

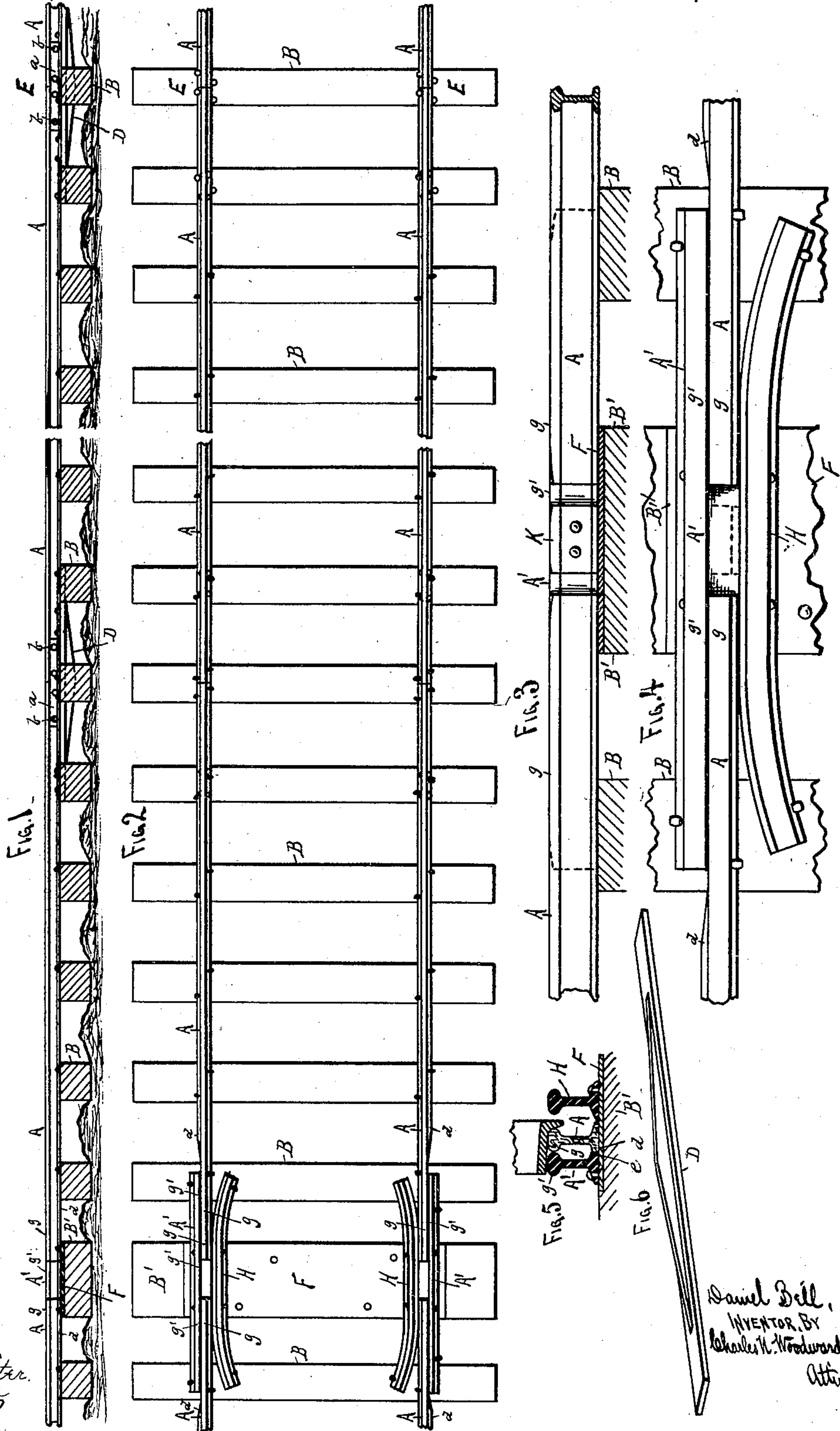
(No Model.)

D. BELL.
RAILWAY CONSTRUCTION.

No. 372,108.

Patented Oct. 25, 1887.

WITNESSES.
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UNITED STATES PATENT OFFICE.

DANIEL BELL, OF ST. PAUL, MINNESOTA.

RAILWAY CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 372,108, dated October 25, 1887.

Application filed December 22, 1886. Serial No. 222,328. (No model.)

To all whom it may concern:

Be it known that I, DANIEL BELL, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Railway Construction, of which the following is a specification.

This invention relates to railway construction; and it consists in the manner of arranging the joints between the rails, whereby the open expansion spaces between the ends of the rails are avoided and a continuous rail provided, so that all "pounding" and "jumping" of the rolling-stock over the open joints when the rails are contracted by cold weather is avoided, and a large amount of wear and tear prevented, as hereinafter shown.

In the drawings, Figure 1 is a sectional side view of a portion of a railway-track with my improvement arranged thereon. Fig. 2 is a plan view of Fig. 1. Fig. 3 is an enlarged view of a portion of the expansion-joint, illustrating more fully its construction. Fig. 4 is a plan view of Fig. 3. Fig. 5 is a cross-sectional view. Fig. 6 is a perspective view, inverted, of one of the tie-plates used to assist in securing the joints of the rails.

In laying railway-tracks the expansion and contraction of the metal of the rails is an important factor that must be considered; hence when the track is laid in hot weather, the rails being expanded to about the greatest extent to which they will ever be expanded, the ends of the rails are laid comparatively close together, whereas if the tracks are laid in cold weather, when the rails are contracted, the ends must be placed some distance apart, (about one-fourth or three-eighths of an inch,) so that when the rails are expanded by the heat of the warm weather they will expand into these spaces and will not crowd against each other and cause the rails to be forced out of place. This expansion and contraction amounts to about fifty-two inches in each mile of railroad, and as there are about one hundred and sixty rails in each mile of track, each wheel must in cold weather "jump" an open space between each rail that number of times in traveling each mile. This is a very serious consideration in the operation of railways, and is the cause of many accidents by the tendency of

this constant pounding to displace or break the rails and wheels.

The object of my invention is to avoid the necessity for leaving the open spaces between the ends of the rails for expansion and contraction, which I accomplish by uniting the ends of the rails firmly and closely together, except at long intervals, and arranging at these long intervals closed expansion-joints, which leaves the rails free to expand and contract, but without forming openings between the ends of the rails.

If the road-bed of the railway has no short curves or abrupt grades, the expansion-joints may be placed at much longer intervals than where the reverse is the fact, the distance between the expansion-joints varying from one thousand feet to one or more miles, according to the lay of the road-bed. At a point midway between each of the expansion-joints the rails A will be firmly secured to the ties B, so that they cannot be moved in either direction. All the joints between the rails A except the expansion-joints will be "fixed" joints, with the ends of the rails, butting tightly against each other, and firmly held in that position. Any suitable method may be employed to thus secure the ends of the rails together; but for the purpose of illustration I have shown the ordinary "fish-plate," a, with the bolts or rivets b, without slots, so that there can be no movement of the joint. I have also shown the fish-plates supplemented by a plate, D, beneath the joint and resting across two or more ties B, and with the ends of the rails A bolted or otherwise firmly fastened thereto, the object desired being to rigidly and firmly secure the ends of the rails together, so that no opening will ever occur between them under any circumstances.

If the rails be laid in cold weather, or when the rails are contracted, the intervals between the ends of the rails at the expansion-joints must be equal to the amount of the expansion of the rails between the expansion-joints and the two nearest fixed points, so that when the rails are expanded in warm weather the ends at the expansion-joints will not come in contact and force the rails out of place.

If the rails are laid in hot weather, or when they are expanded, the ends of the rails at the

expansion-joints will be placed comparatively close together, and when the rails are laid in a medium temperature the amount of expansion must be considered and the intervals between the ends arranged accordingly, this interval of space for contraction and expansion being well understood by track-masters and others who are familiar with the construction of railways.

10 Alongside of the ends of the rails A, at the expansion-joints, shorter sections of rails, A', will be placed to cover the openings between the ends of the rails and form "bridges" to support the wheels and prevent them from dropping into the gap between the rails. This bridging-piece A' may be made of a section of a rail, or of a specially-formed piece; but preferably a section of a rail will be employed, as in the drawings.

20 The edge of the lower flange, *d*, of the rails A will be cut off for a short distance, and a portion of the lower flange, *e*, of the bridging-rail A' will likewise be cut off, so that the adjacent edges of the heads *g g'* of the rails A and the rail A' may be set in close contact to insure the treads of the wheels riding thereon, the treads being amply wide to allow this effect being produced.

30 The ends of the rails A and A' will be tapered on their upper surfaces for a short distance back from their ends, so that the wheels will ride them easily, and not be in danger of jumping at these points.

35 At frogs, crossings, and switches the rails A will be fastened, as at E in Figs. 1 and 2, and the expansion-joints placed upon either side of them, as the rails A must be held from any end movement at these points.

40 The bridging-rails A' will be firmly fastened to a metal plate, F, which rests upon the tie B' beneath the expansion-joint and this plate, and will extend entirely across from one rail A to the other, so that the two opposite bridging-rails will be firmly held in place and all side movement prevented.

45 Guard-rails H will be inserted opposite each expansion joint to prevent the flanges of the wheels from running into the gap between the ends of the rails A; or, if preferred, a block, K, may be inserted to partially fill the gap in cold weather, and adapted to be removed in warm weather; or when the rails A are expanded. The most approved method of using the guard-rails and blocks, however, is to re-

move the blocks and insert the guard rails in warm weather, and insert the blocks and remove the guard-rails in cold weather, when the latter would interfere with the operation of the "flangers," or machines for removing snow and ice from between the rails.

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

1. In a railway, the rails laid in sections of considerable length, the rails in each section being laid end to end close together, and being held immovably together with no opportunity for expansion and contraction between the individual rails, the several sections of rails being laid with an expansion joint or space between them, said expansion-joint being sufficient for the expansion and contraction of all the rails in a single section, in combination with a bridging rail placed alongside the end rails of adjacent sections, substantially as set forth, thereby bridging the joint and providing a rail for the wheels of the rolling stock to pass over said joint.

2. In a railway, the rails laid in sections of considerable length, the rails in each section being laid with no allowance for their expansion and contraction, but being laid with their ends close together, the several sections of rails being laid with an expansion joint or space between them, said joint being sufficient for the expansion and contraction of all the rails in a single section, in combination with a bridging-rail placed alongside the end rails of adjacent sections to break the joint, and a guard-rail on the side next the bridging-rail, substantially as set forth.

3. In railway construction, the combination, with the main rails A, of bridging-rails A', having removable filling-blocks K attached thereto between the ends of said main rails, substantially as and for the purpose set forth.

4. In railway construction, wherein the ends of the rails are immovably united except at long intervals, supplemental plates D, placed beneath the joints and bolted or otherwise attached to the ends of said rails, substantially as set forth.

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

DANIEL BELL.

Witnesses:

C. N. WOODWARD,
H. S. WEBSTER.