

A. C. PIERSON.  
CALCULATING MACHINE.

No. 73,995.

Patented Feb. 4, 1868.

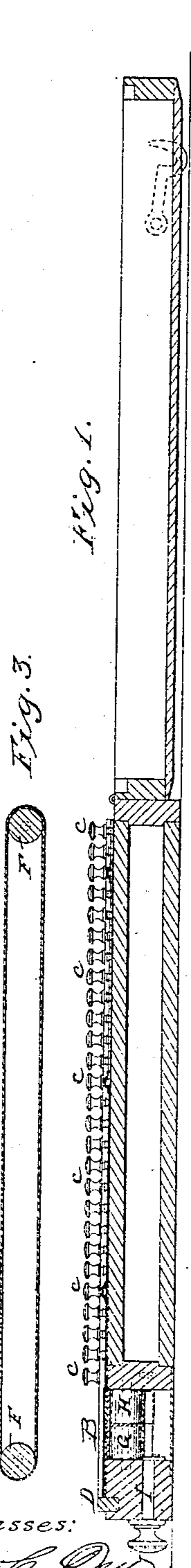
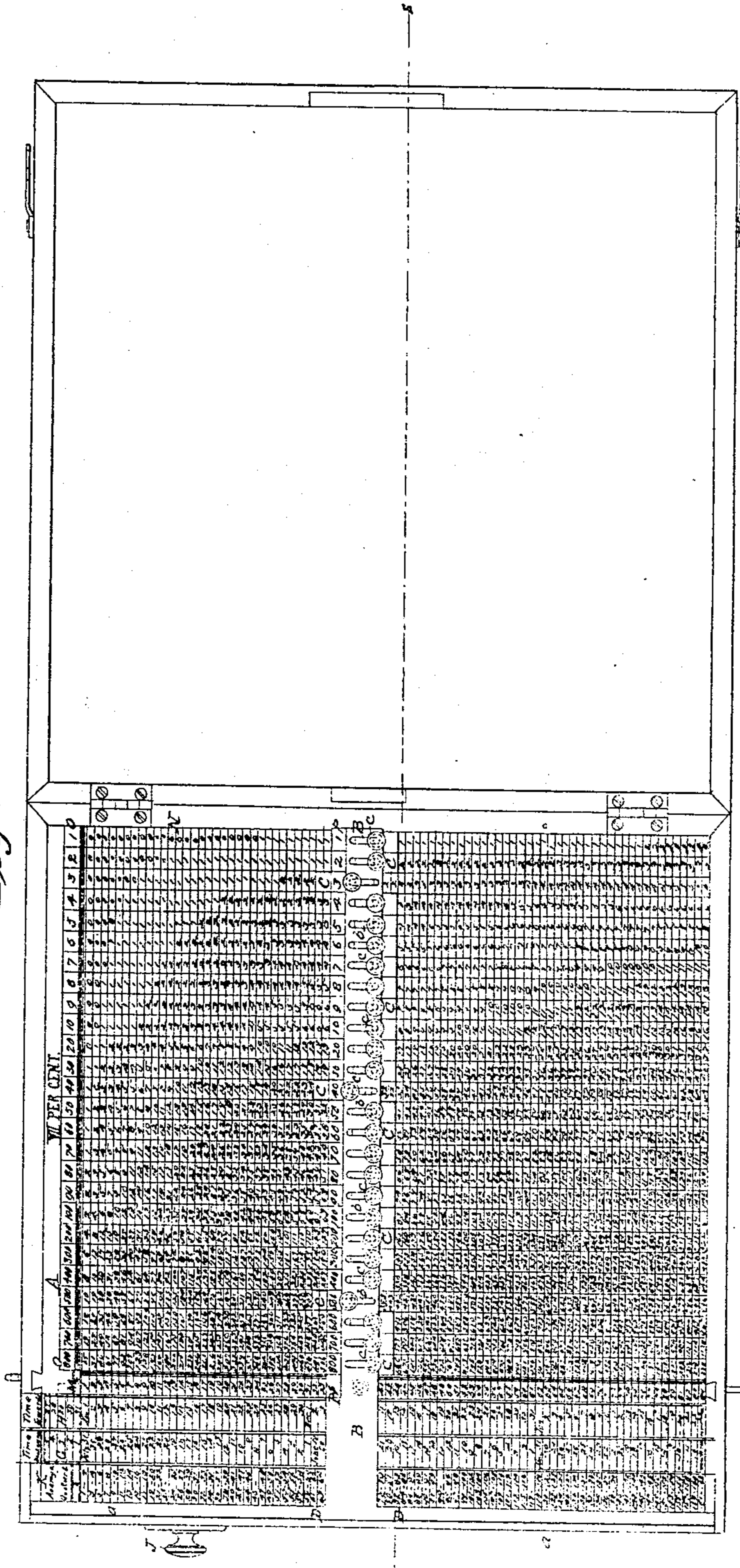


Fig. 3.



Fig. 2.



Witnesses:

*Wm. C. Day*  
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# United States Patent Office.

ALBERT C. PIERSON, OF RAHWAY, NEW JERSEY.

*Letters Patent No. 73,995, dated February 4, 1868.*

## IMPROVEMENT IN CALCULATING-MACHINES.

*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, ALBERT C. PIERSON, of Rahway, in the county of Union, and State of New Jersey, have invented certain new and useful Improvements in Calculating-Machines; and I do hereby declare that the following is a full and exact description thereof.

My invention is adapted more particularly for calculating interest, and for readily estimating, in connection therewith, the length of time between one date and another.

I will first describe what I consider the best means of carrying out my invention, and will afterward designate the points which I believe to be new. The accompanying drawings form a part of this specification.

Figure 1 is a cross-section through the machine on the line S S, in fig. 2.

Figure 2 is a face view of the machine.

Both drawings represent the machine as provided with a cover for protecting the parts, the cover being hinged to the main body of the machine, and provided with means for securing it.

Similar letters of reference indicate like parts in all the figures.

A is the framework, which may be of wood, having a groove or grooves, *a a*, adapted to receive and guide the cross-piece or pieces D of the parallel bar B. This bar B carries a series of slides, C, which are held in place by the aid of buttons or pins, *c*, standing in slots *b*. G and H are belts running parallel each to the other, at right angles to the parallel bar B. The belts G and H are stretched around pulleys E and F, mounted as represented. These belts are to be shifted by hand, at will. Of the many ways of making and operating these belts or moving columns, I have represented two. In figs. 1 and 2 the pin I is traversed in a slot extending through the side of the framework A. So, on operating the button J, on the outer extremity of the pin I, the inner end of the pin I is correspondingly moved up and down on the framework A. The inner end of this pin is secured to the belt H, so that the movement of the pin I compels that belt to traverse. The other belt, G, may then be moved by taking hold of it directly, if desired.

In Figure 3 both the belts are represented as made of thin brass or other suitable strong material, punctured with holes. Such belts may be shifted by introducing the handle of the pen or other suitably strong object into one of the holes, and applying force thereto, to compel the belt to move into the required position.

On the framing A is engraved, or otherwise produced, a series of numbers, increasing successively downward, as indicated in the column *m*. In reckoning interest, these numbers indicate the number of days for which the interest is to be computed. It may be extended to any length desired. There is also engraved or otherwise produced on the framing A, a table, *n*, containing the carefully-computed quantities to which various sums will amount, at interest at the desired per cent., for the number of days indicated in the column *m*. The amounts are indicated in the horizontal line O, across the top of the table. The same amounts are also indicated in corresponding positions on the parallel bar B, as shown, and form the horizontal line designated P.

The numbers in the lines O and P are not sufficient to indicate exactly by single numbers all of the amounts the interest of which is required to be sometimes computed, but they are so distributed that any desired amount may be made up by adding together two or more of these numbers, as will be observed on a careful inspection of the numbers selected. The table may be extended to any amount.

Where it is desired to ascertain the interest for any given amount, as one hundred and six dollars, for any given number of days, as, for instance, for ten days, the tables may be consulted directly, and running the eye along the line opposite the number ten in column *m*, it is found that the interest for one hundred dollars is nineteen cents, and for the six dollars is one cent, which, added, make twenty cents, the desired amount. The same operation may be performed for any other number of days and any other amounts.

But it is found in practice that the mind or the eye of the operator becomes fatigued by continuous application to this kind of labor, and it is desirable to facilitate it by mechanical appliances. My slide B and its connections accomplish this, and so reduce the labor that the calculations may be made by means of this mechanism for a long period without fatigue.

In order to realize the advantages of this machine, it is necessary simply to move down the parallel bar B, sliding the part D in the groove *a* until the lower edge of the parallel bar B touches the number in the column *m*, which indicates the number of days. Now, by touching the buttons *c*, which are opposite to the numbers desired, in the line P, and pushing up the corresponding slides, the amounts required are now exposed directly below the edge of the parallel bar B, and the amounts not desired are concealed. This makes it easy for the eye to catch the desired numbers, and by a quick mental operation they are added together and rapidly entered on the book, or used in any other manner which may be desired.

In the example represented in the drawings, it is desired to find the interest of five hundred and forty-three dollars for forty-one days. The machine being adjusted as represented, the interest is  $393 + 32 + 2 = \$4\ 27$ . So soon as one computation has been thus made, the parallel bar B may be shifted to a new position, indicating a new number of days, and the slides previously used being struck back into their usual position, other slides are thrown up, and the interest indicated and correspondingly taken off for any desired different amount. The replacing of the slides used in each operation may be accomplished, if preferred, by simply sliding the parallel bar B and its connections rapidly up to the top of the scale, and causing the displaced slides to be simultaneously thrown down into position by striking them against a cross-bar or ridge at the top, not represented.

To facilitate the operation of ascertaining the number of days from one date to another, I engrave or otherwise produce a series of marks on each of the belts G and H. The spaces between these marks are exactly equal to the spaces between the figures in the column *m*, and the marks on each belt indicate each one day, designated by the month and day of the month. The time thus indicated increases on the belt G in one direction, and on the belt H in the opposite direction. When it is desired to compute the time from a given date forward to another date, I use the belt G, adjusting it until the first date comes even with the star at the top of the column *m*, and by running the eye down on this belt G to the succeeding date desired, I find opposite to it the number of days desired. Or, in practice with this invention, I do not require to take any notice of the column *m*, but immediately adjusting the belt G as desired, I run the parallel bar D down to the succeeding date, as desired, and proceed, as before, to adjust the slides and take off the interest.

Time can be reckoned both backward and forward by means of one belt or sliding column alone, but a great advantage is gained by using two, as I propose, for the following reasons, viz:

In practice, "to-day" is, in a very large proportion of cases, one of the dates from which interest is to be computed; that is, it is required to compute the interest from "to-day" forward, or from "to-day" to some back date, either of which can be done without moving the belts, when "to-day" on the belts stands opposite the star at the top, so that in the bank or counting-room the belt will seldom have to be moved during the day, after having been once adjusted for the day's work. A practical machine will embrace a period of a full year, and when the belts are adjusted as above, only a glance is necessary to determine the number of days from "to-day" to any other day within the year, either backward or forward. Opposite any given date on belt G or H will be found the number of days to that date. It will thus be seen that a great amount of time and labor is saved, besides the important fact that the liability to error is very much less than by any of the methods in use.

I can employ, in connection with my invention, any other columns that may be required, or I can dispense with the column *m*, or use it alone in connection with the belts G and H; or I can avail myself of some of the advantages of my invention without using all of the columns here indicated. For example, a column of average quotients may be introduced and arranged as shown in the column marked K, and various other columns may be indicated either on that side or the other of the table, and even in the small spaces between the columns in the table *n*. On the other hand, I can dispense with the line O, across the head of the table, and depend on the line P alone, which is carried on the parallel bar B. I can, as before stated, dispense with the column *m*, which indicates the number of days, and can depend entirely on the belts G and H to guide me in placing the parallel bar B in the right position.

The table N can be on a revolving cylinder or other movable shape, with the bar B stationary, or the table N can be on a thin plate of metal or other suitable material, with a part of the figures on each side of the plate turning the plate over when required. The advantage gained by the latter method would be to shorten the machine.

The advantages of most of the distinctive features of my invention have been already alluded to, and will be readily appreciated by those requiring to compute interest for long or short periods. I have tested my invention with success in conducting such operations for a very large miscellaneous business. The line P, on the parallel bar B, is of great advantage in avoiding the necessity of running down the columns from the head of the table, in order to ascertain which of the slides C to touch.

Having now fully described my invention, what I claim as new therein, and desire to secure by Letters Patent, is as follows:

1. I claim, in combination with the table N, or its equivalent, having the interest or other calculations for given amounts entered as represented, the parallel bar B, with or without the adjustable movable pieces, *c*, or their equivalents, adapted to operate in connection with the numbers in the table N, or its equivalent, substantially in the manner and for the purpose herein set forth.

2. I claim, in combination with the above, carrying, on the parallel bar B, the line of figures or other marks, P, indicating the amounts for which the interest or other calculations is to be computed at the several points, substantially in the manner and so as to realize the advantages herein set forth.

3. I claim, in combination with the column of days, the belts or moving columns G and H, carrying the dates in a reverse order, so as to allow the length of time to be ascertained from a given day, reckoning either forward or backward, substantially as and for the purpose herein set forth.

4. I claim the belts or sliding columns G and H, having the dates in reverse order, as shown, in combination with the interest-table *n*, as and for the purpose herein specified.

ALBERT C. PIERSON.

Witnesses:

WM. C. DEY,

FRANKLIN B. GAGE.