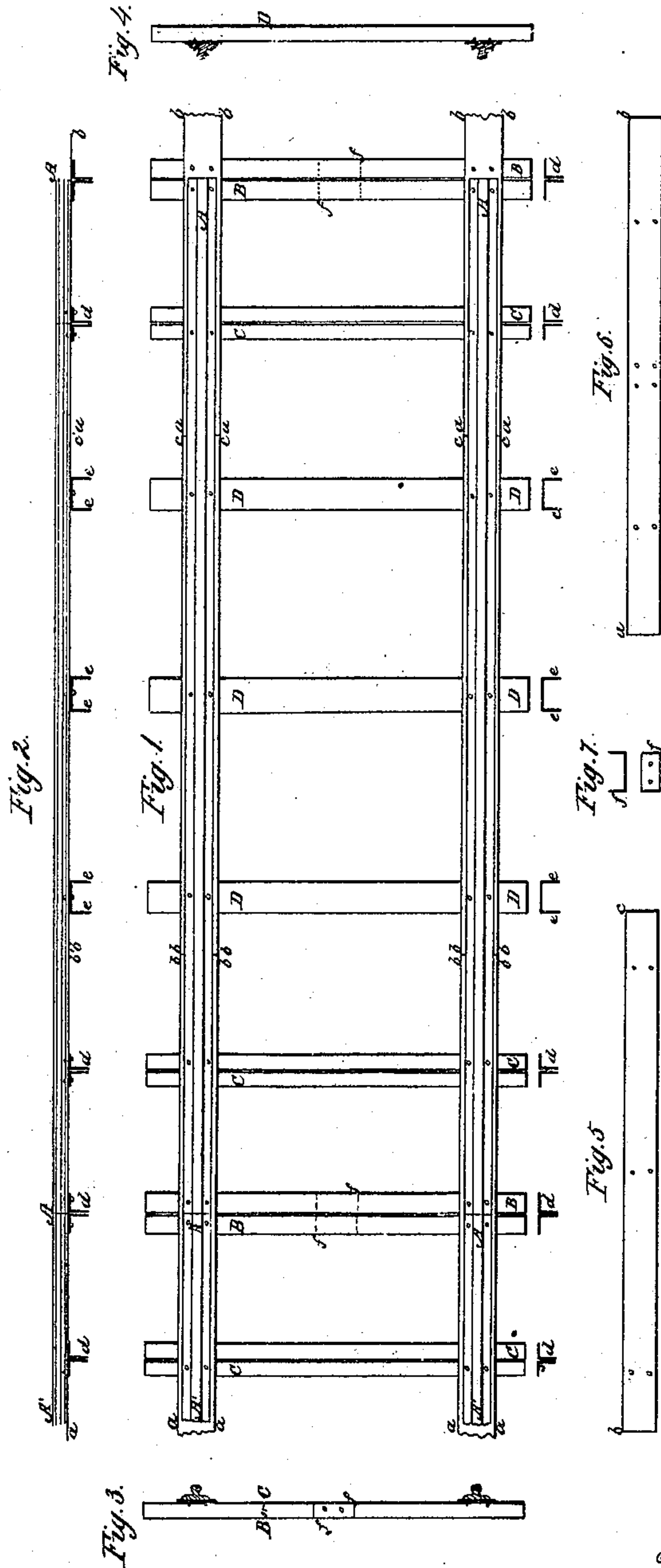


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WROUGHT IRON SUPERSTRUCTURE FOR RAILROADS.  
No. 19,704. Patented Mar. 23, 1858.



Witnesses:

Henry C. Long  
Sho. W. Smith

Inventor:

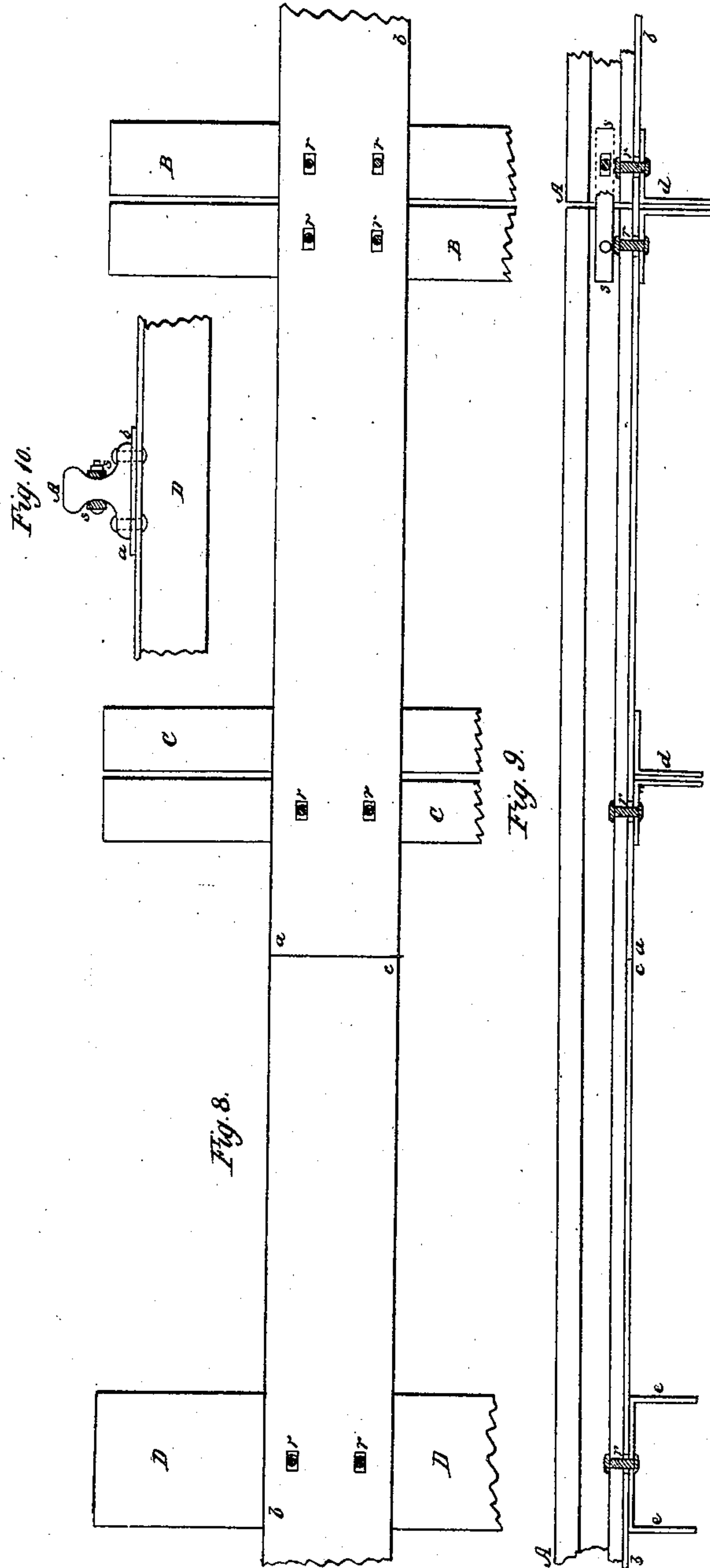
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# UNITED STATES PATENT OFFICE.

STEPHEN H. LONG, OF LOUISVILLE, KENTUCKY.

## SUPERSTRUCTURE OF RAILWAYS.

Specification of Letters Patent No. 19,704, dated March 23, 1858.

*To all whom it may concern:*

Be it known that I, STEPHEN H. LONG, of the United States Army, of Louisville, Kentucky, have invented certain new and  
5 useful Improvements in the Construction of Superstructures for Railways; and I do hereby declare that the following is a full, clear, and exact description of the construction and application of the same, reference  
10 being had to the annexed drawings, (marked Nos. 1 and 2,) making a part of this specification.

The objects of this my invention and the benefits expected to result therefrom are as  
15 follows, viz: firmness, durability, efficiency and economy of structure, safety and despatch of conveyance, together with uniformity and facility of construction and application, all of which are proposed to be  
20 attained by means of arrangements and appliances as follows, viz:

Item 1st: The rails may be of the ordinary form and construction of the T rail, the U rail, or the rectangular or square rail  
25 with a flanged base, the rails having a uniform length of 15', 18', 21', 24', or 27 feet, with their flanges or bases pierced with holes about half an inch in diameter for the reception of rivets or bolts, to confine them  
30 to the other parts of the superstructure.

Item 2d: Grade plates about 6 feet long under the abutting ends of the rails and elsewhere of any convenient lengths, not exceeding 6 or 8 feet, on which the rails  
35 are to repose. These plates are of two distinct varieties, distinguished by their positions with respect to the rails, viz: The compensation grade plates, and the intermediate grade plates. The compensation grade plate occupies a position immediately beneath the abutting ends of  
40 any two rails, and extends equal distances in the direction of the rails, from their abutting joint. This plate is perforated with holes corresponding to the  
45 first and second sets of holes, at and near the ends of the abutting rails, the holes in the compensation grade plates being oblong or elongated, of the same transverse diameter, and about  $1\frac{1}{2}$  of the latter in longitudinal diameter, as compared with the  
50 holes in the bases of the rails, and in the sleepers.

Note: Instead of holes in the compensation plates, notches or mortises may be

substituted for the reception of the rivets or bolts.

The intermediate grade plates occupy positions between the compensation grade plates. These plates are also pierced with  
60 holes, corresponding in position to the intermediate holes of the rail, and serve as before for the reception of rivets or bolts to confine the rail to other parts of the superstructure on which they rest. 65

Item 3d: Compensation or abutting sleepers, at the junction of each set or pair of rails. These sleepers should extend across the rail-track, and about one foot beyond the rails, on both sides of the track. 70 Each sleeper may be constructed of a single piece or plate, folded and flanged in a manner to represent in transverse section the letter T with a single cap and double stem, or of two angular segments combined by  
75 two or more rivets or bolts, inserted through its duplicate stem or rib, about midway of the sleeper. A transverse section of the latter, as well as of the former, will present the form of the letter T. 80 These sleepers are pierced with holes corresponding to those in the ends of the rails, and of the same size.

Item 4th: Common or quarter sleepers, on both sides of the abutting sleeper, and  
85 about two feet therefrom. These sleepers may be of the same form and construction, as the abutting sleepers, except, that their width on the road grade, may be less by about two inches and that their rivet holes  
90 need not exceed two, at both ends of each sleeper.

Note: The sleepers mentioned in the two preceding items, may be furnished with anchor plates of a suitable form, for the  
95 purpose of preventing the sleepers from slipping transversely of the road, and of keeping them in their proper positions. The anchor plates may be attached to the ribs of the sleepers, and confined to the same  
100 by the rivets that combine the segments of the sleeper.

Item 5th: Stationary or fixed sleepers, each consisting of a single piece, molded in a manner to afford a flange or rib on each  
105 side, of the same depth as the rib or double stem of the other sleepers, and subserving a similar purpose, viz: that of preventing the superstructure from slipping forth and back on the road grade. The width of  
110



these sleepers may be the same as that of the common sleepers. Their form and construction may likewise be similar to those of the common sleeper if preferred.

5 The parts above designated, and the relative positions occupied by them in the superstructure will be more clearly understood by an inspection of the accompanying drawings (No. 1 and No. 2) and their ex-  
10 planations which are as follows:

Figure 1, a horizontal or ground plan of the superstructure, with transverse sections of the sleepers (cross-ties) annexed, showing the relative position of the several parts  
15 of the superstructure; Fig. 2, a vertical and longitudinal section through the rails, grade plates, and sleepers showing the order in which the parts recline on the road grade; Fig. 3, a transverse section of the combined  
20 superstructure at the line of junction between the segments of the compensation or abutting sleepers and showing the position of the anchor plates, &c.; Fig. 4, a longitudinal section of a stationary sleeper, or a  
25 side view of an abutting sleeper, as also of a common sleeper, showing the positions of the rails, rivets, &c., and their combinations; Fig. 5, a horizontal view of an intermediate grade plate, showing the positions of its  
30 rivet holes; Fig. 6, a horizontal view of a compensation grade plate, showing the position and size of its holes or mortises; Fig. 7, a side view and section of the anchor plate; Fig. 8, plan of the grade plates and  
35 sleepers, showing the forms and positions of the elongated holes or mortises, as also the positions of the rivets in the mortises, at a mean temperature of the weather; Fig. 9, side view or section of the same, sur-  
40 mounted by parts of two rails, in which the elongated holes in the grade plates, and the rivets passing through the latter, and confining the sleepers to the bases of the rails, are represented; Fig. 10, a transverse section  
45 of a rail resting on its grade plate, and a stationary sleeper, these several parts being confined together by rivets.

*References and explanations.*—A, A, &c., the rails pierced with holes for the reception  
50 of rivets or bolts, to confine the rails to the sleepers, &c.; a, b, compensation grade plates pierced with holes or furnished with notches or mortises corresponding to the holes at and near the ends of the rails; b, c, station-  
55 ary or intermediate grade plates pierced with holes, corresponding to the intermediate holes (6 or more) in each of the rails; d, d, the ribs of the abutting and common sleepers; e, e, the flanges or semi-ribs of the  
60 stationary sleepers; f, f, the anchor plates connected with the abutting sleepers; B, B, abutting or compensation sleeper, a transverse section of which resembles the letter T with double stem and single cap; C, C, com-  
65 mon sleepers occupying positions about two

feet from compensation sleepers, on both sides of the same, and similar to the latter in form and construction; D, D, stationary sleepers with a flange or semi-ribs on each side, and of the form indicated by the sec-  
70 tions at the bottom of Fig. 1. (Note: The stationary sleepers may be of the form represented at D, D, or may be similar in form, construction, and manner of attachment to  
75 the rails to those of the Ammon sleeper;) r, oblong holes through the grade plates, with rivets passing through them, and confining the rail base to the sleeper, in a manner to admit said base and sleeper to move  
80 forth and back, without disturbing the grade plate, the movements as just intimated being occasioned by the expansion and contraction of the rails by changes of tem-  
85 perature; s, splicing plates connected to each other by screw bolts or rivets passing through them, and through mortises near the abutting ends of two rails, for the pur-  
90 pose of keeping the ends of the rails in a rectilinear direction, &c. This improvement was probably in use prior to the date of this invention.

N. B. The letters of reference apply in-  
discriminately to all the figures, in con-  
nection with which they have been intro-  
duced into the drawings, which are to be  
95 regarded as part and parcel of this specification.

The principal parts and appendages to which my said invention applies are as fol-  
100 lows, viz: The grade plates for the double purpose of enlarging the bearing of the superstructure upon the grade or road-bed, and of providing the means of compensat-  
105 ing for the changes produced in the lengths of the rails, by changes of temperature, without deranging other parts of the superstructure; the manner of constructing and applying the abutting or compensation and common sleepers, with their anchor plates,  
110 also the stationary sleepers, all for the purposes of enlarging the bearings of the superstructure, as before,—of preventing said superstructure from sliding forward, back-  
115 ward, and laterally, on the road-grade,—of confining the rails in their proper places on the road,—of keeping the central portions of each rail immovable while their terminal portions are allowed to expand or contract,—and of confining the various parts of the superstructure to the road-bed.  
120 These, and various other details and particulars relating to the nature and character of my claims in the premises have been set forth and explained with sufficient clear-  
125 ness and precision in the foregoing specifications, and cover the several items of improvement which I believe to be new and useful, and which I desire to secure for my own benefit, by Letters Patent of the United  
130 States.



Having thus fully described the nature and object of my invention, what I claim as new in the construction of wrought iron superstructure for rail roads is—

5 1. The combination of grade plates, and ribbed sills as herein set forth, and for the purposes described.

2. I also claim bolting the rail to the sill, through the grade plates, in such manner as  
10 that the expansion and contraction (or

creeping as it is termed) of the rails, shall not be communicated to the grade plates, which allows said plates to retain their position regardless of the moving of the rails substantially as herein stated.

STEPHEN H. LONG.

Witnesses:

THOS. R. SINTON,  
HENRY C. LONG.