

UNITED STATES PATENT OFFICE.

C. H. WEBB, OF NEW YORK, N. Y.

IMPROVEMENT IN ADDING-MACHINES.

Specification forming part of Letters Patent No. 75,322, dated March 10, 1868.

To all whom it may concern:

Be it known that I, C. H. WEBB, of the city, county, and State of New York, have invented certain new and useful Improvements in Adding Machinery or Apparatus; and I do hereby declare that the following is a full description of the same.

The nature of my invention consists, first, in arranging duplicate series of numerals on opposite margins of a disk, or thin plate of metal or other suitable material, in combination with a dial-plate, having a registering-hole in it, and a curved slot corresponding with the curved outline of the disk, and numbered on its edges with a series of numerals of a like character to the series of numbers on the margin of the disk-wheel; second, in the method of arranging the numerals on the rotating disk, from 0 to 9, inclusive, by prefixing a 0 before each numeral, so that the multiplying-wheel will count or add up the sums-total after the numerals 99, as 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, without the interposition of any modification of the simple rotation of the disk or multiplying-wheel; third, in the combination of two or more studs or pins in the face of the disk-wheel, with a lever-and-pawl motion, and multiplying-wheel, for the purpose of operating the multiplying-wheel so as to add up sums whose totals exceed hundreds and thousands. But to describe my invention more particularly I will refer to the accompanying drawings, forming a part of this specification, the same letters of reference, wherever they occur, referring to like parts.

Figure 1 is a plan view of the apparatus. Fig. 2 is a plan view of the rotating numbered disk and multiplying-wheel, as arranged underneath the dial-plate. Fig. 3 is a cut section of the apparatus through line *x x*, Fig. 1.

Letter A is the case or frame of the apparatus, having a disk or circular plate of metal, B, arranged on a center-pin, *c*, in the middle of the case, and also on another center-pin, D, secured in the case just outside of the circumference of the disk B, a second wheel, E, so arranged as to be on the same plane with the disk B, and having their edges rotate in contact with each other. On the margin of the disk B are two equal subdivisions of duplicate figures from 0 (or zero) to 99, inclusive,

with the addition of the prefix of a cipher to and from the zero-point to the numeral 9, so that they would read on the disk thus: 00, 01, 02, 03, 04, 05, 06, 07, 08, 09. The object of this arrangement of the numerals on the face of the disk in duplicate, and also adding the cipher prefix to the numerals from zero-point to 9, inclusive, is, first, to make each half rotation of the disk add up any sum less than 99, before the pin or stud F, in the face of the disk, comes in contact with the lever G, to carry forward the small wheel E one degree or number, to make the sum add up 100, or any other addition, according to the relative positions of the figures on the two wheels; and, second, for the purpose of enabling the single motions of two wheels to indicate the additions of 100, 101, &c., to 109, which it would not be practicable to do if the numbers on the disk ran from 0 to 99, inclusive, and the numbers on the small wheel from 1 to 49, (or any other number,) inclusive. This will be obvious, because a single 0 following 99, on the large disk, would only read 10, when opposite 1 on the small wheel. Therefore, without the prefix of the cipher to the numerals 0, or zero-point, up to 9, the apparatus would not be capable of adding up all sums correctly. For the purpose of controlling the motion of the two wheels—that is, to keep them steadily at any point desired—detent-pins or springs H H are secured to the case, and arranged so as to engage in the wheels to detain them. Covering the surface of the numerator-wheel or disks is a dial-plate, J, having an opening, K, in it just over the marginal figures of the numerator-wheels, so as to exhibit the sum-total of the figures added up. Also, curved slots L and M, corresponding with the curvature of the numerator-wheels, and extending half-way of the circumference thereof. The object of these slots is to admit of pointers N and P (inserted in indicators Q and R, attached to the center-pins C and D of the numerator-wheels) engaging into holes S and T, in the face of the numerator-wheels, to rotate them, and also to limit the rotation of the numerator-wheels to just half their circumference, or to the adding-up point at 0, or the bottom of the slot. To facilitate the operation of adding up the figures, numerals from 0 to 99 are cut on the margin of

the slot L, and by means of the corresponding holes, S, in the numerator-wheel B, the indicator is readily adjusted to any figure desired.

It is evident that the arrangement of the double series of numerals upon the numerator-wheel B, the prefix of a cipher to the digital numbers from zero (0) to nine, (9,) inclusive, upon said numerator-wheel, together with the employment of the small multiplying-wheel E, arranged tangentially to the numerator-wheel B, secures the construction of an exceedingly compact adding-machine, and one having a more extended field of usefulness than is common to such devices.

To operate the machine, it is first necessary that the numerator-wheels are blanked, or set at the zero-point, so that at the aperture K three 0's will only appear. This is accomplished by means of the pointers N and P engaging in the holes S and T, in the face of the numerator-wheels, and rotating them till the zero-points come opposite each other. When the numerator-wheels are thus adjusted the pointer N is supposed to be at the zero-point of the slot L. Now, to find the sum-total of the figures 9, 16, 26, 43, you move the indicator upward to figure 9, when you insert the pointer into the hole in the face of the numerator-wheel opposite or corresponding with the figure 9 on the dial-plate. The indicator is then carried forward to the zero-point or end of the slot L, carrying with it the numerator-wheel, when 9, with the prefix of two 0's will appear at the aperture K. The indicator is now carried back again to number 16 on the dial-plate, and brought down to the end of the slot as before, when the sum of 25, with the prefix of one 0, will appear. The same operation with each of the other figures is gone through, giving the sums of 51 and 94 as the sum-total of the four sums. To carry the sum-total beyond the hundred-point brings into action the small numerator or multiplying-wheel, in consequence of the stud or pin F operating the lever G, to move or rotate it forward one degree. Therefore, if the sum 56 be added to the sum-total of 94, previously obtained, the sum-total of 150 will

appear at the aperture, and by adding 72 to this sum-total of 150 the addition of 222 will appear at the aperture. It will; therefore, be readily perceived that the machine is capable of adding up sums of any amount, according to the multiple of numbers on the small numerator-wheel.

Having now described my invention, I will proceed to set forth what I claim and desire to secure by Letters Patent of the United States:

1. I claim the duplicate series of numbers, arranged upon the margin of the numerator-wheel B, substantially as and for the purpose specified.

2. In combination with the above, I claim the semicircular slot L, in the dial-plate J, corresponding in extent with one of the duplicate series of numbers, for the purpose substantially as described.

3. I claim arranging, on the dial-plate J, a series of numbers corresponding in extent with one of the series of numbers upon the numerator-wheel B, substantially as described, and for the purposes specified.

4. I claim the prefix of a cipher, upon the numerator-wheel B, to the digital numbers from zero (0) to nine, (9,) inclusive, for the purpose specified.

5. In combination with the numerator-wheel B, I claim the revolving multiplying-wheel E, when arranged in apposition to the numerator-wheel, and having its edge in contact, or nearly in contact, therewith.

6. In combination with the elements of the above, I claim the slot K in the dial-plate J, for the purpose specified.

7. I claim the arrangement of the numerator-wheel B, lever G, and multiplying-wheel E, all constructed substantially as described, and for the purposes specified.

8. In combination with the arrangement above specified, I claim the slotted dial-plate J, when constructed substantially as and for the purposes specified.

C. H. WEBB.

Witnesses:

C. ARTHUR TOTTEN,
C. L. BARRITT.