W. L. HOFER.

ADDING-MACHINES.

No. 195,281. Patented Sept. 18, 1877.

Fig. 1.

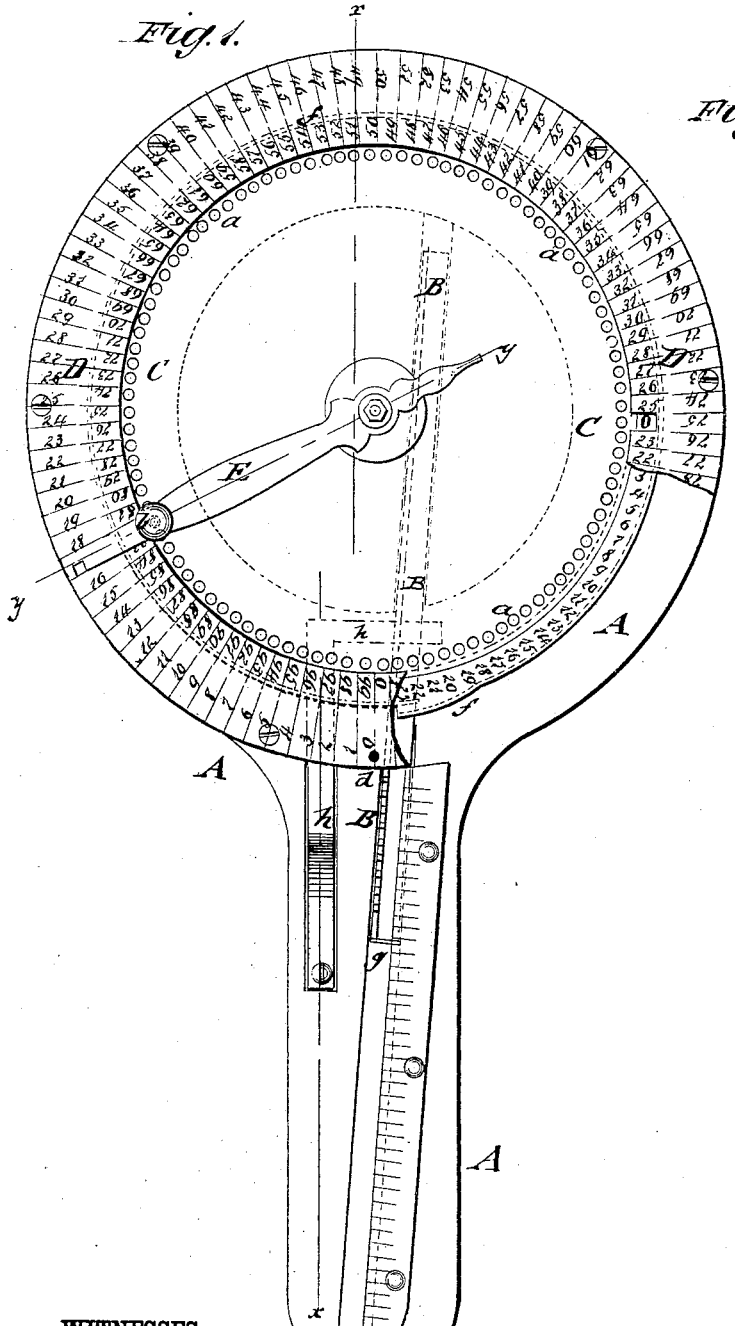


Fig. 2.

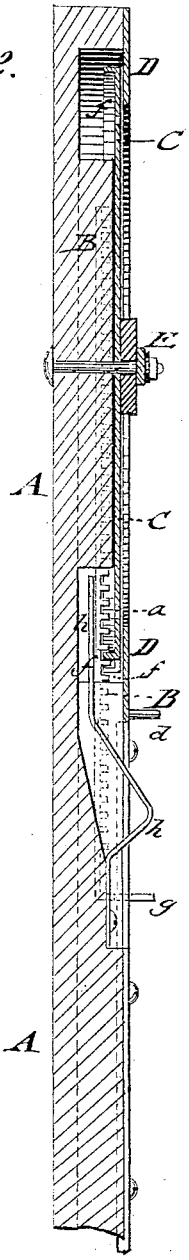
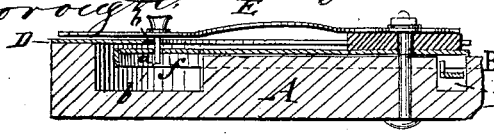


Fig. 3



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IMPROVEMENT IN ADDING-MACHINES.

Specification forming part of Letters Patent No. **195,281**, dated September 18, 1877; application filed July 13, 1877.

To all whom it may concern:

Be it known that I, WILLIAM L. HOFER, of Deposit, county of Broome, and State of New York, have invented a new and Improved Adding-Machine, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a front view of my improved adding-machine with parts broken out; Fig. 2, a vertical longitudinal section of the same on line *x x*, Fig. 1; and Fig. 3, a vertical transverse section of the same on line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts.

This invention has reference to an improved adding and subtracting machine, by which these arithmetical operations may be accomplished in quick and accurate manner by mechanical means; and the invention consists of a revolving wheel or disk, provided with the figures from 1 to 99, and with a corresponding number of holes or notches, that are engaged by a centrally-pivoted spring arm and pin for working the disk. A raised circular rib, at the under side of the revolving disk, engages, by the end points of the rib, which are a small distance apart, a sliding and toothed bar, so that the slide moves at every revolution of the disk, and indicates the hundreds and thousands on the face-plate of the machine, while the tens and units are read off in a side recess of the face-plate.

By referring to the drawing, A represents the bottom piece of my improved adding-machine, which is made with a rim around the disk-shaped portion, and with a guide-groove passing centrally through the disk portion and handle part, in which the toothed slide-piece B moves. A revolving wheel or disk, C, is pivoted to the center of bottom piece A, and guided in suitable manner between the same and the face-ring D. The revolving wheel C is made with one hundred notches or holes, *a*, and with the figures from 0 to 99, which are arranged in a circle on the face-ring around the holes *a*. The wheel C is revolved by means of a swinging spring-arm, E, that is pivoted to the center of the machine, and provided at the end with a button for taking hold of the arm, and with a downward-extending pin, *b*, that enters the holes, and admits thereby the turning of the wheel.

The face-ring has an interior and an exterior circle of figures, running from 0 to 99, which are stamped or otherwise applied thereto, and of which the inner series of figures runs in one direction from the zero-point, while the other series runs along the outer edge of the face-plate in opposite direction to the same, one series serving for addition, the other for subtraction. A side recess, *e*, of the face-ring D admits the reading off of the figures on the disk, and serves for setting the instrument to zero before starting it.

The revolving wheel or disk C is provided at the under side with a circular rib, *f*, at or near its circumference, said rib serving to engage the teeth of the slide-piece B by means of the ends of the circular ribs which do not meet, but are a small distance from each other, equal to that of one tooth of the slide-piece from the adjoining one. Each revolution of the wheel engages, therefore, a new tooth of the slide-piece, and moves the latter forward or back for addition or subtraction, as the case be. The index-point *g* of the slide-piece is thereby passed along the graduated handle part of the device, so as to register thereon the hundreds and thousands.

The toothed slide-piece B is retained in contact with the rib of the wheel by a spring, *h*, that presses the slide-piece up against the wheel C. The spring *h* is released by pressing on a suitable thumb-rest, whenever it is desired to set the slide-piece back to zero, or to any desired number, as the machine is to be used for addition or subtraction. The swinging arm is stopped at the zero-point, whether moved in one or the opposite direction, by a stop-pin, *d*.

The machine is operated for addition by turning the arm toward the handle, and using the figures along the outer edge of the face-ring. For subtracting, the arm is turned from the handle along the inside of the figures, the pin of the arm having first been inserted into the hole corresponding to the figure to be added. The figure seen through the side recess, together with the figure indicated by the pointer of the slide-piece, give the number

that is obtained, the hundreds being indicated by the slide, and the tens and units in the recess. Thus addition or subtraction may be rapidly, easily, and accurately executed by means of the machine.

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

An adding and subtracting machine, provided with a single wheel, a slide-spring held to a rib of said wheel, and a pointer moved along a graduated scale on handle, as shown and described.

WILLIAM L. HOFER.

Witnesses:

HOBERT J. ADAMS,
WM. J. MASON.