

J. E. LYSEN.  
CALCULATOR.

APPLICATION FILED APR. 30, 1921.

Patented June 6, 1922.

2 SHEETS--SHEET 1.

1,418,947.

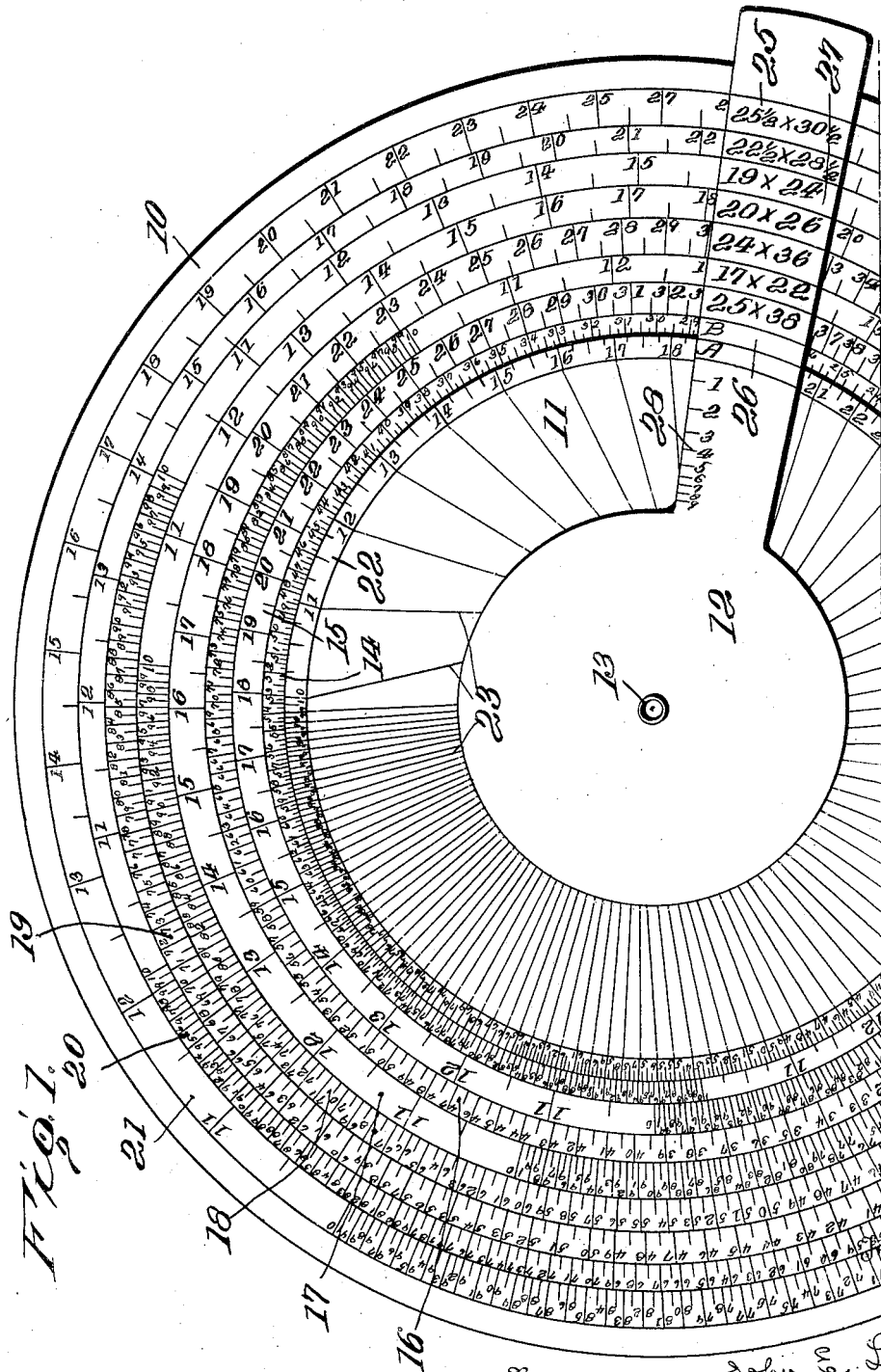


Fig. 1.  
19  
20  
21

inventor

John E. Lysen

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Wm. S. Dodge

Attorney

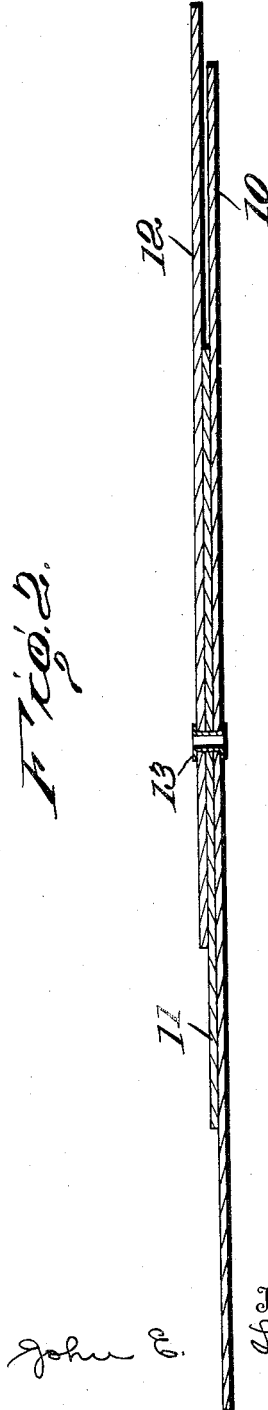
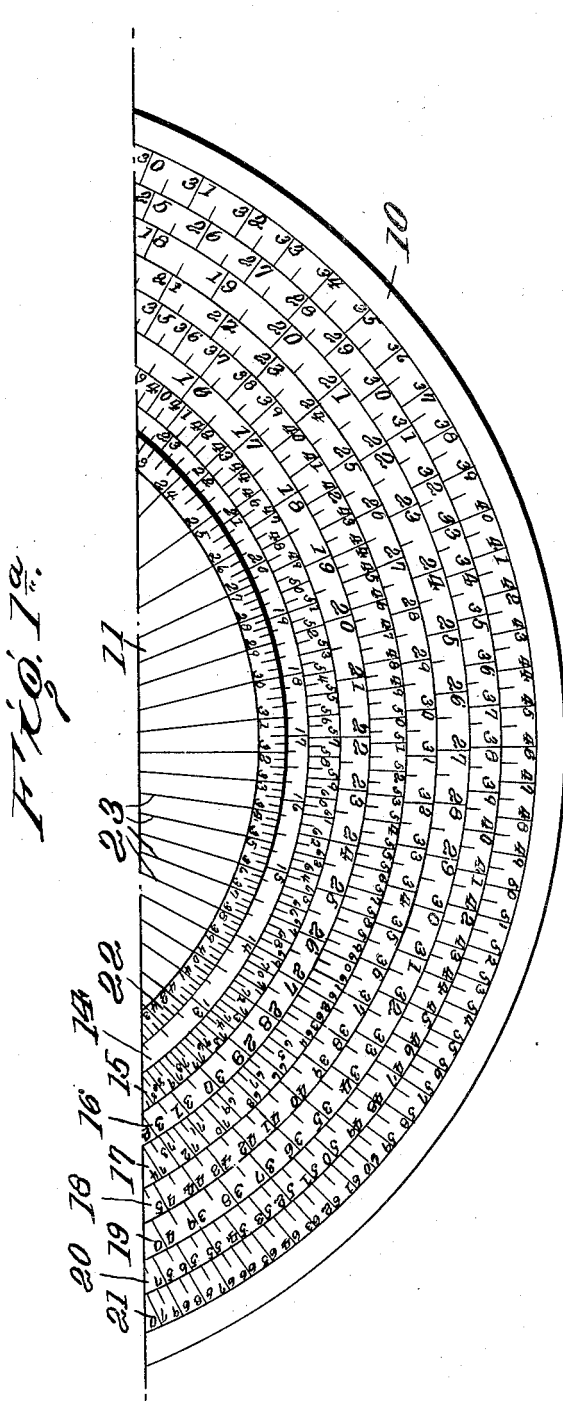
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Inventor  
*John E. Lysen*

By

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# UNITED STATES PATENT OFFICE.

JOHN E. LYSEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO J. W. BUTLER PAPER COMPANY.  
A CORPORATION OF ILLINOIS.

## CALCULATOR.

1,418,947.

Specification of Letters Patent. Patented June 6, 1922.

Application filed April 30, 1921. Serial No. 465,812.

*To all whom it may concern:*

Be it known that I, JOHN E. LYSEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Calculator, of which the following is a specification.

This invention is a device of the slide rule type, designed for use in solving mathematical problems.

One of the objects of the invention is to provide a device of the character mentioned, provided with a plurality of logarithmic scales, so arranged as to minimize the number of operations necessary to solve a given problem, thus affording a great saving of time. A further object is to provide a calculating device which, because of the relatively few operations necessary to solve any problem or series of problems, and because of the simplicity of operation, reduces the possibility of error. A further object is to provide a device whereby ordinary problems constantly arising in the paper industry, may be solved more rapidly than is possible by the use of devices now in general use, although the use of the invention is not limited to this particular industry.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawing:—

Figure 1 is a top plan view illustrating a portion of a calculator constructed to conform with the invention. Figure 1<sup>a</sup> is a similar view illustrating the rest of the device. Figure 2 is a transverse sectional view thereof.

Referring to the drawing, 10 designates a base disk, 11 a second disk resting thereon, and 12 an indicator. The disks and indicator are pivotally connected by suitable means, such as by the eyelet 13, whereby the parts referred to are free for relative rotation.

The disk 10 is provided with a concentrically arranged key scale 14, numbered from 10 to one-hundred, the numbers increasing in value in an anti-clockwise direction. Concentrically arranged with respect to the key scale 14 is a series of logarithmic scales 15, 16, 17, 18, 19, 20 and 21, all of which are provided with numbers running from ten to one-hundred in a clockwise direction, the numbers of each scale being staggered with

respect to the numbers of the other scales, and with respect to the key scale.

The second disk 11 is provided at its periphery with a key scale 22, having numbers running from ten to one-hundred in a clockwise direction, said scale being correlated with the key scale 14 and with all of the logarithmic scales of the disk 10. The scale lines of the scale 22 are extended inwardly from the edge of the disk 11, toward the center of the disk, but in a more or less tangential relation to said center, as indicated at 23.

The indicator 12 is provided with indicia 26 which coincides with the key scales 22 and 14 respectively, and is also provided with indicia 27 positioned to coincide with the respective logarithmic scales. The indicator arm is also provided with a scale 28 along one edge, the graduations of which cooperate with the inwardly extending tangential lines 23.

The device illustrated and described is designed particularly for use in the paper industry, as an aid in ascertaining the weight of various grades and sizes of papers. It will be noted that the indicia 27 specifies different standard dimensions of paper. It is to be understood however, that the invention is not limited in this particular, but is capable of modification for use in any other industry.

In practice the various problems are solved by relative adjustments of the two disks and of the indicator. For instance, assume the following problems:—

Find the weight of a ream of 19 x 28 paper in a 17 x 22—13 lb.—16 lb.—18 lb.—20 lb.—24 lb.—28 lb. and 32 lb. basis.

To solve the problem the numbers "19" and "28" in the key scales 22 and 14 respectively, are placed in register with each other. The disks are then held firmly, and the indicator is set at the number "13" on the logarithmic scale which corresponds with the 17 x 22 size index on the indicator. This will cause the number "5" of the scale 28 to intersect the line 23 leading in from the number "18" of the key scale of disk 11. The total weight is then estimated by putting down the number "18" as the first two digits of the result to be ascertained, and by adding thereto as the third digit, the number "5" indicated on scale 28, thus indicating that the weight of a ream of 19 x 28 paper on a 17 x 22—13 lb.

basis is eighteen and one-half pounds. By successively moving the indicator from "13" to "16", "18", "20", "24", "28", and "32" on the scale 16, the seventeen by twenty-two circle, the respective results demanded by the problem, may be read on the disk 11, without necessitating the alignment of "19" to "32" each time, in scales 14 and 22, as is necessary in devices of this type now in general use.

10 By way of further illustration, let it be assumed that a ream of 32 x 44 paper weighs 74 lbs. What is the weight of a ream of the same paper in a 25 x 38 size?

15 Solution:—Align 32 and 44 on the key scales 22 and 14 of the second disk and the base disk respectively. The indicator is then set at 74 on the key scale 22 of the second disk. Then reading the logarithmic scale on the 25 x 38 circle scale 15 we find that the

20 answer is "50 lbs."

The advantages of the invention will be readily understood by those skilled in the art to which it appertains. It will readily be seen that various calculations may be quickly made by a very simple operation, thereby saving time and reducing the possibility of error.

Having thus explained the nature of the invention and described an operative manner of constructing and using the same, although without attempting to set forth all of the forms in which it may be made, or all of the forms of its use, what is claimed is:—

1. A calculator of the character described comprising a base disk provided with a key scale and a plurality of logarithmic scales all concentrically arranged with respect to each other, a second disk rotatably mounted with respect to the base disk and provided with a key scale correlated with the scales on the base disk and arranged in concentric relation therewith, and an indicator arm movable in a circular path over both of said disks and having indicia registering and correlated with all of the scales of both disks.

2. A calculator of the character described comprising a base disk provided with a key scale and a plurality of logarithmic scales concentric therewith, a smaller disk rotatably connected with the base disk and having a key scale at its periphery concentric with and correlated with the scales on said base disk, the key scale of the smaller disk lying contiguous to the key scale of the base disk and an indicator pivotally connected with said disk at the centers thereof, and having an arm extending over said scales, said arm having indicia registering and correlated with all of the various scales of both disks.

3. A calculator of the character described comprising a base disk provided with a key scale and a plurality of logarithmic scales concentrically arranged with respect to the key scale and to each other, a second relatively movable disk provided with a key scale concentric and correlated with the scales of the base disk, and an indicator arm movable over both disks in a circular path, said arm having indicia registering with all of the respective logarithmic scales, and a second set of indicia registering and correlated with the key scale of the second disk.

4. A calculator of the character described comprising a base disk provided with a key scale and a plurality of logarithmic scales, a second disk rotatable with respect to the base disk and provided with a key scale correlated with all of the scale of the base disk, said second disk having inwardly extending lines coinciding with its key scale, and a movable indicator arm having indicia coinciding with the respective scales on both disks, and also having a scale correlated with the inwardly extending lines of the second disk.

In testimony whereof I have hereunto set my hand.

JOHN E. LYSEN.