A. G. BLACK.

CALCULATING REGISTER.

APPLICATION FILED DEC. 2, 1912.

1,074,347.

Patented Sept. 30, 1913.

Fig. 1

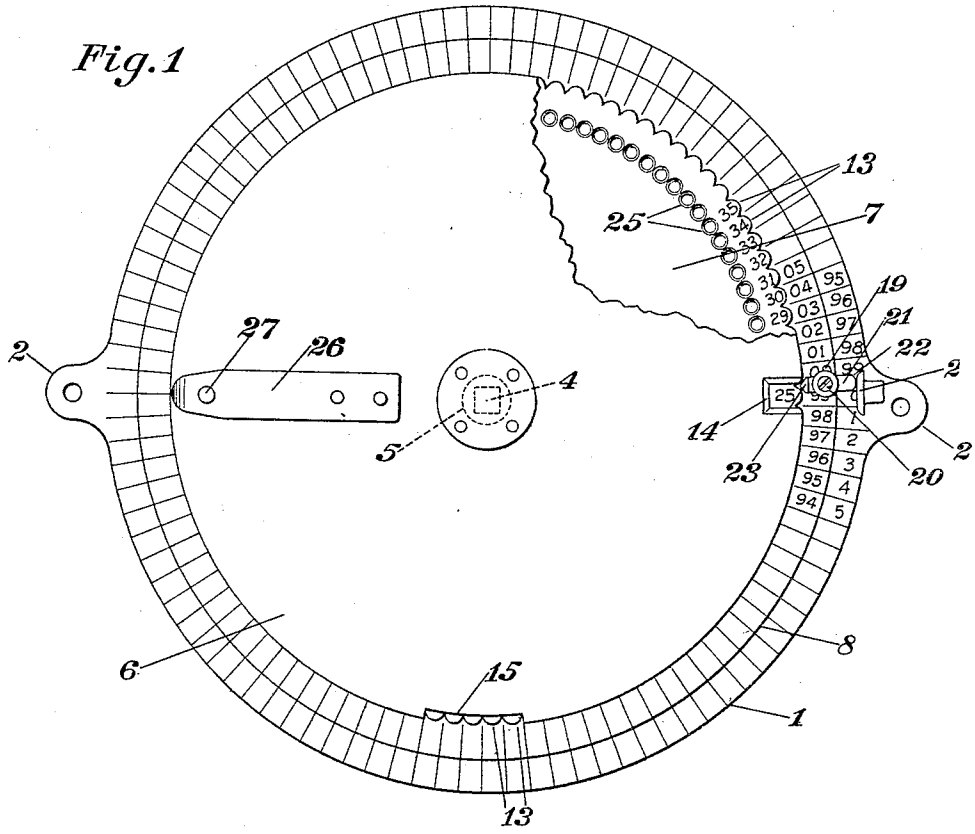


Fig. 2

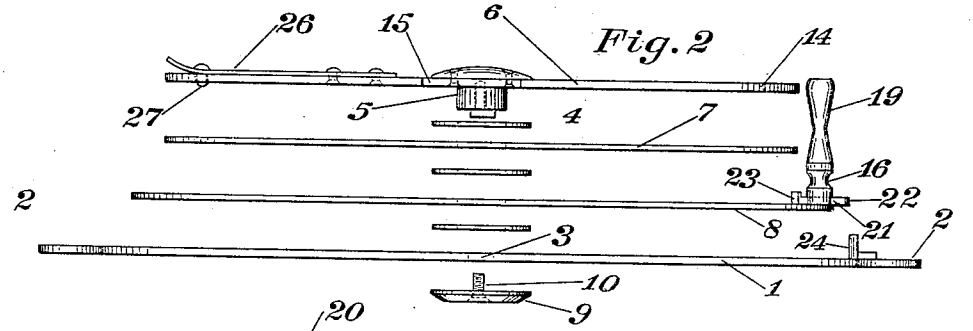


Fig. 3

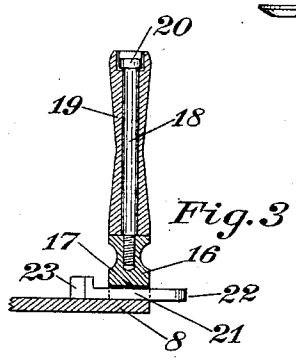
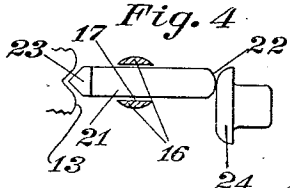


Fig. 4



Witnesses

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UNITED STATES PATENT OFFICE.

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CALCULATING-REGISTER.

1,074,347. Specification of Letters Patent. Patented Sept. 30, 1913.

Application filed December 2, 1912. Serial No. 734,615.

To all whom it may concern:

Be it known that I, ALBERT G. BLACK, a citizen of the United States of America, residing at Millport, in the county of Lamar and State of Alabama, have invented certain new and useful Improvements in Calculating-Registers, of which the following is a specification.

My invention relates to a simple and effective calculating register which is essentially, though not exclusively, adapted for use by postmasters in keeping account of their daily stamp cancellations. A machine, for this purpose, should be light, durable and very inexpensive, and to this end I have, as my preferred construction, utilized two relatively movable superposed spaced plates, the upper of which is circumferentially toothed, and each of these plates is provided with a marginal series of subdivisions consecutively numbered and having the numbers exposed to view and arranged to be in opposite directions. Interposed between these plates and movable relatively thereto is a calculating disk also provided with a marginal series of numbers from 00 to 99 and arranged to be read in the direction of the numbers on the upper plate. This interposed movable disk is provided with a handle and dog which is adapted to engage and move the upper plate one step on the completion of each revolution of the movable plate. I also provide means for preventing the upper plate from being moved more than one point at a time by the normal operation of the disk and I provide additional means whereby the upper plate may be advanced rapidly by means of the dog on the disk without requiring the latter to be rotated. The upper plate, representing dollars, may have one hundred or a less number of numerals displayed thereon but the movable disk and bottom plate should display the numerals from 0 to 99 and these should be so arranged that the subdivisions containing them will assume radial alinement on the several plates and disk.

My invention comprises various modifications of the idea as embodied in the apparatus described and further comprises the details of construction hereinafter more particularly set forth in the accompanying specification and illustrated in the drawings, in which:—

Figure 1 is a plan view of my invention showing the top cover plate broken away to disclose the structure and arrangement of numerals on the upper dial. Fig. 2 is a side elevation of my apparatus showing the several parts in position to be assembled. Figs. 3 and 4 are detail views illustrating the construction and operation of the devices for advancing the upper wheel.

Similar reference numerals refer to similar parts throughout the drawings.

In the preferred embodiment of my invention illustrated, I provide a flat metal base plate 1 having at opposite sides perforated lugs or ears 2 adapted to receive screws by which it can be fastened to any suitable support, preferably in an upright position. This plate has a squared central opening 3 which is adapted to receive the squared shank 4 forming the bottom end of a circular lug 5 which is fastened at the center of the top cover plate 6. This insures a more rigid connection of the plates 1 and 6 to prevent their relative movement. The plate 6 fits down over the upper calculating dial 7 which I term the dollar dial, its circular shank 5 passing through a circular opening in the center of such dial and also passing through a central opening in the movable or calculating disk 8, which is interposed between the dial 7 and the plate 1. Suitable washers are interposed between the several relatively movable parts to reduce friction, and a washer 9 is over the opening 3 and receives a screw 10 which is screwed into an opening in the shank 4, thus holding the parts in assembled position.

It will be noted that the cover plate 6 overlies the top dial 7 covering its marginal teeth or projections 13 within each of which a number is placed. The plate 6 is notched at 14 so as to expose one of the teeth 13 and the number thereon, and at its lower edge the plate is cut away at 15 to expose four or five of these teeth. The dial 7 is provided with any desired number of teeth 13, preferably one hundred and the numbers are arranged thereon counter-clockwise from blank to 99. The calculating disk 8 has its marginal edge exposed below the plate 6 and dial 7 and this exposed portion is subdivided into one hundred spaces which receive the numerals from 00 to 99 arranged successively and counter-clockwise. The bottom plate 1 is likewise provided with one hundred subdivisions and has the numerals from

00 to 99 arranged therein successively and in a clockwise manner. The size of the numerals and the relative subdivisions on the disk 8 and plate 1, are such that numerals in the three series may be brought into radial alinement for reading opposite notch 14. The calculating disk 8, opposite the subdivision for the numerals 00, is provided with a vertical stud 16 having a radial slot 17 disposed therein adjacent to the upper face of the plate and having its upper end reduced to form a spindle 18 upon which a handle 19 is rotatably held in place by a screw 20. A sliding pin 21 has its shank portion inserted through the slot 17 with its rear rounded end 22 projecting beyond same. The forward end of the pin is enlarged and pointed at 23 and adapted to engage the tooth 13 of the dial 7 exposed in the notch 14 when forced inwardly by the engagement of its rounded end 22 with a curved abutment 24 mounted on the plate 1 and disposed opposite said notch. The head 23 of the pin prevents the same slipping outwardly through the opening 17 as it is carried around with the plate 8 and is held out of engagement with the teeth 13 by the plate 6 except when opposite the abutment 24 and notch 14. The pin will not engage the teeth exposed by the cut away portion 15 of the plate 6, due to the fact that it will drop away by gravity from a position to engage these teeth and no means are provided to force such an engagement. When, however, it is desired to move the dial 7 rapidly, without giving the disk 8 a complete revolution for each point the dial is advanced, the operator may move the disk 8 to bring the pin 21 opposite the notch 15 and then by pressing the pin into engagement with the teeth exposed in such notch, the pin may be swung with the disk 8 to advance the dial 7 a number of points at a time.

In operation, the dial 7, disk 8 and plate 1 are set so that opposite the notch 14 they each display zeros. When a number, say 25, is to be set up on the machine, the handle 19 is grasped and the disk 8 moved until its 00 space stands opposite the numerals 25 on the plate 1. This is the position of parts shown in Fig. 1. This will leave the numeral 25 on the disk 8 opposite the notch 14, and thus the number 25 is set up. If the next number to be added is 48, the operator takes the exposed numeral 25 on disk 8 as his beginning point and swings the disk 8 until such numeral 25 stands opposite the numeral 48 on the plate 1. It will be found then that the total of the two numbers, *i. e.*, 73, will be set up opposite the notch 14. If the next number to be added be 175, the operator takes the numeral 73 as the beginning, and disk 8 is swung one complete circle to register 100 and then brought to rest with 73 opposite the numeral 75 on the bottom plate 1. It will be found that the indicated number will be 198, for in passing the notch 14 the lug 21 will have been forced inwardly until it engages the blank tooth on the dial 7 and advanced the dial to expose the succeeding tooth bearing the numeral 1. To prevent the dial 7 advancing more than one step at a time I provide it with a series of tapering sockets 25, one opposite each tooth, and the plate 6 is provided with a flat spring 26 fastened to its top face and provided with a pin 27 which projects down through an opening in plate 6 and has its lower end rounded and adapted to engage as a stop in the holes 25. The engagement is such that the dial 7 may be advanced with sufficient each but which will yet hold it against movement and from traveling beyond a step at a time.

My apparatus is equally available for subtraction, the operation in this case being that when a certain number is set up on the disk 8, if it be desired to subtract say 25 from that, the operator observes the number on the plate 1 opposite the number to be subtracted (*i. e.* 25) where it appears on disk 8 and he then moves the zero on disk 8 opposite the number on plate 1 thus observed. For instance, if disk 8 indicates the number 85 and it be desired to subtract 31, the operator finds the number 31 on disk 8 and opposite it finds the numeral 54 on the plate 1. He then turns the disk 8 back until its zero space stands opposite 54 on plate 1, which, it will be noted, exposes the number 54 opposite the notch 14, which is the correct result. It is only necessary to reverse the movement of the disk 8 to obtain the result of subtraction when the number to be subtracted exceeds 100, it being noted that the lug 23 is so designed to move the dial 7 in both directions when moved past the abutment 24. This gives a positive feed to the dollar dial and the sides of the notch 14 serve to force the lug outwardly as soon as it has advanced the dollar dial one step.

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

1. A calculating register comprising a base plate provided with a marginal scale comprising one hundred subdivisions numbered consecutively, a flat calculating dial superimposed on and pivoted to said base and also provided with a marginal series of one hundred subdivisions which are successively numbered, the numbers being arranged in a reverse direction to and displayed adjacent to those of the plate, a flat toothed dial rotatably mounted above said movable disk and having peripheral symmetrical teeth which are successively numbered, a plate which overlies said dial and has a notch which exposes a tooth of the

latter and its respective number, means connecting the several superimposed parts together and holding said notched plate and base plate in fixed relationship, a handle fixed on the exposed marginal edge of said calculating dial for setting it relatively to the numbers on the base, a radially movable dog mounted on the exposed marginal edge of the calculating dial, and a stud on the base plate which is symmetrically beveled and adapted to engage and force said dog inwardly each time it is moved past the stud in either direction, said dog, when forced inwardly, being held in engagement with the exposed tooth on the upper dial and caused to move the latter the space of one tooth, the exposed marginal numbers on the two dials being arranged in close juxtaposition to jointly present in radial alinement the result of the calculating operation, substantially as described.

2. A calculating machine comprising a non-rotatable base plate having a circular marginal series of one hundred visible numbers running consecutively from zero up, two superimposed relatively movable flat dials of different diameters which are superposed and rotatably mounted on said base plate, the under dial having a narrow peripheral edge left exposed by the upper dial and each of said dials having about its peripheral edge a series of one hundred numbers running consecutively from zero up but progressing in a direction counter to that of the numbers on the base, a hand grip attached to the exposed margin of the under dial opposite its zero point, means to carry from the under to the upper dial, and means to expose and point out the numbers set up in radial alinement on the two relatively movable dials.

3. In a calculating machine, flat superposed numbered dials, of different diameters, a flat base plate on which said dials are concentrically pivoted, teeth around the edge of the upper dial, a stationary plate which extends over the toothed edge of said dial and is notched to expose one tooth at a time, there being a tooth for each number on said dial and each tooth being symmetrical with reference to a radial center line therethrough, a radially slidable dog mounted on the exposed marginal edge of the under dial and having its outer end rounded, a stud on the base plate opposite said notch which forces said dog into engagement with said exposed tooth to cause the top dial to advance a step with the continued movement of the under dial, and means to operate said tooth by hand to engage the upper toothed dial at a point spaced from said notch in the plate over and move it in either direction, substantially as described.

4. In a calculating machine, flat superposed numbered dials of different diameters, a flat base on which said dials are concentrically and pivotally mounted, symmetrical teeth around the edge of the upper dial, a stationary plate which extends over and protects the toothed edge of said upper dial and is notched at one point to expose one tooth at a time, there being a tooth for each number on said dial, an operating handle mounted on the exposed peripheral edge of the under dial, a radially movable dog mounted in said handle and having its outer end rounded, and a vertical stud on the exposed marginal edge of the base plate opposite said notch which automatically forces said dog, as it is moved past said stud, into engagement with said exposed tooth to cause the top dial to advance a step, said stationary plate being notched at a point spaced from said first mentioned notch, to expose a number of said teeth, and said dog being adapted to be manually moved to engage such exposed teeth and advance the upper dial in either direction at will, as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT G. BLACK.

Witnesses:
HOMIL WELSH,
A. K. COLLINS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."