March 19, 1940. E. L. TURNBAUGH 2,193,848

INTEREST CALCULATING MACHINE

Filed Oct. 10, 1936 4 Sheets-Sheet 1

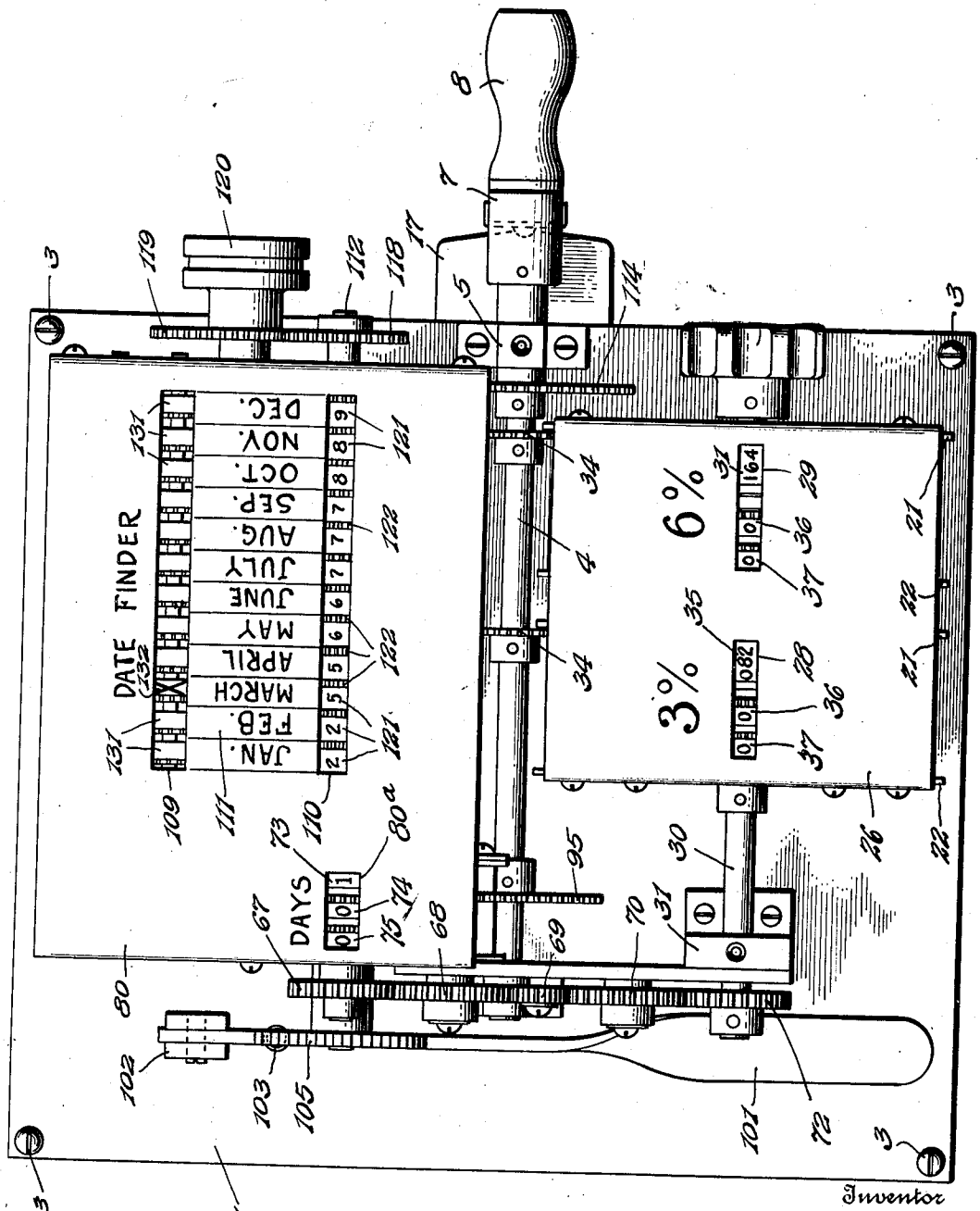

Fig. 1.

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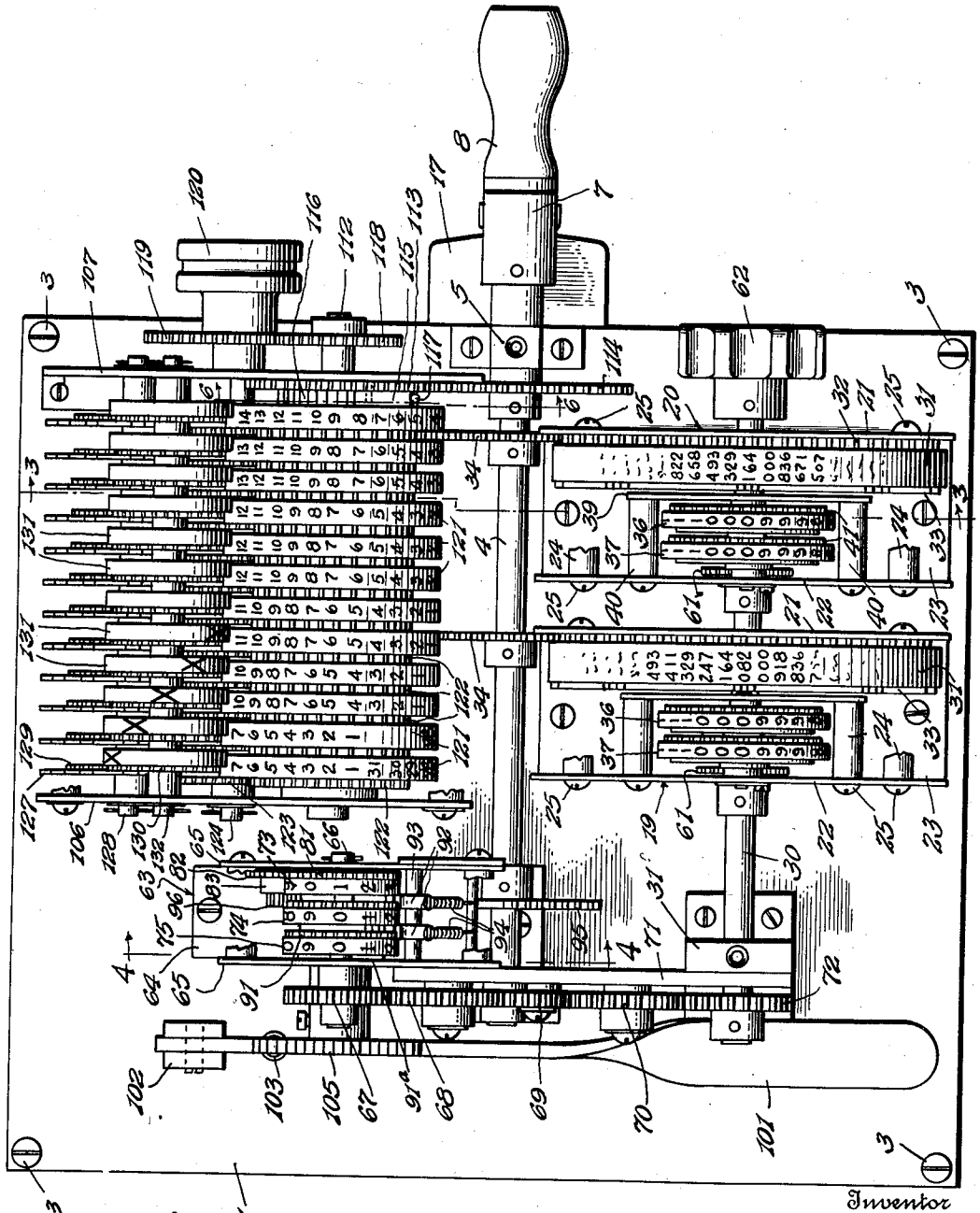

Fig. 2.

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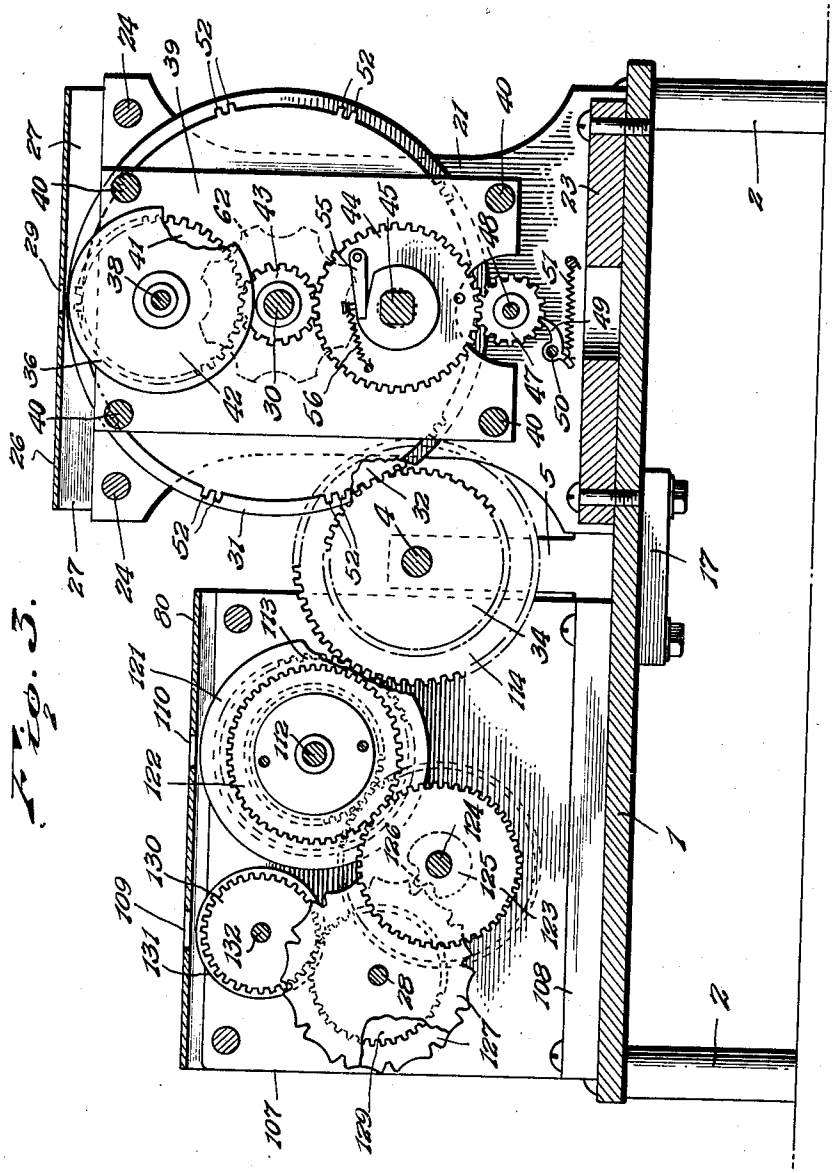

Fig. 3.

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INTEREST CALCULATING MACHINE

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Fig. 4.

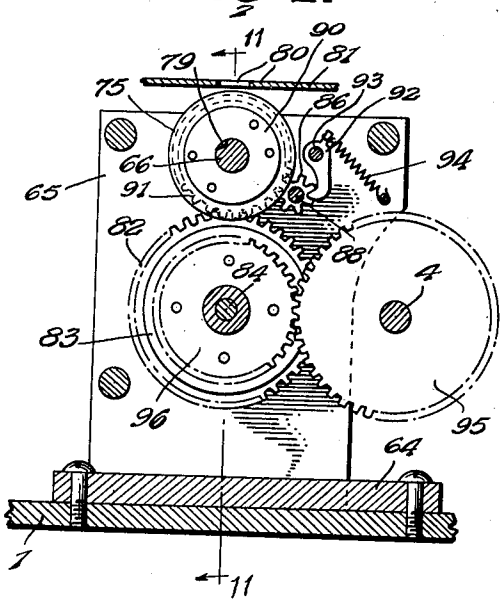
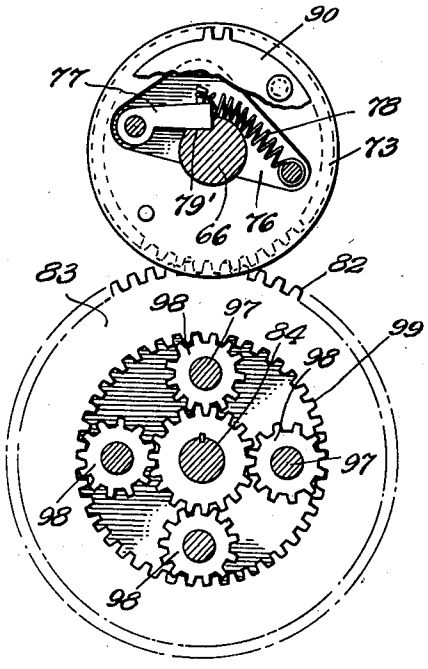


Fig. 5.



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Patented Mar. 19, 1940 2,193,848

UNITED STATES PATENT OFFICE

2,193,848

INTEREST CALCULATING MACHINE

Elbert L. Turnbaugh, San Francisco, Calif.

Application October 10, 1936, Serial No. 105,121

4 Claims. (Cl. 40—114)

This invention relates to an improved date finding unit for use with calculating machines.

One object of the invention is to provide a date finding unit for use with a machine of compact structure which may be conveniently used in banks and other institutions and by means of which the basic amount of interest on one dollar can be quickly ascertained for any length of time up to the capacity of the machine.

Another object of the invention is to provide a machine of this character including mechanism for quickly computing the number of days intervening between any two given dates.

A still further object of the invention is to provide an improved interest calculator of the above character which is durable and efficient in use, easy to manufacture, and one which can be placed upon the market at a reasonable cost.

The machine illustrated in the accompanying drawings is constructed on a 365 day percentage unit basis and any number of percentage units can be installed.

In the accompanying drawings:

Figure 1 is a top plan view of the machine.

Figure 2 is a top plan view of the machine with face plates removed.

Figure 3 is a sectional view taken along the line 3—3 of Figure 2.

Figure 4 is a sectional view taken along the line 4—4 of Figure 2.

Figure 5 is a longitudinal sectional view of the date finding unit.

In order to accurately calculate the amount of interest due on a note, there has been provided a date finder unit which may be set to indicate the starting date of the note, this being the date when the note was signed. This date finder unit is set to indicate the starting date of the note and, during operation of the machine, gradually progresses from the date of the month the note was signed until the day is reached when payment is made, at which time operation of the machine will be brought to a stop. The date finder unit is illustrated in Figures 1, 2 and 3, and referring to these figures it will be seen that it has a frame including side plates or walls 106 and 107 rising from a base 108 and at their upper ends supporting the face plate 80. This face plate 80 is of sufficient size to cover the date finder unit as well as the day counter unit and in addition to the sight opening or window 80a is also formed with sight openings or windows 109 and 110. These sight openings 109 and 110 are in the form of slots extending transversely of the face plate and of such length that upon the upper or outer face of the face plate may be marked the names of the months, as shown at 111. A shaft 112 is rotatably mounted between the side walls 106 and 107 and carries a gear 113 meshing with the gear 114 so that when the shaft 4 is turned by means of the crank 7, rotary motion will be transmitted from the shaft 4 to gear 114 and in turn to the gear 113. In view of the fact that the gear 113 is free on the shaft 112, it may be rotated independent of the shaft but as a pawl 115 is carried by the gear 113 and is yieldably held in engagement with a ratchet wheel 116 by a spring 117, the ratchet wheel will be turned with the gear 113 when this gear is turning in one direction and the shaft 112 to which the ratchet is pinned or otherwise rigidly secured will be turned in this direction with the gear. The shaft 112 also carries a gear 118 which is fixed upon an end portion of the shaft projecting from the side wall 107 and meshes with a gear 119 provided with a turning knob 120. It will thus be seen that rotary motion may be transmitted to the shaft 112 either from the shaft 4 or by turning the knob 120. Twelve discs 121, one for each month, are mounted upon the shaft 112 and each has upon its peripheral edge face numbers corresponding to the number of days in the month below which the disc appears through the sight opening 110. At one side of each of these discs 121 is secured a gear 122 which has 62 teeth and meshes with a gear 123 carried by a shaft 124 supported between the end walls of the frame, and referring to Figure 3 it will be seen that each gear 123 has secured against a side face thereof a plate 125 formed with a finger 126 for operating a Geneva wheel 127. The Geneva wheels are mounted upon a shaft 128 supported between the side walls of the frame and against a side of each Geneva wheel is secured a gear 129 meshing with a gear 130. Each of the gears 130 is secured against a side of a disc 131 carried by a shaft 132. The discs 131 correspond in number to the discs 121 and are disposed opposite these discs so that the discs 131 show through the sight opening or window 109 above the names of the months, as shown in Figure 1. Upon each of the discs 131 is marked a letter X, and upon referring to Figure 2 it will be seen that the letters upon the twelve discs are in such relation to each other that they extend in a spiral path. Therefore, when the discs 121 are rotated and rotary motion transmitted from them to the discs 131, the X marks upon the discs 131 will be successively brought into

position for display through the sight opening 109. The X mark appearing through the sight opening indicates that the month below it is the one under consideration and the number appearing upon the disc 121 under this month will indicate the date of the month under consideration. By this arrangement, the machine may be set to cause the X mark to appear over the month during which the note was signed and the day of this month upon which the note was signed will appear through the sight opening 110. The crank 7 may then be turned to rotate the shaft 4 and rotary motion will be transmitted through the gears 114 and 113 to the shaft 112 and the discs 121 and 131 will be turned, as previously set forth, until the X mark of the month in which payment is to be made appears through the sight opening 109 and the disc 121 opposite this disc 131 discloses the correct date through the sight opening 110.

The manner of operating this calculating machine is as follows:

The first step is to turn the handle 7 until .00164 appears upon the six percent interest unit through the window 29 and .00082 of the three percent interest unit is seen through the window 28. Note that when the machine is cleared, the day counter always shows one day in the window 89a, this being for the reason that interest begins on the date a note is signed and, therefore, in clearing the machine it has to be cleared as of one day.

In order to clear the machine, it is necessary to press down the lever 101 and while holding this lever in a depressed position, turn the knob 82 until the wheels of the day counter show 001 through the window 89. Concurrently the three percent interest unit will show .00082 through the window 28 and the six percent interest unit shows .00164 through the window 29. While in this position, it is necessary to release the lever 101 which is returned to its initial position by the spring 103 and its tooth 104 engages the ratchet 105 to prevent rotation thereof and place the machine in condition for the succeeding operations. Next, set the starting date of the note or other interest bearing paper by turning the knob 120 to effect rotation of the wheels or discs 121 and 131, during which time the discs 131 are successively turned to move their X marks into position to be seen through the sight opening or window 109 and the companion discs 121 are turned to disclose, through the window 110, numbers representing days of the month. Assuming that the note is dated March 5th, the knob 120 will be turned until an X mark appears through the window 109 over the word "March" upon the face plate and the number 5 shows through the window 110 under the month of March. After setting the starting date as of March 5th, the handle 7 is turned until the date the note is payable is reached, and assuming that the note is due on May 12th, the handle will be turned until the X mark appears over the word "May" and the number 12 shows through the window 110 under this month. At this point the day counter will show 69 through the window 89a to indicate the number of days which have elapsed. The three percent interest unit now shows 0.5671 through the window 28 and by looking through the window 29, it will be seen that the six percent interest unit shows 1.1343. These figures are the interest upon one hundred dollars for the elapsed time and are to be multiplied by the amount of the note. Assuming that the note is for $300 and the rate of interest is 6%, 1.1343 showing through the window 29 will be multiplied by 3.00 upon a calculating machine of a conventional construction and the result will be 3.402900. Therefore, the interest due on a note for $300 at 6% is $3.40 for a period of 69 days.

As previously explained, this machine only gives a basic figure for any rate of interest for any number of days up to the capacity of the machine. After obtaining the basic figure, this figure is then to be multiplied by the amount of the principal on any calculator which will give the total interest for the principal and by adding this to the principal the total amount to be paid will be obtained. Any calculating machine of a conventional construction which will multiply may be used for obtaining the total interest and any calculating machine of a conventional construction which will add may be used for adding the interest to the principal and obtaining the total sum to be paid.

In addition to the "day counter" being used to count the intervening days between any given dates, the "day counter" can also be used to insert therein any predetermined amount of money by the turning of crank 7 (Figure 1) until such amount appears in window 89a. Concurrently with the turning in of any sum of money, certain figures will appear in the interest windows 28 and 29. These figures are then to be multiplied by the number of days the note runs.

Example.—After the machine is cleared, suppose we have a note for $1,800.00 that ran thirty days at 6% interest. Turn crank 7 until 18 appears in day counter window 89a (Figure 1). Concurrently with the turning in of this number the number .02959 will appear in the 6% window 29. All that is necessary is to then multiply the number .02959 by thirty days, the running time of the note, and the result will be the correct amount of interest due after properly placing the decimal point. 30 times .02959 equals 88770 and by pointing off four decimal points the result is $8.87 the correct amount of interest due.

In addition the figure 18 appearing in the "day counter" window 89a will also represent $1.80 or $18.00 or $180.00 or $1,800.00 or $18,000.00 or $180,000.00, etc. It only requires the correct placing of the decimal point in the answer to give the correct amount of interest due.

Having thus described the invention, what is claimed as new is:

1. In an interest calculating machine, a rotary drive shaft, and a date finding unit comprising a frame, a face plate formed with spaced sight openings, the names of months of a year being provided upon the face plate between the sight openings, sets of companion discs rotatably mounted in said frame in position for display through the sight openings with the name of a month between discs of each set, a month identifying mark being provided upon one disc of each set and the other disc having numerals for indicating days of the month, means for transmitting rotary motion from said drive shaft to the day indicating discs, and means for intermittently transmitting rotary motion from the day indicating discs to the companion month identifying discs.

2. In an interest calculating machine, a rotary drive shaft, and a date finding unit comprising a frame, a face plate formed with spaced sight openings, the names of months of a year being provided upon the face plate between the

sight openings, sets of companion discs rotatably mounted in said frame in position for display through the sight openings with the name of a month between discs of each set, a month identifying mark being provided upon one disc of each set and the other disc having numerals for indicating days of the month, the month identifying marks being disposed in a spiral path whereby the marks of adjoining discs successively move into position to be seen through the sight opening, means for rotating the day indicating discs from the main shaft, and means for intermittently transmitting rotary motion from the day indicating discs to the companion month identifying discs.

3. In an interest calculating machine, a rotary drive shaft, and a date finding unit comprising a frame, a face plate formed with spaced sight openings, the names of months of a year being provided upon the face plate between the sight openings, a shaft rotatably mounted under one sight opening, a bank of day indicating discs and companion gears secured to each other and rotatable with said shaft, a ratchet at one end of the bank fixed to the shaft, a gear wheel loose on said shaft, a pawl carried by the gear wheel and engaging said ratchet, means for rotating the shaft to initially set the discs, a gear carried by the main shaft and meshing with the gear wheel of the last mentioned shaft to rotate the bank of day identifying discs and gears during operation of the unit, a shaft under the second sight opening, month identifying discs and companion gears rotatably carried by the last mentioned shaft, and means for intermittently transmitting rotary motion from the gears of said bank to the gears of the month identifying discs.

4. In an interest calculating machine, a rotary drive shaft, and a date finding unit comprising a frame, a face plate formed with spaced sight openings, the names of months of a year being provided upon the face plate between the sight openings, a shaft rotatably mounted under one sight opening, a bank of day indicating discs and companion gears secured to each other and rotatable with said shaft, a ratchet at one end of the bank fixed to the shaft, a gear wheel loose on said shaft, a pawl carried by the gear wheel and engaging said ratchet, means for rotating the shaft to initially set the discs, a gear carried by the main shaft and meshing with the gear wheel of the last mentioned shaft to rotate the bank of day identifying discs and gears during operation of the unit, a shaft under the second sight opening, month identifying discs and companion gears rotatably carried by the last mentioned shaft, Geneva wheels rotatably mounted and having gears fixed thereto and meshing with gears of the month identifying discs, and gears meshing with the gears of the day identifying discs and having fingers fixed at their sides and adapted to engage the Geneva wheels to intermittently rotate the Geneva wheels.

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