

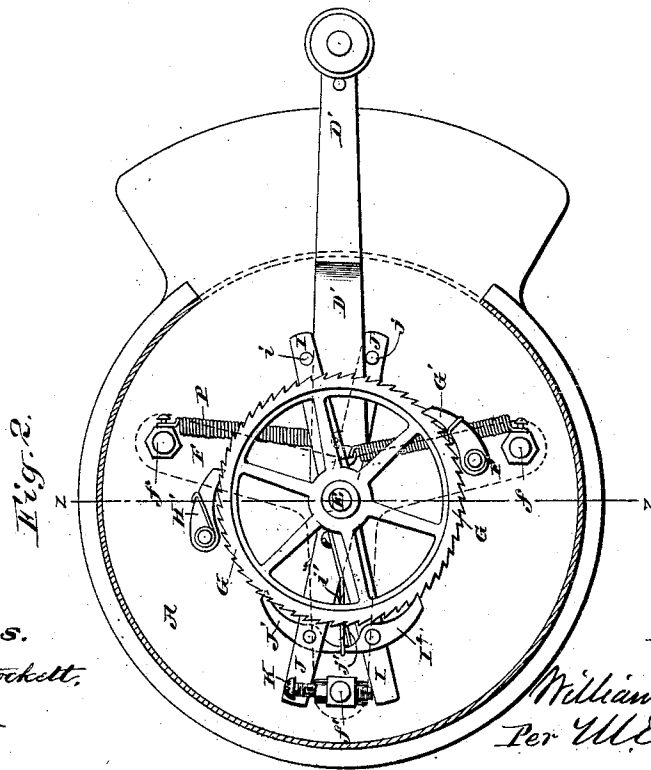
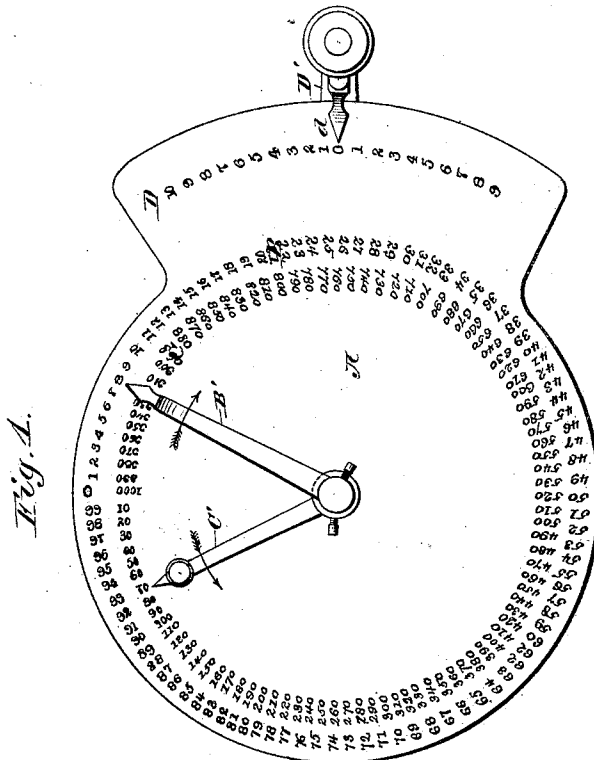
(No Model.)

3 Sheets—Sheet 1.

W. H. BEATLEY. ADDING MACHINE.

No. 297,342.

Patented Apr. 22, 1884.



Witnesses.
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C. C. Poole

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(No Model.)

3 Sheets—Sheet 2.

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Fig. 3.

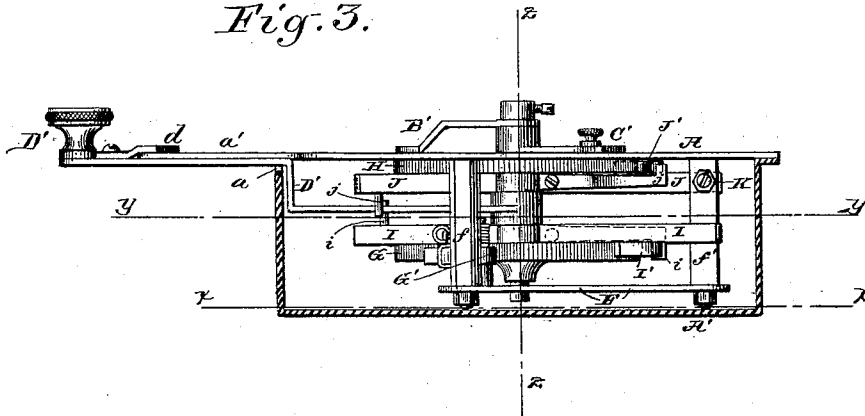
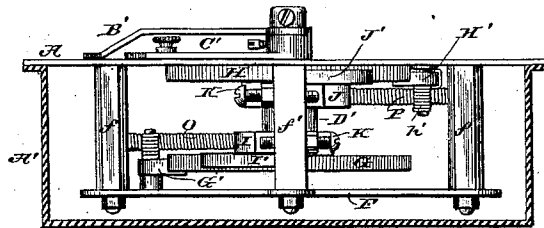


Fig. 4.



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Fig. 5.

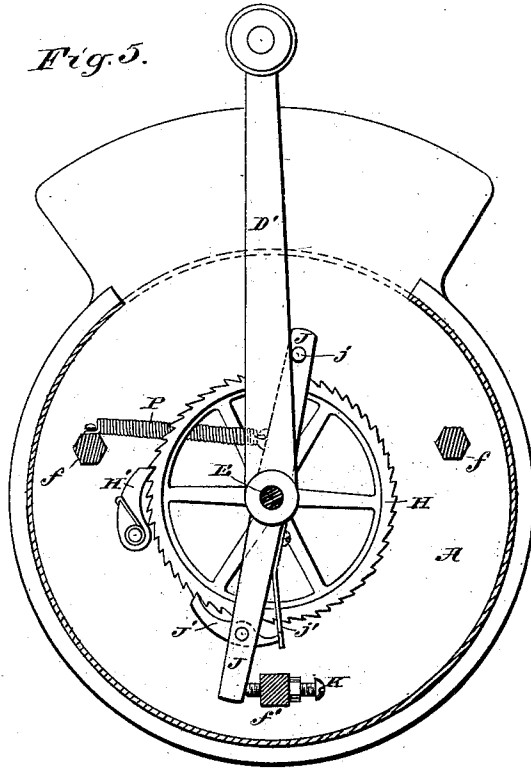
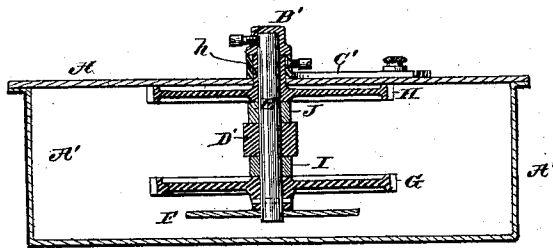


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM HENRY BEATLEY, OF HUMANSVILLE, MISSOURI.

ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 297,342, dated April 22, 1884.

Application filed August 14, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BEATLEY, of Humansville, in the county of Polk and State of Missouri, have invented certain new and useful Improvements in Adding-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

An object of this invention is to provide a simple and improved construction in adding-machines; and said invention consists in the matters hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan or face view of a machine embodying my invention. Fig. 2 is an inverted view of the same, the casing being cut in the line $x x$ of Fig. 3, so as to reveal the operative parts. Fig. 3 is a side view of the operative parts as presented to the eye when the operating-lever is directed toward the left, and showing said parts secured to the under face of the dial-plate, the lower casing being cut in a central vertical plane. Fig. 4 is an elevation of the same parts as seen when the operating-lever is turned into a position away from the eye. Fig. 5 is a section parallel with the face of the machine in the line $y y$ of Fig. 3. Fig. 6 is a section through $z z$ of Figs. 2 and 3, showing the pointer-carrying shaft or arbor and its immediate connections.

The machine herein described and illustrated is of portable form, and is intended to rest upon a table or desk with the dial upward when in use, or, if desired, it may be held in the hands. It is composed of a sheet-metal case, of which the dial forms the top, the operative mechanism being contained within the case and contrived to actuate pointers which sweep around the exposed surface of the dial. A lever connected with the interior operating parts projects at the right hand of the instrument through a slot in the case and beneath the dial-plate into convenient position to be worked by the operator.

In the drawings, A represents the dial-plate, which forms the cover of the case or shell mentioned, and A' is the body of the shell or

case, provided with a slot, a , to allow suitable movement of the hand-lever.

Upon the face of the dial are two rows of numerals, B and C, arranged in concentric circles, the outer row, B, consisting of the series of numerals from 1 to 100, inclusive, and the inner row, C, of the series of numerals increasing by tens from 10 to 1,000, inclusive, both beginning at the top of the dial, or at the point away from the operator as the instrument stands before him, and occupying a complete circle at equal intervals apart. The row or series B is called the "units" series, and the row C is called the "tens" series. The units series is arranged to increase from the zero or "one hundred" point toward the right, and the tens series from the zero or "one thousand" point toward the left, the hundred and thousand points being coincident or in the same radial line. The position of the "100" in the units series is preferably occupied by a cipher or zero mark, as shown. A third row of numerals, D, is also marked upon the dial-plate at the right of and some distance from the series just mentioned, and in an arc concentric therewith, being intended to guide the operator in giving the proper movements to the hand-lever. This last-mentioned row of numerals consists of a double series, starting from a "0" or zero point and reading 1 to 10 upwardly, or from the operator, and, from the same point, 1 to 9 downwardly, or toward the operator, as plainly indicated in Fig. 1. As also indicated in said Fig. 1, the dial-plate is provided with an extension, a' , for the accommodation of the last-mentioned or lever series of numerals, the remaining portion of the said plate being preferably of circular form, and of only sufficient size to give place for the series B and C, stamped thereon at such intervals apart as to be readily legible. Two hands, B' and C', actuated from a central shaft or arbor belonging to the interior mechanism, as will be further described, serve as indicators or pointers in connection, respectively, with the series of numerals B and C, and the hand-lever D', which projects beneath the dial-plate beyond its margin a' , is provided with an inwardly-directed pointer, d , which reaches into proximity with the third row of numerals, D. The hands B' and C' are arranged to move independently of each other

and in reverse directions corresponding severally with the directions of reading or increase in the series of numerals to which they respectively belong. Said hands are constructed to pass each other, like the hands of a clock, the hand B' being outermost or uppermost, as here shown. The arbor E, which carries the hands, projects through the case of the dial, and is supported at its inner end by a stationary back plate of the "spider" or armed form illustrated by dotted lines in Fig. 2, said back plate being upheld by posts f, f and f' .

Adjacent to the plate F is affixed to the arbor E a ratchet-wheel, G. Midway of the arbor the inner end of the lever D' is loosely pivoted on said arbor, and next the face-plate A is also loosely journaled the ratchet-wheel H, of equal diameter with the wheel G, but having its teeth inclined in a direction opposite to those of the said wheel G. The wheel H has its hub h constructed to project through the dial-plate, so as to receive the pointer C', rigidly secured to the said hub, and so, also, as to support the arbor by bearing in the dial-plate.

Between the lever D' and the ratchet G is centrally and loosely pivoted on the arbor E a lever, I, and between the lever D' and the ratchet H is also pivoted on said arbor a similar lever, J. Said levers I and J project on opposite sides of the post f' , which stands in line with the hand-lever D', as best seen in Figs. 2, 3, 4, and 5, and through said post f' are inserted adjusting-screws K, arranged in position to strike the ends of the levers I and J, so as to limit their range of movement, as will hereinafter further appear. At their opposite ends the levers I and J extend obliquely beyond the sides of the hand-lever D', and each is provided with a pin, ij , which rests against the side of said hand-lever, as shown in Fig. 3. A movement of the hand-lever in either direction will therefore swing one or the other of the levers I J. Upon said levers are pivoted the spring-pawls I' J', which are engaged, respectively, with the ratchets G and H. By means of these pawls a movement of the hand-lever D' upwardly or outwardly from the operator will rotate the ratchet-wheel H, and will carry the indicator-hand C' along the tens series C of numerals a distance corresponding with the movement of said hand-lever. Conversely, a movement of the lever D' downwardly or toward the operator will rotate the ratchet G and carry the pointer B' a corresponding distance along the units series of numerals B. The springs O and P are attached to the posts f , and connect, respectively, with the levers I and J, so as to return said levers to their original position against the set-screws K whenever the hand-lever D' is released or returned to the zero-point. During the return movement of the levers I and J the detent-pawls G' H' retain the ratchets, and the pointer-hands respectively connected therewith will stand still until further moved forward by an operation of the hand-lever D'.

The set-screws K are so adjusted as to bring the pins ij closely against the sides of the hand-lever D', and so, also, as to bring said hand-lever into such position that its pointer d will normally stand opposite the zero-mark in the series of numerals D.

The use of the instrument now becomes apparent; but an illustration may be desirable.

Preparatory to the operation of the instrument both indicators B' and C' are brought to coincide opposite the "0" point at the top, which may be done by directly pushing the pointers with the finger, one to the right and one to the left, as in setting the hands of a clock. As a suitable example, suppose it to be required to add together the numbers 58, 75, and 3. The lever D' is first pushed upward or outward until the pointer d stands opposite the numeral 5 in the row D, which carries the pointer C' to 50 of the tens series C. The lever D' is then pushed in the opposite direction past the zero-point, and until said pointer d stands opposite the figure 8 in the row D, which brings the pointer B' opposite 8 in the units series B. The lever D' is then carried upward or outward past zero again to the figure 7, which advances the pointer C' to 120, then again downward past the zero-point to the figure 5, which takes the pointer B' to 13 of the units series B. There being no tens in the next number (3) to be added, the lever D' is first brought to zero, and then downward again to 3 of the row D, which advances the pointer B' to 16 of the series B. The tens-pointer stands at 120, and by adding 120 to 16 the sum desired is obtained. The tens in the units series (16 in the example) may be added to the tens (120) on the machine by moving the lever D' upward to 1 of the row D, which carries the pointer C' to 130. The sum total may then be read directly from the dial by supplying the unit figure in the number to which the hand B' points in place of the right-hand cipher in the number indicated by the pointer C'. It is of course immaterial in which order the indicator-hands are moved, or, in other words, whether the units or tens are first added or indicated.

In order to bring either of the pointers C' B' to the proper figure or numeral by a movement of the hand-lever D', the figures in the double series D will be more widely separated than the figures in either of the other series, B and C, in precisely the ratio of the radii of the circles in which these series are located.

It is evident that the ratchet-wheels G and H should contain the same number of teeth as the number of numerals in the several series B and C, which is 100, or that the number of such teeth should be a multiple of 100. For greater convenience in the drawings, this requirement has not been accurately observed.

I claim as my invention—

1. The combination, with the dial A, bearing the two concentric circular series of numerals B and C, reading in opposite directions, and also bearing a row of numerals, D,

proceeding both ways from a central zero, of indicator-hands B' C', supported centrally of the series B and C, a lever movable in the direction of the row of numerals D, and mechanism connecting the lever with the indicator-hands, constructed to move said hands independently in opposite directions, whereby movements of the lever D to points opposite given numerals in the row D' will carry the indicator-hands a corresponding number of places along the series B and C, substantially as and for the purposes set forth.

2. The combination, with the dial-plate bearing circular series of numerals B and C, of a central arbor, E, oppositely-toothed fast and loose ratchets G and H, indicator-hands B' and C', a hand-lever, D', and movable pawls arranged to engage the ratchets, and constructed to be thrown, one in one direction and the other in the other direction, alternately by vibration of the hand-lever, substantially as described.

3. In an adding-machine, the combination, with the arbor E and ratchet-wheels G and

H, mounted thereon, of a freely-pivoted lever, D', pawl-levers I and J, separately movable by vibration of the hand-lever, a stop or stops for said pawl-levers, means for returning the pawl and hand levers to their normal positions, and means for preventing the rotation of the ratchets during the return of the pawl-levers, substantially as described.

4. In an adding-machine, the combination, with the arbor E and fast and loose oppositely-toothed ratchets G and H thereon, of the lever D', pawl-levers I and J, provided with pins *i* and *j*, springs O and P, and detent-pawls G' and H', substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

WILLIAM HENRY BEATLEY.

Witnesses:

JOB B. WILKERSON,
L. E. BROWNING.