(No Model.)

G. BOUSCAREN.

RAILWAY RAIL JOINT.

No. 476,241. Patented June 7, 1892.

Fig. 1.

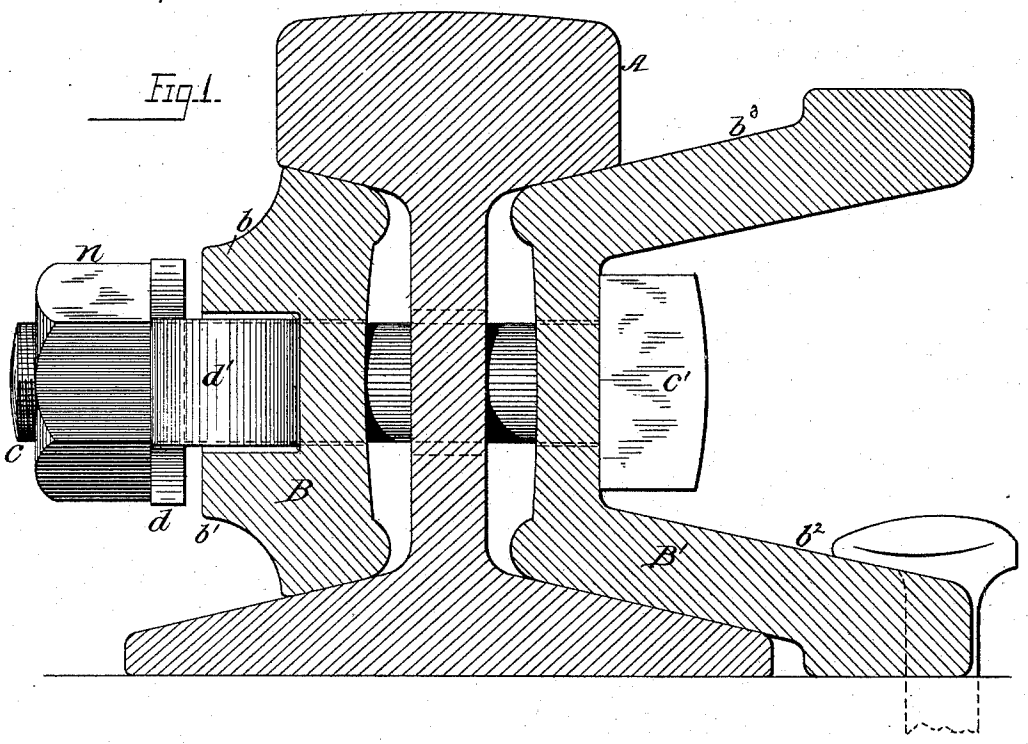


Fig. 2.

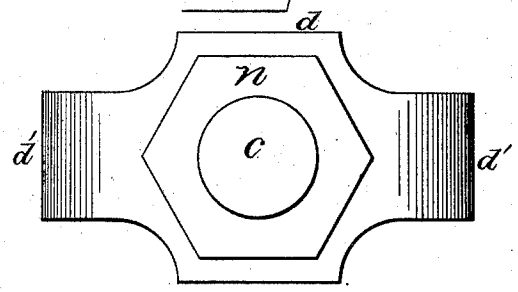
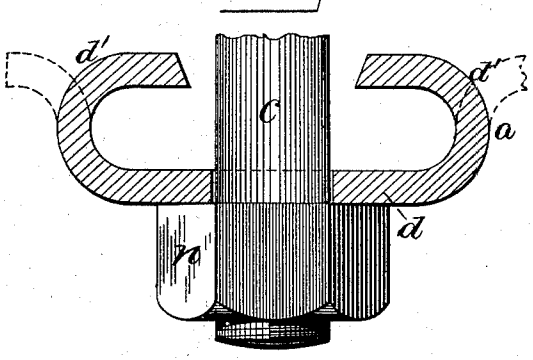


Fig. 3.



Witnesses:
W. C. Jirdinston.
L. C. Hosea.

Inventor:
Gustave Bouscaren
by R. W. Hosea
Attorney

UNITED STATES PATENT OFFICE.

GUSTAVE BOUSCAREN, OF CINCINNATI, OHIO.

RAILWAY-RAIL JOINT.

SPECIFICATION forming part of Letters Patent No. 476,241, dated June 7, 1892.

Application filed November 27, 1891. Serial No. 413,195. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVE BOUSCAREN, a citizen of the United States, residing at Cincinnati, Ohio, have invented new and useful Improvements in Railway-Rail Joints, of which the following is a specification.

My invention relates to railway-rail joints, its object being to produce a simple, cheap, and effective joint of superior strength and stiffness and which shall be durable under the stresses caused by the increasing weight and speed of railway-trains.

In the class of joints to which my improvements are applied two splicing-bars are used overlapping the abutted ends of contiguous rails, usually fitted between the head and base of the rails and bolted together laterally through the rail-web. The passage of every car-wheel over a joint causes a vertical bending strain in the splice-bars, due to the weight carried by the wheel, and a horizontal bending strain, due to the lateral motion of the wheel and the impact of its flange against the inner side of the rail-head. The function of the splice is therefore twofold—namely, to resist both the vertical and the lateral stress with the least amount of deflection in either direction. In the most approved joints of this character in use the splice-bars are angle-shaped in cross-section, but are defective in strength and rigidity, as shown by their frequent breakage, the breaks occurring almost invariably through one of the bolt-holes nearest the rail ends. This weakness is commonly caused by the shallow depth of the splice-bars, by the unfavorable disposition of the metal to resist bending stresses, and by the location of the bolt-holes through a strained part of the bars more or less removed from the neutral axis. Another source of weakness lies in the fact that, with the forms of washers commonly in use under the nuts of the bolts, it is impracticable to maintain a firm and permanent bearing of the splice-bars against the under surface of the head and the upper surface of the base of the rails, the bars becoming loose by the wearing of these bearing-surfaces, thereby increasing very greatly the effect of impact.

I avoid the difficulties mentioned by employing splice-bars as deep as consistent with the clearance of the flange and tread of the wheels; and my invention consists in the channel form of cross-section of the bars, whereby the distribution of metal in the flanges of the bars is as far as possible removed from the neutral axis and thereby conducive to the greatest resistance; in giving the bars a symmetrical cross-section, whereby the bolt-holes are located on the neutral axis and their weakening effect reduced to a minimum; in the use of a non-rotatable spring-washer of great power under the nut of each bolt, whose function is to maintain at all times a perfect bearing between the rails and splice-bars, and in providing for the non-rotation of the bolts, thereby assisting to preserve the proper relation of parts. The combination of all these features gives a joint of great strength and durability under both vertical and lateral stresses, which can be cheaply manufactured and easily maintained in the track.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a cross-sectional elevation of the rail-joint complete; Fig. 2, a plan, and Fig. 3 a longitudinal section, of the spring-washer detached.

Referring now to the drawings, A designates the rail; B B′, the splice-bars; *c*, one of the holding-bolts, and *d* the spring-washer. The rail is of the ordinary T-pattern now commonly used on the railways of this country, and the joint is made with the bars B B′ overlapping the ends of two contiguous rails fitted as a wedge between the head and foot of the rails at opposite sides and secured by a series of cross-bolts *c* in the usual manner.

The inner splice-bar B is rolled with a longitudinal channel at one side a trifle wider than the diameter of the cross-bolts *c*, and the bolt-holes are formed through the bottom of this channel. The flanges *b b′* of the bar are somewhat projected to give depth to the channel, for a reason to be explained in connection with the spring-washer, and also to add to the strength and stiffness. As the upper flange is necessarily limited in form and dimension by the clearance required by the flanges of car-wheels, the lower one is correspondingly formed in order to preserve a symmetrical disposition of metal with reference to the neutral axis.

The outside splice-bar B′ has its lower flange

b^2 extended to cover the base of the rail and is preferably turned down to a bearing upon the upper surface of the cross-ties to which it is spiked through notches to prevent "crawling" of the rails, and the upper flange b^3 is correspondingly extended upward and outward, both flanges being carried as far as possible from the neutral axis to the limit of clearance for worn car-wheels at the upper side and to the surface of cross-ties at the lower side in symmetrical proportions. There is thus formed a splice-bar in which the metal is disposed most favorably to secure the utmost resisting strength, the greatest bulk of metal being as far removed from the neutral axis as the conditions admit and arranged in symmetrical relations therewith. The bolt-holes pierce the vertical web of the bar between its flanges on its neutral axis, and the space between the flanges forms a channel to receive the squared head of the bolt, thus preventing rotation.

The spring-washer d employed with the bolt is preferably formed of steel and provided with two diametrically-opposite extensions or "tangs" d' d', corresponding in width with the width of the channel of the bar B. These tangs are bent over, as shown in Fig. 3, (or as indicated by the dotted lines in said figure,) and when applied the tangs enter the channel resting against its bottom, so as to hold the washer proper outward beyond the outer edge of the flanges b b'. The tangs d' thus bent and applied constitute springs to hold the washer outward against the nut, and have also the function of lugs to prevent rotation of the washer by engaging the sides of the channel. It may now also be explained that the length of the tangs d' and their radius of curvature bear such relation to the depth of the channel in the bar B as that when the nut n is screwed down, forcing the washer d to a bearing against the flanges b b', the said flanges form a stop or abutment, protecting the spring-tangs from breakage or injury by over-compression, thus preserving their life indefinitely. The nuts are to be screwed up from time to time as the washers recede from their bearing contacts by reason of the wear between the rail and the splice-bars.

In Fig. 1 the washer d is shown at its outward position, and the space of its travel thence to its bearing indicates the compression given the spring by the screw of the nut.

An incidental advantage of the symmetrical form of the splice-bars is the greater ease of rolling and consequent cheapness, which is a most important item, since so vast a number of joints is required in a railway of any length.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. In a railway-rail joint, in combination with a channeled splice-bar, a spring-washer consisting of a centrally-perforated plate having spring extensions of reduced width bent under in U form at opposite sides, said plate adapted to seat when compressed by its bolt-nut against the projecting flanges of the splice-bar and its spring extensions to enter the channel between said flanges and bear against the bottom of the channel, substantially as set forth.

2. In a railway-joint, the combination of a channeled splice-bar, a bolt passing through the channel of the same, and a washer for the bolt seating, when ultimately compressed, against the flanges of the splice-bar and having curved spring extensions at opposite sides seating in the channel of the bar, substantially as and for the purpose set forth.

3. The improved joint for railway-rails, embodying, in combination with the rails, a symmetrically-channeled inner splice-bar having channel margins extended to the limit of clearance of wheel-flanges, an outer symmetrical channeled splice-bar having flanges extended considerably outward to the limit of wheel-clearance above and correspondingly below, each splice-bar being pierced for bolt-holes through its channel on its neutral axis, retaining-bolts having heads seated non-rotatably between the flanges of the outer bar, washers seating against the flanges of the inner bar and provided with spring extensions seating in the channel of the same and retaining and preventing rotation of the washer, and retaining-nuts upon the bolts, compressing the washers in opposition to the resiliency of their springs against the channel margins of the inner splice-bar, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GUSTAVE BOUSCAREN.

Witnesses:
L. M. HOSEA,
E. HOSEA.