April 26, 1932. A. LANGSNER 1,855,523

SLIDE RULE INDICATOR

Filed Oct. 12, 1929

Fig. 1.

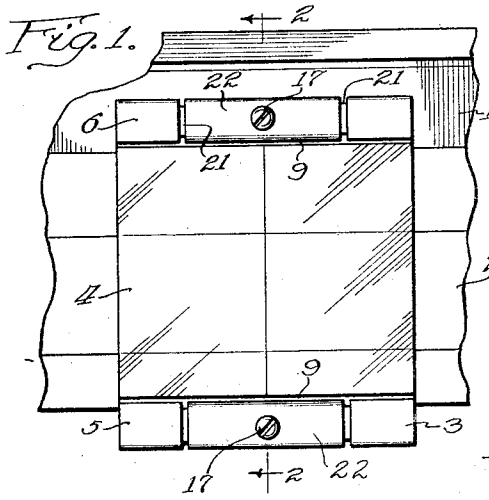



Fig. 2.

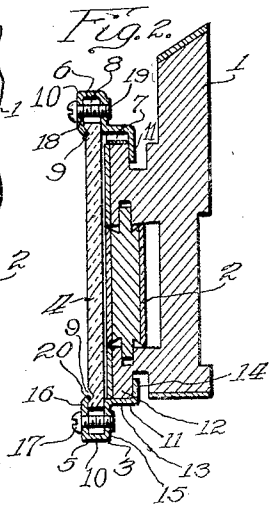



Fig. 3.

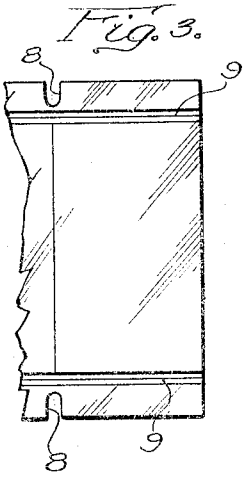



Fig. 4.

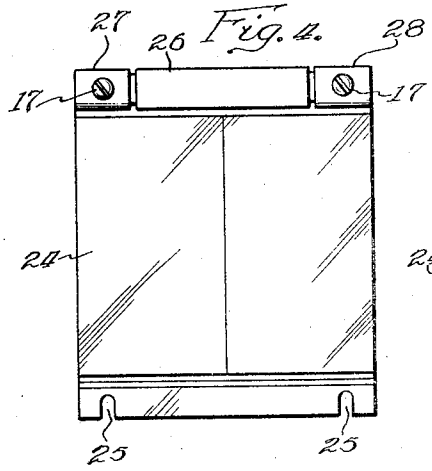



Fig. 5.

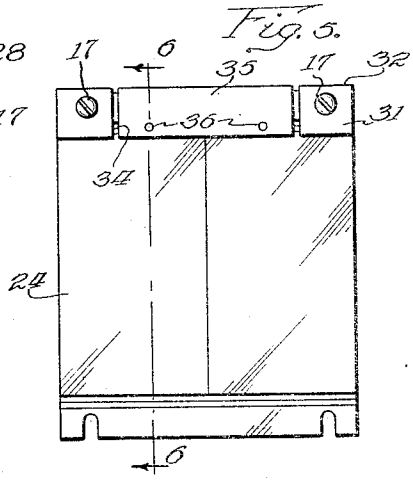



Fig. 6.

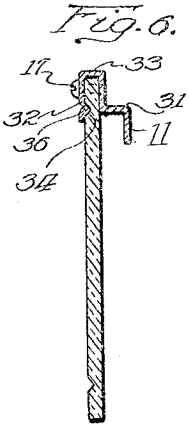



Fig. 7.

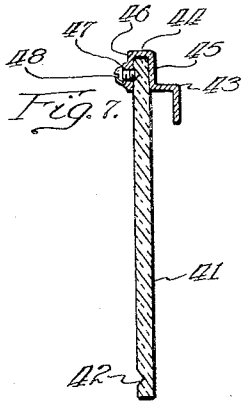



Fig. 8.

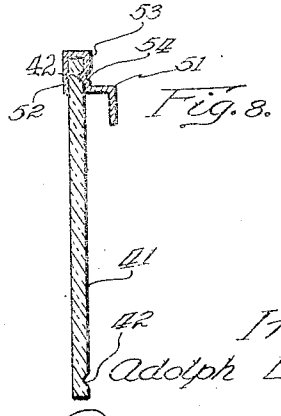
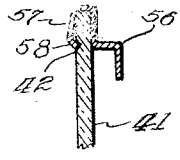



Fig. 9.




Witnesses

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# UNITED STATES PATENT OFFICE

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## SLIDE RULE INDICATOR

Application filed October 12, 1929. Serial No. 399,321.

This invention relates to hair line indicators of the reciprocating slide variety, such as are generally provided on calculating slide rules to facilitate use and enhance the accuracy of readings. It also relates especially to the construction and attachment of lateral guideway engaging means or slide flanges for the indicator.

The main objects of the invention are to improve the construction of and the method of assembling slide rule indicators; to improve the form and arrangement of structural details for the rigidly joined edges of the glass indicator plate and its lateral guide flanges; to provide for ready assemblage and renewal of indicator parts; to provide for positive setting of an edge flange member in its due relation to the corresponding plate edge; to provide for resilient clamping of the plate edges by its lateral guides; to provide for positive interlocking engagement of the guide flanges with the corresponding edges of the plate; to provide for minimizing the lateral overhang and facial projection of the guide flange members and fastenings; to provide an indicator of this sort such that it may be assembled by purely mechanical operations and independently of heat or the use of cement; and to assure ready convenience in reading.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which:

Figure 1 is a fragmentary plan of a medial part of a slide rule equipped with an indicator embodying this invention.

Fig. 2 is a cross section on the line 2—2 of Fig. 1.

Fig. 3 is a plan of the right hand part of the glass indicator plate shown in Fig. 1.

Fig. 4 is a plan of the indicator included in Fig. 1, except that one of the guide members is omitted.

Fig. 5 is a view similar to Fig. 4 but representing a modified form of guide member.

Fig. 6 is a cross section on the line 6—6 of Fig. 5.

Fig. 7 is similar to Fig. 6 but shows a modified form of clamp for the guide member.

Fig. 8 is also similar to Fig. 6 but shows a further modification of the guide clamp and the plate is reversed to bring the grooves on the back side.

Fig. 9 is similar to Fig. 7 except that the guide has an inwardly turned edge instead of a set screw.

In the construction shown in the drawings the slide rule comprises the usual body member or ruler 1, slide 2 and the novel form of indicator 3 embodying the present invention. In each of the forms shown the indicator comprises mainly a hair line plate 4, a pair of mainly similar guides 5 and 6 secured to the lateral edges thereof for engaging the longitudinal guideway portions of the ruler 1, as will be apparent from Fig. 2, and a spring 7 to compensate for side clearance.

Referring first to the form of plate and guides shown in Figs. 1, 2 and 3, the plate 4 has central edge notches 8 and edge-parallel grooves 9 on its front face to accommodate attachment of the clamping parts of the guides 5 and 6.

The said guides are alike except that guide 6 has the spring 7 attached thereto, as shown in Fig. 2. Each guide comprises mainly a channel part 10 to receive an edge of plate 4 and a flange part 11 to embrace a guideway flange 12 on the ruler 1. The part 11 is L-shaped with one arm 13 continuous with channel 10 and the other arm 14 underlying the ruler flange 12. The leaf spring 7 is carried by the vertical arm 13 and bears against the edge of the ruler flange 12. The channel part 10 is substantially U-shaped, with its arms or walls 15 and 16 disposed horizontally to embrace the edges of plate 4, the lower flange 14 being continuous with arm 13 of part 11. Positive clamping is enhanced and assured by means of one or more screws 17, to accommodate which the outer arm is perforated at 18 and the inner arm is threaded at 19. The inner edge of the outer arm 16 is turned downward or inclined somewhat at 20 so as to enter and engage the corresponding plate groove 9. The plate notches 8 register with the guide holes 18 and accommodate edgewise assemblage of the plates and guides with the screws 17 in place, but loosened. The guides may be applied endwise, provided the screws are not in place,

as may be preferable in case the guide material is so stiff as to preclude ready edgewise assemblage. The channel wall 16 is cut at 21 into 3 sections, so as to let the several parts of the clamp grip the plate 4 independently, the screw 17 being in the middle section 22.

Referring now to Fig. 4, the plate 24 is similar to plate 4 except, that instead of a central notch on each supporting edge, it has a pair of spaced notches 25, and guide 26 correspondingly has a pair of screws 17 carried by its outer sections 27 and 28.

As for Figs. 5 and 6 the plate here shown is like that of Fig. 4; but the channel part of the guide 31 differs from the foregoing, in that the outer wall 32 of channel 33 laps past the plate groove 34 and is entirely flat except that the middle section 35 of said outer wall is indented adjacent to its edge to register with said groove, as illustrated at 36.

Figs. 7, 8 and 9 show merely details of variant forms for the coacting edge parts of the plates and guides. In each of these views the plate 41 has merely an edge-parallel groove 42 to receive a corresponding interfitting part or fastening on the guide. In Fig. 7 the guide 43 has a clamping channel part 44 with plain flat sides 45 and 46, except that the front wall 46 is perforated and threaded at 47, opposite groove 42, to receive the set-screw 48. In Fig. 8 the guide 51 is similar to guide 43 except that instead of the front face 52 having a set-screw the back face 53 is indented at 54, and so inwardly humped, opposite the groove 42, the plate here being reversed so as to cause the grooves to face backwardly. The indentation and hump feature at 54 may comprise one or a series of inward deformations as might be preformed with a center-punch, or it may comprise a rib parallel with the edge. In Fig. 9 the guide 56 instead of having a screw or wall depression merely has its outer wall 57 turned inward at its edge, as at 58 to engage the groove 42.

Certain features are common to the several forms shown. For instance each plate is indented or edge-grooved to assure positive setting; and each guide clamp channel is or may to advantage be resilient to inherently set or spring upon the edge of the plate. Each channel has one of its face bearing walls provided with inwardly projecting means to positively engage a plate indentation or groove. These locking means are either set permanently in the channel wall material, as at 20, 36 and 54, or they may be adjustably protrusile, as at 48, where a set-screw provides for variable degrees of clamping. In each embodiment the clamping action of the guide channel holds the parts rigidly against relative vibration and the groove and shoulder feature prevents accidental detachment.

Although certain specific embodiments of this invention and their mode of use have been selected to illustrate my improvements herein set forth, it is to be understood that some of the details may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. A slide rule indicator comprising a transparent plate having a hair line thereon to extend across the rule and having face grooves adjacent opposite edges and extending lengthwise of the rule and lateral guides at said edges secured in said grooves.

2. A slide rule indicator comprising a transparent plate having a hair line thereon to extend across the rule and having face grooves adjacent opposite edges and extending lengthwise of the rule, and lateral guides at said edges, and provided with securing means seated in said grooves.

3. A slide rule indicator comprising a transparent plate having a hair line thereon to extend across the rule and having face grooves adjacent opposite edges and extending lengthwise of the rule, and lateral guides at said edges, and provided with inwardly facing marginal portions seated in said grooves.

4. A slide rule indicator comprising a transparent plate having a hair line thereon to extend across the rule and having grooves adjacent opposite edges and extending lengthwise of the rule, and lateral guides at said edges, and clamps on said guides having jaws seated in said grooves.

5. A slide rule indicator comprising a transparent plate having a hair line thereon to extend across the rule and having grooves adjacent opposite edges and extending lengthwise of the rule, and lateral guides at said edges, clamps on said guides having jaws seated in said grooves, and means for forcing said jaws into gripping engagement with the plate.

6. A slide rule indicator comprising a hair-lined glass plate and a pair of lateral guides attached thereto for engaging appropriate guideways on the slide rule, each guide having a channel shaped edge part to resiliently embrace a corresponding edge part of said plate, one side of the channel being more or less inwardly protrudent, and said plate being grooved to receive said channel.

7. A slide rule indicator comprising a rigid transparent plate and a pair of lateral guides attached thereto for engaging appropriate guideways on the slide rule, each guide having a channel shaped edge part to embrace a corresponding edge part of said plate, one side of the channel being more or less inwardly protrusile, and said plate being indented accordingly to receive the protrusile part for positive attachment of the guide.

8. A slide rule indicator comprising a transparent plate having a hair line thereon

to extend across the rule and having a groove in one face adjacent an edge of the plate and extending at right angles to said hair line, a guide rigidly secured to said edge of the plate, and a clamping jaw mounted on said guide and overlying said plate, said clamp jaw having its inner edge turned down and seated in said groove.

9. A slide rule indicator comprising a transparent plate having a hair line thereon to extend across the rule, and having a marginal face groove extending at right angles to said hair line.

10. A glass plate in combination with a clamp secured rigidly to an edge thereof, said plate being indented for positive engagement, and said clamp being adjustably protrusive in registry with the plate indentation to effect such engagement.

11. In combination, a glass plate and a support rigidly secured to an edge part thereof, said edge part and support being formed for positive mutual interlocking engagement, the plate being appropriately recessed therefor and said support having an adjustable clamping part to engage the plate recess.

12. A device of the class described comprising, in combination, a hair-lined glass plate adapted to serve as a slide rule indicator, and guides rigidly secured in mutually parallel relation to opposite edge parts of said plate perpendicular to the hair line thereof, said edge parts having mutually parallel grooves and said guides having adjustable clamping parts to positively engage said grooves respectively.

Signed at Chicago this 7th day of October, 1929.

ADOLPH LANGSNER.