

Calculating Machine.

No. 62,882.

Patented March 12, 1867.

Fig. 1.

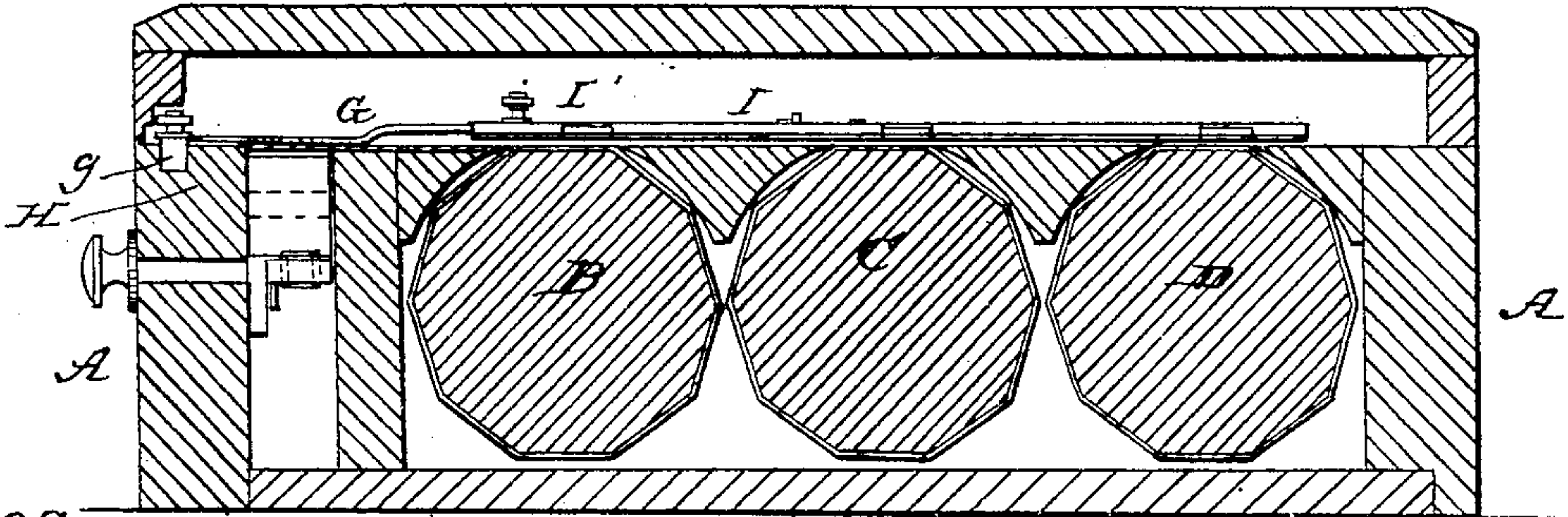
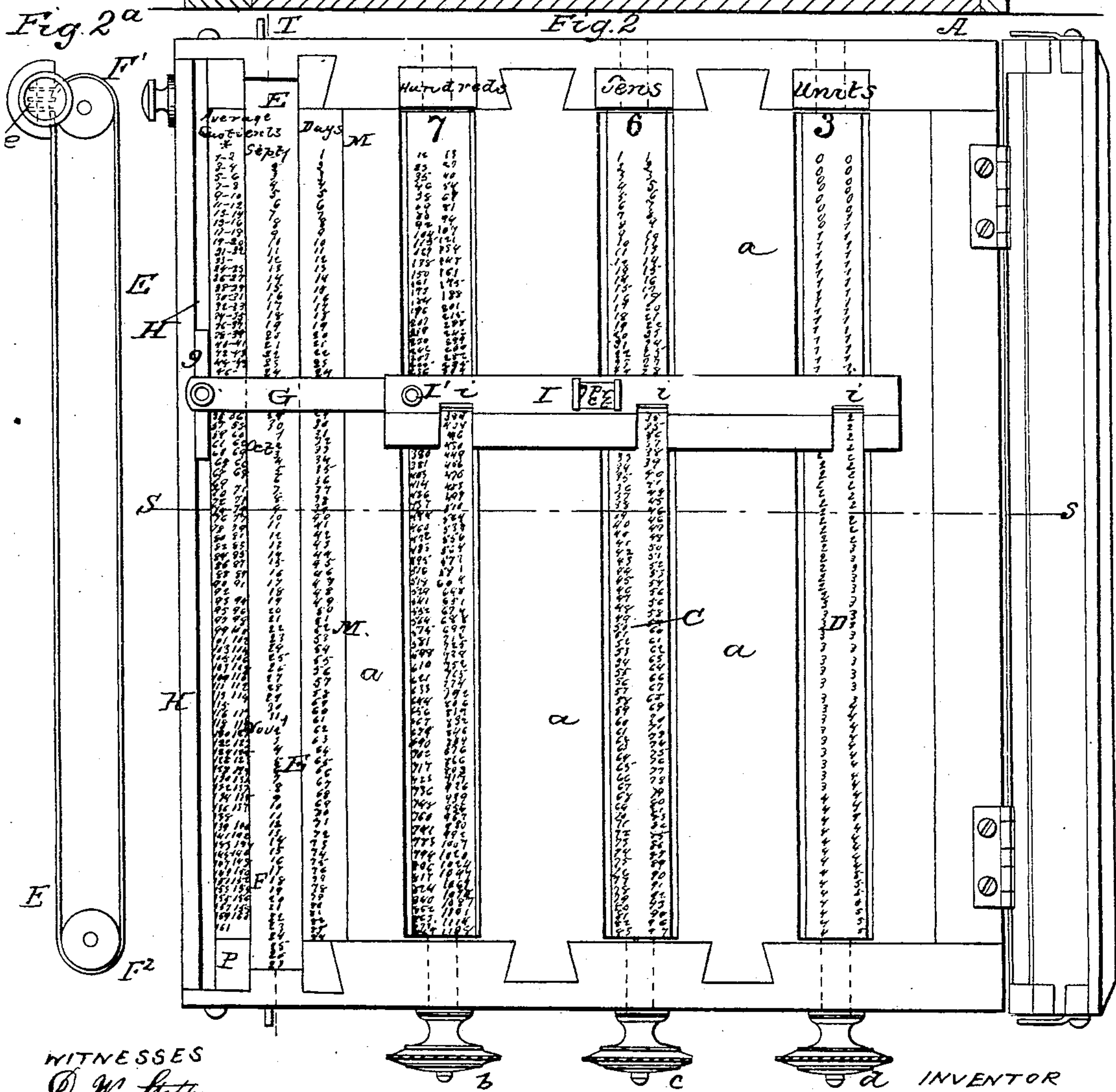


Fig. 2^a



WITNESSES

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United States Patent Office.

ALBERT C. PIERSON, OF RAHWAY, NEW JERSEY.

Letters Patent No. 62,882, dated March 12, 1867.

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 the city of Rahway, and county of Union, in the 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.

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

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

Figure 2 is a plan view.

Figure 2^a is a vertical section through the belt and drums on the line T T in fig. 2.

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

A is the fixed framework for the apparatus or machine. It may be made of wood or metal, or any other material possessing sufficient hardness and strength, and which may be put together in such manner as not to warp or shrink to such extent as to induce difficulty. I have succeeded well with well-seasoned wood. B, C, and D are rollers, or many-sided prisms, mounted in bearings in the framework A, adapted to be turned by the milled-heads or buttons *b c d*. The spaces between the prisms are partly filled by the bars *a*, which are fastened upon the framing A. E is a belt of oiled silk, or other material which is flexible, and which is not liable to materially change its length. It is stretched over the pulleys or small drums *F¹* and *F²*. The belt may be moved by means of the button *e*, which is fixed thereto, and is adapted to slide longitudinally in a slot in the framework. G is a bar of brass or other material firmly fixed upon the T-piece or cross-piece *g*, which latter fits in the groove H on the upper surface of the framework A. This cross-piece *g* is of such length and depth that it takes a firm hold of the groove, and compels the bar G to stand at right angles thereto. I is a sliding piece, adapted to move endwise within certain limits upon the bar G. It is provided with rectangular notches *i*, as represented, and with a button, *I'*, by which it may be conveniently moved. The prisms B C D carry columns of figures, which are ascertained by calculation, and are engraved or otherwise conspicuously indicated. The distance apart of these figures is exactly equal; that is to say, the whole or greater portion of the length of each prism is divided into equal spaces, which may be one-eighth of an inch, more or less, and the figures are placed in these spaces as represented. There is a column of figures on the fixed portion of the framework, as indicated by M, and these figures are correspondingly spaced to match the spacing on the prisms. The machine represented is intended to calculate interest. It will calculate the interest upon any amount less than one thousand dollars, and for any number of days less than eighty-five, at two rates, to wit, six and seven per cent. The column M consists of a column of figures increasing downwards from 1 to the limit of the machine, which figures represent days. Each of the prisms B C D has ten sides, marked 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, respectively. The prism B represents units; the prism C, tens, and D, hundreds. The numbers on the several sides of each show how many units, tens, or hundreds. Each face of each prism carries two columns, the numbers in the right-hand column being the largest.

The process of calculating interest by this machine is as follows: Suppose it be required to find the interest upon \$112 for nine days, at six per cent.; the prism B, units, is turned to present the face 2, the prism C, tens, is turned to present the face 1, and the prism D, hundreds, is similarly adjusted; the bar G is now slid downward until its lower edge rests upon the number 9 in the column M; now seizing the button *I'*, and moving the slide I to the left, there are presented through the openings *i*, directly under the bar G, three numbers, one upon each prism, by adding which together I get the interest. The operation of adding such numbers can be performed mentally in an inappreciably brief period of time. A corresponding process gives the interest for any other number of dollars, and any other number of days, within the range of the instrument; or adjusting the slide I to the right, we obtain the interest at seven per cent. My machine may be constructed to give the interest for any number of days up to or beyond a year; and by increasing its size, or reducing the size of the figures, it may give more than two rates of interest, or it may suffice in many cases to give only one rate of interest. By increasing the number of prisms, the magnitude of the sums computed may be increased at will, each additional prism increasing the capacity of the machine tenfold. The groove H may be made upon one of the bars *a* instead of at one side, if preferred; or there may be two or more of these grooves, or there may be any other convenient means of inducing a parallel motion of the bar G. The belt E is divided into spaces,

exactly corresponding to the column M, and it is marked with the months, and the days in each month, as represented. By turning the belt E I can ascertain the number of days between any two dates in the same year, or in different years, if the machine is made of sufficient capacity, by bringing the first date immediately above the number 1, in the column M, and then observing what number in the column M comes opposite the second date. We then proceed to calculate the interest for that number of days. It will, of course, be remembered that if the machine is graduated for ordinary years, an addition of one day to the number thus obtained must be made in leap year, when the period embraces the end of February. It is not necessary, in the use of my machine, to even observe the number of days between two periods. It is sufficient to bring the first period up to the right position, and slide the bar G down to the second period, and immediately read off and add the interest for hundreds, tens, and so forth. The column P shows average quotients. It is spaced exactly to correspond with the column M. The use of this and various other columns, which may be added at pleasure, will be appreciated by experienced book-keepers. It will be observed that the faces of the bars A, and the faces outside of the bars, may be made to carry various columns additional to those here represented, so as to adapt the machine to making astronomical calculations, working up ships' reckoning, reducing field notes in surveying, apportioning taxes or assessments, measuring lumber, and to computing railroad and canal work, paving, roofing, painting, and various branches of manufacturing by piece-work. The machine may also be of great use in large establishments in computing the wages of men for different numbers of days, and fractions of days, at various rates of pay. The rolling parts, termed prisms above, may be cylindrical rollers instead of prisms, if preferred, it being simply necessary to produce the proper effect by covering with the bars α , or by some equivalent means, the columns of figures of each side, so that only a small portion of the circumference shall be exposed at one time. The column E, carrying the days indicated by dates, will not be as convenient if fixed on a straight, rigid piece, as on my belt, because, in order to obtain the same ranges, the length of the rigid piece would have to be so great as to project beyond the frame of the machine when slid to its extreme at either end of its range. I should remark that I prefer to put the dates for two entire years on my belt E, so that I can run from one year into the other, and calculate interest between any date in each.

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

1. I claim, in calculating machines, presenting to the eye only the columns which are wanted to compute the units, tens, etc., substantially as herein specified, when the several columns for each of the nine digits, with the blank column for the cipher, are arranged to be presented simultaneously, so that they may be read off for units, tens, hundreds, etc., and added mentally with the ease and rapidity of adjustment and of use herein set forth.

2. I claim the belt or sliding calendar column E, when used in combination with columns of calculated interest, or equivalent calculated columns, the quantities in which vary according to the number of days, substantially as and for the purpose herein set forth.

3. I claim the combination of the bar G, having a parallel motion with the several columns on the rollers B, C, and α , with or without the column M or other columns, substantially as and for the purpose herein specified.

4. I claim the slide I, fitted on the bar G, and adapted to operate in combination with calculated columns, so as to expose different columns according as it is moved, and allow only one to be visible for the units, one for the tens, etc., at one time, substantially as and for the purpose herein specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ALBERT C. PIERSON.

Witnesses:

D. W. STETSON,

W. C. DEY.