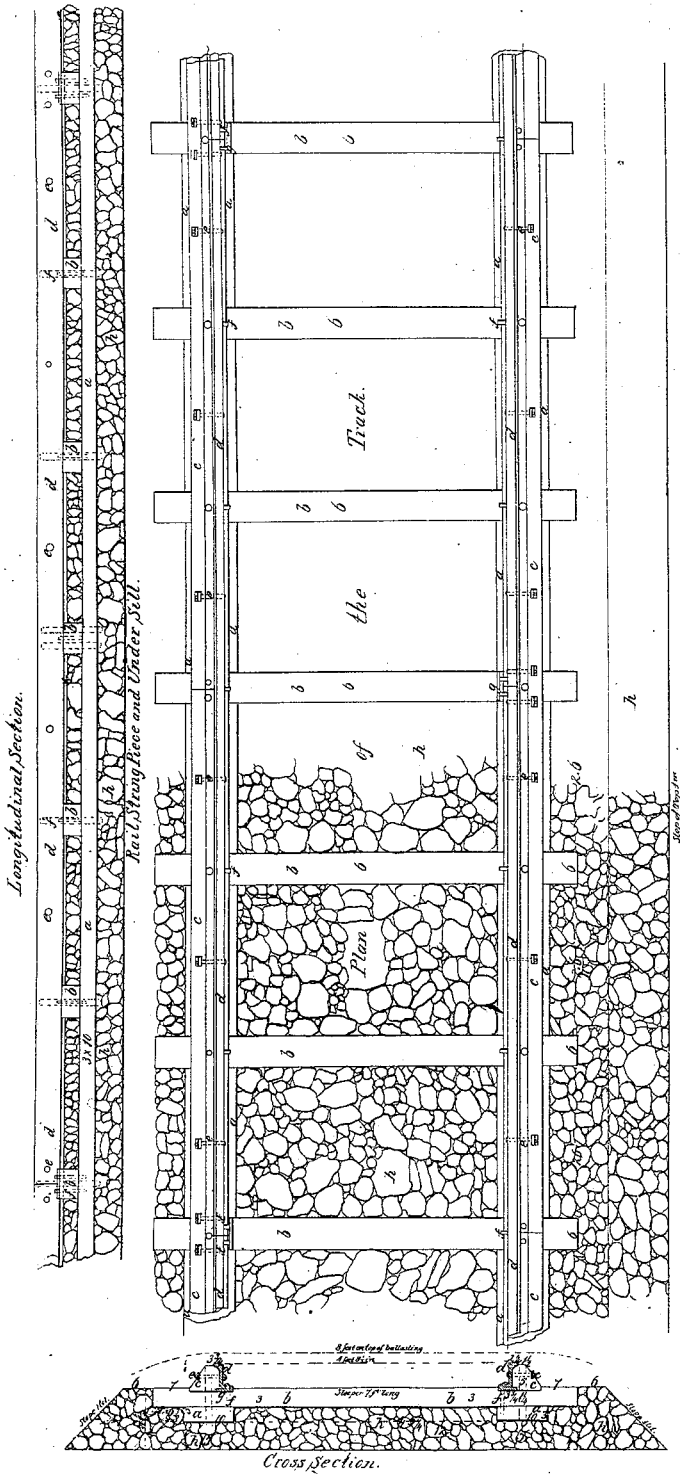
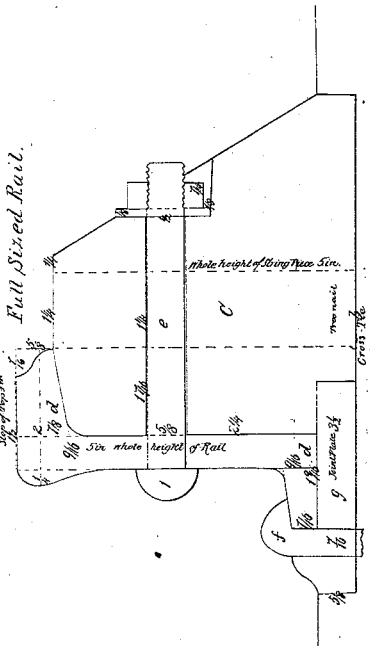
B. H. Latrobe.

Railway Track.

No. 1,808. Patented Oct. 8, 1840.





UNITED STATES PATENT OFFICE.

BENJAMIN H. LATROBE, OF BALTIMORE, MARYLAND.

RAILWAY-TRACK.

Specification of Letters Patent No. 1,808, dated October 8, 1840.

To all whom it may concern:

Be it known that I, BENJAMIN H. LATROBE, civil engineer, of the city of Baltimore, in the State of Maryland, have invented a new and useful Improvement in the Construction of Railway-Tracks, of which the following is a full and exact description, to assist which I refer to the accompanying drawing, exhibiting a plan, longitudinal section, and cross-section of the track on a scale of one inch to the foot and a full-sized transverse section of the rail, string-piece, joint-plate, bolt, and spike.

The track consists of two lines of longitudinal undersills *a*, *a*, upon which are placed cross ties *b*, *b*, at stated distances. These cross ties are notched to receive the string pieces *c*, *c*. The under sill, cross tie, and string piece are connected by vertical tree nails as shown. The iron rail *d*, *d*, is rolled into a form the section of which resembles the letter Z, the head or upper table being turned to one side of the stem or rib, and the foot or lower table being turned to the opposite side. The rail thus shaped is placed against the inner side of the string piece, with the upper table lapping over the upper and inner edge of the string piece, and thus bearing on the top of the latter, and the lower table resting upon the cross ties. A continuous top bearing on the string piece, and detached bottom bearings upon the cross ties are thus obtained. The rail is held against the upright inner side of the string piece by horizontal screw bolts *e*, *e*, at stated distances; which bolts pass through the stem of the rail and through the string piece. The rail is further confined at its foot by hook headed spikes *f f* driven vertically into the cross tie and holding the rail down thereon and at the same time up against the string piece. Under the joinings of the rails, a cast iron bearing plate *g g* is let into the cross tie, and receives the foot of the rails, which are confined laterally by a ledge on the plate, on which they are held down by the hook headed spikes passing through holes in the same, into the cross tie. The string piece for economy of timber is sawed with the trapezoidal section shown in the drawing; the width at bottom being about twice that at top. This form of section is obtained by sawing into two pieces upon a diagonal line, a rectangular scantling of twice the area of each string piece. By this means a broad base is obtained to give steadiness to the string piece, while sufficient width at top is left for the bearing of the upper table of the rail, and for the hold of the tree nail which connects the string piece to the cross tie and under sill.

The track as described will rest upon a bed of broken stone, sand or gravel or other ballasting material (*h*, *h*,) not retentive of water, of about 12 inches deep and filled up to the top of the cross ties, leaving the rail and nearly the whole string piece above ground.

The advantages which I believe to distinguish the above described plan from others heretofore invented and used, are thus briefly enumerated:

1st. The lateral support given to the rail by the string piece, permits the section of the rail to be made thin and deep without danger of bending sidewise under vertical pressure, and thus secures the maximum of strength with a given weight of metal.

2d. The mode of connection of the rail with the string piece, holds the former in its upright position without the aid of chairs or pedestals, and saves their complication and cost.

3d. The same mode of connection, gives a continuous and elastic support to the projecting flange forming the upper table of the rail, and saves it from crushing, splitting off and rapid wear under the wheels.

4th. The manner of supporting the rail top and bottom, upon surfaces of different area (the bottom one being the least) insures a perfect simultaneous bearing for both the upper and lower table; for as the upper bearing on the string piece is withdrawn by the shrinkage of the timber or other cause, the lesser lower bearing on the cross ties being insufficient to sustain the pressure, becomes compressed so as to restore the upper bearing in exactly the degree, and at the rate, in which it is withdrawn. Were the upper and lower bearing surfaces equal in extent this might not take place if the wood of the lower one were considerably the harder of the two.

5th. The portion of the rail on the inside of the string piece causes the latter to receive directly and sustain with its whole power of resisting compression and movement, the lateral pressure of the flanges

of the wheels which force the rail closer to the string piece, and thus relieve the fastenings of strain, instead of subjecting them to it, as when they are employed to hold any of the known forms of rail upon the upper surface of cross ties or string pieces, or blocks, &c.

6th. The manner of attaching the rail to the string piece by a number of bolts passing through both prevents the endwise movement of the rail, so difficult to guard against.

7th. It also secures the lining of the rails along the inner edge of the upper table at the joinings of the bars, making the track safe and smooth at these points.

8th. The sidewise attachment of the rail to the string piece by means of the bolts, secures the springing of the rail to and its maintenance in the line of the curve of the road.

9th. The Z form of the section of the rail, is better adapted than any other to bear the action of the wheels, the coned part of which nearest the flange, imparting the most intense pressure is received immediately by the stem of the rail in which its main strength lies. In the T and H rails, the stem is chiefly acted on through the inner ledge of the upper table with a twisting action unfavorable to the resistance of the stem; this part of the upper table suffering also severely from the tread of the wheel, while the outer ledge gets comparatively little of it. In the Bridge rail the inner leg or half of the stem receives the principal action of the wheel, while the outer one is strained to a less extent; which inequality must injuriously affect the strength and wear of the rail.

10th. The upper and lower tables of the rail consisting of a simple bending of the stem to an angle with itself, the rolling of the rail is made easier than in any known form of edge rail section—while the disposition of the fibers and tamina of the bar is in the Z-rail, as favorable as possible to strength and the endurance of wear.

11th. The fastenings of the Z-rail track, are cheaper, more simple and more accessible for adjustment and repairs, than those of the most improved forms of track in which any other edge rail is used.

12th. The plan described is, finally, recommnded by general economy in first cost and subsequent repairs, when compared with any known form of track of equal strength and efficiency.

The Z-rail track admits, of course, of a considerable variety of shape and dimension in its parts. The forms and sizes of the several parts as shown in the drawing, are considered suitable to a track intended for heavy tonnage and high speeds.

My claims to original invention in the railway track herein described are as follows:

I claim—

1. The form of rail herein described, in combination with a wooden string piece to give it stiffness against lateral disturbance— the upper table of the rail having a continuous bearing on the string piece, and the lower table a support at intervals on the cross ties.

2. I claim the mode of fastening the rail to the inner side of the string piece by horizontal bolts and nuts as herein described, or by spikes in place of bolts and nuts, or by bolts and keys or ~~cotters~~ in combination with said rail.

In testimony whereof I the said Benjamin H. Latrobe hereto subscribe my name in the presence of the witnesses whose names are hereto subscribed, on the seventeenth day of September A. D. 1840.

BENJ. H. LATROBE.

Witnesses:
Thos. P. Jones,
George West.