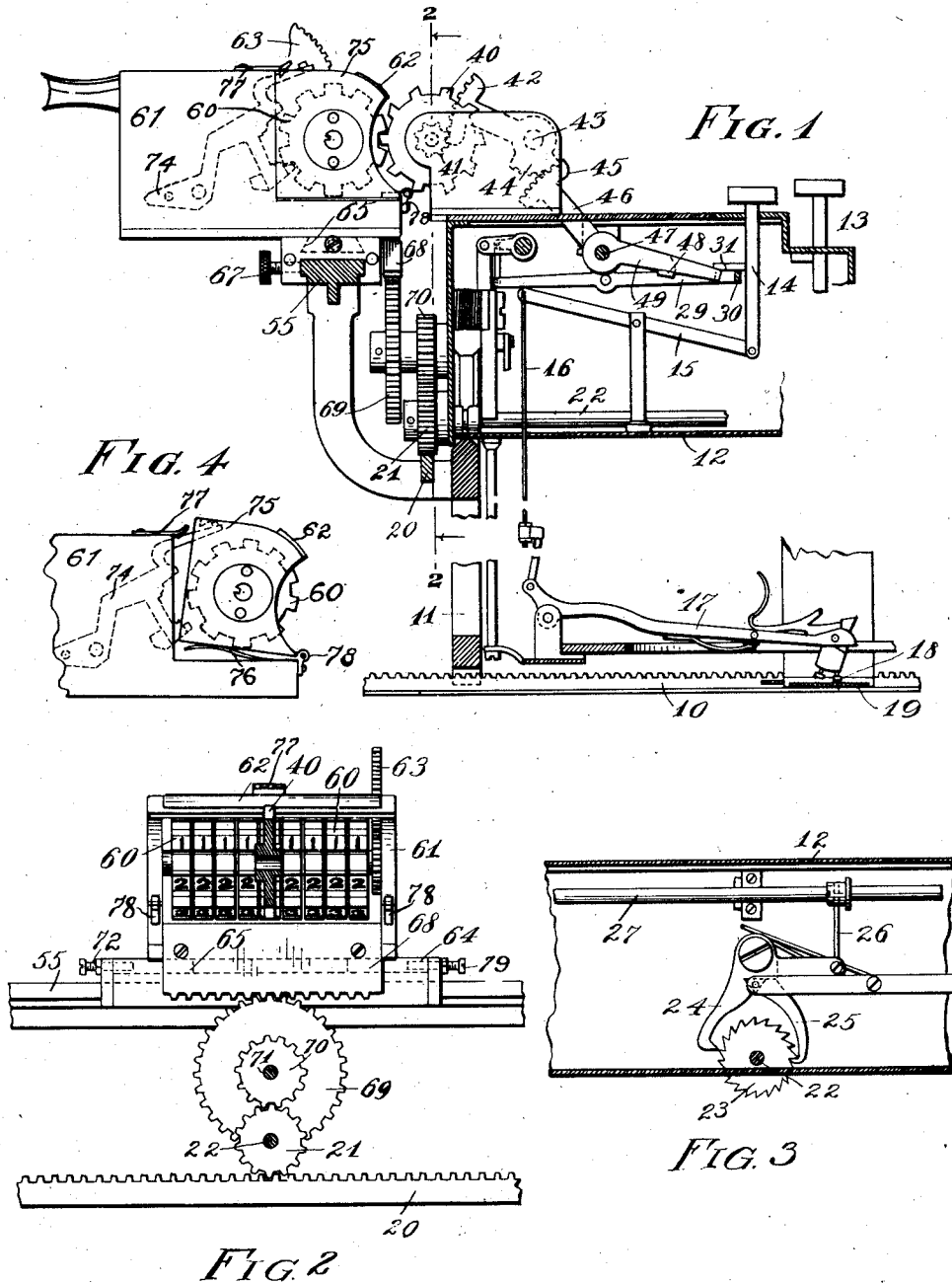


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COMBINED TYPE WRITER AND COMPUTER.
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982,517.

Patented Jan. 24, 1911.



WITNESSES:

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HOLMES MARSHALL, OF NEW YORK, N. Y.

COMBINED TYPE-WRITER AND COMPUTER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HOLMES MARSHALL, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in a Combined Type-Writer and Computer, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

In combining a computing device with a book-typewriter, it has been customary to mount the computing device on a horizontal bar at the rear of the traveling typewriter carriage and provide on that carriage a master wheel which travels from order to order of the computer as the typewriter escapes for each character printed. Such is the arrangement shown, for example, in Patent No. 820,879 issued May 15th, 1906 to C. F. Laganke and J. A. Smith. In such embodiment, the figures on the computer wheels have necessarily been of small size, for no greater width is allowed to the wheel than the width of one space on the typewriter. This makes the figures so small that, even though they are observed through a magnifying lens, the observation is frequently incorrect.

One of the objects of this invention is to provide mechanism whereby there may be combined with the traveling carriage a computing device whose wheels are wider than the escapement space of the carriage. I accomplish this by mechanism which gives the computing device a movement from right to left as the carriage escapes from left to right, so that the wheels on the computer have a width equal to the sum of these movements and thereby are much wider, and their indications more easily visible, than heretofore.

Another object of the invention is to provide means enabling errors in the registration to be easily and quickly corrected.

The invention is hereinafter more fully explained and its essential characteristics set out in the claims.

The drawings show my invention as embodied with a typewriter of the Elliot-Fisher style, such as shown in Patent No. 820,879 referred to.

Figure 1 is a vertical section through the keyboard-carriage and its supporting frame; Fig. 2 is a sectional elevation on the line 2—2 of Fig. 1 looking toward the left; Fig. 3 is

a vertical section looking in the same direction through the traveling carriage, showing the escapement mechanism; Fig. 4 is a partial side elevation of the accumulator, showing the dials disconnected.

As shown in the drawing, 10 represents a rack which is a portion of the open base which holds the paper to be printed; 11 is the intermediate frame which is arranged to travel down the page over the rack 10; 12 is the typewriter carriage which is mounted to travel laterally on the frame 11. This carriage has finger keys arranged in several banks as 13 and 14, connected by levers 15 and links 16 with the type bars 17. The type 18 carried by these type bars strike on top of the ribbon 19 and thus effect the printing.

The periodical escapement of the carriage from left to right a distance equal to a space for a letter or figure is effected by the following means: At the rear of the traveling carriage and mounted on the frame 11 is a rack 20. Meshing with this rack is a pinion 21 on the shaft 22. This shaft is mounted in the traveling carriage and has rigidly mounted on it an escapement wheel 23. Co-operating with this escapement are pallet levers 24 and 25 connected by a link 26 with the rock shaft 27. A suitable rock arm on this shaft is connected with lever arms 29, which have cross bars 30 standing beneath pins 31 projecting rearward from the various key stems. This construction is more fully shown in the patent mentioned, to which reference is made for fuller description. The operation is, that whenever a key is depressed, its pin 31, through the mechanism described, rocks the pallet levers so that when the key stem returns, an escapement of one tooth is allowed the escapement wheel 23. This movement allows the tension spring to draw the carriage one space to the right.

Mounted on the traveling carriage is a master wheel 40, which is shown as provided with the pinion 41 meshing with the segment 42 which is pivoted at 43 and has teeth 44 meshing with the teeth on the segmental end 45 of a rock arm 46. This rock arm is rigid on the shaft 47 from which project arms 48 which engage beneath other arms 49. Each of the arms 49 is bent laterally at its front end and adapted to stand beneath the pins 31 of the corresponding numeral key 14. The normally idle distance between this pin and the arm 49 varies

according to the value of the numeral key, so that the full depression of such key rotates the master wheel an amount corresponding to the digit of the numeral key.

5 The master wheel, moving from left to right with the carriage, and being rotated in proportion to the numeral keys, is presented successively to the different orders of the accumulator or computing device and ro-
10 tates these orders the amount of each digit added. The computing wheels or dials, which show the amounts and with which the master wheel coöperates, are designated 60. They are mounted side by side in a frame
15 or casing 75 which is carried by the casing 61 mounted on the intermediate frame 11 at the rear of the typewriter. In this casing 61 is the carrying mechanism, conventionally shown at 74, and other parts of the
20 computing device. The wheels 60 carry numerals on their peripheries which are adapted to be observed through the window 62. The accumulator mechanism may be of any preferred construction, as, for example, that
25 shown in the patent referred to. It is provided with suitable means for carrying and for setting back to zero, the latter being indicated by the segment lever 63.

To enable the computing wheels to be
30 wider than the escapement space of the typewriter carriage, I mount the whole computer movably, and I provide mechanism for moving it to the left as the carriage moves to the right. Thus, in the embodi-
35 ment shown, the computer case 61 is slidably mounted on the guide 64, the computer case having a dovetailed tongue 65 extending into a corresponding groove in the guide. The guide is clamped to the horizontal bar
40 55 of the intermediate frame by means of a set screw 67. Secured to the computer case is the rack 68. This rack meshes with the gear 69 which is rigid with the pinion 70,
45 both being loosely mounted on the stud 71 projecting from the rear of the typewriter carriage. The pinion 70 meshes with the pinion 21 which is on the escapement shaft.

It results from the above described construction, that when the carriage moves
50 from left to right one space, the pinion 21 turns in the right hand direction and the pinion 70 in the left hand direction a corresponding amount; the gear 69, however,
55 which moves with the pinion 70, is of greater radius, so that while the shaft 71 moves with the carriage one space to the right, the uppermost teeth of the gear move considerably more than one space, to the left. In the embodiment shown, the gear
60 69 is a little more than twice the size of the pinion 70, so that for each space which the carriage (and hence the shaft 71) moves to the right, the uppermost teeth of the gear (and hence the rack 68 and the com-
65 puter) move to the left somewhat more

than two spaces. This enables the computer wheels to have a width over twice the size of the carriage escapement space, while for each escapement, the master wheel changes from engagement with one computing de- 70 vice to a similar engagement with the next.

Suitable adjustable set screws 72 and 79 are provided to limit the movement of the computing device in opposite directions.

With my invention, the left hand portion 75 of the page of paper may be used for ordinary writing of the letter keys; then, as the tabulation portion of the page is reached, the gear 69 comes into mesh with the rack 68, the computing device being then at its
80 extreme right hand position, as defined by the stop 79. When the gear 69 has meshed with the rack 68, for each space of escapement of the typewriter carriage, the computer is shifted to the left a considerably
85 greater distance. The result is that the escapement following the periphery of the units column brings the computing device into its extreme left hand position against the stop 72, while the gear 69 moves out of
90 engagement with the rack 68, allowing subsequent independent operation of the typewriter.

After operation, the computer remains in its extreme left hand position until the car- 95 riage is drawn back to the left, when the gear 69 reëngaging moves the computer to the right, leaving it in its right hand position, as the gear clears the rack 68.

It will be noticed that the amount of 100 movement given to the computing device as the carriage makes each step, may be varied from that shown, to meet the requirements of the particular machine. By this invention, one of the great objections to
105 mounting the computing device on the intermediate frame is done away with; namely, the smallness of the indicating characters, for the characters may, without difficulty, be made as large as desired. 110

One objection to the combined computing devices and book typewriters now in the market is that it is very difficult to correct errors once made, and it has been found impracticable in this class of mechanism, to
115 prevent errors being made. The operator strikes a wrong key or strikes the right key and gives it a blow of unequal force which often prevents the proper operation of the safety devices intended to reduce errors. 120 Errors thus invariably get into the accumulator, and the customary way has been to simply keep track of the errors and correct the final result accordingly, on account of
125 the difficulty of correcting errors once struck into the accumulator. This method is always uncertain and undesirable.

In my invention I have devised a very simple arrangement by which corrections
130 can be made. I mount the dial wheels, with

which the master wheel coöperates, in a casing of their own, designated 75, which stands directly in front of the main casing 61 of the accumulator and is pivoted to the lower portion thereof at 78. In normal usage, the casing 75 is held as if it were a part of the casing 61, by means of the latch hook 77 which engages a notch in the casing 75. In this position of the parts the dial wheels engage on their rear and under sides with the carrying mechanism and other mechanism of the accumulator. When an error has been made, however, the typewriter carriage is simply shifted to take the same out of range of the accumulator, and the thumb latch is disengaged from the casing 75, which is thereupon swung forward by the spring 76 as shown in Fig. 4. This releases the dials from any operative engagement with the rest of the computing device and the dials may be turned as desired by a pencil or stylus point.

The release of the dials from the rest of the computing mechanism enables the operator, in case of striking the wrong key, to set that particular dial backward or forward to the position it would have had had the right key been struck. In case the figure struck caused the computing device to carry and the figure which should have been struck would not have caused it to carry, or vice-versa, he will shift the adjacent wheel one tooth in the corresponding direction. When the correction has been made, the casing 75 is pressed rearwardly and the spring catch 77 engages it and holds it in normal position. Having thus described my invention, I claim:

1. The combination, with a series of digit carriers, of a common operating device adapted to operate successively on the carriers of successive orders, and mechanism for moving the operating device from order to order and for automatically moving the digit carriers in the opposite direction.

2. The combination, with a series of computing wheels, of a master wheel adapted to be successively presented to the several wheels, means for moving the said master wheel in the direction from one order to the next and for automatically moving the series of computing wheels in the opposite direction.

3. The combination of a computing device having a series of wheels side by side, a master actuator with which such wheels may coöperate, and means for moving the master actuator in one direction and the computing device as a whole periodically in the opposite direction in defined steps.

4. The combination of a computing device having a series of digit wheels, a master wheel, means for giving the master wheel varying fractions of a revolution, and means for moving the master wheel in the direction

from an order to the next and for concurrently moving the computing device in the opposite direction.

5. The combination of a traveling typewriter carriage, a master wheel carried thereby, means for moving the carriage a computer with which the master wheel may coöperate, mechanism for moving the computer to the left as the typewriter carriage moves to the right while the master wheel is in range of the computing device.

6. The combination of a computing device, a typewriter carriage, a master wheel, an escapement device for the typewriter carriage, and mechanism whereby said escapement moves the master wheel in one direction and the computing device in the opposite direction.

7. The combination of a computing device having a series of wheels side by side, a master wheel, an escapement device for the master wheel, and mechanism whereby said escapement moves the master wheel in one direction and the computing device in the opposite direction, the distance from each computing wheel to the corresponding point in the next computing wheel being equal to the sum of the movements of the master wheel and computer for one escapement.

8. The combination of a typewriter having an intermediate frame, and a laterally traveling carriage, an actuator mounted on the carriage, a computing device carried by the intermediate frame, and mechanism for moving the computing device toward the left as the actuator moves toward the right.

9. The combination of a typewriter having an intermediate frame and a laterally traveling carriage on which are mounted letter and numeral keys, an escapement device for the typewriter carriage, a master wheel mounted on the carriage, operative connections between the numeral keys and master wheel, a computing device carried by the intermediate frame, and mechanism for moving the computing device toward the left as the master wheel moves toward the right, said mechanism being controlled by the escapement of the typewriter carriage.

10. The combination of a typewriter having an intermediate frame and a laterally traveling carriage, an actuator mounted on the carriage, means for moving the carriage, a computing device carried by the intermediate frame, and mechanism for moving the computing device toward the left as the actuator moves toward the right, said mechanism comprising racks on the computing device and on the intermediate frame and gearing journaled on the typewriter carriage and connected with said racks.

11. In a computing typewriter, the combination of a frame and keyboard carriage mounted to laterally move thereon, a rack carried by said frame, a pinion carried by

the carriage, an escapement device on the carriage controlling the rotations of said pinion, a master wheel mounted on the carriage, a computing device slidably mounted
5 on the intermediate frame, a rack carried by said computing device, and multiplying gearing connecting said rack with said pinion.

12. The combination of a frame and a carriage mounted to travel thereon, a horizontal bar carried by the frame adjacent to
10 the carriage, a guideway adjustably mounted on said bar, a computing device slidably mounted on said guideway, a traveling carriage mounted on said frame, an actuator
15 mounted on the carriage and adapted to cooperate with the computing wheels, a rack depending from the front edge of the computing device, a stationary rack carried by the intermediate frame, and gearing carried
20 by the typewriter carriage and connected with the two racks mentioned.

13. The combination of an actuator, mechanism to cause it to travel step by step, a series of computing wheels, each having a
25 greater width than one of the steps of the actuator, and means for moving said computing wheels in the opposite direction to the travel of the actuator.

14. The combination of a typewriter, an actuator having a travel corresponding to
30 the travel of the typewriter, a computing device with which the actuator cooperates, and which has wheels of a greater width than such typewriter travel, and means for moving the computing device in the opposite di-
35 rection to the travel of the actuator.

15. The combination of a typewriter having letter keys and numeral keys, a computing device, an actuator therefor, mechanism controlled by the numeral keys for
40 giving varying movements to the actuator, and an escapement-controlled mechanism connected with both the computer and actuator and serving to give them concurrent
45 movements in opposite directions.

16. The combination of an accumulator having dials, a movable casing carrying said dials, and adapted to shift them out of engagement with the rest of the accumulator,
50 and means for operating the dials.

17. The combination of a frame, dials carried thereby, carrying mechanism, and means for holding the frame with the dials in engagement with the carrying mechanism,
55 said means being movable to a position to free the dials from engagement with the carrying mechanism.

18. The combination of a casing, dials carried thereby, carrying mechanism inde-

pendent of the casing, means for holding
60 the casing with the dials in engagement with the carrying mechanism, said means being movable to a position to free the dials from engagement with the carrying mechanism, and means for operating the dials.

19. The combination with a computing
65 device having a series of digit wheels, a master wheel for operating the digit wheels, carrying mechanism and means for moving the digit wheels out of engagement with the
70 carrying mechanism whereby corrections can be made.

20. The combination of a book typewriter, a computing device carried by the intermediate frame thereof and having a series of
75 digit wheels, a master wheel carried by the typewriter carriage for operating the digit wheels, carrying mechanism, and means for moving the digit wheels out of engagement with the carrying mechanism, whereby cor-
80 rections can be made.

21. The combination of a book typewriter, a master wheel carried thereby, a computing device adjustably carried by the book typewriter, said computing device comprising
85 a casing, carrying mechanism therein, digit wheels carried independently of said casing and adapted to cooperate with the master wheel and the carrying mechanism or be out of engagement with both.

22. The combination of a book typewriter, a master wheel carried thereby, a computing device adjustably carried by the book typewriter, said computing device comprising a casing, carrying mechanism therein, a second
95 casing pivoted to the casing first mentioned, and digit wheels carried by said pivoted casing and adapted to cooperate with the master wheel and the carrying mechanism.

23. The combination of a book typewriter,
100 a master wheel carried thereby, a computing device adjustably carried by the book typewriter, said computing device comprising a casing, carrying mechanism therein, a second casing pivoted to the casing first men-
105 tioned, and digit wheels carried by said pivoted casing and adapted to cooperate with the master wheel and the carrying mechanism, a spring tending to separate the pivoted casing from the main casing, and a
110 latch to hold such parts together against the action of the spring.

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

HOLMES MARSHALL.

Witnesses:

PETER P. BECK,
LOUIS J. CATLIN.