

(No Model.)

E. J. F. QUIRIN.
TABULAR CALCULATOR.

No. 424,574.

Patented Apr. 1, 1890.

Fig 1-

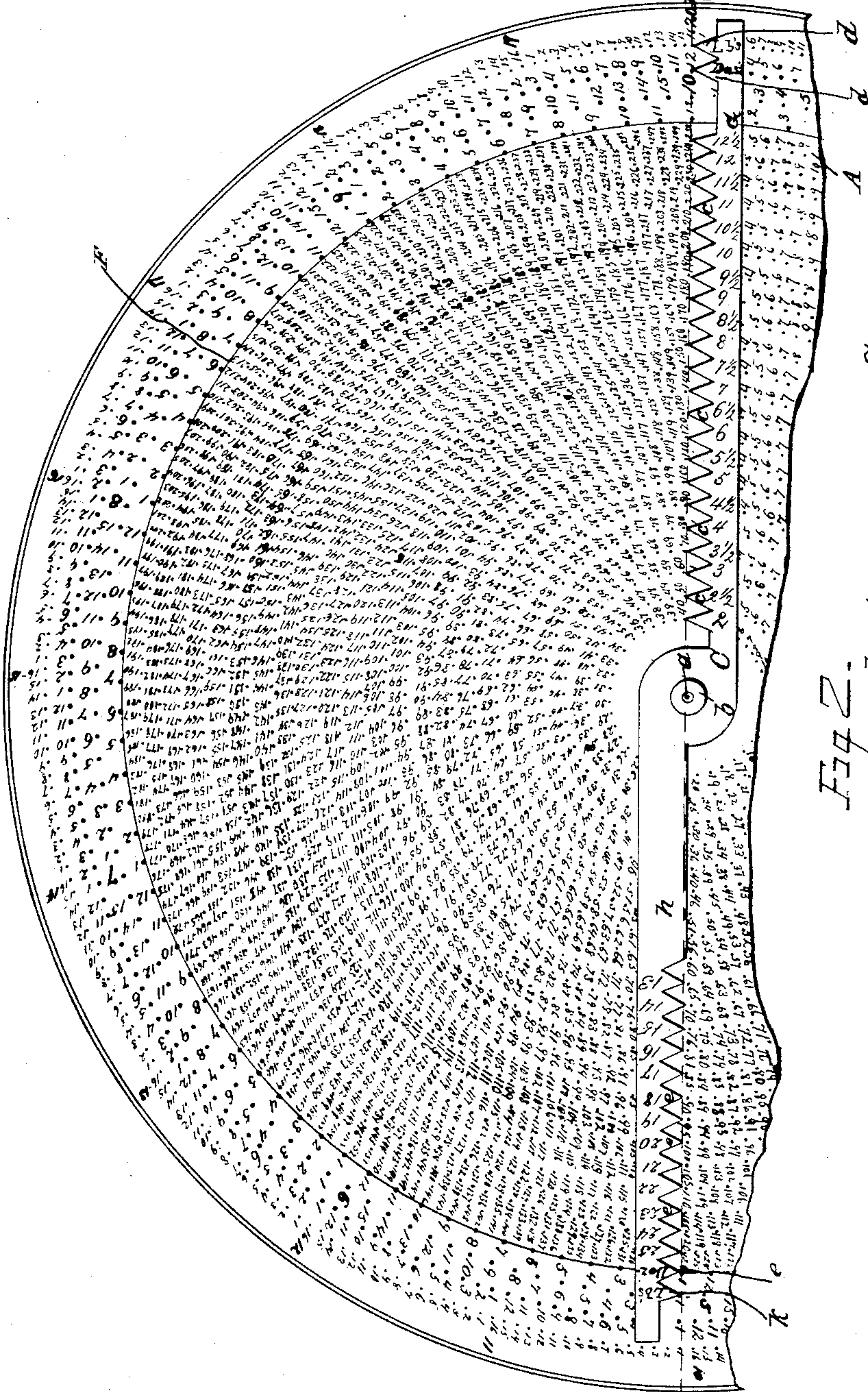
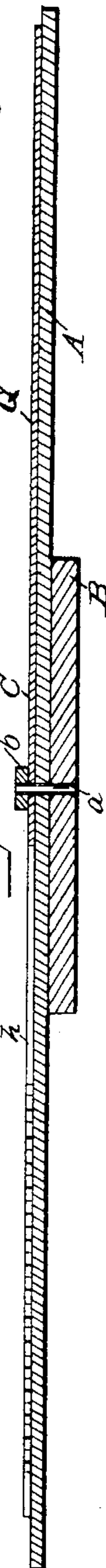


Fig 2-



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TABULAR CALCULATOR.

SPECIFICATION forming part of Letters Patent No. 424,574, dated April 1, 1890.

Application filed November 29, 1889. Serial No. 331,946. (No model.)

To all whom it may concern:

Be it known that I, EMIL J. F. QUIRIN, a citizen of the United States, residing at Tioga Centre, in the county of Tioga and State of New York, have invented certain new and useful Improvements in Tabular Calculators or Ready-Reckoners; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to various new and useful improvements in tabular calculators or "ready-reckoners;" and the object of my invention is to provide a simple and effective device by which the amount in money equivalent to certain articles reckoned in pounds or dozens, or fractions thereof, may be rapidly calculated with the utmost certainty and by persons unacquainted with the mathematical rules for determining the result by ordinary arithmetic.

The principal novelties of my invention consist in a flat circular disk having a number of outer series or rows of figures for representing the amount in pounds or dozens of the articles that are to be calculated, a larger number of inner series or rows of figures representing the amounts in money, and a pointer or index pivoted to the center of said disk and having a number of outer teeth marked and arranged so as to correspond in character and position with the outer series of figures and having a larger number of inner teeth on the pointer or index suitably marked with figures and corresponding in number and arrangement with the rows of inner figures, all as will be more fully hereinafter described and claimed.

For a better comprehension of the invention attention is invited to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a top plan view of the invention, and Fig. 2 a sectional view of the same.

In each of these views corresponding parts are designated by identical letters of reference.

Before beginning a description of my invention it should be distinctly understood that the particular device shown in these drawings is for illustration only and is capable of many changes, all as will be pointed out at the end of the specification.

The device illustrated is capable of calculating the amount in money from one ounce to twenty pounds of any substance at from two to thirteen cents per pound, including half-cents, or from one ounce to ten pounds of any substance at from two to twenty-six cents per pound, or from one article to twenty dozen thereof at from two to thirteen cents, including half-cents, per dozen, or from one article to ten dozen thereof at from two to twenty-six cents per dozen, thereby rendering the device particularly advantageous for produce-dealers, wherein butter, lard, cheese, meat, &c., are calculated in pounds, and eggs, fruit, &c., are calculated in dozens, usually at prices ranging between the limits mentioned.

This device will now be described.

It consists, first, of a large disk A, usually made of pasteboard, or tin or other sheet metal covered with pasteboard or paper, or tin or other sheet metal suitably painted to receive painting. To the under side of the disk A is secured a smaller disk B, which is generally made of wood or some analogous substance, so as to strengthen and sustain the outer disk A from collapsing. This smaller disk is preferably secured in place by glue, and it serves the additional purpose, besides strengthening the outer disk, of firmly receiving the pivoting-pin *a*, which is embedded within the same. This pin *a* forms the pivoting-point for the pointer or index C, having a long and a short arm, and which is placed thereon and is at liberty to turn about the same, and which is held in position on the said pin by means of a cap or nut *b*. The distinguishing differences between these two devices is that a cap is forced over a smoothed pin and retains its position thereon by its friction solely, while a nut, as well known, engages with a threaded pin and is screwed thereon. Either one of these devices can be used; but I prefer the former on account of its cheapness. The pointer or index, as above mentioned, is made, preferably, of sheet metal—such as tin or sheet-iron—and its right edge on one side of the pivoting-point is in exact line with the left edge of the other side, as will be observed in the drawings, so that as the pointer is moved around in one direction these coinciding edges will fall to the rear of the line of movement. The coinciding edge on one side of the pivot is provided with a series of serrations or teeth *c c c*, extending almost to the

center of the disk and with two detached teeth *d d* near the extreme outer end, while the coinciding edge on the other side of the pivot is provided with a series of serrations *e e e*, beginning at about its center and extending almost to the extreme end, and the object of these serrations will be fully explained after the arrangement of the figures has been explained, which will now be done.

For convenience and to prevent confusion I have divided the disk into two parts by the diametrical line *x x*, which marks the beginning and ending of all the series of figures.

First. Arranged around the disk near its periphery are the figures 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, and 20 in large characters. These figures represent pounds in the first instance and are of some color contrasting with the disk and with the next lines of figures below, and in this case these outer figures are of a red color. This outer series of figures begins at the line *x x* and continues entirely around the disk, so as to divide the disk into twenty equal parts.

Second. The next line of figures is arranged immediately within the first line, and is composed of the figures from 1 to 16, inclusive, arranged between each pair of outer figures of the first row, so that the series comprising this second line is repeated twenty times to make the circuit of the disk. This second line of figures represents ounces, and the figures are considerably smaller in size than the figures of the outer line. The second line of figures is colored black, so as to contrast with the outer lines, and begins and ends in the line *x x*.

Third. The third line of figures is arranged directly within the second line, and is composed of the figures from 1 to 12, inclusive, arranged between each pair of figures of the outer line, so that the series of figures comprising the third line is repeated twenty times. Taken in connection with this third line the outer line of figures represents dozens, and each particular figure in the third line stands for a single article. As in the two preceding cases, this line of figures begins at the line *x x*, and for the purpose above mentioned these figures are colored red.

Fourth. The next line of figures begins at the line *x x* with a small figure 1 and continues up to 15, after which, at the proper distance, is placed a large figure 1, which is in a diametrical line with the figure 2 of the outer line. Beginning with the small figure 1 again the fourth line is continued until the figure 15 is reached, after which is placed a large figure 2 in a diametrical line with the figure 4 of the outer line. This is continued until the fourth line is completed, so that it will consist of a series of large figures running from 1 to 10 and a repetition of the figures from 1 to 15, inclusive, between each pair of large figures. It will thus be seen that this fourth line of figures resembles the second line, for the reason that denominations of 16 and the

multiples thereof are to be reckoned, but differs therefrom in the substitution of the line of large figures in the place of the figure 16 of the second line, and also for the reason that the fourth line contains only one-half as many figures as the second line. This fourth line of figures is for denoting the number of pounds and ounces contained in the substance, but is used to calculate in amounts higher than can be reckoned with the first and second lines, as will be explained hereinafter. In the device I am now describing the small series of figures from 1 to 15 are colored black, and the large figures from 1 to 10 are colored red.

Fifth. The fifth line of figures is for calculating higher amounts in degrees and divisors thereof, and it commences at *x x* with the figure 1, which is diametrically within the corresponding figure on the fourth line and continues up to the figure 12, which coincides with the large red figure 1, so as to complete one series. This is repeated again and again until completed, so that there will be ten series extending around the disk and each series occupying the space between each pair of the large figures of the fourth line. The figures in this fifth row are colored red for the purposes mentioned above.

Directly within the fifth line of figures is a heavy line *F*, by which the outer lines of figures are separated from the inner figures. The arrangement of these inner figures will now be described, beginning with the extreme inner set.

First. This line of figures begins at *x x* and extends entirely around its path, from 1 to 40, inclusive, and the figures of this line are colored black. Directly within each figure is placed a black dot or period, which may be stamped or printed, as shown, or which may be formed by punching, so as to be more durable. Corresponding in location with these dots is the inner tooth of the long arm *G* of the pointer, so arranged that the figures in the first row will be revealed between this tooth and the tooth next above. This inner tooth is designated by a figure 2, which also represents in cents the amount per one pound or one dozen of the substance to form the basis of reckoning.

Second. The next line of figures is colored black, and begins at *x x* and extends around its path to the number 50. The next tooth on the long arm of the pointer corresponds with the line of dots beneath these figures, and is designated by $2\frac{1}{2}$, representing the amount in cents, as aforesaid.

The third line of figures extends from 1 to 60, the fourth line from 1 to 70, the fifth line from 1 to 80, the sixth line from 1 to 90, the seventh from 1 to 100, the eighth from 1 to 110, the ninth from 1 to 120, the tenth from 1 to 130, the eleventh from 1 to 140, the twelfth from 1 to 150, the thirteenth from 1 to 160, the fourteenth from 1 to 170, the fifteenth from 1 to 180, the sixteenth from 1 to 190, the sev-

enteenth from 1 to 200, the eighteenth from 1 to 210, the nineteenth from 1 to 220, the twentieth from 1 to 230, the twenty-first from 1 to 240, the twenty-second from 1 to 250, each and every line beginning at the line xx and colored alternately red and black.

Corresponding with the line of dots beneath the figures just mentioned are the teeth on the long arm of the pointer, and designated, respectively, by the figures 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, 5, $5\frac{1}{2}$, 6, $6\frac{1}{2}$, 7, $7\frac{1}{2}$, 8, $8\frac{1}{2}$, 9, $9\frac{1}{2}$, 10, $10\frac{1}{2}$, 11, $11\frac{1}{2}$, 12, $12\frac{1}{2}$, each representing the basis amount in cents per pound or dozen of the substance. Also corresponding with the dots on the tenth, eleventh, twelfth, thirteenth, fourteenth, fifteenth, sixteenth, seventeenth, eighteenth, nineteenth, twentieth, twenty-first, twenty-second, and twenty-third lines of figures are the teeth on the short arm h of the pointer, and which are designated by the figures 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, and 25, representing the amount in cents per pound or dozen of the substance. On the outer end of the long arm G of the pointer are the isolated teeth d d , and which are designated by the words "Pounds" and "Dozens," respectively. One tooth d corresponds with the line of dots beneath the second line of figures and the other tooth d corresponds with the dots within the third line. The short arm h of the pointer is provided with two teeth k and e , similarly designated by the words "Pounds" and "Dozens," and which engage with the dots within the fourth and fifth outer lines, respectively.

In order to understand the operation of my device, let us consider several problems by which its capabilities may be brought into play.

First problem.—What is the cost of seventeen pounds and thirteen ounces of lard at eleven and one-half cents per pound? This amount per pound being under twelve and one-half cents, the long arm of the pointer only is used. This is turned past the 17 on the outer row, representing the number of pounds, until the point of the tooth d (marked "Pounds") is directly coincident with the dot beneath the figure 13 on the second row, representing the ounces. When in this position, the tooth marked $11\frac{1}{2}$, the number of cents per pound, will be almost coincident with the dot beneath the figure 205, which is the answer to the fraction of a cent, or \$2.05.

Second problem.—What is the cost of nine pounds and eleven ounces of butter at twenty-three cents per pound? In this case the short arm h of the pointer is moved past the large figure 9 on the fourth row until the tooth k (marked "Pounds") is coincident with 11. It will be seen that the tooth e (marked 23) is then almost coincident with the dot below 223, which is the answer within a fraction of a cent, or \$2.23.

Third problem.—What is the cost of nine-

teen dozen and three eggs at eight cents per dozen? The long arm of the pointer is moved past 19 on the outer row until the tooth d (marked "Dozens") is directly in line with the dot beneath the 3. It will now be seen that the tooth e (marked 8) is coincident with the dot beneath 154, which is the exact answer in cents.

It will thus be seen that I am enabled to perform almost any problem which would arise in a grocery or produce business in a very little time with absolute certainty. It will also be evident that by enlarging the disk A and elongating the pointer the device can be made to accommodate itself to problems necessitating large prices.

It will be further apparent that instead of calculating in pounds and dozens other denominations may be reckoned—such as in liquid measure with gallons and quarts, or dry measure with pecks and quarts—it being of course necessary to accommodate the figures to fit the circumstances, or that calculations in interest can be accomplished.

It will also be further evident that it is not necessary to make the lines of figures of a contrasting color, that it is not necessary to use a double pointer, and that the outer lines of figures can be merged into the second line, as is the case with the fourth line.

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

1. A tabular calculator comprising a disk having a series or rows of outer figures representing the prices in weight or number of the substance or articles, an inner series or rows of figures representing the amount in money, a pointer or index pivoted to said disk, one or more outer teeth on said index corresponding to the outer rows of figures, designated by some standard of weight and number, and a series of inner teeth on said index corresponding to the inner series of figures and numbered progressively toward the end of the index, representing the amount in money of the standard, as specified.

2. A tabular calculator comprising a disk, a double set of outer figures on said disk, each set representing, respectively, the amounts in weight and number of the article to be calculated, a double index pivoted to said disk, one or more teeth on the long arm of said index corresponding with the outer series of said figures, one or more teeth on the short arm corresponding with the inner series of outer figures, and a series of inner figures representing the amount in money.

In testimony whereof I have affixed my signature in presence of two witnesses.

EMIL J. F. QUIRIN.

Witnesses:

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