J. M. BUCKLIN.

Fastening for Railroad Rail Joint.

No. 201,647. Patented March 26, 1878.

Fig. 1.

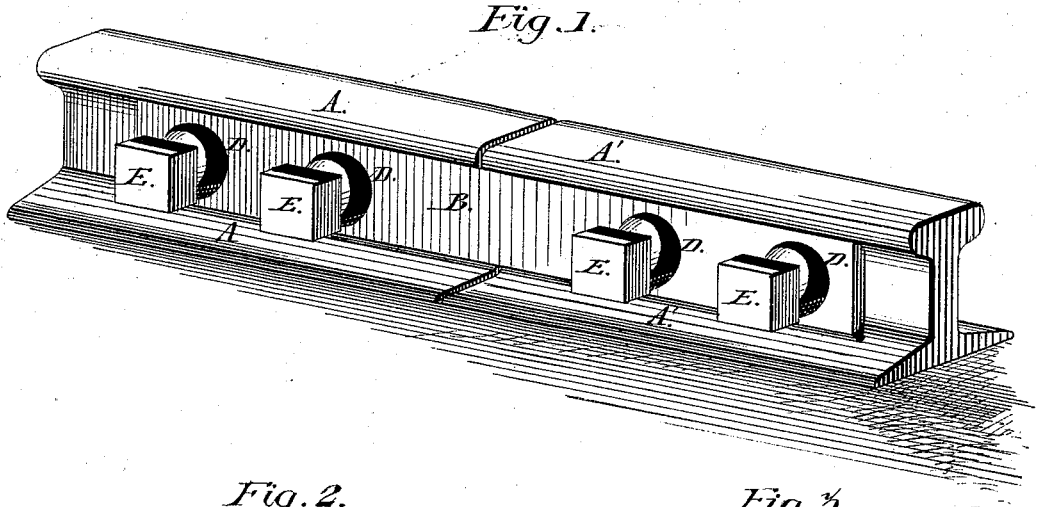


Fig. 2.

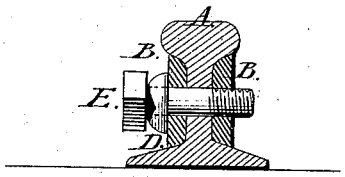
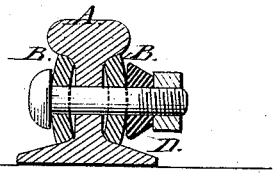


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

JAMES M. BUCKLIN, OF KNIGHTSVILLE, ASSIGNOR OF ONE-HALF HIS RIGHT TO ENSIGN BENNETT, OF MICHIGAN CITY, INDIANA.

IMPROVEMENT IN FASTENINGS FOR RAILROAD-RAIL JOINTS.

Specification forming part of Letters Patent No. **201,647**, dated March 26, 1878; application filed December 10, 1877.

To all whom it may concern:

Be it known that I, JAMES MAGEE BUCKLIN, of Knightsville, in the county of Clay and State of Indiana, have invented certain new and useful Improvements in Fastenings for Railway-Rail Joints; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention has relation to an improved fastening for railway-rail joints, whereby the several connecting parts are held securely in their proper positions, and the expansion and contraction of the transverse bolts holding the same compensated for by the interposition of a reciprocating collar between the heads of the bolts, or the square nuts upon the ends of the same, and the outer face of the fish-plate, all as will be hereinafter more fully described, and pointed out in the claims.

Referring to the drawings, Figure 1 represents a perspective view of a railway-rail joint embodying my improvements. Figs. 2 and 3 are transverse sections.

Similar letters of reference occurring on the several figures indicate corresponding parts.

It may be observed that, by careful observation as to the causes which lead to the loosening of nuts upon the bolts of railway-rail fastenings, and the consequent displacement of parts, it has been amply demonstrated that such causes are not due so much to the jarring occasioned by the transit of trains as to the effects of expansion and contraction induced by sudden changes of the atmosphere acting upon said bolts, and which tends to loosen and displace the nuts upon the same.

The object of my invention, therefore, is to provide an improved means for counteracting the effects of such expansion and contraction, and whereby the several parts forming the rail-fastenings are held securely in position during the various changes of temperature.

In the drawings, A A′ represent the connected ends of two rails, which are preferably provided with a fish-plate, B, which is rolled out flat, so as to lie flush with the side of the rail, and having tapering edges to conform to the inclined sides of the neck and base of the rail, as shown in Figs. 1 and 2.

The object in using the flat fish-plate in preference to the curved fish-plate commonly used, and as shown in Fig. 3, is to dispense with the use of long bolts, and thereby diminish the expansion and contraction, and also to prevent the formation of a receptacle between the fish-plate and the rail for the lodgment of water or soft snow, which, in extreme depressions of temperature, form suddenly into solid ice with force sufficient to burst asunder the strongest fastenings.

E represents the square-headed bolts, which pass through the opening of the fish-plate on one side, and then through the rail, the terminal screw of said bolt engaging with corresponding female screws cut in the opposite fish-plate, as shown in Fig. 2, to hold the parts together, thereby obviating the necessity of nuts upon the ends of the bolts, as commonly used.

Upon the bolt, and between the square head of the same and the side of the fish-plate, is arranged a collar, D, which is made of an alloy of equal parts of zinc and lead, or a larger proportion of the zinc, or of zinc alone, so as to produce a collar the contraction of which corresponds with the contraction of the bolt.

From the results of experiments carefully conducted it appears that cast-zinc expands in length one inch in every three hundred and thirty-six inches, lead one inch in three hundred and fifty, and iron one inch in eight hundred and forty-six, from the freezing-point up to 212°, the expansion in bulk being geometrically equivalent to the expansion in length. The length of the transverse bolts now in general use, (shown in Fig. 3,) exclusive of the heads, is about three and one-half inches; but the ratio of expansion affects adversely only about three inches of this length, and from that three inches should be deducted the space of two inches for the thickness of the two fish-plates and the neck of the rail, the expansion of which is equal to the expansion of that length of the bolt, leaving only one and a half inch, which expands effectively and according to the

same table of expansions. As zinc expands one inch in every three hundred and thirty-six inches, it naturally follows that a collar of zinc nearly two-thirds of an inch in thickness is required to counteract the expansion of the bolts from 32° to 212°, and to maintain the tension of the same without straining the threads of the screws. By the same computation for the shorter bolts, as shown in Fig. 2, a zinc collar of one-half inch in thickness is sufficient to counteract the effect of excessive contraction. This application of the zinc collar for the purpose of obviating the effects of expansion and contraction, the latter especially, is made without necessitating any change of construction, and is an improvement not only in utility, but in point of economy, for the excess in the ratio of contraction of the zinc collar prevents undue strain upon the threads of the nuts, and consequently but one nut on each bolt is required, instead of two, as now generally used. But the simplest and most economical form of fastening is that in which I use the short square-headed bolt, the terminal screw of which engages with the female screw in the fish-plate on the opposite side of the rail, as already described, thereby doing away entirely with the use of nuts.

The zinc collar has the effect, in use, to prevent the oxidation of the bolts and nuts.

Having thus described my invention, what I claim as new and useful is—

1. The combination of the zinc or composition collar D with the square-headed bolts E, fish-plates B, and rails A A′, substantially as and for the purpose specified.

2. The zinc or composition collar D, in combination with transverse bolts constructed of a material capable of expanding proportionately with the said collar, substantially as and for the purpose specified.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

JAMES MAGEE BUCKLIN.

Witnesses:

GEO. W. STARR,

MAURICE MARKLE.