





# UNITED STATES PATENT OFFICE.

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## LEVELING INSTRUMENT.

No. 819,965.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, HARRY S. WILLIAMS, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Leveling Instruments, of which the following is a specification.

My improvement relates to a combined level and straight-edge.

My object is to construct a device which may be operated with the least amount of friction and may be quickly and easily placed in proper position and securely held there, while capable of being easily adjusted.

Figure 1 is a perspective view of the level securely held to the straight-edge. Fig. 2 is a bottom view of the level. Fig. 3 is a detail view of the holding device. Figs. 4 and 5 are views of modifications.

Like parts are represented by similar characters of reference throughout the several views.

$a$  indicates a segment semicircular in shape. This segment is formed with rigid projections  $a'$ , which, together with the bottom face of the segment, constitute the bearing-surfaces. A tube  $a^2$  is pivoted on the segment, as shown in Fig. 1, and may be clamped in any adjustable position by a screw  $a^3$ . This tube  $a^2$  is formed with a bulb and constitutes the level-tube. The arc of the segment is graduated, as indicated in Fig. 1, and by moving the tube about its pivot the tube will indicate the inclination of any line.

This instrument is adapted to be used particularly with a straight-edge  $a^4$ , which is usually formed with a groove  $a^5$ . In my preferred construction the bearing-surfaces formed by the bottom face of the segment and the projections  $a'$  bear upon two surfaces of the straight-edge, as indicated in Fig. 1. I have shown a spring  $a^6$ , which is shown in this particular instance rigidly secured to the bottom face of the segment and projects across the two open spaces formed in said segment, and the ends of the spring-arm are curved toward the rigid projections  $a'$  and end substantially opposite to said projections. In placing the segment upon the straight-edge the spring is adapted to fit within the groove  $a^5$ , the outer edges of the curved ends of the spring  $a^6$  forming bearing-surfaces against the top edge of a flange  $a^7$ . I have

preferably arranged the parts so that the inner edge of the spring-arm  $a^6$  bears against the bottom of the groove, and in this way I have a very secure fastening of the level and straight-edge, but one that is adapted to permit adjustable movement to the level with but slight amount of friction. This is apparent from the fact that the curved ends of the spring-arm  $a^6$ , together with the projections  $a'$ , form secure bearing-surfaces, but the spring-arm  $a^6$  does not bear against the surface of the straight-edge, except at the ends thereof.

The formation of the ends of the spring-arm, together with the arrangement of the spring-arm with reference to the straight-edge, is such that the level may be readily applied to the straight-edge by placing the rigid projections  $a'$  against the face of the straight-edge at the left side thereof, and then by placing the level downwardly the spring-arm  $a^6$  is readily moved within the groove  $a^5$ , while the curved ends bear against the edge of the flange  $a^7$ .

In the modification shown in Fig. 4 I have the straight-edge formed without any groove, and the spring-arm  $a^6$  is fulcrumed to a lug  $a^8$ , which projects from the arc of the segment, and in this modification the rigid projections  $a'$  bear against one edge of the straight-edge, while the spring-arm  $a^6$  bears against the opposite edge.

In the modification shown in Fig. 5 the spring-arm  $a^6$  is secured to the segment in such manner that the ends are adapted to bear against the edge of the straight-edge, while the projections  $a'$  are formed with flanges which are adapted to extend within the groove  $a^5$  and below the flange  $a^7$ .

Having thus described my invention, I claim—

1. In a leveling instrument, the combination with a straight-edge of a main semicircular body portion, projections extending at right angles to the plane of said body on diametrically opposite sides thereof, a yielding guiding-surface arranged opposite to said projections and adapted with said projections to secure said main body portion to the straight-edge, and a bubble-arm adjustably connected to said body at the center of its arc, substantially as and for the purpose specified.



2. In a leveling instrument, a straight-edge having a groove, a main semicircular body portion, holding devices formed on said body portion for yieldingly engaging said groove, and a bubble-tube-holding arm mounted on said main body portion at the center of its arc, substantially as and for the purpose specified.

3. In a leveling instrument, the combination with a straight-edge having a groove, of a main segmental body having graduations and provided with projections at right angles to the plane of said body, and yielding guiding-surfaces opposite said projections to secure said body to said straight-edge and guide the same in said groove, a pivoted bubble-tube-holding arm in the center of the arc of said segmental body, graduations on said arc, and means for securing said bubble-tube-holding arm in different positions determined by said graduations and permitting the

movement of said body on said straight-edge, substantially as and for the purpose specified.

4. In a leveling instrument, the combination with a straight-edge having a flange or rib with parallel sides, a main segmental body with projections at right angles to the plane of said body to engage one side of said rib; and yielding holding devices to engage the opposite side of said rib, a bubble-tube-holding arm pivoted to said segmental body at the center of the segmental arc, and means for holding said tube-arm in different positions of adjustment.

In testimony whereof I have hereunto set my hand this 5th day of April, A. D. 1905.

HARRY S. WILLIAMS.

Witnesses:

CLARA GALLAGHER,  
CHAS. I. WELCH.