E. ABERLE.

COMPUTING TABLE.

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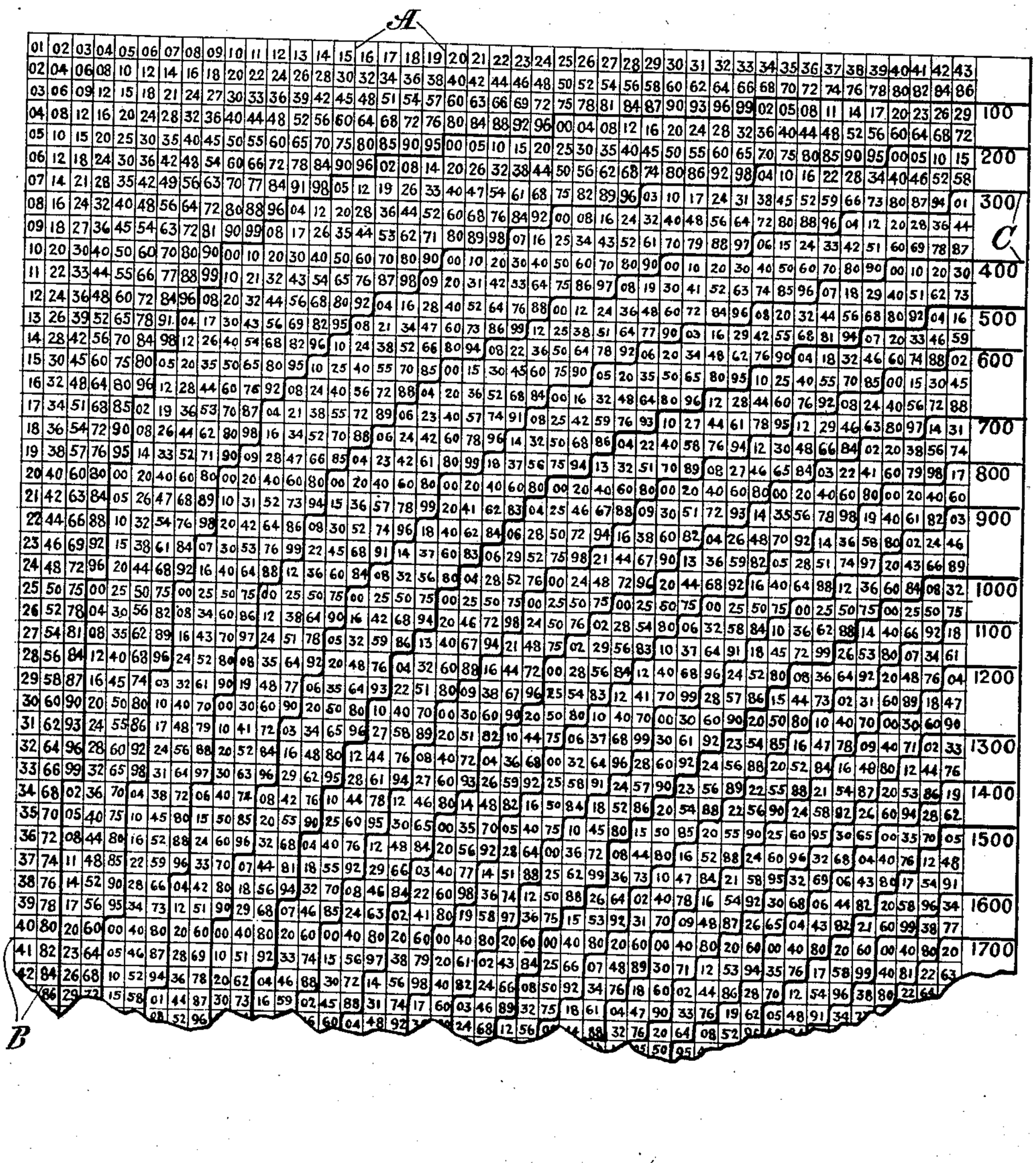
938,737.

Patented Nov. 2, 1909.



WITNESSES

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COMPUTING-TABLE.

938,737. Specification of Letters Patent. Patented Nov. 2, 1909.

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To all whom it may concern:

Be it known that I, EDWARD ABERLE, a citizen of the United States, and resident of West Nutley, Essex county, New Jersey, have invented certain new and useful Improvements in Computing-Tables, of which the following is a specification.

My invention relates to a table which in its general features may be described as a multiplication table, and which in the particular dimensions I prefer to give it will constitute a computer of ems for the use of printers.

In the accompanying drawings, I have shown a portion of a table made according to my invention. This table I prefer to make of transparent or translucent material so that it may be used as a printer's computer of ems, as explained hereinafter. If, however the table is to be used as a multiplication table, it is immaterial of what substance and what size it is made. I shall first explain the arrangement of my table in its broad conception as a multiplication table.

The top row of the table, as well as the left-hand column, consist of a consecutive series of numerals, as is usual in multiplication tables. The particular example shown contains the numerals from 1 to 43 in the top row. In an ordinary multiplication table, each section or square which is not in the top row nor in the left-hand column, contains the full product of the two numbers standing at the top of the column and at the left of the row respectively in which said section or square is found. In my improved table, this usual arrangement is followed only as long as the product contains two figures or less. If the product should contain three figures or more, only the last two figures are placed in the space or square, thus indicating only the tens and units of the product. The hundreds and thousands, that is higher denominations, are indicated at the right-hand end of the table, and irregular lines, more or less step-shaped, are employed to separate the figures belonging to one particular hundred (say 200) from the next (say 300). In the particular example shown, the spaces are formed by vertical lines A and horizontal lines B, although the lines might be dispensed with in some cases. C indicates the step-shaped lines which separate products of different hundreds, as explained above. For instance, if it be desired to find the product 27 times 15, we follow, for instance, the 27 row to its intersection with the 15 column, and find the figures 05 in the corresponding space. Then we follow upward and toward the right the irregular line C next above said space, and find at the right of the table, the numeral 400. The desired product is therefore 405. The same result would be obtained by following the 15 row to its intersection with the 27 column and then proceeding as above to find the numeral 400.

The advantage of the arrangement adopted by me is that it avoids the crowding of three or more figures into some of the spaces, and thus enables me to use large figures which are of a uniform size throughout. The figures are therefore legible with equal ease in all portions of the table.

When I intend my table to be used as a computer of ems for printers' use, three features, which are not essential when the table is used as a multiplication table, are necessary. First, the rows must be exactly at right angles to the columns; second, the width of each column must be equal to the height of each row, or in other words, the spaces containing products must be true squares; third, the size of each column and row must bear an exact relation to the size of type for which it is desired to compute ems. It is further desirable in this case that the table should be made of transparent or at least translucent material. Such a computer of ems (which the drawing may be said to represent), would be used by simply placing its upper left-hand corner on the corresponding corner of the space (say a rectangular space in a newspaper) for which it is desired to compute the ems, the top line and the left-hand line of the table being made to coincide with the corresponding limits of the space being measured. The right-hand lower corner of said space will then coincide with a number of the table which is read off as above explained and indicates the number of ems sought. This will be readily understood, since in this particular case my table is a multiplication table the unit of which is an em of that particular size, each column having the width of that em. The square-forming lines are quite unnecessary for this use of my invention. In practice, a printer would use a number of such tables, each prepared to a different scale, that is, for a different size of type.

For the sake of clearness, every fifth line C (the 500, 1000, 1500 etc. lines) may be suitably distinguished from the others, for instance by thickening it as shown and the same expedient may be employed in connection with the vertical lines A and the horizontal lines B. My table is also applicable as a division table. For instance if we have to divide 513 by 27 we shall find the number 513 in the 27th row and then the quotient 19 at the top of the corresponding column. In some cases the table will not contain the exact number to be divided, for instance we might have to divide 705 by 32. In this case, by following to the right in tht 32nd row until we reach the numbers between the lines C indicating 700 and 800 we will find the figures 04 indicating 704 as the next lower multiple of 32. By subtraction from 705 we find the remainder 1 and by going to the top of the column we find the quotient 22, thus indicating 22 1/32 as the result of the division of 705 by 32. In some cases it might be convenient to use the next higher multiple instead of the next lower multiple and the particular manner of using the table may be varied.

I claim as my invention:

1. A table comprising figures arranged in rows and columns, with the end figures of the products standing at the intersection of the row and column beginning with the factors of the respective product, and step-shaped lines separating figures of the table.

2. A table comprising figures arranged in rows and columns, with the end figures of the products standing at the intersection of the row and column beginning with the factors of the respective product, step-shaped lines separating figures of the table which are to be read in connection with different numbers of higher denominations, and designations of such numbers, adjacent to said lines.

3. A table comprising figures arranged in rows and columns, with the last two figures of a product standing at the intersection of the row and column beginning with the factors of said product, and step-shaped lines separating figures of the table.

4. A table adapted to serve as a computer of ems, said table comprising figures arranged in columns and rows running at right angles to each other, the width of each column as well as the height of each row being equal to the size of an em of the particular size of type for which the computation is made, the end figures of the results or prôducts standing at the intersection of the row and column beginning with the factors of the respective product, and step-shaped lines separating figures of the table.

5. A table adapted to serve as a computer of ems, said table comprising figures arranged in columns and rows running at right angles to each other, the width of each column as well as the height of each row being equal to the size of an em of the particular size of type for which the computation is to be made, the last two figures of a result or product standing at the intersections of the row and column beginning with the factors of said product, and step-shaped lines separating figures of the table.

In testimony whereof, I have hereunto set my hand in the presence of two subscribing witnesses, this twenty-fifth day of August 1908.

EDWARD ABERLE.

Witnesses:
JOHN LOTKA,
EUGENE EBLE.