

(No Model.)

3 Sheets—Sheet 1.

A. L. CROWSON.
ADDING MACHINE.

No. 553,107.

Patented Jan. 14, 1896.

Fig 1

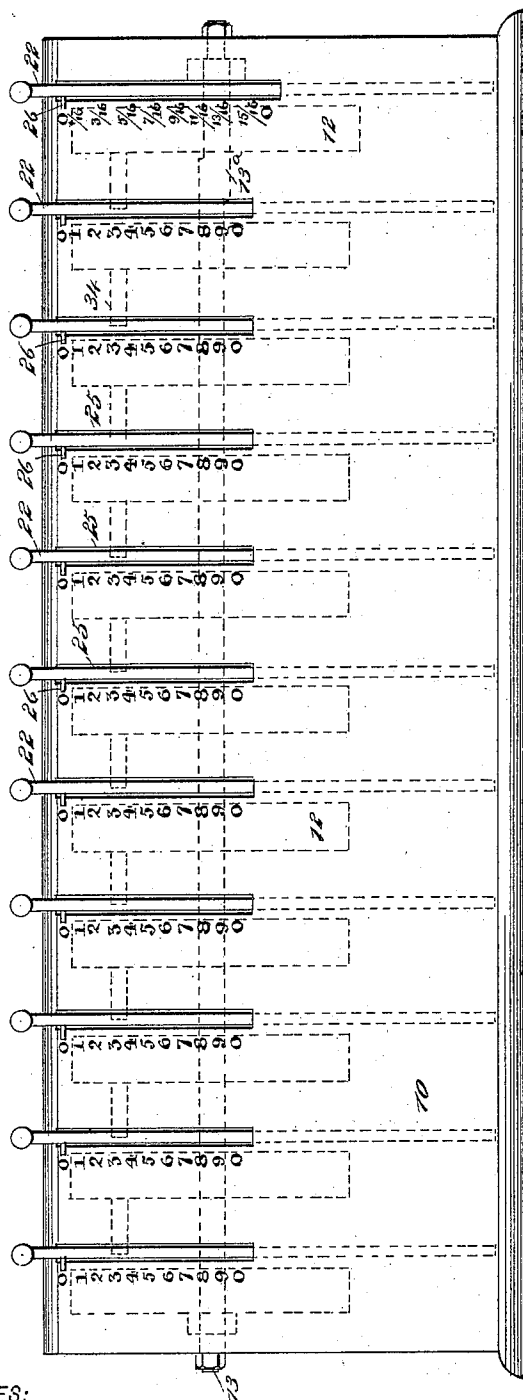
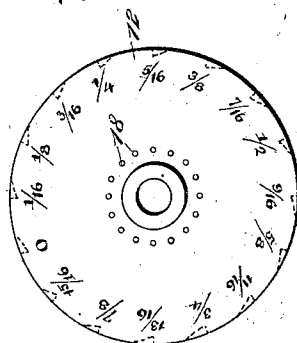


Fig 2



WITNESSES:

W. Walker

H. P. Hutchinson

INVENTOR

A. L. Crowson

BY

Munn & Co

ATTORNEYS.

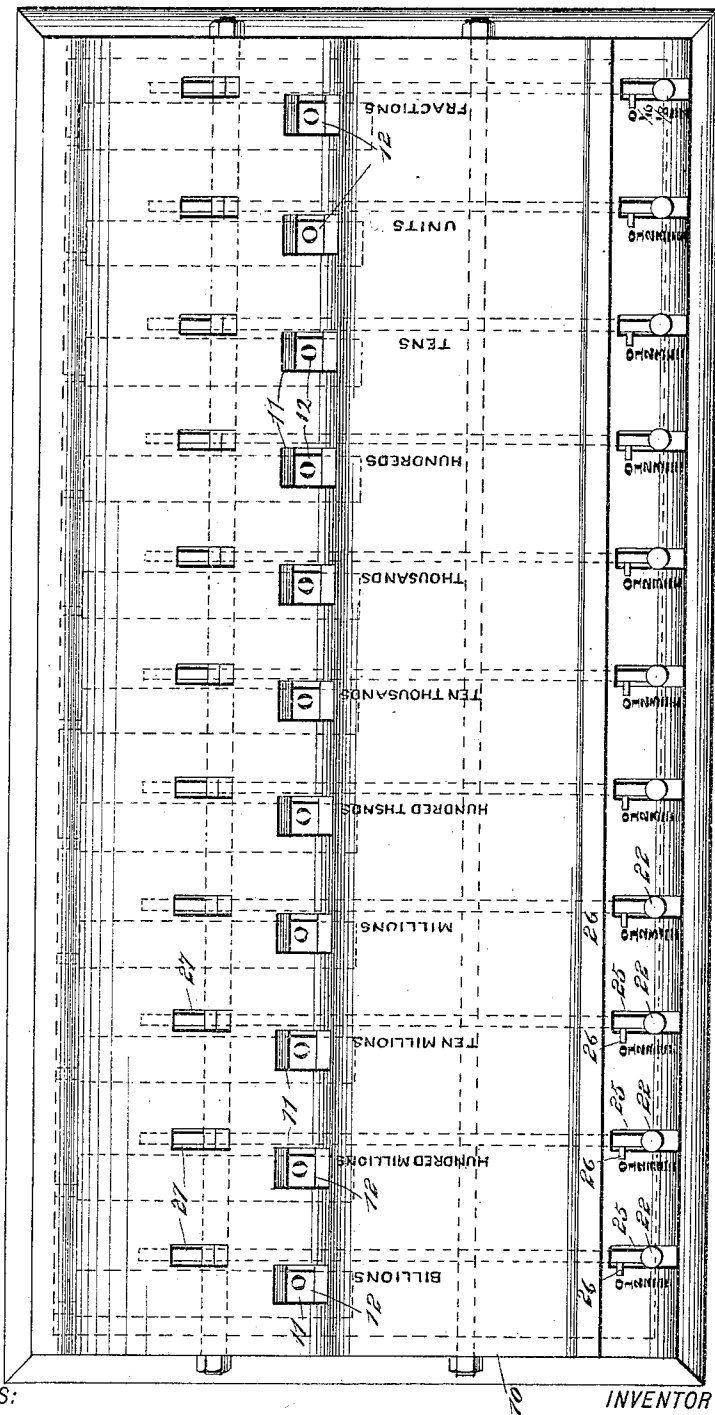
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Munn & B
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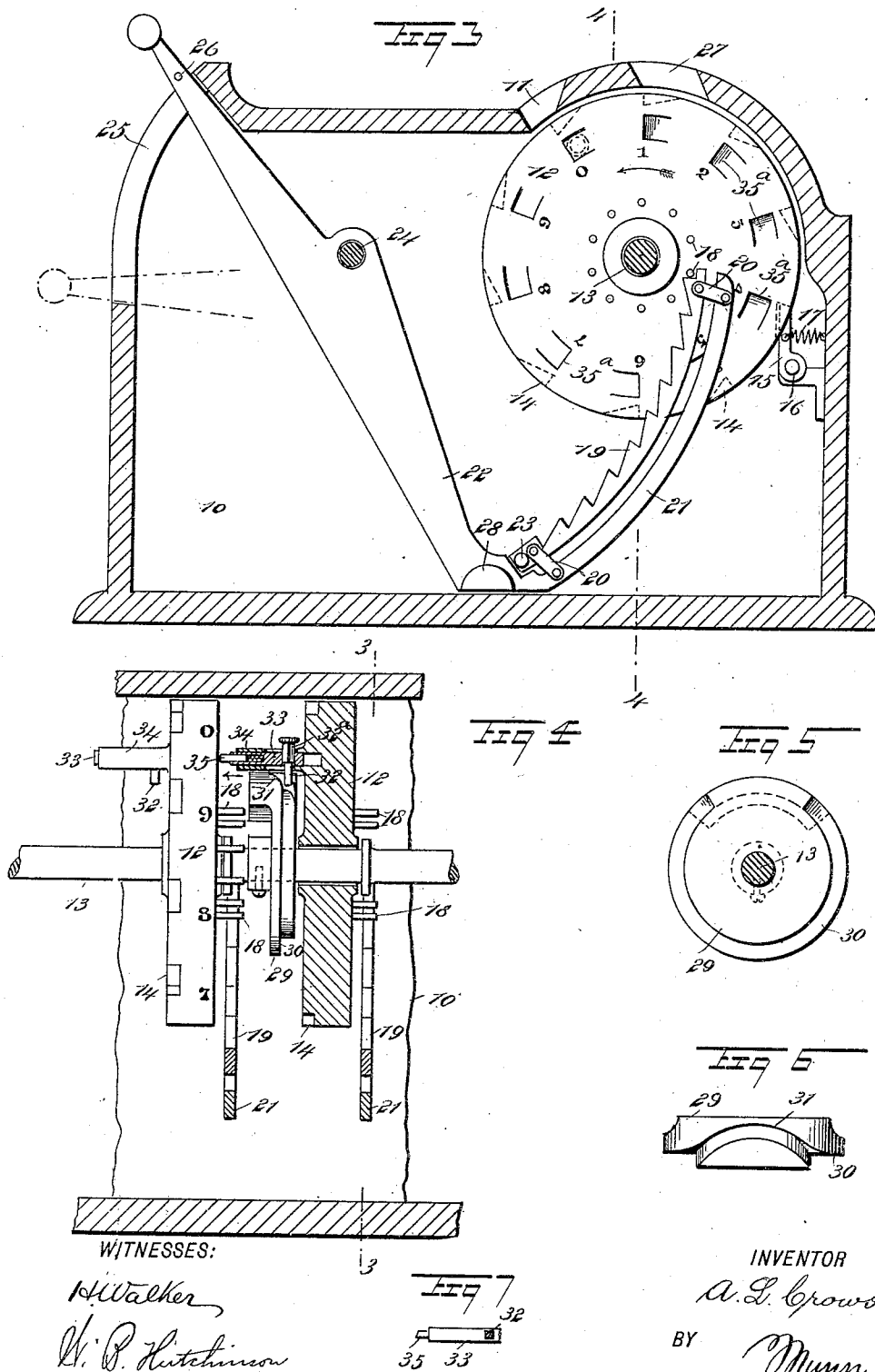
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W. P. Hutchinson

INVENTOR

A. L. Crowson.

BY

Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ALBERT L. CROWSON, OF SPARTA, LOUISIANA.

ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 553,107, dated January 14, 1896.

Application filed February 26, 1895. Serial No. 539,802. (No model.)

To all whom it may concern:

Be it known that I, ALBERT L. CROWSON, of Sparta, in the parish of Bienville and State of Louisiana, have invented a new and Improved Adding-Machine, of which the following is a full, clear, and exact description.

My invention relates to improvements in adding or calculating machines; and the object of my invention is to produce a machine of great simplicity and durability, which can be easily and rapidly operated, which is adapted to add whole numbers and fractions with the greatest accuracy, and which has a peculiar arrangement of number-wheels and carrying devices adapted to be used with any suitable key mechanism.

To these ends my invention consists of certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a front elevation of my improved adding-machine. Fig. 2 is a plan view of the machine. Fig. 3 is a cross-section on the line 3 3 of Fig. 4. Fig. 4 is a broken longitudinal section on the line 4 4 of Fig. 3. Fig. 5 is a detail elevation of one of the cam-wheels used in carrying. Fig. 6 is an edge or plan view of the said cam-wheel. Fig. 7 is a detail view of the pawl actuated by the cam-wheel, and Fig. 8 is a face view of one of the number-wheels.

The machine is provided with a suitable containing case 10, in the top of which are sight-slots 11, which register with revoluble number-wheels 12, which are arranged beneath the slots, and the first of these wheels has on its face fractions representing sixteenths, although the wheel may be subdivided to represent fractions of different denominations, and the other wheels are numbered regularly from 0 to 9—that is, they show the nine digits and the naught-mark. These wheels are arranged in consecutive series to represent units, tens, hundreds, &c., the denomination of each wheel being preferably indicated on the case, as shown clearly in Fig. 2.

The wheels 12 are independently journaled

on the shaft 13, which is held longitudinally in the case 10, and as the fraction-wheel is larger in diameter than the other wheels the axis of the shaft where the fraction-wheel is located is lower than the axis of the remaining part, as shown at 13^a in Fig. 1, this arrangement bringing the top of the fraction-wheel level with the tops of the other wheels 12.

The wheels 12 are provided with peripheral notches 14, which are engaged by detents 15 behind the wheels, (see Fig. 3,) each detent being pivoted, as shown at 16, and pressed into engagement with its wheel by a spring 17, but any suitable detent may be used.

The wheels 12 are rotated by means of pins 18, which project from the sides of the wheels, the pins being arranged on one side of each wheel, and the pins of each wheel are engaged by a curved rack 19, which is pivotally connected by means of links 20 with the upturned inner end 21 of a key 22. The rack is prevented from dropping down too far by a stop 23 contacting with a portion of the key, and so when the end 21 of the key is raised the rack engages the pins 18 and turns the wheel, and when the key drops back the pivotal connection between the key and rack permits the rack to slide back over the pins without difficulty. The stop 23 may be weighted or connected to a spring whereby the rack 19 will be automatically retracted.

Each key 22 is pivoted on a rod 24 which is arranged parallel with the shaft 13 and the key projects outward through a slot 25 in front of the machine, and is provided with a pointer 26 which moves over a row of numbers at the side of the slot 25, these numbers corresponding with the numbers on the wheel 12 with which the key connects, and when the outer end of the key is depressed a certain distance the inner end of the key is correspondingly raised, and the rack 19 engaging the pins 18 turns the number-wheel a distance corresponding with the movement of the pointer over the numbers on the case. The case is slotted at the top, as shown at 27, to provide for the upward movement of the inner ends 21 of the keys 22, and in order that the keys may automatically return they are weighted at their lower ends, as shown at 28, although springs may be substituted for the weights if desired.

By employing the curved racks I am enabled to use a lever, the two portions of which are integral, resulting in a less number of separate parts to be cast, and, further, the operation of the rack is made positive.

The following mechanism is employed for carrying the tens—that is, for turning a wheel a distance of one space or number at every revolution of the wheel of the next denomination. A cam-wheel 29 is placed rigidly on the shaft 13, next each wheel 12, this cam-wheel having a cam-track 30 thereon, which, at one point, is swelled or curved outward, as shown at 31 in Fig. 6, and this cam-track receives and guides a pin 32 on a pawl or pin 33 which slides laterally from the wheel 12 in a slotted hollow guide 34 on the wheel 12, so that when the pin 32 enters the curved part 31 of the cam-track the pawl 33 is forced toward the next adjacent wheel of higher order, as indicated by the arrow in Fig. 4. The pawl 33 is provided with a tubular forward portion wherein is arranged a pin 35 backed by a spring, as clearly seen in Fig. 4. When the pawl 33 is forced toward the next adjacent wheel of higher order, as aforesaid, said pin 35 enters one of the notches 35^a of the next wheel 12 of the next highest denomination, and while the pawl is traveling through the part 31 of the cam-track it is held in engagement with the said notches and so moves the next highest wheel a distance of one number, which fact may be noted in the sight-slot 11. When the pin 35 has entered one of the notches in the next wheel 12 of higher order, it is evident that said next wheel may be rotated by pressure upon its key mechanism without imparting motion to the wheel-carrying pin referred to, the inclined bottom of the notch forcing the pin back against the pressure of its spring. The pin 32 has a squared upper portion 32^a that it may be raised and partially turned and thus be held with its lower end above the cam-groove, to disconnect the two number-wheels, thus rendering the wheels inoperative one with another.

The machine is operated as follows: If, for instance, 291 is to be added to 125, the keys of the units, tens, and hundreds wheels are depressed, the first until the pointer 26 comes opposite the numeral 5, the second until the pointer 26 comes opposite the numeral 2, and the third until the pointer 26 is opposite the numeral 1, and this makes the numbers 5, 2, and 1 appear in the units, tens, and hundreds slots 11, the action being effected by the keys acting on the racks 19 and pins 18 in the manner already described. The units-key is then depressed one number, which causes the first or units number-wheel to turn the distance of one space or number, and 6 will appear in the units sight-slot. The tens-key is then depressed a distance of nine numbers or numerals, and this will carry the tens-wheel around until 1 appears in the tens-slot; but while this is being done the pawl 33 of the tens-wheel will be carried so that

its pin will enter the bend 31 in the cam-track 30 of the cam-wheel 29, and so the hundreds-wheel will be moved by the pawl 33 a distance of one number, and when after this the hundreds-wheel is turned by depressing the hundreds-key a distance of two numbers the number 4 will appear in the hundreds sight-slot, because the key will have turned the hundreds-wheel two numbers and the pawl 33 will have turned it one number, and consequently the final result, 416, will appear in the three sight-slots of the machine.

If fractions are to be added, the fraction-wheel is turned by its key in the manner already described, and when the wheel has made a complete rotation it will turn the units-wheel one notch or number by means of the mechanism already fully described.

The fraction-wheel is placed lower upon the shaft 13 because being divided into more parts, and said parts are necessarily closer together, so that when the fraction-wheel is moved the distance of one of its parts or one-sixteenth of its circumference (when the pawl is engaged with the notches on the units-wheel) it will cause the units-wheel to be rotated one-tenth of its circumference. Thus the smaller the divisions of the fraction-wheel the lower said wheel is mounted upon the shaft, and the notches of the units-wheel are correspondingly nearer to its center.

I do not desire to limit myself to the precise construction and arrangement of my invention as herein shown, since it is evident that by slight modifications the device may be applied for different purposes. For example, by changing the key mechanism or by lifting off said mechanism entirely and substituting suitable gearing, the device may be transformed into a counter for determining the rotations of shafting and the like.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An adding machine comprising a series of independently rotating number wheels, a cam fixed between the pairs of wheels, a hollow guide extended laterally from one wheel and having a longitudinal slot in its wall, a spring-yielding pawl in said guide, a pin extended transversely through the slot in the guide and through the pawl, the said pin being movable with relation to the pawl into a line of engagement with a cam whereby the pawl may be moved into operative engagement with the wheel of next higher order, the said pin being also adapted to be moved and locked in a position out of the line of engagement with the cam whereby no movement can be imparted to the pawl by the cam, substantially as specified.

2. In an adding machine, the combination with a fixed shaft and the rotatable number wheels thereon for indicating integers, of the rotatable fraction wheel on said shaft, the said fraction wheel being of larger diameter than the other said number wheels and hav-

ing its axial center on a lower plane than the axial centers of the other said number wheels, whereby the top of said fraction wheel will be level with the tops of the other wheels, substantially as specified.

5 3. The combination, with the number wheels having the laterally projected pins, of the tilting key having the integral upturned and curved inner end, movable in the arc of a cir-

cle, the curved racks, the links connecting the rack with the upturned inner end of the lever, and a stop to limit the downward movement of the rack with relation to the key, substantially as specified. 10

ALBERT L. CROWSON.

Witnesses:

J. D. JAMES,
G. W. MOON.