M. M. SMITH.

ADDING-MACHINE.

No. 193,425. Patented July 24, 1877.

Fig: 2.

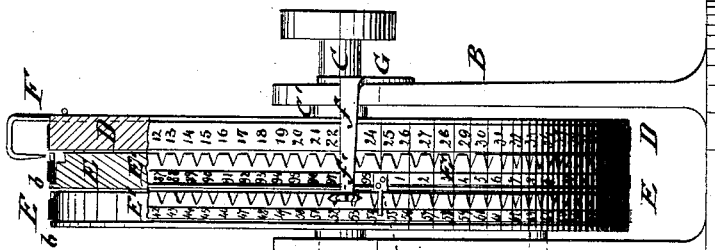


Fig: 4

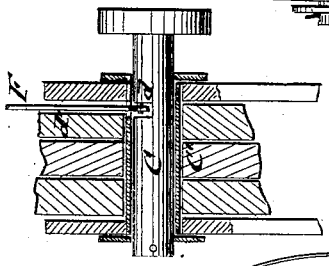


Fig: 5.

Fig: 1.

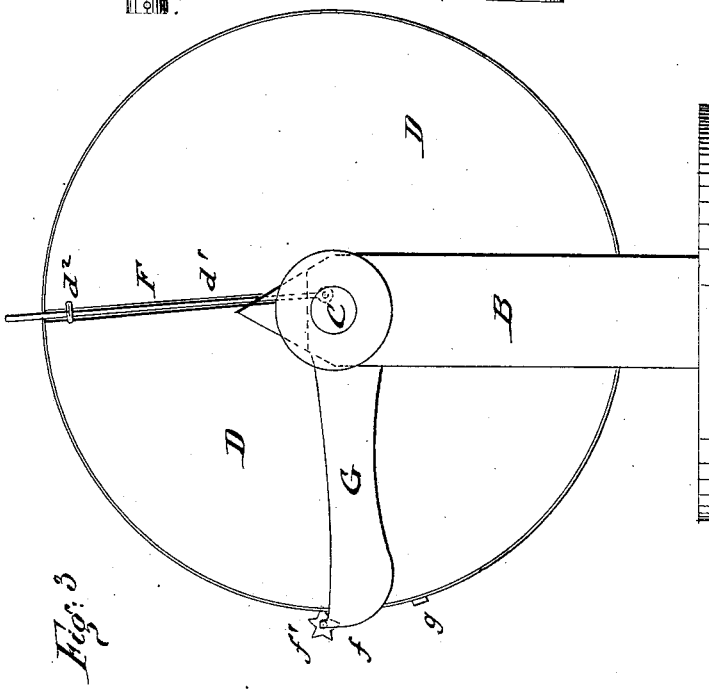
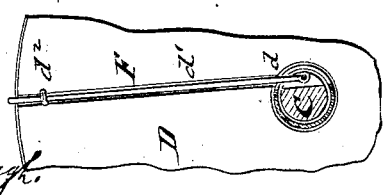


Fig: 3



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MARSHALL M. SMITH, OF KIRKSVILLE, MISSOURI.

IMPROVEMENT IN ADDING-MACHINES.

Specification forming part of Letters Patent No. **193,425**, dated July 24, 1877; application filed May 5, 1877.

To all whom it may concern:

Be it known that I, MARSHALL M. SMITH, of Kirksville, in the county of Adair and State of Missouri, have invented a new and Improved Adding-Machine, of which the following is a specification:

In the accompanying drawings, Figure 1 represents a side elevation; Fig. 2, an end elevation, partly in section, of my improved adding-machine. Figs. 3 and 4 are detail views of the inner and outer operating-shafts, and Fig. 5 a side view of the catch-lever.

Similar letters of reference indicate corresponding parts.

The invention is intended to combine the advantages of an adding-machine and paper-weight in a cheap, neat, and convenient manner, it being reliable and durable in use, and operated with accuracy and dispatch.

It consists of fixed disks with circumferential sliding and toothed rings, and of a movable units-and-tens disk, operated by a thumb-wheel and interior shaft, and by a sliding and eccentrically-pivoted catch-lever.

A fixed arm with pointer or index end extends from the supporting-standards, and carries a small end pinion, that is turned by each revolution of the adjoining sliding ring by a fixed lug at the zero-point for one tooth, and moves the next ring forward thereby.

In the drawing, A represents the base of my improved adding-machine, which is made of cast bronze, in ornamental manner, and heavy enough to be used on the desk as a paper-weight.

Two upright standards, B, that carry the operating-shaft of the machine, are cast in one piece with the base. The standards carry, in suitable bearings, the interior shaft C, having a thumb-wheel at the outer end, and an outer shaft or sleeve, C′, that takes up the weight of the revolving wheel D, the interior shaft turning loosely in the outer shaft.

Two or more disks, E, or a drum of suitable width, are arranged sidewise of the revolving wheel D on the shaft, and secured into rigid position by a thumb-screw, *a*, that passes through one of the standards B into the disks or drum E.

The revolving wheel D is provided at the periphery with a fixed band or strip, on which the numbers from 0 to 99 are printed, the disks or drum being provided with guide-flanges *b*, and with sliding and toothed encircling spring bands or rings E′, of which two or more are arranged, according to the numbers of figures of the sums for which the machine is to be used.

The bands or rings E′ are also provided with printed strips having the numbers from 1 to 100 thereon, and are fitted tightly, but loosely enough to turn freely on the drum when operated by a catch-lever, F, that is eccentrically pivoted to the inner shafts C, passed through a recess, *d*, of outer shaft, and along a guide-groove, d^1, and staple d^2 to the circumference of the revolving wheel D, extending by its hook-shaped end over the wheel, and into the serrations or perforations of the adjoining band or ring E′ of the drum, as shown clearly in Figs. 1 and 2.

The eccentric pivoting of the catch-lever F, in connection with the guide-slot of the outer shaft C, produces the raising of the catch-lever by a turn of the shaft in one direction, and a lowering of the same by turning in opposite directions, before it begins to operate the outer shaft and wheel. When lowered the catch-lever turns both the outer shaft and wheel D, and carries also, by the entering of the hook end, the sliding ring E′ of the adjoining disk forward, releasing the same by the return motion of the wheel and simultaneous raising of the catch-lever hook.

An arm, G, is attached firmly to one of the standards B, extends along the revolving disk, and is bent at the circumference of the same, so as to form a pointer or stop-piece, *f*, which has a small pinion or spur-wheel, *f′*, attached loosely at its outer end, and gearing with the teeth or perforations of the second sliding ring E′ of the drum.

The first ring E is provided at the zero-point with a fixed lug or point, *g*, that extends over the second ring, and engages one of the teeth of the pinion whenever one of its revolutions is completed, so as to move the pinion, and thereby the second ring, forward for one tooth, indicating thereby the hundreds and thousands to sum up to ten thousand.

If a third ring is used a second pinion is arranged, that meshes in analogous manner

therewith, and is operated by a fixed lug at the zero-point of the second ring.

The machine is operated in the following manner: The sliding rings are turned until the zero-points connect with each other, and with the pinion and fixed stop of arm G, so that the pinion will stand in 1, and the stop of the first sliding ring in line with the pointer. The revolving wheel and catch-lever are then turned by the thumb-wheel until the catch-lever forms contact with the stop-piece of arm G, when the wheel is turned in opposite direction and the catch-lever drawn in so as to take along the first ring-band until the first figure to be added appears on the revolving wheel in line with the pointer.

The catch-lever and wheel are then turned back to the stop-piece, and turned forward again until the second number appears thereon, and so on, the catch-lever moving the first band, and the first band moving automatically the pinion, and thereby the second sliding band and so on, the sum total of all the numbers being finally read off at the pointer *f*, being in line therewith.

The addition of different numbers is thus accomplished mechanically in neat, quick, and accurate manner, without the least chance of making mistakes. In setting the bands it is only necessary to set the band indicating the 100 and 1,000 with the finger, as the units-and-tens band may be set easily and readily by the wheel and catch-lever.

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

1. An adding-machine composed of a revolving disk, with eccentrically-sliding catch-lever, of fixed adjoining disks, or a drum having sliding and numbered bands or ring, and of a stationary arm with front pointer or stop-piece, and intermeshing pinion, all arranged substantially in the manner and for the purpose specified.

2. The combination of the shaft C, eccentrically-pivoted catch-lever F, revolving wheel D, stationary arm G, and stop-piece *f*, and sliding adjoining band E, substantially as and for the purpose specified.

3. The combination of the inner shaft C, outer sleeve or shaft C′, having recess *d*, eccentrically pivoted and guided catch-lever F, and revolving wheel D, to first raise or lower the catch-lever, and then turn the wheel, substantially as specified.

4. The combination of the revolving disk D and catch-lever F with the sliding and toothed adjoining band E′, to engage the same and carry it forward, substantially as described.

5. The combination of the revolving disk D and catch-lever F with the first sliding and toothed band E′, having zero stop or point *g*, with pinion *f*′ of stop-piece G, and with the second sliding and toothed band E′, substantially in the manner and for the purpose specified.

MARSHALL M. SMITH.

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