No. 736,481. PATENTED AUG. 18, 1903.

S. N. BETTS.

MATHEMATICAL DEVICE.

APPLICATION FILED JAN. 5, 1903.

NO MODEL.

Fig. 1.

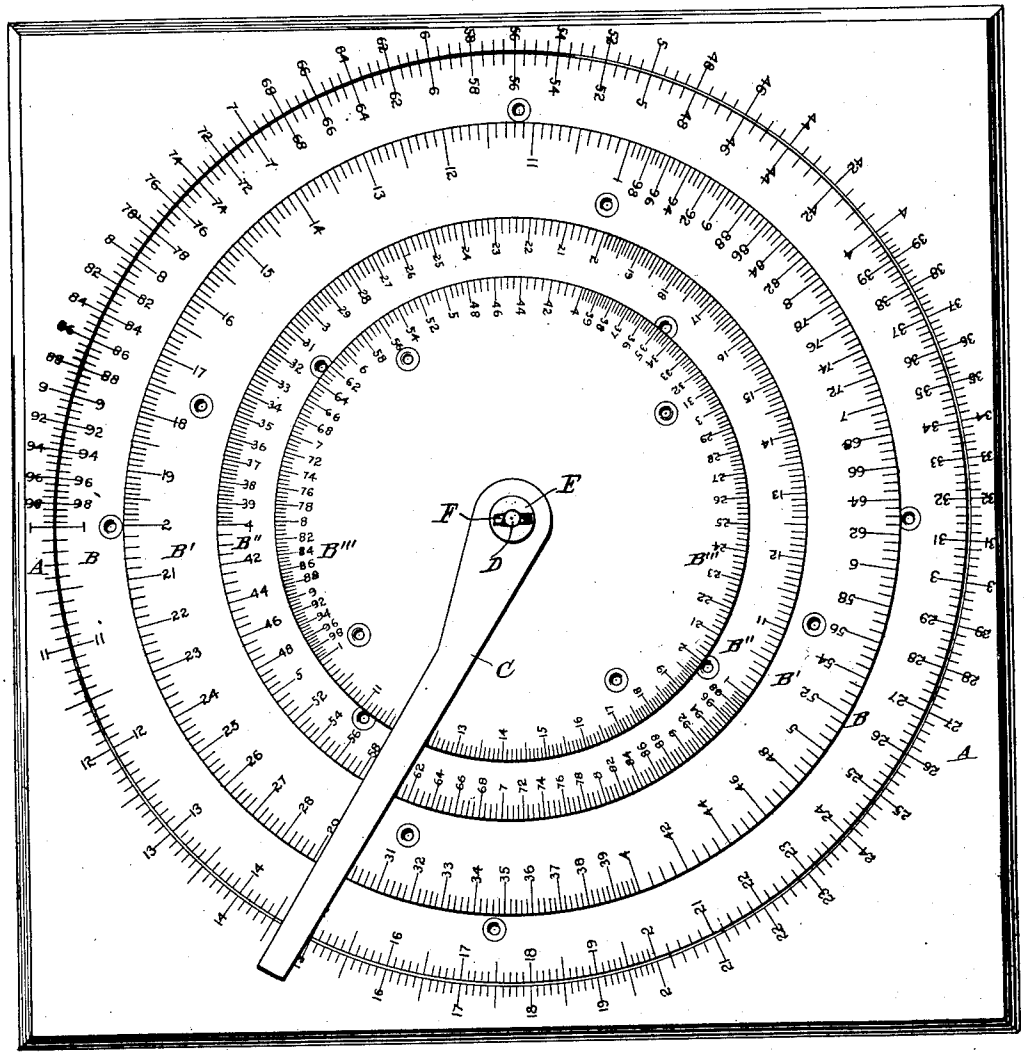


Fig. 2.

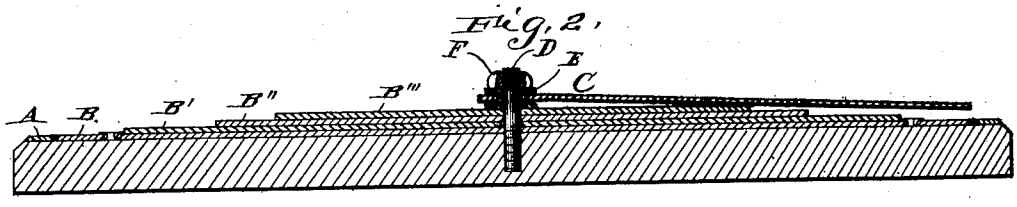


Fig. 3.



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No. 736,481. Patented August 18, 1903.

UNITED STATES PATENT OFFICE.

STEPHEN N. BETTS, OF HILLSDALE, MICHIGAN.

MATHEMATICAL DEVICE.

SPECIFICATION forming part of Letters Patent No. 736,481, dated August 18, 1903.

Application filed January 5, 1903. Serial No. 137,984. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN N. BETTS, of the city of Hillsdale, in the county of Hillsdale and State of Michigan, have invented a new and useful device which I call the "Supervisor's Assistant," of which the following is a specification.

This invention relates to an improved mathematical instrument especially designed to assist supervisors in making out or extending their assessment-rolls, and has for its object to provide a simple, inexpensive, and efficient device of this character by means of which State, county, and town taxes may be quickly and accurately obtained on individual valuations.

In the accompanying drawings, Figure 1 is a top plan view of my improved mathematical instrument. Fig. 2 is a longitudinal section of the same, and Fig. 3 is a side elevation of the stylus for rotating the disks.

In the accompanying drawings, A will be referred to as the fixed part, and B, B′, B″, and B‴ as the rotatable disks or circles. The disks B, B′, B″, and B‴ are rotatably mounted on a pin or bolt D, secured in any suitable manner to the fixed part A, and encircling the bolt D and resting on the disk B‴ is a grooved collar or eyelet E, loosely mounted in an arm or pointer C, a clamping-nut F engaging the threaded end of the bolt D and holding the several parts together. By having the arm C loosely mounted on the eyelet E said arm is free to revolve when the clamping-nut is tightened, while the disks remain relatively fixed, thereby permitting said arm to be swung to any position on the face of the instrument and in alinement with any desired series of graduations on the disks and fixed part A, so that the results may be easily read. The figures on the fixed part A and revolving disks are logarithmically arranged according to the law of decimal notation and are relatively alike, varying only by being a little closer together as the diameter of the disks diminish, the large figures "1," "2," "3," &c., up to "10" occurring in regular order with varying spaces between them and exactly covering the circuit of the disks or circles. The spaces between the lines decrease in logarithmic ratio, the space from "1" to "2" being exactly the same as from "2" to "4" or from "4" to "8," and so on in the same geometrical ratio.

In extending the assessment-roll we consider the figures on the fixed part A as multiplicands and those on the disks or circles products. The figure on the circle or disk opposite to the figure "1" on the fixed part is the multiplier, no matter what that number may be, and each number on the fixed part is multiplied by that number and the product indicated on the circle or disk directly opposite. In dividing, place the divisor found on the disk opposite the numeral "1" on the fixed part. Then find the dividend on the disk, and opposite to it on the fixed part will be found the quotient.

The operation of the instrument is as follows: To extend the assessment-roll, three disks or circles are used in order to obtain the State, county, and town tax at the same time. We find the rate or tax on one dollar for the State on the disk B, which we will suppose to be .00935, and place it opposite the numeral "1" on the fixed part. We then find the rate of tax on one dollar for the county on the disk B′, which we will suppose to be .00446, and place it opposite to the figure "1" on the fixed part, and in like manner find the tax on the dollar for the township on the disk B″, which we will suppose to be .00865, and also place it opposite the numeral "1" on the fixed part. After the above ratio on each disk has been arranged opposite the numeral "1" on the fixed part the clamping-nut F is tightened, which securely holds the several disks in position, the arm C, however, being free to revolve in the eyelet D. The tax on any individual valuation may now be obtained by sliding the arm C on the pivot D to the numeral on the fixed part representing said valuation, when the State, county, and town tax may be easily read on the disks B, B′, and B″, respectively. For instance, if the valuation is eleven hundred dollars we slide the arm C to a position in line with the graduation "11," (which we now call eleven hundred,) and by reading across the circles or disks we find the State tax to be ten dollars and twenty-nine cents, the county tax four dollars and ninety cents, and the town tax nine dollars and fifty-two cents. For any valuation found on the fixed part the tax on

that particular valuation will be found on the circle or disk opposite.

Having thus described the invention, what I claim, and desire to secure by Letters Patent, is—

In a mathematical instrument the combination with a frame, of a pin provided with terminal threads secured to the frame, a plurality of concentric disks rotatably mounted on the pin, said frame and disks bearing calculating-tables, a grooved collar slidably mounted on the pin and bearing against the disks, an arm loosely mounted in the groove on said collar and a nut engaging the threaded end of the pin and adapted to clamp the collar on the disks independently of the arm.

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Witnesses:
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