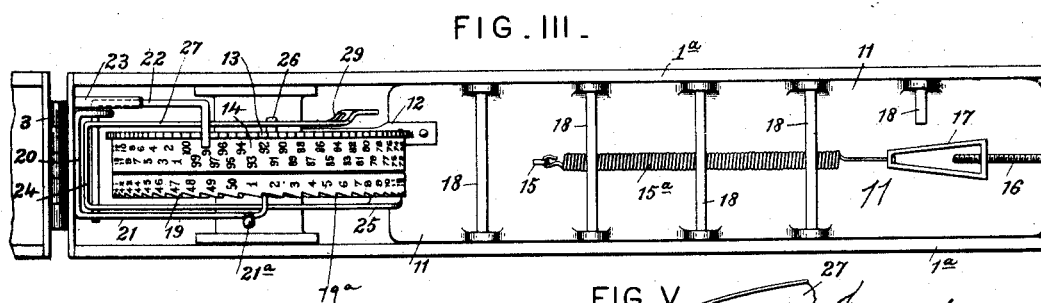
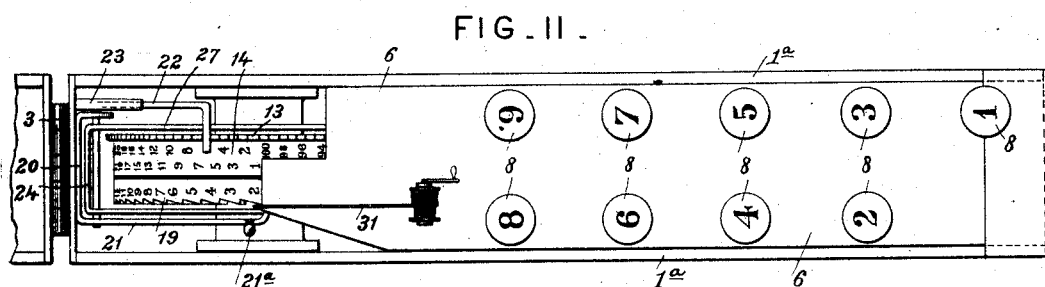
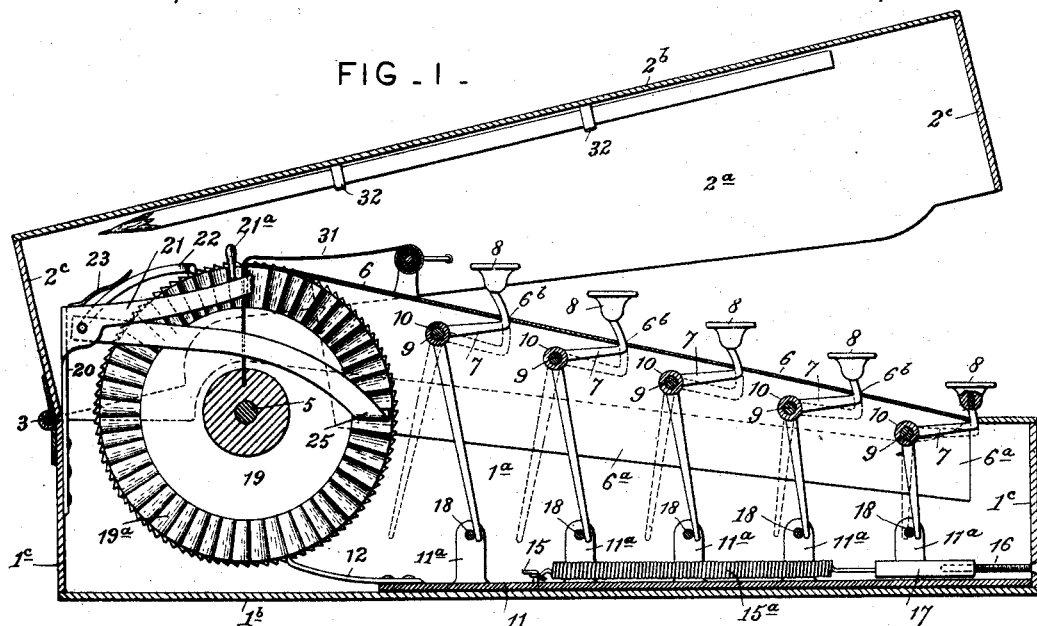


(No Model.)

E. E. WITTER.
ADDING MACHINE.

No. 423,364.

Patented Mar. 11, 1890.



Attest:
Geo. T. Smallwood
Geo. H. Wheelock

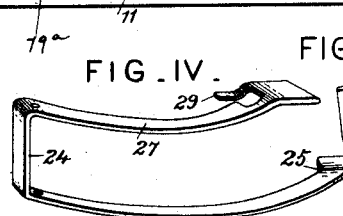


FIG. V.

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UNITED STATES PATENT OFFICE.

EZRA EDGAR WITTER, OF MILFORD CENTRE, OHIO.

ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 423,364, dated March 11, 1890.

Application filed June 12, 1889. Serial No. 314,027. (No model.)

To all whom it may concern:

Be it known that I, EZRA EDGAR WITTER, a citizen of the United States, residing at Milford Centre, in the county of Union and State of Ohio, have invented certain new and useful Improvements in Adding-Machines, of which the following is a specification.

My invention relates to that class of adding-machines that are provided with a series of keys which operate through suitable mechanism upon counting-wheels which register the amount added up; and the invention has for its object the production of a device that may be carried in the pocket, and differs from others in use in not being cumbersome and expensive.

My invention consists in certain features of novelty to be hereinafter fully described, and then particularly pointed out in the claims.

In order that my invention may be fully understood, I will now proceed to describe the same with reference to the accompanying drawings, in which—

Figure I is a longitudinal sectional view of my improved adding-machine, showing the cover partly raised. Fig. II is a plan view, the cover being broken off. Fig. III is a top view with the key-board removed. Fig. IV is a perspective view of the swinging yoke, and Fig. V is a detail of a part thereof.

The casing is constructed with sides 1^a, bottom 1^b, and ends 1^c. The upper edges of the sides are inclined from near one end to near the other end, where they provide bearings for a rotatable shaft 5, situated near the hinge-connection 3 of the lid with the casing. The lid is provided with sides 2^a, top 2^b, and ends 2^c, said sides having their lower edges complementary to the upper edges of the sides of the casing, so that when the lid is closed a neat elongated box is the result.

6 is the inclined key board or plate, having downturned edges 6^a, that are secured on the inner sides of the casing. The hinge end of the casing is the back and the other end is the front. The key-board inclines upwardly from the front, as shown in Fig. I, toward the back.

In the drawings nine key-levers 7 are shown, the upper ends of which are screw-threaded and project through openings 6^b in the key-board 6. Keys or knobs 8 are

screwed onto the upper ends of the levers 7, and by them the throw of the levers may be regulated. The shape of the key-levers is shown in Fig. I. These levers are fulcrumed on pintles 9, extending from side to side of the key-board just below its top. There are five pintles shown, on the first or front one of which lever No. 1 is fulcrumed; on the second, levers Nos. 2 and 3; on the third, levers Nos. 4 and 5; on the next, levers Nos. 6 and 7, and on the last levers Nos. 8 and 9, so that on each of the pintles excepting the first there is a pair of levers. Between each of the levers of each pair there is interposed a sleeve 10 to keep them apart. The numbers of the levers are placed on the top of the keys, as usual.

In the bottom of the casing is fitted a slide 11, having upwardly-extending sides 11^a. The rear end of this slide is provided with a spring-catch 12, that engages with the teeth of a ratchet-wheel 13, fixed on the side of the registering-wheel 14, that is provided with the units and tens on its periphery, as shown, said ratchet and registering wheel being fixed on the shaft 5.

Fixed at 15 to the slide 11 is a spiral spring 15^a, which extends forward and is secured by a tightening-screw 16, that passes through the front of the casing and engages in a perforation in the yoke-piece 17, attached to the spring. This spring removes the catch 12 from engagement with the teeth of the ratchet-wheel 13 by drawing the slide forward. The lower ends of the key-levers engage projections or pins 18, fixed to and extending from side to side of the slide, there being five projections or pins. When the keys are depressed, the catch 12, being pushed back and operating the units-and-tens wheel through the ratchet-wheel 13, will cause the units-and-tens wheel to move a distance depending on the number of teeth passed over before one of the teeth is engaged by the catch.

To the end that the catch will engage a tooth when the key No. 1 is depressed, without passing over a tooth, pass over one and engage the second one of the teeth when key No. 2 is depressed, pass over two and engage the third one of the teeth when key No. 3 is depressed, and so on, I make the levers from 1 to 9, inclusive, of gradually-increasing

length, and this increased length is provided for by inclining the key-board from the front upwardly and fulcruming the levers on the pintles that are arranged at or about the same distance below the key-board. By this arrangement it will be seen that a number of teeth will be passed over by the catch 12, one less than the number on the key depressed before a tooth is engaged.

When the tens have been exhausted, the hundreds-wheel 19, that is mounted loosely on the shaft 5 alongside the units-and-tens wheel, should be moved one number higher, and this is accomplished by means of the following mechanism:

20 is a bracket at the rear end of the casing, that extends upwardly, and is provided with a detent 21, that engages the teeth 19^a on the side of the hundreds-wheel. This detent has a thumb-piece or handle 21^b, by means of which to draw the detent out of engagement with the teeth of the hundreds-wheel.

22 is a U-shaped detent, one leg of which is journaled in the sides of the bracket 20 and constitutes the pivot of the detent, and the other leg constitutes the detent proper that engages with the teeth of the ratchet-wheel 13 to keep the latter from retrograde movement. The detent end is engaged by the free end of a spring 23, fixed at its other end to the bracket 20, to hold the detent in engagement with the teeth of the ratchet-wheel 13.

Mounted loosely on the pivot of the detent 22 is a swinging yoke 24, both arms of which curve downwardly on the outer sides of the registering-wheels. One arm constitutes a pawl 25, that is bent or curved inwardly and upwardly, so as to engage the perpendicular faces of the teeth 19^a of the hundreds-wheel 19 and move said hundreds-wheel a distance of one tooth when it is elevated and ride over the inclined faces of the teeth when depressed, the hundreds-wheel being held from retrograde movement by the detent 21 when the pawl 25 is out of engagement with the teeth.

26 is a pin projecting outwardly from the side of the units-and-tens wheel, and is so situated that when the tens have been exhausted it will engage under the lever 27, which is the other arm of the yoke 24, and raise said lever and consequently the pawl 25 with it, thus moving the hundreds-wheel one tooth or one number. As the units-and-tens wheel continues to revolve, the pin 26 passes into a recess 28 in the lower end of lever 27 and engages with a hook 29, projecting rearwardly from the lever, causing the lever and consequently the pawl 25 to be depressed and the latter to be engaged under another tooth. The extreme end of the lever 27 is bent out, and at the commencement of the hook it is notched at 30, and this is done so that the pin may pass under the lever and through the notch to permit the units-and-tens wheel to further rotate.

When it is desired to reset the hundreds-

wheel back to number 1, a cord 31, wound around the hub of said wheel, is pulled slightly outwardly, so as to press on the pawl-arm of the yoke and draw the pawl out of engagement with the teeth, said cord extending up from the inner side of the pawl-arm. Before the cord is pulled in this manner the detent 21 should be drawn out of contact with the teeth of the hundreds-wheel by pulling on its thumb-piece 21^b.

Clips 32 may be provided, as shown, for securing pen-holders and pencils in the lid.

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

1. In an adding-machine, the combination of a series of vertical key-levers of gradually-increasing throw, having free lower ends, a horizontal slide engaged by the lower ends of said levers provided with a catch, and the registering-wheels operated by said catch, substantially as and for the purpose set forth.

2. In an adding-machine, the combination of a series of key-levers of gradually-increasing throw, an inclined key-board, below which said levers are fulcrumed at or about an equal distance from the top of the board, the keys screwed onto the upper ends of said levers above the board, a slide operated by said levers and provided with a catch, and the registering-wheels operated by said catch, substantially as and for the purpose set forth.

3. In an adding-machine, the combination of a series of vertical key-levers of gradually-increasing throw, having freely-swinging lower ends, a slide operated by said levers and provided with a catch, projections on said slide, with which the lower ends of the levers engage, a spring for retracting the slide, and the registering-wheels operated by said catch, substantially as set forth.

4. In an adding-machine, the combination of a slide carrying a catch, means for actuating said slide, a spiral spring secured at one end to said slide, a tightening device at the other end, consisting of a yoke or nut and a screw passing through the latter, and the registering-wheels operated by said catch, substantially as set forth.

5. The combination, in an adding-machine, of a series of vertical key-levers numbered from 1 to 9, respectively, and gradually elongated, an inclined key-board, through which the levers project, pintles below said board at or about the same distance from the top of said key-board, said levers, excepting No. 1, being fulcrumed on said pintles in pairs, with the lower ends projecting freely downward, a slide operated by said levers and carrying a catch, and registering-wheels operated by said catch, substantially as set forth.

6. In an adding-machine, the combination, with a pair of registering-wheels, means for actuating one of said wheels, and means for actuating the other through the medium of the latter, consisting of a pin, a lever engaged by said pin and having a recess, a hook on

the lever engaged by said pin below the recess, and a pawl actuated by the lever, substantially as set forth.

7. In an adding-machine, the combination,
5 with a units-and-tens wheel having means of rotation and a pin projecting therefrom, of a lever engaged by said pin to move the lever in one direction, a hook carried by the lever and engaged by said pin to move the lever in
10 the other direction, a pawl moved by said lever, and a hundreds-wheel having teeth engaged by said pawl, substantially as set forth.

8. In an adding-machine, the combination,
15 with a units-and-tens wheel, positive means for rotating it, and a pin on the wheel, of a lever engaged by the pin for moving the lever in one direction, a hook on the lever engaged by said pin to move the lever in the opposite direction, a pawl moved by said lever,
20 a hundreds-wheel having teeth engaged by

the pawl, and a detent engaging said teeth, substantially as set forth.

9. In an adding-machine, the combination of a units-and-tens wheel having means of rotation, a pin carried by the wheel, a hun- 25 dreds-wheel having a hub, a cord attached to the hub, a lever engaged by said pin, a pawl operated by the lever and engaging the teeth of the hundreds-wheel, said cord being adapted to engage said pawl and release it 30 from the teeth of the hundreds-wheel and when pulled to bring the hundreds-wheel back to zero, and a detent also engaging the teeth of the hundreds-wheel, all substantially as and for the purpose set forth.

EZRA EDGAR WITTER.

Witnesses:

J. A. CULBERTSON,

GEO. LEGGATE.