

(No Model.)

2 Sheets—Sheet 1.

W. RAYMOND.
CONSTRUCTION OF RAILWAY TRACKS.

No. 551,649.

Patented Dec. 17, 1895.

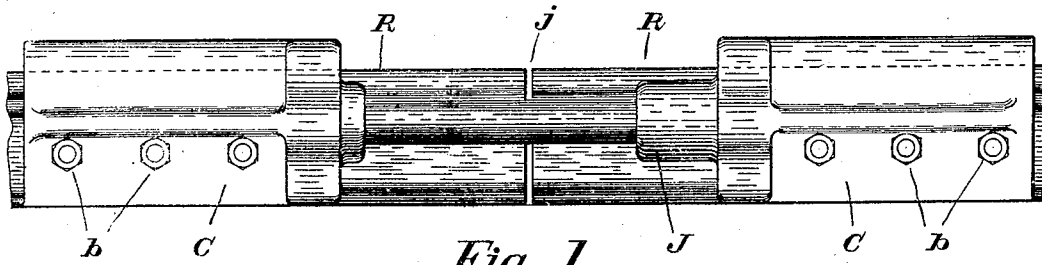


Fig. 1.

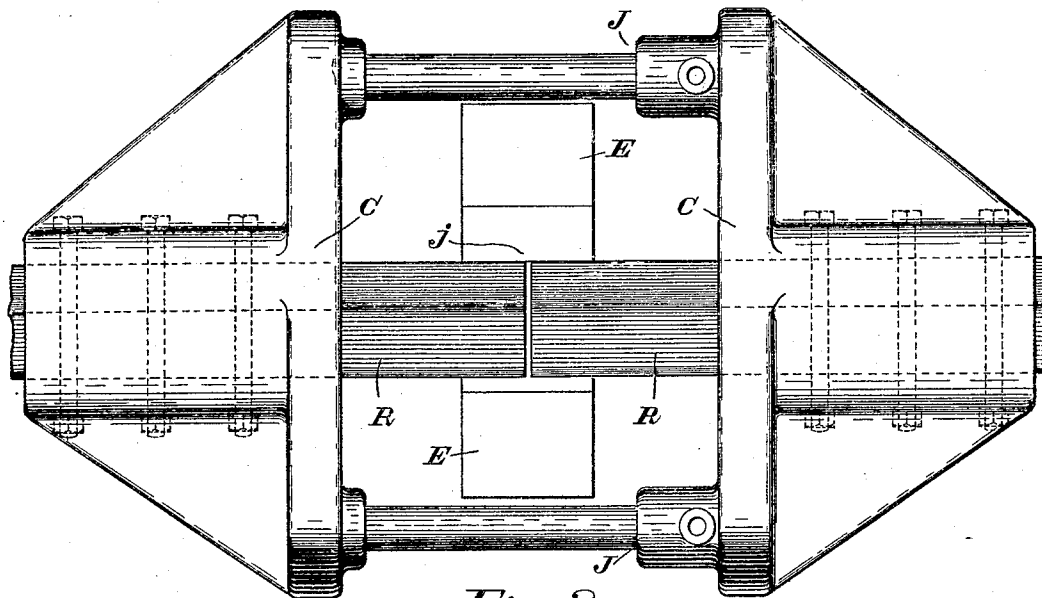


Fig. 2.

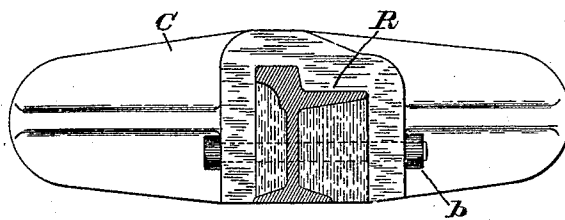


Fig. 3.

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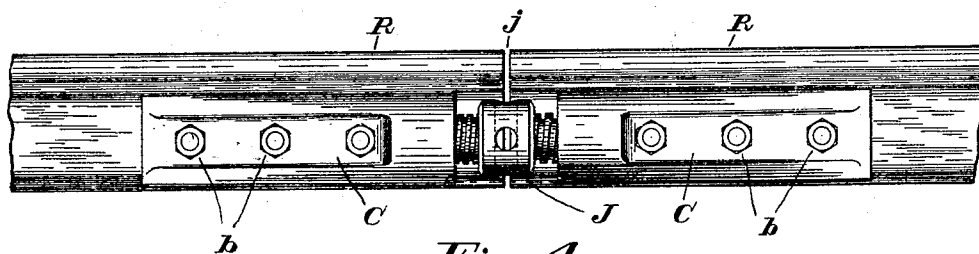


Fig. 4.

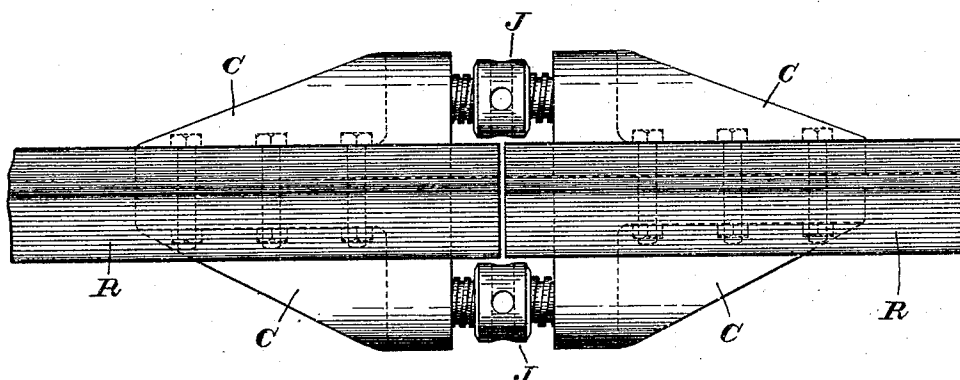


Fig. 5.

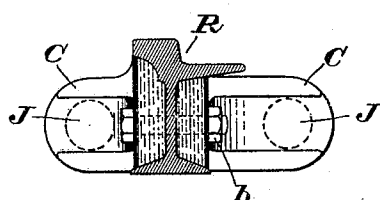


Fig. 6.

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UNITED STATES PATENT OFFICE.

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CONSTRUCTION OF RAILWAY-TRACKS.

SPECIFICATION forming part of Letters Patent No. 551,649, dated December 17, 1895.

Application filed September 17, 1895. Serial No. 562,796. (No model.)

To all whom it may concern:

Be it known that I, WARD RAYMOND, a citizen of the United States, residing at Johnstown, county of Cambria, and State of Pennsylvania, have invented a new and useful Improvement in the Construction of Railway-Tracks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to certain improvements in the art of laying railway-tracks, and has for its object to provide a track in which the longitudinal expansion and contraction of the several rails, due to changes in temperature, are prevented and certain other advantages hereinafter set forth are gained.

In the ordinary construction of railway-track there is a break in the continuity of the bearing-surface at joints of rails. This break in the continuity of the bearing-surface of the rail is very objectionable for several reasons. In the first place, the jar which the wheel receives as it jumps from one rail to the next is very severe upon the track, so much so that the joint is looked upon as the weakest point of the track. This jar is also very hard upon the car itself and objectionable to the passengers.

In the continuous track now laid in which the several rails are electrically welded or otherwise rigidly joined together, the whole line of rail is thrown into a state of tension whenever its temperature falls below that at which it is joined. This is not desirable as it is severe upon the joints.

By my invention I am enabled to so construct a track having the usual splice-bar joints that the rails shall always remain in close contact, and to so construct the welded type of track that the injurious stresses in the joints shall be reduced to a minimum.

In general my invention consists in so laying the track that the rails shall be in a state of elastic compression, so that any contraction due to temperature will be counteracted by the elastic tendency of the rail to expand to its normal length.

I will now describe my invention as applied to tracks in which the several rails are electrically welded together. In tracks of this class

when the temperature of the rail rises above that at which it is welded the tendency of the rail is to expand and the rail to increase in length. This it cannot do, as, owing to its great length, perhaps a mile or more, the frictional resistance of the road-bed and rail-fastenings prevents it. The fastenings and road-bed also resist any tendency to buckle or warp out of alignment. The effect of this rise in temperature is, therefore, to put the rail in a state of elastic compression in the direction of its length. When the temperature falls below that at which the welding was done, however, the tendency of the rail is to contract, and instead of the former state of compression we have the rail in a state of tension, in which case, as the tendency is to a true straight line, the road-bed has a smaller restraining influence, and the stress on the structure itself is great. As a rule the state of compression is preferable to that of tension, as in the latter condition the rail and especially the welded joints are more liable to fracture.

Where the track has been welded in the manner above set forth, the stress set up in the rail when the temperature falls from that of summer when the rail is welded to that of a cold winter causes great strain upon the welded joint. Were it practical to do the welding during cold weather while the rails were cold and in a contracted condition, this difficulty would not be met with, as any rise in the temperature of the rail would cause it to expand and therefore put it in a state of compression, which state would not be injurious to the weld.

My invention has for its object to so construct the track that while it is provided with a continuous bearing-surface, still there will not be with changes of temperature the strain upon the welded or other joint.

I will now describe in what my invention consists.

In general I put the different rails into a state of compression and weld them together, and when the temperature falls the strain of contraction relieves itself on account of the compressed condition of the rail, without throwing any strain on the joint. This mechanical manipulation of the rails might be

performed by many well-known devices. For the purpose of describing my invention I will describe two, the hydraulic and screw jacks.

Referring to the drawings, Figure 1 represents a side view of a joint about to be welded and showing in position a device for operating upon the rails. Fig. 2 is a top view of Fig. 1, and Fig. 3 is an end view showing the rail in section. Figs. 4, 5 and 6 show, respectively, side, top and end views of a device slightly different from that shown in the preceding figures.

In the drawings R R represent the two rails about to be joined at *j*. To each rail I secure the clamps C by any means, such as bolts *b*, and between the clamps I place the jacks J, which jacks I have shown in Figs. 1, 2 and 3 as hydraulic, and in the remaining figures as of the differential-screw type. The various ways of arranging these mechanical devices being well known, I do not show or describe them.

It will be seen that forcing the abutting rails apart as the resisting medium of the road-bed is called into play will compress them in the direction of their length. The rail is also held against longitudinal movement by the gripping action of the surrounding road-bed. This grip is such that whereas when the rail lies passive in the road-bed without any movement therein, it is to a certain extent free. A very slight longitudinal movement therein develops the resistance of the surrounding road-bed causing it to bind. When the rails are put in compression at the time of welding, this slight free movement is sufficient to allow each rail to compress.

In Figs. 1, 2 and 3 I have shown clamps in which the jacks are so far apart that the electrodes E of a welding-machine may pass down between them and make the weld while the rails are held in the desired state. When the rails are compressed and the joint opened, before making the weld, a liner or thin section of the rail may be slipped into the open joint in order that the weld may form a solid mass.

In Figs. 4, 5 and 6 I have shown clamps which are intended to be removed before the welding-machine is applied. These may be employed when the road-bed and track-fastenings are such as to hold the rail in its new state long enough to make the weld, or when the rails are compressed and a liner or thin section of the rail inserted in the joint.

It will be understood that I do not limit myself to the exact device shown on the drawings, but merely show a form of apparatus for producing the desired disturbed condition in

the rails. Many mechanical equivalents are adaptable to the purpose, and such I do not claim.

In welding the rails together my method permits of securing an abutting weld, if desired, by means of end-to-end motion or pressure. This can be done by an excess of compression in the rail and yet leave the resulting structure in either compression or tension, as may be desired.

Instead of compressing both rails at each joint all the disturbance might be placed in one rail each time, which would in effect be keeping the track already welded in the desired condition and putting in the same condition each additional length of rail after being welded thereto.

As I have before said, I have herein shown and described my invention as applied to the construction of street-railway tracks in which the rails are welded together in the road-bed and by it and the customary railway substructure held in alignment. As a general rule, the rails should be compressed so that they should never be called upon to withstand any amount of tensile stress.

Having thus shown and described my invention as applied to the construction of continuous railway-tracks, it will be seen that it is readily applicable to the construction of ordinary tracks, and that tracks may be constructed by this method which will never have any tendency to separate at the joints, thus insuring a track of superior quality.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

1. The improvement in the art of constructing railway tracks, which consists in putting the several rails into compression and joining them while in this condition.

2. The improvement in the art of constructing railway tracks, which consists in putting one or more of the rails into a condition of compression in the direction of their length, and so joining them together.

3. The improvement in the art of constructing railway tracks, which consists in putting one or more of the rails in a condition of compression, and rigidly securing their ends together, while in this condition.

In testimony of which invention I have hereunto set my hand.

WARD RAYMOND.

Witnesses:

P. A. FITZPATRICK,
WM. D. McELHINNY.