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Atty

UNITED STATES PATENT OFFICE.

EDWARD HALSEY, OF SAN JOSÉ, CALIFORNIA.

ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 344,180, dated June 22, 1886.

Application filed September 23, 1885. Serial No. 173,478. (No model.)

To all whom it may concern:

Be it known that I, EDWARD HALSEY, a citizen of the United States, residing in San José, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Adding-Machines, of which the following is a specification, reference being had, by figures and letters, to the accompanying drawings, that form a part thereof.

My invention consists in the combination and arrangement of parts, as hereinafter described, producing an adding-machine for operation as set forth.

Figure 1 of the drawings is a top view of the machine. Fig. 2 is a cross-section at any point, as *x x*. Fig. 3 shows the end portion of the slide in perspective.

A represents a board or tablet having a top plate, B, fixed to and over its upper face in such manner that a small space is left between the plate and the tablet to admit a metal slide, C. By means of wire pins *d d*, driven through the top plate firmly into the board beneath at intervals apart crosswise, and in several sets lengthwise of the board, this space is divided into grooves, the number of which will depend on the number of slides used in the construction. Each slide C, being held and guided by the pins, is easily moved out from under the top plate, and is confined between these guides, so as always to hold its position in line with a slot or long opening, *b*, in the top plate, through which is exposed a portion of the face of the slide beneath.

The machine represented in the drawings has the capacity of adding any number of figures together as high as two hundred and fifty in a single column, and for convenience in manipulating, as well as for general compactness in form and size, these numbers are distributed among five slides, each carrying fifty numbers. On the first slide are marked the numbers from one to fifty, inclusive; on the second, from fifty-one to one hundred, inclusive, and so on through the remaining slides. These numbers are arranged along the face of the slides and at regular spaces apart along one side of the middle from end to end, such number being immediately opposite a circular hole, *C*^x, so that the slide also has, in addition to the

line of figures, a row of holes or perforations, as many in number as there are numbers placed on the slide. This row of perforations is arranged in line along the left side of the slide from end to end. Each slide therefore contains fifty of such perforations, suitably numbered in regular order. To each slide also the top plate forms a cover and screen, except for that portion visible through the slotted opening *b*, and the length of this slot is made equal to the space taken up by nine of the spaced perforations *C*^x, so that nine of the perforations are exposed to sight, the remaining surface of the slide, including all the numbers as well, being covered at the end of the top plate, B. The slides are carried out and turned up to furnish stops *C*², by which the slides are kept from being moved back under the top plate. These turned-up ends also form finger-pieces for convenience in moving the slides when desired to do so by hand.

At each slotted opening *b* is marked a scale, E, consisting of the nine digits, beginning with No. 1, at the top, and ending with No. 9, at the bottom, the intervals between the numbers being made to correspond with those between the perforations. Thus each of the nine perforations seen through the slot *b* is identified by a number on the row of digits along the slide of the slot.

The operation of these parts as thus constructed and combined will be best understood by showing the manner of performing an example in addition of a single column of figures, and as an illustration the following figures may be taken to find their sum, viz: 4 6 5 3 8 6 5 8 9 7 2 5 4 3. The slides are moved by inserting the end of a style or pencil into the perforations in the slide opposite those numbers of the row of digits E corresponding to the numbers required to be added one at a time, moving the slide outside each time until the pencil strikes the head of the slot. Into that one of the perforations exposed through the slot *b* directly opposite the number 4 and corresponding to the first number in the example place the point of the pencil and push out the slide until the pencil is stopped by the head of the slot. Then removing the pencil-point, place it into the perforation opposite 6 of the

numbers E, and proceed in like manner to take each number of the column from the scale E until the last number is reached, when it will be found that the second slide must be brought into service, because the sum produced by adding the 9 to that already obtained will exceed the capacity of the first slide by 4. Where a machine is formed of longer slides, however, a greater number of figures may be carried on each slide. In this case the example requires the second slide, upon which the remaining figures are then worked in the same manner one after the other by placing the pencil-point into the perforations in succession opposite the numbers as taken from the scale E. When the last figure is taken from the scale E, and the slide moved by the pencil, the aggregate will be shown by the highest number that is exposed on the slide at the end of the top plate, and in the case of an example requiring two or more slides to be used, then the last slide will show the required amount.

In constructing these slides I have made them of strips of thin sheet metal with the perforations C^x punched through the strips, and a backing, C³, afterward fixed upon the bottom or lower face, to prevent the point of the pencil or other instrument from scratching or marking the board beneath. The row of figures upon the top face is printed or suitably marked on a strip of paper, which is then fixed

to the metal alongside of the row of perforations.

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

1. The herein-described adding-machine, consisting of the board or tablet A, top plate, B, the slides C C, each provided with the row of spaced perforations, which are numbered consecutively from 1 upward, and the whole set of slides being numbered consecutively and in progression from the beginning of the first to the end of the last one, and the row of numerals from 1 to 9, inclusive, at each opening to designate the perforations exposed, for operation as set forth.

2. In an adding-machine of the character described, the slides C, having the row of perforations, and the column of figures corresponding in numbers therewith and numbered consecutively in regularly-increasing order from the beginning of the first to the end of the last, substantially as described, for operation with a fixed plate, B, having an opening, b, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

EDWARD HALSEY. [L. S.]

Witnesses:

C. W. M. SMITH,
CHAS. E. KELLY.