No. 665,024. Patented Jan. 1, 1901.

# N. E. LISTER.

## DEVICE FOR SURFACING OR GRADING RAILROAD TRACKS.

(Application filed Dec. 4, 1899.)

(No Model.)

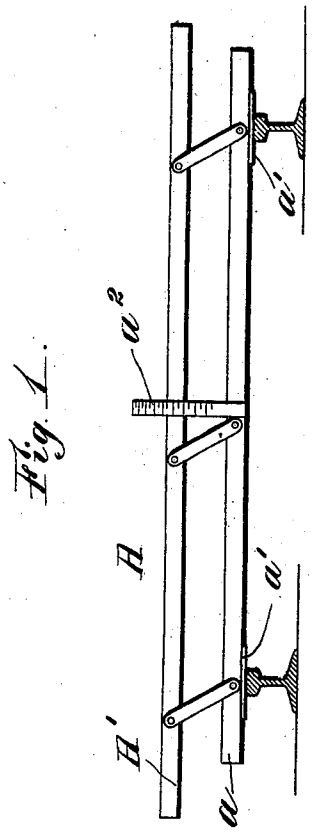


Fig. 1.

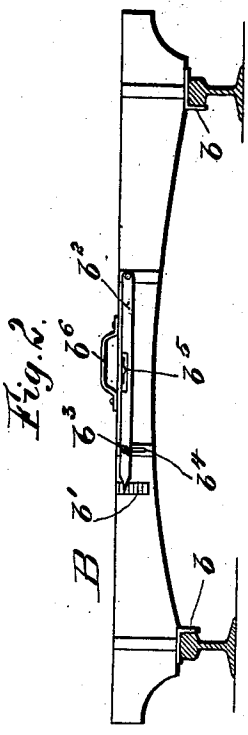


Fig. 2.

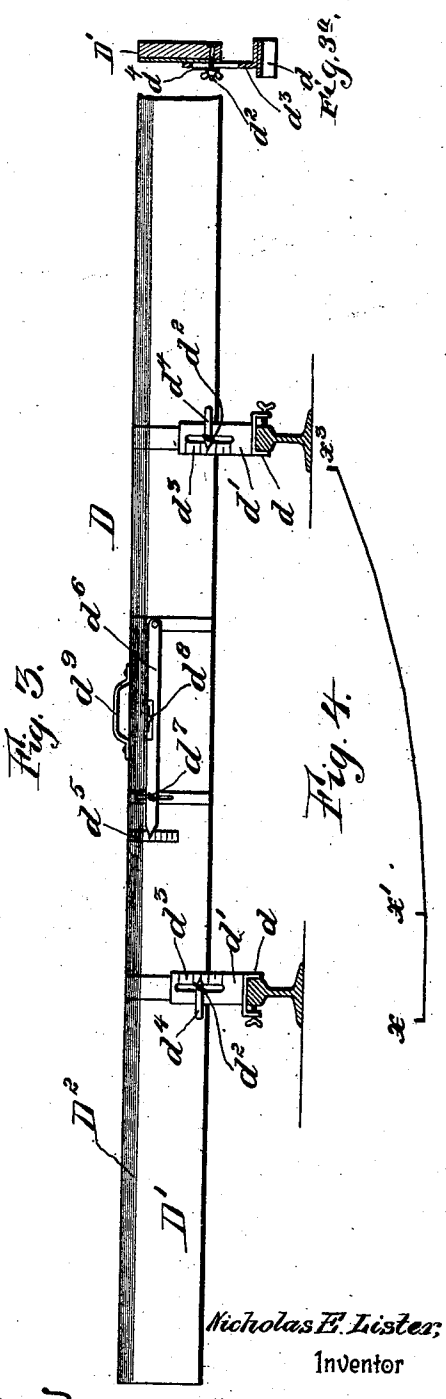


Fig. 3.



Fig. 4.

Witnesses:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

NICHOLAS EDWARD LISTER, OF WESTFIELD CENTRE, CANADA.

## DEVICE FOR SURFACING OR GRADING RAILROAD-TRACKS.

SPECIFICATION forming part of Letters Patent No. 665,024, dated January 1, 1901.

Application filed December 4, 1899. Serial No. 739,093. (No model.)

*To all whom it may concern:*

Be it known that I, NICHOLAS EDWARD LISTER, a subject of Her Majesty the Queen of Great Britain, residing at Westfield Centre, county of Kings, Province of New Brunswick, Canada, have invented certain new and useful Improvements in Devices for Surfacing or Grading Railroad-Tracks; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to devices for surfacing or grading railroad-tracks; and one object is to provide an improved device of this character by means of which the surfacing of tracks may be easily and quickly effected with absolute accuracy.

A further object is to provide a device for this purpose which is simple in construction, accurate in operation, easily handled, and which can be manufactured at a moderate cost.

To these ends the invention consists in a device for surfacing railroad-tracks constructed substantially as herein illustrated and described, and defined in the appended claims.

Referring to the drawings, in which similar letters of reference indicate similar parts, Figure 1 is a view in elevation of one of the parts which form the track-surfacing device contemplated by this invention. Fig. 2 is a similar view of another part, and Fig. 3 is a similar view of the other of said parts. Fig. $3^a$ is a section of Fig. 3, taken through the supporting-standard. Fig. 4 is a diagram of a track to be surfaced.

In the drawings, A represents one of the three parts forming the improved track-surfacing device, which may for convenience be termed the "first sight" and consists of a bar $a$, which may be of wood, metal, or other suitable material and of sufficient length to extend across the track of a railroad and project beyond the rails a suitable distance on each side, as clearly shown in Fig. 1. The bar $a$ is provided with means whereby it may rest firmly upon the rails, consisting, preferably, of a metal plate $a'$, fastened upon the under side thereof. At a suitable point on the bar $a$ is secured a vertically-extending plate $a^2$, upon which is indicated a scale in fractions of an inch, ranging from zero up and down a suitable number of inches. Pivotally connected to the bar $a$ by means of the links $a^3$ is the adjustable bar A', the connection being such as to always maintain the bar A' in a position parallel with the bar $a$, as shown in Fig. 1. The height to which the bar A' is adjusted above or below the zero-mark may be ascertained by a glance at the indicator-plate $a^2$.

The second part of the device is illustrated in Fig. 2, in which is shown the second sight B, which comprises, preferably, a beam or metal plate of a length sufficient to extend across the track and is provided upon its lower edge with suitable plates $b$, having a downwardly-extending flange arranged to bear upon the inside of the rails, by means of which it is steadied and prevented from being blown over by the wind. At a suitable point on the beam B is arranged a scale $b'$, similar to that above described, and operating in connection with said scale is an indicator-arm $b^2$, which is pivoted to the beam B so that the end thereof is adapted to move up and down along the scale $b'$. A suitable binding-screw $b^3$ is mounted in the indicator-arm $b^2$ and engages a slot $b^4$, whereby the indicator-arm may be retained in any adjusted position. Upon the upper surface of the indicator-arm $b^2$ is mounted a suitable fluid-level $b^5$. A suitable handle $b^6$ may be secured to the beam B for convenience in handling the device.

The third part or sight of the device (illustrated in Fig. 3) consists of a beam D of any suitable material, which also is adapted to extend across the track, but is of much greater length than the other parts A and B, above described. The beam D is adapted to be fastened to the rails by means of the clips $d$, through which pass binding-screws which are adapted to engage the rails. The clips $d$ are each provided with an upwardly-extending arm $d'$, which is slotted to receive a binding-screw $d^2$. Upon the arm $d'$ is formed a suitable scale $d^3$, and an indicator $d^4$ is mounted upon the binding-screw $d^2$ and projects over the scale $d^3$. By means of this construction either or both ends of the beam D may be vertically adjusted and locked in their adjusted positions, the indicator noting the degree of

adjustment. The lower portion D′ of the beam D is given a distinguishing color, preferably white, while the upper portion $D^2$ is given a different color, preferably black, for convenience in sighting. A suitable scale $d^5$ is formed upon the side of the beam D, and an indicator-arm $d^6$ is pivoted to the beam so as to move at its outer end up and down said scale in a manner similar to that described above in connection with the sight B. A binding-screw $d^7$ serves to fix the indicator-arm $d^6$ in its adjusted position. A suitable fluid-level $d^8$ is arranged upon the upper side of the indicator-arm $d^6$, and a handle $d^9$ may be provided for convenience in handling the sight.

When it is desired to lift to grade a portion of sunken track where the grade is straight, the sight shown in Fig. 1 is placed on the rails where the grade is correct and the sight shown in Fig. 2 is also placed on the rails where the grade is correct, near sight No. 1, a short distance from the sunken portion. The sight shown in Fig. 3 is placed on the rails at a point where the grade is correct, but on the other side of the sunken portion. The sight No. 1 is now adjusted to the same height as sight No. 2, which will be at the zero-mark, and the sight No. 3 is adjusted until the tops of sights Nos. 1 and 2 range with the bottom of the black portion of sight No. 3. Sight No. 2 is now moved to the end of the first rail-section of the depressed portion of the track, and this rail-section is raised or lifted until sights Nos. 1 and 2 range with sight No. 3. Sight No. 1 is now moved up to sight No. 2, and sight No. 2 is moved another rail-section toward sight No. 3, and this rail-section is lifted, as before described. This operation is continued until the sight No. 3 is reached, when the whole of the sunken portion will be lifted to the true grade.

When it is desired to lift to grade a portion of a track that is irregular or out of surface where the grade is an upgrade, as shown in Fig. 4, the sight No. 1 is placed at $x$, where the grade is correct, and the sight No. 2 is placed at $x'$, where the grade is also correct, the two sights being one rail length apart. The sight No. 3 is placed any desired distance from sight No. 2, as at $x^3$, and adjusted to the height corresponding with the height to which the rails at that point must be raised. Sight No. 1 is now adjusted so as to range with sight No. 2 and the black portion of No. 3 in this instance. Sight No. 1 would be lowered below the zero-mark, which is at the level of the top of sight No. 2. The number of inches sight No. 1 has been adjusted is noted and divided by the number of rail lengths between sights Nos. 2 and 3. Sight No. 2 is now moved one rail length toward sight No. 3, and sight No. 1 is placed at the point formerly occupied by sight No. 2. Sight No. 1 is now raised to a height equal to the product found by dividing the original adjustment of sight No. 1 by the number of rail lengths and the rails at the point where sight No. 2 is placed raised until sights Nos. 1, 2, and 3 range. Sight No. 2 is now moved another rail length toward sight No. 3 and sight No. 1 moved to the point last occupied by sight No. 2 and adjusted another proportionate height. The rails at sight No. 2 are then raised until sights Nos. 1, 2, and 3 range. This operation is repeated until the last rail next to sight No. 3 has been raised to grade. By this method the track can be brought to a perfect grade from one point to another, however great the distance may be.

The fluid-levels on the sights serve to indicate the desired elevation of one rail with respect to the other. If the two rails are to be in the same plane, the indicator-arms are placed at zero, and when the bubble of the level is at the center the rails are in true horizontal level. If it is desired to elevate one rail higher than the other, as in curves, the indicator-arms of sights Nos. 2 and 3 are adjusted to the required point and the rail lifted until the bubble is at the central point.

The sight No. 2 is also useful to ascertain whether the rails are at their proper gage and also level or in the same horizontal plane.

It is believed the methods of using the device will be understood in view of the above description without further detailed explanation.

While I have herein shown a preferred form of carrying my invention into effect, yet I do not desire to limit myself to such preferred details of construction, but claim the right to use any and all modifications thereof which will serve to carry into effect the objects to be attained by this invention in so far as such modifications and changes may fall within the spirit and scope of my said invention.

I claim—

1. In a device for grading railroad-tracks, a sight comprising a track-bar having means for supporting the same on track-rails, a vertically-extending scale, an adjustable bar arranged to traverse the scale, and links pivoted to the adjustable bar and to the track-bar and maintaining the former in parallel relation to the latter, substantially as described.

2. In a device for grading railroad-tracks, a sight comprising a beam, supporting-standards each provided with a scale and with a clamp for attaching the same firmly to a rail, means for adjustably clamping the beam to the separate standards and permitting an independent adjustment of either end of the beam, and a level connected adjustably to the beam between the points of union of the latter with said standards, substantially as described.

3. In a device for grading railroads, an adjustable sight comprising a lower bar adapted to rest upon the rails, an adjustable bar; links arranged at each end of said adjustable bar, whereby the said bar is pivotally connected to said lower bar; and a scale-plate secured

to said lower bar, for indicating the adjustment of said adjustable bar, substantially as described.

4. In a device for grading railroads, an adjustable sight comprising a beam having a distinguishing color along its upper portion, supporting-standards adjustably secured to said beam and adapted to be clamped to the rails; a scale arranged on each of said standards; a scale arranged on said beam; an indicator-arm adjustably pivoted to said beam adjacent to said scale; a level mounted on said indicator-arm; and means for locking the indicator-arm in its adjusted position, substantially as described.

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

NICHOLAS EDWARD LISTER.

Witnesses:
J. A. MARION,
R. A. DE OLLOQUÈ.