

UNITED STATES PATENT OFFICE.

C. WINTER, OF PIQUA, OHIO.

IMPROVED ADDING-MACHINE.

Specification forming part of Letters Patent No. 23,637, dated April 12, 1859.

To all whom it may concern:

Be it known that I, C. WINTER, of Piqua, in the county of Miami and State of Ohio, have invented certain new and useful Improvements in Counting-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in the arrangement of those parts together which will be hereinafter fully described.

In order that those skilled in the arts may make and use my invention, I will proceed to describe its construction and operation.

In the annexed drawings, Figure 1 is a top view showing the dial-plates and hands. Figs. 2 and 4 are side views with one side removed in each view, showing the internal arrangement. Fig. 3 is a top view with the top piece removed.

In the drawings, A A represents a square box in which the machinery is placed. On the top of this box two dial-plates are placed, which are represented by B and C. The dial-plate B is provided with twenty divisions, which are numbered 5, 10, 15, 20, and so on up to 100, and these divisions are again subdivided into five divisions, making one hundred small spaces upon said dial.

The small dial C, which is within dial B, is provided with six divisions which are marked 1 2 3 4 5 6. On the dials are two hands *a* and *b*, which point as the machine is operated progressively at the respective numbers on the dials.

M M represent a series of levers, which are provided at their front end with keys, which are nine in number. These keys are marked with the nine digits, as seen in Fig. 1. The levers M M have their fulcrums on a rod N', which passes through the box from N to N', the rear ends of said levers being connected with the bottom of the box by means of coiled springs Q and rods *q*. The forward ends of these levers rest upon a frame E E'. The frame E E' is pivoted to the sides of the box at its rear end at *x*, and a spring F is placed under said frame, which bears against its forward end and holds it up.

K represents a large ratchet-wheel, which is provided with one hundred teeth. On one end of the shaft on which ratchet-wheel K re-

volves is placed a bevel-wheel *j*, which works into a bevel-wheel *i*, said wheel *i* being secured on a vertical shaft *h*.

h represents a shaft, which is provided with pinion *m* near its upper extremity, with bevel-wheel *i* near its center and with spool P near lower extremity, the hand *b* being attached to the top of said shaft. *n'* represents a short vertical shaft, to which is secured a cog-wheel *n*, which works in the pinion *m* on shaft *h*. *e* and *f* are two stops, which are attached to the wheel *n* and pinion *m*, respectively.

z is a ratchet, which is secured to the portion of the frame E which catches in the teeth of wheel K and drives it forward when the frame is pressed down.

s is also a ratchet, which catches in the teeth of wheel K and prevents its returning after being moved.

o represents a cord, one end of which is secured to pulley P. Said cord passes around the drum J and has its other end secured to said drum. A spring is secured in the drum J in such a manner as that when the cord is wound around spool P the tension of the spring will be increased.

c represents a lever, which has its fulcrum at *c'*. The inner end of this lever is slotted, so that it may embrace the shaft *h*, said shaft having a groove around it at the point of contact with the lever.

d represents a spring secured to the lever *c*, which serves to raise it again after being depressed. L L in Fig. 5 represent openings in the side of the box, in which the levers M M play.

In the operation of this machine we will suppose we have three columns of figures, as follows: 846, 573, and 291, which figures are to be added up and their sum obtained. We will commence adding at the right-hand column, as is common in addition. The hand *a* on dial B will stand at the 100-mark and the hand *b* on dial C will stand at the mark 6. Now the first number in the column to be added is 1, and I consequently place my hand on key which is marked 1 and press it down as far as it will go in opening L. By pressing down the key 1 the lever D, to which it is attached, presses upon the frame E E' and bears it down. When the frame descends, the ratchet *z*, attached to it, turns the wheel K forward just one tooth of said wheel. The

movement of wheel K operates wheels *j* and *i*, shaft *h*, and wheels *m* and *n*. The pulley P moves with shaft *h*, and the cord *o* is wound around it, and the spring in drum J is thus tightened. The movement of this wheel K forward one tooth moves the hand *a* forward on the dial B to the first subdivision of the space marked 5, and at the same time the hand *b* is moved slightly forward, but to no mark. I proceed to the next figure in the column for addition, which is 3, and I press upon key marked 3. This moves the two hands forward, the hand *a* moving three more of the subdivisions and the hand *b* forward proportionately, but to no mark. The next figure is 6, and I press down the sixth key, the hands again move, the hand *a* standing at figure "10" on the dial. I set down the number 10 to one side or on a waste piece of paper, not placing it under the column of figures to be added, then press upon lever *c*, which raises the bevel-wheel *i* from gear with wheel *j*, and the spring and cord, acting on shaft *h*, turn it back, and the hands are made to stand at the point they started from. I then carry the 1 from the 10 and press for it on key 1. I then press down keys 9 7 4 for the second column, which amounts to twenty-one. I set down this number to one side, as in the former case, and immediately under the former number, and carry two, pressing upon the second key for it, after having brought the hands to where they started from, and thus I continue until the whole is added, remembering to place the result as indicated on the dial-plate of each succeeding column immediately under the result of the preceding column to one side on a sheet of waste paper. After the columns have all been added up I read off the result from my piece of waste paper by the following rule: Take the number or numbers in the bottom line of the results placed to one side as the first figure or figures to the left. For the next figure to the right I take the figure to the right of the columns from the next line above. For the next figure to the right I take the figure to the right of the columns in the third

line from the bottom, and so on in regular succession until all the figures are taken. The result thus attained is the amount required. The result may be obtained in a little different manner, and in this way the numbers to be added being

846

573

291

 1710

by pressing upon the keys in the manner before stated the dial marks "10" for the first column to the right. I put down under that column "0," and carry one by the machine. As before stated, I find that the next column amounts to twenty-one. I put down the 1 under it and carry two. I find by pressing upon the keys that the next column amounts to seventeen. This being the last column, I put the 17 down and read off the result—seventeen hundred and ten. The result can be obtained correctly by either mode, as in fact there is no difference between them to one who knows enough to count on any machine. When the hand *a* passes around the dial B once, the hand *b* marks "1" upon dial C, and for every hundred it moves one figure forward.

It will be perceived that by the use of this machine figures may be added rapidly and always with perfect correctness.

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

1. The arrangement of the lever *c*, spring *d*, shaft *h*, wheels *m* *n*, and stops *e* and *f*, in the manner herein set forth, and for the purpose specified.

2. The arrangement of ratchet-wheel K, bevel-wheels *j* and *i*, pawls *s* and *z*, cord *o*, and pulley P, in the manner and for the purpose substantially as described.

C. WINTER.

Witnesses:

JOHN B. LARGER,
AUG. THOMA.

UNITED STATES PATENT OFFICE.

C. WINTER, OF PIQUA, OHIO.

IMPROVED ADDING-MACHINE.

Specification forming part of Letters Patent No. 23,637, dated April 12, 1859.

To all whom it may concern:

Be it known that I, C. WINTER, of Piqua, in the county of Miami and State of Ohio, have invented certain new and useful Improvements in Counting-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in the arrangement of those parts together which will be hereinafter fully described.

In order that those skilled in the arts may make and use my invention, I will proceed to describe its construction and operation.

In the annexed drawings, Figure 1 is a top view showing the dial-plates and hands. Figs. 2 and 4 are side views with one side removed in each view, showing the internal arrangement. Fig. 3 is a top view with the top piece removed.

In the drawings, A A represents a square box in which the machinery is placed. On the top of this box two dial-plates are placed, which are represented by B and C. The dial-plate B is provided with twenty divisions, which are numbered 5, 10, 15, 20, and so on up to 100, and these divisions are again subdivided into five divisions, making one hundred small spaces upon said dial.

The small dial C, which is within dial B, is provided with six divisions which are marked 1 2 3 4 5 6. On the dials are two hands *a* and *b*, which point as the machine is operated progressively at the respective numbers on the dials.

M M represent a series of levers, which are provided at their front end with keys, which are nine in number. These keys are marked with the nine digits, as seen in Fig. 1. The levers M M have their fulcrums on a rod N', which passes through the box from N to N', the rear ends of said levers being connected with the bottom of the box by means of coiled springs Q and rods *q*. The forward ends of these levers rest upon a frame E E'. The frame E E' is pivoted to the sides of the box at its rear end at *z*, and a spring F is placed under said frame, which bears against its forward end and holds it up.

K represents a large ratchet-wheel, which is provided with one hundred teeth. On one end of the shaft on which ratchet-wheel K re-

volves is placed a bevel-wheel *j*, which works into a bevel-wheel *i*, said wheel *i* being secured on a vertical shaft *h*.

h represents a shaft, which is provided with pinion *m* near its upper extremity, with bevel-wheel *i* near its center and with spool P near lower extremity, the hand *b* being attached to the top of said shaft. *n'* represents a short vertical shaft, to which is secured a cog-wheel *n*, which works in the pinion *m* on shaft *h*. *e* and *f* are two stops, which are attached to the wheel *n* and pinion *m*, respectively.

z is a ratchet, which is secured to the portion of the frame E which catches in the teeth of wheel K and drives it forward when the frame is pressed down.

s is also a ratchet, which catches in the teeth of wheel K and prevents its returning after being moved.

o represents a cord, one end of which is secured to pulley P. Said cord passes around the drum J and has its other end secured to said drum. A spring is secured in the drum J in such a manner as that when the cord is wound around spool P the tension of the spring will be increased.

c represents a lever, which has its fulcrum at *c'*. The inner end of this lever is slotted, so that it may embrace the shaft *h*, said shaft having a groove around it at the point of contact with the lever.

d represents a spring secured to the lever *c*, which serves to raise it again after being depressed. L L in Fig. 5 represent openings in the side of the box, in which the levers M M play.

In the operation of this machine we will suppose we have three columns of figures, as follows: 846, 573, and 291, which figures are to be added up and their sum obtained. We will commence adding at the right-hand column, as is common in addition. The hand *a* on dial B will stand at the 100-mark and the hand *b* on dial C will stand at the mark 6. Now the first number in the column to be added is 1, and I consequently place my hand on key which is marked 1 and press it down as far as it will go in opening L. By pressing down the key 1 the lever D, to which it is attached, presses upon the frame E E' and bears it down. When the frame descends, the ratchet *z*, attached to it, turns the wheel K forward just one tooth of said wheel. The

movement of wheel K operates wheels *j* and *i*, shaft *h*, and wheels *m* and *n*. The pulley P moves with shaft *h*, and the cord *o* is wound around it, and the spring in drum J is thus tightened. The movement of this wheel K forward one tooth moves the hand *a* forward on the dial B to the first subdivision of the space marked 5, and at the same time the hand *b* is moved slightly forward, but to no mark. I proceed to the next figure in the column for addition, which is 3, and I press upon key marked 3. This moves the two hands forward, the hand *a* moving three more of the subdivisions and the hand *b* forward proportionately, but to no mark. The next figure is 6, and I press down the sixth key, the hands again move, the hand *a* standing at figure "10" on the dial. I set down the number 10 to one side or on a waste piece of paper, not placing it under the column of figures to be added, then press upon lever *c*, which raises the bevel-wheel *i* from gear with wheel *j*, and the spring and cord, acting on shaft *h*, turn it back, and the hands are made to stand at the point they started from. I then carry the 1 from the 10 and press for it on key 1. I then press down keys 9 7 4 for the second column, which amounts to twenty-one. I set down this number to one side, as in the former case, and immediately under the former number, and carry two, pressing upon the second key for it, after having brought the hands to where they started from, and thus I continue until the whole is added, remembering to place the result as indicated on the dial-plate of each succeeding column immediately under the result of the preceding column to one side on a sheet of waste paper. After the columns have all been added up I read off the result from my piece of waste paper by the following rule: Take the number or numbers in the bottom line of the results placed to one side as the first figure or figures to the left. For the next figure to the right I take the figure to the right of the columns from the next line above. For the next figure to the right I take the figure to the right of the columns in the third

line from the bottom, and so on in regular succession until all the figures are taken. The result thus attained is the amount required. The result may be obtained in a little different manner, and in this way the numbers to be added being

846
573
291

1710

by pressing upon the keys in the manner before stated the dial marks "10" for the first column to the right. I put down under that column "0," and carry one by the machine. As before stated, I find that the next column amounts to twenty-one. I put down the 1 under it and carry two. I find by pressing upon the keys that the next column amounts to seventeen. This being the last column, I put the 17 down and read off the result—seventeen hundred and ten. The result can be obtained correctly by either mode, as in fact there is no difference between them to one who knows enough to count on any machine. When the hand *a* passes around the dial B once, the hand *b* marks "1" upon dial C, and for every hundred it moves one figure forward.

It will be perceived that by the use of this machine figures may be added rapidly and always with perfect correctness.

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

1. The arrangement of the lever *c*, spring *d*, shaft *h*, wheels *m n*, and stops *e* and *f*, in the manner herein set forth, and for the purpose specified.

2. The arrangement of ratchet-wheel K, bevel-wheels *j* and *i*, pawls *s* and *z*, cord *o*, and pulley P, in the manner and for the purpose substantially as described.

C. WINTER.

Witnesses:

JOHN B. LARGER,
AUG. THOMA.

C. WINTER.
Calculating Machine.

No. 23,637.

Patented April 12, 1859.

Fig. 1,

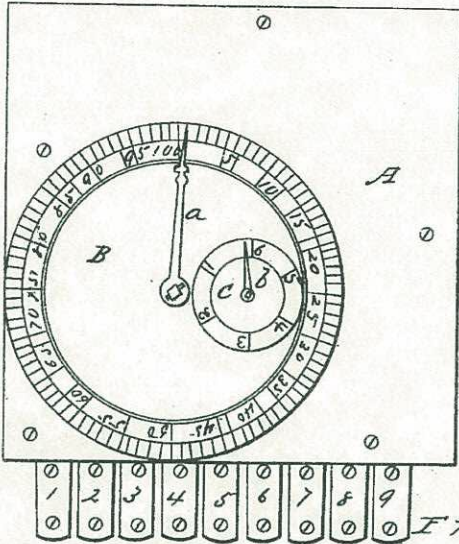


Fig. 3,

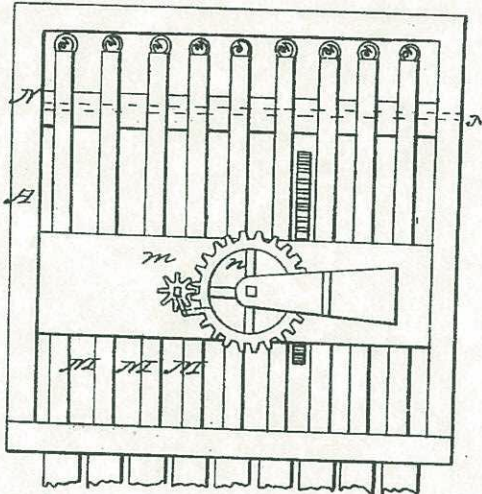


Fig. 2,

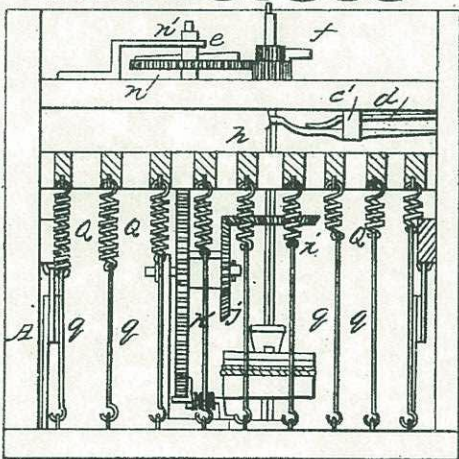


Fig. 4,

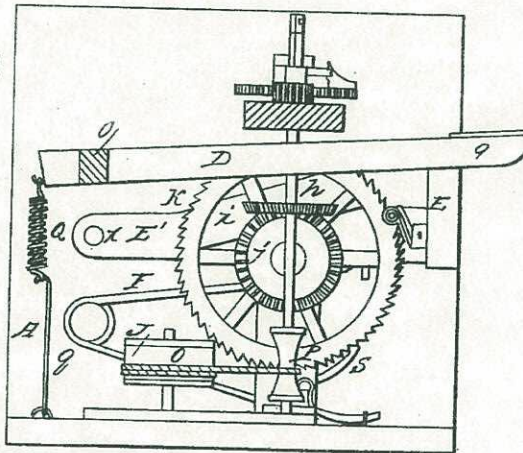
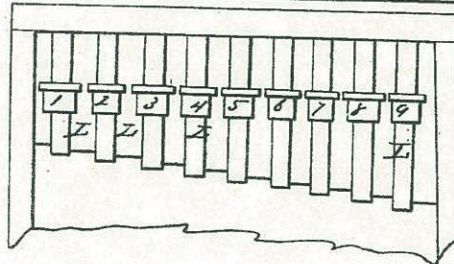


Fig. 5,



WITNESSES:

Charles Delaney
Augustus

INVENTOR:

C. Winter