

1,041,622.

Patented Oct. 15, 1912

Fig. 1.

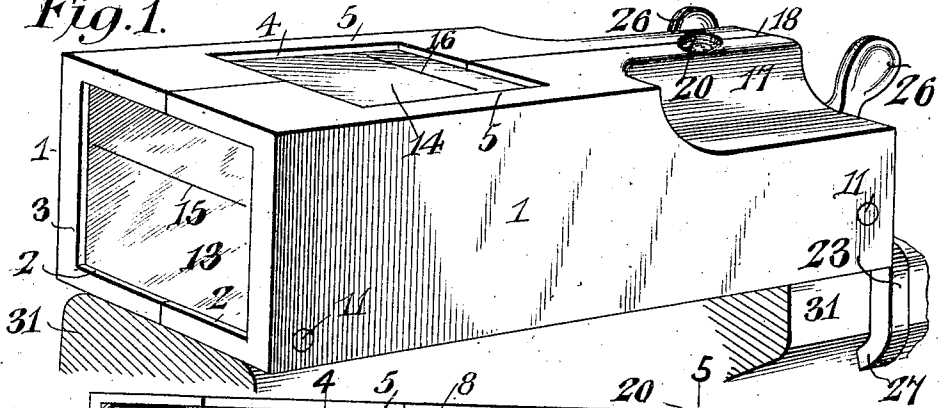


Fig. 2.

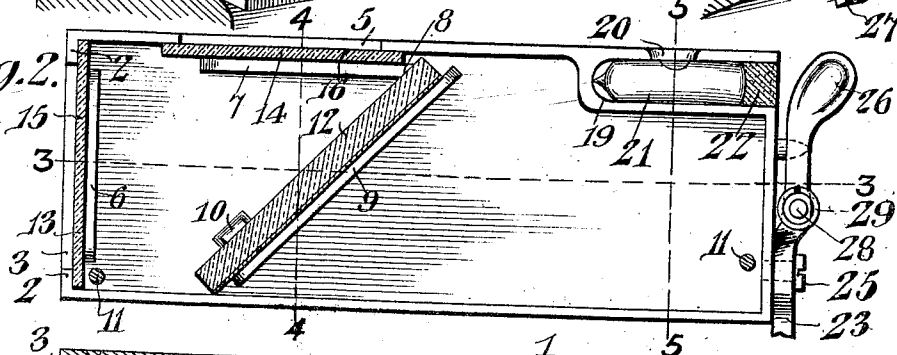


Fig. 3.

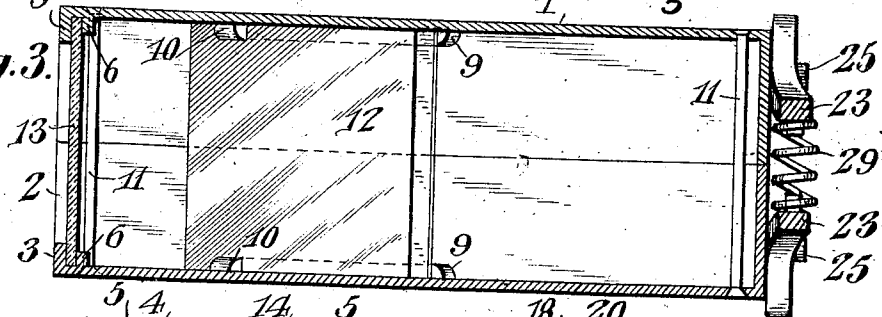


Fig. 4.

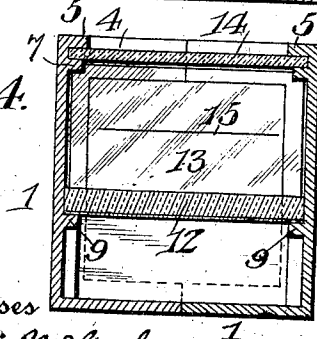
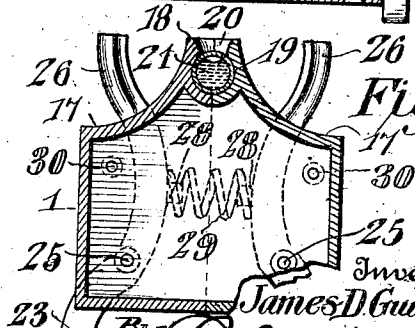


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

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LEVEL.

1,041,622.

Specification of Letters Patent.

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Application filed September 20, 1911. Serial No. 650,450.

To all whom it may concern:

Be it known that I, JAMES D. GUILFOYLE, a citizen of the United States, residing at Titusville, in the county of Brevard and State of Florida, have invented a new and useful Level, of which the following is a specification.

This invention has reference to improvements in leveling instruments for track laying and is designed more particularly for use by track foremen in surfacing and lining track, as well as for other uses.

When railway track rails are laid or replaced or other work is done on the track, it is customary for the track foreman to get down on the ground alongside of the track in a manner to bring the eye close to the track in order that a considerable length of track may be brought in line with the eye and such changes in level or alinement of the track be made as may be necessary. In order to facilitate such surfacing and lining of the track it has been proposed to employ a block or board with a sight-hole there-through at a certain distance above the track to approximately conform with the distance of the eye from the track when the head of the observer is close to the track rail. In combination with such device having a sight-hole there is provided a target movable along the track and this may be utilized in conjunction with a track-board appropriately marked so that the lining or surfacing of the track is facilitated. In all instances, however, it is necessary for the foreman to bring his head close to the track, and this means that the foreman must kneel upon the ground and bring the body close to the ground, this operation if frequently performed becoming very tiresome. With the present invention the same operations of surfacing and lining of the track rails may be performed without the necessity of the foreman kneeling and bending the body to bring the head low, and in fact need not bend the body more than is necessary to permit the gaze to be directed downwardly.

To this end the invention comprises a box-like structure inclosing an inclined mirror with sight-holes properly disposed with relation to the mirror, such sight-holes being covered by glass or other transparent plates upon which are produced indicating marks. The arrangement is such that the box-like body of the device may be readily secured

to a track rail and then by gazing directly downward upon the device so that the mirror is visible through what is then the upper glass plate, the vision is diverted by the mirror so that the line of track at what may be termed the front of the device is visible in the mirror, and by bringing the indicating marks on the two glass plates into coincidence and employing the usual target and track-board the track may be brought to the desired surface condition and into proper alinement with great facility.

The device is made of a size readily adapted to the coat pocket or to the tool kit and may be further provided with a level, where- by leveling of the track or of other devices is readily accomplished.

Devices of this character are liable to rough usage and to provide for convenient assembling and repairs the body of the structure is made in two parts which may be identical one to the other, except that one is a right hand member and the other a left hand member, and these parts are so constructed that when placed together with the glass plates and mirror in their proper places, the securing devices for the two parts of the body also constitute securing devices for the mirror and the glass plates. Moreover, in order that the device may be held to a track without liability of displacement, gripping or clamp devices are provided and the track rails may be adjusted to the desired position without danger of disturbing the relation of the device to the track rail upon which it is placed.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming a part of this specification, with the understanding, however, that while the drawings illustrate a practical embodiment of the invention, the latter is susceptible of other practical embodiments retaining the salient features of the invention, and consequently the invention is not limited to any exact conformity to the showing of the drawings.

In the drawings:—Figure 1 is a perspective view of the device of the present invention applied to a track rail. Fig. 2 is a longitudinal section on the line of division between the two parts of the body of the structure. Fig. 3 is a section on the line 3—3 of Fig. 2 with the mirror and its sup-

ports shown in plan. Fig. 4 is a section on the line 4—4 of Fig. 2. Fig. 5 is a section on the line 5—5 of Fig. 2.

Referring to the drawings there is shown
 5 a body structure 1 of generally rectangular form, being approximately square in cross section and of sufficient length for the purpose. A convenient size for the body member is three inches square in cross section
 10 and about eight inches long, but these figures are only given by way of example and are by no means mandatory. A body member of such size is sufficiently long and the cross sectional size does not prevent the ready carrying of the device in a coat pocket.
 15 The body member is made in two parts meeting along the center line of the completed body member, and the walls of the parts are made quite thin for the sake of lightness, so that if the entire structure be made of aluminum the weight is negligible, and even if made of heavier material the weight is even then not excessive. Considering one end of the structure as the front end, this end is provided with an opening
 20 2 formed by inturned flanges 3 and the top of the structure is formed with an opening 4 which is spaced an appropriate distance from the front of the body member and does not reach quite to the sides of the body member, thereby providing overhanging flanges 5 defining the sides of the opening 4. Each half of the body member has formed on its side member on the inner surface
 35 thereof an instanding flange 6, adjacent but spaced a short distance from the corresponding flange 3 and also another flange member 7 similarly located with reference to the corresponding flange 5, and what constitutes the rear end of the flange 7 is beveled as shown at 8. Also formed on the inner face of each side of the half member of the body 1 is another flange 9 inclined with relation to the top and bottom of the body member
 40 at an angle of forty-five degrees, and this flange 9 extends from a point near the top of the corresponding half of the body member 1 to a point near the bottom thereof, the upper end of the flange 9 being spaced an appropriate distance back of the beveled end 8 of the flange 7. In front of the lower end of each flange 9 there is formed an outstanding elongated stud 10 parallel with the flange 9 and spaced therefrom a distance
 55 approximately the same as the distance between the beveled end of the flange 7 and the corresponding end of the flange 9. The two body members are secured together by rods 11, one near the front and the other
 60 near the rear, but this does not preclude the use of more rods, if desired. The rods are shown as riveted at the ends, but it will be understood that other fastening means in place of riveted rods may be employed.
 65 When the two halves of the body member

are assembled, a mirror 12 is lodged on the flanges 9 and held against movement by the beveled ends 8 of the flanges 7 and the studs 10. The openings 2 and 4 are covered by glass plates 13 and 14, respectively, lodged
 70 between the flanges 3 and 6 and between the flanges 5 and 7, respectively.

Produced upon the plate 13 is an indicating mark 15 and produced upon the plate 14 is an indicating mark 16 and both of these marks may be in the form of a line cut into the plate and filled with pigment or produced in any suitable manner, a line being the form of indication best adapted for the purposes of the invention, although indications other than in the form of a line may be employed. The lines 15 and 16 are so related that the line 15 will be at a predetermined distance above the bottom of the body member and the line 16 will coincide with the reflection of the line 15 in the mirror 12 when the angle of incidence and the angle of reflection define an angle of ninety degrees, the mirror 12 being set at an angle of forty-five degrees to the planes of the plates 13 and 14, and these latter plates being set at an angle of ninety degrees one to the other.

The side and top members of the body 1 are contracted near the rear end of the body member as indicated at 17, thereby defining finger spaces for a purpose which will presently appear, and these contracted portions unite in a ridge 18 rising to the level of the top of the body member, and in this ridge is formed a socket 19, one half of the socket being formed in one half of the ridge, and the other half in the companion half of the ridge, the central division line of the body member extending longitudinally and centrally through the socket 19. At the top of the ridge the two body members are formed with openings coacting to constitute a sight-opening 20, whereby the interior of the socket may be viewed, and this socket is designed to contain a level glass 21 of appropriate form which may be held in place by a plug 22 introduced into the rear end of the socket, which is initially formed open for the purpose. It is customary to make the plug 22 of plaster of Paris or some such material, but any appropriate plug may be employed, the purpose being to confine the level glass 21 in position in such manner that when the body member is level the large bubble in the glass is central to the opening 2, or to a suitable indication on the level glass.

The tread of a railway rail does not constitute a very certain support for a structure of the character herein described and shown in the drawings, but for efficient use the device should be firmly held to the rail and at the same time be readily detachable therefrom. For this purpose there are piv-
 125
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oted to the rear end of the body member two grip levers 23, 23, on opposite sides of the center line, and these grip levers are held to the body member by pivots 25. The levers 5 are shown as of the first order, each with one arm constituting the upper arm when the device is in use, formed into a finger socket 26, and the other end extending below the bottom of the body member and bent as 10 shown at 27 to form a grasping member to underride the tread portion of the rail. On the finger socket end of the levers there are studs 28 for receiving a spring 29 tend- 15 ing to separate the finger ends of the levers and cause the gripping ends of the levers to approach, excessive movements of the levers under the action of the spring being pre- 20 vented by stop studs 30 which may be formed on the rear end of the body member. The finger ends 26 of the levers are long enough and so disposed as to be accessible from the contracted portion 17 of the body member.

When it is desired to apply the device to 25 a rail the finger ends 26 are caused to approach by being suitably grasped by the fingers of the operator and the spring 29 is compressed, thus separating the gripping ends 27 of the levers, which ends may then 30 be readily placed over a track rail, the latter being indicated at 31 in Fig. 1. The finger ends 26 being now released the expansion of the spring 29 will cause the gripping ends of the clamp levers to clasp the tread 35 of the rail in a manner to firmly hold the body member 1 against displacement on the rail while resting on said rail and the clamp members also tend to aline the body member with the rail.

40 It will be understood that the various expressions of position hereinbefore used are with relation to the operative position of the structure on a track rail and the terms front and back or rear are used with refer- 45 ence to the line of sight in the use of the device.

Let it be assumed that the body member 1 is resting on a track rail in alinement therewith, being secured to the track rail by 50 the clamp made up of the gripping levers and that it is desired to surface or line track rails in advance of the device in the direction of the line of sight through the plates 13 and 14 and by way of the mirror 12. The 55 track board may be placed in proper position upon the rail to be surfaced or lined and in the case of surfacing, the usual small target is placed upon the rail, the line 15 being at such a height above the rail upon 60 which the body is supported as to conform to the height of the target. Now by sighting through the plate 14 and bringing the indication 16 into coincidence with the indi- 65 cation 15, the rail carrying the target may

brought into proper relation to the usual mark upon the track board, and this may be done without the necessity of the track fore- man kneeling down at all, for the track fore- man need but to stand in position to gaze 70 down through the plate 14 to ascertain when the proper surface elevation of the rail being operated upon has been reached. For lining the track foreman has but to gaze as before through the plate 14 when the reflec- 75 tion of the line of rails will be seen in the mirror 12 and lack of alinement of these rails is readily ascertained. The leveling portion of the device is utilized in the usual manner and needs no special description. 80

By making the body member of two parts no special fastening devices or provision for the introduction of the glass plates and the mirror are necessary and all parts of these members except those purposely visible, are 85 completely covered or housed. Should the fragile parts become broken, the fastening devices 11 may be removed and the broken parts are readily replaced by new parts without the necessity of any special skill in 90 reassembling the parts, since the seats for the glass members will automatically position the parts at the proper angle.

What is claimed is:—

1. In a device for the purpose described, 95 a body member formed of two coacting parts provided with matching flanged openings and coacting flanges in spaced operative relation to the openings and with other flanges diagonally disposed with relation to the flanged openings and flanges coacting 100 therewith, transparent members forming closures for the openings and supported by the flanges, a mirror supported by the diagonal flanges, and means for securing the 105 two body members together to hold the transparent members and the mirror in operative position with reference one to the other.

2. In a device for the purpose described, 110 a body member formed of two coacting members provided with matching flanged openings and coacting flanges in spaced operative relation to the openings and with 115 other flanges diagonally disposed with relation to the flanged openings and flanges coacting therewith, transparent members forming closures for the openings and supported by the flanges, a mirror supported 120 by the diagonal flanges, and means for securing the two body members together to hold the transparent members and the mirror in operative position with reference one to the other, the transparent members forming 125 closures for the openings each having an indicating mark in coacting relation to the mark on the other.

3. A device for the purpose described comprising a body member with sight open- ings therein at an angle one to the other, a 130

mirror at an angle to both sight openings, transparent covering members for the sight openings each having an indicating mark adapted to coact with the indicating mark on the other, the body member being provided on the interior with supporting flanges for the transparent cover members and the mirror, and said transparent cover members and the mirror being held in place solely by said flanges and coacting members of the body member.

4. A device for the purpose described comprising a body member with sight openings therein at an angle one to the other, a mirror at an angle to both sight openings, transparent covering members for the sight openings each having an indicating mark adapted to coact with the indicating mark of the other, the body member being provided on the interior with supporting flanges for the transparent cover members and the mirror, and said transparent cover members and the mirror being held in place solely by said flanges and coacting parts of the body member, the body member being also provided with a leveling means.

5. A device for the purpose described comprising a body member having sight openings at an angle one to the other and a reflecting member at an angle to the sight openings to reflect light entering through one opening into position to traverse the other opening, and a clamp member carried by the body member in position to engage and grip the support on which the body member is placed in operation.

6. A device for the purpose described comprising a body member having sight openings therein at an angle one to the other and a mirror at an angle to both in position to reflect light entering one sight opening through the other sight opening, and a clamp member carried by the body member and having a normal tendency toward the clamping position, said clamp member being shaped to grip the tread portion of a railway rail with the body member resting on such tread portion of the rail.

7. A device for the purpose described comprising an elongated hollow body member having a sight opening at one end and another sight opening at an angle thereto, a mirror within the body member at an intermediate angle to the two sight openings to direct light entering one sight opening through the other sight opening, and a clamp member at the end of the body member remote from the first named sight opening and comprising two gripping jaws having a normal tendency toward the gripping position and extending beyond that face of the body member remote from the second named sight opening and shaped to grip the tread of a railway rail, the said clamp member having accessible manipulating portions.

8. In a device for the purpose described, a hollow body member formed of two parts and provided with sight openings at an angle one to the other, each sight opening having marginal flanges, other flanges on each part of the body member in spaced operative relation to corresponding flanges of the body member adjacent the sight openings, each part of the body member also having a flange formed thereon at an angle to the other flanges, one of the flanges adjacent to the flange at an angle thereto having the corresponding end beveled, a mirror mounted on the flanges at an angle to the first named flanges and confined at one end by the beveled ends of the corresponding flanges, and transparent cover members for the sight openings held to said sight openings by the flanges in spaced relation thereto, fastening devices being provided for securing the two parts of the body member together.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES D. GUILFOYLE.

Witnesses:

T. H. ATKINS,
A. GREENBERG.