I. Cooper.

Railroad Rail.

No. 293. Fig. 1. Patented Jul. 22, 1837.

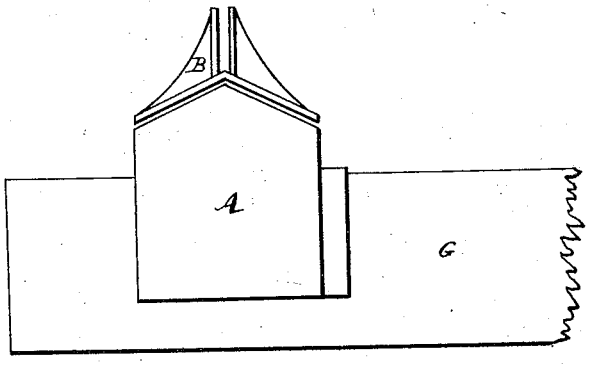


Fig. 2.

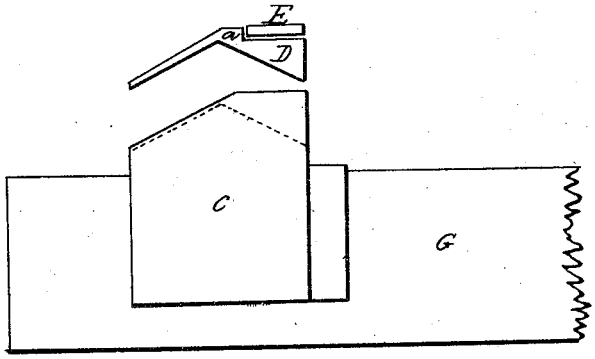
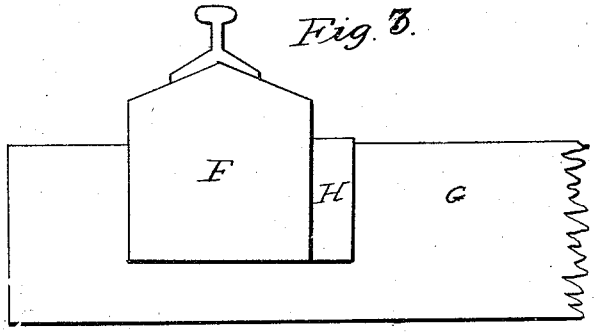


Fig. 3.



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UNITED STATES PATENT OFFICE.

ISAAC COOPER, OF JOHNSTOWN, PENNSYLVANIA.

MODE OF CONSTRUCTING RAILROADS.

Specification of Letters Patent No. 293, dated July 22, 1837.

To all whom it may concern:

Be it known that I, ISAAC COOPER, of Johnstown, in the county of Cambria and State of Pennsylvania, have made certain new and useful Improvements in the Manner of Constructing Railroads; and I do hereby declare that the following is a full and exact description thereof.

My improvements consist, in part, in the form which I give to the upper sides of the string pieces upon which the rails, chairs, or plates, are to be sustained; or to the upper sides of the blocks of wood, or of stone, used for the same purpose; in the form and construction of the chairs adapted thereto; and in the manner of combining and connecting the respective parts together, so as to form a more stable foundation and superstructure than have hitherto been obtained at the same cost.

I sometimes make my rails by taking string pieces of a peculiar form on their upper sides, and upon these I put edge rails, by means of chairs adapted to the form of such string pieces. Fig. 1, in the accompanying drawing, shows a cross section A, of one of the string pieces of timber, and a side view, B, of a chair adapted thereto. These string pieces may be of any convenient length and size, but it will be found best to make them larger than those ordinarily used. Twelve inches in height and ten in thickness, I should prefer. It will be seen by the section that the string piece is made ridge-shaped on the top; the angle formed by the sloping sides may vary considerably, but a descent of two inches and a half on each side will answer all the purposes intended. Instead of descending from the ridge, or middle part, in a straight line, it may do so in one which is somewhat concave, or convex, the chair, in this case, being adapted thereto. The same remark will apply to the blocks of wood, or stone, hereafter to be described. The chair B, is so formed on its under side as to adapt it to the ridge-formed string piece across which it is made to straddle. Such chairs so formed and firmly attached to the string pieces, will afford greater stability, being less liable to displacement, and resisting the lateral thrust more effectually than any mode of forming and fixing such articles, now in use.

When it is desired to use a plate rail, the top of the string-piece must be adapted thereto. In Fig. 2, is shown a section of such a rail and plate, together with the kind of chair which I have invented and adopted to be used with rails of that description. The upper sides of the string pieces are, in this kind of rail, sloped toward the outer edge only, commencing from a point immediately under the outer edge of the iron rail-plate; C, in this figure is the section of the string piece, D, the chair, and E, the rail-plate. The chair is made in the form shown in the drawing. The chair is to be let into the string piece so that its top shall be flush with the top thereof. There is a shoulder, offset, or jog, at *a*, to steady the rail plate; this shoulder may be extended up within an eighth of an inch of the surface of the plate. These chairs I make of cast-iron, of such strength as is necessary to sustain the load; they, however, will be found but little liable to fracture when properly embedded in the rail. The distance of these chairs from each other may vary from eighteen inches to three feet.

Fig. 3, represents a cross section of a rail road, and exhibits an improved mode of construction, in which the rail, or the chair which supports it, is placed upon blocks of wood, or of stone, having the upper surfaces of such blocks ridge-formed, in the same way with the string pieces first described. F are blocks of stone, or of wood, the upper sides of which are ridge-shaped, and their lower let into the cross tie piece, G, and secured there by means of wedges H. The tie pieces may vary in size, but abundant strength is a point of much importance: I contemplate having them, usually, about eight feet long, fourteen inches broad, and eight inches thick, and then make the notches to receive the blocks four inches deep. The rail may be made so as to be used without chairs, in which case its form will be somewhat like that of the T rail, the lower side, however, being rolled in such a shape as to adapt it to the ridge of the block, upon which shape its stability will greatly depend. Edge rails of any of the ordinary forms may be used, by employing chairs adapted to them, and to the ridge-formed block. In a road so constructed a stone block foundation will possess the requisite elasticity, from its resting upon the wooden tie piece. If preferred, a similar

advantage may be obtained by embedding the stone blocks on a rubble foundation in the usual way, leaving their upper surfaces flat, and securing the tie pieces above instead of below them. The ends of the tie pieces are, in this case, to be notched, or cut, into such a form as to adapt them to the kind of chair, or rail, above described; that is to say, they must, where these are seated upon them, be ridge-formed.

What I claim as constituting my improvements in the mode of constructing railroads, is—

1. The giving to the upper sides of the string pieces, blocks, or cross ties, the ridged form, as herein set forth, for the purpose of receiving chairs, or rails, adapted thereto on their under sides.

2. The forming of the string pieces with a slope, or chamfer, along one side of their upper surfaces, when plate rails are used; and the construction and application of chairs, such as are herein described, to the fixing and sustaining of the rail plates, by which means the plate is enabled to resist the lateral pressure to which it is subjected; and the great strain upon the spikes, and the indentation of the timber, are obviated.

3. The application of cross ties of wood, either below or above, the blocks of stone, or of wood, which make a part of the foundation of a railroad, in the manner, and for the purposes, fully made known in the foregoing specification.

ISAAC COOPER.

Witnesses:
THOS. P. JONES,
W. THOMPSON.