2 Sheets—Sheet 1.

G. W. CHAPIN.

ADDING MACHINE.

No. 99,533. Patented Feb. 8, 1870.

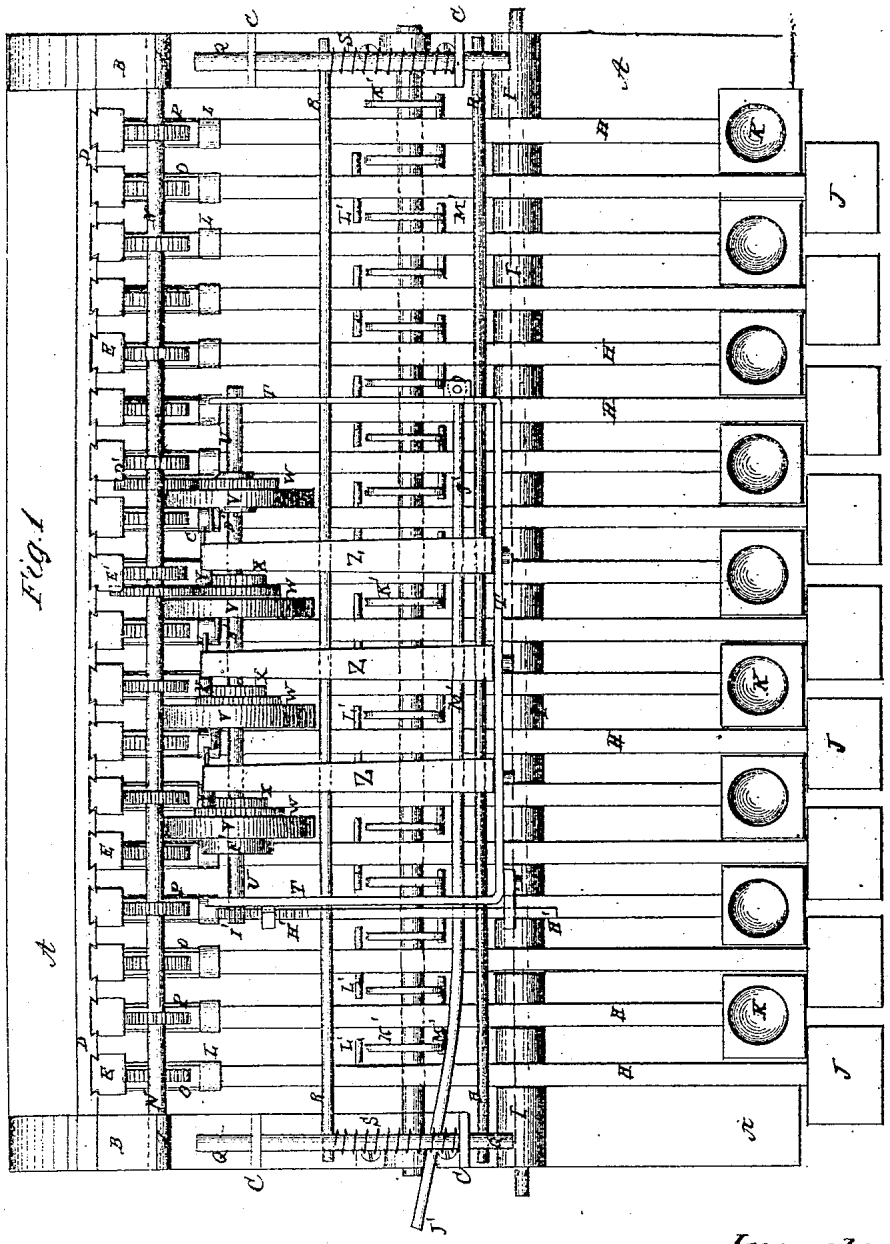


Fig. 1

Witnesses,
A. W. Almquist
Jno. C. Brooks

Inventor,
G. W. Chapin
by Munn & Co
Attys

2 Sheets—Sheet 2.

G. W. CHAPIN.

ADDING MACHINE.

No. 99,533. Patented Feb. 8, 1870.

Fig. 3

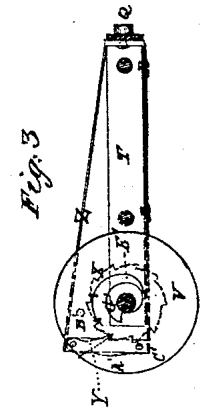
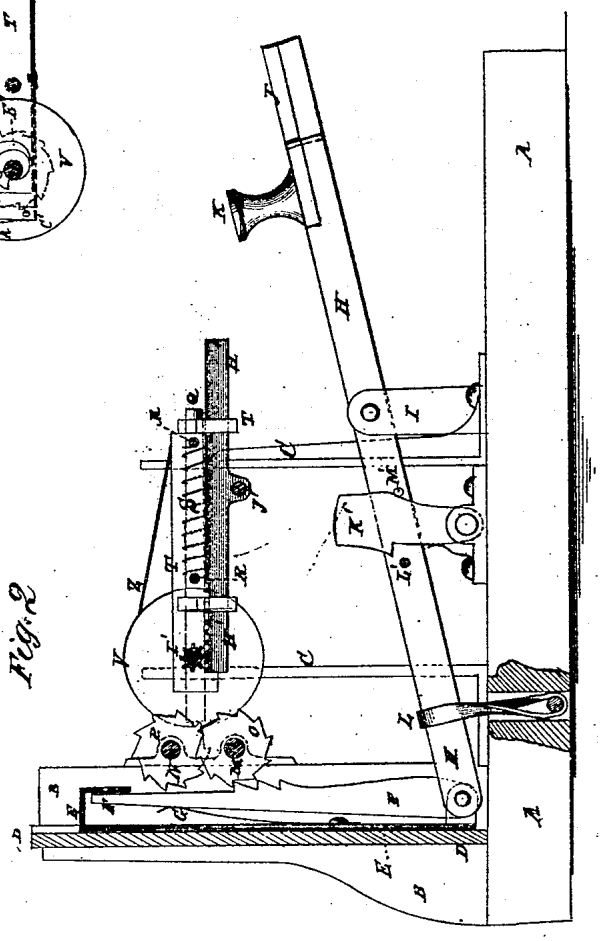


Fig. 2



Witnesses:

A. W. Almquist

Inventor:

G. W. Chapin

Per

Attorneys.

United States Patent Office.

GILBERT W. CHAPIN, OF BROOKLYN, NEW YORK.

Letters Patent No. 99,533, *dated February* 8, 1870.

IMPROVEMENT IN ADDING-MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, GILBERT W. CHAPIN, of Brooklyn, in the county of Kings, and State of New York, have invented a new and improved Adding-Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a top view of my improved machine.

Figure 2 is a vertical cross-section of the same.

Figure 3 is a detail section, showing one of the registering-wheels and its attachments.

Similar letters of reference indicate corresponding parts.

My invention has for its object to furnish a simple and convenient adding-machine, designed more particularly for book-keepers' use, and which will enable them to add columns of figures with quickness and accuracy; and it consists in the construction and combination of various parts of the machine, as hereinafter more fully described.

A represents the bed-plate of the machine, to which are attached the lower ends of the standards B C, that support the various operating-parts of the machine.

D is a vertical plate, the ends of which are secured to the posts or standards B, and the forward side of which is grooved, with a series of eighteen dovetailed grooves, in which work the vertical sliding bars E.

To the lower parts of the sliding bars E are pivoted the lower ends of the ratchet-bars F, which are held forward by the springs G, which are attached to the sliding bars E, and press against the ratchet-bars F.

The upper ends of the sliding bars E are bent forward, or have stops formed upon or attached to them, to receive the upper ends of the ratchet-bars F, and prevent them from being pushed too far forward.

Beginning at the left hand of the machine, the first two of the ratchet-bars F have each one tooth, the second two have each two teeth, and so on to the ninth two, which have nine teeth each.

To the lower ends of the sliding bars E are pivoted the inner ends of the levers H, which are pivoted to supports I, attached to the bed-plate A, and to the outer ends of which are attached keys J K.

The keys J K of the levers H are arranged in two rows, as shown in figs. 1 and 2, and are attached alternately to the said levers H, as shown in fig. 1; a key, J, of the outer row being attached to the left-hand one, and a key, K, of the inner row, to the right-hand one of the lever H of each pair of the sliding bars E.

The outer keys J are the units keys, and the inner keys are the tens keys.

The inner keys K are made high, as shown in fig. 2, so that they may be conveniently operated without disturbing the levers of the outer keys upon each side of the inner keys being operated.

The levers H, and with them the sliding bars E and the ratchet-bars F, are brought back to their places, after being operated, by springs L, connected with said levers H.

The springs L may be made of rubber or metal, and may be connected with the inner ends of the levers H, as shown in figs. 1 and 2, and arranged to draw down the inner ends of the levers; or they may be connected with the outer ends of the levers, and arranged to raise said outer ends, as may be desired.

M and N are two shafts, placed one above the other, and revolving in bearings attached to the posts or standards B.

To the shafts M and N are attached ratchet-wheels O and P, in such positions that the ratchet-wheels O, attached to the lower shaft M, may be acted upon by the ratchet-bars F, with which the outer or units keys J are connected, and so that the ratchet-wheels P, attached to the upper shaft N, may be acted upon by the ratchet-bars F, with which the inner or tens keys are connected.

Q are rods or bars, passing through and sliding longitudinally in holes in the upper parts of the posts or standards C.

R are parallel rods or bars, the ends of which are connected with the rods or bars Q, the rods or bars Q and R thus forming a frame, that may be moved toward or from the ratchet-bars F, by sliding the rods or bars Q forward or back in the posts or standards C.

The frame Q R is held forward by the coiled springs S, placed upon the rods Q, the rear ends of which rest against the rear posts C, and the forward ends of which rest against the ends of the forward rod R, or against other stops attached to the said rods Q.

T is a frame, through holes in the end bars of which the rods or bars R pass, so that the said frame T, and its attachments, may be moved back and forth upon the said bars or rods R, as may be desired.

In bearings in the forward ends of the end bars of the frame T, revolves a shaft, U, upon which is placed a series of four or more register-wheels, V, upon the faces of each of which are placed the nine digits and cipher in their natural order.

W are gear-wheels, placed upon the shaft U, at the side of the register-wheels V, and connected with said register-wheels V by a pawl and ratchet, so that when the said gear-wheels are turned forward, they may carry the said register-wheels with them, and so that the said register-wheels may be turned, when necessary, to adjust them to the zero-mark, without moving the said gear-wheels.

With each of the gear-wheels W, except the right-hand one, is connected a ratchet-wheel, X, which is acted upon by a pawl, Y, pivoted to a spring-frame or arm, Z, and held forward against the ratchet-wheel X by a small spring, A'.

The frames or arms Z are connected with the rear cross-bar of the frame T, and are made elastic, so that they may return to their former position, after being forced down, to cause the pawls Y to act upon the ratchet-wheels X.

The spring-frames or arms Z are forced down by a pin or single tooth, B', formed upon or attached to the left-hand side of the register-wheels, except the left-hand one, and which acts upon a single tooth or pin, C', attached to the spring-frames or arms Z, the pins or teeth B' being so arranged as to operate and thus move the next register-wheel one space, whenever the register-wheel with which it is connected is passing from the nine-space to the zero-space, in order to carry the tens.

D' and E' are gear-wheels, attached to the shafts M and N respectively, in such positions as to mesh into two adjacent gear-wheels W of the register-wheels V, so that the said register-wheels may be revolved by the revolution of said shafts.

To the left-hand sides of the register-wheels are attached spring-pawls F', which rest upon single-toothed ratchet-wheels G', attached to the shaft U, so that by revolving the said shaft in the proper direction, the register-wheels may all, at the same time, be revolved to the zero-mark, ready to be again used.

The shaft U may be revolved to bring the register-wheels to the zero-mark by a sliding rack-bar, H', working in supports attached to the frame T, and the teeth of which mesh into the teeth of a small gear-wheel, I', attached to the end of the shaft U.

The sliding rack-bar H' may be operated by a lever, J', or by other convenient means.

K' are hook-plates, the lower ends of which are pivoted to the bed-plate A, and which extend up between the levers H.

The hook-plates K' have hooks or shoulders formed upon their forward edges, which, when the said hook-plates are forced forward, catch upon pins L', attached to the units levers H.

The rear edges of the hook-plates K' are made inclined or curved, as shown in fig. 2, and the said hook-plates are forced forward by pins M', attached to the tens lever H. By this device, the units lever H will be locked by the movement of the tens levers, so that it will be impossible to move the said units levers accidentally when operating the said tens levers.

If desired, the vertical grooved plate D may be slotted, and the units and tens keys be connected with the sliding spring-ratchet bars E F G though said slot, so that the said sliding spring-ratchet bars E F G may be operated directly by downward pressure, applied to said keys without the interposition of levers; but in this case, the teeth of the ratchet-wheels O P must be reversed, and also the order of the numerals upon the register-wheels V, as the said wheels will necessarily revolve in the opposite direction.

In using the machine, the units or the tens may be added first, or the units and tens may be added alternately, as may be desired.

When the units and tens have been added, the sliding frame T, and its attachments are drawn back, and moved laterally, so as to bring the gear-wheels of the hundreds and thousands register-wheels into gear with the gear-wheels of the shafts M and N. The hundreds and thousands are then added in the same manner as the units and tens were added, the units and tens register-wheels remaining stationary, and showing the units and tens of the amount. Tens of thousands and hundreds of thousands may then be added in the same manner, and so on, as far as the number of register-wheels extend.

Having thus described my invention,

I claim as new, and desire to secure by Letters Patent—

1. The register-wheels V, provided with gear-wheels W, ratchet-wheels X, pawls Y, spring-arms or frames Z, and single teeth or pins B' C', in combination with the adjustable sliding frames T and R Q, substantially as herein shown and described, and for the purposes set forth.

2. The two shafts M N, placed one above the other, and provided with ratchet wheels O P and gear-wheels D' E', in combination with the gear-wheels W of the register-wheels V, substantially as herein shown and described, and for the purpose set forth.

3. The sliding spring-ratchet bars E F G, in combination with the vertical grooved plate D, and with the ratchet-wheels O P, attached to the shafts M N, substantially as herein shown and described, and for the purpose set forth.

4. A series of alternate long and short levers, with spring-keys attached thereto, when operated by the means specified.

5. The combination of the pivoted lock-plates K' and pins L' M', with the units and tens levers H, substantially as herein shown and described, and for the purpose set forth.

6. The combination of the pawl, single-toothed ratchet-wheel G', gear-wheel I', and sliding rack-bar H', with the register-wheels V, shaft U, and adjustable sliding frame T, substantially as herein shown and described, and for the purpose set forth.

The above specification of my invention signed by me, this 20th day of July, 1869.

GILBERT W. CHAPIN.

Witnesses:

GEO. W. MABEE,

E. TATE.