

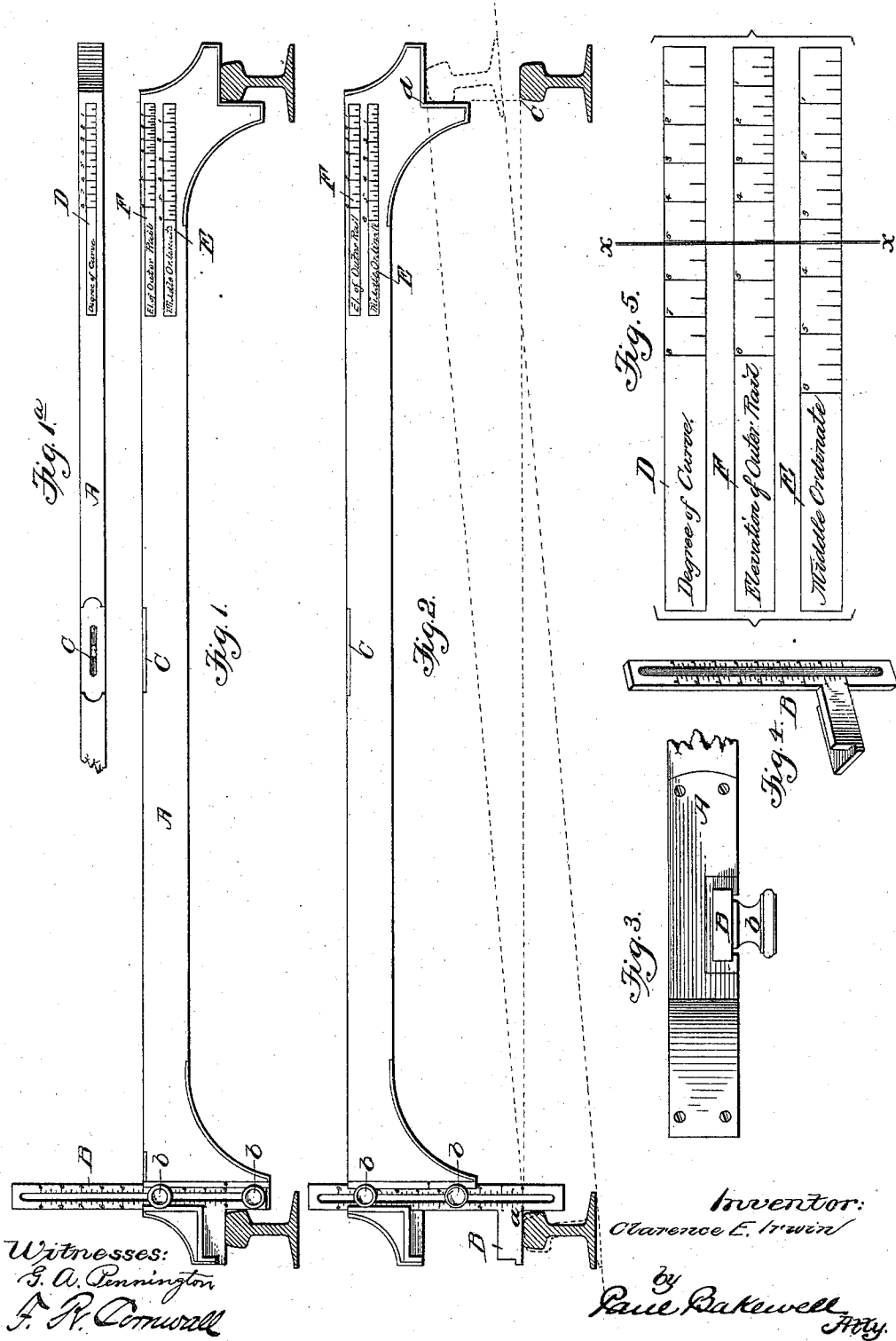
(No Model.)

2 Sheets—Sheet 1.

C. E. IRWIN.  
TRACK GAGE.

No. 577,580.

Patented Feb. 23, 1897.



(No Model.)

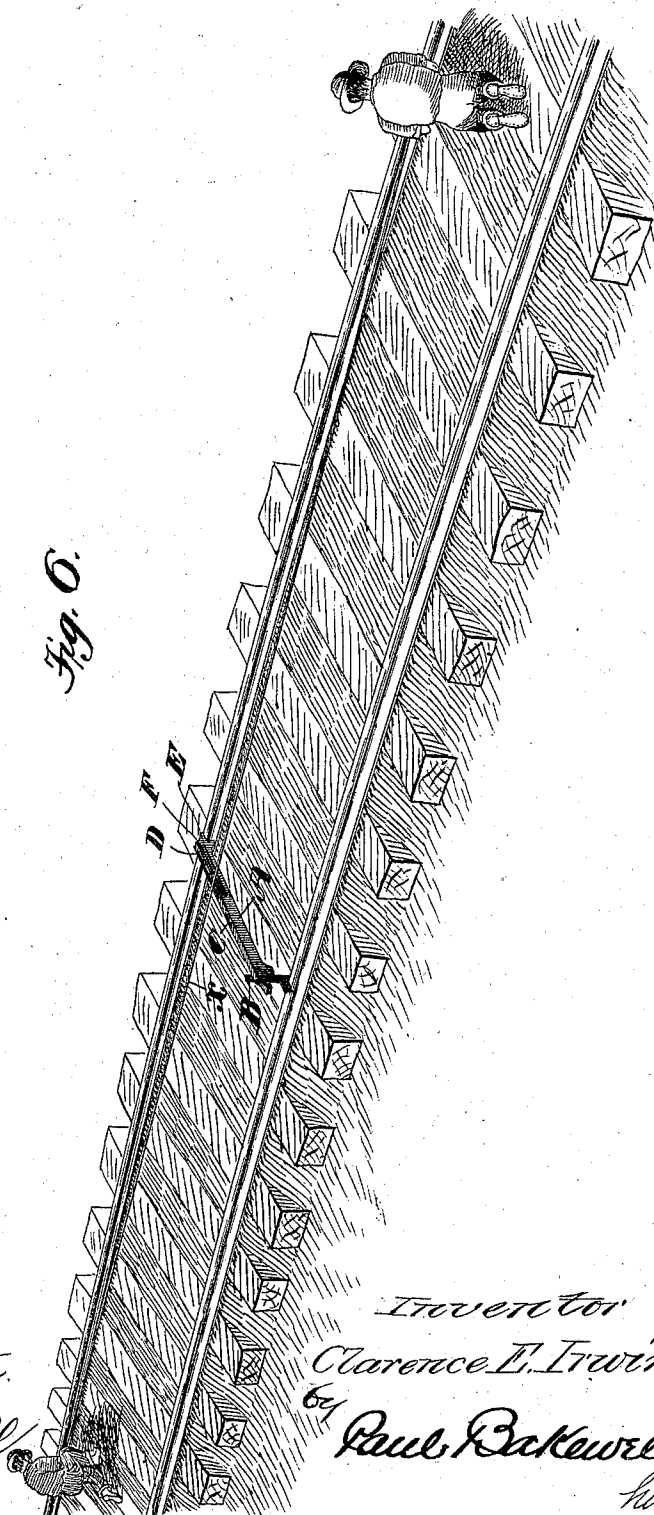
2 Sheets—Sheet 2.

C. E. IRWIN.  
TRACK GAGE.

No. 577,580.

Patented Feb. 23, 1897.

Fig. 6.



Witnesses:  
G. A. Pennington.  
J. R. Cornwall.

Inventor  
Clarence E. Irwin,  
by Paul Backwell.  
his atty.

# UNITED STATES PATENT OFFICE.

CLARENCE E. IRWIN, OF ST. LOUIS, MISSOURI.

## TRACK-GAGE.

SPECIFICATION forming part of Letters Patent No. 577,580, dated February 23, 1897.

Application filed April 4, 1896. Serial No. 586,205. (No model.)

*To all whom it may concern:*

Be it known that I, CLARENCE E. IRWIN, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Track-Gages, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a side-elevational view of my improved track-gage in position on a track, showing the same used as an ordinary standard-gage. Fig. 1<sup>a</sup> is a fragmentary top plan view of the gage. Fig. 2 is a side-elevational view showing my improved gage in position on a curve. Fig. 3 is an enlarged top plan view illustrating the bracket and its guideway. Fig. 4 is a detail view of the adjustable bracket. Fig. 5 is a view illustrating the several scales, and Fig. 6 is a view illustrating the manner of using my improved track-gage on a curve.

This invention relates to a new and useful improvement in track-gages, the objects being to construct a gage by which can be determined, first, the degree of curvature of an unknown curve; second, the elevation to be given the outer rail or which the outer rail should have in any curve; third, the middle ordinate of a cord by which the radius may be determined, and, fourth, the widening of the rails for curves to accommodate the fixed wheel-base of rigid trucks.

With these objects in view the invention consists in arranging a number of suitable scales on the gage, which scales are adapted to cooperate with a chord made by a line, such as a tape-measure, which indicates at its point of contact with the gage in respect to the scales the degree of the particular curve being measured, the height to which the outer rail in that curve should be raised or should occupy to comply with the standard table of elevations for given curves and the middle ordinate for a given length of chord of the curve being measured.

The invention further consists in arranging an adjustable foot or bracket at one end of the gage, whereby when the elevation which the outer rail should occupy has been estab-

lished this bracket can be adjusted accordingly, and should the outer rail not reach that level it can be built up to the required level, which is determined by a spirit-level arranged on the gage. Incidentally this feature of the invention involves another important factor in the construction of railroad-curves, and that is the widening of the gage to accommodate the wheel-base of rigid trucks. This is one of the results flowing from the use of a gage such as I have shown, and I therefore claim it as my invention.

Other minor details of the invention reside in the construction, arrangement, and combination of the several parts all to be hereinafter described, and afterward pointed out in the claims.

In the drawings, A indicates an ordinary standard track-gage, having the usual seats or recesses at its ends to cooperate with the rails to determine their proper distance apart. One of these seats is movable or is formed as an adjustable bracket B, mounted in a suitable guideway, said bracket being preferably slotted to receive binding-screws, which hold the bracket in adjusted positions, although there are other forms of locking devices for this bracket which could as advantageously be used. This bracket is provided with a scale, preferably in inches, starting from a fixed zero-point on the gage when the bracket is in its normal position or "home" and running up the vertical member of the bracket eight or nine inches, as shown in Fig. 1. It will of course be understood that the scope of adjustment of this bracket and this scale could be increased as much as desired, but nine inches has been found sufficient for ordinary usage.

C indicates a spirit-level whose use and operation are well understood. This spirit-level is preferably located on the top of the gage, about its middle.

D indicates a scale which I will term the "degree-of-curve" scale and is marked with points which indicate the degree of curve in a given arc from a tangent, said arc having a given chord. This scale is used to save the trouble of a trigonometrical survey if such has never been made.

E indicates a scale which is marked with points, preferably in inches, which indicates the distance between the crown of the arc being measured or the outer rail and the chord of the same or the length of the middle ordinate.

F indicates a scale which is marked with points to indicate the elevation which the outer rail should occupy to conform to the standard of elevation for outer rails in given curves. It is by this scale that the bracket B is adjusted.

The operation of the device is as follows: As shown in Fig. 1, the device can be used as an ordinary standard track-gage. We will assume, however, that the track in Fig. 1 is on a curve whose degree, &c., is unknown and it is desired to have the same conform to the standard of curves. A tape-line or other cord or chain, whose length in coöperation with my improved gage has been predetermined and the scales made accordingly, is placed upon the inner edge of the outer curved rail and forms a chord of which the rail is the arc, as shown in Fig. 6. I will assume that this tape-measure is fifty (50) feet long and that the twenty-five (25) foot mark is located immediately above my track-gage in position. The tape-measure is stretched taut and the scales read. We will assume that  $x$  in Fig. 5 indicates the tape-measure. The readings of the scales will show that it is a five-degree curve, that the outer rail should be elevated four and one-half inches, and that the length of the middle ordinate, or the distance between the arc or outer rail and the chord or tape-measure, is about three and three-eighths inches. These figures can be employed in reports, &c. Having ascertained this, the next thing to do is to elevate the outer rail to the height indicated by the scale. To do this, the bracket B is adjusted down until its four and one-half inch mark is opposite the zero-mark on the gage and the binding-screws  $b$  tightened. The outer rail is now raised, as shown by the dotted lines in Fig. 2, until the spirit-level reading shows that it has reached the proper elevation. In elevating this outer rail by the use of the laterally, or, I might say, the vertically adjustable bracket, the gage of the rails is widened in proportion to the square of the altitude, which, we will say, is represented by the square of the dotted line extending from points  $a$  to  $c$ , plus the square of the base, which, we will say, is represented by the square of the dotted line extending from point  $c$  to point  $d$ , which combined squares equal the square of the length of the hypotenuse, or the distance between the points  $a$  and  $d$ . The less the degree of curvature, the less will be the widening of the gage, as the bracket will be lowered very little and the base of this triangle lessened accordingly, while the shorter the radius of the curve or the greater the degree of curve the more the bracket will be lowered, and consequently

this base will be lengthened, making the hypotenuse of the right-angle triangle so formed, or the distance between the rails, greater.

I am aware that many minor changes in the construction, arrangement, and combinations of the various parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of the invention.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A track-gage for determining the degree of curvature of a track-curve, said gage having a scale arranged thereon near the end which coöperates with the outer rail, and with a cord or tape-measure which is adapted to be placed on the outer rail on each side of said gage; substantially as described.

2. In a track-gage for railroad-curves, the combination with the body portion of the gage, a scale on said body portion for determining the elevation which the outer rail of the curve being measured, should occupy, and a cord or tape-measure for coöperating with said scale; substantially as described.

3. In a track-gage for railroad-curves, the combination with the body portion of the gage, a scale on said body portion for determining the elevation which the outer rail of the curve being measured, should occupy, a cord or tape-measure for coöperating with said scale, an adjustable bracket on the end of said body portion, and a spirit-level arranged in said body portion; substantially as described.

4. In a track-gage for railroad-curves, the combination with the body portion of the gage, a scale on said body portion for determining the elevation which the outer rail of the curve being measured, should occupy, a scale on said body portion for determining the degree of curvature, and a cord or tape-measure for coöperating with said scales, substantially as described.

5. In a track-gage for railroad-curves, the combination with the body portion of the gage, a scale on said body portion for determining the elevation which the outer rail of the curve being measured, should occupy, a scale on said body portion for determining the degree of curvature, a scale on said body portion for determining the middle ordinate, and a cord or tape-measure for coöperating with said scales; substantially as described.

6. The combination with the body portion of a track-gage, which gage is designed to be used on curves and in connection with a cord or tape-measure, of a scale on said body portion which is adapted to coöperate with the cord or tape-measure for determining the elevation which the outer rail of the curve should occupy, a vertically-slotted bracket which is adjustably mounted on one end of the body portion of the gage, said bracket

having a scale on its vertical member by which it is adjusted, a rail-seat on the lower end of the bracket, and a spirit-level for establishing the proper elevation of the outer  
5 rail after the bracket has been adjusted; substantially as described.

In testimony whereof I hereunto affix my

signature, in presence of two witnesses, this 14th day of March, 1896.

CLARENCE E. IRWIN.

Witnesses:

HUGH K. WAGNER,  
F. R. CORNWALL.