(No Model.)

C. H. LOCKWOOD.

LEVELING INSTRUMENT.

No. 479,518. Patented July 26, 1892.

Fig. 1.

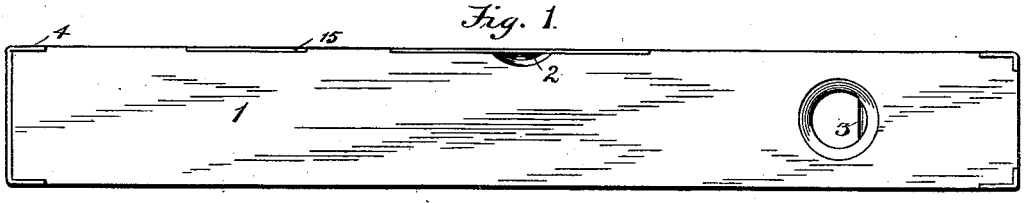


Fig. 2.

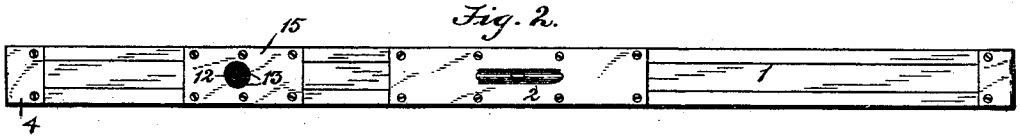


Fig. 3.

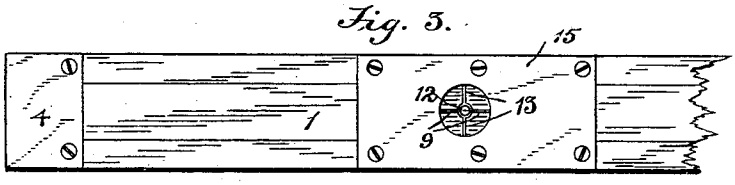


Fig. 4.

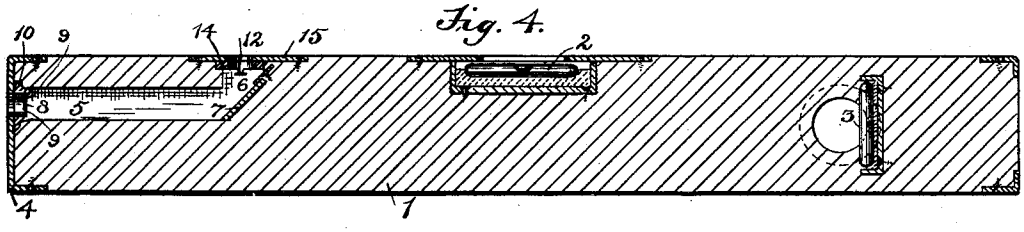


Fig. 5.

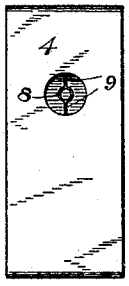


Fig. 6.

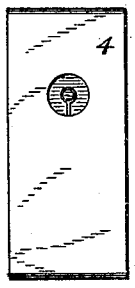
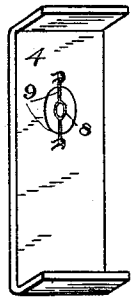


Fig. 7.



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

UNITED STATES PATENT OFFICE.

CHARLES H. LOCKWOOD, OF ROCHESTER, NEW YORK, ASSIGNOR OF ONE-HALF TO JOSEPH A. BEGY, OF SAME PLACE.

LEVELING-INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 479,518, dated July 26, 1892.

Application filed December 12, 1891. Serial No. 414,855. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. LOCKWOOD, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Levels; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention has for its objects to provide a device whereby the operations of leveling and squaring can be accomplished without moving the instrument from its position or without the necessity of the user changing his position, and thus the sills of a house, for instance, can be leveled and the corner-posts set, or shafting can be set either in horizontal or vertical position at a single operation; and to this end the invention consists in certain novelties of construction and combinations of parts, all as will be hereinafter fully described, and the novel features pointed out in the claims at the end of this specification.

In the drawings, Figure 1 is a side elevation of a level constructed in accordance with my invention; Fig. 2, a top view of the same; Fig. 3, a similar view showing reflection in the mirror when leveling and squaring; Fig. 4, a longitudinal sectional view; Fig. 5, an end view; Figs. 6 and 7, modifications.

Similar reference-numerals indicate similar parts.

The stock 1 of the device is of the ordinary or any preferred construction, containing the liquid leveling-tube 2 in the top and the vertical leveling-tube 3 near one end, the ends of said stock being protected, as usual, by the plates 4. Extending longitudinally of the stock for a portion of its length and opening at one end is a channel or passage 5, communicating at the inner end with a recess or passage 6, opening at the top, and at the intersection of these passages is arranged a mirror 7, placed at an angle of forty-five degrees, so that objects in front of the stock can be seen from the top. At the forward end of the passage 5 is arranged a small ring 8, preferably formed with stems 9, projecting vertically and serving as a means for supporting the ring in the center of the passage. This ring and its stems are in turn secured to a plate 10, located in a recess at the end of the stock and held in place by the end protecting-plate 4. In the upper end of passage 6 is arranged a ring 12, similar to ring 8, and having supporting-stems 13 extending crosswise of the stock, these stems being secured to a plate 14, similar to plate 10, and held in position by a plate 15, as shown. If desired, the rings might have a single supporting-stem, as in Fig. 6; but I prefer to employ two stems, as there is less liability of the parts becoming deranged; also, instead of securing the stems to the plate in a recess in the stock end, as shown, they could be supported from lugs on the rear of plates 4 and 14, as in Fig. 7.

In using the instrument, for instance, for leveling the sills and setting the corner-posts of a building, one end of the sill is leveled, as usual, by the use of tube 2, and then the operator, looking in the aperture in the top of the stock, brings the two rings 12 and 8 directly over each other, (the reflection of the latter being seen in the mirror,) and an object at the other end of the sill or other distant point is then moved or adjusted so that it is clearly seen through the center of the rings, when it will be found to be level with the center of the stock, and the distance of the ring above the bottom of the stock being constant, say two inches, the leveling is accomplished. In the same manner, the stock being kept level and parallel with the sill edge or the edge of an ordinary carpenter's square, an object seen through the centers of the superposed rings will be parallel with the stock and the edge of the square, allowance being made, of course, for the distance the ring is from the edge of the stock—say, five-eighths of an inch. The stems 9 and 13, being at right angles to each other and vertical and horizontal, will, if the bottom of the stock be level, serve as guides for the operator in properly adjusting his distant objects, whether vertical or horizontal, in proper position.

I am aware that heretofore wires have been used in levels in connection with an inclined mirror, but in such devices it is difficult to

see the distant object clearly and to locate it exactly at the proper point; but by employing the rings supported in comparatively large passages plenty of light is admitted and the adjustable objects can be plainly seen at the sides of the rings and accurately and quickly adjusted to the proper position in their center.

By the use of this instrument it will be seen that a frame can be both leveled and squared without the necessity of the operator moving from his position or moving the tool, both the adjustments necessary being visible in the aperture in the top.

If it is desired to set a vertical shaft—for instance, or any vertical object—it is only necessary to set the instrument on end, using the tube 3 instead of tube 2, in order to obtain the correct vertical position of the stock.

In Fig. 3 is shown the reflections and wires seen by the operator when looking in the upper hole in the stock, as will be understood.

These instruments can be made cheaply and are found in practice to be admirably adapted to the purpose, much time being saved by their use.

I claim as my invention—

1. The combination, with the level-stock having the passages arranged at right angles to each other and the mirror arranged at the intersection of the passages, of the two open rings having supporting-stems, one ring being arranged in each passage, substantially as described.

2. The combination, with the level-stock having the passages arranged at right angles to each other and the mirror arranged at the intersection of the passages, of the two open rings, each having supporting-stems on opposite sides thereof arranged in the passages, the stems of the rings being arranged at right angles to each other, substantially as described.

CHARLES H. LOCKWOOD.

Witnesses:
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