C. E. SPEAR.

ADDING MACHINE.

No. 106,881. Patented Aug. 30, 1870.

Fig. 1.

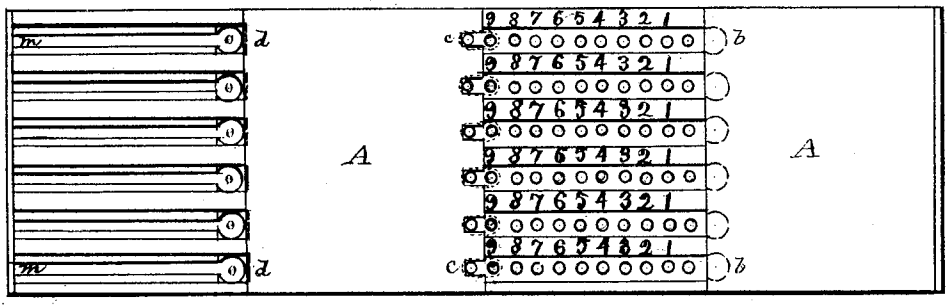


Fig. 2.

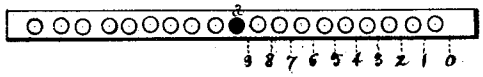


Fig. 3.

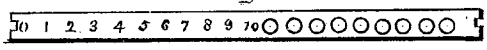


Fig. 4.

Fig. 5.

Fig. 6.

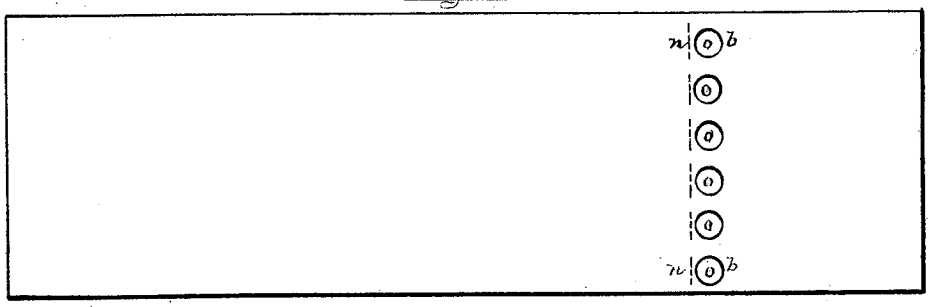
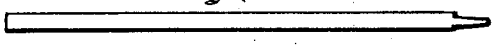


Fig. 7.



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Letters Patent No. 106,881, *dated August* 30, 1870.

IMPROVEMENT IN ADDING-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, CHARLES E. SPEAR, of Gardiner, in the county of Kennebec and State of Maine, have invented a new and improved Instrument for Adding Numbers; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

My invention consists of a very simple and reliable adding-instrument, by the use of which the mind is relieved from the tiresome process of adding long columns of figures, and such additions are more accurately and speedily accomplished.

The instrument is constructed of a board or bed-piece of any suitable material, in form of a parallelogram, and having six longitudinal grooves on each side. In these grooves are fitted sliding bars, those on the upper side being perforated, and numbered on their under sides from right to left, as indicated in Figure 2, and having pins or stops, *a*, projecting upward.

The slides on the under side are perforated, and numbered on their upper sides from left to right, as indicated in Figure 3.

Figures 4 and 5 are opposite-end views of the grooved board in which the slides operate.

Figure 1 represents a top view of the adding-instrument, with its slides in proper position to commence adding a column of figures.

The upper or adding-slides are kept in the grooves by the traverse-caps A A, and the under or carrying-slides are kept in their grooves by a back covering the entire under side of the instrument, and shown in Figure 6.

At the left end of the instrument, the upper and under grooves open into each other, and through the circular apertures are seen the ciphers on the carrying-slides.

Between the caps A A are seen the adding-slides, and on the board, between the grooves in which these slides operate, are repeated the figures from 1 to 9, inclusive.

Opposite the 9s stand the pins or stops on the adding-slides, while opposite each of the other figures is a perforation.

The dotted circular lines *b b*, in the right-hand cap A, indicate apertures through the grooved board and the back, as shown in fig. 6, through which the ciphers on the under side of the adding-slides are seen, and through which the results of additions are read.

The dotted lines *d d*, in the left-hand cap A, are downward projections or flanges on the edge of said cap, which enter the upper grooves, and serve as a stop to the adding-slides when moved to the left, while the stop-pins on said slides limit their movement in the opposite direction by striking against the edge of the right-hand cap A.

The under or carrying-slides are stopped in the left-hand direction by an end piece fastened across the grooves, while in their movement to the right they are checked by projections into their grooves from the back, as indicated by dotted lines *n n*, fig. 6.

The dotted lines *c c* represent the slots in the grooved board, through which the pointer, Figure 7, is allowed to pass in its left-hand movements when the addition amounts to more than nine, and enter the perforations of the carrying-slides, and move them simultaneously with the adding-slides. Thus, if we wish to add the two units 9 and 6, we move the pin opposite 9 in the upper line of figures to the right until it comes in contact with the edge of the cap A; then we insert the pointer in the perforation opposite the figure 6, and, with a slight downward pressure, move it to the left as far as it will go; when opposite the figure 9, it will drop through the slot *c* into a perforation in the carrying-slide, and move said slide along one number, when, as a result of the addition, will appear at *b* on the back of the instrument the figure 5, while in the opposite aperture on the face of the instrument will appear the number to be carried to the tens column, (1.)

After completing one addition, the instrument is adjusted for use again by simply moving all the adding-slides to the left as far as they will go, which will bring the pins on the same opposite the 9s, as shown in fig. 1. The carrying-slides are then moved to the right by inserting the pointer in the openings *m m*, and pressing it against the ends of said slides, and thus moving them back to the position, with their ciphers in the circular apertures, as shown in fig. 1.

To add tens, hundreds, thousands, &c., it is simply necessary to move the slides representing tens, hundreds, and so on, in the manner described. Thus, six colums of figures (and more by increasing the number of slides) may be added at a time, including dollars and cents, and amounting to millions, with perfect accuracy, and without taxing the mind with the carrying numbers from one column to the next higher. The numbers to be carried will stand before the operator in their respective apertures on the left, and need not be carried to the next columns till the other additions are completed. The result of the additions, when completed, will appear in the apertures on the back of the instrument.

The slides are kept in position by friction applied in any convenient manner, and which may be so applied as to be adjustable, and enable the operator to clamp said slides firmly in their grooves in any desired position, when the result of an addition is required to be kept for a time.

The instrument is very simple in construction, and easily understood and operated. It is positive and accurate in its operation, as every movement or change

is directly controlled and impelled by the hand of the operator, and not left to depend, in any degree, on the automatic action of springs, or any mechanism, whereby the liability to inaccuracy arising from the wear and consequent derangement of such devices is wholly avoided, and its simple carrying principle secures the greatest mathematical exactness with the least mental labor.

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

1. The arrangement of two series of slides in a double-grooved board or bed, with slots *c c* through the same, whereby a carrying and adding-slide may be moved with a pointer simultaneously, as and for the purposes described.

2. The double-grooved board, with its openings *m m*, slots *c c*, apertures *b b*, and its arrangement of numbers between its grooves from 1 to 9, the two series of slides, with their numbers, stops, and perforations, the caps A A, with the stops *d d*, and the back board, with its stops *n n* and apertures *b b*, when constructed, combined, arranged, and operated substantially as and for the purposes described.

Witnesses: CHARLES E. SPEAR.

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