N° 11,029 A.D. 1909

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COMPLETE SPECIFICATION.

"Improvements in Circular Slide Rules."

I, WILHELM OELSCHLÄGER, of 10, Aranka-utcza, Budapest, Hungary, Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

For quick and easy solutions of complicated arithmetical problems and formulas, no other instrument surpasses the well-known slide rule in usefulness. This instrument has therefore come to extensive use and is almost indispensable for technicians and engineers in all lines.

The most common form of slide rule is the straight one, but this form is often found to be inconvenient, especially when the slide rule is wanted outside the office or on journeys and for that purpose carried in a pocket. As the instrument is very sensitive, it may easily happen that, when it is put into the pocket together with the books and papers, the cursor is bent or lost, the celluloid split, the glass broken, and so on. At any rate it is always a cumbrous article for carrying in the pocket, as is well-known by those who work with the instrument.

In order to eliminate these disadvantages, slide rules of circular form and in about the size of a watch, have been constructed. In this form and size, the slide rule may conveniently be carried in a waistcoat pocket, but the construction and consequent mode of operation of the circular slide rules, have not so far been favourable for any extensive use of the same.

The present invention relates to a slide rule of the ordinary circular form in pocket size, but of a construction that makes it a particularly good substitute for the ordinary straight slide rule, when calculations are to be made on journeys or generally outside the office.

In the accompanying drawings, the improved slide rule is illustrated in the form which is most adaptable for practical purposes.

Figure 1 represents a front view of the slide rule,

Figure 2 a side view partly in section, and

Figure 3 a back view of the same.

A casing *a* is provided on the front side with two concentric scales *b* and *c* which flush with each other and correspond to the scales of an ordinary straight slide rule, giving logarithms for the numbers 1 to 10. Both these scales are covered by a transparent disc *d* which is rigidly connected to the casing and serves as the cursor. The latter may be provided with one or several guiding marks, preferably four, in the form of fine lines. By having several marks, the angle of displacement of the scales can be reduced, as the line which is nearest the number in question is used for marking the same.

The scale *c*, which corresponds to the sliding scale, is rigidly connected to the back plate *e* of the casing. This scale can therefore be operated by turning said back plate with the right hand, while holding the instrument with the left hand in the ring *f*.

The scale *b*, which is the argument scale, is connected to a central, dished plate *h* and is pressed against the cursor *d* by means of a spring *g*, arranged underneath said plate. This scale is consequently coupled to the cursor, and thereby to the casing, and does not, therefore, alter its relative position to these elements, when the scale *c* is turned by means of the back plate *e*. However,

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by depressing the plate *h*, which projects through the central aperture of the cursor, by means of the right hand thumb, the scale *b* can be disengaged from the cursor and coupled to the scale *c* by means of a friction surface *i*. The cursor together with the casing can then be turned freely about the scales *b* and *c*. In this manner the scales and the cursor can easily be brought in any desired position relative to each other.

The advantages of the above-described arrangement are obvious:

While the instrument is continually held in the left hand, the adjustments of the scales are effected by the right hand. The thumb of the latter is for this purpose alternately applied, to the edge of the back plate *e* for adjusting the scale *c*, and to the plate *h* for adjusting the cursor with regard to the two scales. The fact that the cursor is rigidly connected to the casing and that the scales are displaceable with regard to both, has, however, a further important advantage. Supposing for instance that the argument scale instead of the cursor had been rigidly connected to the casing (which at first sight may seem more natural), then the readings would have to be taken at different angles on the instrument; to the right or left or at the bottom, in which latter case the figures would have to be read upside down, which is inconvenient. The cursor being rigidly connected to the casing, however, the readings can always be taken at the top, or, when the cursor is provided with several guiding marks, at the place which is most convenient for the operator.

The back side of the casing is, similarly to ordinary slide rules, provided with a scale *k* having divisions for logarithms, sines and tangents, which appear in a segmental slot *l* in the back plate *e*. This scale contains four concentric divisions, the outermost of which is laid out with graduations relating to the logarithms of the numerals 1 to 10. The second division contains the degrees 1° to 90°, which are disposed in such a manner that their sines can be directly read off from the numerals of the first-mentioned division. The fourth, or innermost, division carries the degrees 1° to 45° which are arranged so that their tangents can be directly obtained from the numeral scale, and the third division contains the degrees 0° to 6°, the combined sines and tangents of which will always be found in the usual way on the outer or numeral scale. To the left of the slot *l*, the plate *e* is marked (L), S, T for the corresponding divisions, in known manner, and to the right an arrow indicates where the respective results are to be read off. The number of ciphers to precede each result are also here indicated. The slot *l* may also be covered by a transparent plate having guiding marks.

Underneath the slot *l*, sufficient space is left on the plate *e* for laying out a small table of useful figures and other data.

In order to render the slide rule still more practicable, it is provided in known manner with a tape measure *n* arranged between the front and back scales and adapted to roll itself up automatically by means of a spiral spring *m*, in well-known manner. On one side said tape is laid out with French, and on the other with English, measurements and allows therefore, at the same time, a comparison of inches with millimeters.

It will be observed from the above that the object of the invention is not the introduction of a new kind or type of slide rule. The ordinary straight slide rule will naturally continue to rank first, as the best instrument for office use, and the above-described pocket size slide rule is only intended to take the place of the former, when, for practical reasons, a more handy and readily portable instrument is required.

In the construction of the present slide rule, therefore, the inventor has proceeded with a view to make it correspond, as far as arrangement and capacity is concerned, with the ordinary straight slide rule, so that a person acquainted with the latter can also work with a circular slide rule without previous practice and without having first to get accustomed to a new arrangement and division of the scales.

The new slide rule will not, therefore, constitute a competitive article to the ordinary one but rather a welcome complement to the same.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A circular slide rule, comprising a casing rigidly connected to a transparent ring-shaped disc, serving as cursor, two concentric, logarithmic scales arranged underneath said cursor, the outer one being connected to the loose back plate of the casing and adapted to be rotated thereby, and the inner one being connected to a dished plate projecting through the central aperture of the cursor, so that, by depressing the last-mentioned plate, the scale can be coupled to and rotated together with the outer scale, whereas it is ordinarily coupled to the cursor by means of a spring bearing against said dished plate, substantially as and for the purpose set forth.

2. In a circular slide rule, according to Claim 1, a scale arranged behind the back plate of the casing and visible through a segmental slot in said plate, substantially as and for the purpose set forth.

Dated this 10th day of May, 1909.

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OELSCHLÄGER'S COMPLETE SPECIFICATION.

(1 SHEET)

[This Drawing is a reproduction of the Original on a reduced scale.]

FIG. 1

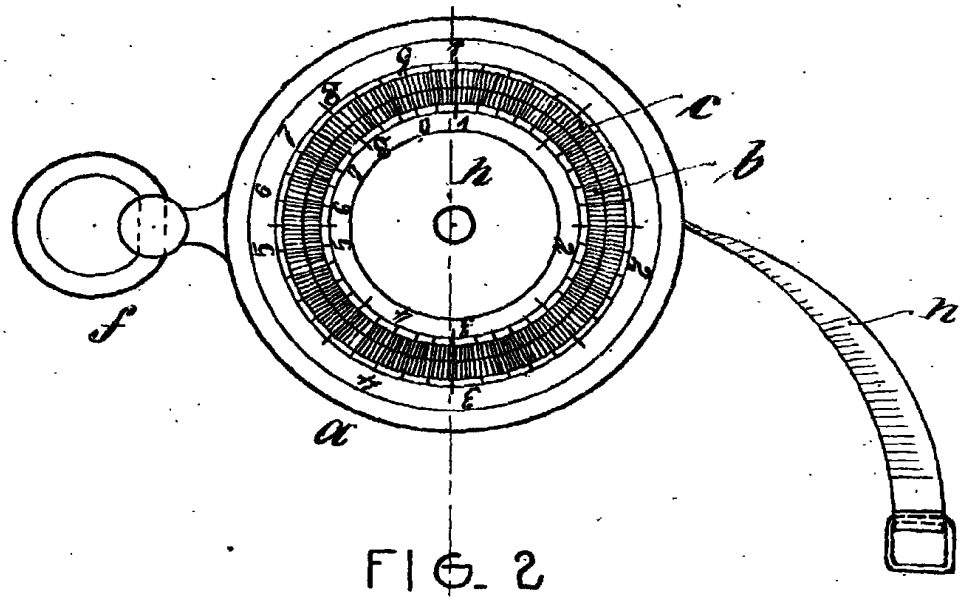


FIG. 2

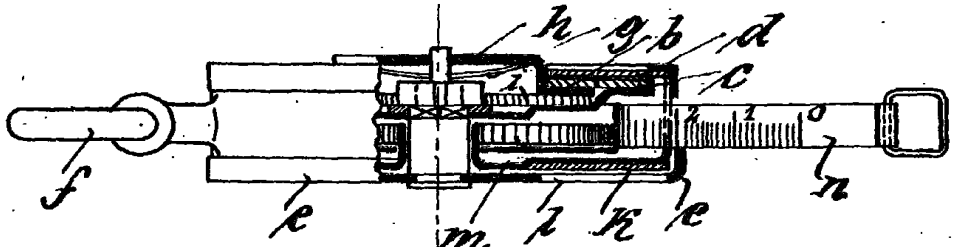
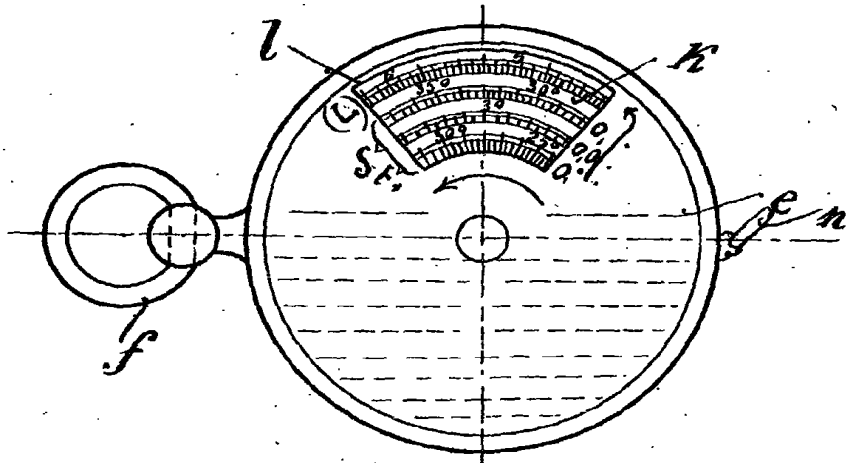


FIG. 3



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