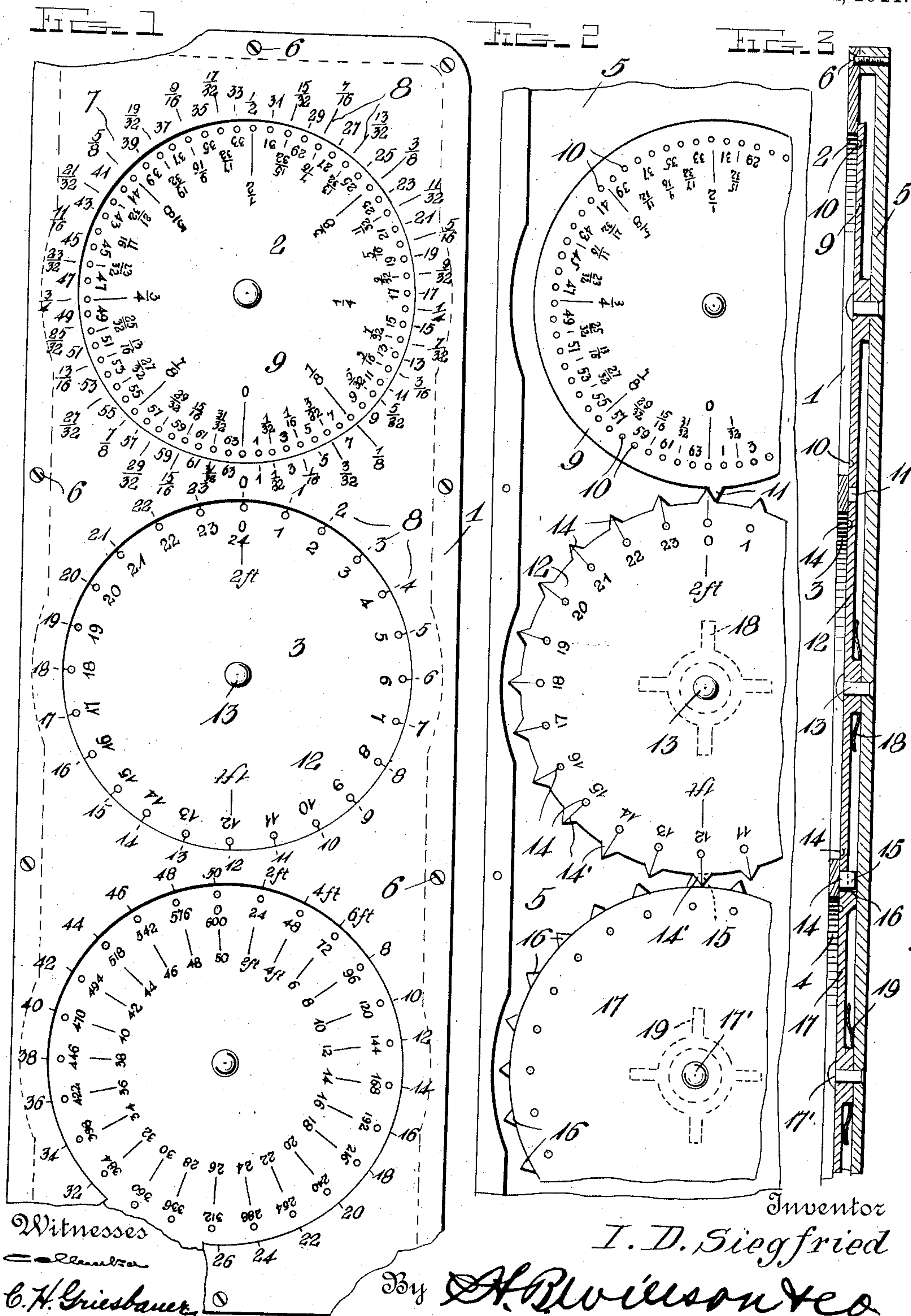


I. D. SIEGFRIED.
 CALCULATING DEVICE.
 APPLICATION FILED NOV. 16, 1908.

984,397.

Patented Feb. 14, 1911.



Witnesses

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UNITED STATES PATENT OFFICE.

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CALCULATING DEVICE.

984,397.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, IRA D. SIEGFRIED, a citizen of the United States, residing at Wadsworth, in the county of Medina and State of Ohio, have invented certain new and useful Improvements in Calculating Devices; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in calculating devices, and comprises the construction of a simple calculating device adapted to be carried by a person and operated by a pointed instrument.

One of the objects of the invention is the production of a simple and inexpensive calculating device comprising a plurality of rotatable co-acting calculating disks capable of being employed for purposes of addition and subtraction in connection with the calculation of fractional numbers or whole numbers.

With these and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be more fully described and particularly pointed out in the appended claim.

In the accompanying drawings, Figure 1 is a plan view of my improved calculating device, Fig. 2 is another plan view with the face plate removed, and Fig. 3 is a central vertical longitudinal section.

In the accompanying drawings which are for illustrative purposes, and accordingly are not drawn to scale, I have illustrated one form of my invention comprising a three-disk calculating device designed to be carried by a person, and which may be employed for adding purposes.

The numeral 1 indicates a face plate which is provided with a plurality of openings 2, 3 and 4. A rear plate 5, has a body recess formed therein secured to the face plate 1 by means of attaching screws 6. Around the openings 2 a series of scale marking or gradations 7, are arranged, said gradations or markings being preferably arranged in quarters, eighths, sixteenths, thirty-seconds and sixty-fourths, though any system of grading may be employed. The gradations are concentrically disposed around the opening 2, and a series of score or lead lines 8, lead therefrom toward the center of said opening.

Around the opening 3 a series of numerals 8, designed to represent whole numbers are arranged, 24 numerals being shown in the embodiment illustrated. Around the opening 4 a series of numerals are arranged to represent the units of twenty-five, said numerals totaling six hundred. Secured to the back plate 5 and movable in the opening 2 is a fraction disk 9, which is provided with a series of scale markings or gradations corresponding to the gradations arranged around the opening 2, and is further provided with a series of score or lead lines adapted to register with the score or lead lines formed around said opening and also with a plurality of openings 10, disposed in the path of said score lines and adapted to receive a pointed instrument. The fraction disk 9 is provided with a single peripheral tooth 11, which tooth is arranged on said disk at the point zero is indicated thereon. A second disk 12 is pivotally secured to the back plate 5 by a pivot 13, and is provided with a series of gradations or markings corresponding to those arranged around the opening 3, and further with a series of score lines and radially arranged spaced holes 14 adapted to receive a pointed instrument. The disk 12 is formed with a plurality of peripheral teeth 14, said teeth being equal in number to the number of gradations arranged on said disk, and being formed of the same pitch as the peripheral teeth 11 of the fraction disk 9, which is adapted to engage therewith. The disk 12 is also provided with a tooth 15, which is adapted to project laterally of the tooth 14, and to engage with the peripheral teeth 16, formed on a third disk 17, which is provided with a series of scale markings or gradations corresponding to those arranged around the opening 3, said disk being pivotally secured by a pivot 14, to the back plate 5. A friction spring 18 is arranged on a pin 19 secured to the back plate 5 and bears against the rear face of the disk 12 in a recess formed therein, thereby preventing said disk from rotating too freely on said plate. A second spring, 20, which is similarly secured to the back plate 1, bears against the disk 17, in a recess formed therein.

When it is desired to employ my calculating device for adding fractions the fraction disk 9 is placed at zero and a pointed instrument disposed in one of the openings formed in said disk at the point indicated by one of the fractions to be added, and said

disk rotated so that the right side thereof will be moved in a downward direction and the left side in an upward direction, and the opening engaged by said instrument will be brought to the zero position indicated on the face plate. For example should it be desired to add $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{5}{16}$, the fraction disk 9 and the whole number disk 12 are brought to zero position and a pencil or other pointed instrument is inserted in the opening in the path of the score line indicated by the fraction $\frac{1}{2}$ in the fraction disk 9, and said disk is moved so that said opening will register with the zero mark on the face plate 1. A pencil or other pointed instrument is then inserted in a hole opposite to the $\frac{1}{4}$ mark around the opening 2 and said disk is moved so that said opening will register with the zero mark on the face plate 1. This brings a total of $\frac{3}{4}$. The next movement is to insert the pointed instrument or pencil in the opening adjacent to the $\frac{5}{16}$ mark on the face plate 2, and to bring said opening in registering position with the zero mark on the face plate. The total is shown by the sum of the figures on the fraction disk 9 and the whole number disk 12 registering with the zero mark of the face plate 2. In the case of the example given this total will be $1\frac{1}{8}$. To employ the calculating device for subtracting the reverse operation is performed. To solve the following sum $1\frac{1}{4} - \frac{1}{2} - \frac{5}{16}$, the fraction disk 9 and the whole number disk 12 are moved to $1\frac{1}{4}$, respectively, and the pointed instrument is inserted in the opening at the point indicated by the $\frac{1}{2}$ mark on the face plate, and said opening is brought into registering position with the score line indicated on the face plate by the fraction $\frac{1}{2}$. The instrument is again inserted in the opening registering with the zero mark on the face plate, and said opening brought into registering position with the score line indicated by the fraction $\frac{5}{16}$ on the face plate. The total of this sum in subtraction will appear on the disk in registering position with the zero mark on the face plate and it is $\frac{1}{2}$.

In the process of subtraction the fraction disk is moved in an opposite direction to that which the disk is moved when the device is used for the purpose of addition. Each time the disk 9 makes one complete revolution the disk 12 is moved one step, and each time the disk 12 is moved one step the disk 17 is moved one step so that it would take 24 revolutions of the disk 9 to make one revolution of the disk 12, and

25 revolutions of the disk 12 to make one revolution of the disk 17. It is obvious that any number of disks may be employed, and any system or systems of grading can be used. The disk 12 is also formed with an inner circle of scale markings arranged to represent divisions of one twelfth the sum represented by the maximum mark on said disk; the disk 17 may also be formed with an inner scale of markings, or if desired a number of such circles. This arrangement enables an operator to more quickly calculate various sums, especially when inch measurements are being dealt with, as it enables an operator to promptly arrive at a desired solution in terms of feet and inches.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

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

A calculating device comprising a recessed base with three alined disks journaled therein, the central disk and one of the outer disks having continuous marginal apertures therein and also provided with the same number of alined circumferential teeth, the teeth of said central and outer disk intermingling one with the other, a single tooth on the other outer disk adapted to contact with the teeth of the central disk so as to rotate the same thereby rotating the first mentioned outer toothed disk, said disk with the single tooth having continuous fractional marginal apertures therein, an apertured face plate having calculating indicia surrounding all of the apertures, calculating indicia on said three disks cooperating with the indicia on the face plate, said indicia on the face plate having its zero marks arranged in alinement with each other, one of the marks adapted to designate two disks, and spring actuating means secured between the base plate and the central and outer toothed plate and adapted to bear on the rear faces of said central and outer toothed disks.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

IRA D. SIEGFRIED.

Witnesses:

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