

T. V. ALLIS.
Railroad Rail-Joints.

No. 137,587.

Patented April 8, 1873.

Fig. 1

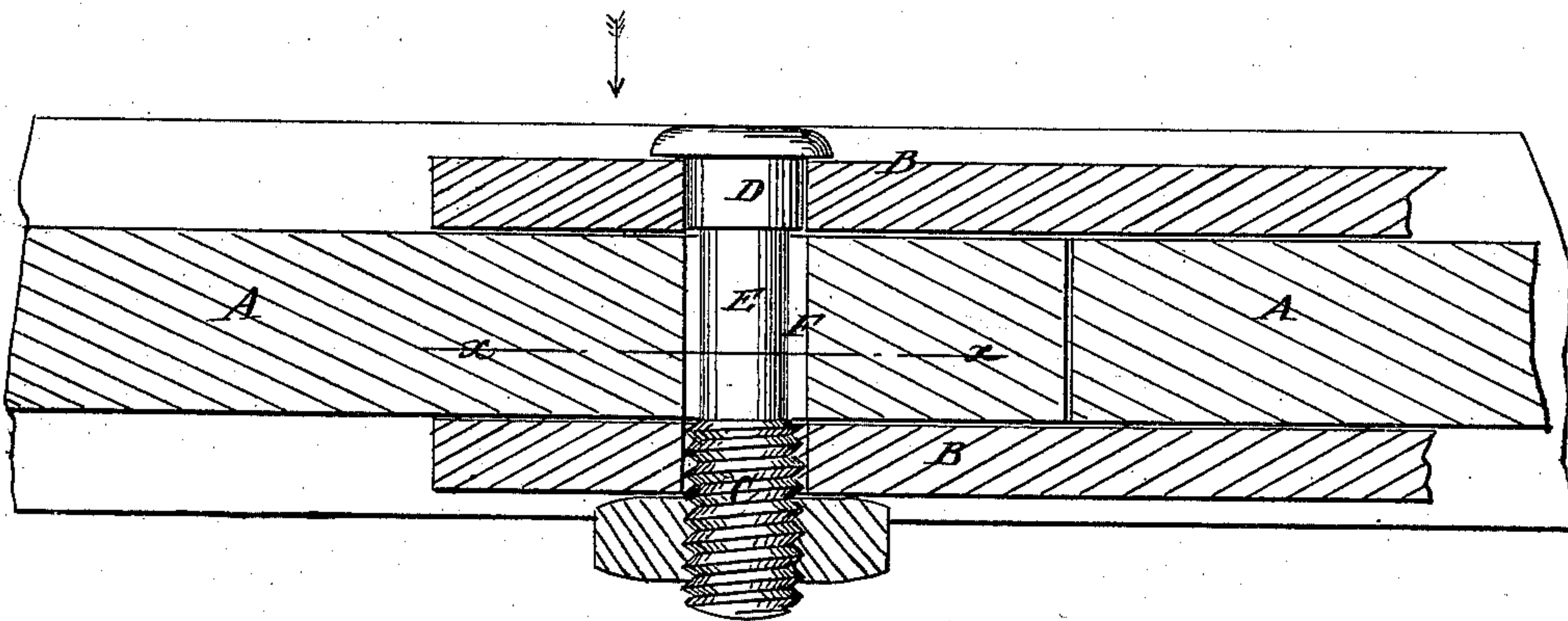
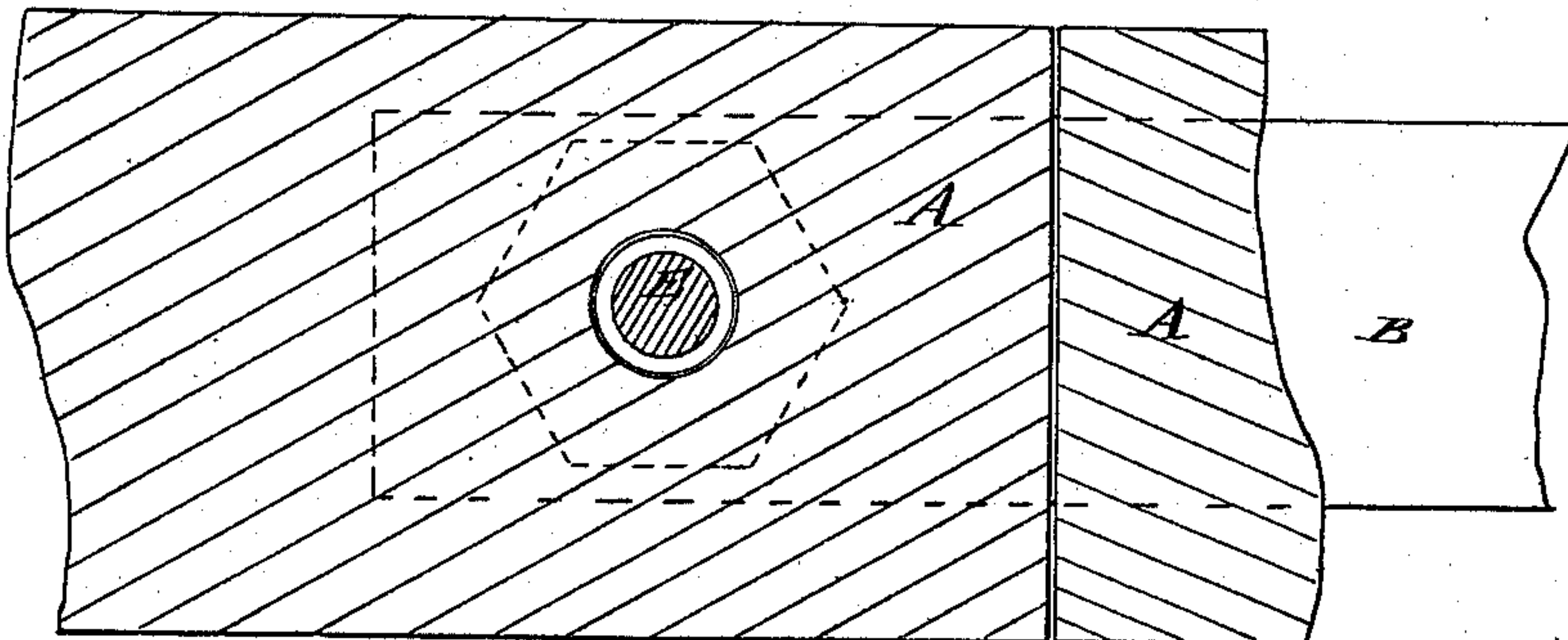


Fig. 2



Witnesses:

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UNITED STATES PATENT OFFICE.

THOMAS V. ALLIS, OF NEW YORK, N. Y.

IMPROVEMENT IN RAILROAD-RAIL JOINTS.

Specification forming part of Letters Patent No. **137,587**, dated April 8, 1873; application filed February 21, 1873.

To all whom it may concern:

Be it known that I, THOMAS V. ALLIS, of the city, county, and State of New York, have invented a new and useful Improvement in Railway-Rail Joints, of which the following is a specification:

Steel rails are so liable to fracture by punching that it has been found necessary to make the holes for the bolts of fish-joints by boring, so that the hole made is necessarily round, and as there must be provision for the endwise motion of the rail along the bolt caused by expansion and contraction, the hole is of necessity made much larger than the bolt, so that it weakens the rail in its cross-section to a very considerable extent, and more than it would be weakened if, as in iron rails, oblong holes having no greater diameter crosswise of the rail than the bolt could be punched; therefore it is of great importance to contrive how to lessen the size of the holes and yet preserve the necessary strength in the bolts, which is the object of my invention, and which I propose to do by making the holes just the size of the ordinary bolt, and then reducing the bolt in size in the part which is in the bolt-hole of the rail when the joint is completed as much as the depth of the screw-threaded part, making it by so much smaller than the hole, and thus providing for the expansion and contraction, and yet not lessening the strength, of the bolt, because it is still stronger, or at least as strong, in this reduced part as it is in the threaded part, owing to the deep angular grooves therein, which it is necessary to have, but which make that the weakest part of the ordinary bolt, so that the non-threaded part has greater strength than is available, and consequently greater size than there is any need of; so that by reducing this part till it has about the same measure of strength that the threaded part has I can lessen the bolt-hole in the rail by the same measure and have the same strength in the bolt that I would otherwise have, and thus gain the necessary difference between the sizes of the hole and the bolt, to provide for the endwise motion with a much smaller hole.

Figure 1 is a horizontal section of a railway joint constructed according to my improve-

ment, and Fig. 2 is a horizontal section taken on the line *x x* of Fig. 1.

Similar letters of reference indicate corresponding parts.

A represents the rails; B, the fish-plates; C, the threaded portion of the bolt; D, a portion of the shank next to the head, which is of the same size as said threaded part. E is the part between said parts C and D, which is reduced to the size calculated to have the same strength as the threaded part, which, in practice, will, I think, be found a little smaller than the diameter between the bottoms of the threads, for the sharp angles at the bottoms of the grooves favor breaking more than a smooth surface does. F is the hole in the rail for the bolt, which is just large enough to allow the screw-threaded part to pass through. The part D of the shank not reduced is that which is in one of the fish-plates, and is left large enough to fill this hole, which must also be large enough to pass the screw-threaded part through; but this is not material, as the bolt may be reduced throughout the length from the screw-threads to the head.

While I have described and represented my invention as an improvement in rail-joints, I do not mean to limit myself to this particular application of it, because it is useful also in the construction of bridges, buildings, and other structures where steel bars or rails are to be connected so that allowance must be made for expansion and contraction; also, when iron bars or rails are used in which it is preferred to bore the holes instead of punching them.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

In a rail or other joint in which the rails or bars are subject to expansion and contraction, the holes for the joint-bolts formed of the same size in the crosswise direction of the rails or bars as the threaded portion of the bolts, and said bolts made as much smaller in the parts which are in said holes as the depth of the grooves of the thread, or thereabout, substantially as specified.

THOMAS V. ALLIS.

Witnesses:

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ALEX. F. ROBERTS.