

F. H. SEELY.
 CALCULATING DEVICE.
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1,383,492.

Patented July 5, 1921.

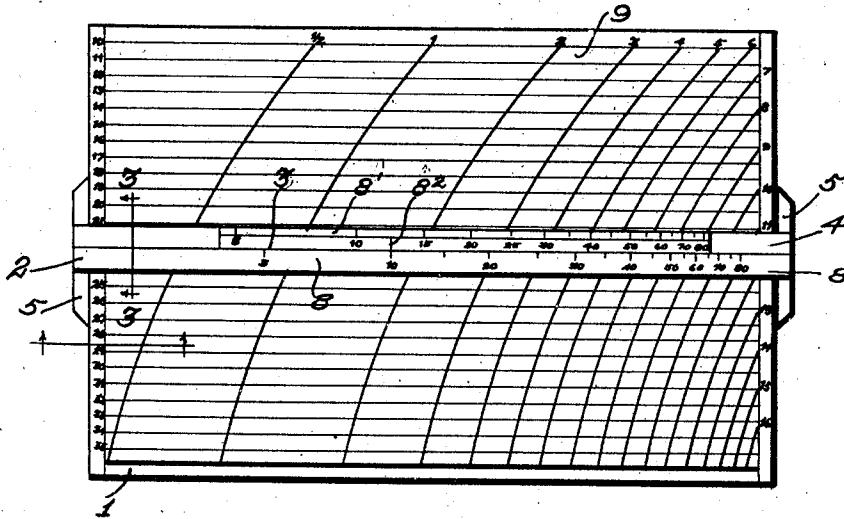


Fig-1-

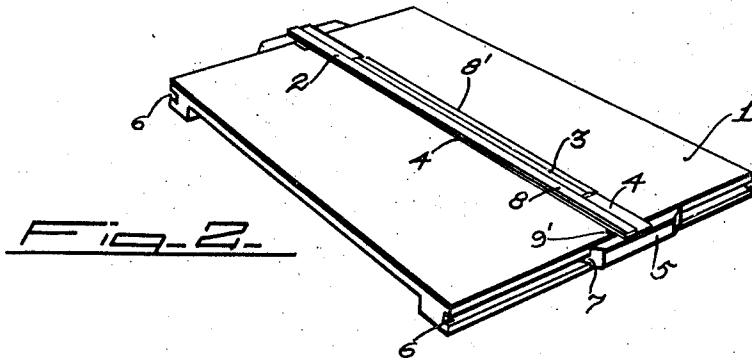


Fig-2-

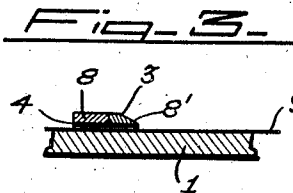


Fig-3-

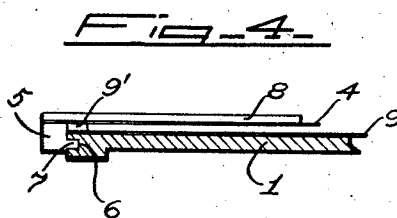


Fig-4-

WITNESS

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CALCULATING DEVICE.

1,383,492.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANK HOWARD SEELY, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Calculating Devices, of which the following is a specification.

My invention relates to improvements in those calculating devices which are based on the principle of the movable logarithmic scale, or slide rule, and while the same is adapted for use in connection with the solving of problems generally, it is illustrated specifically for the purpose of obtaining at a single operation the product of three or more factors, especially in cases where such result is in a unit different from that of the factors themselves; for example, when employed in connection with one form of chart to obtain with one operation the cubic measurement in feet and fractions thereof, of a container whose dimensions are in inches (multiplying three factors and dividing by 1728); to obtain with one operation the capacity in gallons of a round container whose height and diameter are given in inches (multiplying four factors and dividing by 230).

To accomplish these results I provide a device which in its simplest form may be roughly described as a slide rule associated with a T square moving across a board on which is contained or mounted a chart. The novelty consists in the above combination, which increases the capacity of the slide rule, and the arrangement of scales on the chart, the whole performing a new function, and solving problems that have hitherto required several operations or the use of bulky mathematical tables.

With the above mentioned and other objects in view, the invention consists in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawings and pointed out in the claim hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claim may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

I shall describe in detail a form of my invention which I have found to be convenient and practical, but do not confine

myself to strict adherence to the details of construction herein described, feeling free to utilize any convenient form which will accomplish the purpose stated and is substantially as set forth.

To more fully comprehend the invention reference is directed to the accompanying drawings, wherein—

Figure 1 is a view in plan of the preferred embodiment of the invention.

Fig. 2 is a view in perspective of the invention with the chart removed from the board.

Fig. 3 is a cross sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is a broken sectional view of the device taken on line 4—4 of Fig. 1.

Referring more particularly to the drawings, wherein like characters of reference designate corresponding parts,—1 is a board, such as an ordinary drawing board. 2 is a rule which I designate as the "movable rule," and which moves latitudinally, or "up and down" upon the board 1. 3, I designate as the "sliding rule." It is mounted upon the movable rule 2 in such manner as to move longitudinally, or back and forth across the surface of the board 1.

A simple and convenient mode of construction is the following. A plate 4, preferably of thin metal, is attached rigidly, in any suitable manner, to guides 5, arranged one at each end of the member 2. The guides 5 are so placed as to hold the movable rule 2 firmly in place across the surface of the board 1, and at the same time permit it to slide freely up and down thereover without lateral play. In the ends or sides of the board 2 along which the guides 5 move are grooves 6 in which fit tongues 7 protruding from the inner surface of the guides 6, holding the rule 2 in position on the board 1, so that it cannot lift or fall off, Fig. 2 of the drawings.

Attached to the plate 4 in any suitable manner, and at its ends to the members 5, and preferably of equal length, but narrower, so as to leave the upper portion of plate 4 exposed, is a fixed rule 8 carrying a logarithmic scale. A like scale is on the sliding rule 3, which moves with one edge in contact with that of rule 8 and is suitably secured to rule 2 so as to slide freely. The scale on 3, however, is not against the scale on 8, but on the upper edge 8', which is thin. As scale 3 is of the same width as the ex-

posed portion of plate 4, the scale on 3 is close to the surface of board 1. The only point of contact between scale 8 and scale 3 is the guide line 8² on scale 3.

5 Plate 4 is kept from actual rubbing contact with board 1 by shoulders 9'.

In this particular embodiment of the invention, a chart 9 is attached to the surface of board 1, and the same is so marked by
10 lines, points or figures as to express the result of the multiplication of two factors by means of the logarithmic scales 3 and 8, multiplied by a third factor determined by the position of movable rule 2 on board 1,
15 and this result multiplied or divided by another (fixed) factor if desired.

To illustrate the operation of the device, I will describe its application and operation in connection with chart 9 in the measurement of packages for ocean shipment.
20 It is customary for shippers to give the three dimensions of such packages in inches. It is then necessary to find the measurement in cubic feet and twelfths of a cubic foot,
25 (commonly called inches). This involves multiplying the three factors together, dividing the result by 1728 to get the cubic feet and dividing the remainder by 144 to get the inches. It is a long and tedious
30 process, and shippers are accustomed to use a bulky book of tables.

With my device the same result is reached as follows. Place the edge of plate 4 on the line that corresponds with one of the
35 dimensions of the package, as shown at the left hand side of chart 9. Move sliding rule 3 so that the guide line 8² is opposite another dimension; then find in scale 3 the third dimension; and on table 9 at that point
40 will be the result in cubic feet and inches.

In Fig. 1, movable rule 2 is so placed that the dimension 21 is indicated at the left

hand margin. The dimension 10 is indicated by the position of guide line 8² on rule 3. The third dimension is to be read on
45 scale 3. If, for instance, the third dimension should be 25, the reading on table 9 would indicate 3, which means that a package 10" x 21" x 25" would measure a little over three cubic feet, which is correct, the
50 actual mathematical measurement being 3.038 feet, or, in the language of the shipper three feet and half an inch.

Other uses of the device will occur to those interested in the solution of problems
55 of this character.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:—

A device of the character described comprising a supporting base having enlarged
60 end portions provided with guiding grooves within the outer surfaces thereof, a freely slidable main rule adapted to move over said base, and a guide block secured to each
65 end of said rule having projections riding within the recesses of the enlarged ends of the base, said rule having its upper surface formed to provide a raised graduated surface and a space bordered by said raised
70 graduated surface, a movable rule positioned within said space of a length less than the length of the main rule and having its upper surface lying flush with the surface of the raised graduated portion of the main
75 rule, said movable rule being graduated and slidable relative to the main rule.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK HOWARD SEELY.

Witnesses:

N. A. ACKER,
S. CONSTINE.