

No. 666,220.

Patented Jan. 15, 1901.

I. C. HALL.
ADDING MACHINE.

(Application filed May 19, 1900.)

(No Model.)

3 Sheets—Sheet 1.

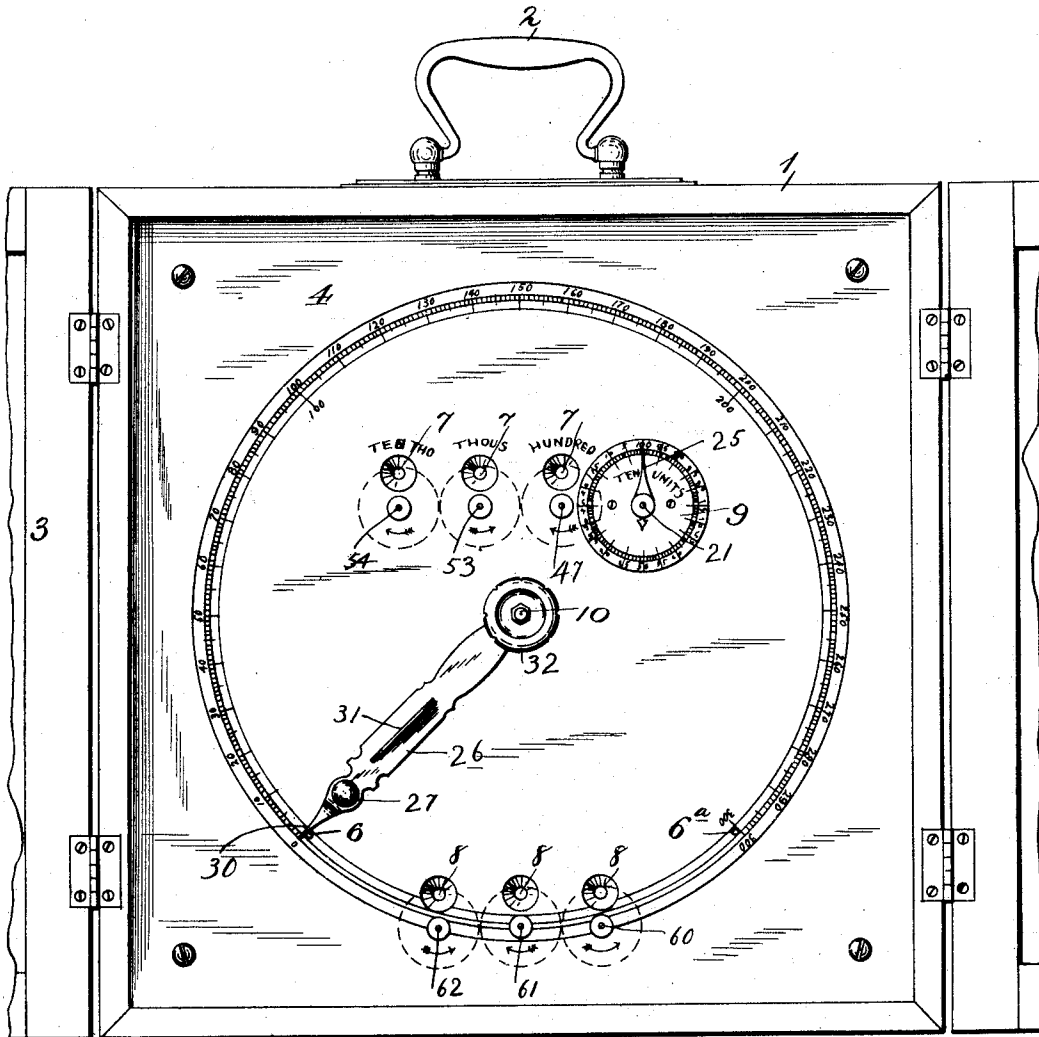


Fig. 1.

Witnesses:
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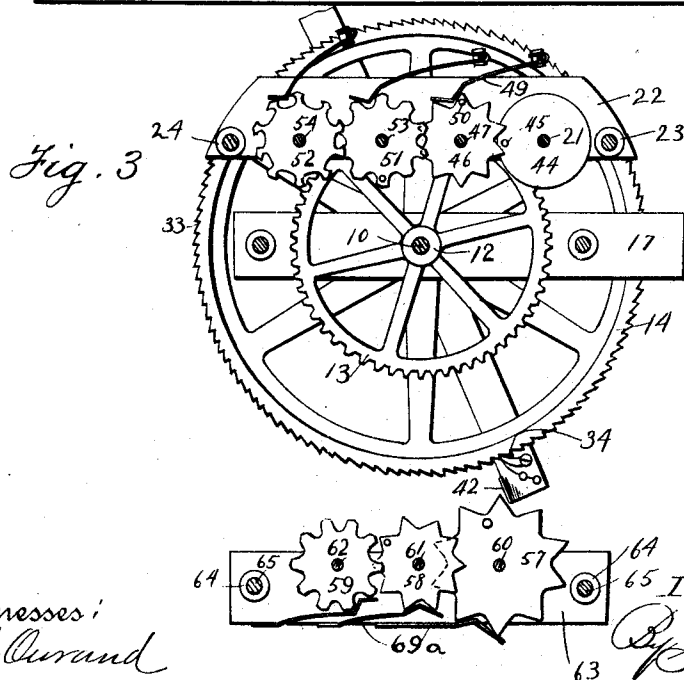
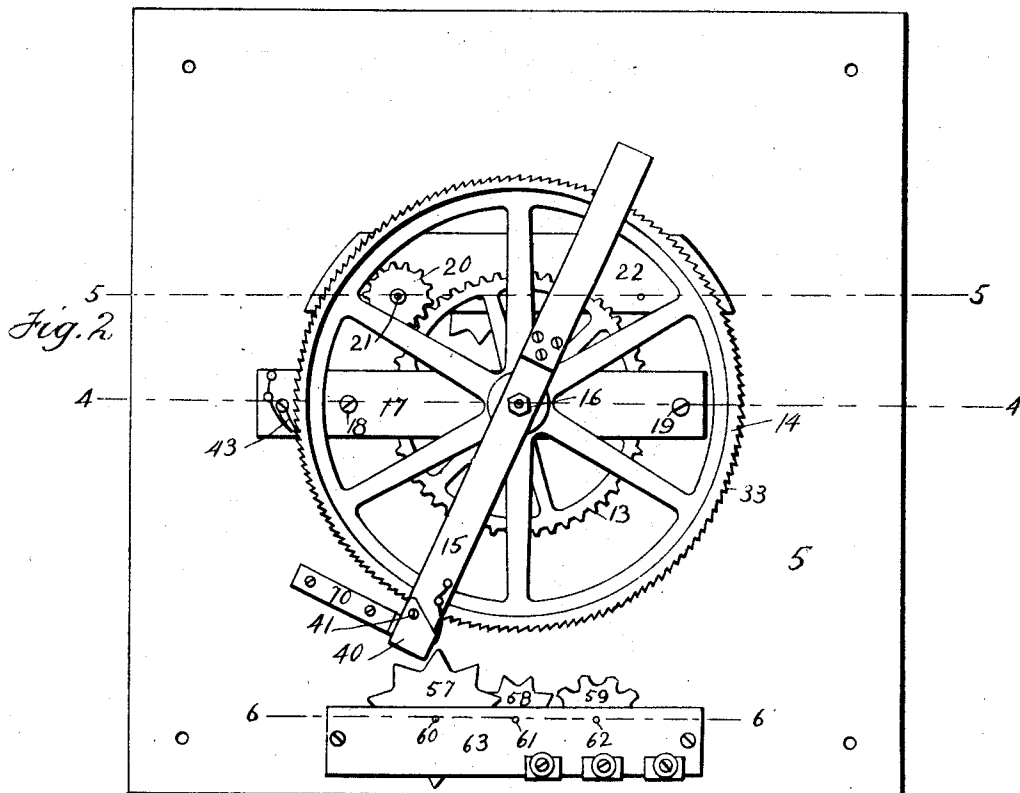
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3 Sheets—Sheet 2.



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Fig. 4.

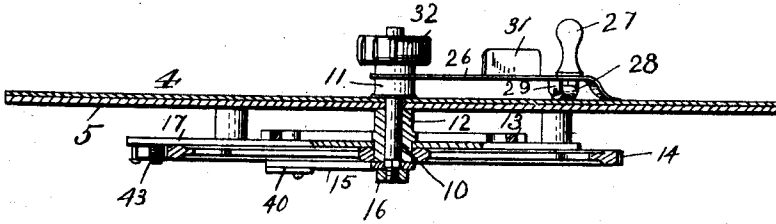


Fig. 5.

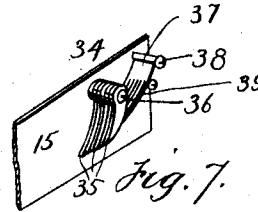
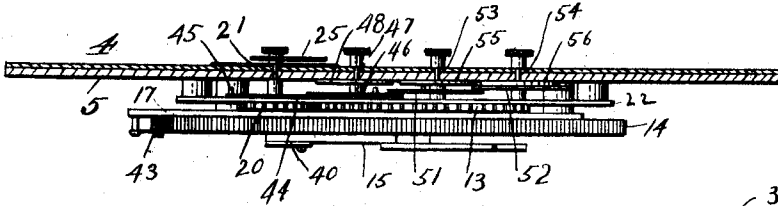


Fig. 6.

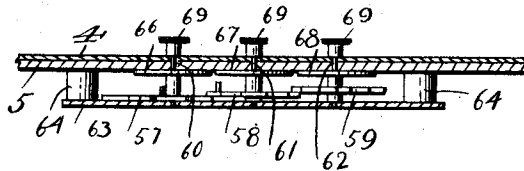


Fig. 9.

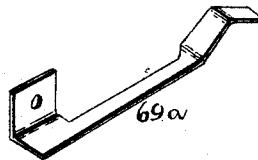
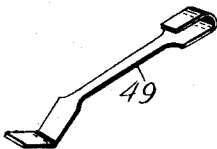


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

IRA C. HALL, OF FARMER, NEW YORK.

ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 666,220, dated January 15, 1901.

Application filed May 19, 1900. Serial No. 17,260. (No model.)

To all whom it may concern:

Be it known that I, IRA C. HALL, a citizen of the United States, residing at Farmer, in the county of Seneca and State of New York, have invented new and useful Improvements in Adding-Machines, of which the following is a specification.

My invention relates to adding-machines; and the objects of the same are to provide a machine of this character which will be accurate, reliable, and quick in action and which will be comparatively simple in construction and not liable to get out of order in use. By use of my invention the total sum of a column of figures will be accurately indicated and at the same time the number of individual lines in the column will be footed up automatically.

With these objects in view my invention consists of the construction shown in the accompanying drawings, which illustrate a preferred embodiment of my invention, and in which—

Figure 1 is a front elevation of an adding-machine made in accordance with my invention. Fig. 2 is a rear elevation of the mechanism. Fig. 3 is a vertical section through the mechanism, taken immediately in rear of the dial-plate. Fig. 4 is a transverse section on the line 4 4, Fig. 2. Fig. 5 is a transverse section on the line 5 5, Fig. 2. Fig. 6 is a like view on the line 6 6, Fig. 2. Fig. 7 is a detail perspective view of the end of the pawl-carrier arm. Fig. 8 is a similar view of one of the spring-pawls for one of the indicator-wheels. Fig. 9 is a similar view of a spring-pawl for another indicator wheel or disk.

Like numerals designate like parts wherever they occur in the different views.

In said drawings, the numeral 1 designates a cabinet or casing in which the operative mechanism is preferably mounted. This cabinet may be provided with a handle 2 and hinged doors 3. A dial-plate 4 is secured to a base-plate 5 by screws at the corners, which secure the two plates to the casing. This dial-plate is provided with a graduated scale of figures from "0" to "300," as shown, arranged in a segment of a circle on said dial, and at each end of the scale a stop-pin 6 6^a is secured to the dial-plate for a purpose to be hereinafter referred to. Within this circu-

lar scale a series of sight openings or apertures 7 are formed near the upper portion of the dial, and near the lower portion thereof a similar series of apertures 8 are provided. An auxiliary dial 9, having indicated thereon unitary indicia from "0" to "100," in a circular series, is secured to the dial-plate 4 in line with the sight-openings 7.

Journaled centrally in the dial-plate is an axis or shaft 10, said shaft passing through collars 11 12 upon opposite sides of the dial. The collar 12 is mounted on the shaft 10, and a cog-wheel 13 and a ratchet-wheel 14 are fixed to revolve with said collar 12. Fixed to revolve with the shaft 10 is a pawl-carrying arm 15, which is held to the shaft by a nut 16. Between the cog-wheel 13 and the ratchet-wheel 14 a transverse plate 17 is mounted, said plate being secured to the base-plate 5 by screws 18, collars 19 serving to set the plate 17 the required distance from the base-plate 5. The shaft 10 passes freely through an aperture in the plate 17. The cog-wheel 13 meshes with a small cog-wheel 20, fixed to a shaft 21, journaled in the dial 4 and base-plate 5, said shaft also passing through a plate 22, spaced from the back of the plate 5 by collars 23 and screws 24. The shaft 21 carries a small indicator-hand 25, which traverses the auxiliary dial 9 on the face of the main dial 5. The main indicator-hand 26 is fixed to revolve with the shaft 10. A knob or handle 27 is secured near the outer end of the hand for operating it, and immediately under the knob 27 a rubber roller 28 is journaled in a keeper 29. The hand 26 is made of spring metal, and by bearing down upon the knob 27 a slight friction is created between the roller 28 and the dial-plate 4, so that when the point 30 of the hand is brought to a position near the number on the dial which it is desired to indicate sufficient friction may be created to prevent the point of the hand from passing the desired number without some exertion on the part of the operator. A plate 31 is secured to the hand 26 and projects upward at right angles therefrom to serve as a thumb-rest to steady the action of the hand in operation. A milled wheel 32 is secured upon the end of the shaft 10, outside the hand 26, and may also be used to turn the hand. The point 30 of the hand 26 is bent downward to nearly

contact with the dial and to abut against the stop-pins 6 6" when carried around the dial. The ratchet-wheel 14 is provided upon its periphery with a number of ratchet-teeth 33, there being in the present instance four hundred such teeth, and said teeth are of the same distance apart as the graduations on the scale of the dial 5.

The pawl-carrying arm 15 has secured to one of its ends a pawl 34, which engages the teeth 33. This pawl consists of a series of detents 35 of different lengths pivoted upon a pin 36, secured to the arm 15. A flat spring 37, secured at one end to a pin 38 on the arm 15, is slitted to form separate spring-tongues 39, and one of these tongues bears upon each detent 35 to hold it in engagement with the teeth 33. The advantage gained by having a plurality of detents is that more security is attained in the action of the pawl as an entirety, as more than one tooth will be engaged at all times, and that the strength of the spring may be distributed, thus preventing undue wear to the ratchet-teeth on the bearing edges of the detents. A spring pawl or detent 40, consisting of an angularly-bent plate pivoted at 41 to the arm 15 and having an arm 42, which crosses the path of one of the lower indicator-wheels, serves in its retrograde movement to turn said wheel the distance of one tooth at each full throw for a purpose which will be presently described. Pivoted near one end of the plate 17 is a pawl 43, constructed similarly to pawl 40. This pawl serves to engage the teeth of the ratchet-wheel 14 to prevent backward rotation of said wheel during a reverse movement of the pawl-carrying arm 15.

A disk 44 is fixed to the shaft 21, and said disk is revolved by the cog-wheel 20. A pin 45 on the disk 44 engages the teeth of a wheel 46 and moves said wheel the distance of one tooth at each revolution of the disk 44. The wheel 46 is fixed to a shaft 47, which carries an indicator-disk 48, having a series of numerals on its face which are successively brought into coincidence with one of the sight-openings 7. The disk 48 is the "hundreds-indicator," and its toothed wheel 46 is provided with a spring-detent 49, which prevents its retrograde movement. A pin 50 on the wheel 46 moves the "thousand-wheel" 51 the distance of one tooth at each revolution, and a similar pin on the wheel 51 moves the "ten-thousand" wheel 52 the distance of one tooth at each revolution thereof, as will be understood upon reference to the drawings. Each wheel 51 52 is fixed to its shaft 53 54, and an indicator-disk 55 56 is also carried by said shafts and their numerals are successively brought into register with the sight-openings.

Three toothed wheels 57, 58, and 59 are fixed to shafts 60 61 62, journaled in the base-plate and dial and in a plate 63, spaced from the base-plate by collars 64 and attaching-screws 65. These wheels 57 58 59 carry numbered disks 66 67 68, the numerals on which disks

are successively brought into coincidence with the sight-openings 8. Spring-detents 69, secured to the plate 63, serve to prevent backward movement to the wheels 57 58 59. The shafts 47 53 54 60 61 62 project beyond the face of the dial 4, and fitted to the projecting ends of said shafts are milled thumb-nuts 69. A stop 70 on the back of the base-plate limits the throw of the pawl-carrying arm 15.

The operation of my adding-machine is as follows: The hand 26 is first moved around the dial until the units-hand 25 registers at any point between the numerals "40" and "80." The indicator-disks 48 55 56 are now revolved by means of the milled nuts 69 until the numeral "9" is displayed in each sight-opening 7. The indicator-disks 66 67 68 are then revolved to bring the numerals "9" in sight through the apertures 8. The hand or pointer 26 is now carried back to "0" on the dial and then carried forward until all the disks indicate "0" through the sight-openings. The hand 26 is again brought back to "0" and the apparatus is then ready to foot up a column of figures. For example, in adding the numbers "210, 195, 205" the hand 26 is to be moved from "0" to "210" on the dial 4 and then returned to "0." At every movement of the hand 26 from "0" the wheel 57 is moved one tooth by the pawl 40 to indicate that one individual line of figures in the column has been added. The hand 26 is then moved to "195" on the dial and back to "0," and then forward to "205" and back to "0." The figure "6" will now appear at the sight-opening designated "hundreds," and the small hand will indicate "10" on the units-dial. The right-hand sight-opening 7 will now contain the figure "3," indicating the number of individual lines of figures added to the column.

It will be obvious from the foregoing that my invention will be of great utility in keeping tally of weights and numbers of pieces handled and that the totals may be set down at the end of each day and the machine set for operation for the next day, and that the machine is comparatively simple in construction and reliable in operation.

Having thus fully described my invention, what I claim is—

1. In an adding-machine, a dial, a spring hand or pointer, a soft-rubber roller journaled under said hand and back of the point thereof to bear on the dial and create friction when the hand or pointer is pressed down and moved around the dial, and a train of gearing actuated by said hand, substantially as described.

2. In an adding-machine, a dial, a hand or pointer journaled centrally therein, a ratchet-wheel having teeth of uniform depth and journaled on the shaft of said hand, a pawl carried by an arm independently journaled to said shaft, a train of gearing with indicator-disks actuated by said pointer, said pawl

comprising a plurality of detents of different lengths to engage different teeth on the ratchet-wheel, and a slitted spring formed into separate tongues to bear upon the detents, substantially as described.

5 3. In an adding-machine, a dial, a hand or pointer, a ratchet-wheel having teeth of uniform depth, a cog-wheel carried thereby, a train of gearing actuated by said cog-wheel,
10 an arm independently journaled on the hand-shaft, a pawl carried by said arm, said pawl

comprising a plurality of detents of differing lengths and a slitted spring bearing upon said detents, substantially as described.

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

IRA C. HALL.

Witnesses:

O. G. WHEELER,
D. C. WHEELER.