

(No Model.)

B. F. SMITH & A. E. SHATTUCK.

ADDING MACHINE.

No. 363,972.

Patented May 31, 1887.

FIG. 1.

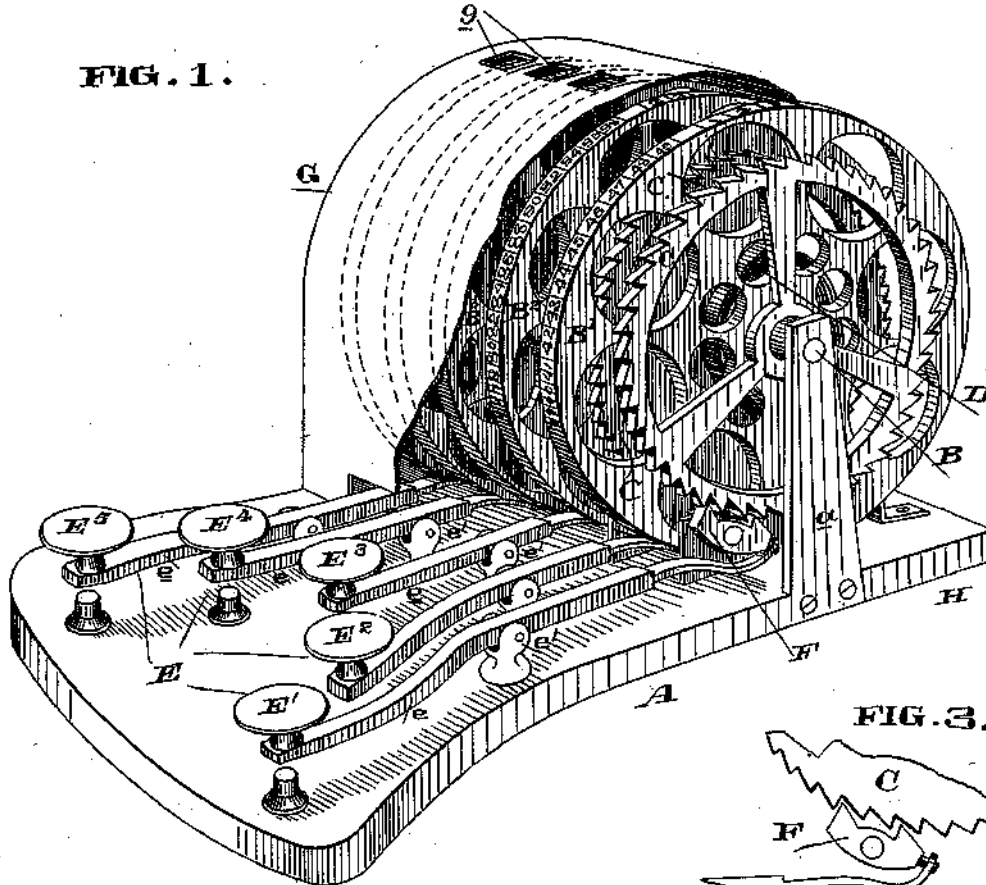


FIG. 3.

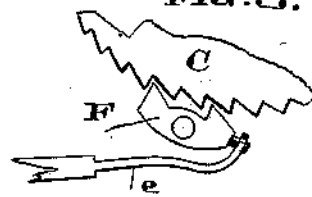
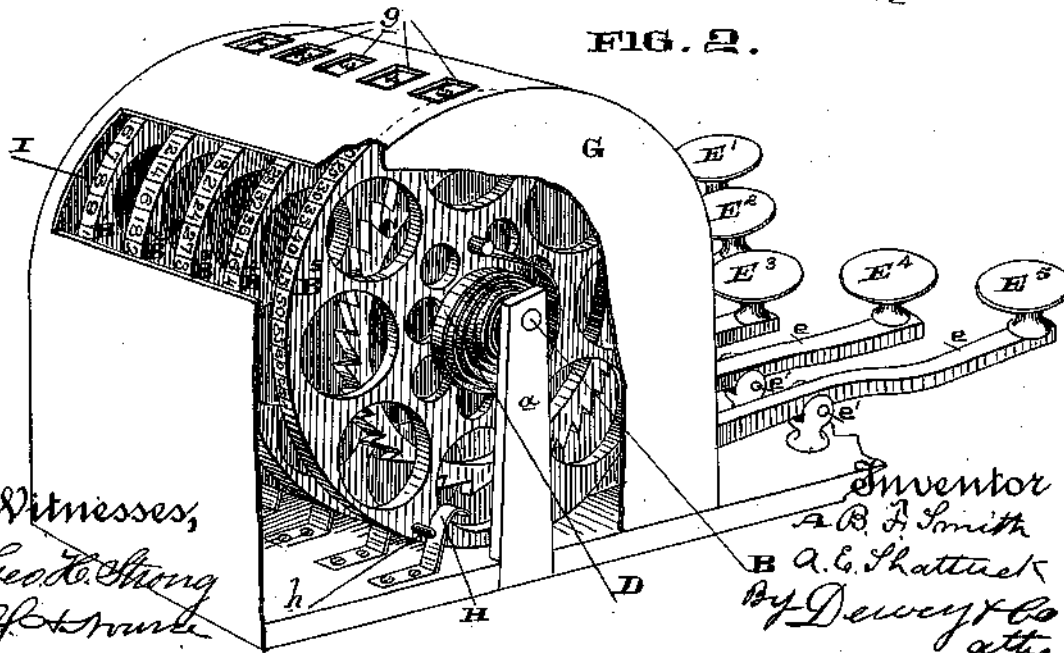


FIG. 2.



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# UNITED STATES PATENT OFFICE.

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## ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 363,972, dated May 31, 1887.

Application filed June 14, 1886. Serial No. 205,158. (No model.)

*To all whom it may concern:*

Be it known that we, BRAINARD F. SMITH, of Sacramento, Sacramento county, State of California, and ARTHUR E. SHATTUCK, of the city and county of San Francisco, State of California, have invented an Improvement in Adding-Machines; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to that class of adding-machines in which independent wheels having upon their peripheries a different digit and multiples of said digit are separately actuated by means of suitable levers; and our invention consists in the combination of the spring-actuated wheels, the pivoted keys, and the ratchet and escapement-pawl mechanism, which we shall hereinafter fully claim.

The object of our invention is to reduce a long column of figures to a short one.

Referring to the accompanying drawings for a more complete explanation of our invention, Figure 1 is a perspective view of our adding-machine, looking from the front of one side, a portion of the casing being broken away. Fig. 2 is a perspective view, looking from the back of the other side. Fig. 3 is a detail of the escapement.

A is a bed, having near its rear end the standards *a*, between which is mounted a shaft, B, upon which shaft are fitted loosely a series of wheels, (represented by B', B<sup>2</sup>, B<sup>3</sup>, B<sup>4</sup>, and B<sup>5</sup>, respectively.) These wheels are entirely independent of one another, and each is provided on one side with a ratchet, C. Each has also a spring, D, the tendency of which is to rotate it in one direction. E is the key-board, generally composed of the keys E', E<sup>2</sup>, E<sup>3</sup>, E<sup>4</sup>, and E<sup>5</sup>, respectively. These keys have shanks *c*, pivoted at *c'*, and the inner ends of the shanks are each connected with a pivoted double or escapement pawl F, engaging the ratchets C of the wheels. There is one key and one escapement-pawl for each wheel, the key E' being connected with the wheel B', and so on.

G is a casing fitting over all the wheels and having apertures *g* in its top, through which a small section of the periphery of each wheel may be seen.

H are stops at the back of the bed A, with which small pins *h* on the sides of the various wheels are adapted to come in contact to limit the complete rotation of each wheel and to

stop it when turned back to the initial point. This may be done by any suitable means, though we have here shown simply an opening, *i*, in the back of the casing, which exposes the rims of the wheels, thus allowing the operator to turn them back by hand.

The operation of the mechanism is as follows: By pressing down key E' its escapement is momentarily released, and the spring of the wheel B' turns said wheel the distance of one tooth of its ratchet before being caught by the escapement-pawl. The other wheels are operated in like manner by the other keys. By reversing the direction of the rotation of the wheels to bring them back to an initial point their springs are wound up for a fresh operation.

The peripheries of the wheels have upon them numbers, which are arranged as follows: Upon the wheel B' we place the unit and multiples thereof—for example, 1, 2, 3, 4, 5, 6, 7, 8, 9, &c. Upon the wheel B<sup>2</sup> are placed figure 2 and its multiples—thus, 2, 4, 6, 8, 10, 12, &c.; upon wheel B<sup>3</sup>, the figure 3 and its multiples—thus, 3, 6, 9, 12, 15, 18, &c.; on B<sup>4</sup> the figure 4 and its multiples—thus, 4, 8, 12, 16, 20, 24, &c., and on B<sup>5</sup> the figure 5 and its multiples—thus, 5, 10, 15, 20, 25, 30, &c.—that is to say, each wheel carries a different digit and the multiples of said digit.

The object in view is, as we have said, to reduce a long column of figures to a short one. The operation by which we attain this object is best explained by an example. Given the following column of figures to add:

3	
6	
9	90
7	
6	
5	
8	95
4	
1	
3	
2	
8	100
1	
9	
1	
2	
5	
7	105

All the wheels are first turned back to the initial point at zero. For the 7 we press simultaneously the keys  $E^7$  and  $E^2$ . This will cause the wheel  $B^6$  to exhibit a 5 and the wheel  $B^2$  to exhibit a 2. For the 5 key  $E^5$  is pressed, thus causing the wheel  $B^2$  to exhibit a 10, which is the present 5 added to the 5 previously exhibited. For the 2 key  $E^2$  is pressed, whereby the wheel  $B^2$  now exhibits a 4, being the sum of the present 2 with the 2 previously exhibited. For the 1 the key  $E^1$  is pressed, causing the wheel  $B^1$  to exhibit a 1. For the 9 we press simultaneously the keys  $E^1$  and  $E^9$ , whereby the wheel  $B^9$  exhibits 15, while the wheel  $B^1$  exhibits a 4. For the 1 the key  $E^1$  is again pressed, thus causing its wheel to exhibit a 2. For the 8 the keys  $E^8$  and  $E^2$  are pressed simultaneously, thus causing the wheel  $B^2$  to exhibit a 20 and the wheel  $B^3$  to exhibit a 3, and so on throughout the column, until as a result we will observe through the apertures of the casing the figures 50 on the wheel  $B^5$ , 12 on the wheel  $B^1$ , 12 on the wheel  $B^2$ , 8 on the wheel  $B^3$ , and 5 on the wheel  $B^4$ . It will thus be seen that a long column of figures has been reduced to a short one of 5, which may be readily summed up. If, now, a second column or row of figures has to be added, all the wheels are turned back to their initial point at zero, and the amount which is to be carried over from the previous addition is first taken, and then the column is run up, as previously described.

We are aware of a calculating-machine in which independent wheels are operated, each of its own mechanism, and we do not therefore claim such, broadly, but confine ourselves to the construction of our machine, which is simple and effective and enables us to place a practical and rapid machine upon the market at a small cost.

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

In an adding-machine, the series of wheels, each wheel having upon its periphery a different digit and multiples of said digit, the springs D, by which each wheel is turned in one direction, and the ratchet G on each wheel, in combination with the series of keys, one for each wheel, said keys having pivoted shanks  $e$ , and the independent double or escapement pawls F, each attached to a key-shank and operated thereby, and each engaging a ratchet of a wheel, substantially as herein described.

In witness whereof we have hereunto set our hands.

BRAINARD F. SMITH,  
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