No. 654,992. Patented July 31, 1900.

H. MARSHALL.

COMBINED TYPE WRITING AND COMPUTING MACHINE.

(Application filed Apr. 14, 1898.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

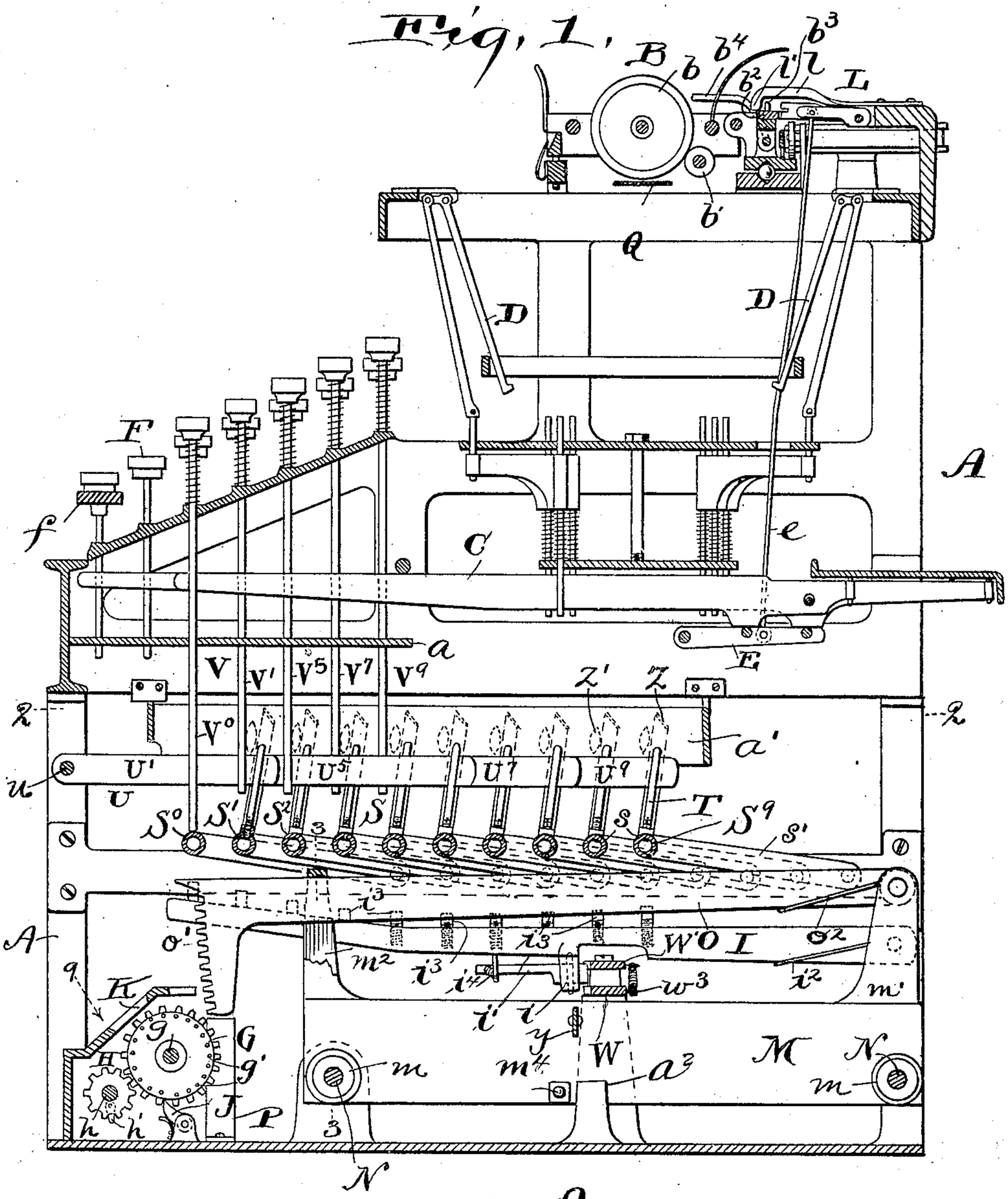
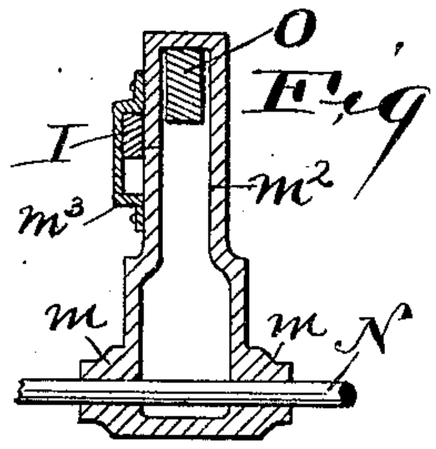


Fig. 3.



Witnesses:
E. B. Gilchrist
Philip E. Knowlton.

Inventor:
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By his attorneys,
Thurston & Bates

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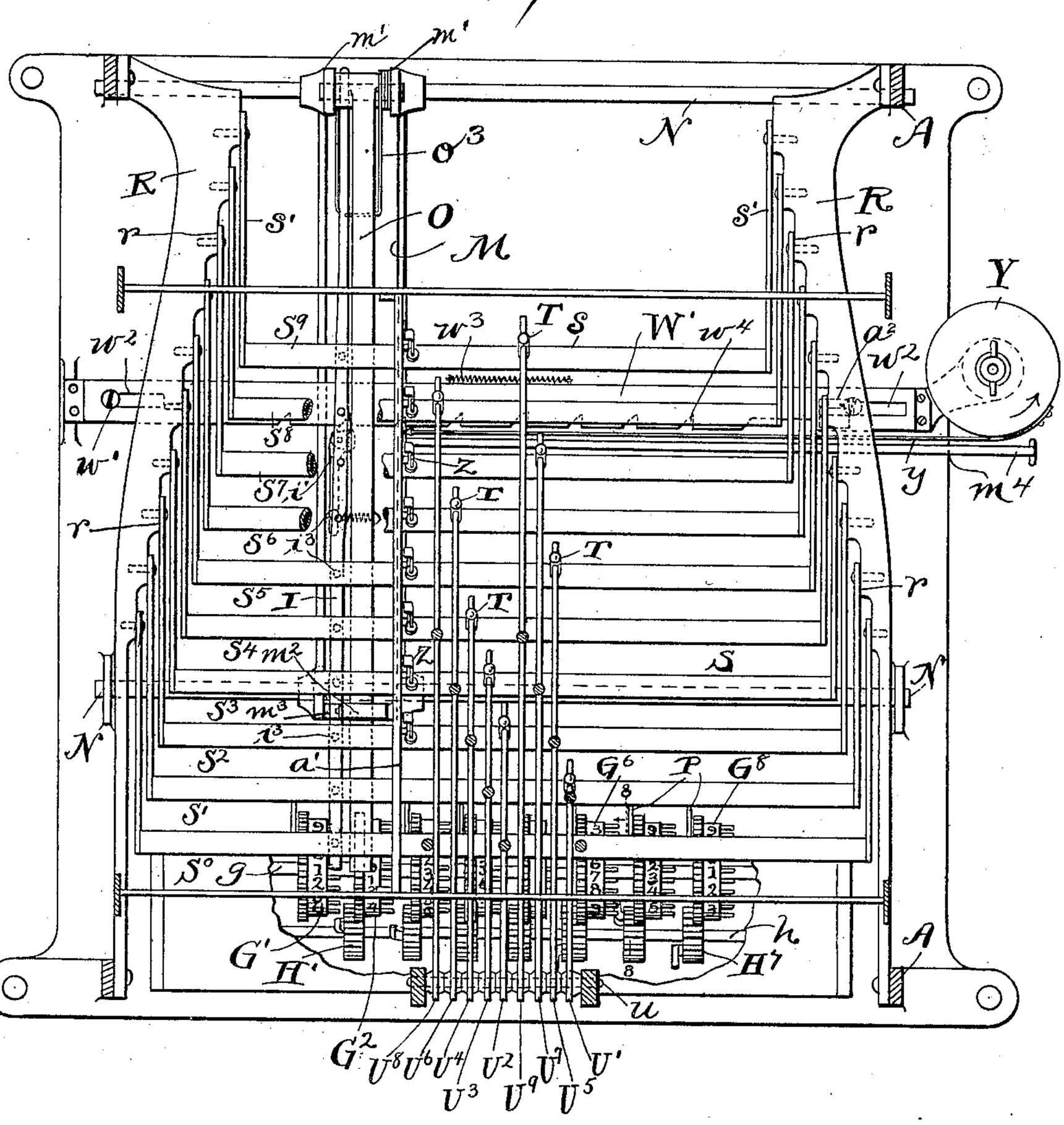
(No Model.) 3 Sheets—Sheet 2.

Fig. 2.



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(Application filed Apr. 14, 1898.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 4,

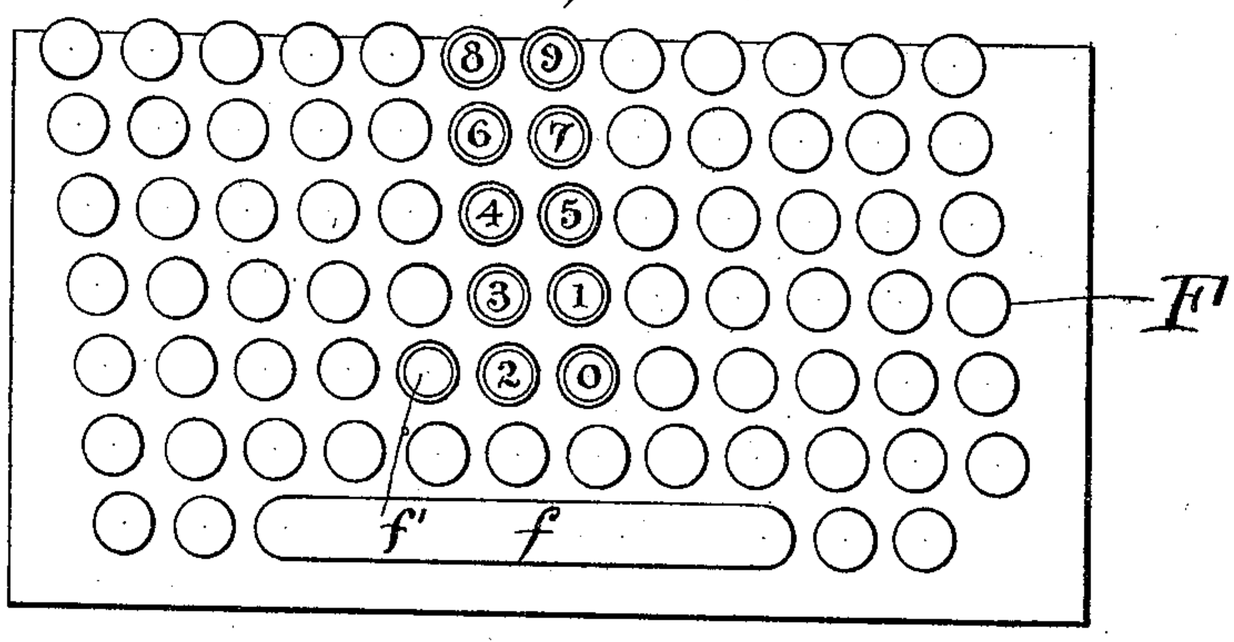


Fig. 5,

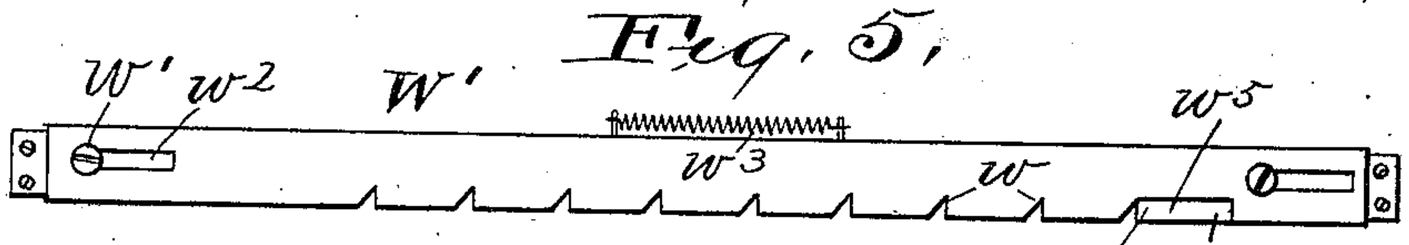
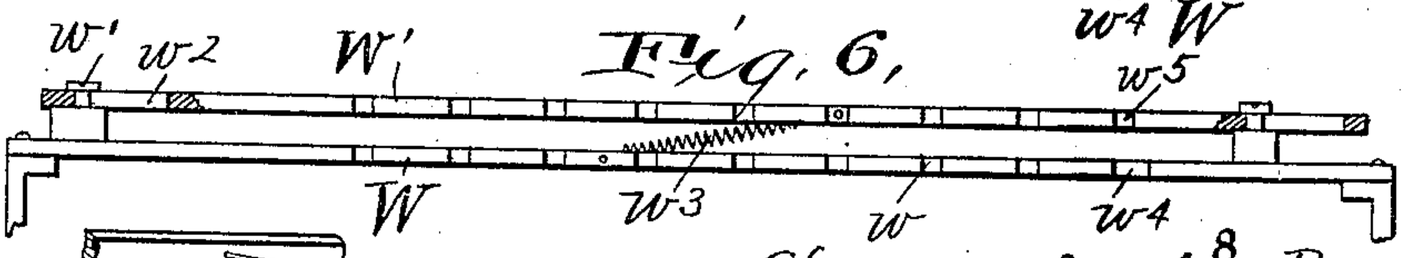


Fig. 6,



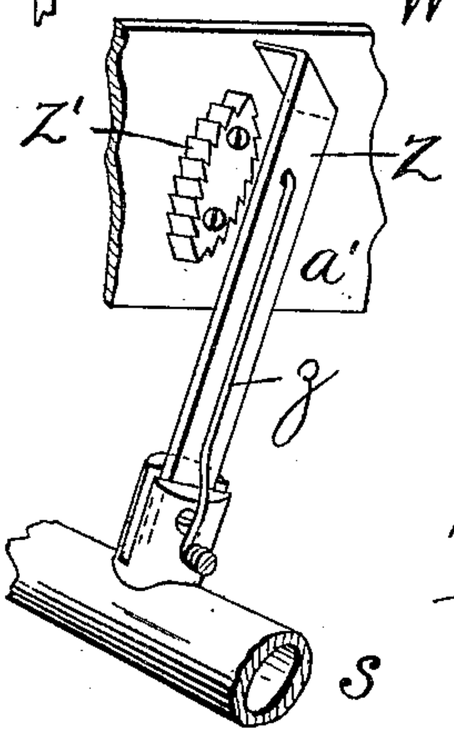


Fig. 7.

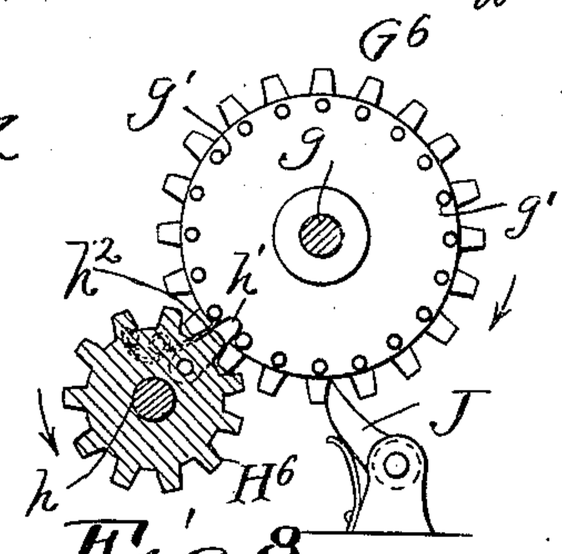
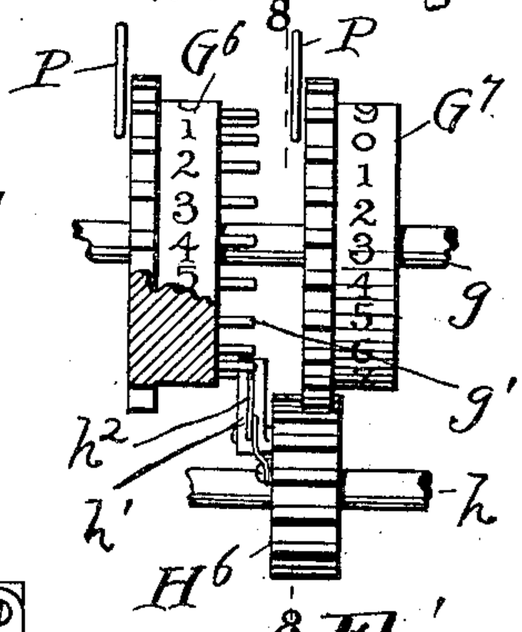


Fig. 8,



8 Fig. 9,

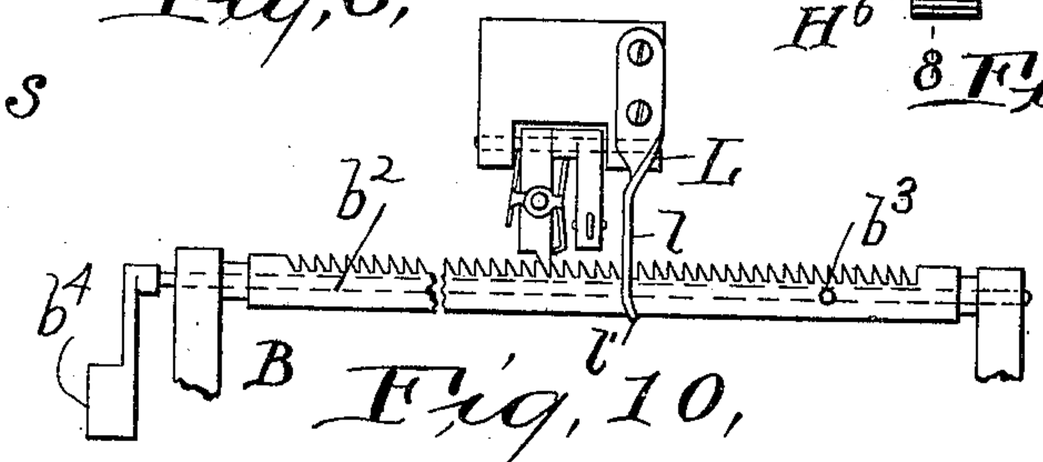


Fig. 10,

Witnesses
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Inventor:
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By his Attorneys,
Thurston & Bates

UNITED STATES PATENT OFFICE.

HOLMES MARSHALL, OF CLEVELAND, OHIO, ASSIGNOR TO THE NATIONAL ADDOGRAPH COMPANY, OF JERSEY CITY, NEW JERSEY.

COMBINED TYPE-WRITING AND COMPUTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 654,992, dated July 31, 1900.

Application filed April 14, 1898. Serial No. 677,586. (No model.)

To all whom it may concern:

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

My invention is an improvement on the combined type-writer and computing-machine shown in my prior patent, No. 575,570, granted to me January 19, 1897. In the construction there shown a computing-machine is placed below a type-writing machine and there is an interposed plunger-carriage which (when the numerals are used) moves with the type-writer carriage over the computing-machine keys and the different plungers of which are caused to strike upon the different computer-keys according to the numeral-key which is depressed on the type-writer. The movement of the plunger-carriage with the type-writer carriage has the disadvantage that no marks other than numerals requiring a movement of the type-writer carriage for their proper spacing—*e. g.*, the comma separating thousands and the period dividing cents from dollars—can be interspersed among the numerals without shifting the plunger-carriage to the wrong computing-keys.

One of the objects of the present invention is to overcome the above-mentioned difficulty and render the lateral movement of the computer-operating mechanism independent of the movement of the type-writer carriage. This is accomplished by providing for that mechanism its own escapement and operating the same by numeral-keys of that type-writer.

Another object is to simplify and cheapen the construction and do away with much of the intermediate mechanism heretofore required between the type-writer and the computing-wheels.

Other objects are to render the machine more convenient for the operator and more certain in its action.

The invention may be best described as consisting in the combinations of parts hereinafter specified, as definitely enumerated in the claims. I wish to be understood, however, as claiming the combinations set out in the claims for any and all purposes and without limitation to the specific form in which I have shown the invention.

The drawings clearly disclose the invention.

Figure 1 is a sectional side elevation of the same. Fig. 2 is a plan of the computing mechanism and the operating-levers, being a section on the line 2 2 of Fig. 1. Fig. 3 is a vertical section on the line 3 3 of Fig. 1, showing the computer-carriage. Fig. 4 is a plan of the keyboard of the type-writer. Fig. 5 is a plan, and Fig. 6 a side elevation, of the escapement-bars for the computer-carriage, the movable bar being shown in the position it normally has when in use, as in Fig. 2, when the tension of the spring shown is overcome by a stronger spring. Fig. 7 is a perspective view of the safety device for insuring full movement of the computer-lever when the type-writer numeral-key is depressed. Figs. 8 and 9 show the computing-wheels, the former being a vertical section on the line 8 8 of Fig. 2 or Fig. 9 looking in the direction of the arrow and the latter being a view at right angles to the plane connecting the axes of the wheels shown in Fig. 8—*i. e.*, looking in the direction of the arrow marked 9 in Fig. 1. These two views show the manner in which the "tens" are "carried" from one column to the next on the computer-wheels. Fig. 10 is a detail view in plan of an indicating mechanism for temporarily stopping the type-writer carriage at a proper point during its travel. This mechanism is shown in side elevation at the top of Fig. 1.

I will first describe very briefly the type-writer mechanism shown and then the computing-wheels and their immediate operation and then, with considerable fullness, the connecting mechanism between the two.

A represents the frame of the machine; B, a usual type-writer carriage traveling on the top thereof and having the platen *b* and pivoted rack-bar b^2; Q, the inking-ribbon; C, the operating-levers, which are connected by suitable intermediate mechanism, so that

their depressions cause the type-bars D to be swung up into operative positions. The depressions of the levers C also cause, through the intervention of a suitable lever E and link *e*, the operation of the escapement for allowing movement of the type-writer carriage. F represents the ordinary finger-keys for the letters and punctuation-marks of the machine, and *f* the usual space-bar for causing the movement of the carriage alone. It is to be understood, of course, that this much of the mechanism may be of any approved construction.

The computing mechanism proper consists of a series of loosely-journaled wheels carrying on their periphery digits in order combined with proper mechanism, whereby any wheel may be rotated independently of the wheels at its right; but when it has rotated one space in excess of the complete gamut of its digits the wheel next to the left is caused to move the distance of one digit, thus effecting the carrying of one to the next left wheel every time ten is added to a wheel. The computing-wheels are referred to herein generically by G. Eight of them are shown and designated, specifically, by G′ to G⁸. They are loosely journaled in the shaft *g*.

The connecting mechanism between the computing-wheels consists of a series of wheels H′ to H⁷, (designated, generically, by H,) loosely journaled on a suitable shaft *h* and having gear-teeth which mesh with similar teeth on the wheels G and each having a pawl *h*′, which is adapted at every revolution of the wheel H to impinge against a pin *g*′, projecting from the side of the next left wheel G, and thereby move such wheel the distance of one digit. Spring-pressed dogs J engage with the wheels G and prevent their backward movement, while a light spring *h*², acting on the pawl *h*′, allows each wheel G to be rotated forward independently of the pawl, but returns the pawl to place each time a pin *g*′ moves past it. The friction of the wheels on their shafts and of the dogs J against the wheels G prevent any wheel G when turned while engaging the pawl *h*′ from thereby turning the wheel H and the wheel G at the right, the spring *h*² always yielding to allow the pins *g*′ to move idly past the pawl.

There may be one or more complete gamuts of digits on the computing-wheels G, as desired; but the connection between these wheels, by means of the gears H, must be such that when any wheel moves through one more than the complete gamut the wheel next to the left will move the distance of one digit. In the form shown in the drawings there are two complete gamuts of digits on each computer-wheel, and there are twenty gear-teeth on these wheels and twenty pins *g*′, each gear-tooth and pin corresponding, therefore, to one digit. There are ten gear-teeth on the wheel H.

As an illustration of the operation of the wheels, suppose the wheel G² is moved a distance from "0" to "6." None of the other wheels are thereby affected; but if it is moved an additional distance of "6" it will have completed its half-rotation when this movement is four-sixths of the way through, and this will have caused a complete rotation of the wheel H′, which will drive the wheel G′ the distance of one digit, while the other two-sixths of the movement will move the wheel G² to the position "2," wherefore figure "1" will be read on the wheel G′ and figure "2" on the wheel G², thus giving the result of "12." Suitable windows K over the wheels G furnish means for reading the proper numerals.

This much of the construction is old and may be of any approved form, and is thus fully described that it may be clearly understood.

I will now take up the description in detail of the mechanism by which the depression of a numeral-key on a type-writer keyboard causes the corresponding rotation of the wheels G.

A suitable frame M, preferably of a sort of channel shape, constitutes what I call the "computer-carriage" and is slidably journaled on a pair of parallel transverse rods N, suitably supported by the frame of the machine, bosses *m* on the sides of the frame furnishing suitable bearings around the rods and allowing the rest of the frame to be made quite light. Pivoted between a pair of ears *m*′ at the rear of the carriage is a lever O. This lever passes loosely through a suitable guiding-yoke *m*² at the forward end of the carriage and has its forward end curved in the arc of a circle about its pivot and gear-teeth *o*′, formed thereon. These teeth are adapted to mesh with the teeth of the wheels G when the lever is depressed. A suitable spring *o*² tends to raise the lever O until it is stopped by hitting against the top plate of the yoke *m*². There are at least as many teeth *o*′ on the lever as there are teeth on such portion of the wheel G as corresponds to nine digits, and hence if a lever is depressed its full distance the wheel G will be rotated to add nine, whereas if the lever is depressed only a portion of its distance the wheel G will be rotated through a corresponding portion of such movement. By depressing the lever, for example, one-ninth of the way down after it has engaged the wheel G that wheel is rotated one digit.

Extending across the frame from front to back at each side is a bar R, having on its inner edge a series of bearing-faces *r*, arranged in echelon, and there are pivoted to these faces a series of bails S⁰ to S⁹. Each bail consists of a transverse tube *s*, having projecting from its ends the bars *s*′, at the rear ends of which the pivots are secured. The pivoting of the bails in the manner described allows them to be nested one within the other from the rear to the front of the machine, as shown.

If a bail (generically designated S) is depressed sufficiently to impinge against the lever O and force it downward into engagement with the wheel G in front of the lever, that wheel will be rotated a distance depending upon the distance of the bail from the fulcrum of the lever O. For example, if the rear bail S^9 is depressed its full stroke the lever O is forced downward sufficiently to rotate the wheel G from "0" to "9," while if the bail S′ is depressed its stroke the wheel G is rotated only the distance of one digit.

The finger-keys which represent the numerals are placed in the center of the keyboard, as shown, and are slightly elevated, which I find to be a very convenient arrangement. Each of these keys has a stem V, (the specific stems having exponents corresponding to the numeral on the keys,) which forks over one of the operating-levers C for the operation of the type-bar in the usual manner, but instead of ending at the guide-plate *a*, carried by the frame, as the rest of the keys do, extends downward and may act directly upon a bail, as shown in the case of the stem V^9 or it may operate the bails through intermediate mechanism. Such mechanism consists, preferably, of a flat lever U, (sc., a series U′ to U^9,) pivoted to the frame at its front end at *u* and projecting through a slot at the lower end of the stem and through a slot in a rod T, which extends upward from the bail. This mechanism furnishes convenient means, whereby the stem may act upon a bail, which is a distance back of it.

It is to be noticed that the rods T are screw-threaded into the bails and hence are adjustable, and therefore the bail may be made to stand at just such height above the lever O that when the numeral-key corresponding to that bail is depressed its full distance the bail will depress the lever O just the distance required to turn the wheel G the number of digit-places of that numeral-key.

The depression of each numeral-key, in addition to operating the lever O, actuates the escapement of the computer-carriage, causing it to move one space to the right. I will now describe this escapement.

A pair of bars W W′ extend across the machine one above the other, as shown. These bars have on their front edges notches *w*, the distance between which is equal to the distance between two consecutive wheels G. The lower bar W is stationary, while the upper bar, being secured by screws *w*′, passing loosely through slots w^2 in said bar, is capable of a movement limited by the length of that slot, and this movement is equal to the distance between two consecutive notches. A spring w^3 tends to draw the upper bar to its extreme left position.

Pivoted between the lugs *m*′ of the computer-carriage below the lever O is a lever I, from the under side of which depends a lug *i* in front of the notched bars, and to this lug is pivoted a dog *i*′, having a V-shaped nose, which is adapted to take in the notches of the bars. A spring i^2 tends to raise this lever, and a strap m^3, passing around the same on the side of the yoke m^2, limits the movement of the lever and guides it. The spring i^2 keeping the lever I normally elevated also keeps the dog *i*′ normally out of the lower notched bar and in engagement with the upper bar W′, and a strap *y*, leading from the drum Y, (which incloses a spiral spring tending to rotate the drum in the direction of the arrow shown thereon and being stronger than the spring w^3,) draws the carriage, and with it the upper bar W′, to the extreme right-hand position of that upper bar. The lever I being depressed a short distance, the dog *i*′ will pass out of the notch in the upper bar and into the notch in the lower bar. The lower bar will prevent the strap *y* from moving the carriage, while the spring w^3 will draw the upper bar to the left. When the dog again rises, it passes into a notch in the upper bar, which is next to the notch occupied previously, and as the dog leaves the lower bar the pull on the strap *y* will move the carriage one space to the right. It thus results that upon the return to its normal position of the lever I after a depression the computer-carriage is moved one space to the right.

Projecting from the upper side of the lever I are a series of adjustable screw-pins i^3, of which there are as many as there are bails S. One of these pins stands under each bail and is so adjusted that the bail will not strike it until almost at the lower limit of its movement, when it will strike the pin and depress the lever I enough to operate the escapement. If the finger-key marked "0" is forced downward its full movement, the lever O is not depressed sufficiently to engage with the wheel G; but the lever I is moved downward and causes the escapement of the carriage as the bail begins to rise. When the numeral 1 is depressed, the bail S′ depresses the lever O sufficiently to cause its engagement with the wheel G and rotate it one tooth. This depression of the bail also depresses the lever I. As the bail reaches the lowest end of its movement and begins to return, the lever O is prevented from returning by the engagement of its teeth with the wheel G, which cannot rotate backward on account of the dog J; but as the bail rises the lever I rises and the dog *i*′ passes back into the notch of the bar W′, and the escapement of the computer-carriage is actuated. Thereupon the strap *y* draws the computer-carriage to the right, drawing the teeth of the lever O horizontally out of the teeth of the wheel G. After the lever O has cleared the wheel G this lever rises, by means of its spring o^2, and passes above the next wheel G into position to engage with it, coming to rest there as the escapement is completed.

A series of plates P, projecting upward, as

shown, just at the left of the rear portion of each wheel G, prevents the teeth of the lever O from passing into engagement with the next wheel at the right, when the escapement is caused, if the tension on the spiral spring with the drum Y should be such as to operate the carriage more quickly than the spring o^2 causes the rise of the lever O.

At the side of the numeral-keys on the keyboard I place a key f', which has a stem operating upon the bail S^0, and thus causing the escapement of the computer-carriage the same as the zero key, and this key has a corresponding lever C, which operates the escapement mechanism of the type-writer carriage, as usual, but has no type-bar, wherefore it results that when this key is depressed the escapement of the type-writer carriage and the computer-carriage is simultaneously effected and the two move in unison without either the type-writer printing or the computer adding. The ordinary space-bar f causes the escapement of the type-writer carriage alone.

Some suitable stop, as the post a^2, projecting upward from the base, is provided for the computer-carriage when it comes into the position at the right of the last computer-wheel, and additional notches in the bars W W' are provided for the up-and-down movement of the dog i'. The lower notch w^4 may be made somewhat wider than the notches w, so that an accurate position of the stop need not be required, while the upper notch may be wide enough so that the bar W' can travel its full movement without engaging the dog, as shown at w^5 in the drawings. If it is not desired to use the computer, all that is necessary is to let the computer-carriage pass to the extreme right, where its levers will be operated idly.

I have shown a bar m^1 projecting from the computer-carriage, which furnishes convenient means for the returning of that carriage to the left-hand computer-wheel. As it is returned the dog i' simply springs past the notches in the upper escapement-bar, the spring i^4, acting on that dog, always returning it to its normal place.

As the amount of rotation of a wheel G depends upon the amount of depression of the lever O it is essential that means be provided whereby if a numeral-key is depressed at all it must be depressed its full stroke. The safety device which I employ to attain this result is shown in Figs. 1 and 2 in place in the machine and in Fig. 7 in detail. It consists of a suitably-shaped ratchet-pawl Z carried by each bail and a stationary ratchet-block Z', of the approximately-elliptical shape shown, carried by the plate a' of the frame. As the bail is depressed about its pivot the pawl moves forward and downward, and thus the lip z at its upper end comes into contact with the ratchet-teeth on the back face of the block Z'. If before the bail reaches its lowest limit the downward pressure on the numeral-key is stopped, the ratchet-pawl holds the bail depressed and the key will not rise nor the computer-carriage move. As the bail reaches its lowest position the pawl passes beneath the block and the spring z' acting thereon causes its upper end to swing over onto the front face of the ratchet-block. As the bail rises, therefore, the pawl-lip z travels upward on the front face of the block, where the ratchet-teeth are in the reverse direction, and these teeth prevent the depression of the bail before it has reached its highest position. When it has reached this position, the pawl springs back into the normal position shown in Fig. 7. It therefore follows that after a key has been once depressed a material distance it must be depressed its full distance and brought back to its normal position.

In writing a series of numbers which are to be added it is of course essential that they be directly beneath each other in the proper columns. In order that the type-writer carriage may be quickly and accurately brought to the same point at each line for the beginning of the column, I provide on some independently-movable part of the carriage, as the rack-bar b^2, a suitable pin b^3, and on some stationary part of the machine a suitable bar L, which has an overhanging portion l, which projects over the normal path of the said pin and is free therefrom, but has at its end a depending lip l', which is adapted to stand in the path of that pin when the rack-bar is tipped. The usual lever b^4 is provided for tipping the rack-bar. When that bar is tipped, the carriage becomes released from the escapement-dogs and is shifted to the left until the pin b^3 impinges against the lip l'. Thereupon the pressure is taken off of lever b^4 and the rack-bar returns to its normal position, the dog engaging with the teeth and the carriage standing in such position that there are the desired number of spaces at the end of the line. In the form shown in the drawings, Fig. 10, there is just space enough left after the pin b^3 is brought against the lip l' for the writing of eleven characters. This provides for the eight numerals which the computer is designed to take, a period, a comma, and a dollar-sign—*e. g.*, $100,000.00.

In the operation of my machine the type-writer, with exception of the numerals, is operated exactly as if there were no computing mechanism present. If it is not desired to use the adding mechanism, the computing-carriage may be allowed to move to the extreme right out of the path of any of the wheels G and the numerals used in the ordinary manner. When it is desired to add numbers which are to be written by the type-writer, the computer-carriage is shifted to the left and the wheels are each brought to zero by striking on the keyboard successively those figures which added to the figures read on the wheels through the windows K will in

each case produce "9" until the last wheel is reached, when enough is added to make "10." Thus if the number which is read through the windows of the computer is "237,368.42" the keys should be depressed to produce the number "762,631.58," which will leave all the computer-wheels at zero. The computer-carriage is then shifted to the left and the computer is ready to add.

Of course any desired explanation may be written by the type-writer before the numbers to be added. If the name of the account, for instance, is written on the machine and then the type-writer carriage shifted to the left until the pin b^3 impinges against the bar L, this leaves the type-writer carriage in a position corresponding to that occupied by the computer-carriage, and when the numerals are now struck both carriages move in unison. If it is desired to put in commas or periods to separate the dollars from cents, this can be done without affecting the computer, as it only moves when the numerals are depressed. After the number is written the computer-carriage is returned to its left-hand position and the process repeated. After all the numbers have been written their sum is read from the computer through the windows K and may be written at the bottom of the column.

Having described my invention, I claim—

1. A computing mechanism having a plurality of gear-wheels adapted in their rotation to move numeral characters to compute, a shiftable geared member adapted to engage with different gear-wheels and rotate them, and means for shifting said member whereby it may operate successively on different wheels, combined with a type-writer having numeral-keys, and intermediate mechanism between such numeral-keys and such shiftable member whereby the keys may actuate the member different amounts and thereby rotate the computing-wheels an amount corresponding to the numeral of the key, substantially as described.

2. In combination, a plurality of computing-wheels, loosely journaled side by side, a pivoted lever having a segmental rack on an arc about its pivot, said rack being adapted to engage with said wheels, means for changing the relative position of the lever and computing-wheels whereby the lever may engage with different wheels, and mechanism for actuating said lever the desired amount, substantially as described.

3. In combination, a plurality of computing-wheels, loosely journaled side by side, a pivoted lever having a segmental rack on an arc about its pivot, said rack being adapted to engage with said wheels, means for moving the lever out of engagement with a computing-wheel irrespective of the amount of rotation thereof, means for preventing the lever when thus released from passing into engagement with the next wheel until it has returned to an initial position, and mechanism for actuating said lever the desired amount, substantially as described.

4. The combination of a type-writing mechanism, and a computing mechanism, two distinct escapement mechanisms for the same, and finger-keys some of which operate both escapement mechanisms and some only one, substantially as described.

5. A type-writer mechanism having two classes of depressible keys, namely, numeral-keys and letter or punctuation keys, and a shifting paper-carriage and an escapement therefor which is adapted to be actuated by the depression of either class of keys, in combination with a series of computing-wheels, a shiftable intermediate mechanism between the computing-wheels and the numeral-keys of the keyboard whereby the actuation of the numeral-keys may cause the operation of the computing-wheels, an escapement mechanism for said shifting intermediate mechanism and means for actuating this escapement mechanism by the actuation of the numeral-keys but not by the other class of keys whereby characters other than numerals may be interspersed among the numerals written by the type-writer mechanism without shifting the intermediate mechanism to the computing-wheels, substantially as described.

6. The combination of a series of computing-wheels, a pivoted lever adapted to actuate the same, a series of type-writer keys adapted to strike numerals on a type-writer and to also operate said pivoted lever, an escapement mechanism for the pivoted lever distinct from the escapement of a type-writer carriage, and means for actuating said escapement by the depression of the numeral-keys, substantially as described.

7. The combination of a series of computing-wheels, a pivoted lever, a series of bails located above the same, a series of type-writer keys adapted to strike numerals on a type-writer and to depress these bails against the lever, means for communicating the movement of said lever to said computing-wheels, and an escapement actuated by the bails for shifting the lever laterally, and another escapement governing the printing of the type-writer, substantially as described.

8. A type-writing machine having a paper-carriage, type, and finger-keys connected with the type to print on paper on the carriage, and an escapement for the type-writer carriage, combined with a computing mechanism, a computer-carriage carrying means adapted to govern the computing mechanism and shiftable with reference thereto, an escapement for the computer-carriage distinct from that for the type-writer carriage, and connections between the finger-keys and the governing means of the computer-carriage, substantially as described.

9. In a combined type-writing and computing machine, a plurality of computing mem-

bers, a computer-carriage, means carried thereby and adapted to govern the computing members, an escapement mechanism for said carriage adapted to move it laterally, part of said escapement being carried by said carriage, a keyboard containing numeral-keys, and suitable connections from said keys to said governing means and said escapement carried by the carriage, whereby said keys may operate said computing members and cause the escapement of said computer-carriage, combined with a carriage for the paper to be printed and an escapement for said paper-carriage, suitable type, and a connection between the type and said keys whereby the keys may actuate the printing of the paper on said paper-carriage, substantially as described.

10. In a combined type-writing and computing machine, a plurality of computing-wheels, a computer-carriage, a lever carried thereby and adapted in its movement to actuate the wheels, an escapement mechanism for said carriage adapted to move it laterally, a second lever carried by said carriage and adapted to actuate the escapement mechanism, a keyboard containing numeral-keys and suitable connections between said keys and the first-mentioned lever, and between said keys and the escapement-lever whereby said keys may operate said computing-wheel and cause the escapement of said computer-carriage, combined with a second carriage, for the paper to be printed, type adapted to coöperate therewith, and a connection between the type and the said keys whereby the keys may actuate the printing of the paper, substantially as described.

11. In a computing mechanism, the combination of a plurality of computing-wheels, a movable carriage, an operating-lever pivoted thereto, said lever being adapted to actuate said computing-wheels, a spring tending to draw said carriage in one direction, an escapement-lever pivoted to said carriage, a dog carried by said lever and constituting a portion of a suitable escapement mechanism, said escapement mechanism normally operating to retain the carriage against the pull of said spring but allowing said spring to pull the carriage a certain definite distance after the escapement has been actuated, substantially as described.

12. The combination of a series of computing-wheels arranged side by side, a shiftable lever adapted to operate the same, the amount of rotation of said wheels depending upon the amount of depression of said lever, finger-keys adapted to depress said lever different amounts, and an escapement adapted to cause said lever to shift laterally with reference to said computing-wheels, and means whereby said escapement may be actuated by a finger-key when said lever is depressed the full amount said key is adapted to give it, whereby a computer-wheel may remain undisturbed when the lever shifts from it, substantially as described.

13. The combination with the key-levers and type-bars of a type-writing machine, of a set of numeral-keys the stems of which not only engage with said key-levers but continue below the same while rigid with the upper part of the stem, a set of bails, said stems operating to actuate said bails, whereby depressions of the numeral-keys depress the usual key-levers and also the bails, combined with a computing mechanism operated by the depression of said bails, substantially as described.

14. The combination of a computing mechanism, a depressible lever for actuating the same, and adapted to actuate the same to a definite amount according to the depression of the lever, a type-writer mechanism, intermediate mechanism between the type-writer and lever whereby the depression of the key causes the actuation of said lever, and a safety device operating to prevent the return of said key to its normal position after it has been depressed a material amount until it has been depressed its full stroke, whereby a lever is always depressed a definite amount by the depression of a given key, substantially as described.

15. In a combined type-writer and computing mechanism, the combination of a lever for operating the computer, a series of bails standing across the lever and adapted to be depressed onto it and cause its depression, a stationary block having ratchet-teeth, a pawl carried by the bail and adapted to engage with said ratchet-teeth and prevent the return of the bails after such engagement has once begun until the pawl has descended clear of the block, and a key adapted to cause the depression of said bail, substantially as described.

16. The combination, in a type-writing and computing machine, of a type-writer mechanism having a movable paper-carriage and a computing mechanism adapted to add a column of figures of less width than the width of the line which may be written by the type-writing machine, and a stop for bringing the carriage to a standstill at a proper point at the left of the numerals to be added, said stop being normally inoperative, but being thrown into operation when the escapement mechanism of the carriage is thrown out of gear and the carriage loosely shifted, substantially as described.

17. The combination with a type-writer mechanism having a traveling carriage for its paper and a movable rack-bar on that carriage which may be moved to allow the free shifting of the carriage, of a pin secured to said rack-bar, and a stationary bar normally out of the path of said pin but adapted to stand in its path when the rack-bar is moved to allow free shifting of the carriage, whereby the carriage may be shifted by means of re-

leasing its rack-bar and brought to a stop at a proper point by its pin engaging said bar, said engagement being broken when the rack-bar is returned to its normal position, substantially as described.

18. The combination of a type-writing mechanism and a computing mechanism, two distinct escapement mechanisms for the same, and a key which operates both escapements but does not operate to print or compute, substantially as described.

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

HOLMES MARSHALL.

Witnesses:
ALBERT H. BATES,
E. B. GILCHRIST.