No. 744,275. PATENTED NOV. 17, 1903.

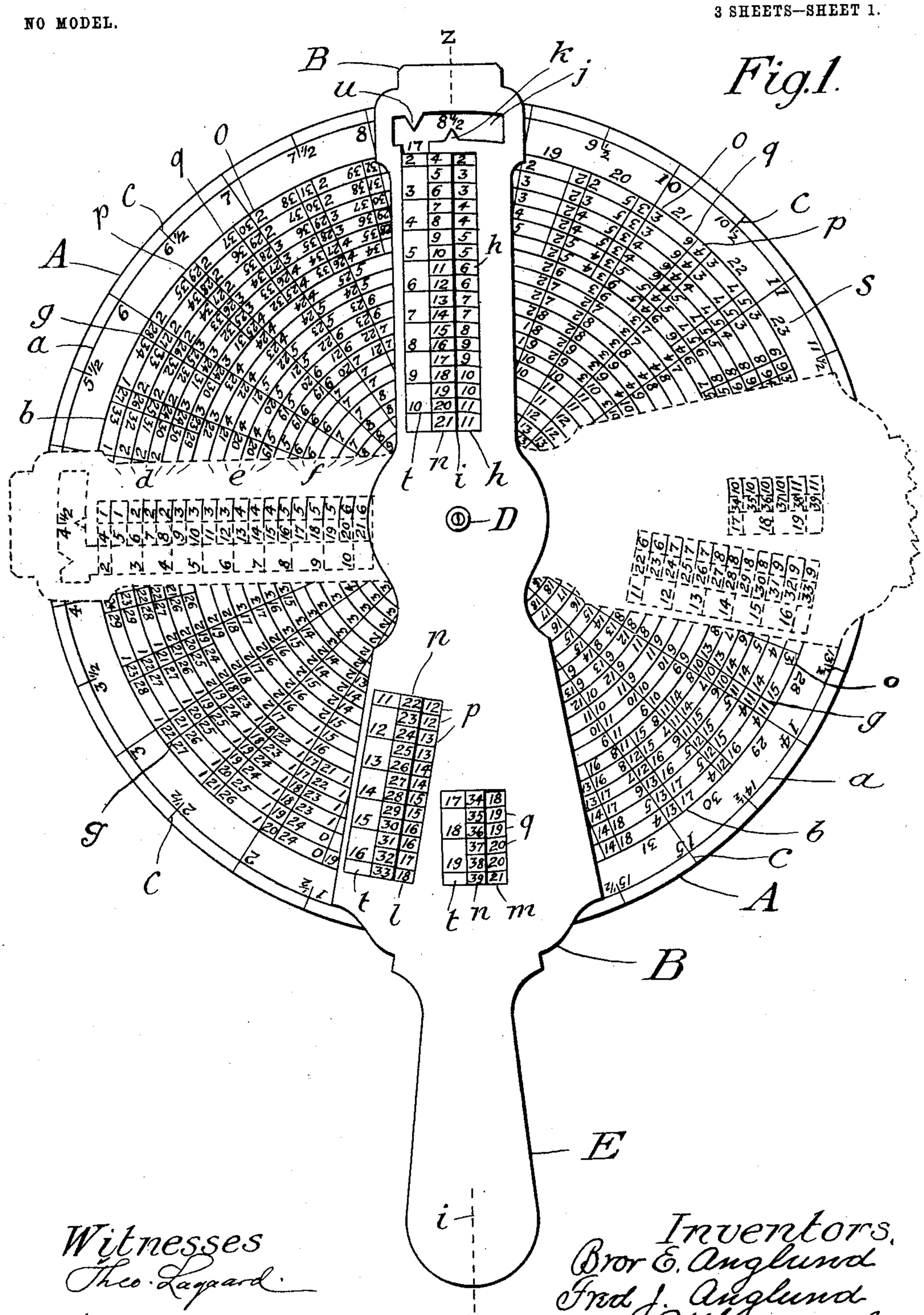
B. E. & F. J. ANGLUND.

COMPUTING DEVICE.

APPLICATION FILED MAR. 24, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.



Witnesses
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their Attorney.

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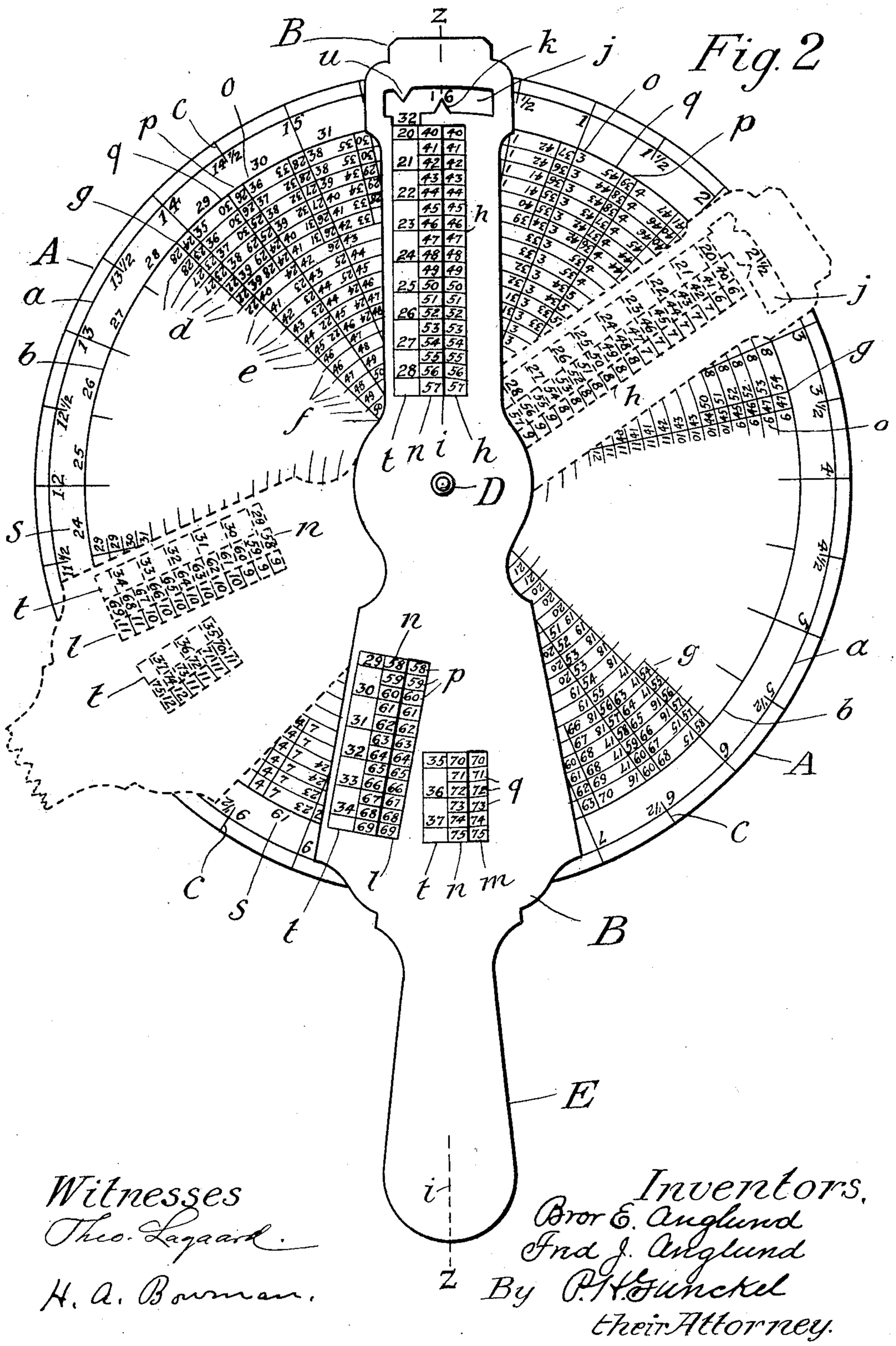
NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2



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NO MODEL. 3 SHEETS—SHEET 3.

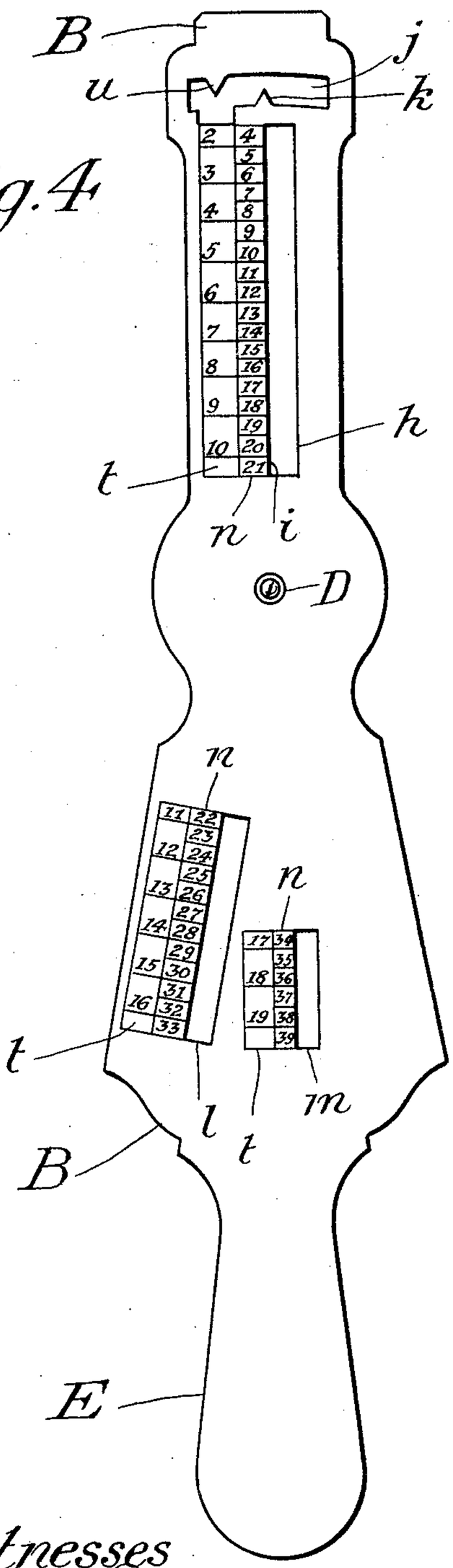

Fig. 4

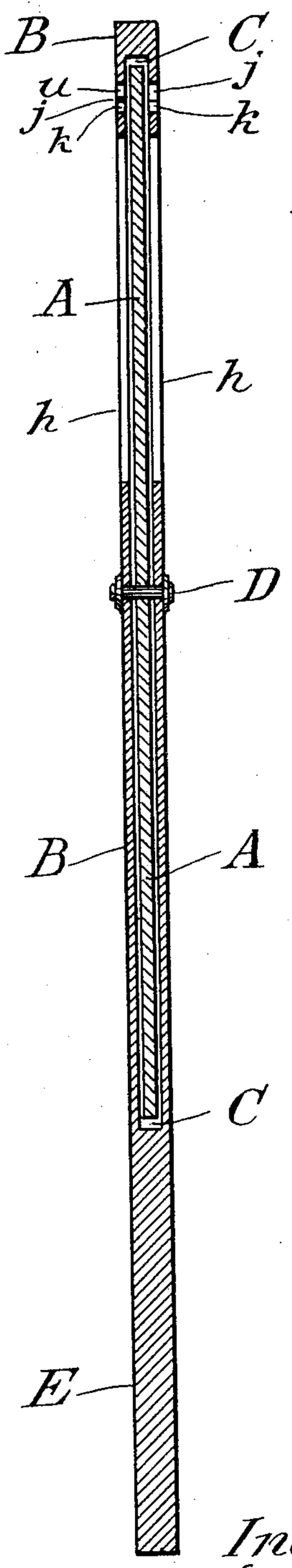

Fig. 3

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No. 744,275. Patented November 17, 1903.

UNITED STATES PATENT OFFICE.

BROR E. ANGLUND AND FRED J. ANGLUND, OF MINNEAPOLIS, MINNESOTA.

COMPUTING DEVICE.

SPECIFICATION forming part of Letters Patent No. 744,275, dated November 17, 1903.

Application filed March 24, 1903. Serial No. 149,260. (No model.)

To all whom it may concern:

Be it known that we, BROR E. ANGLUND and FRED J. ANGLUND, citizens of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have jointly invented a certain new and useful Improvement in Computing Devices, of which the following is a specification.

Our invention relates to mechanical calculating devices; and the object of the invention is to provide a simple and convenient means for computing the cost of designated quantities of articles at designated prices.

More specifically stated, the object of the improvement is the production of a device that can be readily and conveniently operated to mechanically calculate and indicate the cost of fractional parts of weights and measures at different prices.

Stated in a general way, the device comprises a rotatable disk provided with appropriate figures in concentric circular and radial arrangement and a suitable indicator, also provided with appropriate figures, connected to the axis of the disk for indicating the figures of the problem to be solved. In the device illustrated in the drawings the disk is arranged to be rotated in a horizontal slot in the indicator, and both sides are intended for use, the front or initial side indicating by one series of figures weights increasing by half-ounces from one-half ounce to sixteen ounces and prices increasing cent by cent from four to thirty-nine cents per pound and in another series weights increasing by ounces from sixteen to thirty-two and prices increasing cent by cent from two to nineteen, and the back indicating by similar series of figures the continuation of the first series of weights and prices—that is, in one series weights from one-half ounce to sixteen ounces at prices from forty to seventy-five cents per pound and in the other series weights from seventeen to thirty-two ounces at prices ranging from twenty to thirty-seven cents per pound.

Our improvements are illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the front or initial side of the disk and indicator, showing by full and broken lines, respectively, two positions of the indicator relative to the disk. Fig. 2 is a plan view of the back of the disk and indicator, showing a continuation of the figures and showing also by full and broken lines, respectively, two positions of the indicator on the disk. Fig. 3 is a sectional view on the line *z z* of Fig. 1, and Fig. 4 is a plan view of the indicator detached.

In the drawings, A designates a disk of wood, metal, paper-board, or other suitable material, and B a frame or support which is made to serve also as an indicator or pointer and which has a horizontal slot C wherein the disk is placed and adapted to turn on a pivot D that is suitably secured to the support B at the center of the disk. The frame B is preferably extended below the disk to form a handle E for convenience in using the device. The figures on the faces of the disk are arranged in concentric circles and radial columns, and while it is not necessary to the successful use of the device that circular and radial division-lines be provided on the disk it is desirable to employ them to separate the circles and radial columns of figures to insure accuracy in the placing and inspection of the figures, and they are therefore shown in the drawings. To provide suitable spaces on the disk for the characters showing weights, circular lines *a* and *b* are drawn near the periphery, and near the outer circle *a* are placed the characters "$\frac{1}{2}$," "1," "$1\frac{1}{2}$," "2," &c., in thirty-two equidistant spaces and coincident with the diametric lines *c*, and these figures may be assumed to represent ounces and half-ounces. Within the inner circle *b* are series of equally-spaced concentric circles, which for convenience may be regarded as divided into three series or sets, (marked *d*, *e*, and *f*, respectively.) Between these circles and in proper radial columns separated by the radial or diametric lines *c* and the lines *g* parallel thereto are placed the figures intended to represent the answers to the problems, the quantities being shown near the periphery of the disk, as stated, and the prices on the indicator, as will be hereinafter explained. In providing these figures no account is taken of fractions less than one-half cent; but when the fraction is one-half cent or more it is computed as one cent.

The portion of the indicator B above its center has a longitudinal slot *h* formed at the right of the longitudinal axis *i* of the in-

dicator and extending from the circle *b* to the inner circle of the series *f*. Near the head or outer end of the indicator B is a transverse opening *j* coincident with the space between the circles *a* and *b*, and into this opening a pointer *k* is projected from the inner wall of the opening in line with the longitudinal axis of the indicator B. Below its center the indicator is provided with a slot *l*, extending radially toward the left of the axial line *i* of the indicator in angular direction equal to 11.25 degrees and corresponding with one of the thirty-two subdivisions produced by the diametric lines *c* and extending from the inner line of the set of circles *e* to the circle *b*, and in this lower portion of the indicator there is also provided a second but shorter slot *m*, extending radially from the inner line of the set of circles *d* to the circle *b* and parallel with but slightly to the right of the indicator-axis *i*. In radial columns at the left of the indicator-slots *h*, *l*, and *m* and coincident with the spaces between the circles *d e f* the figures (designated *n*) indicating prices per pound are arranged, and in the series selected for illustration these prices range from four to thirty-nine cents on the front of the indicator and from forty to seventy-five cents on its back. This range of prices and the division of weights as well should be understood as having been selected merely to illustrate the invention in connection with familiar scales of prices and articles, for it will be obvious that other divisions of weights or measures and a different range of prices could be employed without material change of the mechanical structure or operation of the device or change in the mode of computation. The figures (designated *o*) intended to show the cost of ounces and half-ounces indicated on the disk margin at the prices shown at the left of the slot *h* in the indicator are arranged in radial columns on the right-hand side of the diametric lines *c*, and those designated *p* and *q*, respectively, intended to show the cost of articles at the higher prices adjacent to the lower slots *l* and *m*, are arranged in similar columns on the opposite or left-hand sides of the lines *c* and are inverted relatively to the characters *n* in order that they may not appear upside down when viewed through the lower slots *l* and *m*. To separate the columns of figures *p* and *q*, so that they may not have a confused appearance, lines *g* may be drawn parallel with the lines *c*, or the spaces occupied by the different columns of figures *o p q* or the figures themselves may be of contrasting colors to accomplish the same purpose.

For the purpose of increasing the capacity of the device as a calculator both the front and back may be provided with additional figures indicative of quantities and prices, while using the same means for ascertaining the answers as in the arrangements above set forth. To this end the disk front and back are provided with a second series of figures (designated *s*) placed outside the circle *b* and midway between the diametric lines *c*, beginning with "17" placed between the eight and eight and one-half ounce marks and continued to "32" between the fifteen and one-half and the sixteen ounce marks, and such numbers are intended to refer to ounces beyond sixteen and up to thirty-two, and to utilize these numerals the indicator B is provided with a second series of price-figures (designated *t*) placed at the left of the columns of figures *n* and ranging from "2" to "19" on the indicator front and from "20" to "37" on its back. It is preferable that the sets of numerals *s* and *t* contrast in color with the others to readily distinguish them. The indicator is provided with a second pointer *u*, extending inward from the outer wall of the opening *j* and a proper distance to the left of the pointer *k*. The pointer *u* is used only in connection with the figures *s*, and the figures *t* are used only when the pointer *u* registers with one of the figures *s;* but the radial columns *o p q* on the disk are used, as in the other instance, to determine the results of the computations.

The manner of using the device in solving problems will probably be apparent from the foregoing description. If the cost of articles ranging in weight from one-half ounce to sixteen ounces and in price from four to thirty-nine cents is to be ascertained, the disk is turned until the pointer *k* at the front of the disk registers with the proper marginal figures indicative of the weight, and the price is found at the left of the indicator-slot *h*, *l*, or *m*, and the cost or answer is seen through the slot immediately at the right of the price-figures. If the cost of articles ranging between seventeen and thirty-two ounces at prices ranging from two to nineteen cents is to be found, the same side of the disk is used, and the pointer *u* is made to register with the proper marginal figures of the series *s*, and the price characters of the series *t* are employed, and the answer is found at the right in the appropriate slot *h*, *l*, or *m*, as in the former calculations. The back of the device is used in the same way to ascertain the cost of greater weights and higher prices, as heretofore explained. In the position the indicator is shown by full lines in Fig. 1 the pointer *k* registers with the weight characters "8½" and the cost of articles of that weight at prices ranging from four to thirty-nine cents per pound can be read in the proper indicator-slot. In the same position of the indicator the pointer *u* registers with the figures "17" of the weight characters *s* and enables the cost of articles weighing seventeen ounces at the prices shown by the price characters *t* to be also read in the indicator-slots, and in the position the indicator is shown by broken lines in Fig. 1 the pointer *k* points to the weight characters "4½" and enables the cost of articles of that weight to be read on the disk in the manner explained.

In Fig. 2 by the full lines the pointer *k* is shown as registering with the weight characters "16" and the pointer *u* with the weight characters "32," and by the broken lines the pointer *k* is shown as registering with the weight characters "$2\frac{1}{2}$." In both instances the solutions of the problems can be read in slots *h*, *l*, or *m*, as above explained.

It will be obvious that the arrangement and values of the various characters, the location of the slots and pointers, and the provision of circular or radial lines, columns, and other disk divisions can be varied considerably to meet the requirements of computations for different purposes without departing from the plan of the invention herein disclosed, and therefore we do not limit ourselves to the specific means set forth for the accomplishment of the end in view.

What we claim, and desire to secure by Letters Patent, is—

1. In a computing device, a revoluble disk, marginal series of characters thereon representing quantities, inner sets of columns consisting of series of characters arranged on the disk in concentric circles and in substantially radial order representing values, the characters in one set of columns reading radially inward and those of the other columns reading radially outward, and an indicator extending diametrically across the disk and pivoted to its axis for selecting the quantity characters and provided with slots at opposite sides of the axis for exposing the appropriate columns of value characters, the indicator having price characters arranged at the sides of said slots, substantially as set forth.

2. A computing device comprising a disk having two concentric marginal series of characters representing quantities and inner series of characters arranged in concentric circles and substantially radial columns representing values, an indicator having a transverse slot through which selected quantity characters of said two series are exposed and longitudinal slots through which certain of said value characters can be seen and having also double series of characters adjacent to the latter slots representing prices, pointers projecting into said transverse slot for designating quantity characters, and a central pivot connecting the disk to the indicator, whereby the disk or indicator may be revolved to properly locate the pointer and thereby enable the appropriate quantity, price, and value characters to be read on the disk and indicator, substantially as set forth.

3. In a computing device, a revoluble disk, two concentric marginal series of characters representing quantities, inner sets of columns consisting of series of characters arranged on the disk in concentric circles and in substantially radial order representing values, the characters in one set of columns reading radially inward and those of the other columns reading radially outward, an indicator-body having a transverse slot through which selected quantity characters of said two marginal series are exposed, whereby the disk or indicator may be revolved to properly locate the pointer and thereby enable the appropriate quantity, price, and value characters to be read on the disk and indicator, substantially as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 12th day of March, 1903.

BROR E. ANGLUND.
FRED J. ANGLUND.

Witnesses:
P. H. GUNCKEL,
H. A. BOWMAN.