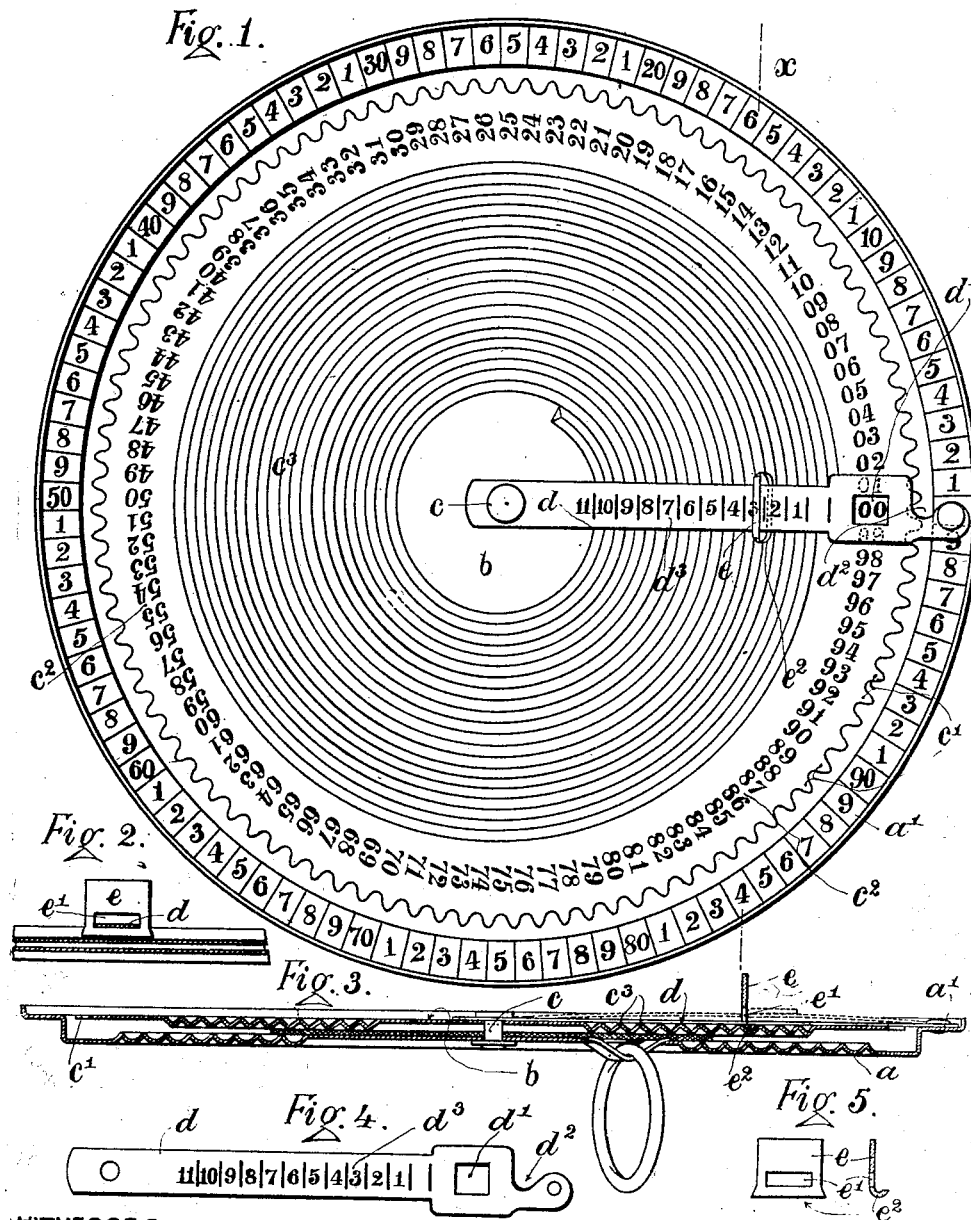


A. A. A. DREYFUS & A. H. V. LEVY.
 CALCULATING MACHINE.
 APPLICATION FILED OCT. 8, 1908.

920,840.

Patented May 4, 1909.



WITNESSES

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UNITED STATES PATENT OFFICE.

ARMAND ALBERT ABRAHAM DREYFUS, OF HANDSWORTH, NEAR BIRMINGHAM, AND ALFRED HENRY VICTOR LEVY, OF EDGBASTON, NEAR BIRMINGHAM, ENGLAND.

CALCULATING-MACHINE.

No. 920,840.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed October 8, 1908. Serial No. 456,828.

To all whom it may concern:

Be it known that we, ARMAND ALBERT ABRAHAM DREYFUS and ALFRED HENRY VICTOR LEVY, subjects of the King of Great Britain, residing at 2 Selbourne road, Handsworth, near Birmingham, England, and White Lodge, 7 Church road, Edgbaston, near Birmingham, England, respectively, have invented certain new and useful Improvements in Calculating - Machines, of which the following is a specification.

This invention relates to calculating machines and has for its object to provide a new and simplified construction of machine for mechanically adding or subtracting any series of figures or numbers.

Figure 1 of the accompanying drawings represents a plan of a calculator constructed in accordance with this invention. Fig. 2 is a fragmentary section on line x Fig. 1. Fig. 3 is a diametrical cross sectional view along the radial line of the hundreds indicator bar, the latter appearing in edge elevation. Fig. 4 is a plan of the "hundreds" bar detached from the machine. Fig. 5 shows the "hundreds" indicator in section and front elevation.

The same letters of reference indicate corresponding parts in each of the figures of the drawing.

The base plate a has its edge a' raised as shown, so as to form said plate into a hollow dish-shaped. Around said edge a' a continuous series of numbers from 1 to 100 are marked, the last named number being indicated by zero. Within the hollow interior of said base plate a , a central disk b is arranged, said disk b being pivotally mounted at c so as to be capable of being freely rotated. The edge of this disk is provided with a series of notches or teeth c^1 equal in number to the figures around the edge of the base plate, while near the edge of the disk, and opposite to said notches, is a series of numbers c^2 from 1 to 100, the latter being indicated by zero. Formed in the face of the disk c is a volute spiral groove c^3 , commencing near the center and gradually increasing in diameter until it reaches nearly to the figures c^2 , giving, in the particular example represented, eleven coils or revolutions of said spiral. Bridging this spiral is a flat radial bar d , one end of which is fixed at the center, and the other end upon

the outer edge a' of the base a . In this bar is formed an aperture d^1 which comes immediately over the figures c^2 so as to expose one of the latter therethrough. There is also formed near the outer end the gap d^2 whose inner end comes opposite to the zero mark on the edge a' of the base a .

Carried by the bar d is an indicator e consisting of a small vertically-arranged sheet metal plate having a slot e^1 through which the bar d freely passes, so that the sides of said indicator embrace the opposite edges of the bar. The lower edge of this indicator is turned up and rounded, as at e^2 , and engages with the spiral groove c^3 , so that when the disk c is rotated, said spiral will cause the indicator e to move axially along the bar. Thus for each complete revolution of the disk c , the indicator will be moved a distance equal to the pitch of the spiral, and in order to indicate the number of revolutions thus made, and thus the number of "hundreds" calculated, the bar d is marked with a series of numbers d^3 , each opposite to one of the grooves of the spiral, so that the indicator comes opposite to one or other of said numbers according to the number of revolutions of the disk c and thus the number of "hundreds" calculated. The indicator is also capable of being lifted out of engagement with the spiral and slid along the bar, for this purpose the latter being made flexible so that it can be arched as shown in dotted lines in Fig. 3.

The operation of the machine is as follows:—In every case before each operation, the zero mark on the disk b must be brought beneath the aperture d^1 of the bar d , and the indicator at the outer end of the bar. For the purpose of adding a series of numbers, for instance, 11, 8 and 23, after the machine has been placed in its zero position, a suitable style or the like is placed in the notch opposite the figure 11 on the outside ring of figures, and the disk b rotated thereby until the style engages the bar d as a stop, entering the recess d^2 thereof. The number 11 on the disk will then appear beneath the aperture d^1 . Then place the style in the notch opposite the figure 8 of the outside ring and move the disk as before, and then repeat the operation with respect to the figure 23, the style being placed in the notch opposite this

number on the said outside ring. When it has been brought around to the recess d^2 the number 42 will appear beneath the aperture d^1 , that is, the total sum required. When the total exceeds 100 the indicator e will automatically register each hundred.

In order to subtract two numbers, the figures upon the disk b represent the minuend, and the numbers upon the outer ring a^1 the subtrahend. Thus to subtract 47 from 84, the style is placed in the notch opposite to the figure 84 and moved around until opposite to the number 47 upon the outer ring a^1 , when 37, the difference between the two numbers, will appear beneath the aperture d^1 . Should the two numbers be for instance 129 and 57, the style is placed in the notch opposite the figure 29 and turned past the bar d until same comes opposite to number 57 on the outer ring. When the difference exceeds 100, the indicator e will automatically register each successive hundred.

Having fully described our invention, what we desire to claim and secure by Letters Patent is:—

1. In a calculating machine, the combination of a rotatable disk having a volute spiral groove therein, a radial and graduated indicator bar arranged over said plate, and an indicator carried by said bar consisting of an open frame through an opening in which the bar passes, the lower end of said indicator engaging with the spiral groove of the rotatable disk and adapted by the rotation of the latter, to be moved along the bar, the whole operating as described and set forth.

2. In a calculating machine the combination of a dished base plate having a raised periphery marked with a series of figures, a rotatable disk mounted upon said base plate, having its edge provided with a series of numbered notches, and having a volute spiral groove in the face thereof, a radial "hundreds" indicator bar arranged over said plate and being graduated to correspond to the coils of said groove and an indicator carried by said bar consisting of an open frame through an opening in which the bar passes, the lower end of said indicator being formed so as to engage with the spiral groove of the rotatable disk and adapted, by the rotation of the latter to be moved along the bar, and also adapted to be lifted out of engagement with said spiral and moved to any position upon said bar, the whole being constructed and operating substantially as described and set forth.

3. In a calculating machine, in combination, a base plate having a raised peripheral portion marked with a series of figures, a rotatable disk mounted upon the base plate and having its peripheral edge portion marked with a series of figures corresponding to the figures on the base plate, a radially disposed resilient indicator bar having its

end portions fixed, a member mounted on the indicator bar for movement axially thereof and means upon the disk for engagement with the member to cause radial movement thereof when the disk is operatively rotated.

4. In a calculating machine, in combination, a base plate having a raised peripheral portion marked with a series of figures, a rotatable disk mounted upon the base plate and having its peripheral edge portion marked with a series of figures corresponding to the figures on the base plate, a radially disposed indicator bar, a member mounted on the indicator bar for movement axially thereof, and means upon the disk for engagement with the member to cause radial movement thereof when the disk is operatively rotated, said member having an opening through which the indicator bar passes and being movable away from the disk out of engagement with said means.

5. In a calculating machine, in combination, a base plate having a raised peripheral portion marked with a series of figures, a rotatable disk mounted upon the base plate and having its peripheral portion marked with a series of figures corresponding to the figures on the plate, said disk having also a volute spiral groove, a radially disposed indicator bar, and a member slidable axially of the indicator bar and having its lower end of upturned angular cross section for conformable engagement in said groove.

6. In a calculating machine, in combination, a base plate having a raised peripheral portion marked with a series of figures, a rotatable disk mounted upon the base plate and having its peripheral portion marked with a series of figures corresponding to the figures on the plate, a radially disposed indicator bar having its ends fixed, a member movable axially of said indicator and means on the disk engaging said member to cause radial movement thereof upon operative rotation of said disk, said indicator bar having an opening in its outer end portion to expose the particular figure of the disk thereunder.

7. In a calculating machine, in combination, a base plate having a peripheral portion marked with a series of figures, a disk rotatably mounted upon said base plate and having its peripheral portion marked with a series of figures corresponding to the figures on the base plate and having also peripheral notches, corresponding in number and arrangement to the figures and a fixed radially disposed bar having a portion thereof beyond the edge of the disk formed with a notch, as and for the purpose set forth.

8. In a calculating machine, in combination, a base plate having a raised peripheral portion marked with a series of figures, a disk rotatably mounted upon the base plate and having its peripheral portion marked with a series of figures corresponding to the figures

on the base plate, the disk having also a volute spiral groove, a flat resilient radially disposed indicator bar, and a member mounted upon the bar for movement axially thereof
5 and having an end portion engaged in said groove.

In testimony whereof we have hereunto

set our hands in presence of two subscribing witnesses.

ARMAND ALBERT ABRAHAM DREYFUS.

ALFRED HENRY VICTOR LEVY.

Witnesses:

HENRY SKERRETT,

HENRY NORTON SKERRETT.