Dec. 19, 1933. N. J. MEAGHER 1,940,177

COMPUTING INSTRUMENT

Filed April 21, 1932

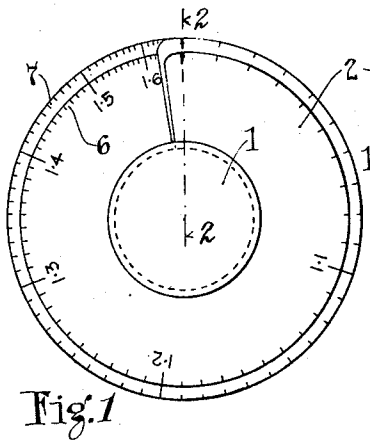


Fig. 1

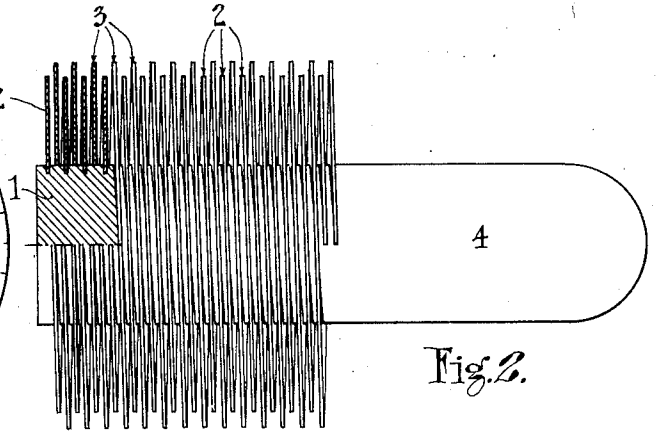


Fig. 2.

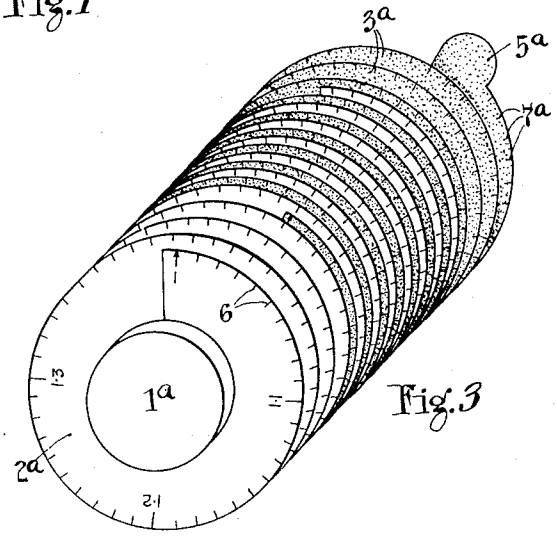


Fig. 3

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COMPUTING INSTRUMENT

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1 Claim. (Cl. 235—67)

This invention relates to computing instruments of the slide-rule type and has for its object to provide an improved construction whereby, with an instrument of a given length, calculations can be effected over a greater range and with greater accuracy than with an ordinary straight slide-rule.

According to the present invention the slide-rule comprises a helical element bearing throughout its length slide-rule graduations, and a second helical element slidably mounted in the space between the convolutions of said first mentioned element and bearing throughout its length slide-rule graduations co-operating with the graduations on the first mentioned element, said helical elements being of flexible sheet material and each having a multiplicity of convolutions.

The invention consists in the combination and arrangement of parts hereinafter described and more particularly pointed out in the appended claim.

Referring now to the accompanying drawing, which illustrates, by way of example, certain embodiments of the invention:—

Figure 1 is an end elevation of one form of the invention;

Figure 2 is a side elevation partially in section on the line 2—2 of Figure 1;

Figure 3 is an isometric view of a slightly modified form of the arrangement shown in Figures 1 and 2, the same reference numerals with the index letter "*a*" added, being used to indicate corresponding parts.

According to Figures 1 and 2 the invention comprises a cylindrical element 1 provided with a helical element 2. A helical member 3 is arranged in the narrow space between the convolutions of the element 2.

Suitable means are provided for facilitating the relative movement between the members 1 and 3. For example, the element 1 may be provided with a handle 4 of suitable length, depending on the length of the member 3, and the element 3 may be made of a slightly larger diameter than the member 2. The marginal portions of the elements 2 and 3 are provided with co-operating series of graduations. As shown, one series of graduations is provided on the element 2, as indicated at 6, and one on the helix 3, as at 7.

No attempt has been made in the drawing to illustrate the graduations accurately, as these may take the form of any well known arrangement of graduations employed on existing slide-rules. For example, the series 6 and 7 may correspond to the scales ordinarily marked A and B respectively on straight rules.

The helical element 3 is made of sheet material and the graduated scales are placed on the faces of the elements. By constructing the device in this manner a greatly increased number of convolutions and length of scale per unit of length can be obtained. As illustrated, the element 2 is separate from the support 1 but is rigidly mounted thereon. For example, the element 2 may be securely mounted in a helical groove in the support 1. The movable member 3 may be rotatably mounted on the support 1 or in a helical groove therein, and both members 2 and 3 are preferably arranged with their convolutions as closely together as possible.

The members 2 and 3 are made of flexible sheet material such as paper, thin metal, celluloid or the like, so that the elements may be easily separated with the operator's finger in order to expose the desired portion of the scales. If desired, one of the elements may be transparent.

For the purpose of easily manipulating the movable element, the latter may be made of slightly larger diameter than the element 2, as indicated in Figure 2; or the elements may be made of the same diameter and a projection 5 provided on the movable element, as shown in Figure 3.

The operation of the device will not be described in detail as the cooperation of the scales to effect various calculations is exactly the same as that of a straight rule, the only difference being that the movement of the "slide" element 3 is helical instead of linear.

In Figure 1 the elements are shown in the zero position, while in Figure 3 the element 3*a* is shown rotated several turns from the zero position with respect to the element 2*a*.

To facilitate recognition of the coils of the two elements they may be coloured differently. For example, the element 2*a* may be made white and the element 3*a* of some contrasting colour, as indicated by stippling in Figure 3.

It will be seen that the improved rule of any given length will contain a scale of very much greater length than a straight rule of the same length and that the scales may be much more highly subdivided so as to obtain a greater degree of accuracy.

It will be understood that the device may be of any convenient diameter and may be extended to any desired number of convolutions. It will also be understood that the foregoing

description and accompanying drawing are given by way of example only and that various other modifications, within the scope of the appended claim, may be made without departing from this invention.

I claim:

A calculating instrument comprising a helical element bearing throughout its length slide-rule graduations, and a second helical element slidably mounted in the space between the convolutions of said first mentioned element and bearing throughout its length slide-rule graduations cooperating with the graduations on the first mentioned element, said helical elements being of flexible sheet material and each having a multiplicity of convolutions.

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