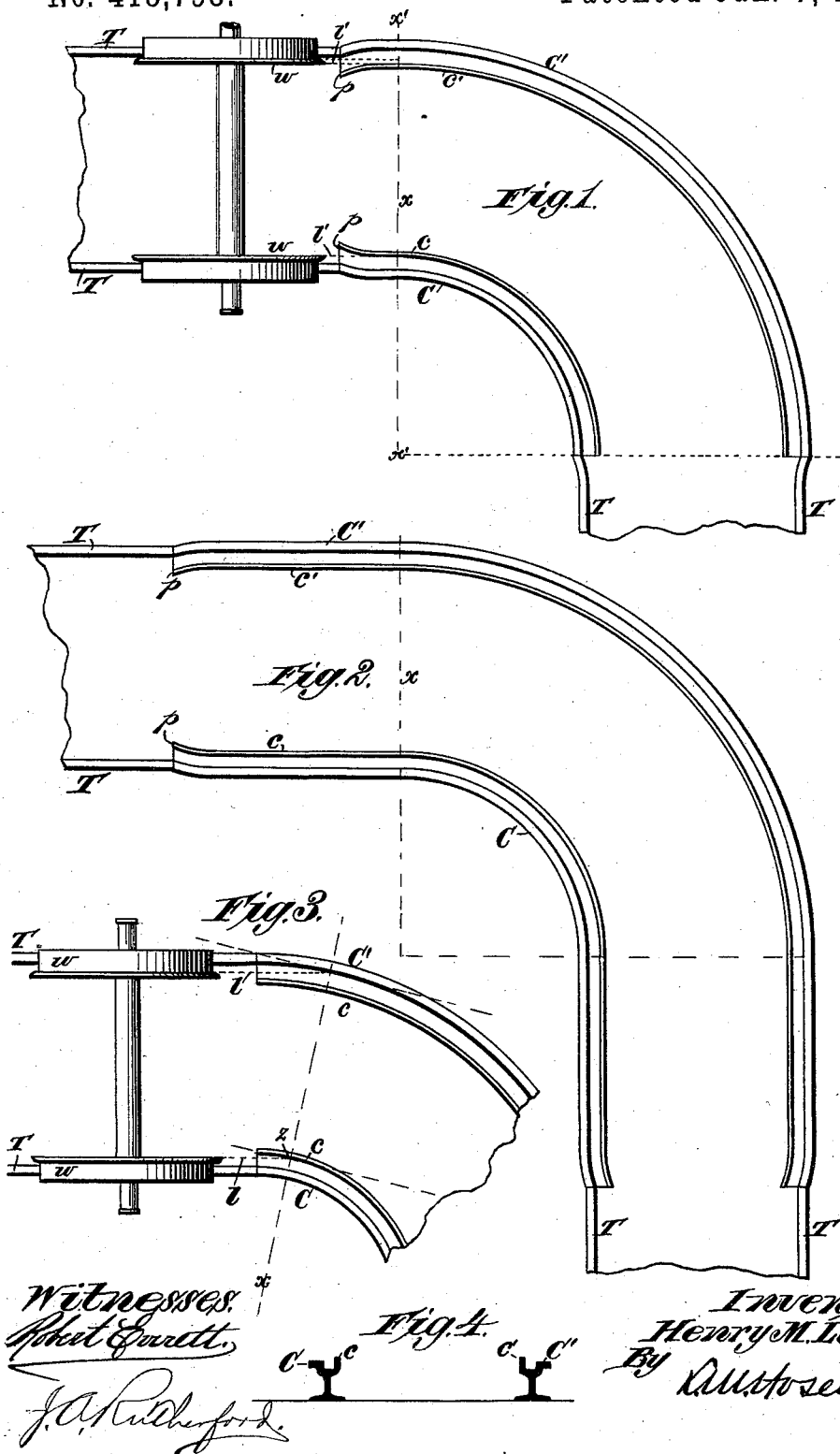


(No Model.)

H. M. LANE.  
RAILWAY CURVED TRACK.

No. 418,798.

Patented Jan. 7, 1890.



# UNITED STATES PATENT OFFICE.

HENRY M. LANE, OF CINCINNATI, OHIO.

## RAILWAY CURVED TRACK.

SPECIFICATION forming part of Letters Patent No. 418,798, dated January 7, 1890.

Application filed April 23, 1889. Serial No. 308,333. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY M. LANE, a citizen of the United States, residing at Cincinnati, Hamilton county, Ohio, have invented  
5 new and useful Improvements in Railway Curved Tracks, of which the following is a specification.

My invention relates to curve constructions for street-railway or tramway tracks, its object being to provide a curved trackway arranged to accommodate the wheel-flanges and take the strains occasioned by the tangential tendency and movement of the wheels and car in passing into or out of a curve in such  
15 manner as to avoid lurching of the car and undue wear of the rails at any one point.

To this end it consists in the curve trackway, constructed and arranged as hereinafter described and illustrated, embodying as a  
20 leading constructive principle the placing of the guard-rails on curve-sections of track in such definite gage relations to the wheel-base and to the adjoining straight track as that, upon entering the guard-rails, the course and  
25 deflection of the car is at once controlled by the impingement of the inner surfaces of the wheel-flanges at both sides of the car against the guards.

It also consists in the construction of a  
30 guard-rail, adapted to the purposes herein set forth, as a new article of manufacture.

My invention is illustrated in the accompanying drawings, in which—

Figures 1 and 2 are plan views of a tramway or street-railway curve constructed and arranged according to my invention; Fig. 3,  
35 a diagram or plan showing the common method of laying track-curves for purposes of comparison; Fig. 4, a cross-section of the  
40 track, as in the plane  $x'x'$  of Fig. 1.

To explain the nature of my invention clearly, it must be premised that the structure of street-railway cars, as ordinarily used, involves a rigid wheel-base with wheels rigidly attached  
45 to the axles, and that the track-rails on curves are each provided with an inner guard standing slightly higher than the surface of the rail proper. The car-wheel flanges upon the curve impinge against the guard and compel  
50 the change of direction by the pressure of the flanges against the same, the fore-wheel

flanges impinging against the guard of the inner rail and the hind-wheel flanges against that of the outer rail. It is obvious, also, that the rigid wheel-base of the car compels  
55 a widening of the gage of the track on the curve to accommodate the tangential relations of the wheel-base to the tracks; and this, in ordinary practice, is a slight enlargement of gage for an easy fit without recognition of the principle of setting the guards apart to a close engagement against the inner sides of the wheel-flanges at both sides of the car.

It is a matter of common experience that  
65 the car upon entering the curve of the ordinary construction is subjected to a side lurch more or less sudden and violent, according to the liberality of the speed, gage, and the condition of the track as to wear. The cause of  
70 this may be readily explained by reference to the plan, Fig. 3, showing the tracks laid in the usual manner. The rails T T, of liberal gage, merge at once into the curve C C at the radius-line  $x$ , the curve being, as a matter of  
75 practice, somewhat wider in gage than the straight track, for the reasons stated, but leaving the guards distinctly within a proper gage or fit against the insides of the wheel-flanges. Now, as the rigid wheel-base of the  
80 car is normally capable of motion only in a straight line, the fore wheels  $w w$  traverse the dotted lines  $ll$  until the flange of wheel  $w$  impinges against the guard  $c$  of the inner rail of the curve at  $z$ , where the angle of deflection, as indicated by the tangential dotted  
85 line, is relatively great. Obviously this condition subjects the rails to excessive and destructive wear at the point  $z$ , soon wearing the metal and destroying the integrity of the  
90 curve, as it wears back the impinging surfaces more and more, as shown by the black line, constantly aggravating the difficulty and causing a more and more violent lurch of the car.

My invention is designed to obviate the difficulty, and does so by a construction and arrangement of the rails upon the curve and in relation to the straight track, wherein the guard-rail section—which may begin and  
100 terminate at the junction of the tangent-line and the curve and include only the

curve-section, or may extend somewhat beyond and include part of the tangent at either or both ends of the curve—is widened in definite relations to the wheel-flanges, so as  
 5 to take the bearing of the inner sides of the wheel-flanges upon the guards, and thus control the car in close relations to the track at the beginning and throughout the deflection of its course from a straight line. The preferable manner of accomplishing this is to  
 10 bend the rails C C each with a short horizontal inward curve at the junction with the straight tracks T T, as shown—enough to bring the impinging inside of the guards *c c* in line with  
 15 dotted paths *l' l'* of the inside of the wheel-flanges *w w* in each case—allowing slightly for proper play and variation in gage of wheels. The bending of the guard-rails thus at the junction also gives a guiding-flare *p*, to insure  
 20 the proper entrance of the wheel-flanges into the curve and a proper gage for abutting sections of straight and curved tracks. The wheel-base of the car being rigid and always in tangential relations with the curve, the deflection of the car by the curved rails is effected by the impingement of the flange of the fore wheel *w* against the guard *c* of the inside curve and the impingement of the  
 25 flange of the opposite rear wheel against the guard *e'* of the outside curve. Now, in order to insure a perfect action at the entrance of the curve, so as to begin the deflection gradually, I may bring the straight tracks T T to the tangent-points on the radius *x* at proper  
 30 and close gage, thus perfectly controlling the position of the car and bringing the wheel-flanges in proper relations, as already described and as indicated by the dotted path-lines *l' l'* in Fig. 1 with the guard-rails *c c*.  
 35 In practice, however, I find it desirable to extend the guard-rails C C' a short distance into the straight track, as indicated in Fig. 2, suf-

ficiently to accommodate, approximately, the wheel-base of the car and bring the wheel-flange into proper relations with the guards  
 45 before beginning the deflection.

At the outgoing terminus of the curve the junction terminals of the straight track rails T T may be bent in the opposite direction, as shown, so as to set these rails inward to the  
 50 normal gage, or the guard-rails C may be extended into a short section of straight track to carry the car beyond centrifugal influence and leave it under control of its own normal tendency to go forward in the proper straight  
 55 line of the subsequent track-section. This construction is indicated by dotted lines in Fig. 1.

I claim as my invention and desire to secure by Letters Patent of the United States—  
 60

1. The improvement in railway-track curves consisting in offsetting the guard-rails outwardly at the junction with the straight track at or before the tangent-point to bring  
 65 both guard-rails into the impinging path of the inner surfaces of the wheel-flanges and maintaining such track relations throughout the curve to or beyond the leaving tangent-point, substantially as set forth.

2. As a new article of manufacture, a guard-rail for railway-track curves, having its end  
 70 deflected horizontally inward, so that by its junction with the normal straight track the guard is brought into the impinging path of the inside of the wheel-flanges, substantially  
 75 as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HENRY M. LANE.

Witnesses:

HORATIO ROGERS,  
 E. R. BAKER.