

J. THORNLEY.
Grading Levels.

No. 151,173.

Patented May 19, 1874.

Fig. 1.

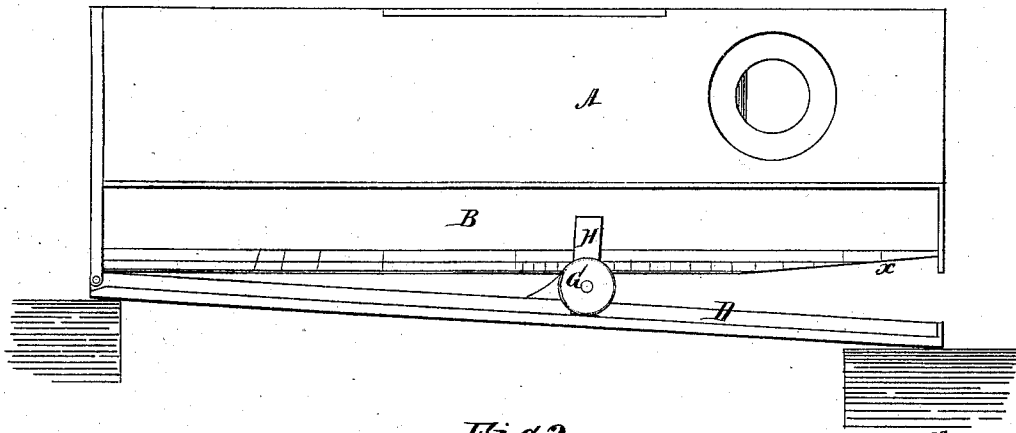


Fig. 2.

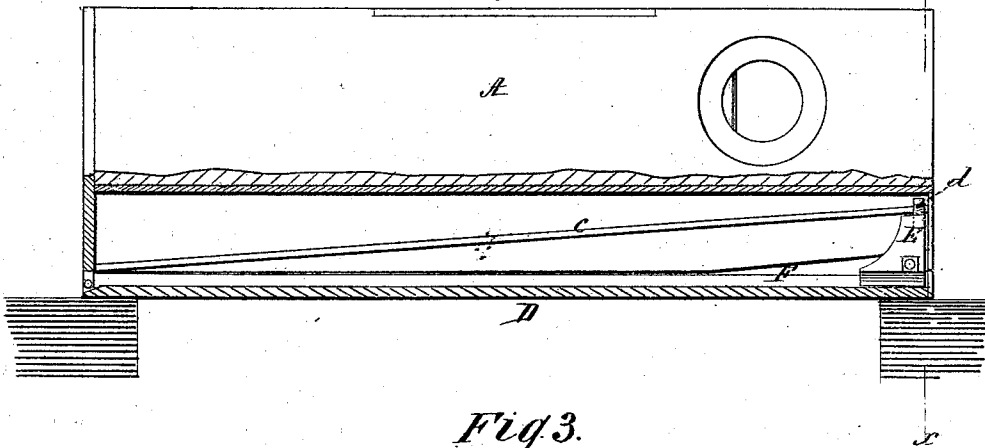
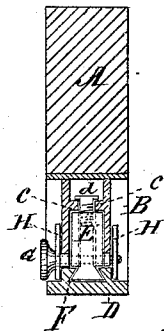


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN THORNLEY, OF CHARLOTTESVILLE, VIRGINIA.

IMPROVEMENT IN GRADING-LEVELS.

Specification forming part of Letters Patent No. **151,173**, dated May 19, 1874; application filed February 12, 1874.

To all whom it may concern:

Be it known that I, DR. JOHN THORNLEY, of Charlottesville, in the county of Albemarle and State of Virginia, have invented a new and Improved Grading-Level; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a side elevation of the instrument, as adjusted for indicating a grade. Fig. 2 is a partly sectional side view. Fig. 3 is a cross-section on the line *xx* of Fig. 2.

The invention relates to an improvement in the class of levels provided with a hinged base-bar for indicating different grades by its adjustment or angle to the body of the level proper. The improvement consists in arranging a block or prop piece to slide between the hinged bar and an inclined plane formed on the base of the level, so that the bar will be adjusted at an angle to the base corresponding to the distance it moves over the inclined plane. Means are provided for clamping the sliding block at any desired point, and the base is graduated to indicate the grade. The block is also connected with the base and hinged bar by a screw and dovetailed groove, as hereinafter more fully described.

In the drawing, *A* indicates the level proper, having the usual arrangement of bubble-tubes. The piece or bar *B* attached to its under side is grooved longitudinally, and has straight parallel ribs *c c* formed on the sides of the groove, and extending diagonally from a point near the hinge-connection of the base-bar *D*. The said ribs form thus an inclined plane, with which the head of block *E* slides always in contact. A headed screw, *d*, passes down between the ribs into the block, and the latter is connected with the hinged bar *D* by a dovetailed groove, *F*. The block may be grooved and the bar provided with a dovetailed projection, or vice versa. The block is enlarged at its base to form a broad bearing on the bar *D*, and thus prevent binding as it

is moved along the bar from one point to another. The block is secured at any point by a thumb-screw, *G*, passing through clamp-plates *H*, which are arranged to bear at their ends, respectively, on stationary bar *B* and hinged bar *D*. The under side of the base *B* is cut away obliquely at *x* to accommodate the screw *G* at that point.

As will be readily understood, a grade is indicated by adjusting the bar *D* at such an angle as will bring the level proper parallel to a horizontal plane. This adjustment is effected by moving the block *E* in the groove of bars *B* and *D*, and when the right point is reached the screw is tightened to hold the parts in the desired position. The angle of the inclined plane formed by the ribs bears a certain relation to the length of the level, it being correspondingly greater or less. In any case the distance which the block must be moved to effect any desired adjustment of the hinged bar varies inversely as the angle of inclination or grade to be determined.

As here shown and described, the parts *B* and *D* constitute an attachment which may be furnished for sale in the market as a separate device, to be applied to the ordinary level; but I contemplate forming the body and grooved base of the level in one piece—say, of cast-iron, suitably ornamented.

Having thus described my invention, what I claim is—

1. The combination of the sliding block, with the grooved base or piece having an incline, as shown, and the hinged bar, as and for the purpose specified.

2. The combination of the clamp-plates and screw, with the grooved bar *B* having inclined ribs *c*, the screw *G*, hinged bar *D* having dovetailed groove *F*, and the block *E*, as shown and described.

The above specification of my invention signed by me this 4th day of February, 1874.

Witnesses: JOHN THORNLEY.

SOLON C. KEMON,
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