

(No Model.)

A. R. BREINL.
APPARATUS FOR TEACHING ARITHMETIC.

No. 604,963.

Patented May 31, 1898.

Fig. 2

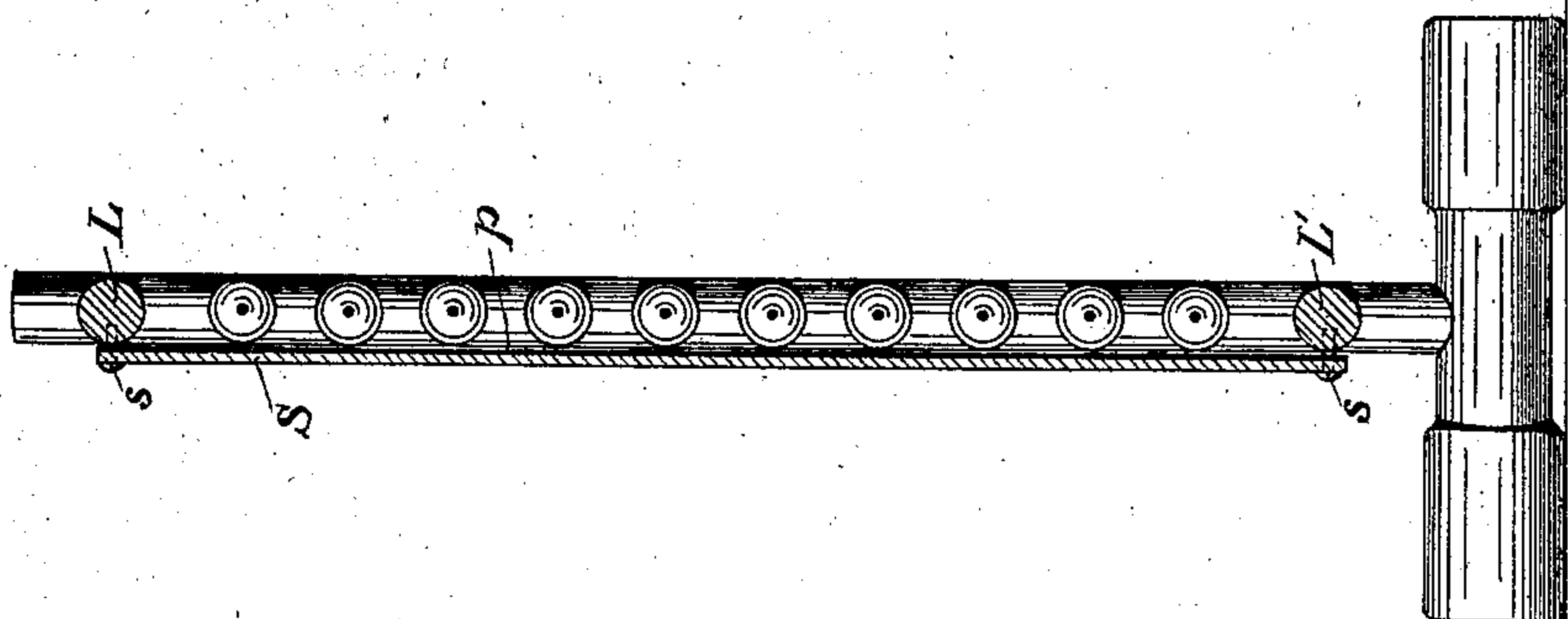
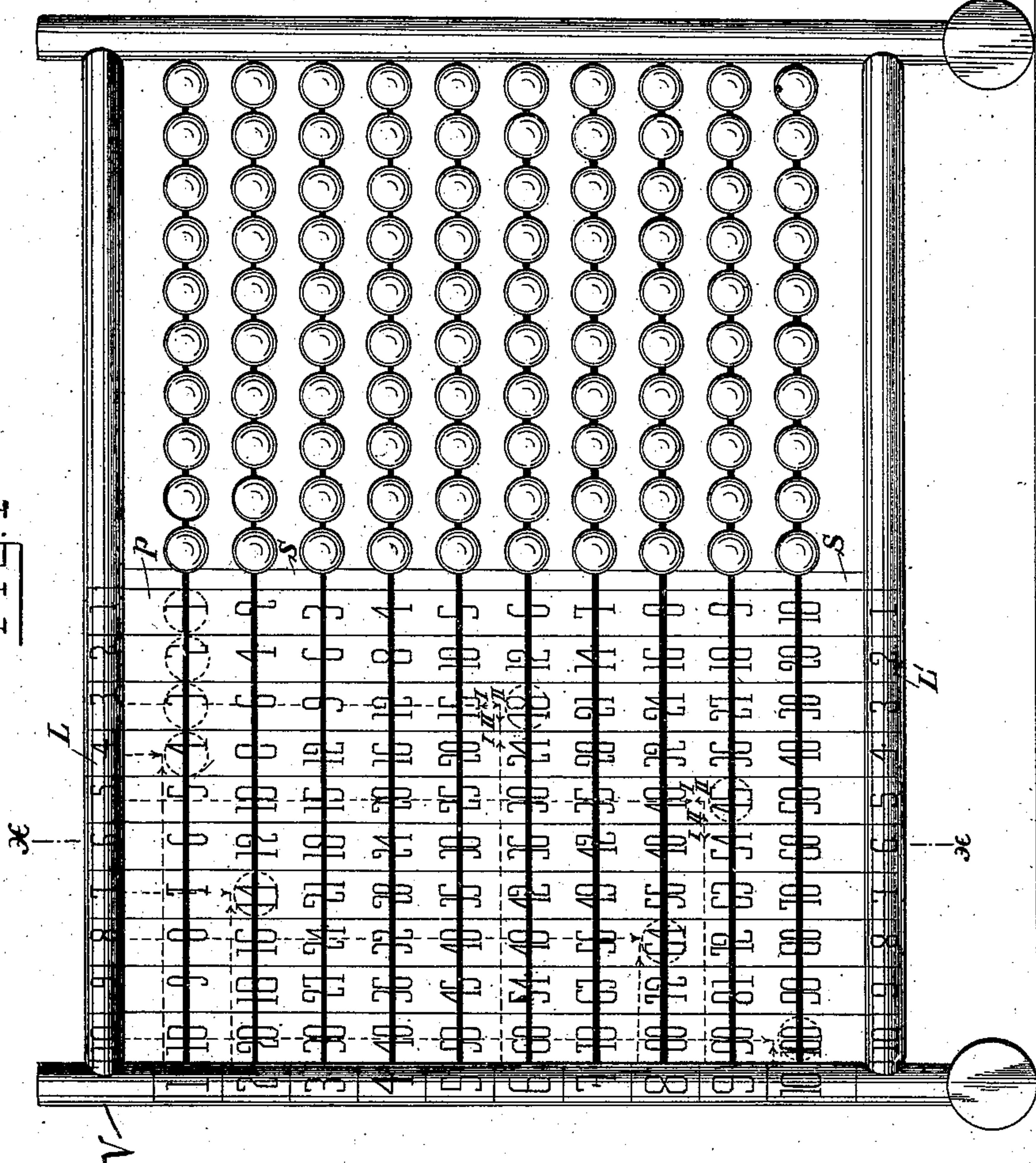


Fig. 1



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APPARATUS FOR TEACHING ARITHMETIC.

SPECIFICATION forming part of Letters Patent No. 604,963, dated May 31, 1898.

Application filed November 1, 1897. Serial No. 657,092. (No model.)

To all whom it may concern:

Be it known that I, ANTON RICHARD BREINL, manufacturer, a resident of Graslitz, in the Kingdom of Bohemia, Empire of Austria-Hungary, have invented certain new and useful Improvements in Apparatus for Use in Teaching Arithmetic, of which the following is a specification.

The reckoning or counting apparatus forming the object of the present invention is a device for teaching counting to children, which device in addition to the ordinary calculating operations of addition and subtraction is intended to teach children in an easily-comprehensible manner also multiplication and division.

The apparatus consists of ten wires arranged in a frame and one hundred balls adjustable on the ten wires, ten of such balls being, as usual, arranged on each wire and serving, as usual, for enabling children to easily grasp the operations of calculation.

The present improved apparatus may be as easily used for multiplication and division as hitherto was the case for addition and subtraction.

Numbers from "10" to "1," diminishing from the left to the right, are arranged on the two longitudinal bars L L' of the frame from one end up to the center of the same, while the left vertical upright or bar V is provided with similar figures increasing from the top to the bottom in such a way that to each figure one of the horizontal rows of balls corresponds and lies opposite the corresponding wire. These figures marked on the top and bottom bars in addition and subtraction serve as value-numerals and in multiplication or division as factors or quotients. The other corresponding factors or divisors are figures shown on the side bar V. On the back of the frame a table P, of paper or other suitable material, is attached by means of pins s, Fig. 2, which table or sheet carries on its front side in ten rows the products formed from the figures contained on the top bar L or bottom bar L' and side bar V, which products are arranged in ten vertical rows, so that these products in vertical rows stand under and above the figures on the top and bottom bars L L' and in horizontal rows against the figures on the side bar V. On the rear side of the

table or sheet P there is attached a writing-tablet, such as a slate, which is intended for inscribing the calculations or other exercises or for any other suitable purpose. Addition and subtraction take place in the ordinary manner by pushing the balls together or moving them apart, whereupon the result may be read off from the top and bottom bars L L'.

Multiplication calculations may be easily and comprehensibly taught in the following manner: If, for instance, the question be put to a child how much is four times one, the following is the procedure after all the balls have been pushed on the hereinbefore-described calculating-table to the right side in order to allow of their being more easily overlooked. The figure "1" lying opposite the first row of balls on the side bar V is always to be remembered by the child as the figure which is to be multiplied—that is to say, it is the multiplicand. The child then takes the first ball of this row and pushes it into the vertical row beneath the figures shown on the top bar L successively from "1" to "2," to "3," and to "4" and counts "once," "twice," "thrice," "four times," whereupon the ball standing on the product "4" gives the latter as the result. The operations indicated by dotted lines in Fig. 1 show various examples of multiplication. Calculation of division takes place in a reverse manner. For instance, "How many times is 6 contained in 18?" or "How much is $18 \div 6$?" 6 is the divisor, and this always gives the number of the horizontal row. In this the child finds "18," pushes the ball then onto that number, and having found the vertical row travels along the same to the top or bottom bar L L', which shows the quotient "3" as the result. When the child has become more experienced, it can carry out these calculating operations in the opposite way, as shown by the dotted arrow II in Fig. 1, the multiplicand and multiplier and divisor and quotient then reversing or changing places.

The apparatus is shown in the accompanying drawings, in which—

Figure 1 is an elevation, and Fig. 2 a section on the line xx of Fig. 1.

I declare that what I claim is—

1. In a device for teaching arithmetic, the combination with a frame, of ten wires car-

ried thereby, each of said wires being provided with ten adjustable balls, a numerical table attached to the back of the frame and having figures, the products of the numbers from "1" to "10," arranged thereon in ten horizontal and ten vertical rows, the top and bottom bars of the frame having numbers from "10" to "1" arranged thereon opposite the ends of the vertical rows of figures on the table, and the side bar V of the frame having numbers from "1" to "10" arranged thereon opposite the ends of the horizontal rows of figures on the table, said horizontal and vertical rows of figures on the numerical table, showing at their points of intersection, the products of the figures opposite their ends on the side bar V and end bars, respectively, of the frame, to which points of intersection the balls on the wires are adapted to be moved, substantially as described.

2. In a device for teaching arithmetic, the combination with a frame, of a numerical table attached to the back thereof and having a series of numbers arranged thereon in vertical and horizontal rows, and a series of numbers arranged on the bars of the frame oppo-

site the ends of the vertical and horizontal rows of numbers on the numerical table, said vertical and horizontal rows of numbers on the numerical table being the products of the numbers opposite their ends on the bars of the frame, substantially as described.

3. In a device for teaching arithmetic, the combination with a frame, of a numerical table attached to the back thereof and having a series of numbers arranged thereon in vertical and horizontal rows, a series of numbers arranged on the bars of the frame opposite the ends of the vertical and horizontal rows of numbers on the numerical table, said vertical and horizontal rows of numbers on the numerical table being products of the numbers on the bars of the frame, and a writing-tablet attached to the back of the numerical table, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ANTON RICHARD BREINL.

Witnesses:

ADOLPH FISCHER,
HENRY SCHMOLKA.