

UNITED STATES PATENT OFFICE.

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PLUMB RULE.

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Our invention relates to level devices for indicating horizontality and verticality, and more particularly to a combined rule and level indicator especially adapted to be used by carpenters, bricklayers and stonemasons.

Heretofore it has been the general practice to provide plumb rules with a number of bubble tubes stationarily mounted at intervals along the frame, a pair of longitudinal tubes being usually mounted centrally of the frame, and a pair of transverse tubes near each end. This duplication of tubes has been for the purpose of affording convenience to the user in permitting him to observe the indication on the tube most readily accessible and to obviate the necessity of turning the rule to bring a bubble tube to the upper side or end, as the case may be. Such duplication, however, increased the cost of the level and also increased the possibility of breakage because of the greater number of tubes.

It has been proposed to mount a bubble tube for adjustment longitudinally of a rule, but the arrangement has been such that the tube and its containing slide were exposed to accidental damage.

The general object of our invention is to provide a combined rule and level indicator of new and improved construction particularly adapted to afford convenience to the user, while at the same time having a minimum number of bubble tubes mounted thereon. This object we attain by providing a construction wherein the bubble tubes are mounted for adjustment longitudinally of and within the rule, where they are effectively protected from injury.

In the accompanying drawings,
Figure 1 is a side view, partly in section, of one form of our invention.

Fig. 2 is an edge view thereof.

Fig. 3 is an enlarged view of the slide containing the bubble tubes, a portion of the frame being shown in section.

Fig. 4 is a reduced sectional view approximately along the line 4-4 of Fig. 3.

Fig. 5 illustrates a modification.

While our invention is susceptible of embodiment in many different forms, we have

shown in the drawings and will herein describe in detail two such forms with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to these forms. The scope of the invention will be pointed out in the appended claims.

Referring to the drawings, our invention in the form illustrated in Figs. 1 to 4 comprises a rectangular metal frame 1 having graduated straight edges 2 and 3 with integral cross bars 4 and 5 on one side of the frame. The end bars 5 are preferably of substantial width so that together with front plates 6 and end plates 7 (herein shown as secured to the edges 2 and 3 by screws) pockets 8 are formed at each end of the frame. As shown in Fig. 4, the frame 1 provides a passageway 9 between the edges 2 and 3 through which a rectangular block or slide 10 may pass. The edges 2 and 3 have longitudinal grooves 11 on the inner sides thereof adapted to engage in sliding contact with the correspondingly formed edges 12 of the slide 10. The guide grooves 11 preferably have recesses 13 at the bottom thereof, said recesses at one side of the frame communicating with the outside of the latter as through holes 14 to provide outlets for any foreign matter which may collect in the guide grooves.

In the exemplary form illustrated, the adjustable slide 10 has a diamond-shaped aperture 15 across the corners of which a set of four bubble tubes 16 are mounted in the slide parallel to the sides of the rectangular frame 1 as shown in Fig. 1. On each side of the slide is suitably framed a glass 10^a which effectively prevents accumulation of foreign matter on the tubes 16.

Although any suitable means may be provided to secure the slide in its adjusted position in the frame 1 the preferred construction is as follows: Below the aperture 15 and in front of the slide 10 a flat spring 17 is mounted between two projecting portions 18 of the slide. Secured to the spring in an upright position is a plunger 19 normally under tension of the spring and bearing down-

wardly against the inner surface 20 of the lower edge 2 to frictionally hold the slide in its adjusted position. A pair of levers having operating handles 21 are pivoted to the slide as at 22 and have their opposite ends 23 suitably pivoted to the plunger 19 so that when either operating handle is depressed the tension which the spring 17 exerts on the plunger is counter-balanced and the slide 10 is free to move. It may then be slid to any desired position in the frame 1 after which by releasing the operating handle the slide will be effectively secured in the adjusted position.

When the plumb rule is not in use the slide 10 may be moved into either of the pockets 8 which are of sufficient depth to provide an effective housing for the block and thereby protect the tubes 16.

In Fig. 5 is illustrated a modified form of the invention which is particularly adapted for use in plumbing or leveling horizontal and vertical corners, the form illustrated comprising an elongated frame 1^a of L-shaped cross-section, each flange 24 of the frame being constructed similar to the rule illustrated in Figs. 1 to 4 and having a slide 10 containing four bubble tubes movable longitudinally therein. This form of our invention readily permits leveling or plumbing two surfaces concurrently, the rule being placed upon the work so that the corner is within the angle between the flanges of the frame. The edges of the frame are preferably beveled as at 25 on a 45° angle with the flanges, thereby providing a substantial bearing surface should it be desirable to use the rule in a position such that these beveled edges contact the work. The rule in this form has other advantages, one being that if positioned on a horizontal surface with the beveled portions 25 contacting the work it is far more stable and less likely to be accidentally tipped over than a rule of the form shown in Figs. 1 to 4 because in such a position the rule shown in Fig. 5 has a relatively great width at the base, i. e., the distance between the outer edges of the beveled portions 25. Another advantage results in that in such position the indications of the bubble tubes in the two slides 10 may be checked against each other to check the accuracy of the indications of the rule.

The frame 1^a is also beveled on a 45° angle at 25^a to provide a substantial surface to make contact with a vertical or other surface and to permit the use of the rule in plumbing interior corners where the adjacent surfaces have a fillet therebetween.

From the foregoing it will be apparent that we have produced a new and improved plumb rule whereby with a set of four bubble tubes the level indicated may be observed from any point along the entire length of the rule. When the rule is placed against a wall,

floor or other structure, to be plumbed or leveled, the user may readily adjust the slide which carries the bubble tubes to that position in the frame in which the tubes are most readily observed, thus minimizing the necessity for stooping to read the indication. It will also be apparent that we have provided simple and effective means to protect the bubble tubes from injury when the rule is not in use.

We claim as our invention:

1. A plumb rule having, in combination, a rectangular metal frame comprising spaced parallel straight edges having longitudinal guide grooves therein on their adjacent sides, an apertured slide adjustable within said frame in said grooves, said slide carrying four bubble tubes parallel to the sides of said frame, said frame having end portions adapted to house said slide, a spring pressed plunger mounted on said slide bearing against said frame to hold the slide in its adjusted position, and means operable to release said plunger.

2. A plumb rule having, in combination, a rectangular metal frame comprising spaced parallel straight edges having longitudinal guide grooves therein on their adjacent sides, an apertured slide adjustable within said frame in said grooves, said slide carrying a plurality of bubble tubes, and spring means mounted on said slide adapted to hold the slide in its adjusted position, said frame having end portions adapted to house said slide, said frame also having a longitudinal recess in the bottom of one of said guide grooves which communicates with the outer edge of the frame.

3. A plumb rule having, in combination, an elongated frame comprising spaced parallel straight edges, and an apertured slide carrying a plurality of bubble tubes and adjustable longitudinally within said frame from end to end, said frame having fixed end portions adapted to house said slide.

4. A plumb rule having, in combination, an elongated frame of L-shaped cross section, a slide adjustable longitudinally in each of the flanges of said frame, said slides each carrying a plurality of level indicating means in a fixed angular relation with the edges of said frame.

5. A plumb rule having, in combination, a rectangular frame comprising a pair of spaced parallel straight edges and a pair of transverse ends fixed thereto, said frame having a rectangular aperture therethrough and a rectilinear guideway along one side of the aperture parallel to the said edges, a relatively short slide adjustable longitudinally within said aperture on said guideway between the ends of said frame, and a plurality of bubble tubes in closely nested relation carried fixedly on said slide parallel to the sides of said frame.

6. A plumb rule having in combination, a frame comprising a pair of straight edges secured rigidly together in spaced relation by means of a pair of longitudinally spaced transverse members, one of said edges having a rectilinear guideway on the inner side thereof and a relatively short slide carrying bubble tubes in closely nested right angle relation, said slide being adjustable longitudinally in said frame between the ends thereof on said guideway. 10

In testimony whereof we have hereunto affixed our signatures.

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