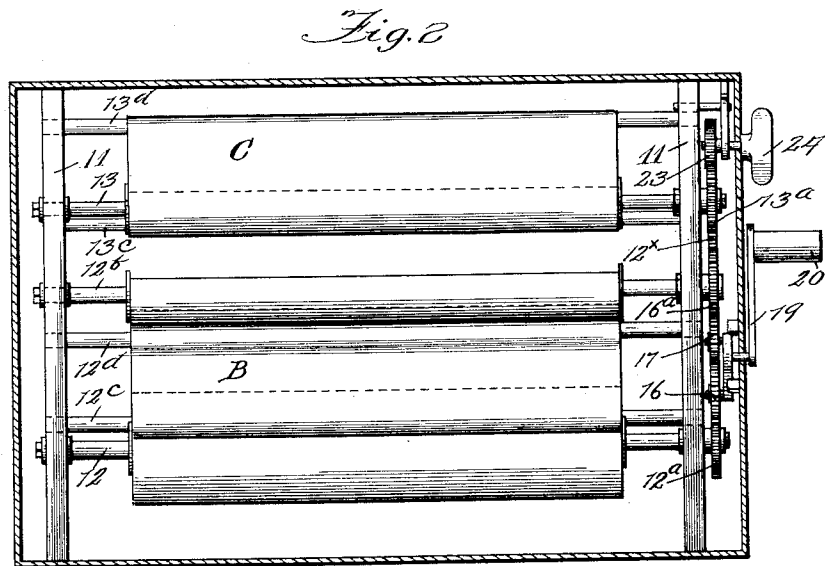
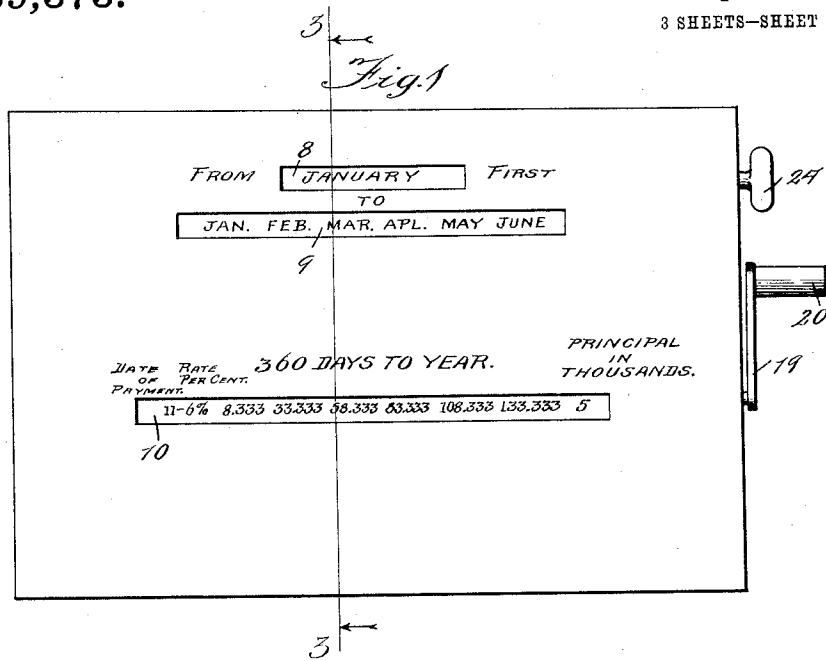


J. J. FITZGERALD.
 INTEREST CALCULATING DEVICE.
 APPLICATION FILED MAY 5, 1910.

1,039,373.

Patented Sept. 24, 1912:

3 SHEETS—SHEET 1.



Witnesses:

Edw. P. Kemp
Edw. B. Nelson

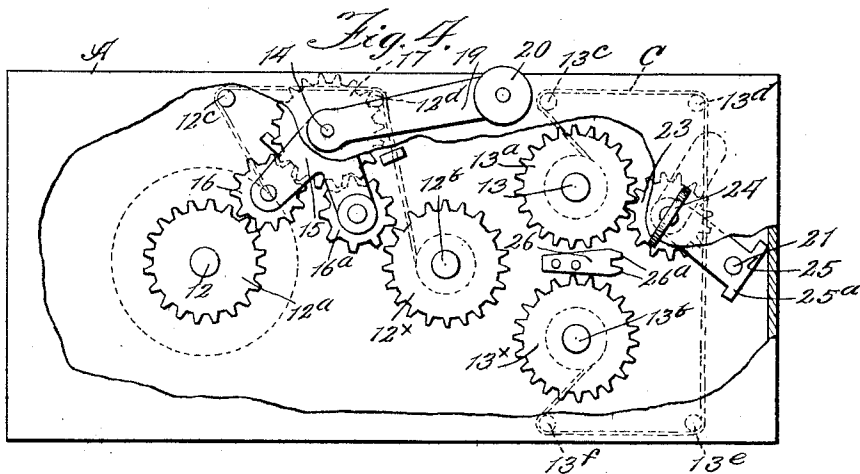
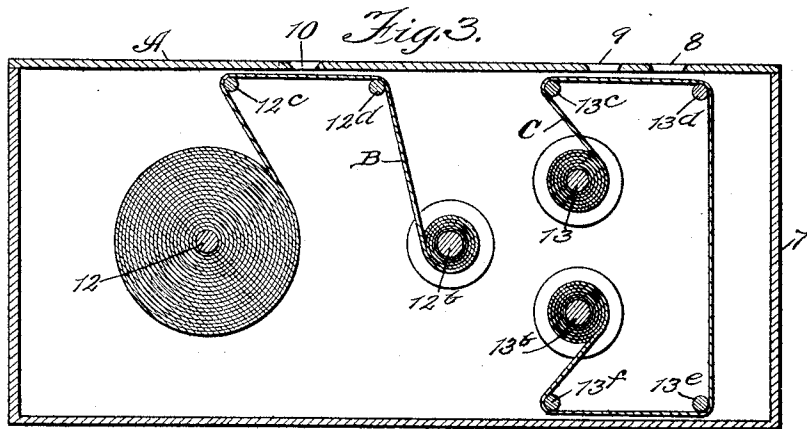
Inventor:
James J. Fitzgerald
per Buckley, Diamond & Drury
 Attys.

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3 SHEETS—SHEET 2.



Witnesses:
Edw. D. Perry
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3 SHEETS—SHEET 3.

TURN BACK

JANUARY

JAN. FEB. MCH. APL. MAY JUNE
FEBUARY

FEB. MCH. APL. MAY JUNE JULY
MARCH

MCH. APL. MAY JUNE JULY AUG.
APRIL

APL. MAY JUNE JULY AUG. SEP.
MAY

MAY JUNE JULY AUG. SEP. OCT.
JUNE

JUNE JULY AUG. SEP. OCT. NOV.
JULY

JULY AUG. SEP. OCT. NOV. DEC.
AUGUST

AUG. SEP. OCT. NOV. DEC. JAN.
SEPTEMBER

SEP. OCT. NOV. DEC. JAN. FEB.
OCTOBER

OCT. NOV. DEC. JAN. FEB. MCH.
NOVEMBER

NOV. DEC. JAN. FEB. MAR. APL.
DECEMBER

DEC. JAN. FEB. MCH. APL. MAY

TURN BACK

Fig. 5.

TURN BACK

8-3 $\frac{1}{2}$ %	0.681	3.597	6.514	9.431	12.347	15.264	1
8-3 $\frac{1}{2}$ %	1.361	7.194	13.028	18.861	24.694	30.528	2
11-6%	8.333	33.333	58.333	83.333	108.333	133.333	5
15-6%	18.667	58.667	98.667	138.667	178.667	218.667	8
15-6%	21.00	66.00	111.00	156.00	201.00	246.00	9

Fig. 6.

Witnesses:

Edw. Perry
Chas. B. Nelson

Inventor:
James J. Fitzgerald
By *Frederick D. Dunning*
att'y

UNITED STATES PATENT OFFICE.

JAMES J. FITZGERALD, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-THIRD TO DONALD RAWSTRON AND ONE-THIRD TO HENRY RAWSTRON, BOTH OF CHICAGO, ILLINOIS.

INTEREST-CALCULATING DEVICE.

1,039,373.

Specification of Letters Patent.

Patented Sept. 24, 1912.

Application filed May 5, 1910. Serial No. 559,430.

To all whom it may concern:

Be it known that I, JAMES J. FITZGERALD, a citizen of the United States of America, and resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Interest-Calculating Devices, of which the following is a specification.

My invention relates to improvements in interest calculating devices, and has for its object the production of a device by means of which the amount of interest due on any particular amount for any length of time and at any rate per cent. may be quickly and accurately indicated.

A further object is the improved arrangement of dates and figures by means of which such results are made possible.

A further object is the production of a device embodying mechanism by the use of which, in combination with the arrangement of dates and figures, the desired results are attained.

A further object is the production of a cheap and efficient device of few parts and one not liable to get out of order.

These and such other objects as may hereinafter appear are attained by my device, embodiments of which are illustrated in the accompanying drawings, in which—

Figure 1 represents a top plan view of my device. Fig. 2 represents a top plan view of my device with the cover removed. Fig. 3 represents a sectional view on the line 3—3 of Fig. 1, looking in the direction indicated by the arrows. Fig. 4 represents a side elevation of my device with portions broken away. Fig. 5 represents a plan view of the month roll. Fig. 6 represents a plan view of a section of the interest roll.

Like numerals of reference indicate like characters in the several figures of the drawings.

Referring now to the drawings: 7 represents a box or case having a top or cover A provided with a plurality of openings 8, 9 and 10. Mounted within the case is a frame 11, in which are journaled two pairs of rollers 12 and 12^b and 13 and 13^b. Mounted on these rollers and adapted to be wound from one to the other are a pair of strips or rolls bearing words and figures, one (B) that I term the interest roll passing from rollers 12 to 12^b and over the idlers 12^c—12^d to bring a flat section into view through the

opening 9; and the other (C) that I term the month roll, passing from the roller 13 to 13^b and over the idlers 13^c—13^d—13^e—13^f, and bringing a flattened portion of the roll into view through the openings 8, 9 and 10. Motion is transmitted to the rolls in any desired manner, and I have shown two methods for so doing, one as applied to the movement of the roll B and the other as applied to the movement of the roll C.

Referring now to the first method: a shaft 14 is mounted in the frame 11 on which hangs a yoke 15 on the ends of which are mounted a pair of sprocket wheels 16—16^a meshing with a gear wheel 17 rigid on the shaft 14. It will be noted that as the yoke is rocked the sprockets 16—16^a are alternately brought into and out of engagement with the gear wheels 12^a and 12^x. Stops 18 and 18^a are so placed as to limit the movement of the yoke 15. Rigidly mounted on the shaft 14 is a crank 19, terminating in a handle 20. When the crank 19 is turned in the direction indicated by the arrows, the yoke 15 springs upwardly until the teeth on the sprocket 16 engage the teeth on the gear 12^a, the sprocket riding over the gear until the teeth mesh. The stop 18 limits the further upward movement of the yoke 15, and in further revolution of the crank the strip B is unwound from the roller 12^b and wound onto the roller 12. When it is desired to reverse, the crank is turned in the opposite direction. This throws the sprocket 16 out of engagement with the gear wheel 12^a and brings the sprocket 16^a into engagement with the gear 12^x. The extreme movement of the yoke 15 is limited in this direction by the stop 18^a, and the continued revolution of the crank 19 unwinds the roll from the roller 12 onto the roller 12^b. Referring now to the other form of mechanism employed for revolving the rollers, which I have shown applied to the movement of the roll C: in this form a bearing pin 21 is mounted within the frame within the case adjacent the edge, on which is journaled the lever 22. On the end of this lever is mounted a sprocket wheel 23 adapted to engage the teeth of the gear wheels 13^a and 13^x. Mounted on the shaft of the sprocket 23 is a thumb-screw 24 used to actuate the sprocket. The opposite end of the lever 22 is provided with oppositely disposed stops 25—25^a adapted to limit the

extreme movement of the lever. Positioned between the two gear wheels 13^a and 13^x is a segment 26 the teeth 26^a of which engage the teeth of the sprocket 23 as it passes from one gear to the other to assist the sprocket in this movement in a manner which will be readily apparent. In the operation of this form of the device, the rotation of the sprocket 23 engaging the gear 13^a unwinds the roll from the roller 13^b onto the roller 13. When it is desired to reverse the movement, the sprocket 23 is swung outwardly and intermeshes with the gear 13^x , any further movement being limited by reason of the stop 25^a striking the side of the case. The further rotation of the sprocket 23 while in mesh with the gear 13^x unwinds the roll C from the roller 13 onto the roller 13^b . Of course, it is understood that while I have shown these two methods of operating the rollers as in use in a device, probably only one form will be used in an operative device.

Referring now to the month roll C: it will be noted that this comprises a sheet or strip of paper, cloth or any other desired material, having printed at its extreme ends the words "Turn back." Printed or engraved on the sheet, and in such relation to each other as to make each pair visible through the openings 8 and 9 in the top, are two sets of symbols, one (the upper) being the name of the month—for instance, January, as shown at the top of Fig. 5—and the other a plurality of months, either three, six or twelve, shown in this case in Fig. 5 as 6, viz.: January, February, March, April, May, June. Following these words are a second pair—February, and February, March, April, May, June and July. And so on consecutively, it being noted that whatever month appears in the opening 8, in the opening 9 a plurality of months will appear commencing with the month appearing in the opening 8; it being further noted that the series of months appearing through the opening 9 are placed in columns of three, six or twelve, depending upon the number of months shown. In the device as shown, it is intended to be used for the calculation of interest for a period not exceeding six months, it being understood, of course, that in order to make it applicable for a full year twelve columns of months must be printed and shown through the opening 9.

Referring now to the interest roll B: this roll comprises a long sheet having a series of figures in lines and also in columns. In the roll a portion of which is shown in Fig. 6, a single line comprises, first, a numeral indicating a date, such as 8; a rate per cent., such as $3\frac{1}{2}$ per cent., and a series of figures six in number, representing units and decimals to three places, the number of sets of

figures being six, corresponding to the months in the roll C. In the event that a greater or less number of months is shown, the columns of interest figures will be decreased or increased accordingly. At the extreme right hand of the line appears a numeral 1, representing principal in thousands. It will be noted by reference to Fig. 6 that the roll B contains under each date—as, for instance, the eighth of the month—nine lines of figures, each referring to the eighth of the month and $3\frac{1}{2}$ per cent., but differing at their right in digits 1, 2 and 3 to 9. Under the same date, the eighth, will appear other per cents., such as 6, with the same number of lines, 1 to 9.

By reference to Fig. 1 it will be noted that the purpose of the device is to obtain the interest on any particular amount of money, shown in this case as principal in thousands, for any length of time from the 1st of any month to any day in any succeeding month. For instance, if it is desired to find the interest at six per cent. on \$5,000 from January 1st to January 11, it is simply necessary to turn the rolls until the word "January" appears in the opening 8, and to turn the roll B until the numerals 11, representing the date, and 6 per cent., representing the rate per cent., appear at the left-hand portion of the opening 10, the numeral 5 at the right-hand portion indicating the principal in thousands. When the roll is in this position, the figures 8.333 appearing first and in line with the word "January" in the opening 9, represents the interest from January 1st to January 11th. If it is desired to find the interest from January 1st to May 11th at the same rate and for the same amount, no change in the position of the rolls would be required, but it would be simply necessary to glance along at the fifth set of figures under "May"—that is, 108.333, which would represent the interest of \$5,000 at 6 per cent. from January 1st to May 11th. In the event that it is desired to get the interest from the 1st of any other month—say, July 1st—it is simply necessary to revolve the roll C until the month "July" appears in the first opening 8, and then to operate the roll B in order to bring the desired figures into view through the opening 10.

It will thus be noted that I have produced a simple and compact device that will be of great value to brokers and bankers, or those connected with such offices; or, in fact, to any one who finds it necessary to compute interest.

As stated above, I do not limit myself to the precise construction shown, or to the use of the device to ascertain interest for simply the terms noted in the drawings, but the device itself may be enlarged to any degree and adapted to meet the required

conditions in any case in which it is desired to compute interest on any amount for any definite time at any given rate per cent.

It is quite evident that, although the interest is shown for principal in thousands, any multiple or decimal portion thereof may be ascertained by a simple process of addition; in the event that it is desired not to extend the length of the roll to cover too wide a range of figures. For instance, if it is desired to compute the interest on \$8989.00 from January 1st to May 15th at 6 per cent. This particular sum is taken for the reason that the figures necessary in computing the interest appear in Fig. 6. A reference to the figures shown in Fig. 6 will show that if the roll is turned until the next to the last row of figures shown in this figure appears in the opening, the figures 178.667 will appear in line with the word "May" in the opening 9; while in the next line 201.00 appears as being the interest on \$9,000.00. Inasmuch, however, as the 9 refers to 900, the figures will be placed under the 178.667 but one point to the left. Similarly, the interest for \$80.00 and \$9.00 will be the same figures duplicated, but successively removed one point to the left, as shown below:

30	178.667
	20.10
	1.786
	.20,

making a total of 200.75 as the interest on this sum for the above designated period. Thus it will be seen that it is simply necessary to perform a simple problem in addition in order to compute accurately the interest on any desired amount. In the use of the device, however, among brokers and dealers in bonds and securities, most of the figures are in even thousands, which obviates any necessity for any supplemental calculations, but makes it possible to read the desired amount directly from the face of the device. It is also evident, from the foregoing description of the method of ascertaining the interest, that the month roll is not an absolute necessity in order to arrive quickly and accurately at the desired result, as the sums shown in the first column represent the interest for the period from the first of the month to the date shown in the horizontal line. The sum shown in the second column represents the interest for one month longer period than the first sum, and the sum shown in the third column represents the interest for two months longer period, and so on for the full six or twelve months' period represented by the table.

If desired, the numerals 0, 1, 2, 3, etc., may be printed or inscribed on the face of the device, but after one has become accustomed to the use of the table, little if any

attention is paid to the numerals, as the fact that each column is applicable for a definite period becomes well known.

The device can be used to compute interest from any date other than the first of the month by simply deducting from the date of payment the number of days elapsing from the first of the month. For example, if it is desired to obtain the interest from January 15 to March 30, the operator would take the interest from January 1st to March 16th—that is, deduct fourteen days from the 30th of March, making it March 16th, and carrying back the fourteen days from January 15th to January 1st. If, for instance, the amount of interest from April 25th to June 10th is desired, this would be the same as from April 1st to May 16th, as thirty days only are figured in each month, and twenty-four days deducted from June 14 gives May 16 as the date on which interest is computed from April 1st.

While I have shown in detail the construction and operation of the mechanism by means of which the rolls are actuated, I make no claim therefor, the claims for such invention being made in an application of Donald Rawstron filed on even date herewith.

I claim:

1. In a device of the class described, a case provided with a plurality of display openings, a pair of rollers mounted within said case, a month table mounted on one of said rollers, said table consisting of a single month and a plurality of consecutive months arranged alternately in transverse rows, an interest table mounted on the other roller consisting of days of the month, rate per cent., unit of value with calculated interest on said unit for predetermined intervals of time arranged in transverse rows, a plurality of rows for various units being arranged in vertical columns, and means for causing the characters on said strips to be brought into view through said display openings.

2. In a device of the class described, a case provided with a plurality of display openings, a pair of rollers mounted within said case, a month table mounted on one of said rollers, said table consisting of a single month and a plurality of consecutive months arranged alternately in transverse rows, an interest table mounted on the other roller consisting of days of the month, rate per cent., unit of value with calculated interest on said unit for predetermined intervals of time arranged in transverse rows, a plurality of rows for various units being arranged in vertical columns, said calculated interest column being in line with the consecutive months appearing on said first table, and means for causing the characters on said strips to be brought into view through said display openings.

3. In a device of the class described, a case provided with a plurality of display openings, a pair of rollers mounted within said case, a month table mounted on one of said rollers, said table consisting of a single month and a plurality of consecutive months commencing with said first-named month arranged alternately in transverse rows, an interest table mounted on the other roller consisting of days of the month, rate per cent., unit of value with calculated interest on said unit for predetermined intervals of time arranged in transverse rows, a plurality of rows for various units being arranged in vertical columns, and means for causing the characters on said strips to be brought into view through said display openings.

4. In a device of the class described, a case provided with a plurality of display openings, a pair of rollers mounted within said case, a month table mounted on one of said rollers, said table consisting of a single month and a plurality of consecutive months, arranged alternately in transverse rows, an interest table mounted on the other roller consisting of days of the month, rate per cent., unit of value with calculated interest on said unit for predetermined intervals of time arranged in transverse rows, a plurality of rows for various units formed into as many series as there are dates and desired percentages, and arranged in vertical columns, and means for causing the characters on said strips to be brought into view through said display openings.

5. In a device of the class described, a case provided with a plurality of display openings, a pair of rollers mounted within said case, a month table mounted on one of said rollers, said table consisting of a single month and a plurality of consecutive months arranged alternately in transverse rows, an interest table mounted on the other roller consisting of days of the month, rate per cent., unit of value with calculated interest on said unit for predetermined intervals of time arranged in transverse rows, a plurality of rows for various units formed into as many series as there are dates and desired percentages, and arranged in vertical columns, and means for causing the characters on said strips to be brought into view through said display openings.

6. In a device of the class described, a case provided with a plurality of display openings, a pair of rollers mounted within said case, a month table mounted on one of said rollers, said table consisting of a single month and a plurality of consecutive months commencing with said first-named month arranged alternately in transverse rows, an interest table mounted on the other roller consisting of days of the month, rate per

cent., unit of value with calculated interest on said unit for predetermined intervals of time arranged in transverse rows, a plurality of rows for various units formed into as many series as there are dates and desired percentages, and arranged in vertical columns, and means for causing the characters on said strips to be brought into view through said display openings.

7. An interest table comprising a plurality of columns of figures representing respectively a day of the month to which the interest is desired, a rate per cent., a unit on which the interest is desired, and a number of columns representing sums of interest, the first of said columns representing the amount of interest from the first of the month to the date indicated in the first date column, and each of the succeeding columns representing the amount of interest for a period represented by the preceding column plus one calendar month.

8. An interest table comprising a plurality of columns of figures representing respectively the number of days for which interest is desired, a rate per cent., a unit on which interest is desired and number of columns representing sums of interest, the first of said columns representing the amount of interest for the number of days indicated in the first date column, and each succeeding column representing the amount of interest for a period represented by the preceding column plus one calendar month.

9. In a device of the class described, a case provided with a display opening, legends inscribed in a horizontal line on the top of said case immediately above said display opening, comprising a number of days less than one month and successively 1, 2, 3, 4, etc., months, an interest rate and an amount of principal; rollers mounted within said case, means for actuating said rollers, a strip of material mounted on said rollers, a plurality of columns of figures positioned on said material and registering with the various headings noted above, the figures themselves representing successively the amount of interest for a certain number of days indicated in the same horizontal line on said material; a second set of figures representing an amount of interest for a period one calendar month in excess of that represented in the first column, and each succeeding set of figures representing an amount of interest for a period one month in excess of the preceding column.

Signed by me at Chicago, Illinois, this 23rd day of April, 1910.

JAMES J. FITZGERALD.

Witnesses:

J. NORBY,

R. SEHUEM.