(No Model.)

D. B. VANCE & J. W. BREVARD.

ADDING MACHINE.

No. 421,455. Patented Feb. 18, 1890.

Fig. 1.

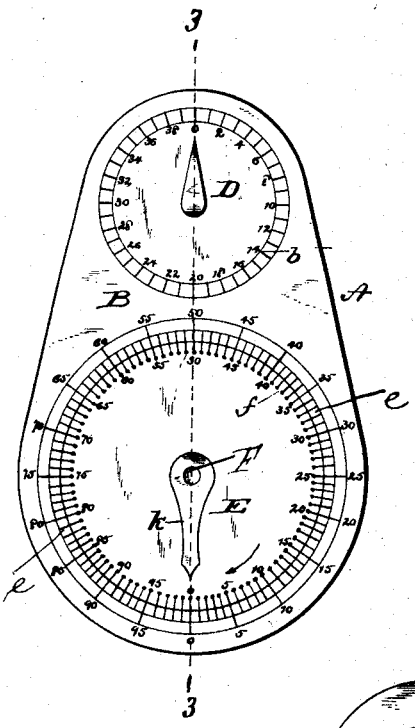


Fig. 3.

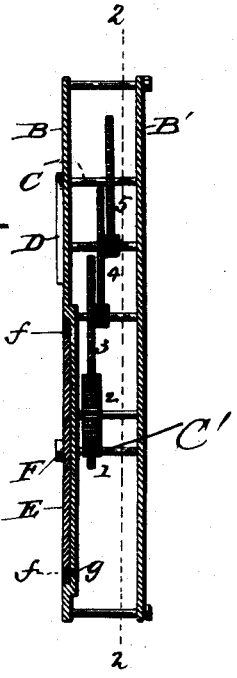
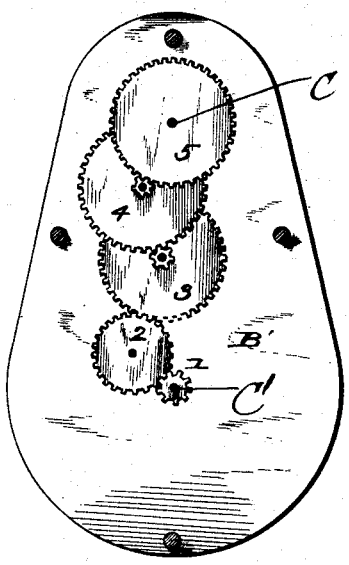


Fig. 2.



WITNESSES

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DANIEL B. VANCE AND JAMES W. BREVARD, OF WOODBURY, TENNESSEE.

ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 421,455, dated February 18, 1890.

Application filed May 25, 1889. Serial No. 312,046. (No model.)

To all whom it may concern:

Be it known that we, DANIEL B. VANCE and JAMES W. BREVARD, residents of Woodbury, in the county of Cannon and State of Tennessee, have invented certain new and useful Improvements in Adding-Machines; and we hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification.

The object of our invention is to provide a mechanical device for adding numbers that will be accurate in its movement and quickly and easily operated and that shall combine such simplicity in construction and compactness of form as to render it convenient in use, economical in cost, and neat and attractive in appearance; and to this end it consists of a combination of parts, as will be hereinafter more fully described, and specifically set forth in the claim.

In the drawings, Figure 1 is a side or face view of the invention. Fig. 2 is a sectional view on line 2 2 of Fig. 3. Fig. 3 is a vertical transverse section on line 3 3 of Fig. 1.

Like letters and figures of reference refer to like parts.

A designates the case of the machine, containing the operating mechanism.

B B′ are parallel sides of the case. The side B will be hereinafter designated as the "face-plate." The operating mechanism consists of a train 1 2 3 4 5 of spur-gears so graduated in their movement that an exact number of rotations of the spur-gear 1 on its axes will turn the spur-gear 5 one complete rotation on its axes, or in this particular case the spur-gear 1 will make forty rotations on its axes to one rotation of the spur-gear 5. The ends of the shafts C′ C of the spur-gears 1 and 5 respectively extend through the face-plate B. To the end of the shaft C is attached a pointer or indicator-arm D, and to the end of the shaft C′ is attached a graduated disk E, which is seated in the face-plate B level with its surface. Around the shaft C on the face-plate B is inscribed a small circle or dial *b*, radially divided, for the purpose of illustration, into forty parts, each part designated by numerals from zero upward. Starting at the top of the vertical center, in this case each division represents one hundred units, and the pointer in making one rotation will indicate that forty hundred or four thousand units have been counted.

The disk E is radially divided on the face near the periphery into one hundred parts, representing units and designated by numerals, starting from zero at the bottom of the vertical center line when in its normal position, and one rotation of this disk will move the pointer K one subdivision, representing a like number of units.

Around the disk E is another circle *e* inscribed upon the face-plate B, also radially divided into one hundred spaces. Each space is numbered in the same direction to that of the spaces marked on the disk E, but not in the same direction as the numbers increase on the upper circle *b*—viz., from zero at the top around the circle to the right, while on the movable disk and also the circle *e* the figures increase from zero at the bottom around the circle to the left.

The numbering of the divisions on the movable disk and the stationary circles or dials may be reversed, or the starting-point may be at the top of the vertical centers of both stationary dials, or the machine be operated to the right or left, as may be found desirable, without material change in construction.

In a circle at each of the radial divisions on the disk E, near its periphery, is a small hole *f* for the insertion of a pointed instrument—such as a lead pencil—to operate the disk with. Under the disk E in the wall of the case near the zero-point in the vertical radial line is a hole or socket *g*, registering in turn with each of the small holes *f* in the disk E. The object of this hole *g* is to provide a way of stopping the movement of the disk E positively at the zero-point, and this is accomplished by means of the pointed instrument used to operate the disk E in this way: A slight pressure of the hand upon the instrument after the point has been inserted in one of the small holes *f* will cause it to bear against the surface of the back wall of the recess and upon reaching the hole *g* to run

into the same, and thus form a positive stop. A knob F is also provided for the purpose of operating the disk, if preferred.

The mode of operation is as follows: The movable disk E is first turned around until the hand or pointer D of the dial *b* is at zero. The zero-point on the movable disk (indicated by a pointer *k* engraved on the face of the disk) will be at zero-point on the outer circle of stationary figures, and, set in this manner, the machine is ready for operation. A pencil-point is then placed in one of the holes *f* opposite the number to be added, (shown on the circle *e*,) and the disk turned around to the right until the hole *f* registers with the hole *g* or is opposite zero on the outer circle. This operation is repeated until all the numbers to be added have been carried down to the zero-point. As the sum of the figures being added increases above one hundred it will be indicated on the upper dial and the fractions or sums of the units under one hundred will be shown on the disk E opposite the zero-point on the outer circle.

While this invention is specially adapted to be operated by hand, it is obvious that it can be operated by other power—such as a weight or spring—without material modification in construction. When such power is applied, a spring-stop or its equivalent should be substituted for the hole *g* to check the movable disk, the spring-stop to be operated by means of the instrument used to turn the disk.

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

The combination, in an adding-machine, of a case A for containing the operating mechanism, a dial *b*, a rotating shaft, a pointer mounted thereon to indicate each and every hundred units that have been counted, a recess formed in the case surrounded by a graduated circle, a hole or socket in the recess in line with the cipher, a graduated movable disk to rotate within the circle provided with holes opposite each graduate mark, a rotating shaft on which the graduated disk is mounted, and a train of gears connecting the shafts of the pointer and disk, substantially as described, whereby the disk and with it the pointer are controlled by the instrument used for operating the device and held fixed relatively to each other at each successive operation and until the amounts total have been ascertained, as set forth.

In testimony that we claim the foregoing as our own we hereby affix our signatures in presence of two witnesses.

DANIEL B. VANCE.
JAMES W. BREVARD.

Witnesses:
W. C. HOUSTON,
JOSEPHUS FINLEY.