

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in or relating to Slide Rules

I, SIDNEY LIDDERDALE SCARLETT-SMITH, a British subject of, 2 Akenside Road, London, N.W.3, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to slide rules, i.e. calculating devices having relatively movable members bearing co-operating scales, and has for an object the provision of an improved slide rule which has special utility in effecting calculations relating to building operations, i.e. the calculation of area, of volumes, and of total cost on the basis of a given cost per unit of area or of volume.

According to the invention a slide rule comprises a first part having three logarithmic scales thereon and indicating respectively units of height, units of length, and numerical units, and a second part carrying four further logarithmic scales indicating respectively units of volume, units of length, and units of area, and units of area and volume, the said first and second parts being movable with respect to each other to enable any one of the said three scales to be adjustably positioned with respect to any one of the said four further scales.

At least one of the scales of length, area or volume may be duplicated to permit operation of the slide rule in two systems of unit. Conveniently, the two systems are British units and metric units respectively.

The slide rule may be of flat rectangular, flat circular or of cylindrical construction. In the known construction of flat rectangular slide rule, the cursor of the rule is slidably supported thereon by turned over edge portions of the cursor which slidably engage in grooves extending along the longitudinal edge surfaces of the base or stock of the rule.

These grooves run out at the end of the stock with the result that the cursor can slide completely off each end of the rule, and

this frequently results in the cursor becoming detached from the rule as it is withdrawn from its carrying case. According to a further aspect of the invention therefore the stock of a flat rectangular slide rule having cursor-supporting grooves along its longitudinal side edges is provided with stops engageable by the cursor to prevent it from becoming detached from the stock. The said stops may be formed either by cutting the groove so that one end stops short of the corresponding end of the stock or by fixing inserts in the grooves.

One embodiment of the invention will now be described with reference to the sole figure of the drawings accompanying the Provisional Specification, illustrating in plan view a flat rectangular slide rule according to the invention.

As shown in the drawing, the slide rule comprises on known manner a base or stock 1 of elongated rectangular shape having a cursor-supporting groove 2 along each longitudinal edge thereof and slidably supporting intermediate its width a longitudinal extending slide 3. A cursor (not shown) is slidably supported on the stock by means of inturned edges or tongues or similar elements on the cursor which engage in the grooves 2, one of which is stopped at 2a.

The stock 1, has four logarithmic scales engraved or otherwise delineated thereon, the said scales comprising:—

- A cubic dimension scale V marked in cubic yards from 0.35 to 33 cubic yards.
- A linear dimension scale A indicating width and marked in inches and feet from 4 inches to 30 feet.
- A numerical scale D of 1 to 100 for indicating square measure in square yards.
- A scale F for indicating square feet or cubic feet and extending from 9 to 900.

In a similar manner the slide 3 bears three logarithmic scales as follows:—

[Price 4s. 6d.]

- a) A linear dimension scale B indicating length or height and marked in inches and feet from 4 inches to 30 feet, this scale being the inverse of scale A of the stock 1.
- 5 b) A linear dimension scale L indicating length and marked in feet and inches from 1 foot to 5 feet and in feet from 5 feet to 100 feet.
- c) A numerical scale C of 1 to 100.
- 10 In employing this slide rule for calculating area, the scales A and B are employed for multiplying the width and length of the area and the result is read off either in square yards on scale D or in square feet on scale F. Thus
- 15 for example, to calculate the area of a room 20 feet 6 ins. long by 9 feet 4 ins. wide, the cursor line is set over 20 feet 6 ins. on scale A and the slide is moved until 9 feet 4 ins. on scale B registers with the cursor line. The
- 20 cursor is then moved to register its line with the indication 1 on scale C, and the area in square yards is then indicated by the cursor line as 21.3 square yards on scale D or 192 square feet on scale F.
- 25 In order to calculate the area of a circle, the cursor is positioned so that the cursor line registers on scale A with the radius of the circle, the slide is moved until the radius of the circle on scale B coincides with the cursor
- 30 line, the cursor is then moved until the cursor line registers with π (3.14) on scale C and the result is read off in square yards on scale D or in square feet on scale F.
- For the calculation of volumes the scales
- 35 A, B, and L are employed. Thus for example, to calculate the volume of a room 20 feet 9 ins. long by 13 feet 5 ins. wide and 10 feet 10 ins. high, the cursor is set with the cursor line in register with 13 feet 5 ins. on scale A
- 40 and the slide moved until 10 feet 10 ins. on scale B registers with the cursor line. The cursor is then moved until its line registers with 1 on scale L and the slide is moved back until 100 on scale L registers with the cursor
- 45 line. The cursor is again moved to register the cursor line with 20 feet 9 ins. on scale L and the result is read off as 3030 cubic feet on scale F, or 112 cubic yards on scale V.
- The scale C can be used to multiply or
- 50 divide any figures set on scale D, F or V.
- Thus for example, to find the value of 35 square yards at \$1.55 [1.55 dollars] per square yard the slide is moved until 1 on scale C registers with 35 on scale D. The cursor is
- 55 then moved until its line registers with 1.55 on scale C and the result is read as \$54.4 on scale D.
- The scale C can also be used in conjunction with scale V and scale F for multiplication or division. For example, in order to calculate the value of 18.9 cubic yards at \$14.50 per cubic yard the cursor is set so that its line registers with 18.9 on scale V, the slide is moved to bring 1 on scale C under the cursor
- line and the cursor is then moved to register with 1.45 on scale C, and the result is read as \$274. on scale V.
- Similarly, scale L can be used in conjunction with scales D, F or V for multiplying or dividing in shillings and pence, without decimalising the pence, by reading feet as shillings and inches as pence.
- The slide rule according to the invention greatly facilitates the calculation of area for strip materials. Thus for example to find the number of lineal feet of 1 3/4 inches wide strip to cover an area of 12 1/4 square yards, the cursor line is brought over the gauge-mark L.F. at 108 on scale F. The width in inches at 1.75 on scale C is then brought under the cursor line. The cursor is then moved to 12.25 on scale C and the quantity of 756 lineal feet of strip, is then read under the cursor line on scale F.
- Furthermore the slide rule according to the invention greatly simplifies the calculation of the number of square or rectangular units which aggregate to an area of one square yard, and thus the total number required to cover a given number of square yards. Thus for
- 90 example, to find the number of 10 1/2 x 10 1/2 inch units to cover 18 1/2 square yards, 10 1/2 inches on scale B is brought under 10 1/2 inches on scale A. The number of units per square yard is then read at 10.75
- 95 on scale C over 1 on scale D. The cursor is then moved to 1.85 on scale D and the answer read as 218 (21.75 x 10) under the cursor line on scale C.
- The slide rule also facilitates the calculation of the number of repeats, of widths or patterns, which will fit into a given dimension. Thus, for a width or repeat of 27 inches, the cursor line is set over 1 on scale D and the slide moved until 2 feet 3 inches on scale
- 105 L is under the line. For a dimension of 18 feet 3 inches, the cursor is then moved until the line is over 18 feet 3 inches on scale L and 8.1 is read under the line on scale D, thus indicating that 9 repeats are required.
- A further embodiment of the invention which although not illustrated will be readily understood, includes extra scales which allow for the immediate conversion of lineal feet and inches, square feet or yards and cubic
- 115 feet or yards into lineal metres, square metres and cubic metres. For this purpose the stock has engraved upon it the following additional scales.
- a) A linear dimension scale conveniently designated M^1 marked in metres and fractions of metres, conveniently from 0.10 metres to 9.00 metres.
- b) A plane dimension scale conveniently designated M^2 marked in square metres and fractions of square metres, conveniently from 0.85 to 85.0 square metres.
- c) A cubic dimension scale conveniently designated M^3 marked in cubic metres and

fractions of cubic metres, conveniently from 0.25 to 25.0 cubic metres.

5 These scales are so positioned that, by bringing the cursor line over scales A, D, F or V, the metric equivalent can be read under them on scales M^1 , M^2 or M^3 as required. It will be appreciated that scales C and D, or scales M^1 , M^2 and M^3 severally in conjunction with scale C, also permit calculations to be performed directly in the metric system.

10 From the above it will be apparent that the slide rule according to the invention has a multitude of uses, since it can be used for normal slide-rule calculations in addition to 15 the special functions described.

WHAT I CLAIM IS:—

1. A slide rule for calculations involving dimensions, areas, volumes and costs which comprises a first part having three logarithmic scales thereon and indicating respectively units of height, units of length, and numerical units, and a second part carrying four further logarithmic scales indicating respectively units of volume, units of length, and units of area, and units of area and volume, the said first and second parts being movable with respect to each other to enable any one of the said three scales to be adjustably positioned with respect to any one of the said four further scales, for effecting a desired calculation.

2. A slide rule as claimed in claim 1 in which at least one of the scales of length, area or volume is duplicated to permit operation of the slide rule in two systems of units.

35 3. A slide rule as claimed in claim 2

in which the two systems are British units and metric units respectively.

4. A slide rule for calculations involving dimensions, areas, volumes and costs, which comprises a first part having three logarithmic scales thereon and indicating respectively units of height, units of length, and numerical units, and a second part carrying four further logarithmic scales indicating respectively units of volume, units of length, and units of area, and units of area and volume, the second part also carrying duplicate scales of length, area and volume calibrated in a system of units different from the first-mentioned corresponding scales, and the said first and second parts being movable with respect to each other to enable any one of the said three scales to be adjustably positioned with respect to any one of the said seven further scales.

5. A slide rule as claimed in any one of claims 1 to 4 of the flat rectangular type, in which stop means are provided in the cursor-supporting grooves, engageable by the cursor to prevent it becoming detached from the stock.

6. A slide rule substantially as described with reference to and as illustrated by the drawing accompanying the Provisional Specification.

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