N° 23,968 A.D. 1914

Date of Application, 12th Dec., 1914

Complete Specification Left, 11th Jan., 1915—Accepted, 17th June, 1915

PROVISIONAL SPECIFICATION.

Improvements in and relating to Logarithmic Calculating Apparatus.

I, WALTER ELSWORTHY LILLY, 39, Trinity College, Dublin, Engineer, do hereby declare the nature of this invention to be as follows:—

This invention relates to a slide rule of cylindrical form in which logarithmically divided scales are used in the following manner. At equidistant intervals on the circumference and parallel to the axis of the cylinder are a series of logarithmically divided scales forming a grid, on which the numbers are spaced proportionately to the value of their logarithms and which vary in magnitude from 0 to 1. The number of scales is such that when multiplied by the common difference of the logarithm numbers between any two consecutive scales that their product is equal to 1. Adjacent to and forming a continuation of the first grid is a second grid exactly similar in every respect to the first grid except that the logarithmically divided scales are placed in advance the distance apart of any two consecutive scales on the circumference of the cylinder. On the cylinder is placed a tube of closely fitting transparent material which can slide on it both circumferentially and longitudinally. On the tube are printed or otherwise fixed a series of logarithmically divided scales exactly similar to those of the first grid and so arranged as to fit in between the spaces of the scales on the cylinder. The manner of using the cylindrical slide rule is similar to that of the ordinary slide rule now in use except that it involves a turning of the tube relatively to the cylinder as well as sliding longitudinally on it. Compared with a slide rule of equal length the readings obtained with the cylindrical slide rule are more accurate in direct proportion to the number of scales used on the cylinder.

Dated the 10th day of December, 1914.

W. E. LILLY.

COMPLETE SPECIFICATION.

Improvements in and relating to Logarithmic Calculating Apparatus.

I, WALTER ELSWORTHY LILLY, 39, Trinity College, Dublin, 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:—

This invention relates to cylindrical slide rules and in particular to improvements in rules of the known type in which the transparent cylindrical tube is moved on and relatively to the cylindrical member. Its principal feature consists

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in the combination of the particular arrangement of the logarithmically divided scales on the transparent cylindrical tube and the cylindrical member.

In the accompanying drawing Fig. 1 shows the construction and arrangement of the parts of the cylindrical slide rule and Fig. 2 shows the scales developed or unrolled from the cylinder on a plane surface.

Referring to Fig. 2, the scales within the rectangle ABCD, form a grid on which the numbers are spaced proportionately to the numerical value of their logarithms which range in value from 0 to 1.

On the figure 10 scales of equal length are shown, the logarithms of the numbers on the first scale AB range from 0 to .1 and on the second scale LK from .1 to .2 and so on. The lengths of the scales are thus proportionate parts of the total length of the ten scales. The product of $.1 \times 10 = 1$ and in any slide rule of this type, the number of scales multiplied by the difference of their logarithm numbers must be equal to 1.

Adjacent to the grid ABCD is a second grid EFGH exactly similar in every respect to the grid ABCD, except that the scales are so placed that the second scale BJ forms a continuation of the scale AB and so on alternately for all the other scales. The complete scales the arrangement of which as above described is well known are printed or otherwise placed on the cylinder M shown on Fig. 1. the circumference of which is equal to AD or FG. The nature of my invention is as follows: Referring to Fig. 1, on the cylinder M is placed a cylindrical tube T of closely fitting transparent material which can slide on it both circumferentially and longitudinally.

On this tube are printed or otherwise placed a series of logarithmically divided scales exactly similar to those of the grid ABCD. These scales, as shown on the figure, are so arranged as to fit in between the spaces of the scales on the cylinder M.

The manner of using the cylindrical slide rule is similar to that of the ordinary slide rule now in use, except that it involves a turning of the tube relatively to the cylinder as well as sliding longitudinally on it.

The transparent cylindrical tube may be duplicated the arrangement of the scales is then an exact duplicate of those on the cylinder.

If desired the logarithms of the numbers on the cylinder may be marked between the scales and also the values of the logarithms of the trignometrical functions such as the sine.

If desired a cursor or runner similar to those at present in use on the ordinary slide rule can be used, the form of the cursor is then a short length of tubing sliding on the cylindrical tube.

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:—

The application to cylindrical slide rules with logarithmically divided scales of the particular kind described, of the cylindrical transparent tube with logarithmically divided scales printed or otherwise placed on it.

Dated this 10th day of April, 1915.

W. E. LILLY.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1915.

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

FIG. 1.

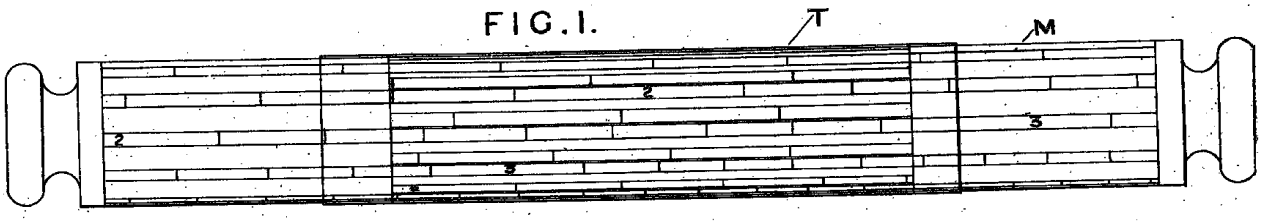

FIG. 2.

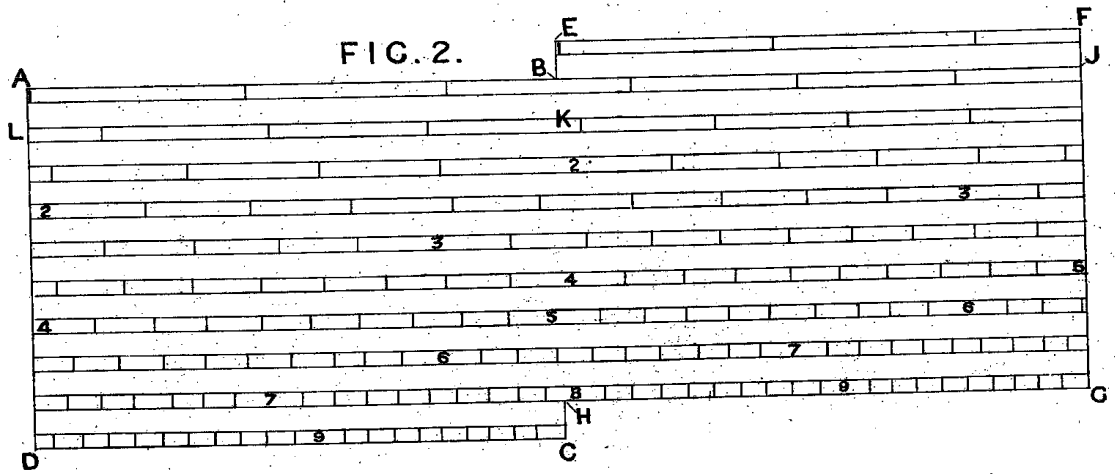

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FIG. 1.

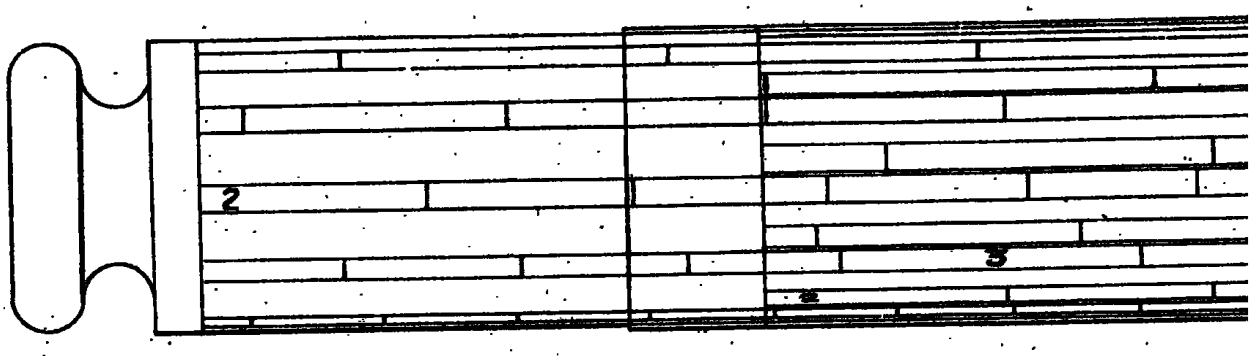
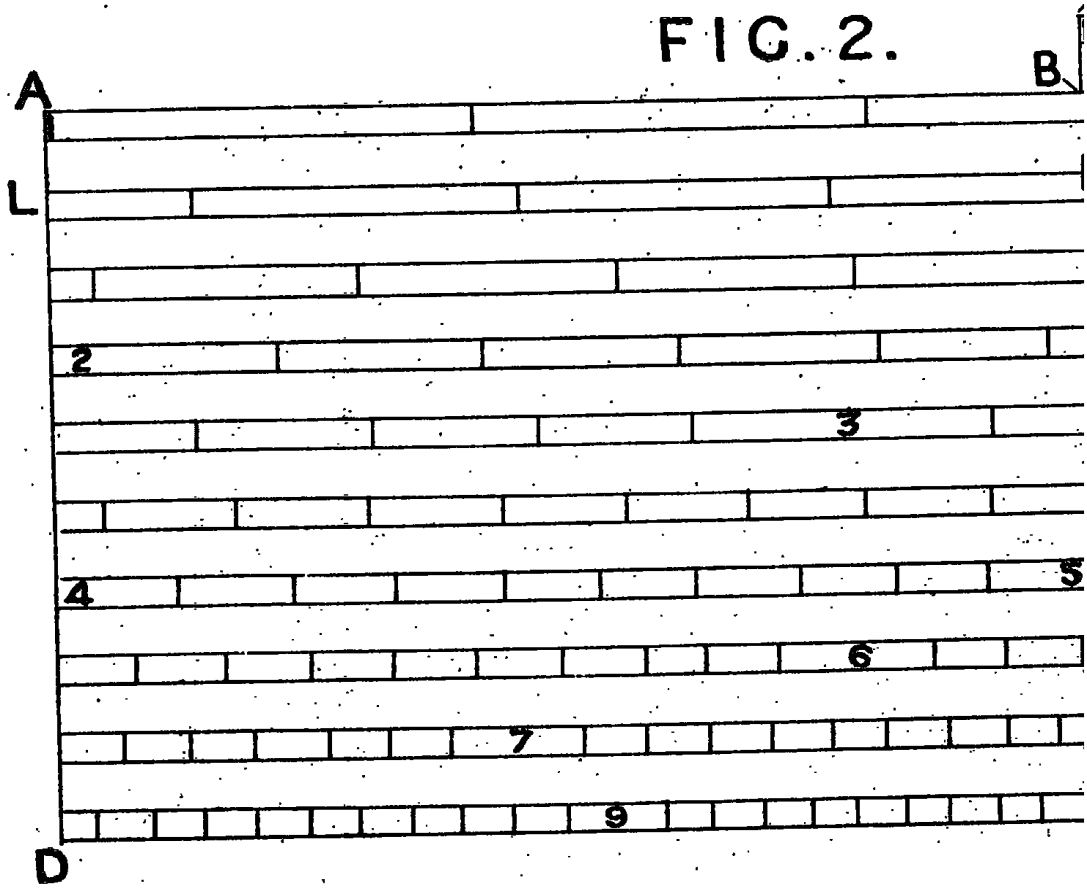
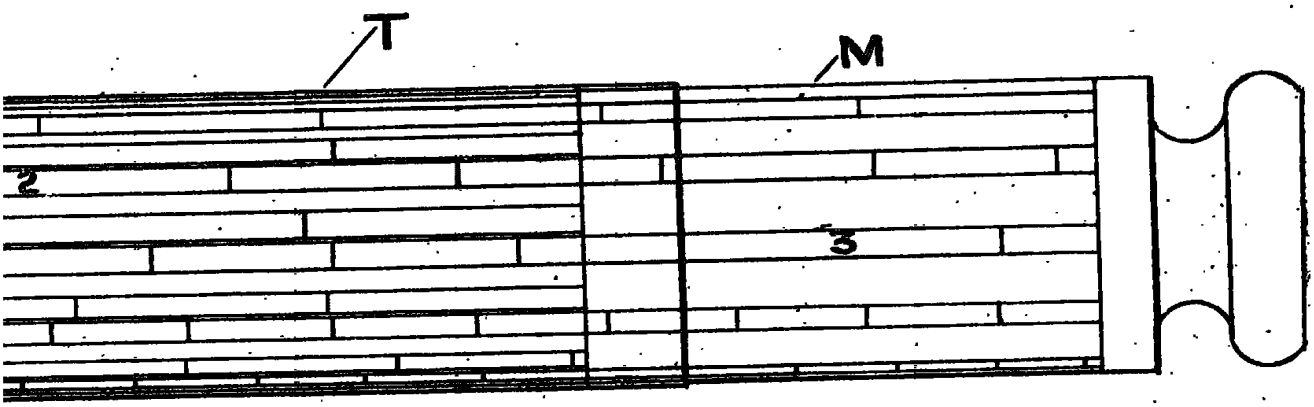
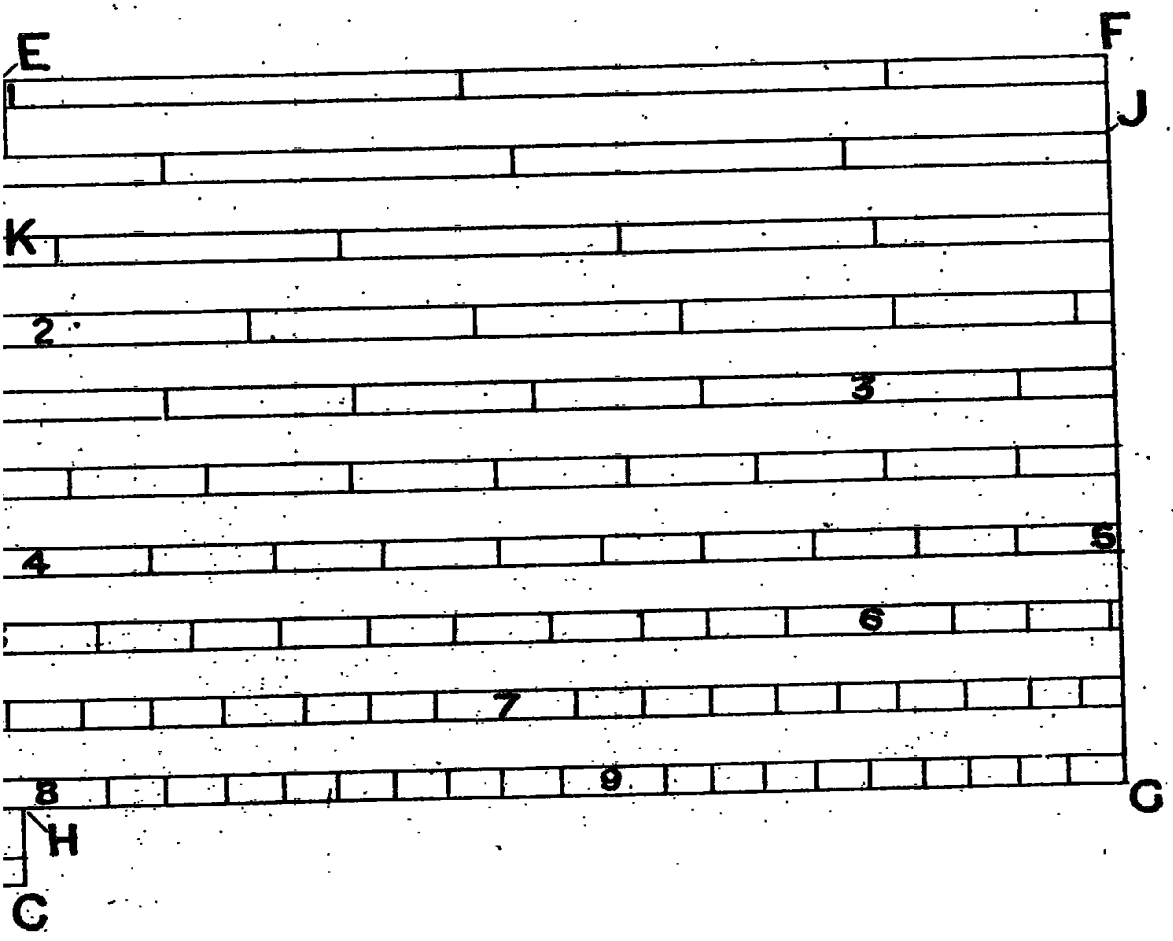


FIG. 2.







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