(No Model.)

J. A. TRAUT.

SPIRIT LEVEL.

No. 534,303. Patented Feb. 19, 1895.

Fig. 1.

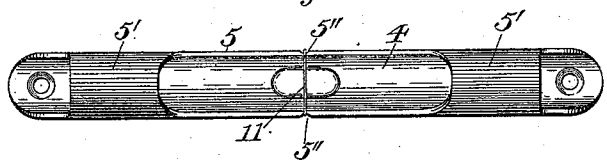
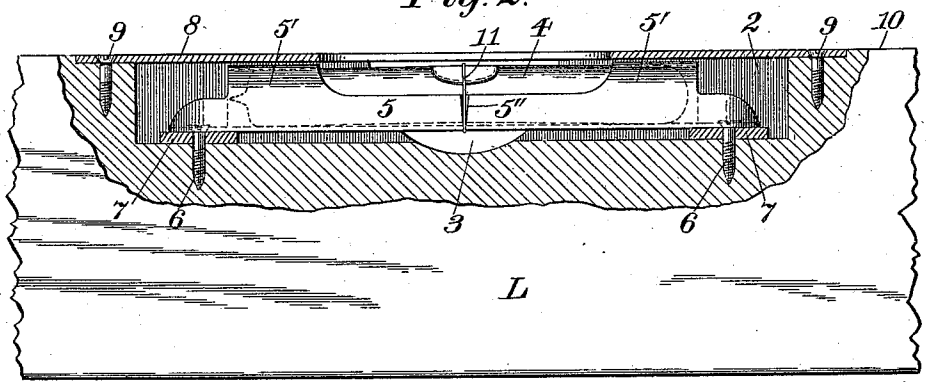


Fig. 2.



Witnesses:

J. L. Edwards Jr.

Fred. J. Dole.

Inventor:

Justus A. Traut.

By his Attorney,

F. A. Richards

UNITED STATES PATENT OFFICE.

JUSTUS A. TRAUT, OF NEW BRITAIN, CONNECTICUT.

SPIRIT-LEVEL.

SPECIFICATION forming part of Letters Patent No. 534,303, dated February 19, 1895.

Application filed October 8, 1894. Serial No. 525,201. (No model.)

To all whom it may concern:

Be it known that I, JUSTUS A. TRAUT, a citizen of the United States, residing at New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Levels, of which the following is a specification.

This invention relates to levels, and has for its object to furnish an improved instrument, of the class in which the bubble-glass is supported in an adjustable bed or carrier, whereby the upwardly-curved bubble-glass will be held in place in the adjustable bed by a tension-device extending outside of the glass and the bed or carrier, and serving also as an indicator for observing the position of the bubble within the glass.

In the drawings accompanying and forming a part of this specification, Figure 1 is a plan of a bubble-glass, held in operative relation with an adjustable bed or carrier in accordance with my invention. Fig. 2 is a sectional side elevation of a portion of a level embodying the same.

Similar characters designate like parts in both views.

The body of the level, which is of the usual construction, is designated herein by L, and is provided with the usual longitudinal mortise 2, in one edge thereof, for the reception of a bubble-glass and its carrier, and with the transverse substantially semi-cylindrical opening 3, for the usual purpose of facilitating the observation of the bubble.

The bubble-glass, designated by 4, is shown herein as of the usual construction, slightly curved upwardly from each end thereof, and is shown as mounted within an adjustable bed or carrier, such as 5, having a substantially tubular conformation, the ends of the bubble-glass being secured within the tubular ends 5′ of said carrier, and the upper central portion of the carrier being removed adjacent to, and for a considerable distance upon each side of the bubble-portion or center of the glass. The carrier 5 is also shown as secured to the bottom of the mortise 2 by means of screws 6, passing through corresponding screw-holes in the ends of the carrier 5, and through the base-plates 7, upon which the carrier rests, and thence into the body of the level. The usual top-plate or face-plate, 8, is shown herein as secured to the body of the level by means of screws 9, and as surrounding the mortise 2, and as seated in the body L with its upper face flush with the edge 10 of the level, said top-plate being thereby adapted to cover the glass and its carrier in the usual manner.

A tension-device, shown herein as a fine-wire, 11, extends over the bubble-glass 4, and outside of the bed or carrier 5, said wire being secured to said bed or carrier under suitable tension in any well known manner, such as by soldering the ends thereof together upon the under side of the carrier, or by binding said ends together at that point under proper tension.

The binder or wire 11 is held against lateral movement, longitudinally of the glass by means of shoulders 5″ at each side of the adjustable bed and one upon each side of the wire. The middle portion of the wire, which is engaged against the under side of the bubble-glass, is held taut by means of the tension of the wire and by said shoulders, so that said wire will quickly return to its proper position should it by accident or otherwise be deflected from the normal position shown in the drawings. By these means said binding wire is adapted to be constantly and truly held at the desired point and to constitute the indicator-line for observing the position of the bubble in the glass, and for thereby determining the position of the level.

It will be observed that, as the bubble-glass is upwardly curved at the center thereof, and is supported at its ends in the adjustable bed, the binding-wire 11, being extended around and outside of said glass and carrier, exerts a tension upon said parts, and springs the central portions of the glass and the carrier slightly toward each other, whereby the parts are not only held in more positive relation to each other but the tendency of said glass and carrier to separate slightly at their central points, where they are clasped by the wire, increases the tension upon the wire, and prevents the loosening thereof upon its normal line of engagement with the glass and the bed.

The shoulders 5″ are shown herein as formed contiguous to the tension-device, by notching or filing the outer shell of the car-

rier transversely upon its central line, the width and depth of the cut preferably increasing from the under side of the bed toward each upper edge of the intermediate cut-away portion of the carrier. This is a simple and practical means for obtaining the desired result, viz., maintaining that portion of the wire which surrounds said carrier against movement with respect to the carrier; but it will be evident that said shoulders might be formed as projections or shoulders extending out from the sides of the substantially tubular carrier.

As the position of the wire or band 11 is fixed with respect to the adjustable bed, said band not only serves as a means for positively engaging the carrier and the glass, substantially upon their central line, but it also serves as the indicator for locating the bubble, since the resiliency of the wire or tension-device is sufficient to return it to its normal position, with the upper half thereof in the plane of the portion surrounding the bed, should said portion which surrounds the glass be accidentally thrown out of its proper position.

The organization of devices herein shown and described therefore constitutes a very perfect means for positively engaging the bubble-glass and its carrier adjacent to the central lines thereof, and for locating the position of the bubble at all times with accuracy and certainty; and it has the additional advantage of being applicable to most forms of bubble-glass and carrier.

Having thus described my invention, I claim—

In a level, the combination with an adjustable bed or carrier supported therein and having a central longitudinal opening in its upper side; of a bubble-glass mounted in said carrier; a laterally-resilient tension-device extending transversely around and alternately of said glass and carrier substantially centrally thereof, and independent of the body of the level, and non-contiguous to the glass for a short distance adjacent to each of the longitudinal edges of said opening in the carrier, whereby longitudinal movement of the glass relatively to the carrier and to said non-contiguous portions of the tension-device is permitted; and shoulders formed upon the carrier one on each side of said tension-device and freely but positively engaging the same, (said tension-device intersecting the longitudinal edges of said opening in the carrier,) and adapted to prevent relative movement with respect to the carrier of that portion of the tension-device which surrounds the carrier, whereby said tension-device tends to constantly return to and maintain its normal position transversely of the glass and the carrier, and thereby forms also an indicator-line for locating the bubble in the glass, substantially as described.

JUSTUS A. TRAUT.

Witnesses:
FRED. J. DOLE,
FREDERICK A. BOLAND.