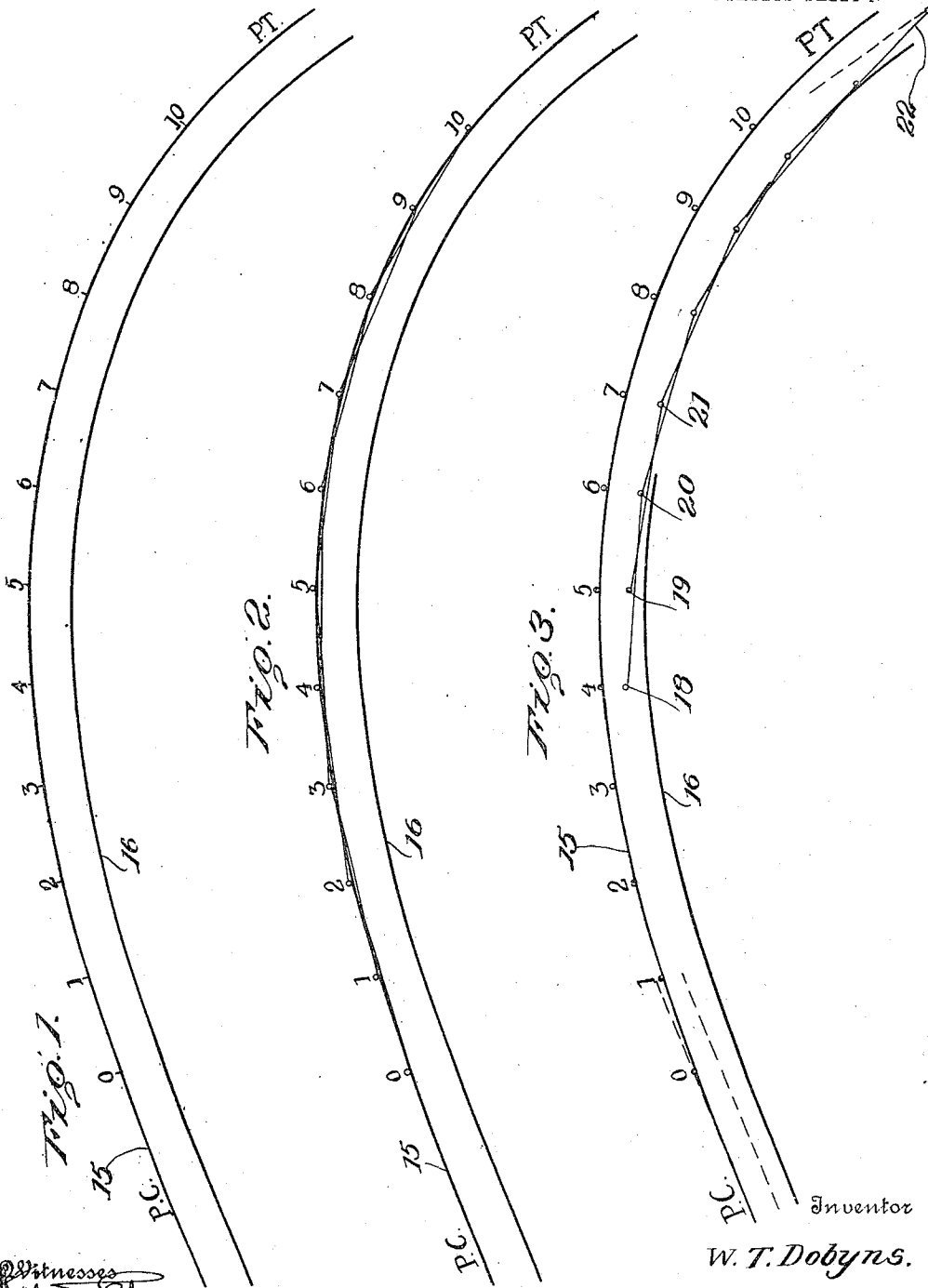


W. T. DOBYNS.
METHOD OF LINING RAILROAD CURVES.
APPLICATION FILED JULY 23, 1912.

1,127,204.

Patented Feb. 2, 1915.

2 SHEETS—SHEET 1.



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334

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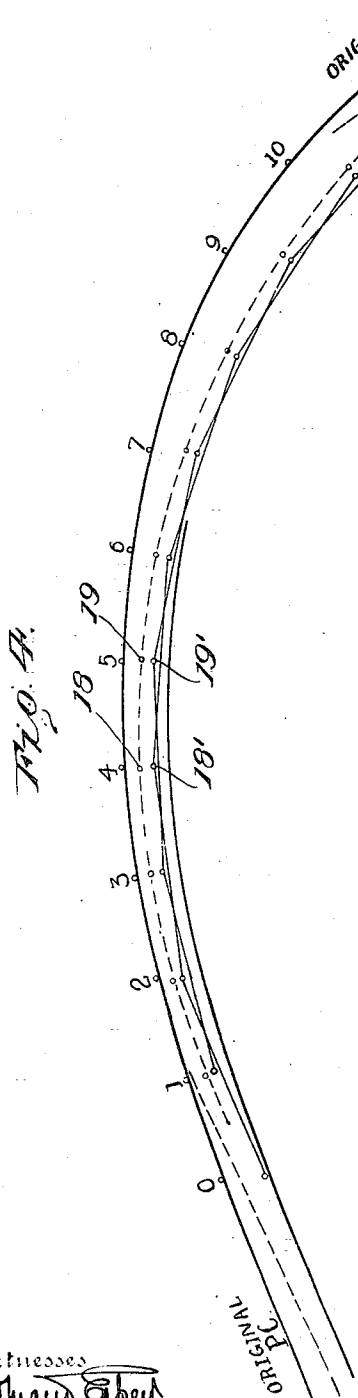


FIG. 4.

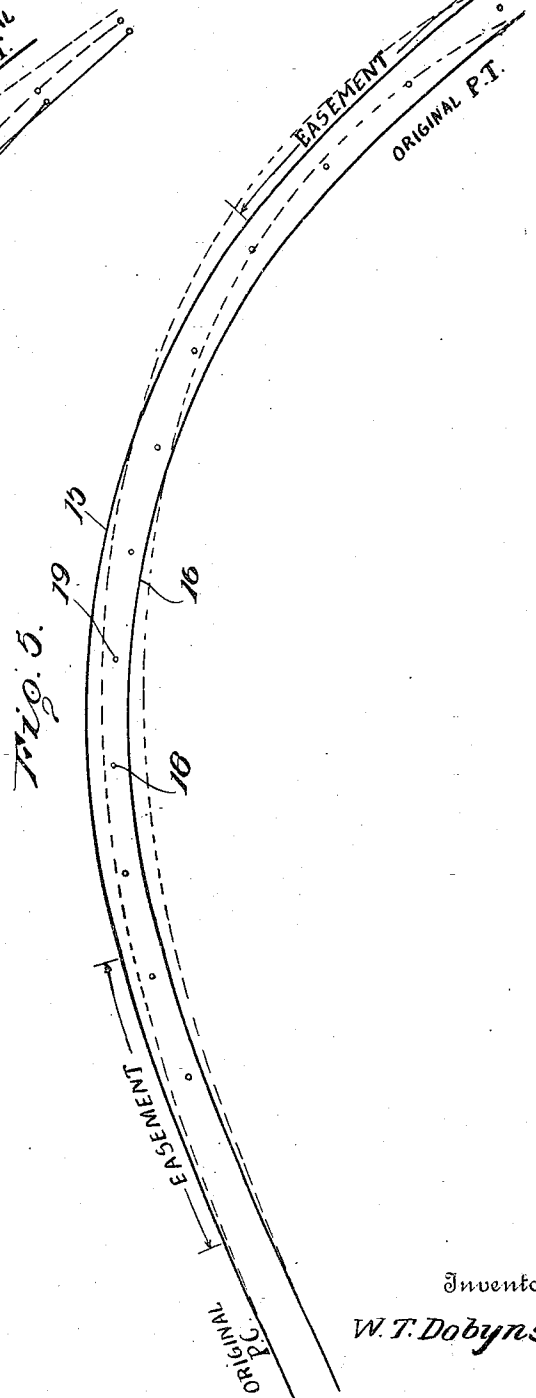


FIG. 5.

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UNITED STATES PATENT OFFICE.

WILLIAM T. DOBYNS, OF BRISTOL, TENNESSEE.

METHOD OF LINING RAILROAD-CURVES.

1,127,204.

Specification of Letters Patent.

Patented Feb. 2, 1915.

Application filed July 23, 1912. Serial No. 711,180.

To all whom it may concern:

Be it known that I, WILLIAM T. DOBYNS, a citizen of the United States, residing at Bristol, in the county of Sullivan and State of Tennessee, have invented certain new and useful Improvements in Methods of Lining Railroad-Curves, of which the following is a specification.

My invention relates to new and improved methods of laying railway tracks, and the object of my invention is to provide a method for determining the degree of curvature of a track already laid and for obtaining centers to place a curve in proper alignment with the track, this method being employed in relining curves on tracks already laid.

A further object of my invention is to provide a method of the above described character which does not require any unusual technical knowledge on the part of the men that are relaying the track, a tape being the only instrument employed in locating the centers and the calculation necessary being of the simplest character.

With these and other objects in view, my invention will be more fully described, illustrated in the accompanying drawings, and then specifically pointed out in the claims which are attached to and form a part of this application.

In the drawings: Figure 1 is a plan view, showing a portion of track, the curve of which is to be relined, the first step in the operation, namely, the marking off of unit distances of thirty-one feet upon the outer rail, being here shown; Fig. 2 is a similar view, showing the method of obtaining the average degree of curvature, this being the second step in the operation; Fig. 3 is a plan view of the track, illustrating the running of the new curve, parts of the inner rail being omitted for the sake of clearness; Fig. 4 is a plan view, showing the new center line of the curve and also illustrating the manner by which this center line may be moved in bodily when it is found to lie outside of where it should; Fig. 5 is a plan view, showing the track lined in.

Corresponding and like parts are referred to in the following description and indicated

in all views of the drawings by the same reference characters.

In order to insure a clear understanding of the method, I have illustrated in the various figures a curved section of track, the original curve being best shown in Fig. 1. In all of these figures, the numeral 15 designates the outer rail of the track, while the numeral 16 designates the inner rail.

My method consists of a number of successive steps or operations, the first of which is the dividing or marking off of the curve portion of the outer rail into unit distances of thirty-one feet, the point so marked off being indicated in the various views by the numerals 1 to 10 inclusive. In dividing off the curve in this manner, no part of the easement at either end of the curve is included.

The next step consists in the determining of the average degree of curvature of the curve. This is accomplished by stretching a cord between alternate points on the rail, that is, points sixty-two feet apart and measuring the middle ordinate at each of the cords. More specifically, a cord is stretched between the points zero and 2 and the distance between the point 1 and the center of the cord is measured in inches. The cord is then stretched between the points 1 and 3 and the distance between the point 2 and the central portion of the cord is measured, this being continued for all points marked off.

The length in inches of the ordinate measured, when the curve is divided into distances of thirty-one feet, is equal to the degree of curvature in degrees and minutes. For instance, if the distance measured between the point 2 and the center of the cord is five and a half inches, then the curve is a five degree thirty minute curve. In this manner, the curvature at each point marked off is found and the average curvature of the entire curve is obtained by adding the length of the ordinates measured and dividing the sum by the number of ordinates measured.

The next step consists in the running of a trial curve with the average degree of curvature so found. Two stakes or nails 18 and 19 are set midway between the inner and

outer rails of the track, near the middle of the curve and in radial alinement with adjacent points marked off on the outer rail, the positioning of these stakes being shown in Fig. 3. A cord is now stretched from the stake 18 and the average ordinate found measured inwardly from the stake 19 and the cord swung to the end of the ordinate so measured, this determining the direction of the cord. For instance, if the average degree of curvature is 4 degrees forty-five minutes, the ordinate set off is four and three-quarter inches. The length of the cord employed is substantially sixty-two feet and a third stake or nail 20 is driven at the end of the cord when so positioned, this stake being located substantially opposite the divisional point marked 6 and with 18 and 19 giving three points in the center line of the new curve. The cord is then stretched from the stake 19 and the ordinate measured from the stake 20, and another stake driven opposite the point 7 of the outer rail as shown at 21. In this manner, points on the line of the curve are obtained opposite all the points of division of the outer rail until the easement is reached. This center line of the new curve should fall about one foot, two inches inside of the center line of the tangent, as shown at 22, in order that an easement may be had. If the line is found to fall correctly, the track may be then lined in, in a manner which will be hereinafter described. If however, it does not fall at about the right point, the distance from where it does fall to the point where it should fall is measured and then divided by the number of points set, counting stake 19 as one, 20 as two etc. The result thus obtained will be the distance which it will be necessary to move station 19 in order to throw the curve right when it is to be run again. Of course station 19 must be moved inwardly or outwardly according to the direction in which it is desired to throw the curve.

It may be necessary to move station 19 or station 18, or both, more than once in order to insure the proper curve at both ends. If the curve as run in appears to be too flat, the length of the ordinate used is slightly increased and a new curve run. If on the other hand, the curve is not flat enough, the length of the ordinate used is slightly decreased and a new curve run in. If the curve run in seems to be of the right degree of curvature but to lie for its entire length about the same distance, either outside or inside of where it should, then the curve may be moved bodily in the desired direction by moving each center stake the full amount which it is desired to move the curve and then running a new curve. This latter step is illustrated in Fig. 4, in which the stations 18 and 19 are moved into the

position shown at 18' and 19'. After the curve has been correctly run in both directions from the center, the track is lined in, in the manner shown in Fig. 5, the center curve of the track as so lined in passing through the points 18, 19, 20, etc., and the rails being properly gaged from this line, as shown in full lines in Fig. 5.

As will be apparent from the foregoing description, this gives practically a rule of thumb method for relining old curves, all measurements and computations required being of the most elementary sort and so simple that any foreman in charge of the work can readily line out the proper curve without the assistance of an engineer or other technically trained man.

Having thus described the invention, what is claimed as new is:

1. The method of determining the degree of railroad curves and for placing centers to put railroad curves in proper alinement which consists in dividing the outer rail of the track into distances of thirty-one feet, measuring the ordinate between each point so laid off and the chord between adjacent points on either side of the first, averaging the ordinates so obtained to get the average degree of curvature, fixing points opposite central points of curvature and in the middle of the track, running chords from these points with the average ordinate as the middle ordinate, measuring the distance from the center line of the curve so obtained to the center line of the tangent of the original curve and then changing one or both of the center points and running similar curves to obtain a curve in which this distance is one-half the gage of the track.

2. The method of determining the degree of railroad curves and for placing centers to put railroad curves in proper alinement, which consists in determining the curvature of the track at spaced intervals, averaging these curvatures to determine the average degree of curvature, fixing points in the middle of the track at the central portion of the curve and spaced thirty-one feet from each other, running a substantially sixty-two foot chord from one of these points, its middle ordinate being measured from the other of said points and being as many inches as the average curvature is degrees, the free end of this chord locating a third point, running a second substantially sixty-two foot chord from the second point to locate a fourth, and continuing this to plot the center line of the new curve.

3. The method of determining the degree of railroad curves and for placing centers to put railroad curves in proper alinement, which consists in ascertaining the average curvature of the track, fixing spaced points centrally of the track and curve, laying off

the average curvature from one of these points as a middle ordinate, running a chord from the other point through the end of the ordinate to a point as far beyond the ordinate as the ordinate is beyond the other point thus locating a third point, repeating this operation with the first and third points, etc. to the easement of the curve and

running the center line of the new curve through the points so located.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM T. DOBYNS. [L. S.]

Witnesses:
PAUL F. SALE,
T. W. SLIVER.