(No Model.)

2 Sheets—Sheet 1.

A. C. VAUGHAN.

RAILROAD RAIL.

No. 264,976. Patented Sept. 26, 1882.

Fig. 1.

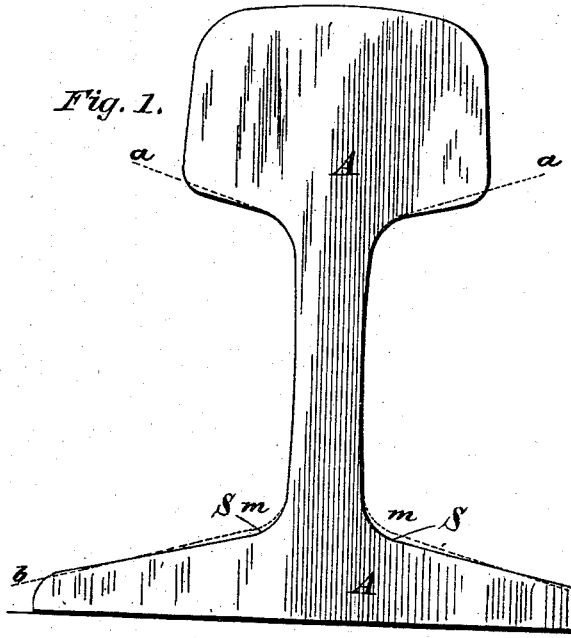


Fig. 2.

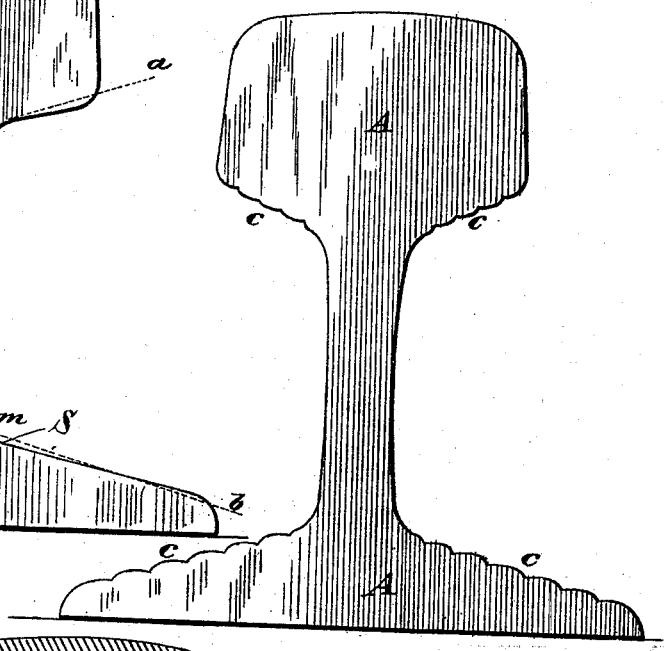
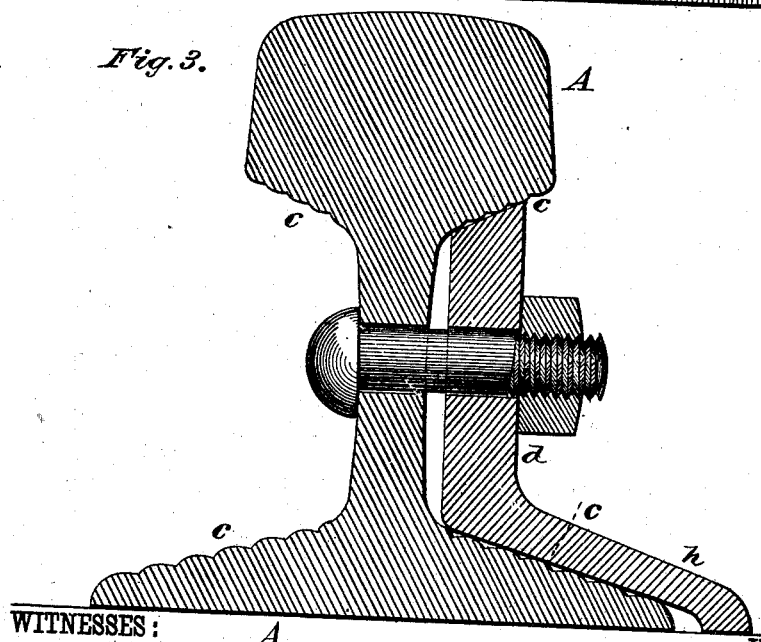


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

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RAILROAD RAIL.

No. 264,976. Patented Sept. 26, 1882.

Fig. 4.

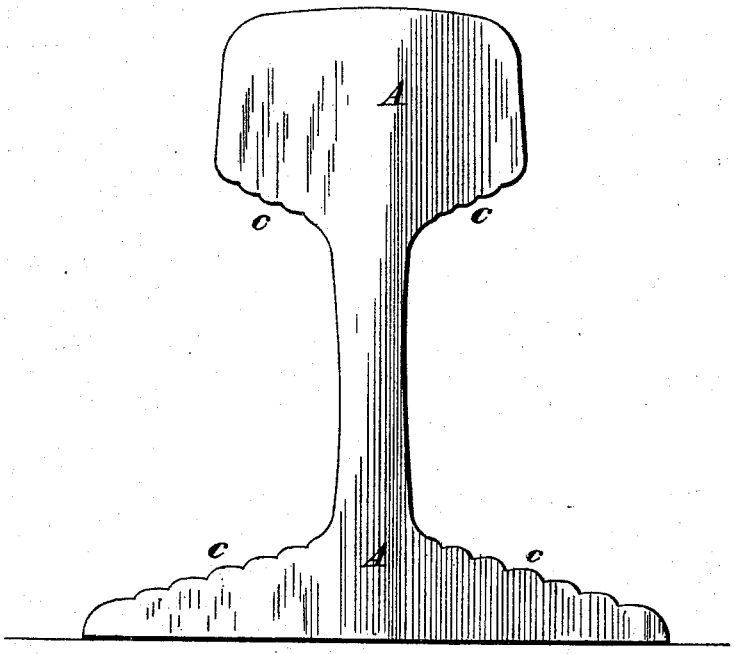
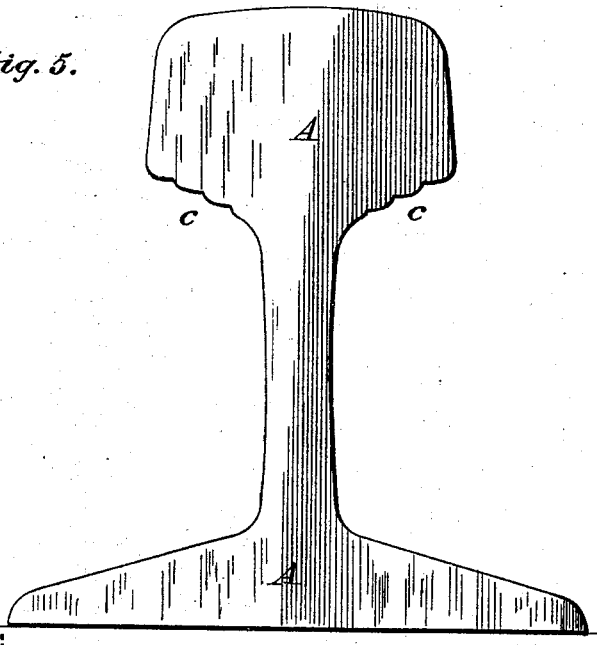


Fig. 5.



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UNITED STATES PATENT OFFICE.

AARON C. VAUGHAN, OF SHANE'S CROSSING, OHIO.

RAILROAD-RAIL.

SPECIFICATION forming part of Letters Patent No. 264,976, dated September 26, 1882.

Application filed February 7, 1882. (No model.)

To all whom it may concern:

Be it known that I, AARON C. VAUGHAN, of Shane's Crossing, in the county of Mercer and State of Ohio, have invented a new and useful Improvement in Railroad-Rails; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a transverse section of a T railroad-rail of the ordinary construction. Fig. 2 represents a transverse section of my improved construction of T railroad-rail. Fig. 3 represents a similar view of my improved construction of T railroad-rail and angular fish-plate secured thereto; and Figs. 4 and 5 are detail views.

My invention relates to improvements in T-shaped railroad-rails, whereby a great saving of steel in the manufacture of the rail is attained without decreasing the strength of the rail, and better joints formed between the rails and fish-plates, thus relieving the tension on the bolts which secure the fish-plates to the rails; and to these ends my invention consists in first cutting away by a change of the angles a part of the lower faces of the T-head of an ordinary T-rail and adding a less amount of metal to the upper faces of the base of the T-rail, and forming curved indentations in the opposite inclined under faces of the rail-head and in the opposite upper inclined faces of the base, or in the under face of the head alone, which construction will require less metal than the ordinary rail, and will form, also, much better joints with the fish-plates to prevent them from slipping than the ordinary construction, as hereinafter more fully set forth.

In the accompanying drawings, A represents a T-rail of the ordinary construction.

The dotted lines *a a*, Fig. 1, indicate the change in angles I make of six degrees in the under part of the head in my improved construction, as shown in Fig. 2, over the T-rail of usual form, thus saving a considerable amount of metal over the ordinary construction. The dotted lines *b b* on the top sides of the base, Fig. 1, indicate the change in angles of three degrees I make in the base in my improved construction, as shown in Fig. 2, over the usual form of T-rail, thus adding a small amount of metal to the base over the ordinary construction, as seen in Fig. 1.

c c represent curved indentations formed on the under faces of the head and the upper faces of the base in the dotted lines *a a b b*. These curved indentations may be made in the head alone.

d represents an angular fish-plate, secured in position on one side of the rail, in the usual manner, by bolts. The upper edge of the angular fish-plate *d* and its angular plate *h* are in contact with the curved indentations *c* in the head and base of the rail, and the curved indentations *c* hold the fish-plate securely in place and prevent it from slipping, thus relieving the tension on the bolts that secure the fish-plates to the rails. The T-rail A is made of steel and the fish-plates of iron, and when secured together by bolts and subjected to so great a pressure the steel embeds itself into the iron surface of the fish-plate. The greater part of the bearing-surface of each curved indentation is horizontal, though the general direction of the lines of indentation is inclined or angular, and by means of this horizontal character of each curved indentation I have a direct bearing to assist in sustaining the weight of an engine and train, which is not as liable to slip as the smooth inclined plane of the ordinary construction of T-rail. The union formed between these curved indentations is designed to be slightly curved when rolled, so as to avoid any sharp angles. In tightening up the fish-plates from time to time the old embedded surface rests more directly upon the horizontal surface of each curved indentation, thus forming by long-continued use a better joint.

In Fig. 4 I have represented my improved T-rail of extra size—weight, sixty-six and seventeen-twentieths pounds per yard, made four and five-eighths inches in depth, with the usual width of base. The standard height of a sixty-seven-pound T-rail is four and a half inches. In this case I have increased the depth of rail by increasing the depth of web one-eighth of an inch. I cut away by the change of angles at the dotted lines *a a*, Fig. 1, one thousand seven hundred and ten pounds of steel. In forming the curved indentations *c c*, I remove thirteen hundred and ninety pounds of steel, and in the change of angles at *m m* in the upper

part of the base I add two hundred and eighty-four pounds of steel. The whole amount cut away equals three thousand one hundred pounds of steel. Deducting from this two hundred and eighty-four pounds of steel—the amount added at the base—I have left two thousand eight hundred and sixteen pounds of steel as a net saving per mile, single track, the above calculation being based upon a mile of single-track railroad.

The advantages of my improved construction of T-rail are a better bearing for the fish-plate between joints and great saving of steel in the construction of the T-rail, which to a large railroad company would be a very important consideration, and the peculiar manner in which the steel is cut away does not interfere with the strength of the rail. Indeed, owing to the change in the angles of the base at dotted lines *b b*, Fig. 1, and the addition of metal directly at the opposite curves S S, between the web and base, I gain strength and have a better and stronger rail, with a better formation for a joint and the attachment of a fish-plate.

In my large-sized rail, (represented by Fig. 4,) in which I have increased the depth of rail to four and five-eighths inches by adding one-eighth of an inch to the depth of web, I have preserved the general outlines of the changes in the angles of the lower faces of the head and the upper faces of the base and the curved indentations, as shown in my improved rail shown in Fig. 2. In order to make this increase of depth, it requires two thousand two hundred and twenty-eight pounds of steel per mile, single track. Deducting this from two thousand eight hundred and sixteen pounds of steel—the whole amount cut away—I have left five hundred and eighty-eight pounds as a net saving in steel. This rail would be very materially stronger than the present sixty-seven pounds per yard rail and yet cheaper, weighing sixty-six and seventeen-twentieths pounds per yard. By increasing the depth of web I increase the depth of fish-plate in the same ratio, which makes them much stronger. The advantages of a rail constructed according to Fig. 4 would be, therefore, a rail very materially stronger in formation and less expensive, a rail having greater depth of web for the attachment and strengthening influence of the fish-plate, and by which better joints can be secured and maintained, a better bearing for the fish-plates, and fish-plates of greater depth, and consequently stronger. These advantages, practically applied, furnish a better, stronger, and cheaper rail, with stronger and better joints, and a smooth road-bed to travel upon.

I do not desire to confine myself to any particular number of curved indentations in the head and base, and the curved indentations may be made in the lower face of the head alone, without making any such curved indentations on the upper face of the base or flange, without departing from the spirit of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. A T-rail having the under faces of its head cut away and the upper faces of its base added to and cut away, as set forth, and provided with curved indentations *c*, substantially as described, and for the purpose set forth.

2. The combination, with the fish-plate *d*, of the T-rail A, provided with curved indentations *c c*, formed on the under faces of its head, substantially as described, and for the purposes set forth.

3. The combination, with the fish-plate *d*, of the T-rail A, provided with curved indentations *c c*, formed on the under faces of its head and the upper faces of its base, substantially as described, and for the purposes set forth.

AARON C. VAUGHAN.

Witnesses:

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CORNELIUS W. BULGER.