Sept. 21, 1926. 1,600,676

W. KIENBAUM

LOGARITHMIC CALCULATING DEVICE

Filed May 21, 1926

Fig. 1

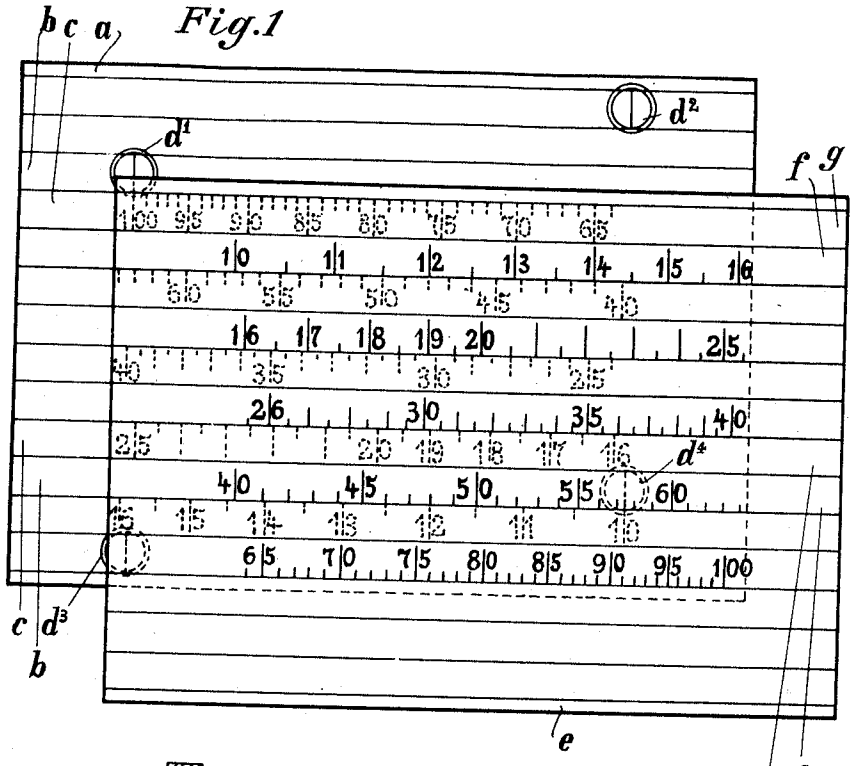


Fig. 2

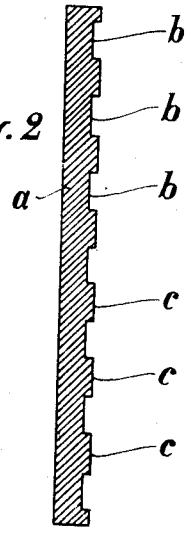
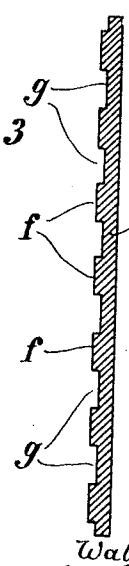


Fig. 3



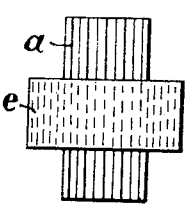


Fig. 4

Inventor:
Walter Kienbaum
by [signature]
his attorney

Patented Sept. 21, 1926.

1,600,676

UNITED STATES PATENT OFFICE.

WALTER KIENBAUM, OF GUMMERSBACH, GERMANY.

LOGARITHMIC CALCULATING DEVICE.

Application filed May 21, 1926, Serial No. 110,636, and in Germany May 26, 1925.

This invention relates to a logarithmic calculating device of the slide-scale type comprising an under or bottom-plate and a transparent upper or top-plate or a top-plate provided with window-like openings, the two plates being guided parallel to one another.

In the known devices of this kind the means for guiding both plates parallel consist of two toothed racks provided at the sides of the bottom plate and arranged transversely to the scales and of two rods fixed to the sides of the top-plate and arranged parallel to the scales, said rods being adapted to engage the gaps between the teeth of said racks. The two rods project to a great amount from the sides of the upper plate, while the lower plate is considerably longer and wider than the top-plate.

In the new device according to the present invention the two plates are guided parallel to one another by means of mutually engaging ledges or borders and grooves or channels provided on the contact surfaces of the two plates. This arrangement is not only simple and cheap, but it gives also the advantage that the dimensions of the calculating device can be very small. The under plate need no longer be larger than the upper plate, and, furthermore, projecting guide rods, which are liable to become bent the wrong way, are avoided.

My invention is illustrated, by way of example, on the annexed drawing, in which—

Fig. 1 is a plan view of the calculating device in a working position,

Fig. 2 is a transverse section of the under plate, and

Fig. 3 is a transverse section of the upper plate.

Fig. 4 illustrates a modification.

Referring to the drawings: a is the under or bottom plate, and e the upper or top-plate. The bottom plate a is, at its upper side, provided with a number of spaced grooves or channels b of rectangular cross section, which channels run in the longitudinal direction of the plate a. All the grooves have the same width and they are arranged equally distant apart. On five of the strip like parts of the plate surface which lie between two adjacent channels a recurrent or retrograde scale of logarithms divided in five parts of equal length is laid out. The marking lines of the starting point and of the end point of this scale, i. e. the marking lines of the numbers 10 and 100 are somewhat extended upwards, and the extensions of these lines are each surrounded by a double circle line d^1, d^4 to form reading marks. Two similar reading marks d^2 and d^3 are arranged in the vicinity of the upper right and the lower left corners of the plate a. The mark d^2 is arranged on an imaginary upward extension of the mark line of the starting point d^4 of the scale, and the mark d^3 on an imaginary downward extension of the mark line of the end point d^1 of the scale. The mark d^2 lies at a higher level than the marks d^1, but the mark d^3 at a lower level than the mark d^4, the vertical distance between the mark d^1, d^2 and d^3 and d^4 being equivalent to the transverse distance between two adjacent parts of the scale.

The upper or top-plate e is made of a transparent material, celluloid for example. On its lower side a scale of logarithms of the same length and graduation as the scale of the bottom plate a is impressed, which scale is, similarly to that of the bottom plate, divided in five parts. However, the scale of the upper plate e, when seen from above, is a progressive one. Furthermore, the plate e is provided at its lower side with a number of spaced longitudinal grooves or channels g of rectangular cross section, the depth, width and distance of these channels corresponding exactly to the channels on the upper side of the bottom plate a. The channels g are so arranged with respect to the scale of logarithms that the five parts of the latter each lie between two adjacent channels. On both plates a and e the width of the channels b and g is equal to the width of the ledges c and f formed between the channels. Thus, when the top-plate e is placed on the bottom plate a, the ledges of the one plate fit exactly in the grooves of the other plate. On calculating, the top-plate e may be displaced upwards and downwards, and it may be shifted sideways either to the right or to the left. At all times, the two plates are guided parallel to one another, so that the result of the calculation can be read off exactly.

Instead of being made of transparent material, the upper or top plate e may also be provided with window like opening exposing the scale on the lower or bottom plate a.

Instead of superposing an oblong upper

plate upon an oblong lower plate, as shown in Fig. 1 by way of example, I may turn one of the plates through an angle of 90 degrees relative to the other plate, so that then an oblong plate cooperates with a high-edge oblong plate, the respective interengaging grooves and ribs or ledges extending in the one case crosswise of the oblong plate, and in the other case lengthwise of the high-edge plate, as shown in Fig. 4 of the drawing, or vice versa.

I claim:

In a logarithmic calculating device: an under plate provided at its upper side with a number of parallel ledges and grooves, and an upper plate provided at its lower side with a number of parallel ledges and grooves, the ledges and grooves of the one plate being adapted to respectively cooperate with the ledges and grooves of the other plate.

In testimony whereof I affix my signature.

WALTER KIENBAUM.