

No. 754,544.

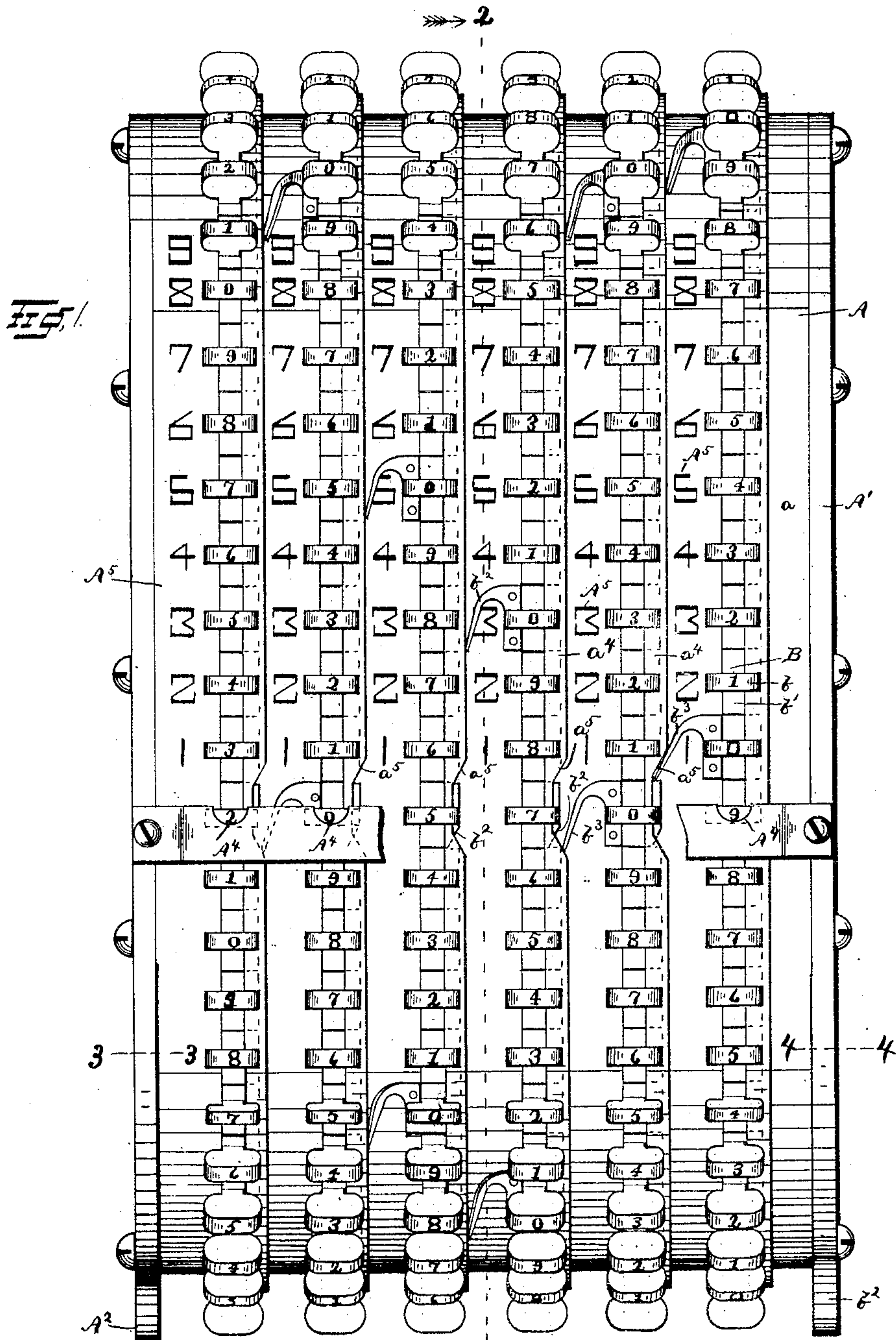
PATENTED MAR. 15, 1904.

W. H. CLARK.
ADDING MACHINE.

APPLICATION FILED DEC. 24, 1894.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

Wm. M. Loefer
J. P. Slocum

INVENTOR

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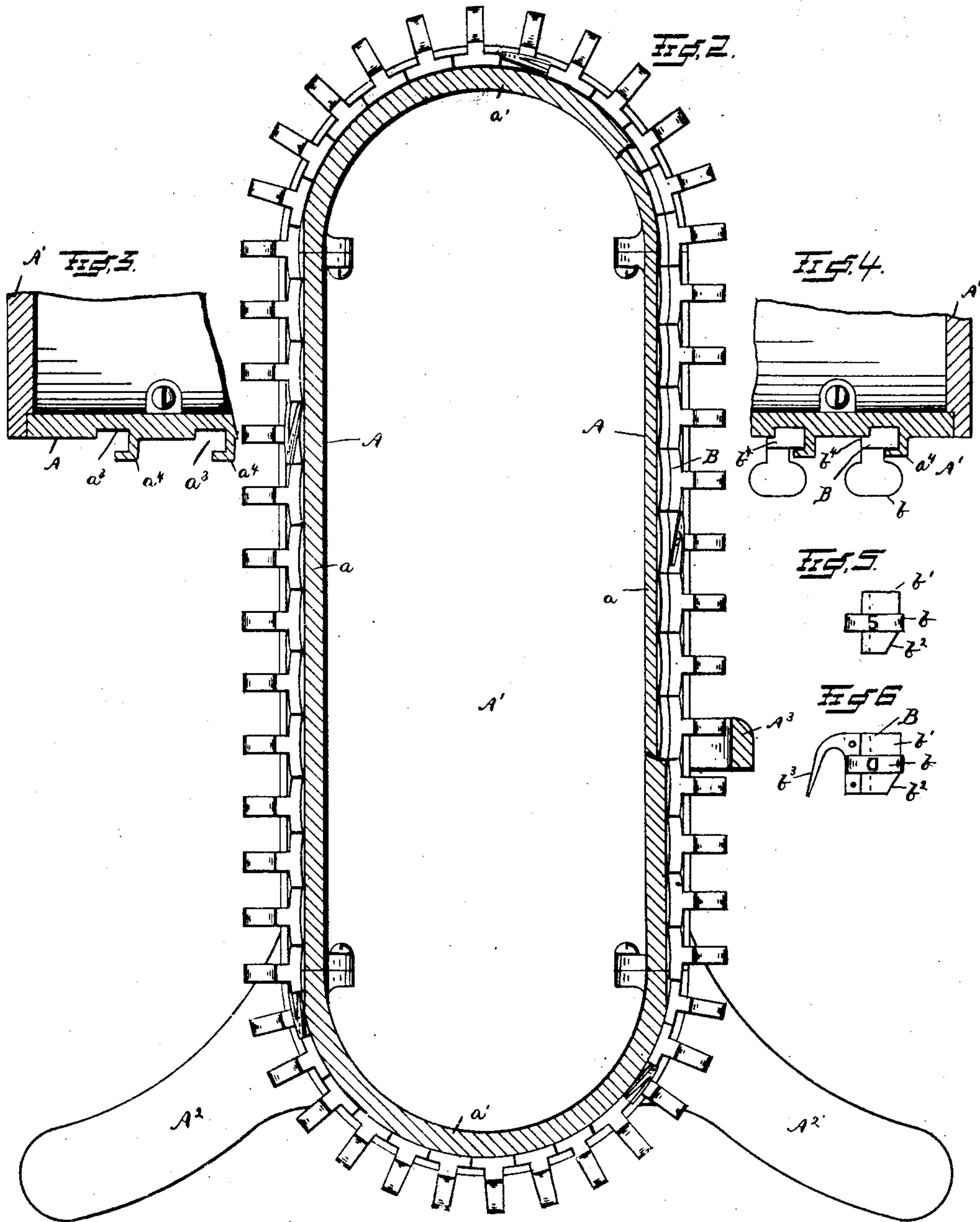
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W. H. Clark
J. P. Slocum.

INVENTOR

William H. Clark

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UNITED STATES PATENT OFFICE.

WILLIAM H. CLARK, OF ERIE, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL CASH REGISTER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 754,544, dated March 15, 1904.

Application filed December 24, 1894. Serial No. 532,855. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. CLARK, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Adding-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to adding-machines; and it consists in certain improvements in the construction thereof, as will be hereinafter fully described, and pointed out in the claims.

The invention is illustrated in the accompanying drawings as follows:

Figure 1 shows a front elevation of the machine. Fig. 2 shows a section on the line 2 2 in Fig. 1 looking in the direction of the arrows, a part being broken away to the next tally-piece groove to the right. Fig. 3 is a section of a fragment of the frame on the line 3 3 in Fig. 1, showing the tally-piece guides. Fig. 4 is a section of a fragment of the frame on the line 4 4 in Fig. 1, showing the tally-piece guides with the tally-pieces therein. Fig. 5 shows a detached tally-piece. Fig. 6 shows a detached tally-piece with a carrying-finger thereon.

A marks the frame having the tally-piece guides therein and is composed of the front and rear plates *aa* and top and bottom pieces *a' a'*. The end pieces *A'* are secured to the ends of the frame and are provided with the lower projections *A''*, which serve as legs or supports for the machine. The frame is traversed by a series of grooves *a'''*—one for each denomination—and these grooves are endless or continuous, passing around the machine, and form guides for the tally-pieces. The tally-pieces *B* are placed in these grooves or guides, and the adding is accomplished by the movement of the tally-pieces in these grooves. The tally-pieces have the finger-pieces *b* and the slides *b'*. The slides *b'* are placed in the grooves *a'''*, and an L-shaped lip *a''*, which extends out from the frame and over the slides *b'*, holds them in place. The tally-pieces of each

denomination are numbered in series from "0" to "9." In the machine shown there are five series for each denomination. This is simply a matter of convenience, as one or more series may be used with the same effect. The numbers are placed on the outer surface of the finger-pieces, it being the most prominent position, to display them.

A stop-bar *A'''* is placed across the front of the machine, under which the tally-pieces pass and against which the finger-piece is stopped in its movement in actuating tally-pieces. In line with each guide is a small reading-notch *A''*, through which is displayed the number of the tally-piece immediately under it, and these notches, taken together, I term the "reading-line." By looking at the guide to the left of the machine we see that this denomination is set at "2." If it is desired to add, say, four to this denomination, we might perform the mental operation and push the "6" tally-piece down into the reading-line. To obviate this mental operation, I place adjacent to each guide a series of figures *A''''*—one opposite each tally-piece and running from "1," one tally-piece above the reading-line, to "9," nine tally-pieces above the reading-line. Now taking our former example, the left guide, if it is desired to add four to the "2" indicated at the reading-line it is only necessary to place the finger upon the tally-piece opposite "4" of series *A''''* and push this tally-piece down to the reading-line, which tally-piece, as will readily be seen, is "6," the indication desired. A similar arrangement of the guides and figures of the other denominations allows of a similar operation.

As the sum possible to indicate in each guide operated independently could only equal at most the number of tally-pieces in said guide, in order to give the machine any considerable capacity it is necessary that each sum in the lower denomination equal to a unit of a higher denomination should be carried or indicated in the higher denomination and that there should be a naught indication in the lower denomination in place of the sum so carried, or, in other words, a tally-piece of the higher

denomination should be actuated when the sum of the operations of the lower denominations equals a unit or tally-piece of the higher denomination. To accomplish this purpose, I employ the following means: At some point, preferably at the reading-line, a notch a^5 is cut through the L-shaped lip a^4 and exposes a corner of the slides b' as the tally-pieces pass under it. By reference to Fig. 4 it will be seen that the slide is thicker than the depth of the groove a^3 and has a projection b^4 , which slides on the surface of the frame A. In each series one of the tally-pieces in the construction shown (the "0" tally-piece) is provided with a spring-finger b^3 , which projects over and normally rides against the lip a^3 of the next higher denomination and so forms a friction to hold the tally-pieces in place. Each of the tally-pieces has the lower right-hand corner beveled off, as shown at b^2 , Figs 5 and 6. As a spring-finger b^3 comes to notch a^5 it springs into it. The beveled corner of the tally-piece at the top of the notch allows the finger to engage the upper right-hand corner of the tally-piece under the notch a^5 . As the tally-pieces in the way of lower denomination are moved the finger actuates the tally-pieces in the next higher way one tally-piece and is then thrown out of engagement by the inclined surface at the lower end of the notch a^5 . The result of this operation is obvious. The "0" tally-pieces are the tenth tally-pieces. Taking the first two columns to the right for examples, they are now set at "09." If we add one, the "0" (tenth) tally-piece will be brought into the reading-line of the lower denomination. At the same time the finger has pushed the "0" tally-piece of the next higher denomination out of the reading-line and the "1" tally-piece of said denomination into it, so that the reading of the two columns will be "10"—the correct sum. The other columns are arranged in the same way.

It will be readily seen that any denomination—tens, hundreds, &c.—may be added by the operation of the tally-pieces in the guides of said denomination, the carrying will be accomplished in the same manner as described, and the amount indicated at the reading-line will be the sum of the operations.

What I claim as new is—

1. In an adding-machine, the combination of a series of guides, each one representing a different denomination, plural series of tally-pieces adapted to move in said guides, each

series representing a different denomination and each tally-piece adapted to be moved initially to operate its series, a spring-finger on a tally-piece of each lower denomination adapted to engage a tally-piece in the next higher denomination as said finger passes a designated point, a fixed abutment for disengaging said finger from said tally-piece and for holding the same normally out of engagement with any tally-piece, whereby the sum of the number of the tally-piece of the lower denomination is transferred to a digit of the higher denomination and the pressure of said spring-finger upon said abutment forms a brake for preventing overthrow of the tally-pieces.

2. In an adding-machine, the combination with guides for different denominations; tally-pieces in said guides; and a spring-finger on a tally-piece of the lower denomination that moves a tally-piece in the higher denomination and forms a friction-plate for holding the tally-pieces in place.

3. In an adding-machine, the combination with guides for different denominations having the L-shaped retaining-lip a^4 with notches a^5 therein; tally-pieces in said guides; a spring-finger on a tally-piece of lower denomination that normally rides against the retaining-lip of the higher denomination and is adapted to enter the notch a^5 to actuate a tally-piece of the higher denomination.

4. In an adding-machine, the combination of a series of guides, each one representing a different denomination, plural series of tally-pieces adapted to move in said guides, each series representing a different denomination and each tally-piece adapted to be moved initially to operate its series, a spring-finger on a tally-piece of each lower denomination adapted to engage a tally-piece in the next higher denomination as said finger passes a designated point, a fixed abutment for disengaging said finger from said tally-piece and for holding the same normally out of engagement with any tally-piece, whereby the sum of the number of the tally-piece of the lower denomination is transferred to a digit of the higher denomination and the pressure of said spring-finger upon said abutment forms a brake for preventing overthrow of the tally-pieces.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. CLARK.

Witnesses:

H. A. STRONG,
H. C. LORD.