

E. S. SWIFT.
SIGHT PLATE FOR COMPUTING MACHINES.

APPLICATION FILED JULY 28, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

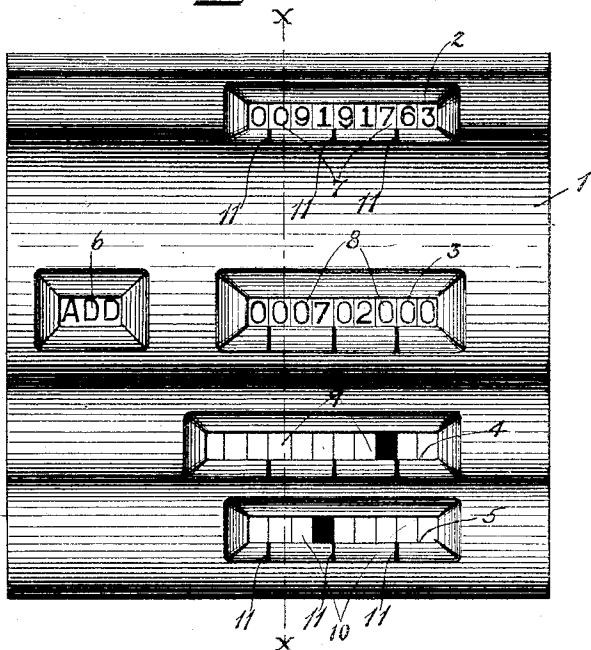


Fig. 3.

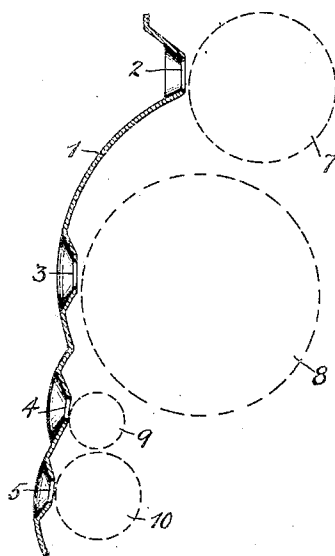
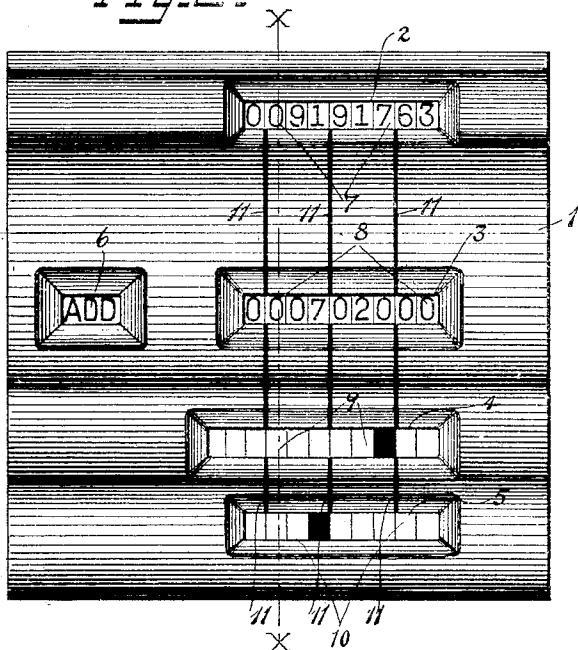


Fig. 2.



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2 SHEETS—SHEET 2.

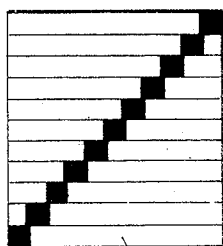


Fig. 4.

Fig. 5.

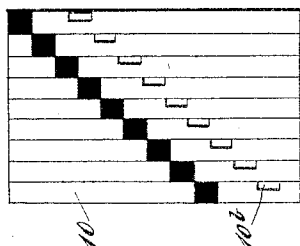


Fig. 6.

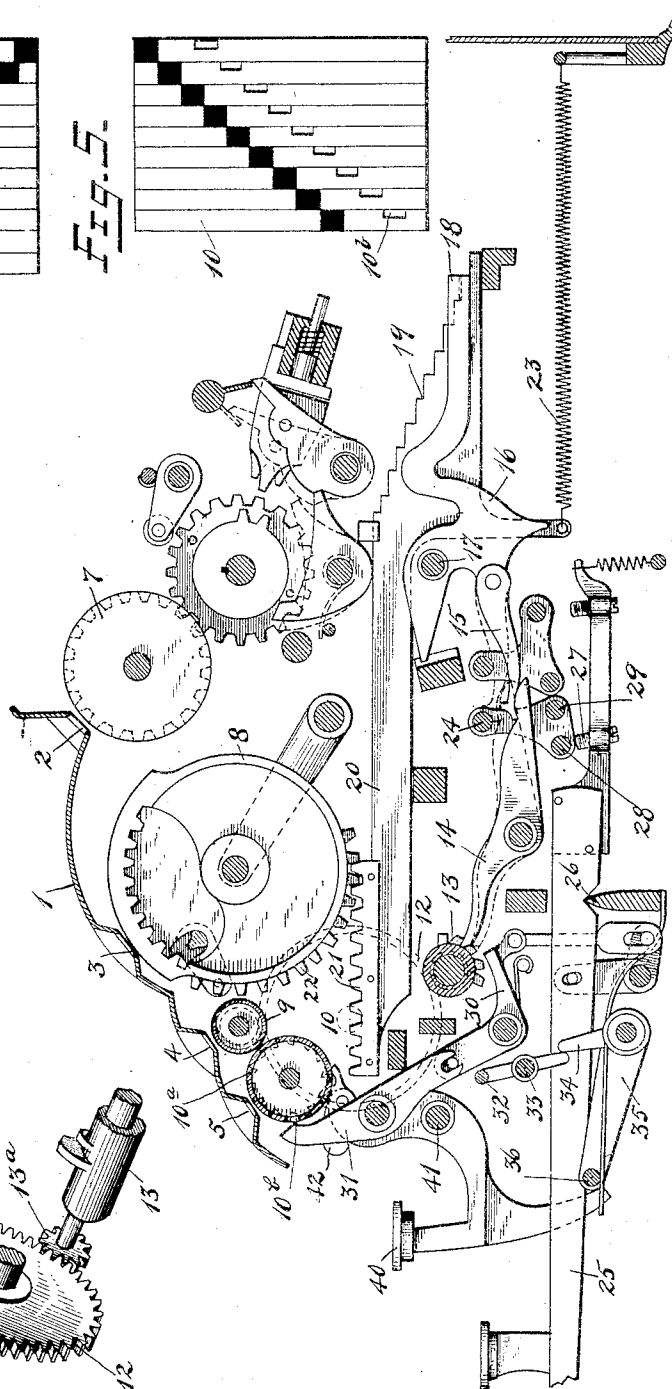
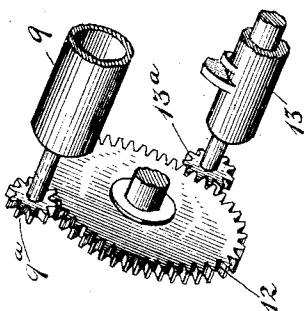


Fig. 7.



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UNITED STATES PATENT OFFICE.

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TO SAID EDWARD STRONG SWIFT, TRUSTEE, OF NEW HAVEN,
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SIGHT-PLATE FOR COMPUTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 789,410, dated May 9, 1905.

Application filed July 28, 1904. Serial No. 218,450.

To all whom it may concern:

Be it known that I, EDWARD STRONG SWIFT, a citizen of the United States, residing at New Haven, New Haven county, Connecticut, have
5 invented certain new and useful Improvements in Sight-Plates for Computing-Machines, of which the following is a full, clear, and exact description.

My invention relates to computing and
10 printing machines, and has for its object to increase the ease and accuracy with which the machines may be operated. This object is attained by assisting the eye to more readily locate the position of the figures displayed.

15 The particular application of this invention was first made to the machine shown and described in the application of Fred M. Carroll, Serial No. 51,765, filed March 18, 1901, and is therefore illustrated in connection with
20 elements described and shown therein.

The subject of visual display in computing-machines is of such importance as to be considered at some length. The starting-point of the computation is visually shown by the
25 location of the spot on the normally stationary cylinder. The progress of the computation is shown by the successive appearance of the spots of the traveling indicating-cylinder. The figures representing the item which has
30 been set up on the item-wheels and is to be transferred to the totalizing-wheels is shown on the periphery of the item-wheels, and the total is constantly and consecutively shown on the totalizing-wheels. The item-wheels are
35 arranged side by side with practically no space between, so that the figures, reading across the wheels, form horizontal lines of figures. This is also true of the totalizing-wheels. To avoid the confusion of seeing several spots on
40 each of the cylinders and several figures on each of the wheels, it is necessary to cover these parts with a mask or sight plate having horizontal slots, so that only one spot of each cylinder and only one figure on each wheel
45 can be seen, thus showing only one line of figures. For commercial use it is customary in printing amounts to punctuate them with decimal point and commas. For quick read-

ing of the figures and indicators it is very helpful to have punctuation points or lines on the mask or sight plate locating decimal point and the commas for thousands and millions, and that results from my invention. Moreover, the relations of the indicators to the figures is made very much more clear, so as to
55 result in increased accuracy and quickness in ascertaining just what the relations are.

The following is a description of embodiments of my invention, reference being had to the accompanying drawings, in which—
60

Figure 1 is a front view of a mask-plate with cylinders and wheels, the same embodying my invention. Fig. 2 is a similar view of a modification of the same. Fig. 3 is a sectional view of either form on the line *ww*,
65 the cylinders and wheels being shown in dotted lines. Figs. 4 and 5 represent, respectively, partial developments of the traveling column-indicator cylinder and the stationary column-indicator cylinder above referred to.
70 Fig. 6 is a diagrammatic view showing the interrelation of the parts 7 8 9 10 and the means for actuating the same. Fig. 7 is a detail view.

Referring more particularly to the drawings, 1 is a mask or sight plate having slots
2 3 4 5 6, as shown.

7 and 8 are series of wheels bearing rows of numerals on their faces. The wheels 7 are the accumulating-wheels, each being provided
80 with a series of numerals, one of which appears through the slot 2 for indicating totals. The wheels 8 are item-wheels, on which the items to be transferred to the accumulating-wheels are initially set up. These item-wheels each
85 bear a series of numerals, one of which appears through the slot 3. When no numbers are set up on the item-wheels, the zeros of each series are in front of the slot 3.

9 and 10 are two cylinders for indicating
90 columns. 10 is a column-indicator normally stationary, which indicates the column in which the first figure of a new item will be set up. 9 is a traveling column-indicator, which indicates the column in which will be
95 set up the figure corresponding to the next

key depressed. The slot 6 shows the word "Add" when the machine is adjusted for addition, but does not form a part of the subject-matter of my invention.

5 In order to make the relations of the numbers and spots appearing in the slots 2, 3, 4, and 5 quickly and accurately determinable, I so arrange these slots that the right-hand ends are in line with one another. I then
10 make the wheels 7 and 8 of equal widths—that is, so that the centers of their faces are equally spaced—and make the lateral displacement of the spots on the cylinder 9 and the spots on the cylinder 10 equal to the lateral
15 displacement of the centers of the wheels 7 and 8, as shown in Figs. 4 and 5, which represent, respectively, developments of the traveling column-indicator 9 and the stationary column-indicator 10. I then point off all
20 these slots by marks 11, the indicator-slots being graduated by marks equally spaced with those of the numeral-slots. The two numeral-slots are graduated by marks corresponding to the decimal point, thousands, and
25 millions. In the modification, Fig. 2, these marks are continuous except as broken by the openings of the slots, thus serving to more distinctly mark the relations of the numbers and indicators.

30 The interrelation of the various parts 7 8 9 10 is shown in Fig. 6, in which the indicator 9 is shown as connected, through the intermediate gears 9^a, 12, and 13^a, with the selector-shaft 13. This selector-shaft through
35 its spirally-arranged teeth controls a series of levers, such as 14, so as to actuate them one at a time. When the left-hand end of any of the levers 14 is depressed, that lever raises the left-hand end of the corresponding one
40 of a series of the dogs 15 to the position shown in dotted lines. This dog 15 is connected to the corresponding one of a series of levers 16, pivoted on the shaft 17. These levers 16 are so arranged that their rear
45 ends 18 each engage steps 19 on the corresponding one of a series of bars 20, carrying racks 21 and known as "rack-bars." Each rack 21 engages with teeth 22 on the corresponding one of a series of wheels 8, causing
50 it to revolve an amount corresponding to the movement of its rack-bar 20. Each of the rack-bars is retracted by its corresponding spring 23, connected to a lug depending therefrom. When the selector-shaft through its
55 engagement with one of the rocking levers 14 has elevated a dog 15, the dog 15, together with the lever 16, is in a position to be moved to the right by the universal bar 24 when that bar is actuated by one of the numeral-keys.
60 25 represents one of a series of nine numeral-key bars, which are pivoted at the point 26 and are provided with adjusting-screws 27, whereby they can be adjusted so as to engage the universal bar 28 and when a key is actuated by such engagement move the universal

bar 24, which is supported on bell-cranks pivoted at 29, a distance to the right corresponding to the value of the key depressed. This will raise the end 18 of the corresponding lever 16, so that it will release its rack-bar 20
70 and reengage it on the step which corresponds to the numeral-key depressed. After a key is actuated the selector-shaft is moved one step. Inasmuch as the indicator-drum 9 is geared to the selector-shaft, it revolves with
75 it, and the spots on the indicator-drum 9 as they appear at the opening 4 show the progress of the computation, while the numerals on the item-wheels 8 as they appear on the opening 3 show the value of the computation.
80

In order to determine the point to which the selector-shaft shall return after it has been reset, I provide a series of levers 30, whose lower ends are normally held out of the paths of the teeth upon the selector-shaft. This
85 lever is connected with another lever, 31, so as to form a toggle-joint. The upper end of this lever 31 bears against the periphery of the drum 10, except as one of them enters one of a number of corresponding holes 10^b, arranged in a spiral thereon. When the upper
90 end of any one of these levers enters one of the said holes, the lower end of the lever co-acting with it rises in the path of a corresponding tooth upon the selector-shaft and blocks
95 the movement of the selector at a point corresponding thereto. In order to release the selector-shaft, a universal bar 32 is provided, which is adapted to engage all the levers 30. This bar is pivoted at 33 and has its lower
100 end engaged by a crank-arm 34, which is actuated by the arm 35, carrying a universal bar 36, with which all of the key-levers 25 engage. Upon the depression of any key-lever, therefore, the universal bar 32 acts to
105 move the lower end of any lever 30 out of the path of its selector-shaft tooth, and therefore permits the shaft to revolve.

The drum 10 is adapted to be actuated by the key 40, which is carried by a lever pivoted at 41 and carries a dog 42, which, as shown, engages ratchet-teeth 10^a upon the end of the drum 10, therefore providing a means for rotating the drum as desired. The
110 accumulating-wheels 7 are provided with teeth 115 which are adapted to be engaged by the teeth 22 upon the item-wheels and are also connected with suitable carrying mechanism for carrying the tens, which, however, form no part of my present invention and is therefore not
120 particularly described.

What I claim is—

1. In a computing-machine, the combination of a sight-plate having an opening with graduated margin and indicating devices independently movable in a direction transverse to said graduated margin.
125

2. In a computing-machine, the combination of a sight-plate having an opening with graduated margin and item-indicating devices
130

independently movable in a direction transverse to said graduated margin.

3. In a computing-machine, the combination of a sight-plate having an opening with
5 graduated margin and total-indicating devices independently movable in a direction transverse to said graduated margin.

4. In a computing-machine, the combination of a sight-plate having an opening with
10 graduated margin and column-indicating devices normally stationary but movable in a direction transverse to said graduated margin.

5. In a computing-machine, the combination of a sight-plate having an opening with
15 graduated margin and traveling column-indicating devices.

6. In a computing-machine, the combination of a sight-plate having openings with
20 graduated margin and movable indicators which visually indicate the value and progress of the computation.

7. In a computing-machine, the combination of a sight-plate having openings with

graduated margins and indicators which visually indicate the starting-point, the value, and
25 the progress of the computation.

8. In a computing-machine, the combination of a sight-plate having graduated openings, the marks of graduation extending from
30 one opening to the next, and movable indicators behind said openings.

9. In a computing-machine, the combination of a sight-plate having graduated openings whose right-hand ends and graduation-
35 marks are in line, means for indicating the value of the computation, and means for indicating the progress of the computation, said means having respectively numeral-faces and spots whose centers have equal lateral dis-
40 placement.

Signed at New Haven, Connecticut, this
26th day of July, 1904.

EDWARD STRONG SWIFT.

Witnesses:

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M. A. SEGAR.