Aug. 21, 1951 M. H. LEMAIRE 2,565,382

SIGHTING DEVICE FOR THE LEVELING OF RAILWAY TRACKS

Filed Aug. 19, 1948 2 Sheets-Sheet 1

Fig.6.

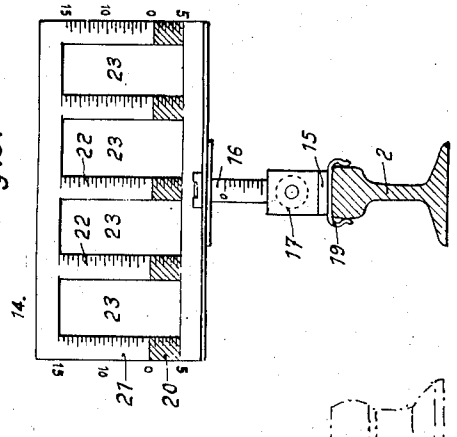


Fig.5.

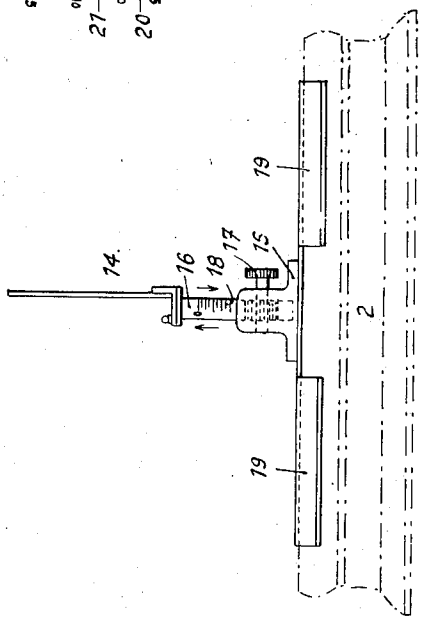


Fig.7.

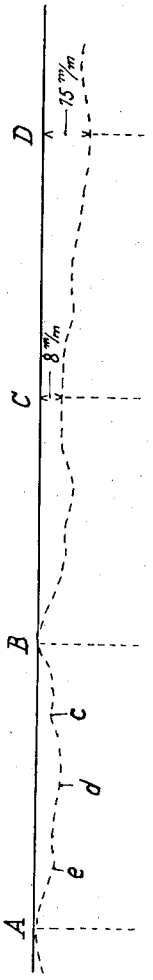
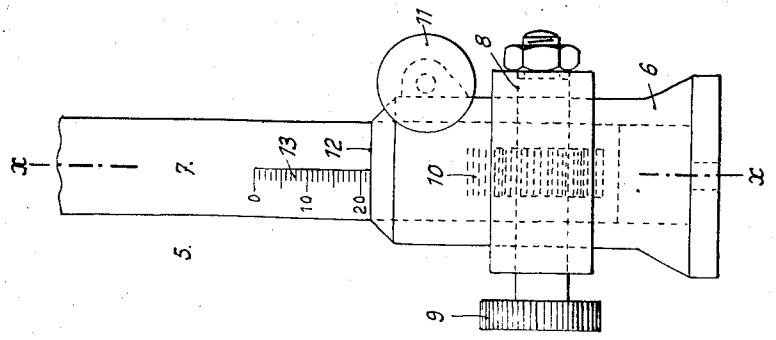


Fig.1.

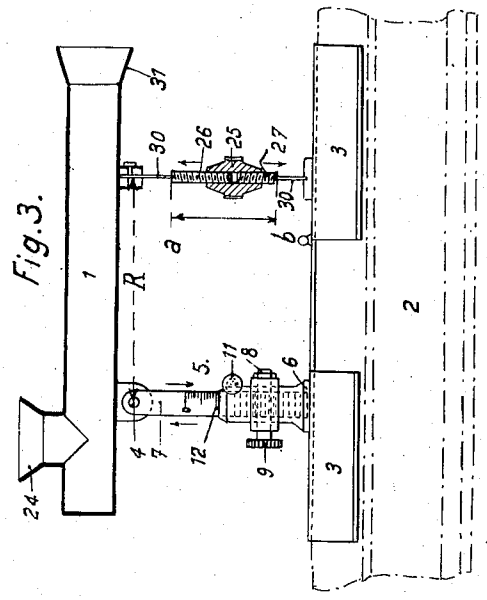


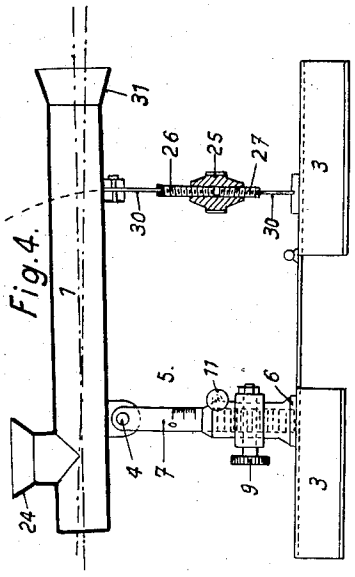
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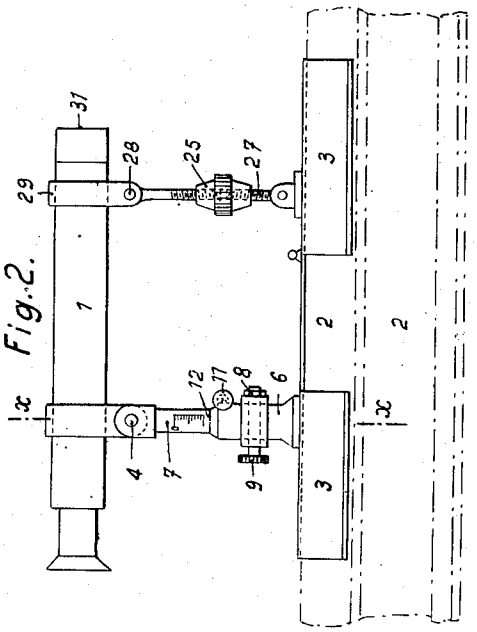
Aug. 21, 1951 M. H. LEMAIRE 2,565,382

SIGHTING DEVICE FOR THE LEVELING OF RAILWAY TRACKS

Filed Aug. 19, 1948 2 Sheets-Sheet 2







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2,565,382

SIGHTING DEVICE FOR THE LEVELING OF RAILWAY TRACKS

Maurice Henri Lemaire, Paris, France

Application August 19, 1948, Serial No. 45,167
In France April 12, 1948

2 Claims. (Cl. 33—60)

1

This invention relates to sighting devices for the levelling of railway tracks.

In his United States Patent No. 1,922,895, the applicant has already described a method and means for the levelling of railway tracks and, more particularly, for measuring the permanent visible subsidence of certain portions of the track when said track is not loaded.

The contemplated devices comprised three elements, viz., an oscillating sighting-telescope (having a web constituted by crossed horizontal and vertical wires), a levelling-rod and a target provided with perforations and a multiple scale graduation.

These apparatus which during operation are secured on the rail, were respectively supported by holding means which were stationary, that is to say, which did not allow one to move them, if desired, in the vertical direction.

This invention has for its object to materially simplify and advantageously improve the aforesaid apparatus which, in practice, allows a considerable cost reduction and quicker and easier measuring operations.

The improvements primarily comprise:

1. Substituting for the assembly constituted by the perforated and graduated target and the levelling-rod a single element acting as a perforated levelling-rod and ensuring simultaneously the functions previously performed by both elements.

2. Substituting for the stationary supports of the sighting device thus reduced to two pieces of apparatus (sighting-telescope and levelling-rod) extensible supports which allow one to impart to said apparatus a vertically measured motion.

3. Combining possibly the double threaded rod constituting the front support of the telescope with one or more flexible steel strips acting as a guiding and returning means when the telescope is pivoted about its horizontal axis.

The aforesaid improvements are illustrated in the accompanying drawings in which:

Fig. 1 is a partial view of an extensible support.

Fig. 2 is a side elevation view of an embodiment of the sighting-telescope provided with said support.

Fig. 3 is a side elevation view of a modified embodiment of the telescope.

Fig. 4 is a view corresponding to Fig. 3 after a certain oscillation of the telescope.

Fig. 5 is a side elevation view of the perforated levelling-rod.

Fig. 6 is a front view of Fig. 5.

Fig. 7 shows schematically the use of the improved sighting device.

2

In each figure:

1 indicates the sighting-telescope which is secured on the rail 2 by means of resilient jaws 3—3 which take their bearing on the side faces of the rail-head, as described in the above mentioned patent application.

The telescope the reticle of which comprises two crossed horizontal and vertical wires may be swung about an axle 4 carried on an extensible support 5 the base 6 of which is constituted by a socket integral with one of resilient jaws 3.

In socket 6 may slide a rod 7 graduated in millimeters and supporting axle 4. A spindle with pinion 8 controlled by a milled knob 9 meshes with a rack 10 on rod 7 for generating the vertical motion of said rod along axis x—x.

A locking screw 11 allows one to lock the supporting rod 7 in each one of the well-defined positions into which it is moved due to the rotation of milled knob 9. A bevelled edge of base 6 is used as a reading mark on graduation 13 on rod 7.

The apertured levelling-rod 14 (Figs. 5 and 6) is secured on an extensible support 15—16, with a control milled knob 17 and a graduation 18 this assembly being similar to the telescope assembly just described. The levelling-rod is in turn secured on the rail by means of resilient jaws 19—19. The said levelling-rod is constituted by a rectangular screen having two superposed areas 20, 21 which are differently colored, the lower area 20 being for example colored red.

The levelling-rod comprises a plurality of sets of vertical graduations 22, five in the present case, said graduations being separated from each other by the perforations 23. The figures of the graduations are preferably reversed so that they may be easily read through the sighting telescope. Each one of said graduations is divided into two portions bounded by the zero marking line; one of said portions the mark figures of which increase upwardly indicates the positive corrections while the other one the mark figures of which increase downwardly indicates the negative corrections.

The alternative embodiment of the sighting-telescope shown in Figures 3 and 4 differs from the above described embodiment primarily in that the sighting-telescope instead of being straight is bent so that the sighting takes place not horizontally but from the top by means of an eyepiece, 24. This telescope sighting device may be of the type described in the United States patent application No. 10,755 filed on February 25, 1948, now abandoned.

On the other hand, while in the first embodiment the body of telescope 1 was pivoted about axle 4 through the action of a milled nut 25 on a double threaded rod 26—27 directly coupled through an axle 28 to a collar 29 on said body, in the embodiment of Figs. 3 and 4 said rod is connected to the telescope body through flexible steel strips 30—30.

Thus when the milled nut is acted upon to cause the oscillation of the telescope about axle 4, flexible strips 30 tend to become incurved along a circumference arc the centre of which is at 4 and the radius of which is R, portion *a—b* corresponding to the double threaded rod being of course left straight. Said flexible strips 30 ensure also a rational guiding of the telescope body during its oscillation and moreover take up the possible looseness of the telescope on axle 4.

The action of flexible strips 30 is the same, whichever may be the direction in which milled knob 9 is acted upon.

The practical use of the two-element sighting device according to the invention is illustrated in Fig. 7 and will be described hereunder.

The problem of the levelling of a line of rails between two points A—B considered as "correct" and taken as zero points will be first contemplated.

The sighting telescope is located at point A and the levelling-rod at point B, then both apparatus are adjusted so that their respective levels are made horizontal. The telescope is then focussed on the levelling-rod and the horizontal wire of the telescope web is moved by means of the control knob 25 onto the zero line of the levelling rod.

For this operation and in the case under consideration care must be taken to previously bring supporting rod 7 of the telescope body to its lower position, the zero line being flush with the bevelled edge 12, by operating milled knob 9 then locating screw 11.

A "zero" is written on the cross-tie in front of point B, then the levelling-rod is brought nearer to the telescope. At several positions, *c, d, e,* the difference of level is measured with respect to point A where the telescope remains. These measurements are effected by a mere reading on scales 22 of the levelling-rod, through the telescope. As previously, the plurality of the scales makes the reading easier in the curves of the track.

In another case, the levelling of a line of rails between two points C—D is to be effected together with the raising of said points. For example, it is contemplated to effect the levelling while raising points C and D of 8 mm. and 15 mm., respectively.

The sighting-telescope is set into position at C and the levelling-rod at D after having operated milled knobs 9 and 17, respectively, of the telescope and of the levelling-rod so as to mark 8 mm. on the first one and 15 mm. on the other one. By means of knob 25, the horizontal wire of the telescope web is brought on the zero line of the levelling-rod. As in the previous case, the levelling-rod is brought nearer to the telescope while taking readings without varying the setting knobs 9 and 17.

In the heretofore used systems, it was necessary, for obtaining the same result, to interpose between the rail and the apparatus bases, long wood wedge-pieces of a corresponding thickness, i. e. in the present case, an 8 mm. wedge-piece at position C under the telescope and a 15 mm. wedge-piece at position D under the levelling-rod. The further operations were similar to those above described, the levelling-rod being moved without interposition of any wedge-pieces, but the 8 mm. wedge-piece being kept under the telescope.

It will be easily understood that the improvements in the respective supports of the telescope and of the levelling-rod making them extensible allow one to suppress the use of such wedge-pieces, owing to the measured sliding system of the supporting-rod of the said apparatus, telescope and levelling-rod, in their holding socket.

An additional improvement of the system consists in adding to the telescope, in its portion opposite to the eyepiece, a removable sunshade 31, constituted by a cylindric tube which is fitted on the front end of the telescope body; this extension which has a length of a few inches allows operators to effect sightings without being dazzled by the sun at certain hours of the day.

I claim:

1. A sighting device for the levelling of railway tracks comprising a sighting telescope having at its end located near the objective, an extensible support articulated on both its ends, and at its end located near the eyepiece, an extensible support, on the one hand, articulated on the locking collar of the telescope and, on the other hand, slidably mounted in a base serving as a sleeve, said last named extensible support having means for its locking on the supporting sleeve.

2. A sighting device for the levelling of railway tracks comprising a sighting telescope having at its end located near the objective, an extensible support articulated at both its ends on flexible strips respectively fixed to the body of the telescope and to the base, and at its end located near the eyepiece, an extensible support, on the one hand articulated on the locking collar of the telescope and, on the other hand, slidably mounted in a base serving as a sleeve, said last named extensible support having means for its locking on the supporting sleeve.

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