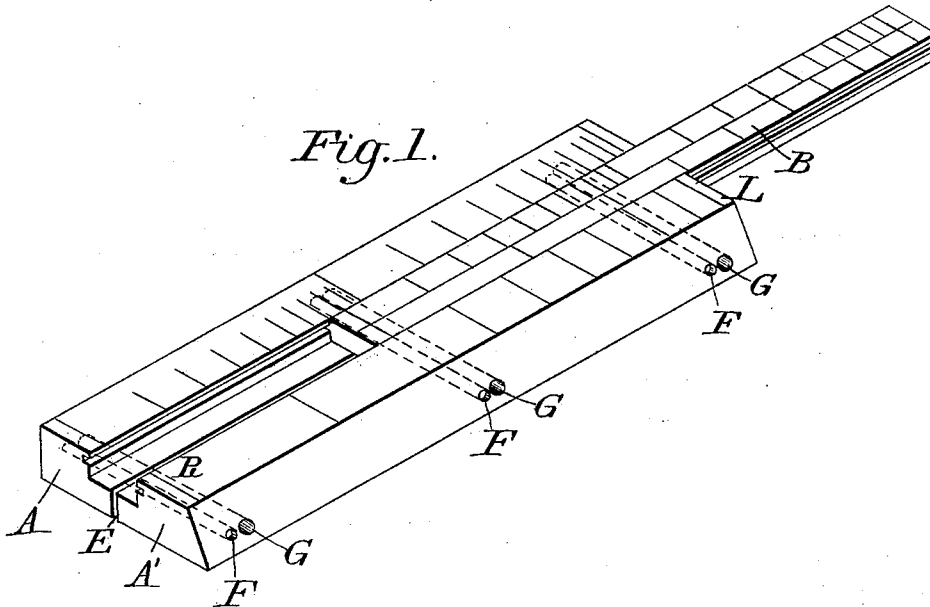
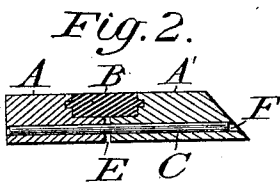
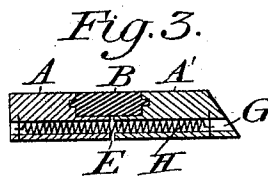
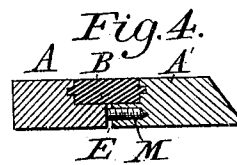


(No Model.)

J. G. D. MACK.
SLIDE RULE.

No. 606,388.

Patented June 28, 1898.



Witnesses:
C. E. Brown
M. E. Smith.

Inventor:
J. G. D. Mack.

UNITED STATES PATENT OFFICE.

JOHN G. D. MACK, OF MADISON, WISCONSIN, ASSIGNOR TO THE EUGENE DIETZGEN COMPANY, OF CHICAGO, ILLINOIS.

SLIDE-RULE.

SPECIFICATION forming part of Letters Patent No. 606,388, dated June 28, 1898.

Application filed February 8, 1897. Serial No. 622,519. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. D. MACK, a citizen of the United States, residing at Madison, in the county of Dane and State of Wisconsin, have invented a new and useful Slide-Rule, of which the following is a specification.

The object of my invention is to provide a better mechanical construction for the slide-rule than that hitherto employed.

The ordinary slide-rule, of which the Mannheim type is representative, is composed of three elements—namely, the rule, the slide, and the indicator—and as the latter one of these has no bearing on my invention all reference to it will be omitted in the specification and drawings.

For the slide-rule to work perfectly it is necessary that the slide should move with a light and uniform resistance throughout the length of its travel and have only just sufficient friction to maintain its position, and also that the abutting scales on rule and slide shall be maintained in contact. With the slide-rules of ordinary construction if this perfect working condition be once secured it is not likely that it will be permanent, for the rule and slide are each composed of one or more portions of organic substance or metal, the former of which undergoes continual changes of shape due to warping or shrinking, and both are subject to wear, which causes finally render the rule unfit for use. After once becoming imperfect this form of slide-rule does not admit of being readily trued, for if the edges be scraped the slide then becomes too small to fit the rule. My invention, however, overcomes these difficulties in construction and is shown in the accompanying drawings, in which like letters refer to the same parts.

Figure 1 is an isometric view of the rule and slide, with the slide partly withdrawn. Fig. 2 is a section through rule at a guide-pin, as C. Fig. 3 is a section through rule at a pressure-spring. Fig. 4 is a section through rule at a stop-pin M, not shown in other figures.

The rule A A' is formed in two parts by being split longitudinally at E, and a series of transverse holes are drilled through both sections A A' of the rule, as shown at F, Fig. 2.

Into each of these series of holes F is inserted a guide-pin C, preferably of metal and closely fitting hole F. With the holes F properly located a perfect registering of the upper and lower scales of the rule A A' is obtained, while the pins C allow the portions A A' of the rule a relative parallel motion to each other.

A second series of transverse holes G G are drilled through both sections A A' of the rule similar to the series F F. Into each of the holes of the series G is inserted a spiral spring H, the ends of H being secured under tension, one to section A and one to section A' of the rule.

The scales of the rule A A' will by means of the springs H be held under spring-pressure in contact with the abutting scales of the slide B, and this spring-pressure will be maintained throughout the extent of travel of the slide, and it will produce a uniform sliding friction, such as is necessary for the proper working of the slide-rule. This construction has the further advantage that if one of the abutting edges requires to be straightened by scraping the spring-pressure will close the space which would be formed between the abutting scales in slide-rules of ordinary construction.

In employing my device the evil due to irregularities in parallelism of the edges of the slide or rule is avoided by means of the pressure of the abutting edges due to the springs.

If the slot E, Fig. 1, be too wide and the slide, for example, be projected the greater part of its length beyond the end L of the rule, the spring at the end R will close this latter end of the slot E and throw the abutting edges of the slide and rule out of contact at the end L. This tendency is avoided, when likely to occur on account of slot E being too wide, by placing a series of stops along slot E, as shown at M, Fig. 4. These stops can be made adjustable by means of a screw in one portion A' of the rule, as shown in Fig. 4.

It is desirable that the slide's space in the rule should, when the slide is entirely withdrawn, be minutely less than the width of the slide itself, so that when the slide is in place there will still be the spring-pressure of con-

tact, and yet no noticeable tendency of the abutting scales to separate when the slide is near the end of its travel.

With the slot E properly proportioned the necessity of the stops M does not exist.

My invention is not limited to the specific methods described, for the same result could be obtained by splitting the slide and placing within it the compensating device or by using other forms of spring, guide, and stop. Still other methods can be devised embodying the same general principle; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a slide-rule, the combination of a longitudinally-divided rule or slide, with a series of springs maintaining the abutting scales in contact, and a series of guides for the registering of the scales of the divided portion.

2. In a slide-rule, the combination of a longitudinally-divided rule or slide, with a series of pressure-springs, a series of guide-pins and a series of adjustable limiting-stops, substantially as described and for the purposes set forth.

3. In a compensating slide-rule, the combination of a longitudinally-divided rule or slide with transverse guide-pieces connecting the sections of the divided portion, and a series of springs, the latter being arranged so as to cause the longitudinal sliding surfaces to move under spring-pressure, for the purposes set forth in this specification.

JNO. G. D. MACK.

Witnesses:

JOHN E. DORMAN,
E. M. HEUWOOD.