

R. LONG.
RAILROAD RAIL-JOINT.

No. 170,384.

Patented Nov. 23, 1875.

Fig. 1.

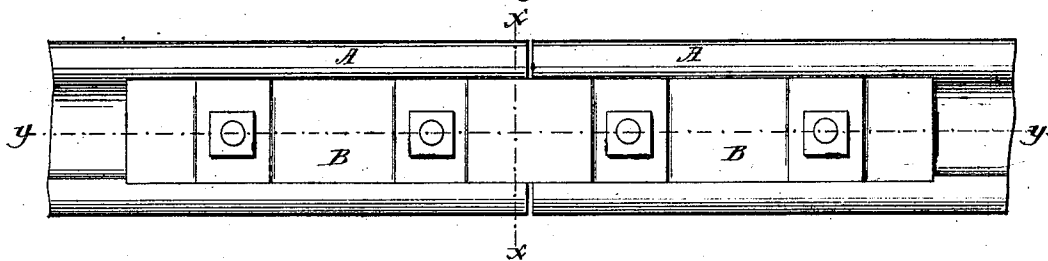


Fig. 2.

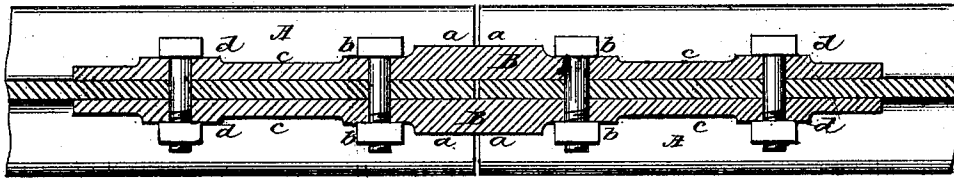
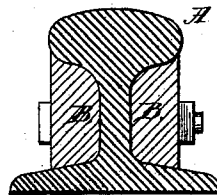


Fig. 3.



Witnesses:

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RICHARD LONG, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN RAILROAD-RAIL JOINTS.

Specification forming part of Letters Patent No. **170,384**, dated November 23, 1875; application filed August 4, 1875.

To all whom it may concern:

Be it known that I, RICHARD LONG, of the city of Pittsburg, county of Allegheny and State of Pennsylvania, have invented an Improvement in Fish-Plates for Railroad-Joints, of which the following is a specification:

The object of my invention is to construct a fish-plate for railroad-joints that will, when applied to the rail, make it practically continuous.

It has been fully proved that there is always a deflection in the rails when the cars are passing over them, which exists not only directly under the wheels, but also a slight distance in front and rear of the same, and that this deflection passes along the rails in the direction in which the cars are going, similar to a wave in front of a prow of a boat. This wave or deflection travels, as stated, along the rails until it reaches the rail-joint, where it is broken and ceases, or is not transmitted to the rail in advance, and as the forward end of the rail upon which the cars are passing is slightly depressed below the end of the next rail, the wheels, striking this elevation, are caused to jump from the depressed rail to the end of the one in advance, and in this way the ends of the rails become battered, and have very soon to be removed.

It has also been fully demonstrated by practical experience that, owing to this irregularity of the joint, causing the wheels to strike the ends of the rails, as stated, the wheels are made to rebound from the track, and strike again on the track a few inches from the joint, and thus injure and wear out the rails at this point also.

There are two principal causes for this trouble, arising, as stated, from the breaking or stoppage of this wave of deflection at the joint, and thus preventing the same from being transmitted to the rail in advance, one of which is that the fish-plates now in use do not give the extreme rigidity to the rail just at the point where it is essential—viz., directly at the joint—but owing to their uniform thickness, the same degree of rigidity is maintained throughout, or from one end of the fish-plate to the other; while another cause is found in the fact that the fish-plates now used are not constructed in a manner adapted to

their being retained firmly in position or tight up to the head, web, and base of the rail, as they do not have sufficient bearing upon these points to prevent the fish-plates from slightly slipping or springing when the engine comes upon them, thus permitting the end of one rail to be depressed below the end of the other.

In order to remedy these evils I have invented a fish-plate of different thicknesses, having a very strong re-enforcement in the middle, so as to give the extreme rigidity desired directly at the joint of the rails; also, a small re-enforcement or narrow boss at or near each end of the fish-plate, so as to have greater bearing on the head and base of the rails, thus preventing any slipping or springing of the plates. These re-enforcements, near the ends of the fish-plates, are made so as to take in the part of the plate where the holes are punched to receive the bolts, (the two end bolts,) so as to admit of these bolts drawing and retaining the fish-plates very firmly in position, or tight up against the different parts of the rail, as well as to prevent any springing of the plates at these points. The re-enforcement in the middle of the fish-plate is lessened in thickness at the points where the two inner bolts pass through, and ceases entirely just beyond, or outside, these points, thus lessening the thickness of that portion of the fish-plates between the inner and the end bolts, so as to reduce the extreme rigidity which is desired directly at the joint, (but nowhere else,) so as to permit the rails to slightly yield at a point a few inches from the joint of the same, and in this manner overcoming the injury occasioned by the rebounding of the wheels and their striking and battering the head of the rails at this point, as before stated. Should the head of the bolt project too far out, by reason of the additional thickness of the re-enforcements, a depression can readily be formed in the same to receive the head of the bolt, and thus obviate any difficulty of this kind. Owing to the increased thickness of the fish-plates at the points where the holes are made to receive the bolts, caused by the re-enforcements on the surface of the plates, a screw-thread can readily be cut in the holes in one of the plates, and the fastening-bolts screwed directly into these holes, thus doing

away entirely with the use of nuts, should this plan be deemed preferable over the ordinary way of using the bolts and nuts.

In the manufacture of these fish-plates, they are passed between "rolls" having suitable depressions and elevations formed on the surface thereof, to produce the re-enforcements on the surface of the fish-plates, thus adding nothing to the cost of their construction over the ordinary fish-plates, except in the additional amount of iron used in the re-enforcements.

In the accompanying drawing, forming a part of this specification, Figure 1 is a side elevation of the adjoining ends of two rails, showing one of my improved fish-plates in position. Fig. 2 is a horizontal longitudinal section on the line *y y* of Fig. 1, showing the two fish-plates in position and bolted to the rails. Fig. 3 is a transverse vertical section on line *x x* of Fig. 1.

In the drawing, *A A* represent the adjoining ends of two railroad-rails of the usual construction. *B B* represent the two fish-plates in position—one on each side of the rails, and secured thereto by bolts and nuts in the usual manner. *a a* designate the largest or thickest re-enforcements on the middle of the fish-plates, at the point where the joint between the two rails is located. *b b* designate the thinner portion of this main or central re-enforcement, at the points where the inner bolts pass through the plates. *c c c c* designate that part of the fish-plates which is

made the thinnest, in order to allow the rails to yield slightly at these points. *d d* designate the smaller re-enforcements near the ends of the fish-plates, through which the end bolts pass. The increased bearing for the head and base of the rail, obtained by the addition of the re-enforcements of the fish-plates, is fully shown in Fig. 3.

Having thus fully described my invention, what I desire to secure by Letters Patent is—

1. A fish-plate, constructed with a heavy re-enforcement at its central portion, and extending from the top edge to the bottom thereof, substantially in the manner and for the purpose set forth.

2. A fish-plate, constructed of varying thicknesses, as described, whereby different degrees of rigidity are obtained therein, and capable of being rolled in their manufacture, as stated, substantially in the manner and for the purpose set forth.

3. The fish-plates *B B*, having the depressions *c c* formed in the face thereof, in combination with the rails *A A*, as described, whereby the rails are allowed to yield, in the manner and for the purpose set forth.

4. The fish-plates *B B*, constructed with the re-enforcements *a a*, *b b*, and *d d*, and the depressions *c c*, substantially in the manner and for the purpose set forth.

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Witnesses:

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