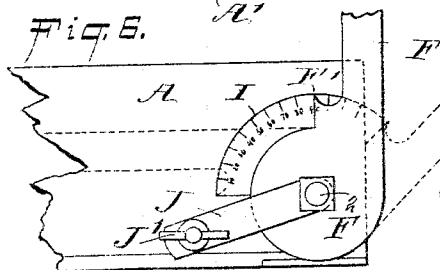
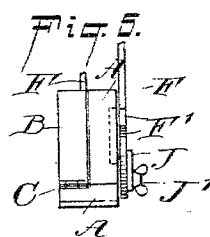
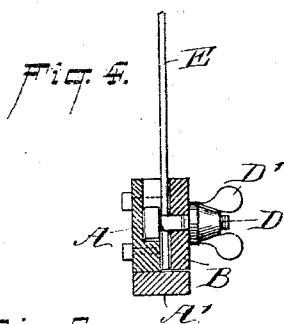
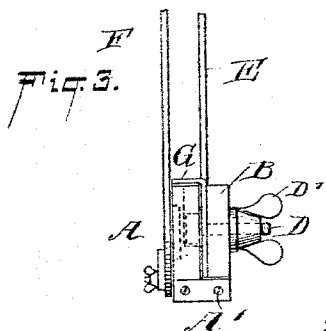
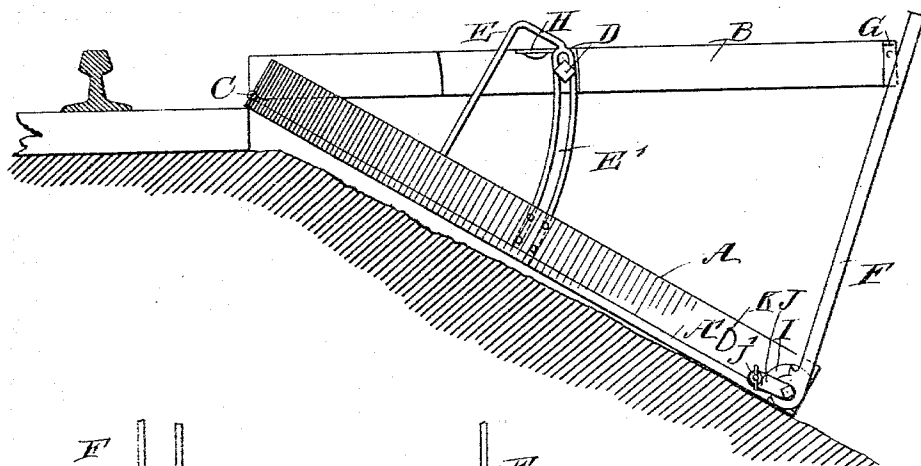
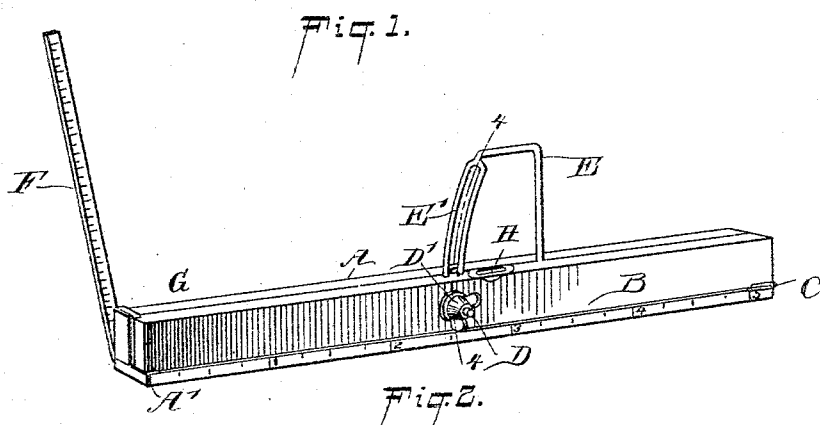


(No Model.)

E. F. HARGRETT.
LEVELING INSTRUMENT.

No. 531,931.

Patented Jan. 1, 1895.



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ERASMUS F. HARGRETT, OF BOSTON, GEORGIA.

LEVELING-INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 531,931, dated January 1, 1895.

Application filed October 19, 1893. Serial No. 488,631. (No model.)

To all whom it may concern:

Be it known that I, ERASMUS F. HARGRETT, of Boston, in the county of Thomas and State of Georgia, have invented a new and Improved Leveling-Instrument, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved leveling instrument, which is simple and durable in construction, very effective in operation and designed for use on roads, railroad tracks, ditches and other places to properly indicate the side slope of the road, the inclination of the track, &c., plumbing posts or setting them at any inclination, or cutting posts or bevels on bridges.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of the improvement in a closed position. Fig. 2 is a side elevation of the improvement as applied on the slope of a railroad bed. Fig. 3 is an end view of the improvement in a closed position; Fig. 4 is a transverse section of the same on the line 4—4 of Fig. 1. Fig. 5 is an end view of the improvement in a closed position, as seen from the hinged end; and Fig. 6 is an enlarged side elevation of part of the improvement.

The improved instrument is provided with the two bars A and B arranged one alongside the other with the bar B resting, when closed, on a projecting flange or base A', formed integral with the other bar A. The bar B is connected at one end by a hinge C to this flange or base A', so as to permit of opening the bars by swinging the bar B upward.

On the bar B and near the middle thereof is arranged a transversely-extending bolt D engaging a segmental slot E' formed in the curved arm of the bail or handle E attached to the bar A. The lower surface of the base is smooth so that it can be set on a level surface or used to determine a plane surface, the curve of said segmental slot being struck from the center of the hinge C. On the bolt D screws a wing nut D' for securely clamping

the said plate on the slotted handle E to fasten the bar B in an angular position relative to the bar A.

On the free end of the bar B is secured a transversely-extending pointer G adapted to indicate on the graduation of an arm F pivoted to the free end of the bar A, the said graduation indicating inches numbered consecutively say from 0 to 20. On the top of the bar B is arranged a spirit level H of any approved construction, and the graduation on the arm F is so arranged that when the said instrument is applied as shown in Fig. 2, and the bubble of the level H stands at 0, then the pointer G indicates the proper slope on the arm F, for instance in inches per foot, or per any number of feet.

An indicator I, shown in Fig. 6, is arranged on the bar A at the pivot end of the arm F and this indicator is provided with a segmental plate fixed to the arm A and having a degree scale on which indicates the pointer F' of the arm to indicate the angle at which the arm F stands to the bar A.

A clamping plate J held loosely on the pivot F² of the arm F extends across the enlarged pivot end of the said arm, the said plate being engaged by a set screw J' screwing in the bar A and serving to clamp the plate J tightly onto the pivot end of the arm F to lock the latter in place on the side of the bar A. A plumb level K is also arranged in the bar A as shown in Fig. 2.

The instrument is used as follows: For indicating the slope of a road, railroad bed or other place, the bar A is set in an inclined position down the slope, as indicated in Fig. 2, with the upper end of the bar resting on a railroad tie, stone or other suitable support. The bar B is swung upward until the bubble in the level H indicates a level position, with the pointer G reading the proper amount of slope to be given for a certain number of feet, on the arm F. Now, the smooth lower face of the bar A indicates the correct slope and the latter can be filled in if such is necessary or surplus earth removed if required while the instrument remains in position until the proper slope is obtained, and the bar F can be set to give the outer slope or back slope to the ditch by making the angle between the bar A and the arm F equal to the angle be-

tween the two slopes of the ditch. The plate J is arranged in such a manner as to securely hold the arm F in place after the proper adjustment is made. The device may also be used for other purposes. This arm F has somewhat the same relation to the bar A as the bars A and B have to each other. After setting the bar B to the scale on the bar F, fasten the bar B at that point with the wing nut; and then move the bar F out to any degree desired on the indicator I. In this way both the inner and the outer slopes of a ditch may be obtained and the level glass in the board B shows that both slopes are correct or when they are correct.

The several parts indicate as follows: First say spread the boards A and B twenty inches. The pointer G on the board B points to 20 inches on the bar F. Then fasten the board B at that point with the wing-nut D. Then move the bar F away from the pointer G. Then if the angle between the inner and the outer slopes of the ditch is to be one hundred and twenty degrees move the pointer F of the bar F to 120° on the indicator I. Make the said bar F fast at that point with the part J as already described. The instrument when put in this position and applied in a railroad cut, when the bubble in the bar B stands at 0 two correct slopes are obtained one with the bar A and one with the bar F. Railroad ditches in cuts have two slopes, one sloping from the track and the other bank sloping to the track. Further set the instrument in any position with the different scales and indicator I adjusted as described, and the bubble in the bar B will show when the slopes are correct.

When using to elevate curves on railroad tracks, the bars A and B are spread; say, let the pointer G point to 4 inches on the bar F. Then tighten or stop the bar B at that place with the wing-nut D. Then close the bar F so as to have it out of the way. Place the instrument on the track one end on each rail, and when the bubble H in the bar B stands at 0 the spread end will be 4 inches the lowest and give curve any elevation desired.

To use the instrument as a square, the two bars A and B are closed side by side and then the wing-nut D is tightened so the bars will stay. Then in order to apply the device to a piece of timber to cut off square or any angle the top edge of the bar A is placed alongside of the timber with the instrument turned down sidewise, as the level on this kind of work is not used. Then with the bars A and F and indicator, any angle can be laid off as far as the pointer F' of the bar will reach, as already described, on indicator I. To use as plumb in upright work, spread the bars A and B until the pointer G on the bar B points to the desired inclination on the bar F. Then set the bar A upright and when the bubble K in the bar A stands at 0 the bar B stands or shows the proper inclination.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A leveling instrument, comprising a base bar, a level bar hinged to one end thereof, a graduated arm pivoted to the other end of the base bar, an index on the level bar, a bail or handle secured to the base bar and having a curved arm provided with a guideway that is concentric with the hinge, and a fastening device secured to the level bar and constructed to engage the guideway of the handle, substantially as described.

2. A leveling instrument, comprising a base bar, a level bar hinged to one end thereof, means for securing the level bar relatively to the base bar, a graduated arm pivoted to the free end of the base bar, an indicator arranged on the base bar concentric with the pivot of the graduated arm, a pointer secured to the graduated arm and adapted to indicate on the said indicator, an index on the level bar, and means for fastening the graduated arm relatively to the base bar, substantially as described.

ERASMUS F. HARGRETT.

Witnesses:

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T. T. STEPHENS.