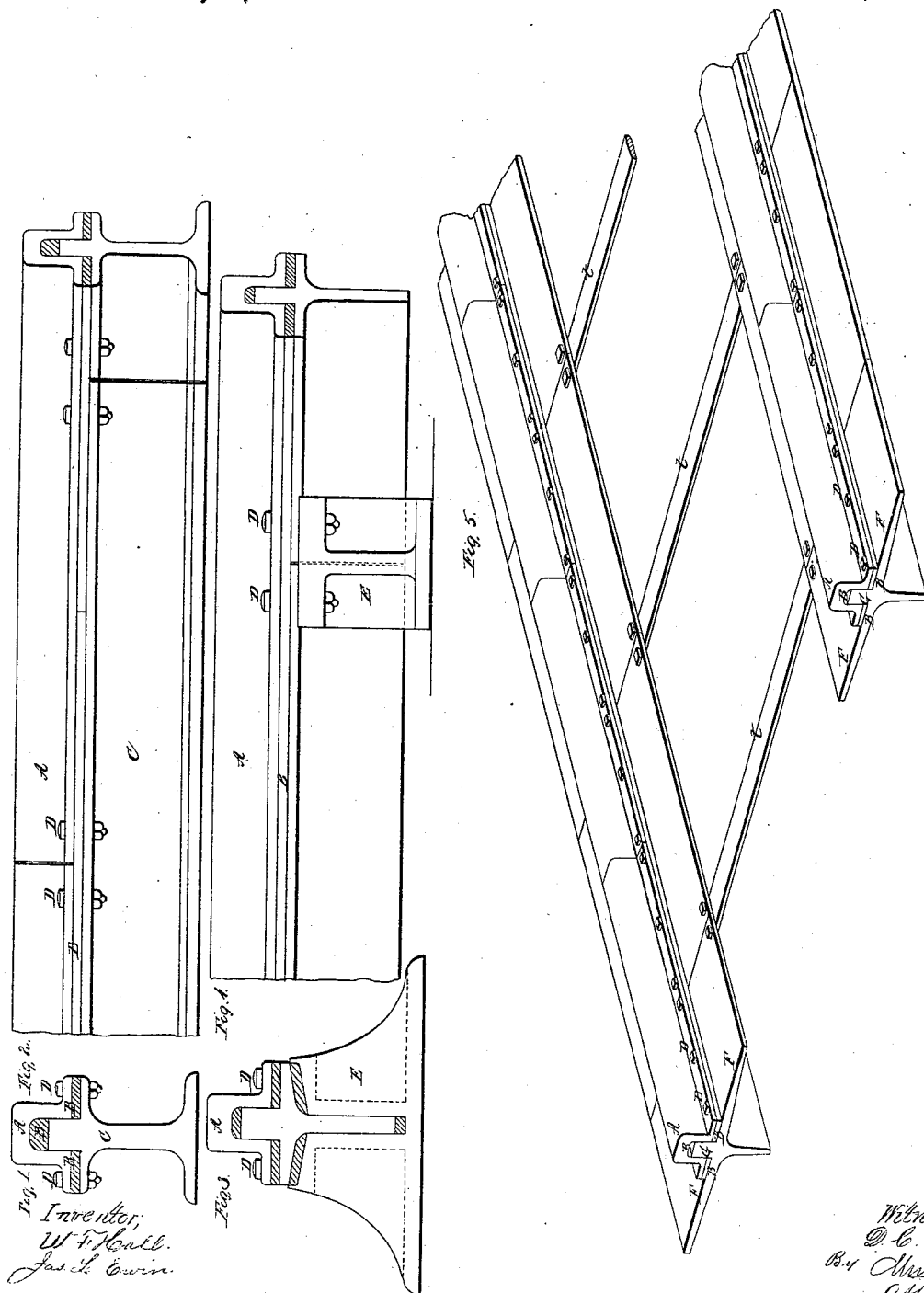


*D. C. Pierce,*

*Railroad Rails,*

*N<sup>o</sup> 53,479.*

*Patented Mar. 27, 1866.*



*Fig. 1.*  
*Fig. 2.*  
*Inventor,*  
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*Witnesses,*  
*D. C. Pierce*  
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# UNITED STATES PATENT OFFICE.

D. C. PIERCE, OF CLAYTON, NEW YORK.

## IMPROVED RAILROAD-RAIL.

Specification forming part of Letters Patent No. 53,479, dated March 27, 1866.

*To all whom it may concern:*

Be it known that I, DENNISON CHAUNCEY PIERCE, of Clayton, in the county of Jefferson and State of New York, have made new and useful Improvements in Railroad-Rails; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, sufficient to enable one skilled in the art to construct and use the same, reference being had to the accompanying drawings, which are made part of this specification, and in which—

Figure 1 is a vertical and transverse section of a rail constructed on this principle. Fig. 2 is a side elevation, showing an end section of the same rail as exhibited in Fig. 1. Fig. 3 is a vertical and transverse section of a rail on substantially the same principle as Fig. 1, but the main rail is sustained by a chair. Fig. 4 is a side elevation of the rail shown in Fig. 3. Fig. 5 is a perspective view of a modified form of rail, embracing the same general principles, but with a widely-displayed flange, which lies upon the ballast of the road, and tied together by cross-bars, dispenses with sleepers.

These improvements chiefly consist in the construction of the rail in two parts, one of which constitutes the body or main rail, and the other forms the cap or head thereof and serves as the table of the rail, and the employment of strips of prepared wood, felt, papier-maché, gutta-percha, or other suitable and slightly compressible material between the cap and main rail, the whole being fastened together by keys or screw-bolts, as illustrated in the accompanying drawings.

In this arrangement the blows of the wheels of the passing train are delivered upon the adjustable cap of the new rail, which does not oppose a rigid resistance thereto, as does the solid rail, but yields to the extent of the elasticity of the material between it and the main rail.

I claim that this method of construction will make not merely a nominal, but a real permanent way.

The adjustable cap may be made of either iron or steel, but I prefer it should be made of steel and hardened in oil, which will be lighter, more durable, and in the end more economical than an iron cap of greater weight.

I apply my invention in several different ways to meet the views of different people

and to suit the varied circumstances and requirements of the different countries.

In the drawings, Fig. 1 is a transverse section, and Fig. 2 an elevation, of a flat-footed rail, illustrating the method of applying my invention. C is the main rail, A is the iron or steel cap, and B B B are three strips of prepared wood or other slightly compressible material, the whole being fastened together by the screw-bolts D D.

Figs. 3 and 4 are substantially similar to Figs. 1 and 2, except in the shape of the foot of the main rail, which is adapted for the use of chair E.

Between the side flanges of the main rail and the top of the chair I place the additional strips of wood or other material, B B, and under the foot of the main rail, inside the chair, the piece of similar material, B, all for the purpose of absorbing vibration and concussion, and thus prolonging the durability of permanent way and rolling stock. The screw-bolts D D, which fasten the cap to the main rail, also pass, as will be seen, through a flange on the top of the chair into recesses in the sides thereof, where the nuts are manipulated and the whole thus securely fastened together. The chair is fastened to the cross-tie in the usual manner.

Fig. 5 illustrates still another method of applying my invention, arranged with a view of dispensing altogether with wooden or other cross-ties, and is the one which I esteem to be most valuable. I term this my "longitudinal iron-sleeper system." The side flanges, F F, are continued the whole length of the rail, and may be made of any width required to afford sufficient bearing-surface to sustain the weight of the trains. The subprojection G is designed to give sufficient vertical strength to the main rail. The cap and method of employing it, in combination with the wood or other compressible material, is the same as described in Figs. 3, 4, and 5. The gage is regulated by the iron cross-tie rod *t*. It will be seen that the caps are so placed on the main rails as to break joints.

The main rail of a permanent way constructed according to this system will remain intact for an almost unlimited length of time, from the fact that the light and adjustable cap sustains all the wear and tear, and also, together with the wood or other material be-

neath, absorbs all, or nearly all, the vibration and concussion produced by the passing trains.

The expense and inconvenience of keeping the old permanent way in repair is known to be very considerable, while that upon the new way is next to nothing at all, it being only necessary to occasionally repack the ballast under the iron longitudinal sleeper.

The great advantage possessed by the new as compared to the old system of construction with regard to facility and economy of renewal, so far as renewal of the new system is necessary, is valuable and indisputable. The renewal of the old way means almost the entire reconstruction thereof at nearly the original cost, while the renewal of the new way means the renewal of the caps only. The economy of renewing a cap weighing twenty-seven and one-third pounds, instead of a solid rail weighing seventy-five pounds per yard, to say nothing of the other expenses, must be manifest to all.

The great facility with which the new way can be repaired or renewed is such as to render accident almost impossible. In no case is it necessary to materially disturb the main rail, nor will it be necessary at any time or under any circumstances to remove more than the two parallel length of caps at once, and eight men will be quite sufficient to remove the old and replace them by two new caps in the short space of ten minutes, so that this will be the longest period of time during which the new track can remain in any other than the most perfect condition. Under these circumstances it is difficult to conceive how accident of any kind can possibly occur. The old cross-tie system necessitates the constant removal and renewal of the sleepers at one or more points, and the considerable disarrangement of the permanent way has oftentimes caused, directly or indirectly, accidents of the most tragic character.

From false motives of economy the solid rail is sometimes allowed to remain in service long after it has been worn to a degree that renders it quite unsafe. The cap of the new rail being the only part that deteriorates, therefore the main rail or permanent way cannot, under any circumstances, nor in any length of time, become unsafe.

Another element of safety lies in the fact that the vertical strength of the combined rail and longitudinal iron sleeper is about double that of the solid rail and cross-tie system now in use.

The employment of an elastic material between a light cap and a comparatively heavy rail will, to a great extent, remedy the rigid resistance now offered by the solid rail, and

thus add materially to the durability of the rolling-stock and reduce the expense of keeping the same in repair. The method of breaking joints in the new way also contributes much to the same result. The greater degree of comfort to passengers in traveling over the perfectly smooth and elastic way will be readily perceived and appreciated.

It will be seen that this system of constructing a longitudinal permanent way will require much less ballast and offer less obstruction to drainage than any other yet proposed.

My rail being fabricated in two pieces, neither of which is more than one inch thick in any place, the iron is therefore more thoroughly worked and welded in the rolling during the process of fabrication; consequently a stronger and more durable rail is obtained from an equal quantity and quality of original material.

By reference to the perspective views annexed it will be seen that the caps are so arranged that their joints fall midway between those of the main rails, thus entirely dispensing with the necessity of fishing or otherwise securing the rail-joints, that difficult and expensive duty being performed in the most economical and satisfactory manner by the cap of the new rail. By breaking joints in this manner, those of the main rail, being always protected by the cap, will remain uninjured for a great length of time, while those of the cap, resting as they do upon the middle of the main rail, cannot deflect or become disarranged in any way, but will wear smoothly down with the rest of the cap, and thus the violent concussion at the joints of the solid rails, so exceedingly disagreeable to travelers and so destructive to both rails and rolling-stock, is entirely overcome. Inasmuch as the renewal of the permanent way on this system requires only the renewal of caps weighing twenty-seven and one-third pounds per yard, instead of a solid rail of seventy-five pounds per yard, the saving in transportation, particularly when the distances are great, as to Russia, India, Australia, and North and South America, becomes a matter of vast importance.

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

The combination of the upper or cap rail with lateral flanges, the interposed elastic material, and the lower continuous bearing rail supported upon the road-bed, either immediately or by intervening chairs or sleepers.

D. C. PIERCE.

Witnesses:

SEWALL WARNER,  
ROBERT WARNER.