

ADDING MACHINE.

Patented Jan. 23, 1912.

2 SHEETS—SHEET 1.

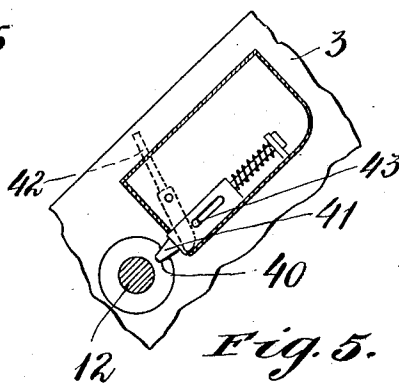
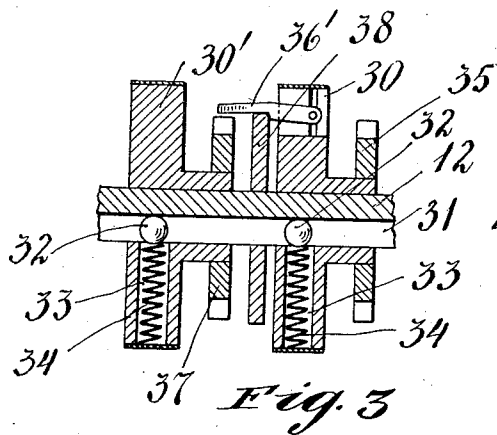
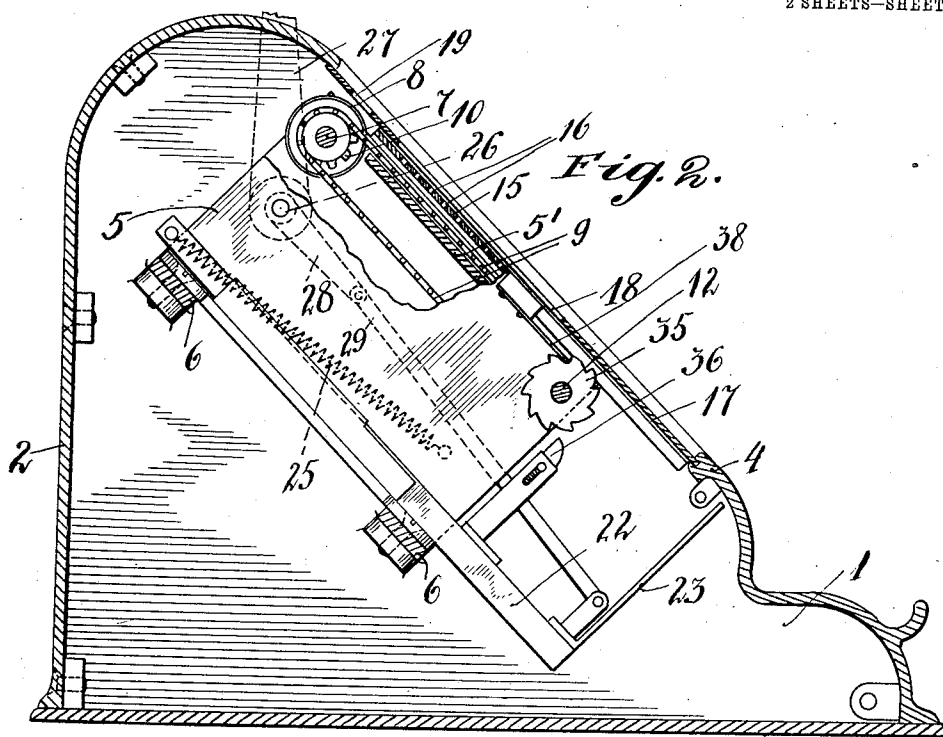


Abraham I. Gancher ^{Inventor}
By ^{Attorney} $\frac{1}{2}$ ~~Wm. B. Ordway~~

1,015,307.

A. I. GANCHER.
 ADDING MACHINE.
 APPLICATION FILED MAY 18, 1911.

Patented Jan. 23, 1912.
 2 SHEETS—SHEET 2.



Witnesses:
Henry C. Heilig
R. Brockman.

Abraham I. Gancher
 By *Attorney*
Max. Vidmann

UNITED STATES PATENT OFFICE.

ABRAHAM I. GANCHER, OF NEW YORK, N. Y.

ADDING-MACHINE.

1,015,307.

Specification of Letters Patent.

Patented Jan. 23, 1912.

Application filed May 18, 1911. Serial No. 627,895.

To all whom it may concern:

Be it known that I, ABRAHAM I. GANCHER, a citizen of the United States of America, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Adding-Machines, of which the following is a specification.

The present invention relates to adding machines such as shown and described in the United States Letters Patent 847,759, granted to Abraham I. Gancher and Albert P. Zabriskie on March 19, 1907.

One object of my invention is to provide means, which will enable the operator to read off each item after it is added and before the adding of a further item, so as to avoid mistakes.

A further object of my invention is to provide means, whereby the number in the order of arrangement of a series of items to be added will be automatically indicated on the machine after each addition, so that the operator can make no mistake as to which of the items was already added.

My invention further has for its object to provide means, whereby the several devices of the machine may be simultaneously reset to zero.

With these and other objects in view, my invention consists in the construction, arrangement and combination of parts as hereinafter fully specified and claimed.

In the accompanying drawings, which form a part of this specification and in which similar reference numerals denote corresponding parts, Figure 1 is a front elevation of the machine of which a part is broken away to show some details of construction; Fig. 2 is a section on line 2—2 of Fig. 1; Fig. 3 is a sectional view of a detail; Fig. 4 is a section on line 4—4 of Fig. 1; and Fig. 5 is a section on line 5—5 of Fig. 1.

The construction of the adding machine being substantially identical with that of the aforesaid patent, I shall not describe the details which have been fully disclosed in the said patent, but shall restrict myself only to those parts that are new and whereby the aforesaid objects are attained.

The casing 1 of the adding machine has an open front face and a removable back 2 and the side walls 3 of the casing have inclined front edges 4. Inside of said casing a substantially rectangular frame 5 is se-

cured to cross bars 6 fixed in the casing, so as to extend in an inclined position parallel to the plane of the front edges of the casing. In the upper front end of the said frame is the shaft 7 on which are mounted to turn loosely number wheels 8, 8', 8², 8³ and 8⁴ corresponding in their construction and arrangement and adapted to serve the same purpose as the number wheels D, D' . . . shown in the aforesaid prior patent. The turning of the number wheels manually and independently of one another, is accomplished by sprocket chains 9 which are passed around sprocket wheels 10 fixed on the shaft 7 and also around sprocket wheels 11 mounted to loosely turn in one direction on the resetting spindle 12 journaled in the frame 5 at the lower end thereof and having one end extending through the casing 1.

The table 5' which is formed integrally with or is fixed to the frame 5 and over which the sprocket chains 9 travel is formed with guide ways 5² for the chains and fixed to said guide ways to extend longitudinally of the sprocket chains are bars 13, each having lateral guide grooves 14 (Figs. 1 and 4). Slidingly engaging the oppositely located guide grooves of two adjacent bars 13 are plates 15, 15', 15², 15³ and 15⁴, of which each bears on its outer face numerals *n* from "9 to 0" arranged one below the other in longitudinal direction of the plate, and of which each is provided with a series of perforations 16 arranged in alinement with the said numerals. The said plates extend over the sprocket chains and their perforations 16 are adapted to coincide each with a space between two adjacent links of the sprocket chains, the distance between the adjacent perforations or the numerals on the plates corresponding to the length of a link of the sprocket chain. The open face of the casing is covered by a plate 17 which has parallel recesses 18 of such a width and length as to expose all numerals and perforations of each slidable plate 15, 15' . . . when the latter are in their initial position. In longitudinal alinement with these recesses and above the latter are the total openings 19, of which each is arranged over a number wheel and which are adapted to expose a single number of the corresponding wheel. At one side of the plate 17 two further openings 20 are provided (one only being shown) adapted to

expose a single numeral of item counters arranged on the resetting spindle 12 in a manner and for the purpose as will be hereinafter specified.

5 To operate the adding wheels, the operator inserts the pointed end of an appropriate tool into the perforation of one of the sliding plates engaging with it the corresponding chain and pulls the slide together with
10 the chain downward until the tool strikes the lower edge of the corresponding recess in the face plate 17, whereby the adding wheel in the manner described in the above named patent is given a turn exposing a
15 certain number through the item opening. Thus, for instance, if the item to be added is "123" the operator inserts his tool into the perforation corresponding to the numeral 3 on the sliding plate 15⁴ and engaging with
20 his tool the corresponding chain, pulls the slide 15⁴ and chain down until the tool strikes the lower edge of the corresponding recess in plate 17. In the same manner, but engaging at a point 2 he operates the slide
25 15³ and so on. The item "123" appears at the lower edges of the recesses in the plate 17, and remains in that position, until the next item is added. The operator thus is enabled before he makes the next addition
30 to assure himself that the figures of the item have been correctly added. Of course, with the first item only added the item would also appear in the total openings 19, but when further items are added, the numerals
35 appearing in the said openings will be the totals and not show whether or not the figures of the items were correctly added. In the patent above referred to there was no way of controlling the correctness of the addition
40 made, since the number plates there are stationary and upon the displacement of the sprocket chains, there was nothing to show that the operator had engaged the said chain at the proper point.
45 After an addition of an item is made, the corresponding sliding plate or plates are displaced and before the next item can be added it is necessary to return the said plate or plates into initial position. To accom-
50 plish this, I provide a frame 22 which is slidably guided in the stationary frame 5 and which has a forwardly projecting part 23, the forward edge of which is formed with a series of projections 24. The latter
55 in number correspond with the number of the slidable plates 15, 15' . . . and are so spaced apart from one another as to register with the forward or lower edge of a sliding plate. This slidable frame 22 is capable of
60 an up and down movement and by means of a spring 25 is so connected to the stationary frame 5 that normally it will be pulled downward and away from the forward edges of the slidable plates. Journaled in
65 the frame 5 is a spindle 26 one end of which

extends outward through the casing 1 and carries a crank arm or handle 27. By means of a crank 28 and pitman 29 or other suitable means, reciprocatory motion can be transmitted from the spindle 26 to the frame 22. Thus, on turning the spindle by means of the handle 27, the frame 22 against the tension of its spring 25 will be given a movement toward the lower edges of the slides 15, 15' . . . thereby engaging with
75 its projections 24, the said slides, and returning them into initial position. The slides owing to their inclined position and the friction in their guides will be retained in the position into which they have been
80 placed.

The item counters above referred to comprise two (or more) number wheels 30, 30' containing on their peripheral faces successively arranged numerals n' from "0 to 9"
85 one wheel, as 30, representing units, the other 30' tens, etc. The wheels 30 and 30' are mounted on the resetting spindle 12, which has a groove 31, in the same manner as the wheels N in the abovenamed patent, 90 that is to say, by means of a ball 32 acting in a radial recess 33 and pressed on by a spring 34, so that the said wheels are free to rotate on the spindle 12 in one direction but will be coupled with the spindle when
95 the latter is turned in the opposite direction. Fixed to one of the wheels, in the present case, to the unit wheel 30, is a ratchet wheel 35 arranged in the path of a spring tooth 36 carried by the reciprocatory
100 frame 22, so that when after the addition of an item has been effected and on the frame 22 being operated in the above described manner, to reset the displaced slides 15, 15' . . . , the tooth 36 engages the wheel 35
105 and feeds thereby the wheel 30, a distance of one numeral. This feeding of the wheel 30 is repeated each time the frame 22 is given an upward movement to reset the plates 15, 15' When the unit wheel has been
110 fed all around, that is to say from "0 to 9" then the wheel 30' will come into operation to expose the tens. To this end, a similar arrangement is provided as with the number wheels D, D', D² . . . in the patent above
115 referred to, viz. the wheel 30 is provided with a sidewise extending pawl 36' fulcrumed in said wheel and adapted to engage a ratchet wheel 37 secured to the hub of the next wheel, in this case, wheel 30', and the
120 said pawl rides on the peripheral surface of a disk cam 38 secured to the spindle 12. The disk cam 38 is arranged to normally hold the pawl 36' out of engagement with the wheel 37, and is so formed as to allow
125 the pawl 36' to move into engagement with the tooth of the ratchet wheel 37 with a view to turn the latter to rotate the wheel 30' to bring the next following numeral into
130 view at the aperture 20. Spring pawls 38

secured to a stationary part engage the ratchet wheels 37 and 35 to prevent the number wheels 30, 30' from turning in opposite direction. It will be observed, that by the aid of these wheels, the numerals of which will be exposed at the apertures 20, the items added will be counted and there will be no possibility for making a mistake in the choice of the correct item to be added.

10 The device for simultaneously resetting all devices to zero is constructed as follows: The hub of the knob 39 which is fixed to the resetting spindle 12 has on its peripheral face at a point corresponding to the zero position of the adding wheels 8, 8' . . . and the item counter wheels 30, 30' a notch 40. In a small casing fixed to the side wall of the casing 1 of the machine, a spring actuated tooth 41 is provided, which normally projects outward of the casing toward the hub of the knob. A fulcrumed handle 42 arranged outside of the casing is adapted to engage a projection 43 on the tooth, whereby the tooth may be lifted out of engagement with the notch 40. When it is desired to reset the devices to the zero position, the tooth 41 is allowed to ride on the periphery of the hub of the knob and the spindle 12 is turned around by means of said knob. As soon as the tooth 41 encounters the notch 40 it will engage the latter, locking the spindle in the zero position.

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

1. In an adding machine, the combination with number wheels and manually controlled means for turning said number wheels, of a slidable member for each number wheel, said slidable member bearing on its face successive numerals and having perforations arranged in alinement with said numerals and in register with the said means, and serving to enable the simultaneous operation of the said means and of the displacement of said sliding members.

2. In an adding machine, the combination with number wheels, and manually controlled sprocket chains for operating said wheels, of a slidable member for each number wheel arranged longitudinally to and over a sprocket chain and having on its face successive numerals and perforations arranged in alinement with the said numerals and in register with the links of said sprocket chains, and serving to enable the simultaneous operation of the said sprocket chains and of the displacement of the said sliding members.

3. In an adding machine, the combination with number wheels and manually controlled sprocket chains for operating said wheels, of a slidable member for each number wheel

arranged longitudinally to and over said sprocket chains and having on its face numerals and perforations arranged in alinement with said numerals and in register with the links of said sprocket chains, and manually controlled means for simultaneously resetting the displaced sliding members.

4. In an adding machine, the combination with number wheels and manually controlled sprocket chains for operating said wheels, of a slidable member for each number wheel arranged longitudinally to and over said sprocket chains, and having on its face numerals and perforations arranged in alinement with said numerals and in register with the links of said sprocket chains, reciprocal members arranged in the path of said sliding members and means for manually controlling said reciprocal members to simultaneously reset all said sliding members.

5. In an adding machine, the combination with number wheels and manually controlled sprocket chains for operating said wheels, of a slidable member for each number wheel arranged longitudinally to and over said sprocket chains and bearing on its face numerals and perforations arranged in alinement with said numerals and in register with the links of said sprocket chains, a reciprocal frame having members arranged in the path of said sliding members, a manually controlled spindle and means operatively connecting said spindle with said reciprocal frame.

6. In an adding machine, the combination with a casing, number wheels and manually controlled sprocket chains for operating said wheels, of a sliding member for each number wheel arranged longitudinally to and over said sprocket chains and having on its face numerals and perforations in alinement with said numerals and a face plate in said casing having recesses over said sliding members to expose the numerals and perforations therein and apertures exposing the numerals of the number wheels.

7. In an adding machine, the combination with the resetting spindle, of sliding members, a reciprocal member cooperating with said sliding members, to reset the latter, an item counter comprising a number wheel mounted on said resetting spindle to loosely turn in one direction, a ratchet wheel connected to said wheel and operated from said reciprocal member.

In testimony whereof I affix my signature in presence of two witnesses.

ABRAHAM I. GANCHER.

Witnesses:

JOHN T. CARMODY,
MAX D. ORDMANN.