W. HART.

Calculators.

No. 199,289. Patented Jan. 15, 1878.

Fig. 1.

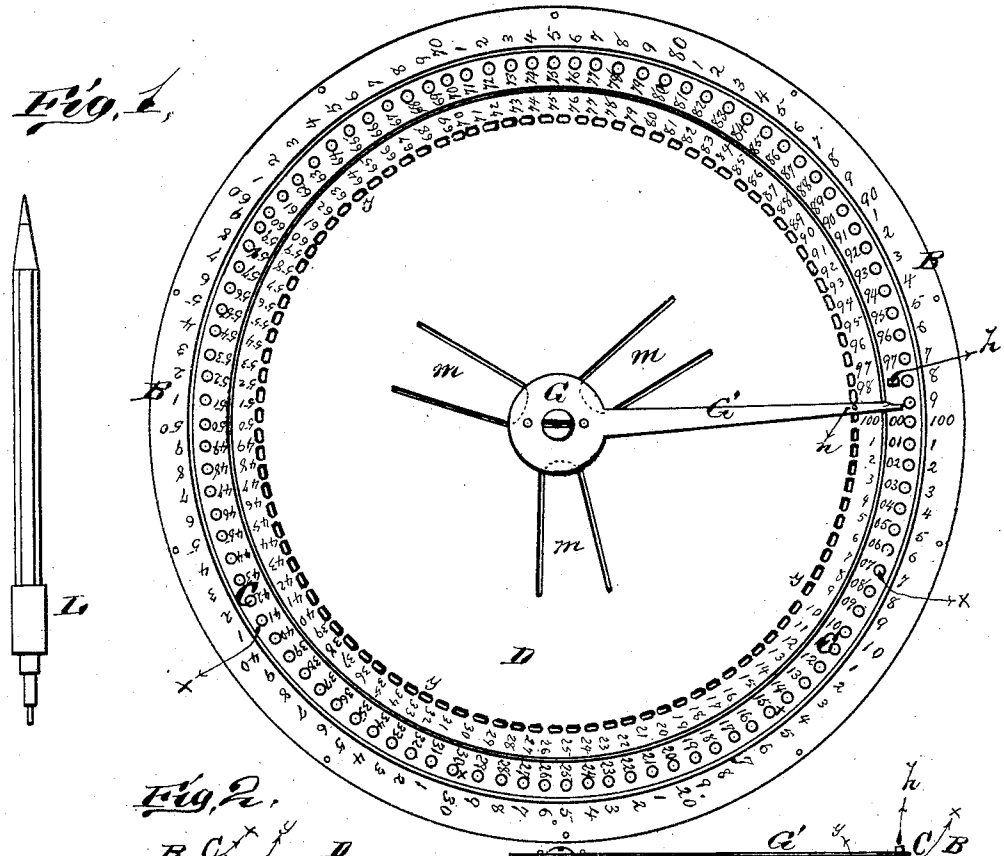


Fig. 2.

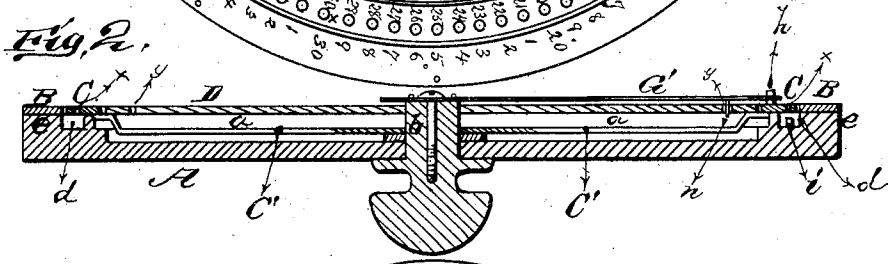
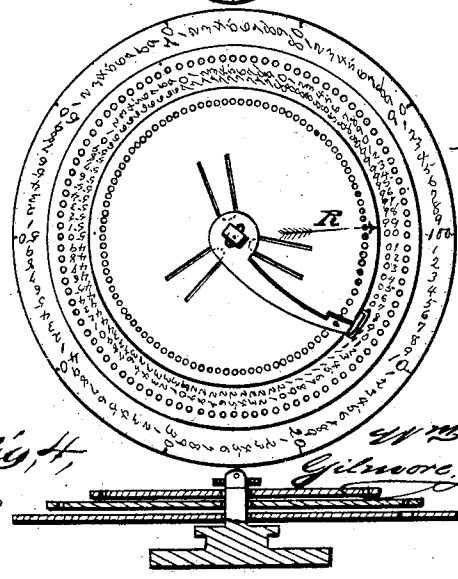


Fig. 3.



WITNESSES

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IMPROVEMENT IN CALCULATORS.

Specification forming part of Letters Patent No. **199,289**, dated January 15, 1878; application filed June 16, 1877.

To all whom it may concern:

Be it known that I, WILLIAM HART, of Kirksville, in the county of Adair and State of Missouri, have invented a new and valuable Improvement in Mechanical Accountants; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a plan view of my mechanical accountant. Fig. 2 is a central sectional view. Fig. 3 is a plan view of a modification thereof, and Fig. 4 is a central sectional view of a modification thereof.

The nature of my invention consists in the construction and arrangement of a mechanical counting device, as will be hereinafter more fully set forth.

The accompanying drawing, to which reference is made, fully illustrates my invention.

A represents a circular disk of any suitable dimensions, the face of which is cut down to form an annular recess, *a*, around a central hub, *b*. Beyond the recess *a* is formed an annular groove, *d*, leaving a rim, *e*, around the edge of the disk. On this rim is fastened an annular metal ring, B, having upon its face the numbers 1 to 100, arranged at equal distances apart. In the groove *d* is fastened a stop-pin, *i*, between the figures 99 and 100.

C represents an annular metallic ring, covering the groove *d* in the disk, and attached to a spider, C′, which lies in the bottom of the recess *a*, fitting around the central hub *b*. This ring C has also upon its face the numbers 1 to 100, arranged at equal distances apart, and opposite each number in the outer portion of the ring is a hole, *x*, as shown. On the face of the ring is a lug, *h*, directly on the number 98.

D is a metallic disk fitting within the ring C, and having a central hole fitting around the hub *b*. This disk has also on its face, near the edge, the numbers 1 to 100, and inward from each number is an elongated hole or slot, *y*. The body of the metal forming the disk D is cut and bent to form three radial spring-fingers, *m*, the outer ends of which remain united to the disk, while their inner ends are sprung upward and bear against the under side of a circular plate, G, fastened permanently to the face of the hub *b*. This plate has a spring-arm, G′, projecting from it, and pointing directly to the number 99 on the stationary ring B. From this spring-arm projects a pin, *n*, into one of the holes *y* on the disk D, to hold the same from turning.

To set this device for work, the pointer or tool L is placed in the hole 99 on the ring C, and said ring turned to the left until the tool strikes the stop *i*, when the number 99 on the ring C will be directly opposite the number 100 on the ring B, and the lug *h* will be under the end of the spring pointer or arm G′, having raised the same up so that its pin *n* will be elevated above the disk D. Then, with the tool L, the disk D is turned until the number 99 thereon is between 98 and 99 on the ring C. Then place the tool in the hole opposite the two 0's on the ring C, and turn said ring to the stop *i*, when the machine is ready for work.

This device may be used for addition, subtraction, multiplication, and division. For example, in addition, to add the numbers 2,024, 3,209, 2,630, 1,927, and 1,628—sum, 11,418—place the tool in the hole on the ring C opposite the number 28 on the stationary ring B, and turn said ring C to the left until the stop *i* is reached; then place the tool in the hole opposite 27, and carry forward until the stop is reached again, and so proceed until the whole column is added complete, when at top, opposite the 100 on the ring B, will be found 118, the disk D having been moved by friction one space when the lug *h* raised the spring-arm G′ and passed under the same. Note the 18 and reset the machine, as before directed, and proceed in the same manner, first moving forward the 1 which was carried, and, when through, at the head will be found 114, which, placed to the 18, gives the amount, as indicated. This addition is made by double numbers.

So is subtraction in the following manner. In this case no resetting of the machine is necessary. For example, in subtracting 151,612 from 231,227—remainder, 79,615—place the tool in hole 27 of ring C, and bring it against 12 on ring B, and at top will be found 15.

Note it. In same manner place 12 on ring C against 16 on ring B, and at the head will be found 96, which is noted; but as 16 cannot come from 12, 1 has virtually been borrowed, which place to 15, and make 16. Place 23 on ring C against 16 on ring B, and at the head will be found 7, which, when noted, gives the remainder, as shown. Thus, by three moves, any amount in hundreds of thousands can be subtracted.

For multiplication—as, for example, in multiplying 9,863 by 2—result, 19,726—reset the machine, place the tool in ring C opposite 63 on ring B, and carry forward to stop *i*. Repeat this operation, and at the head will be found 126. Note the 26, 1 to carry. Reset the machine, place the tool in hole at 98, carry forward twice, and at the head will be found 196, and the 1 to carry makes 197, which, when placed to the other, gives the result.

The device can also be used for division in the following manner—as, per example, in dividing 28,758 by 13—dividend, $2{,}212\frac{2}{13}$—reset the disk or ring C; then carry 13 forward once to the stop, and again the second time, when 28 on the ring C will have been brought above 13 on the ring B, which shows that 13 cannot go again in that number. Directly opposite and outside of 28 on the ring C will be found 2 on the ring B, which is the remainder; hence 13 in 28 goes twice and 2 over. Note the number and the remainder in their proper places and bring down the 7, and so proceed until the sum is completed.

The machine is gotten up expressly for addition, though it is certain in the other examples.

In this machine the carrying is done by the lifting of the latch G′, while in the modification shown in Fig. 3 it is done by the dropping of the latch. To set this modified device by the use of the tool L, place the point of the arrow R at 99 by turning the disk in either direction; then place the tool in the hole at the two 0's on the other disk, and carry forward or around until coming to a stop, when it is ready. The amount carried, or the amount in dollars, is pointed out by the arrow, while the amount in cents is found on the same disk at the head, or at the 100 number.

The machine having three sets of figures can be worked very rapidly and with safety, and I prefer to use the same.

What I claim as new, and desire to secure by Letters Patent, is—

1. A device for counting, consisting essentially of a stationary ring or plate, B, with one set of figures, a movable ring or plate provided with a second set of figures and corresponding holes, and turned by hand, and a disk or plate having a third set of figures, held by a latch and turned by friction when the latch is raised, substantially as herein set forth.

2. The combination of the base A, the stationary numbered ring B, the movable numbered and perforated ring C, having the lug *h*, the movable numbered and perforated disk D, the latch G′, with pin *n*, and the stop *i*, all constructed substantially as and for the purposes herein set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM HART.

Witnesses:
A. SLINGERLAND,
ALBERT DUTCHER.

1,500 words.