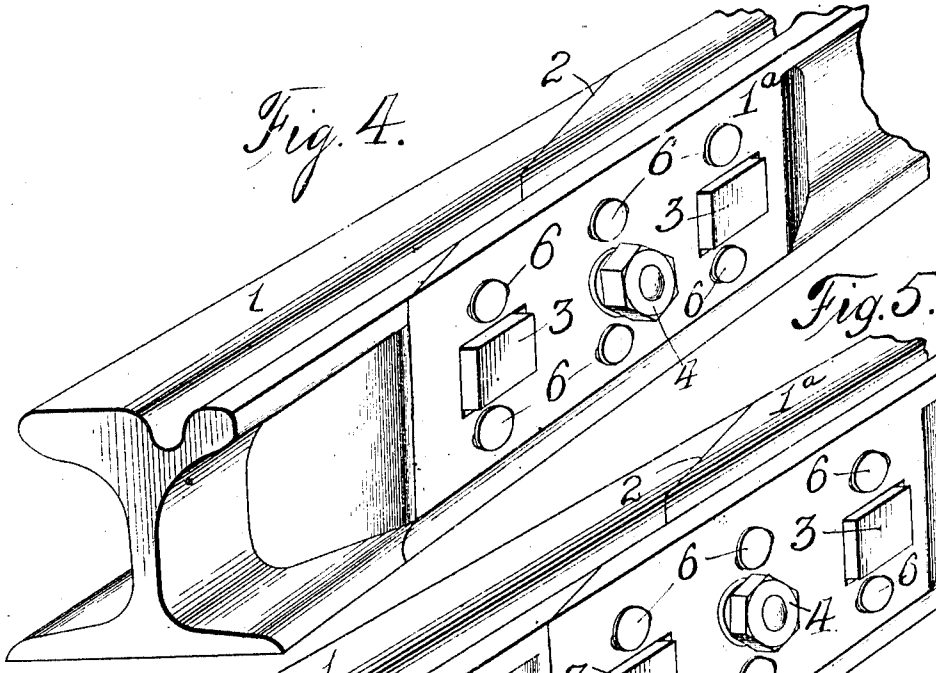

Fig. 5.

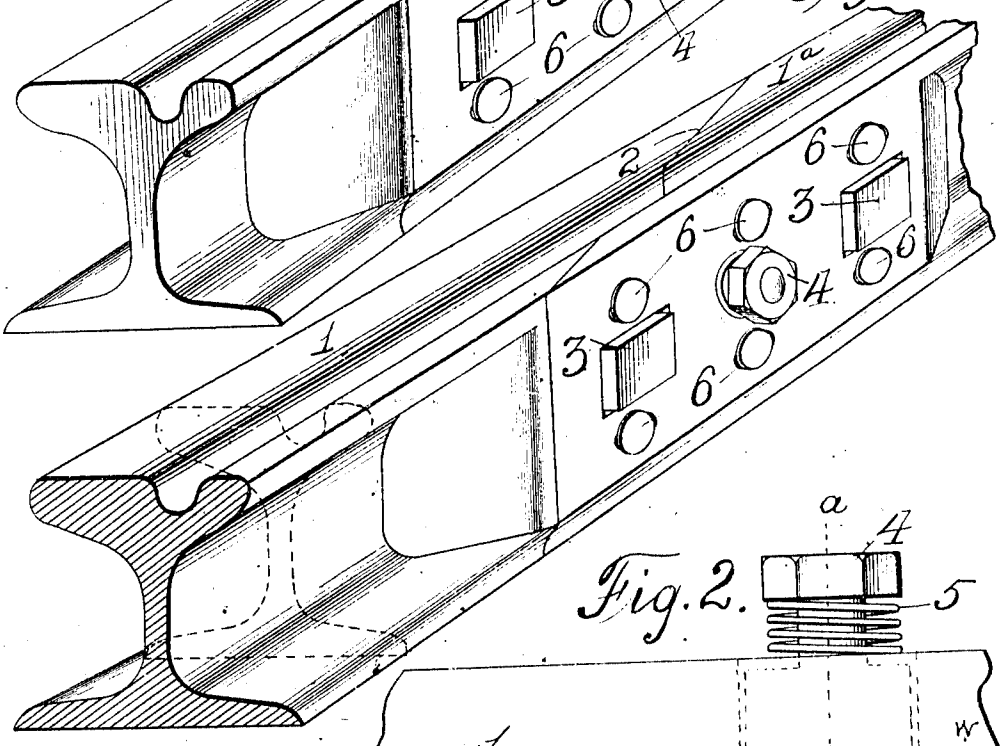

Fig. 2.

WITNESSES.

W. F. Kayle.

J. M. Wynkoop.

INVENTOR

Edgar W. Boyle

BY

Knight Bros

Attorneys

UNITED STATES PATENT OFFICE.

EDGAR W. BOYLE, OF WASHINGTON, DISTRICT OF COLUMBIA.

RAILROAD-RAIL JOINT.

1,012,510. Specification of Letters Patent. Patented Dec. 19, 1911.

Application filed July 28, 1911. Serial No. 641,022.

To all whom it may concern:

Be it known that I, EDGAR W. BOYLE, a citizen of the United States, residing at 1308 Sixth street northwest, in the city of Washington, District of Columbia, have invented certain new and useful Improvements in Railroad-Rail Joints, of which the following is a specification.

This invention relates to means for connecting adjacent ends of railroad rails, and has for its object to provide a joint by which the ends integral with the rails will be supported one upon the other in the vertical direction without the use of fish plates; also a joint which will have the dividing plane between the abutting ends so disposed as to enable the car wheel, before leaving one rail, to find support upon the next rail, whereby hammering and the unavoidable objections incident thereto are completely eliminated; also a grooved or channeled rail in which the splice formed by the vertical bevel faces crosses the different supporting and guiding surfaces, in different transverse planes.

A further object is to provide a construction in which the vertical support of the ends of the rails, upon each other is kept tight at all times nothwithstanding vibration and wear.

A further object is to adapt the invention to be applied to and become an integral part of rolled railroad rails of standard design.

The invention will be fully understood upon reference to the accompanying drawings, in which,

Figure 1 is a perspective view of a solid block railroad joint, embodying several features of my invention; Fig. 2 is a plan view of the same; Fig. 2ª is a section on the line *a*—*a*, Fig. 2; Fig. 3 is a perspective view of an end block together with one of several means for permanently uniting it to the end of a standard railroad rail; Fig. 4 is a perspective view showing the splicing-block ends formed for autogenous welding to the ends of the standard rails; and Fig. 5 is a similar view showing a portion of the standard rail welded to the splicing-block; the welding plane being indicated by dotted lines.

The purpose of the invention is primarily to secure, in a manner which will be practicable from the standpoint of service and permissible manufacture, a bevel splice joint for railroad rails. To these ends the invention consists in providing a pair of blocks 1, 1ª, having abutting faces in a plane at an acute angle to the longitudinal direction of the rail, forming a bevel splice 2, so that, as will be seen from Fig. 2, the dividing line assumes such relation to the direction of travel that the tread of the wheel, before leaving one rail, will have already obtained vertical support upon the next rail. This will be obvious from the fact that the line of separation is at an acute angle to the theoretical transverse line *w*, *x*, of bearing of the cylindrical surface of the wheel upon the flat surface of the track. This result can be further insured, if desired, in the grooved type of rail selected for illustrating the invention, by affording a bearing for the flange of the wheel at the joint, as is done in railroad crossings. In this bearing, the flange would encounter the taper splice joint at a point such as *y* (Fig. 2), whereas the wheel tread would encounter the joint at the line *w*, *x*.

To support the rails vertically one upon another, a series of keys 3 are introduced through the spliced ends; these keys being tapered on their upper and lower faces so that they can be drawn into intimate bearing against correspondingly tapered upper and lower faces of the key-ways formed in the blocks to receive them. Each key may have upon its smaller end a nut 4 for the purpose of drawing it to its seat and this nut may exert pull upon the key through the medium of a spring 5 normally under such tension as to exert a constant pull upon the wedge key, so as to take up all wear and remain constantly seated notwithstanding vibration. The keys 3 will fit the key-ways loosely in the longitudinal direction of the rails in order to permit such relative movement between the spliced ends as may be necessary to compensate for expansion and contraction under changes in temperature. The coefficient of expansion of the metal of which the railroad rails are constructed is such that with the sharp angle of the taper splice, no material offset will occur at the sharp end of the splice. The end can very readily be cut away sufficiently to avoid any offset due to expansion of the rails and if some slight offset should occur, it would be in such position as to encounter the curved fillet of the wheel where the flange joins the tread and it would be without objectionable result. The spliced ends are

firmly tied together by bolts 6 of usual construction, located at such points as may be convenient relatively to the wedges.

Several methods may be employed for integrally uniting standard types of railroad rails with splice blocks in accordance with my invention. Two methods are shown herein. According to the method illustrated in Fig. 3, each splice block, formed of cast steel malleableized or forged as may be desired, is provided with a pair of welding arms 7, integral with the block, and extending in such position as to lie in the opposite hollow faces of the rail, where they can be permanently welded to the rail after the latter is rolled and dressed. According to the method suggested in Figs. 4 and 5, the block itself is reduced near its end so as to provide a section conforming exactly to the section of the rail to be united (see Fig. 4) after which the block is united to the rail by autogenous electric welding as suggested in Fig. 5, where the plane of welding is indicated by dotted lines.

In any case, the economy of my new method of uniting rails will be apparent, inasmuch as there is a total saving of the cost of fish plates; the length of each pair of splicing blocks is added to the length of the rail so that in a given number of joints, a proportionate number of railroad rails will be saved; and the cost of maintenance will be reduced by the permanency of the joint, to such an extent that it alone will more than save the cost of the joint.

I claim:—

1. Railroad rails having grooved or channeled bearing heads and taper splicing blocks integrally united therewith, forming continuations of the bearing surfaces of the rails and also constructed with channels or grooves in continuation of the channels or grooves of the rails; the splice joint extending entirely through the said blocks, whereby the different surfaces of the bearing portion of the rail are intersected in different transverse planes.

2. In a taper splice joint for railroad rails, the combination of the rails, the taper splice blocks integrally united with the rails and forming continuations of the bearing and supporting portions of said rails; said blocks being fitted together by a taper splice joint and having transverse key-ways extending through the same with vertically supporting keys fitting said key-ways; the upper and lower surfaces of the keys and key-ways converging to provide a wedging fit and resilient means being provided to draw the keys to a constant seat in the key-ways to maintain a tight joint notwithstanding vibration and wear.

3. In a railroad rail joint, the combination of railroad rails and splice blocks permanently welded to the ends of the rails and constructed to be united by a taper splice joint.

4. In a taper splice joint for railroad rails, the combination with the rails and taper splice blocks having integral welding arms embracing the rails and permanently welded thereto.

The foregoing specification signed at Washington, D. C., this 21 day of July, 1911.

EDGAR W. BOYLE.

In presence of—
HERVEY S. KNIGHT,
EDWIN S. CLARKSON.