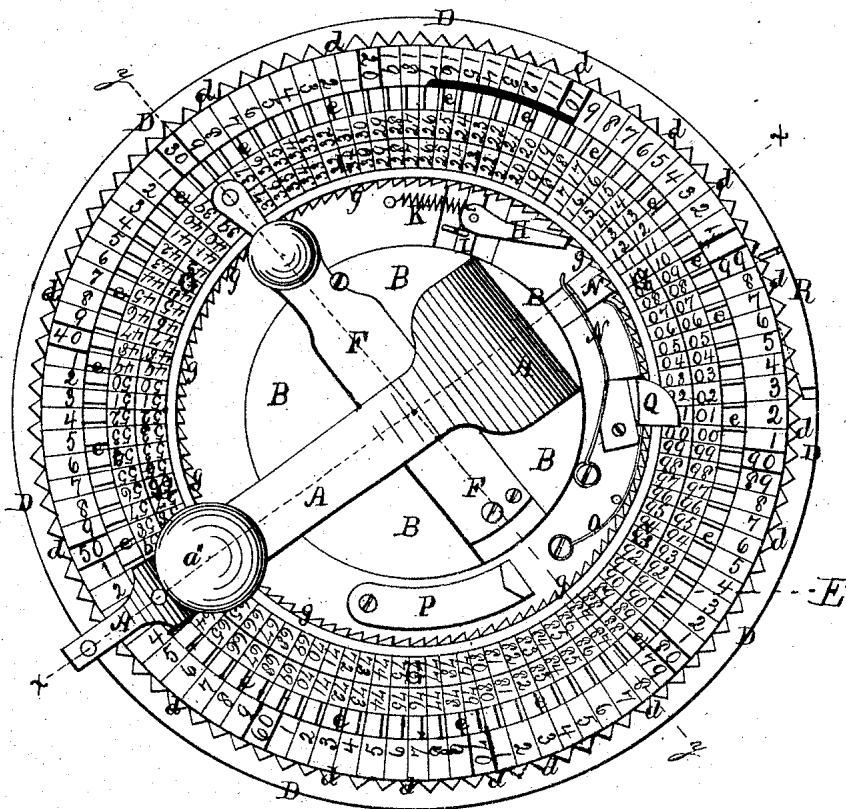


E. W. TAYLOR.
Adding-Machines.

No. 155,772.

Patented Oct. 6, 1874.

Fig. 1.



WITNESSES-

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John R. Young

INVENTOR.

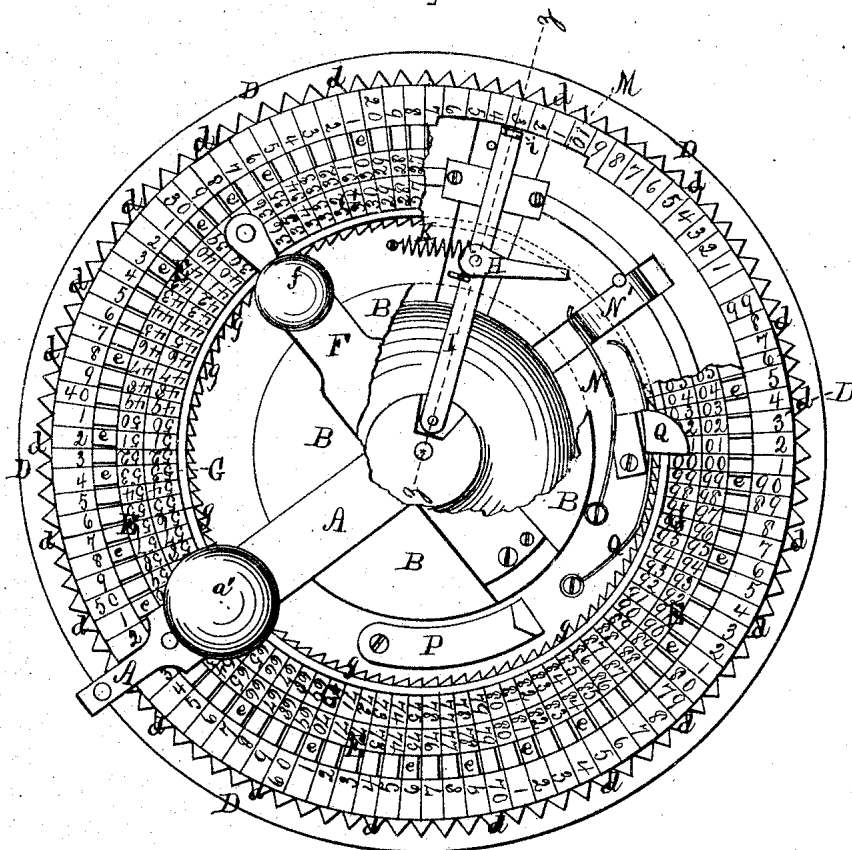
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Fig. 2.



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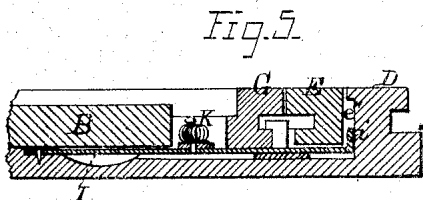
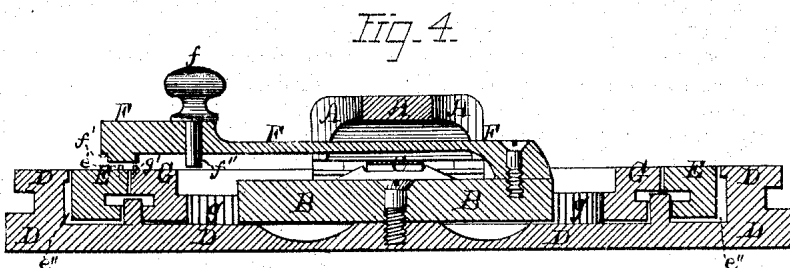
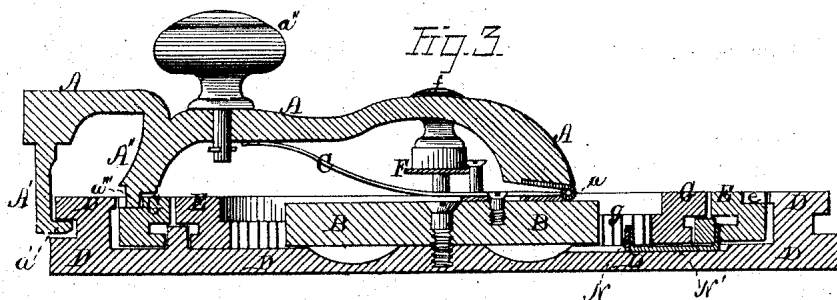
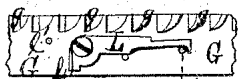


Fig. 6.



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UNITED STATES PATENT OFFICE.

ELMORE W. TAYLOR, OF FRANKLIN, INDIANA, ASSIGNOR OF ONE-HALF HIS RIGHT TO RICHARD T. TAYLOR, OF SAME PLACE.

IMPROVEMENT IN ADDING-MACHINES.

Specification forming part of Letters Patent No. 155,772, dated October 6, 1874; application filed May 21, 1874.

To all whom it may concern:

Be it known that I, ELMORE W. TAYLOR, of Franklin, in the county of Johnson and in the State of Indiana, have invented certain new and useful Improvements in Machines for Adding; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 is a plan view of the upper face. Fig. 2 is a like view with a portion broken away to show the mechanism. Fig. 3 is a vertical central section on line *xx* of Fig. 1. Fig. 4 is a like section at right angles with the former, and on line *yy* of Fig. 1. Fig. 5 is a vertical section of a portion of the device on line *zz* of Fig. 2, and Fig. 6 is a side elevation of the arm for communicating motion to the inner annulus.

Letters of like name and kind refer to like parts in each of the figures.

The object of the present invention is to provide an accurate and simple device for accountants' use in adding; and it consists, chiefly, in a machine provided with an outer fixed annulus, having a serrated edge, and two inner and movable annuluses, the upper and exposed faces of all of said annuluses suitably marked with a series of figures, said machine being provided with revolvable arms, and suitable and convenient mechanism operated thereby, by means of which the said movable annuluses may be used in connection with each other and said outer ring, the several parts being combined in the manner and for the purposes set forth more fully hereinafter.

In the annexed drawings, A denotes the main arm or lever, which is attached to and moved upon the centrally-pivoted disk B. This attachment or connection is ordinarily made by means of a hinge, as at *a*. This arm, when the machine is not in use, rests upon the spring C, the use and office of which will be hereinafter more fully explained. The outer end of the said arm extends over and beyond the outer periphery of the outer annulus D of the machine, and is provided at this end with a finger, A', which has at its lower extremity a pointed projection, *a'*, extending

inwardly on a line with the said arm A. This pointed projection is designed and adapted to fit into any of the serrations or indentations *d* in the outer horizontal edge of the fixed annulus D, when the arm A is pressed downward, and said pointed projection is brought into suitable relation with any one of said serrations; likewise when it is now desired to restore the arm to its ordinary or normal position the said projection is brought into conjunction with any of said serrations, and the force of the spring C at once brings up the end of the arm A, as desired. These serrations are made of such size and shape relative to the pointed projection of arm A that it shall fit easily and readily down into any of them; but when so set in for use, said projection shall not be likely to come out while the arm A is revolved horizontally, until said arm has been brought round to the enlarged serration at the point where the motion is stopped. For convenience in manipulating the said arm I have applied a revolving handle, *a''*, near its outer end. There is likewise on the under side of said arm, and at a point or position a little within the outer extremity, a depending piece, A'', having a sharp point or projection at *a'''*, the object and use of which is to engage upon the surface of the annulus E, horizontally notched on its outer edge, at *e*, in correspondence with the series of figures on its inner face. The vertical upward motion of the arm A upon the spring C may be controlled by means of a stop conveniently placed, or by any like and well-known means. I have thus explained the detail of the construction of this portion of my device; but it is obvious that the arm itself can be constructed so as to afford all the necessary spring required for the manipulations above referred to, and by only the exercise of ordinary mechanical skill.

This fixed annulus D is usually made a part of or one with the base or foundation of the machine, in like manner as now generally represented in the drawings. The under arm F is secured to or upon the disk B, so that it projects or extends, ordinarily, at right angles to arm A, its outer end reaching over the inner annulus G and the figures on annulus E. This arm may be provided with a spring in

like manner as is now shown in connection with arm A, or one spring may be used for both arms, or the arm itself may be so made as to afford all the spring necessary for performing the office for which it is designed. The said arm F may be operated by means of a revolving handle, *f*. On the under side of the outer end of said arm is a depending lug, *f'*, the use of which is to move the annuluses E and G, and this is done by turning said arm around horizontally until said lug meets the pins or equivalent projections *e'* and *g'*, respectively, in the upper face of annuluses E and G. The upward motion of said arm F may be stopped by a hook fixed to the disk B, and engaging in an eye affixed to the under side of said arm, or in any convenient way. Upon the inner edge of the annulus G are teeth or serrations *g*, into or upon which the pawl H engages. This pawl is pivoted to the bar I. This bar I is pivoted near the center of the bottom piece of my machine in such a manner as to allow its outer end sufficient motion to accomplish its designed purpose. At its side is a spring, K. This is so attached to the pawl or the bar I that it will, in use, operate upon both. At the outer end of the bar I is an upward projection, *i*. This arm may move in a grooved place in the bottom of my machine, as is now shown, or any convenient and desirable arrangement or adaptation of it may be designed, that will admit its motion within the required limits, as aforesaid, and without injuring or displacing the annuluses E and G, under which it is located. The length of space required for this motion can be very easily calculated in a machine of any size. This upward projection *i* is adapted to operate upon the depending shoulder *e* of the pivoted arm L in the following described manner: In using this device, when the ring or annulus E is being moved round, the said pivoted arm remains in position shown in Fig. 6, and is thus carried freely in the clear space or groove *e'*, and when its shoulder *l* comes in contact with the upward projection *i*, of the bar I, it causes said bar to be carried forward until the outer end of said arm comes into the slot or open place M in ring D. At this moment the force of the spring K operating on said bar causes it to throw up the outer end of said arm. The shoulder *l* is then cleared from said bar, which returns to its normal position, ready to operate again upon said arm, in the manner above described, at the next revolution of ring E. When the said bar is being moved forward by the force exerted upon it by the projection *i* it causes the pointed end of the pawl H to engage upon one of the teeth or notches *g* in ring G, and thus moves said ring forward a given distance. As the ring E moves on, said arm L strikes on the edge of the slot M, and is thrown back into its horizontal position, and moves forward in its proper groove, as above described. In order to aid and regulate its motions when thus operated by

the bar I and the slot M, I have placed pins *ll* at any suitable point in relation to the said arm. To give a certain fixedness to the motions of the rings E and G, I sometimes have found it of advantage to employ springs, as now shown at N and O, the former pressing arm N' horizontally upon ring E, the latter in like manner acting directly on ring G. Any usual or desirable means of this kind may be applied and used as occasion may require. I can also use flanges or guides upwardly-projecting from the base, which shall serve more effectually in some instances to keep the rings in position when in motion.

In regulating the revolutions of the movable rings E and G, when operated by means of the arm F, as above described, the two pins *e'* and *g'* can be brought into line on same radius by means of the upward projection on stop P. This stop is ordinarily an arm fastened at one end to the base of the machine, and, as said arm F is pressed down and revolved to carry said rings, this stop meets the point *f''*, which projects downward from the under side of said arm F, all in manner and form as will be more fully detailed hereinafter.

Q is the index or pointer. This may be secured to the body or base of the machine in any convenient manner, and projects over the ring G, so as not to interfere with it; but it may be applied in any desirable manner, so long as it shall be made to serve as a marker or pointer for the uses and purposes now intended.

R is a spring-stop, fastened to the body or base of the machine outside the fixed annulus D, and serves to prevent the movement of the arm A in one direction when its fingered end is below the serrated circle, but allows the free sweep of the arm in the opposite direction. As placed and arranged, it is used to stop the motion of the movable annuluses, as communicated by arm A, at any desired point.

The several annuluses D, E, and G have marked, fixed, or printed in any plain and legible manner, and in suitable places or spaces, figures—from one to one hundred. In the outer ring D I have marked the decimal points by bold lines, so as to more readily assist the eye of the operator in guiding the finger of the arm A. The serrations *d* on the outer edge of this ring correspond in number and place with these figures. Likewise the grooves *e* on the ring E correspond with its figures, and also serrations *g* on ring G.

As thus made and constructed, my said machine is designed for use in the following manner: By means of it a single column of figures may be added, or two columns may be added at the same time.

To place the machine in order for use, the arm F is pressed down upon the annuluses E and G, and revolved until the two pins *e'* and

g' are brought upon nearly the same radial line with stop P. The said arm F, now being released, is sufficiently above the rings, projections, &c., as to have a free and unobstructed horizontal movement. The figures on the upper surface or horizontal face of said annuluses are so arranged that, when the several parts are in the position above specified, the hundred points, as indicated by 00,00, on each are in the same radial line with the end of the pointer Q. The arm A is now carried to the first figure or brace of figures to be added—for instance, to 26. At this point the fingered end is pressed down, and, motion toward the hundredth point or blank being given, the inwardly-projecting point on the finger engages under the projecting edge of ring D, and is thus detained till the finger is stopped by R. During this motion the point *a'''* of projection A'' has engaged in or upon the groove *e* of ring E, and brought round said ring, so that the figures 26 now stand in said ring, in the same radial line with 00 of ring G, under the end of the pointer or index Q. If, now, 40 is to be added to this number, the finger of arm A is in like manner placed in serration 40 of ring D, and moved back to the stop R. It will then be seen that the figures 66 stand in ring E opposite the end of the pointer. If, now, 55 should be added to this sum, it will be found the figures 21 are represented in the ring E, and figure 1 in ring G, or a total of 121. The single motion of the ring G has been obtained by the revolution of ring E entirely around. When this motion has been nearly completed, the pivoted arm L is operated upon by the bar I, and in turn motion is communicated by pawl H to the ring E, all as has been before fully described. When the end of the double column is now reached, the units and tens are placed under their appropriate columns, and 1, or the hundreds, will remain to be carried. This is noted in pencil, or retained in mind, while the rings E and G are being placed as at the beginning of the addition. When thus done, this number may be added to the first figures of the next column, or it may be indicated in the ring E by placing the finger in figure 1 of ring D, and moving the arm forward accordingly. The operation of adding can now be carried on with the next column of figures.

Thus it will be seen that a column of any length, and a sum of any amount, can be easily added by this machine.

The advantages derived from its use are very great, because it reduces the wearisome and annoying complications of adding long sums or large amounts to the merest mechanical operation. There is only needed care in placing the index-finger of the main arm at the proper point in the fixed or outside ring, and in adjusting the rings to correspond with the change in the columns, and a careful ob-

servance of the detail of manipulation, as above set forth, and there is no possibility of any error or mistake in the result attained.

The celerity with which the process can be carried on is a matter of dexterity or use.

It has been found in practical experience that, after only a short use of the machine, the process of addition can be carried on at as rapid a rate as an ordinary accountant can run up the columns; and it is evident that any considerable degree of skill or familiarity with the machine will enable the user to add much faster than an ordinary accountant possibly can.

These advantages and these results are of such evident moment that they readily attest the great value of the present invention.

This device can be made in a very cheap, durable, and handsome style. It can be made of wood, or of wood and metal, or entirely of metal. The mere detail of its manufacture will, of course, be a matter of taste or of cost. It can be made of any convenient size.

The method or style of figures, or of marking, painting, or affixing them to the rings, is a mere matter of detail, and should be regulated by the taste of the maker.

The chief object in this marking or painting is to make the figures so clear and individually distinct that they cannot easily be mistaken or confused one with the other.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. In an adding-machine, the inner movable rings E and G, grooved or notched, as described, each of said rings having numerals on its face, and the revoluble arms A A' *a'* A'' *a'''* and F *f'* *f'''*, combined with the outer fixed ring D, with serrated edge, and numerals on its face, to operate in the manner and for the purposes herein set forth.

2. In an adding-machine substantially as herein described, the arm A, attached to the revoluble disk B, and constructed as shown, and adapted to operate in connection with the outer fixed ring D, serrated at *d*, and the inner movable ring E, notched at *e*, in the manner and for the purposes set forth.

3. The arm F, combined and operating in connection with the revoluble disk B and movable rings E and G, substantially as described.

4. The combination of revoluble arm A, movable rings G and E, bar I *i*, pawl H, spring K, and pivoted arm L *l*, in the manner described, and for the purposes specified.

In testimony that I claim the foregoing I have hereunto set my hand this 11th day of May, 1874.

ELMORE W. TAYLOR.

Witnesses:

WILLIAM FITCH,
JOHN R. YOUNG.