

935,365.

Patented Sept. 28, 1909.

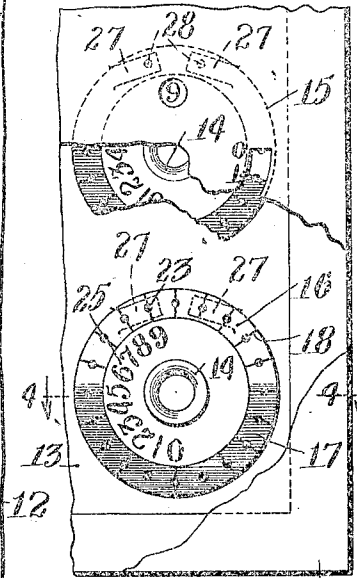
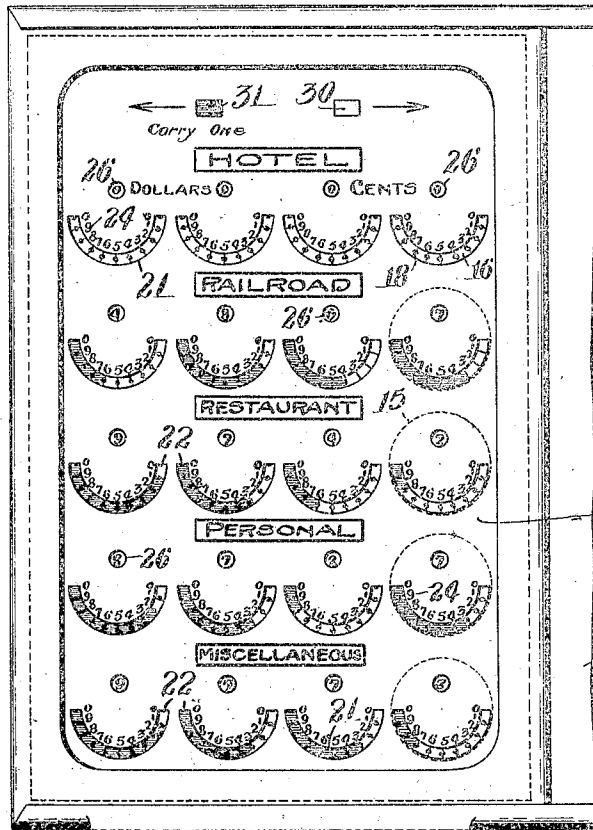


Fig. 2. 20

Fig. 3. 13



Fig. 4. 20 13

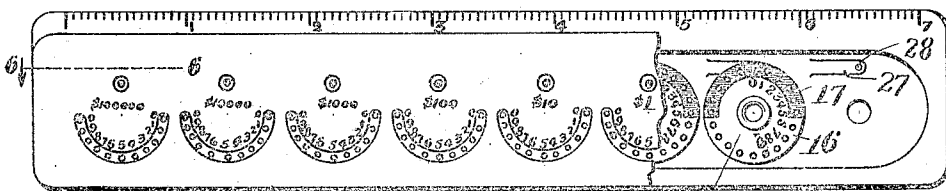
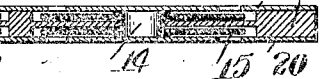


Fig. 5. 15

Witnesses:
 C. F. Nisson
 C. W. Allen.

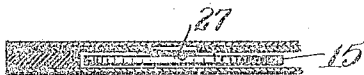


Fig. 6.

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UNITED STATES PATENT OFFICE.

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ADDING DEVICE.

935,365.

Specification of Letters Patent. Patented Sept. 28, 1909.

Application filed March 30, 1908. Serial No. 424,234.

To all whom it may concern:

Be it known that I, CARL C. HARRIS, a citizen of the United States, residing at Orange, in the county of Franklin and State of Massachusetts, have invented a new and useful Adding Device, of which the following is a specification.

This invention relates to a register or accountant which is capable of use in several ways.

The principal objects of the invention are to provide a simple and convenient construction which will be inexpensive to make and so constructed that several separate counting devices may be mounted adjacent to each other on a card or the like, and in such relative position that when an addition is completed in one column necessitating the carrying of one in the next, the two operations can be performed by moving a stylus or the like twice in closely adjacent positions and in the same direction, so that household and other accounts may be kept and adding and subtracting operations performed in a convenient manner.

Another important object of the invention is to so construct the device that it may be operated and read from the same side, which permits the use of two series of registering devices arranged back to back. This results in economy of space and manufacturing cost.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings which show certain forms of the invention, and in which—

Figure 1 is an elevation of a form suitable for a pocket cash register. Fig. 2 is a similar view on an enlarged scale showing certain modifications which render the device suitable for a pocket adder in which both sides of the device are employed. Fig. 3 is a sectional view through the center of one of the disks in Fig. 1. Fig. 4 is a similar view on the line 4—4 of Fig. 2. Fig. 5 is an elevation of a calculator which may be used for numbers having several figures, and Fig. 6 is a sectional view of the same on the line 6—6 of Fig. 5.

The form of the invention shown in Fig. 1 is illustrated as comprising a casing 10 which may be carried in the pocket, and which is provided with a flange or border 11 under which the edges of the register 12 are held. The register may be made to be with-

drawn from the casing if desired upon moving it to the right in Fig. 1, and the casing is adapted to be folded over to cover the entire device. The register itself may be made of sheet metal, celluloid, card-board, or any convenient material, and is shown as having a plate 13 provided with eyelets or the like 14 by which a series of disks 15 are rotatably mounted on the plate. These disks are designed to be turned for the purpose of registering and adding numbers or for any similar purpose, and in order that the adding operation may be performed accurately and rapidly without the necessity of any manual adjustment on the part of the operator, they are constructed in the following way:—Each of the disks is provided with two contrasting sections 16 and 17. In order to give the proper contrast these sections are preferably colored differently, and I shall hereafter refer to the section 16 as the light section, and the section 17 as the dark section. The disk is divided by radial lines 18 into twenty spaces. These spaces, of course, are arranged in a circle. Eleven of the lines 18 are in the dark section and nine in the light section. Extending over the disks is a cover or outer plate 20 having a series of curved openings 21 registering with the spaces between the lines 18 and exposing ten of the spaces, but eleven of the lines bounding them. These openings are terminated at their ends by walls 22 which constitute stops. The disks are provided with perforations 23 so that a sharp pointed instrument 23 may be inserted at any exposed point, and the disk turned until the instrument engages one of the stops. In order to provide for readily showing how far the disk is turned in this manner the outer plate is provided with a scale 24 having numerals along the curved opening, spaced at the same distance apart as the lines 18 to show where the instrument must be placed in order to turn the disk any desired number of spaces. The numerals correspond with the eleven lines which are exposed, and may be numbered from zero to nine, an additional zero being shown for uniformity, although it is not required. Now in order to register the operations of the disks they are provided with a series of characters, preferably digits 25, preferably located just inside the contrasting spaces 16 and 17 and running from zero to nine. The cover 20 is provided with an opening 26 conveniently located to expose

one of these digits at all times. In the form shown the opening 26 is located at about 90 degrees from both of the stops 22, and consequently the zero of the series of numbers 25 is located at about 90 degrees from the boundary between the dark and the light spaces. Two or more of these disks are preferably located side by side, as indicated in Fig. 1, so that members of two or more figures may be added. In operation the disk is placed so that the space of one contrasting color, for example, the light one, as that covers the smaller number of division lines, is exposed. This brings the two division lines 18 at the ends of the dark section opposite the two zero points on the scale 24. It also brings the zero on the scale 25 behind the opening 26. Now with all the disks set in this way at zero; suppose it is desired to add the numbers 92 and 75. The disk corresponding with the tens column; that is, the second one from the right, is first manipulated by introducing the pointed instrument on the division line which is opposite the division 9 and turned to the right until it brings up against the stop. This brings the number 9 on the scale 25 in the opening 26. Now the instrument is inserted at 2 on the units disk and turned in the same way until it brings up against the stop. This brings the number 92 in the two openings at the right. Now to add 75, place the sharp pointed instrument in the opening in the tens disk opposite the number 7; but now it will be seen that it does not come on the light section of the disk, but on the dark section. This shows according to the present system that the figure to be added will carry the same through the zero point and in order to accomplish this, the disk must be turned in the opposite direction, that is to the left, until the instrument brings up against the opposite stop, which brings the number 6 behind the opening 26. When the instrument comes on the dark or shaded portion of the disk it indicates that the disk is to be operated in the opposite direction, and that there is one to carry; consequently, the operator moves the pointed instrument across the short clear space between the adjacent ends of the second and third disks and inserts it in the second opening from the right in the third, or hundreds disks to bring the numeral 1 under that disk and moves it upwardly to the right, thus turning that disk to the opening 26. Now it remains to add the 5 to the units column as before, giving the sum 167. Subtraction may be done in an obvious manner.

It is to be observed that in carrying one, the stylus has to be moved across a small space only, and then it is moved upwardly in the direction of its last motion in the next disk or opening to the right, although the result of these motions is to turn the two disks

in opposite directions. This overcomes a serious objection to the adding devices on the market, as the direction of motion of the stylus is not changed, and in taking it from one disk to the next one it has to cover only a small distance and does not pass over any character or any part of a disk. Thus a pregnant chance for confusion is avoided. This result is due to the particular arrangement of disks shown.

It will be observed that what may be termed the "carry-1" section (in this instance the dark section 17) contains the eleven division lines or holes and that the lines or holes at the end of this section will just be visible at the ends of the crescent slots when the disks are set at zero. This is essential in the present specific embodiment of the invention because of the fact that the first operation from zero must always be made on the light section and that the same number of divisions or holes on the dark section must be brought into view in the slot as are obscured by the operation on the light section. This arrangement also requires that the semi-circular row of ten digits 25 shall begin with 0 at the middle division line of the carry-1 section and terminate with 9 near the middle of the other section, the remaining portion of the circle being blank to show the error at once if the disk be operated in the wrong direction. This construction is important for a further reason, to wit, that I am enabled to bring both the crescent or operating slots and the sight-openings on the same side of the cover or frame. It will be observed further that with my invention the number of parts, the number of operations, and the amount of printing are reduced to a minimum. The chances of errors are also reduced to a minimum not only because the operating slots and sight-openings are on the same side of the holder but also because the construction enables the use of but a single set of registering digits 25 so arranged that they lap over from the carry-1 section to the other section and thus leave a blank tell-tale space to apprise the operator of a turn of the disk in the wrong direction, this error being the most usual one in that type of registers involving the use of independently-operable oppositely-turning registering disks.

In order to enable the operator to know which way to turn the disks two indicators 30 and 31 are employed, each consisting of a space colored like one of the sections 16, 17, and each having means for indicating which way the disk is to be turned when on the color corresponding with that indicator. One of them also, as 31 indicates that one is to be carried, this may be specified in the register near the indicator 31 if desired.

It will be observed that the openings 21 and 26 are on the same side of the cover 20, so that the device is operated and read from

the same side. This is an important feature because it permits the use of a double disk as indicated in Fig. 4. In this case there is a disk on each side of the central wall or partition 13, and there are two outside covers 20. They are both constructed in the same way as that shown in Fig. 1, and obviously the device may be only half as large as that in the other case to accomplish the same results.

In order to provide means for holding the disks frictionally in any position in which they may be put, the plate 13 is shown as provided with a tangential tongue 27 having a slight projection 28, for entering the perforations or indentations 23. In the form shown in Figs. 2 and 4 this results in having two tongues extending in different directions between the two disks.

The form shown in Figs. 5 and 6 represents a counting device provided for a large number of columns; otherwise it is the same as before, and need not be placed in a case, and is shown as having a scale thereon.

In Fig. 1 a holder 34 is shown integral with the casing 10 for receiving the instrument 33, which, by the way, may be an ordinary pencil.

While I have illustrated and described certain forms in which the invention may be embodied, I am aware that many modifications may be made therein by persons skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to the particular details of construction shown, but

What I do claim is:—

1. An adding device comprising a series of disks each mounted to rotate in either direction having a complete circle of divisions thereon, and having the digits from zero to nine arranged thereon in a semi-circle, the remainder of the circle being blank, a cover having a semi-circular opening concentric with said circle of divisions and always exposing one more than half of the divisions, and having an opening for exposing one of said digits, and means for indicating which way the disk is to be turned to add the digits, said digits and last named opening being so arranged relatively to each other that if the disk is turned in the wrong direction that fact will be indicated by said blank space on the disk appearing under the second opening.

2. An adding device comprising a disk mounted to rotate in either direction, having divisions arranged thereon on the arc of a circle, a cover having a curved opening concentric with said arc for exposing a plurality of said divisions and having a small opening, and means on the disk for indicating the sum produced by turning the disk in the right direction and for showing the error if

it has been turned in the wrong direction, said means consisting of an arcuate series of digits extending only part way around the disk and in position to be seen one at a time through the small opening when the disk is turned in the right direction.

3. In an adding device, the combination of a plate, a series of rotatable disks mounted on each side thereof, each having a series of numerals thereon, means integral with the plate for engaging said disks on both sides of the plate and frictionally holding them against accidental displacement in both directions and allowing them to be turned by force in either direction, and two covers, one on each side of the plate, each cover covering one series of disks and having openings through which the disks of one series may be seen, and perforations through which said numerals on the same series of disks may be seen.

4. As an article of manufacture, an adding device comprising a plate having a series of substantially semi-circular openings arranged end to end, each having a series of digits from 1 to 9 arranged along the same with a zero at each end and the lowest digits on the right, the extreme left end of each of said openings being substantially parallel with and closely adjacent to the extreme right end of the next opening to the left and separated from it by a short clear space, and a disk having divisions under each opening and visible therethrough, said disks being rotatable in both directions.

5. In an adding device, the combination of a plate provided with a plurality of nearly semi-circular openings arranged in alignment, and each having a series of digits from zero to 9 extending along the same, and visible from the outside of the plate, the 9 of each series being adjacent to the zero of the next series to the left, and a rotary disk under each opening having divisions accessible therethrough by means of a stylus or the like, whereby when any disk is rotated to the left by the stylus inserted through the opening until the stylus engages the left end of the opening, the stylus will be left in position adjacent to the zero end of the next opening to the left, and its last motion will be in the same direction as the motion necessary to add one in said next left-hand opening.

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

CARL C. HARRIS.

Witnesses:

HARTLEY R. WALKER,
HAROLD W. BAKER.