

**No. 704,938.**

**Patented July 15, 1902.**

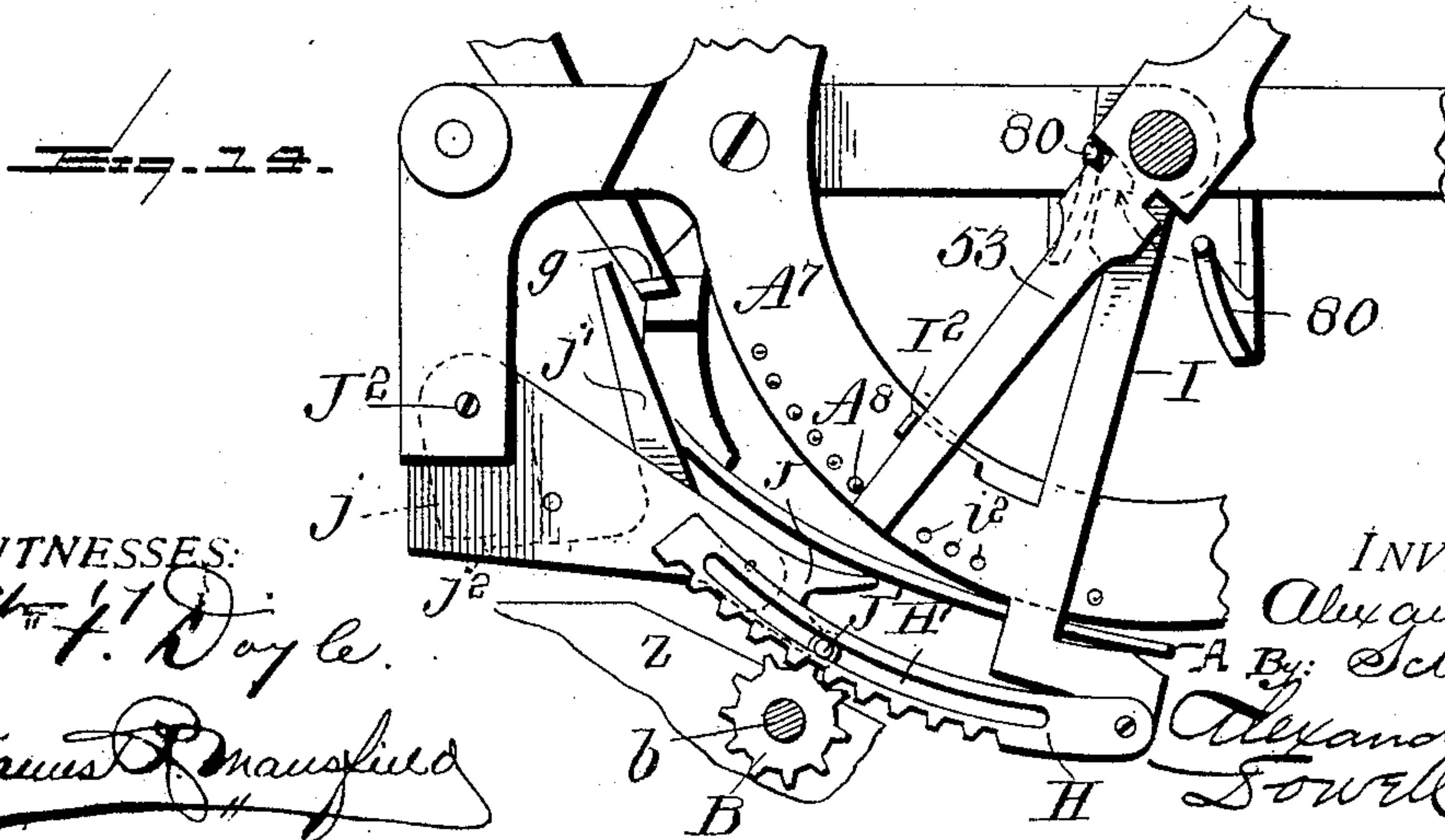
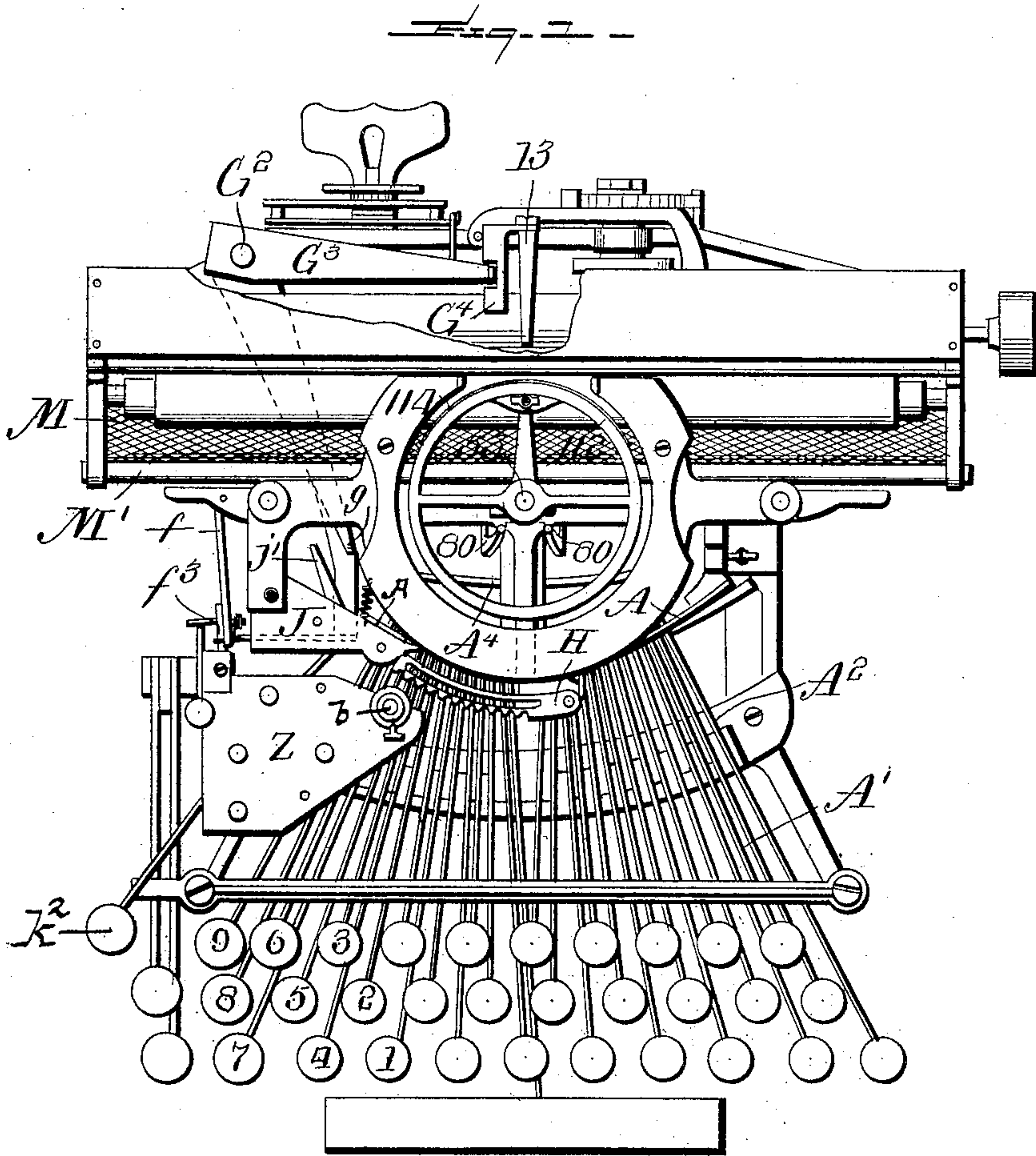
**A. C. SCHUMAN.**

**ADDING MACHINE.**

(Application filed Mar. 20, 1902.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES:

W<sup>th</sup> 7<sup>th</sup> Daye.

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INVENTOR,

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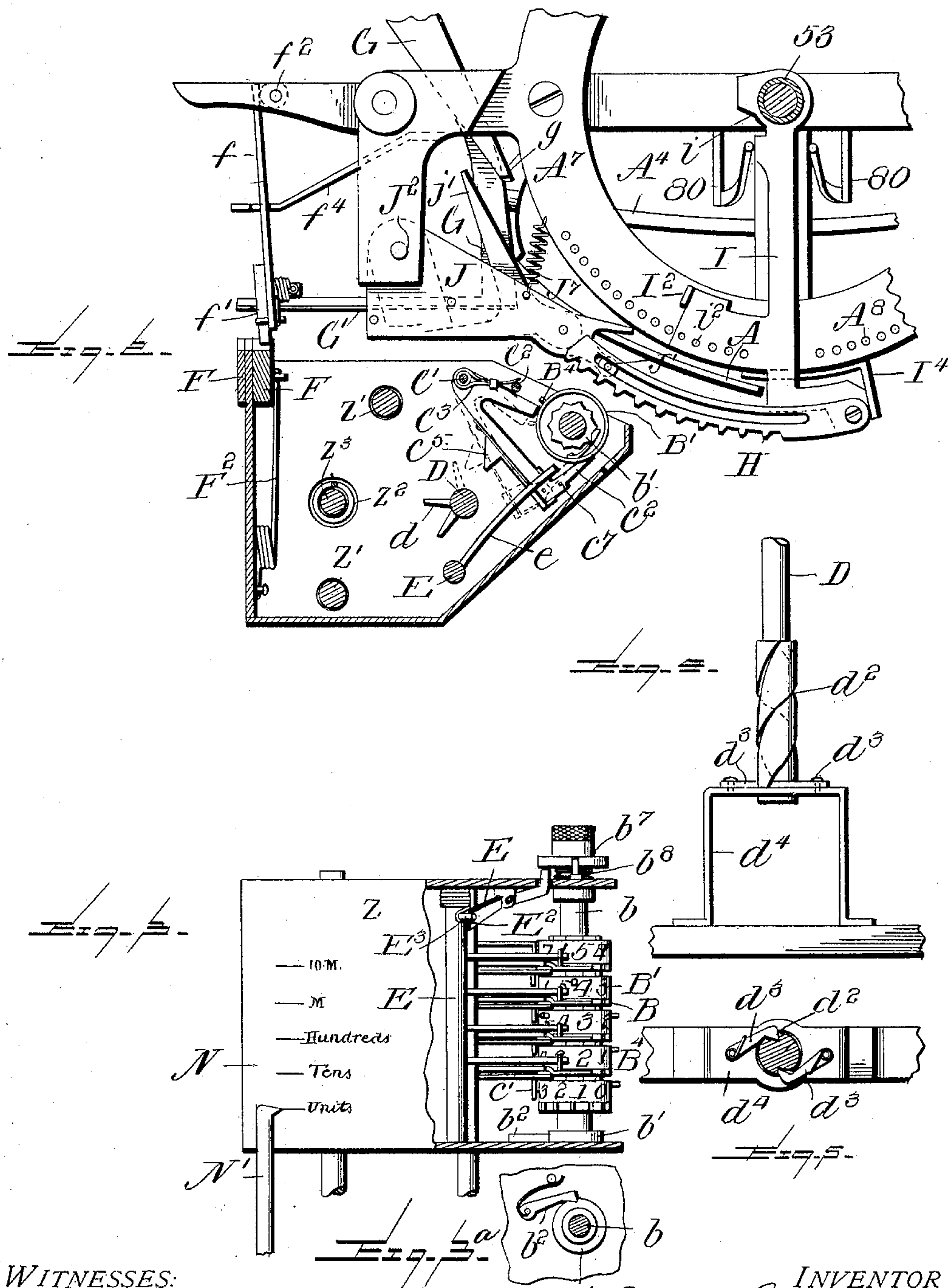
**A. C. SCHUMAN.**

## ADDING MACHINE.

(Application filed Mar. 20, 1902.)

(No Model.)

4 Sheets—Sheet 2.



WITNESSES:

11<sup>th</sup> 7<sup>th</sup> Day 6

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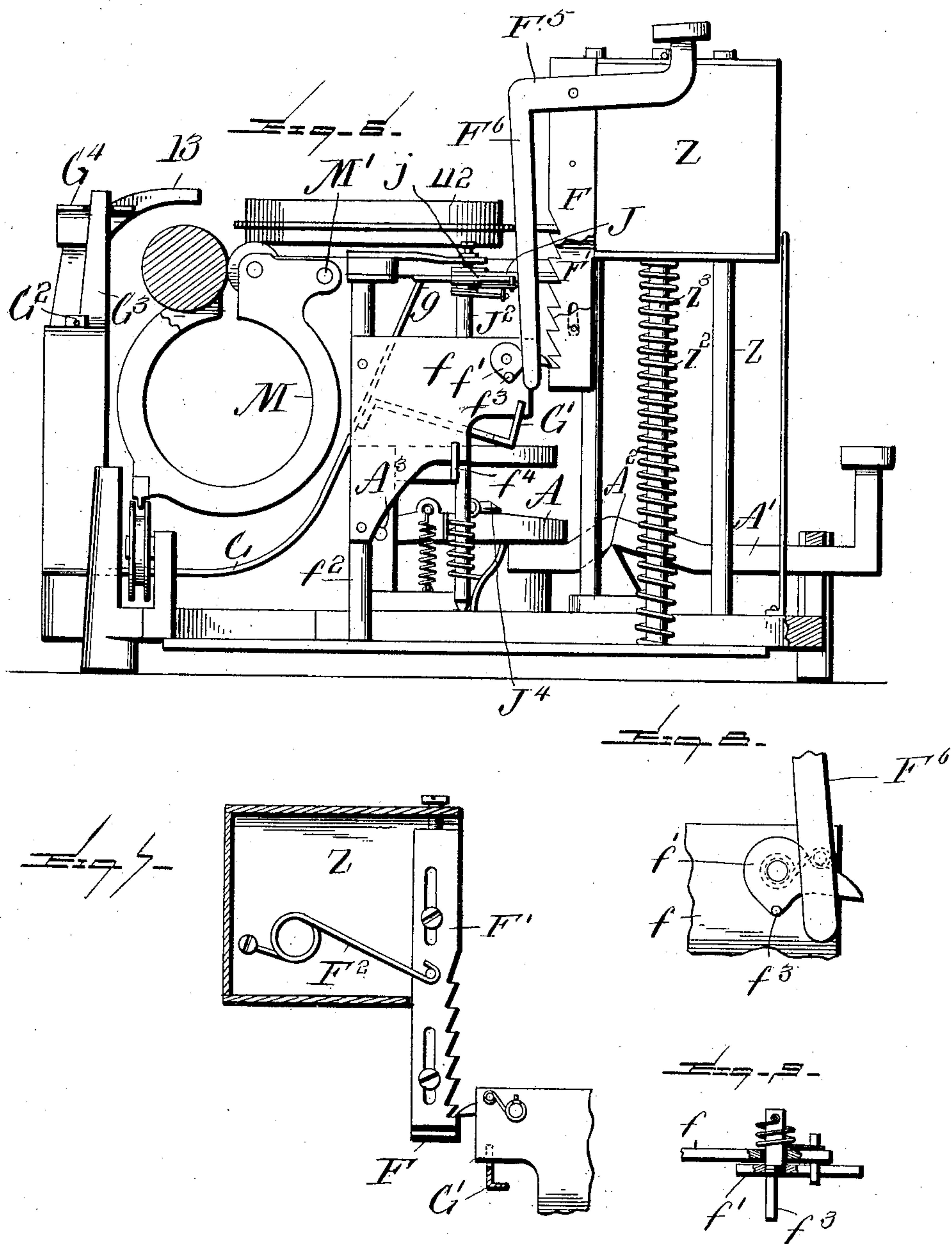


**A. C. SCHUMAN.**  
**ADDING MACHINE.**

(Application filed Mar. 20, 1902.)

(No Model.)

4 Sheets—Sheet 3.



*WITNESSES:*

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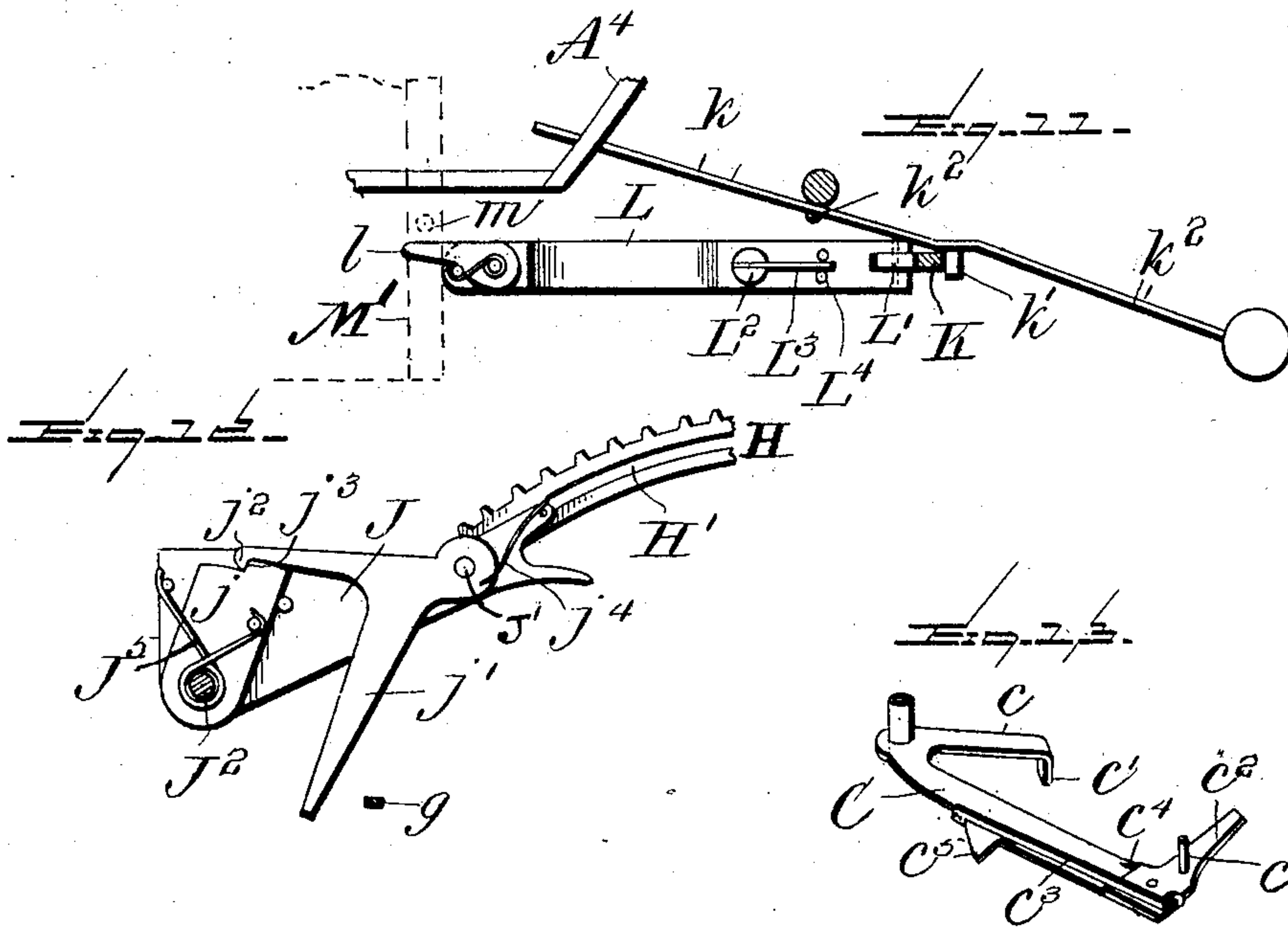
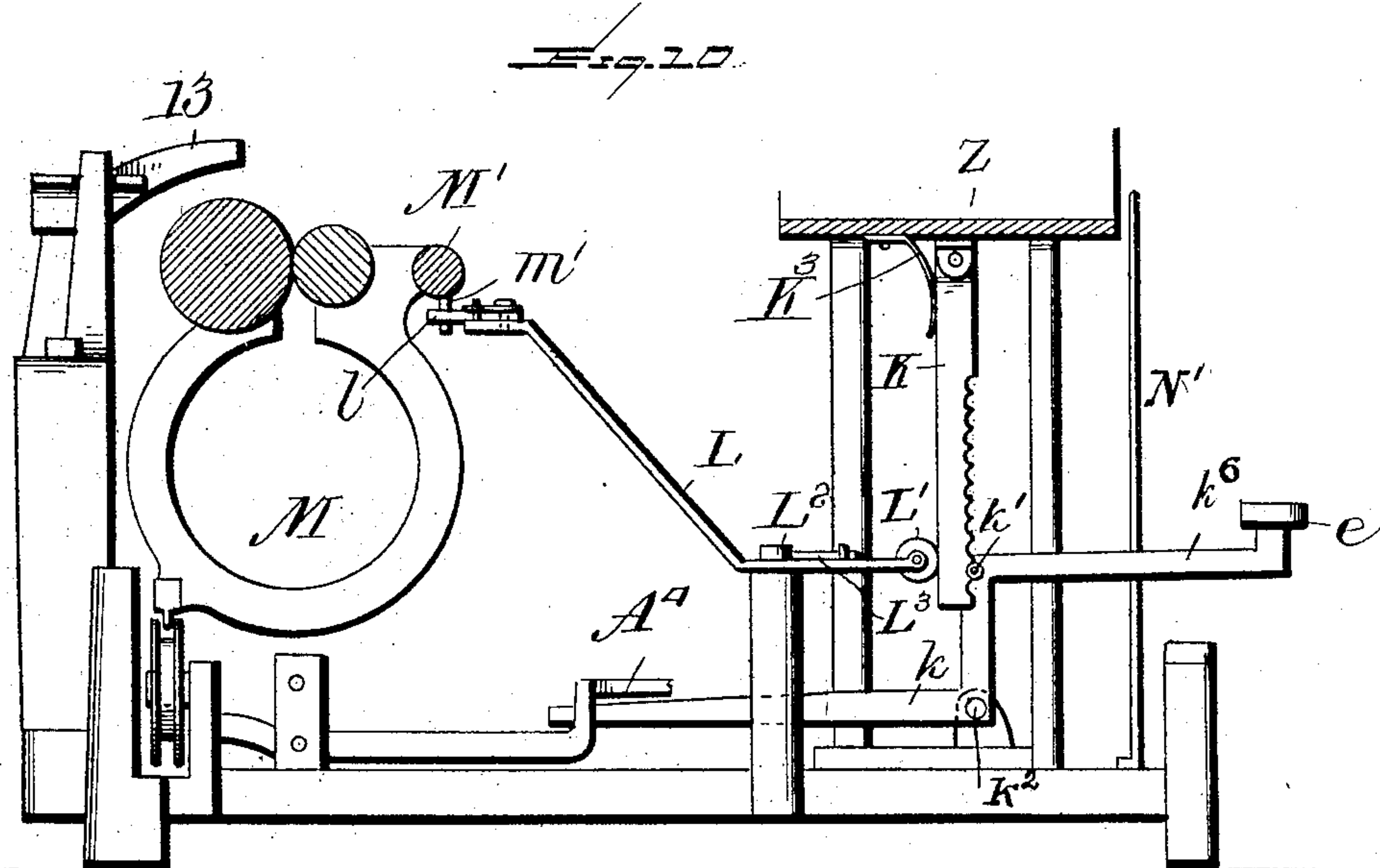
A. C. SCHUMAN.

ADDING MACHINE.

(Application filed Mar. 20, 1902.)

(No Model.)

4 Sheets—Sheet 4.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

ALEXANDER C. SCHUMAN, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO  
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## ADDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 704,938, dated July 15, 1902.

Application filed March 20, 1902. Serial No. 99,199. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER C. SCHUMAN, of Louisville, in the county of Jefferson and State of Kentucky, have invented certain  
5 new and useful Improvements in Adding Attachments for Type-Writing Machines; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings,  
10 which form part of this specification.

This invention is an improved attachment for type-writing machines whereby the total amount of items tabulated on the machine can be ascertained at any time; and it consists in a novel registering mechanism where-  
15 by the amounts of any items tabulated or written upon the type-writer can be added simultaneously with the writing thereof at the will of the operator and at any time the op-  
20 erator can determine from the registering-wheels the total amount of any sums or series of sums which have been registered on the machine.

The device can also be used as an adding  
25 mechanism to calculate totals of items not written on the machine.

The adding mechanism is preferably arranged to be operated by or from the ordinary numeral-keys of the type-writing machine, be-  
30 ing thrown into or out of operation at the will of the operator by a very simple contrivance, so that the registering mechanism need not be operated except when desired, which enables the numeral-keys of the type-writing machine  
35 to be used for dating and ordinary numeral work in the usual manner without affecting the registering mechanism, or the numeral-keys may be caused to actuate the registering mechanism simultaneously with their or-  
40 dinary imprinting actions. In the drawings I have shown the adding attachment applied to the well-known Hammond type-writer; but it is applicable to other makes and kinds of type-writing machines, and I do not restrict  
45 myself to the specific application of the invention nor to the specific construction of parts there shown in the drawings.

I will now describe the invention as illustrated in the drawings and refer to the claims  
50 appended to the description for summaries of the features and combinations of parts which

I deem novel and for which I desire protection.

In said drawings, Figure 1 is a plan view of a Hammond type-writing machine with my  
55 improved adding attachment applied thereto. Fig. 2 is a detail part-sectional plan view of the adding attachment and connections. Fig. 3 is a front view of the registering mechanism, partly broken. Figs. 3<sup>a</sup>, 4, and 5 are de-  
60 tails. Fig. 6 is a detail side view of the adding attachment and portion of the type-writer, partly in section. Fig. 7 is a detail view of the adding-frame escapement mechanism. Figs. 8 and 9 are details thereof. Fig. 10 is  
65 a detail sectional elevation of the type-writing machine and adding mechanism, illustrating the devices for spacing the type-writer carriage by the depression of the adding-  
70 frame. Fig. 11 is a detail plan of Fig. 10. Fig. 12 is an inverted plan view of the plate J shown in Fig. 2 and connections. Fig. 13 is a detail of one of the "carry-over" levers. Fig. 14 is a detail view of registering-wheel-  
75 actuating mechanism shown in Fig. 2, showing the segment in mesh.

112 designates the anvil of a Hammond type-writer, on which is mounted the type-shuttle 114, which is vibrated by means of a vibrating shuttle-arm 53, which is actuated by either  
80 of two driver-arms 80, each of which is operated by suitable connections from curved bars A, each of which extends over one-half of the series of key-levers A', that are suitably fulcrumed at A<sup>2</sup>, and when the outer end  
85 of a key-lever is depressed its inner end is raised, lifting bar A, thereby rocking the connected pusher-arm 112, which moves the shuttle-arm and shuttle more or less, according to the key depressed. Upon the release  
90 of the key the parts are returned to normal position by suitable springs. An impression is taken from the type on the shuttle 114 at the proper time and point by means of the hammer 13, which is actuated by suitable  
95 mechanism controlled by the lift-bar A<sup>4</sup>, which is operated by the key-levers, like bars A. As all the foregoing parts are constructed and operated just as in the ordinary Hammond  
100 type-writing machine in common mercantile use, it is not necessary to more particularly describe them.



*The adding attachment.*—A series of similar registering-wheels B are loosely mounted on a shaft  $b$ , journaled in a frame Z. These wheels have numbered flanges  $B'$ , and fixed on shaft  $b$  beside each wheel B is a star-wheel  $b'$ , which is engaged by a double-beveled spring-pressed pawl attached to the adjacent registering-wheel. These star-wheels and pawls permit the registering-wheel to be independently rotated on shaft  $b$  and at the same time permit them in "setting" the adding mechanism to be rotated with the shaft back to zero position and then stopped. The shaft  $b$  can only be rotated in one direction, (to reset the registering-wheels,) being provided with a notched disk  $b^5$ , engaged by a spring-actuated pawl  $b^2$  on the frame, which prevents forward rotation of shaft  $b$ . Each registering-wheel (except that of highest denomination) is provided with a carry-over pin  $B^4$ , which is adapted to contact with a lug  $c'$  on the short arm  $c$  of an oscillating lever, the longer arm C of which extends beside the wheel of the next higher denomination, and on the extremity of arm C is pivoted a dog  $c^2$ , which is adapted to engage with and turn the said higher wheel when the carry-over lever is moved inwardly, as hereinafter described. The dog  $c^2$  is normally pressed inward by a spring  $c^3$ , but is arrested in proper position by a lug  $c^4$  on arm C, as shown. The carry-over levers are all loosely pivoted on a shaft  $C'$  and are kept from free vibration by suitable friction devices, frictional springs  $C^3$  being shown for this purpose, said springs being fast to a rod  $C^2$ , fixed in the frame. On the long arm C is a cam projection  $c^5$ , which is adapted to be engaged by an arm  $d$  on a rotatable shaft D, and the arms  $d$  for actuating the carry-over levers of disks of successively higher denominations are so placed on the shaft that they will actuate these levers in succession instead of simultaneously, so as to enable the disks to carry over successively at one rotation of shaft D, if necessary to do so, as would be the case in adding three hundred and thirty-three to six hundred and sixty-seven.

Adjacent to dogs  $c^2$  is a rock-shaft E, having a series of fingers  $e$ , which are adapted to engage pins  $c^7$  on dogs  $c^2$  and move the latter out of position to engage the registering-wheels when the latter are to be reset. The shaft E may be rocked by means of an oscillating lever  $E'$ , fulcrumed on the frame and having a beveled end  $E^2$  engaging a pin  $E^3$  on shaft E. The other end of the lever comes beneath a button  $b^7$ , splined on the end of shaft  $b$  and normally pressed outward by a spring  $b^8$ ; but upon pushing the button inward lever  $E'$  is oscillated, rocking shaft E and causing fingers  $e$  to move dogs  $c^2$  out of position to engage the registering-wheels, and then by rotating button  $b^7$  the shaft  $b$  can be turned so as to rotate registering-wheels B backward until the pins  $B^4$  strike the rear side of lugs  $c'$ , which arrests the registering-

wheels at "zero" position. I would state here that on the forward or registering movements of wheels B the movement (one-tenth of a revolution) imparted to such wheels for each unit registered thereby is sufficient to cause pin  $B^4$  to engage lug  $c'$ , shift lever C, and move past the lug, so that the pins  $B^4$  will not interfere with the carrying-over movements of levers C. Each time any number has been registered by the wheels shaft D is rotated once, so as to cause the carrying-over operations, if such be necessary.

In the machine shown the frame Z, with the registering-wheels and devices above described, is vertically movable, being guided on upright rods  $Z'$ , attached to the main frame, and the frame is normally pressed upward to highest position by a coiled spring  $Z^2$ , surrounding a rod  $Z^3$ , as shown. After each item is registered the frame is depressed before beginning the registration of a new item, and this depression causes the rotation of shaft D, which is provided with coarse angular spiral grooves  $d^2$  in its lower end which are engaged by dogs  $d^3$ , pivoted on a support  $d^4$ , attached to the main frame, and during the downward movement of the frame the dogs  $d^3$ , riding in the grooves  $d^2$ , cause shaft D to rotate once, thereby effecting the carry-over operations, as above described. On the upward movement of the frame the dogs simply ride or back out of the grooves without rotating the shaft D. The shaft D is suitably journaled in frame Z so it can reciprocate therewith and rotate therein; but its lower end passes freely through the opening in support  $d^4$ . In the present invention the several registering-wheels are successively operated by a single segment, which is actuated from the key-levers, as hereinafter described, and at each depression of a number-key (when the registering mechanism is in operation) the frame Z is shifted so as to bring a disk of lower denomination into position for actuation by means of the spring  $Z^2$ , the shifting of the frame Z, however, being controlled by an escapement mechanism, which I will now describe.

*The escapement mechanism for the registering devices.*—Attached to the rear side of frame Z is a fixed vertical ratchet F, whose teeth correspond in number and distance apart to the registering-wheels B. Beside ratchet F is a corresponding movable rack  $F'$ , which is guided by slots and pins and upheld by a spring  $F^2$ , as shown. These racks are alternately engaged by a dog  $f'$ , pivoted on a laterally-oscillating plate  $f$ , which is supported on a vertical rod  $f^2$ , pivoted in suitable bearings on the main frame of the typewriter. The oscillation of plate  $f$  is limited by a slotted stop-bar  $f^4$ , attached to the frame, as shown. As plate  $f$  oscillates dog  $f'$  is engaged alternately with racks F  $F'$  and the frame Z permitted to rise by a step-by-step movement, similar to the carriage-escapement action of a type-writing machine. The



plate  $f$  is oscillated by a rocking lever  $G$ , the front end  $G'$  of which is bent laterally outward and provided with a notch adapted to engage the edge of plate  $f$ , so as to vibrate the latter and at same time permit lever  $G$  a greater movement than is necessary to actuate the plate, the lever  $G$  performing additional functions, hereinafter explained. The lever  $G$  extends rearwardly beneath the paper-carriage and in rear thereof is fulcrumed on a pin  $G^2$ , attached to the main frame, and to the rear end of lever  $G$  is attached an angular arm  $G^3$ , which extends to the hammer 13 and is engaged by a notched plate  $G^4$ , attached to the side of the hammer, so that the latter imparts oscillating movements to lever  $G$ . A releasing-lever  $F^5$  is pivoted to the frame  $Z$  and provided with a thumb-piece or key on its upper end, while its lower or inner side  $F^6$  depends beside the dog  $f'$  and is adapted to engage a pin  $f^3$  on the dog when the key on lever  $F^5$  is depressed, so as to disengage the dog from the racks  $F F'$  and allow the frame  $Z$  to rise. The normal position of said frame is in its elevated position, and it is not intended to be depressed until it is desired to add an item. Then the frame is depressed and is released by the escapement mechanism above described each time a numeral is printed.

*The devices for shifting the registering-wheels in recording items.*—The shaft  $b$ , carrying registering-wheels  $B$ , is vertical in the construction shown and is located at the left-hand side of the machine at a point adjacent to the type-shuttle. The registering-wheels are accessible at this point and are adapted to be engaged by a vibrating segment  $H$ , which is arranged horizontally and is supported at one end on an oscillating lever  $I$  (to which the segment is pivoted) and is further supported by a pin  $J'$  on a vibrating plate  $J$ , loosely attached to a shaft  $J^2$ , pivoted between suitable bearings on the main frame, as shown. The pin  $J'$  engages a longitudinal slot  $H'$  in segment  $H$ , so that the latter can reciprocate on the pin. The plate  $J$  is upheld by a plate  $j$ , fixed to shaft  $J^2$ , (see Figs. 2 and 12,) so that it can oscillate on the shaft  $J^2$ . An angular lever  $j'$  is pivoted to the under side of plate  $J$  and has a tooth  $j^2$  on one arm adapted to engage a notch  $j^3$  in plate  $j$ , so as to lock the plates  $J j$  together normally, a spring  $j^4$  being arranged to normally hold the tooth  $j^2$  in engagement with notch  $j^3$ . The other arm of lever  $j'$  projects in rear of the plate  $J$  and is adapted to be struck by a finger  $g$  on the lever  $G$  when the latter is moved by the type-hammer, as above explained. The shaft  $J^2$  is provided with a cam  $J^4$  on its lower end, which lies above and is engaged by the lift-bar  $A$ , so that as the latter is lifted by the keys shaft  $J^2$  is turned so as to swing plates  $J j$  toward the registering-wheels, and thus through pin  $J'$  move segment  $H$  into mesh with a registering-wheel, if the latter are in position for mesh therewith. When

the key is released, bar  $J^2$  and plates  $J j$  are rocked backward by a spring  $J^5$ . A spring  $J^7$  is also connected to plate  $J$  and to a suitable adjacent fixed point on the frame, and if catch  $j^2$  disengages notch  $j^3$  spring  $J^7$  will immediately throw plate  $J$  backward, so as to withdraw the segment  $H$  from mesh with a registering-wheel before shaft  $J^2$  is thrown backward, which is necessary; otherwise the segment would remain in mesh on both strokes, and therefore would return the registering-wheel to starting position and fail to register accurately. The segment  $H$  is thrown forward in position to mesh with a registering-wheel each time the left-hand bar  $A$  is raised by the depression of a key; but the segment  $H$  is not oscillated or reciprocated unless one of the numeral-keys is depressed, and then it moves more or less, according to the numeral of the key. In practice the segment  $H$  will be vibrated by the depression of the ordinary numeral-keys of the type-writing machine; but I prefer to arrange all the numeral-keys at one side of the machine, so that all such keys will actuate the left-hand type-controlling lift-bar  $A$ , (two such bars, one on right-hand and one on left-hand side of machine, being employed in the Hammond type-writing machines.) The keys bearing the numbers "1" to "9," inclusive, on the drawings are thus arranged. Except for this changing of the location of the numerals on the keys (and consequent rearrangement of characters on the type-shuttle) no other change is necessary in the mechanism of the Hammond type-writing machine when the invention is applied thereto.

The lever  $I$ , carrying the segment  $H$ , is almost a counterpart of the shuttle-arm 53, which is used in the Hammond machine to actuate the type-carrier. It is, however, only operated by the left-hand driver-arm, and consequently needs but one slot  $i$  to engage therewith. (See Fig. 2.) The lever  $I$  is pivoted on the sleeve of arm 53 and projects forwardly beyond the ordinary stop-rod ring  $A^7$  of the Hammond type-writing machine to permit the segment  $H$  to be pivoted thereto and work clear of the stop-rods  $A^8$  of the machine. The lever  $I$  works below the ordinary shuttle-arm 53 of the machine and is not vibrated until the proper key is depressed. Then the left driver-arm 80 engages the notch  $i$  and moves the lever  $I$  and segment  $H$  until the arm  $I'$  on the lever  $I$  brings up against the stop-rod  $A^8$ , which has been raised by the depressed key, (as usual in the Hammond type-writing machine.) The arm  $I'$  of lever  $I$  is provided with an upstanding lug  $I^2$ , which is engaged by the shuttle-arm 53 of the machine when a numeral-key is depressed, so that the proper movement of segment  $H$  is insured. It may not be necessary to use both the slot  $i$  and the lug  $I^2$ , but I show both in the drawings. The arm  $I$  may be perforated, as at  $i^2$ , to permit the passage of underlying stop-rods when the lever  $I$  is in normal retracted posi-



tion. The lever I is returned, with segment H, by the action of shuttle-arm 53, just as the shuttle of the Hammond machine is returned, and is arrested in normal position by a stop I<sup>4</sup>, attached to the side of the upper stop-rod ring, as shown.

*The tabulating device.*—Pivotally suspended from the under side of the frame Z is a link K, having angular notches K' in one edge which are adapted to engage a roller k', fixed on the short arm of a bell-crank lever k, which is pivoted at k<sup>2</sup> on a suitable support on the main frame, as shown. The longer arm of lever k is carried down under the hammer-release and spacing bar A<sup>4</sup> of the type-writing machine, which is raised every time a key is depressed, or each time the spacing-bar is depressed, as in the ordinary Hammond type-writing machine. When the frame Z is depressed, the roller k', riding over the notches K', oscillates lever k and causes it to lift bar A<sup>4</sup> each time it rides over a notch, sufficiently to operate the carriage-escapement and allow the carriage to move down (just as if the ordinary space-bar was operated) one space for each notch K' in link K. The link is normally held in engagement with roller k' by means of a roller L' on one end of an oscillating lever L, which is pivoted at L<sup>2</sup> on a fixed support secured to the frame, and is kept normally in position to hold the link in engagement with the tooth by means of a double-acting spring L<sup>3</sup>, attached to the fixed pivot L<sup>2</sup> and engaging between lugs L<sup>4</sup> on the lever, so as to return the lever L to central position whether it be rocked to right or left. The rear end of lever L projects close to the guide-bar M' of the paper-carriage M of the type-writing machine, and on this bar is fixed a pin m, which is adapted to strike a dog l, pivoted to the inner end of lever L, and move the lever so as to disengage roller L' from link K, (as the carriage moves to the left,) so that the link rocks or vibrates over the roller k' instead of rocking the lever. A spring K<sup>3</sup> is arranged to press the link inward toward the roller k', so as to permit the roller L' to move behind the lever as soon as permitted by the carriage; but this spring is not sufficiently powerful to cause the link to actuate the lever when roller L' is displaced.

This device is quite useful in tabulating work, for it enables the operator to rapidly space the carriage without manipulating the space-key. For example, after entering an item of merchandise the operator can depress frame Z, and this movement of the frame-depressing link K vibrates lever k and operates the carriage release or escapement mechanism, permitting the carriage to move down until the lever L is displaced by pin m (which is always at a certain point) or until the frame Z is fully depressed. If when fully depressed the carriage must move still farther to the tabulating-point, the carriage can be moved on by manipulating the space-

key of the machine in the ordinary manner. When the frame Z is fully depressed, it is in position to begin registering with the wheel of highest denomination. If, however, some smaller denomination is to be registered, the frame Z must be raised until the desired registering-wheel is in position for engagement with segment H. This may be accomplished by means of the release-key F<sup>5</sup>, but I preferably attach a key-lever k<sup>6</sup> to lever k, lever k<sup>6</sup> extending to a convenient position so that by depressing this lever k<sup>6</sup> the bar A<sup>4</sup> will be raised sufficiently to fully release the hammer 13, which, making its full stroke, causes lever G to operate the escapement F' of the frame Z and permit it to rise one notch, and this allows the paper-carriage to simultaneously move one notch to the left. Thus if the tabulating-point was at "50" on the index, and owing to the small denomination of the item the carriage must move on to "53" and the registering-frame rise three notches, three depressions of lever k<sup>2</sup> will effect both the proper shifting of the carriage and the proper raising of the registering-frame.

The frame Z may be provided with an index N, moving past a fixed indicator N', by which the operator can tell at a glance the denomination of the registering-wheel which is in position for actuation by the segment H.

Operation: The particular operation of the several parts have been explained above in connection therewith. The general operation is as follows: While the frame Z is in its uppermost position the type-writer can be operated as usual, so that the dates and character of items can be recorded, written without the registering-wheels being affected. After writing out the item the operator depresses frame Z, this through the described mechanism simultaneously spaces the type-writer carriage to the left, until the tabulating-point is reached or (if it stops short of that point when frame Z is fully depressed) it can be moved down by the ordinary spacing-key. This tabulating-point would correspond to the highest denomination of disk, (tens of thousands in the machine shown,) and if the amount of the item recorded was in this denomination the operator would simply write it on the machine. The amount would be registered on the adding mechanism simultaneously with the writing thereof on the paper. At the end of the item the frame Z has risen so that the date and character of the next item can be written without affecting the adding mechanism, if the amount of the next item is, say, one hundred dollars. After the frame Z has been fully depressed the release-key k<sup>2</sup> is operated until the frame Z rises to the "hundreds" point on the scale. Then the amount of item is written. The frame Z should be raised fully and depressed fully between each registering operation, so as to insure the proper complete rotation of the carry-over devices.



The invention is not restricted to the construction of parts nor application thereof to the particular type-writing machine shown in the drawings, but includes the combinations and constructions of parts set forth in the following claims, which define the nature and extent of the invention for which protection is sought.

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

1. In combination with a type-writing machine, a registering mechanism mounted in a movable support beside the type-writing machine, and a vibrating actuating device therefor operated by and from the ordinary numeral-keys of the type-writer, and adapted to engage the registering mechanism on one stroke and to be disengaged therefrom at the end of such stroke and during its return movement, substantially as described.

2. In combination with a type-writing machine, and a laterally-swinging and longitudinally-vibrating segment actuated from the numeral key-bars thereof, with an adding mechanism composed of a series of axially-aligned registering-wheels, and means for bringing said wheels into position to be engaged by the segment, substantially as described.

3. In combination with a type-writing machine, a series of registering-wheels mounted in a movable support beside the same, and a swinging and reciprocating actuating device operated by the numeral-keys of the type-writing machine adapted to operate the registering-wheels on one stroke and be disengaged therefrom during its return stroke, said registering-wheels being bodily movable into or out of operative position at the will of the operator, substantially as described.

4. In combination with a "Hammond" type-writing machine having a vibrating driver-arm, a series of registering-wheels mounted in a movable support beside the type-writing machine, and a vibrating actuating device operated by and from the "driver-arm" of the machine adapted to engage any of the register-wheels at the will of the operator.

5. In combination with a type-writing machine, a series of registering-wheels mounted in a movable support beside the type-writing machine, a vibrating segment and actuating-key connections adapted to cause said segment to engage a register-wheel when a numeral-key is depressed and to disengage such wheel at the end of its forward stroke, substantially as described.

6. In combination with a type-writing machine, an adding mechanism comprising a series of registering-wheels mounted in a movable support, a single vibrating actuating device actuated from the ordinary numeral-keys of the type-writing machine, adapted to engage a registering-wheel on one stroke and to be disengaged therefrom before and during its return stroke, said support being movable

at the will of the operator to bring any registering-wheel into engagement with the actuating device.

7. In combination a series of registering-wheels mounted in a vertically-movable support, and an actuating device adapted to operate the registering-wheels successively as the support rises, and means for resetting the wheels to "zero position" when the support is depressed.

8. In combination with a type-writing machine, a series of registering-wheels mounted in a vertically-movable support, and an actuating device operated by the numeral-keys of the type-writer adapted to operate the registering-wheels successively as the support rises, and means for resetting the wheels to "zero position" when the support is depressed.

9. In combination a series of registering-wheels mounted in a vertically-movable support, an actuating device adapted to engage and operate the disks successively, means for moving the support, and an escapement mechanism whereby the support is raised one step each time the actuating device is operated.

10. In combination a series of registering-wheels mounted in a movable support, an actuating device adapted to engage and operate the disks successively, means for moving the support past said device, and an escapement mechanism whereby the support is permitted to move one step each time the segment-actuating device is operated until the registration is finished, and means for automatically resetting the disks upon and during the return movement of the registering-wheels.

11. In combination with a type-writing machine, a series of registering-wheels mounted on a movable support, a swinging and reciprocating actuating device adapted to successively engage the registering-wheels, said device being operated from the ordinary numeral-wheels of the type-writing machine, and an escapement mechanism controlling the registering movements of said support; with means for resetting the registering-wheels each time the support is retracted, said registering mechanism being movable into or out of operative position at the will of the operator.

12. In combination with a type-writing machine, an adding mechanism adapted to be actuated by and from the ordinary numeral-key levers of the type-writing machine, and means for moving said adding mechanism into or out of operative position; with mechanism whereby upon the movement of the adding mechanism to operative position the type-writing carriage is simultaneously released and caused to move toward tabulating position, substantially as described.

13. In combination with a type-writing machine, a series of registering-wheels mounted in a movable support beside the same and independent thereof, and an actuating device operated by the numeral-keys of the type-writing machine adapted to operate the reg-



istering-wheels, said registering-wheels being bodily movable into or out of operative position at the will of the operator; with mechanism whereby when the registering-wheels  
5 are moved to operative position the type-writer carriage is automatically and simultaneously released and shifted toward tabulating position, substantially as described.

14. In combination with a type-writing machine, a series of registering-wheels mounted in a movable support beside the same, and an actuating device operated by the numeral-keys of the type-writing machine adapted to operate the registering-wheels, said registering-wheels being bodily movable into or out  
15 of operative position at the will of the operator, and mechanism actuated by the support whereby when the latter is depressed the type-writer carriage is released and to move  
20 toward tabulating position, substantially as described.

15. In combination with a type-writing machine, a series of registering-wheels mounted in a vertically-movable support, and an actuating device operated by the numeral-keys of the type-writer adapted to operate the registering-wheels successively as the support rises, and means for resetting the wheels to  
25 "zero position" when the support is depressed; and mechanism whereby when the registering-wheels are moved to operative position the type-writer-carriage escapement is simultaneously operated to move the carriage toward tabulating position, substantially as described.  
35

16. In combination with a type-writing machine, a series of registering-wheels mounted in a vertically-movable support, and an actuating device operated by the numeral-keys of the type-writer adapted to operate the registering-wheels successively as the support rises, and means for resetting the wheels to  
40 "zero position" when the support is depressed, and mechanism connected with and actuated by the support whereby when the latter is depressed the type-writer carriage is permitted to move toward tabulating position, substantially as described.  
45

17. In combination with a type-writing machine, a movable frame thereon carrying registering-wheels and a device actuated by the numeral-keys of the type-writing machine adapted to operate the registering-wheels; with an escapement mechanism controlling  
50 the movement of the registering-frame and comprising a fixed and movable ratchet, a vibrating dog engaging the ratchets alternately, an oscillating lever and connections for actuating said lever by and from the type-writer escapement mechanism, substantially as described.  
60

18. In an adding-machine, the combination of a movable frame, a series of registering-wheels mounted therein, a series of carry-over levers in the frame beside the registering-wheels, a rotary shaft journaled in the frame and provided with arms adapted to ac-

tuating any displaced carry-over levers, and mechanism for rotating said shaft when the frame is depressed, substantially as described. 70

19. In an adding-machine, the combination of a vertically-movable frame, a series of registering-wheels therein, a series of carry-over levers beside the registering-wheels, a rotary shaft journaled in the frame and having arms adapted to engage displaced carry-over levers and spiral threads and means engaging the threads for causing the rotation of said shaft when the frame is depressed, substantially as described. 75 80

20. The combination with a type-writing machine, of a vibrating lever adapted to be actuated by the type-writing machine pusher-arms when the numeral-keys are depressed, and a segment pivotally attached to said lever; registering-wheels mounted in a movable support beside the vibrating segment, and means for throwing the segment into and out of mesh with the registering-wheels, substantially as described. 85 90

21. The combination with a type-writing machine, of a vibrating lever adapted to be actuated by the numeral-keys of the type-writing machine, a toothed segment pivoted to said lever, a support for the other end of the lever, a registering-wheel beside the segment, and means for moving said support so as to throw the segment into and out of mesh with the registering-wheels, substantially as described. 95 100

22. The combination with a type-writing machine of a vibrating lever adapted to be actuated by the numeral-keys of the type-writing machine, a toothed segment pivoted to said lever, a pivoted plate supporting the other end of the lever, a series of registering-wheels beside the segment, and means for rocking said plate so as to throw the segment properly into and out of mesh with the registering-wheels, substantially as described. 105 110

23. The combination with a type-writing machine, of a vibrating lever adapted to be actuated by the numeral-keys of the type-writing machine, a toothed segment pivoted to said lever, a support for the other end of the lever, a registering-wheel beside the segment, and means for moving said support so as to throw the segment into and out of mesh with the registering-wheels; with means for imparting a step-by-step movement to the series of register-wheels so as to bring them successively into position to mesh with the segment substantially as described, and means for resetting the registering-wheels to zero, substantially as described. 115 120 125

24. The combination with a type-writing machine, of a vibrating lever adapted to be actuated by the numeral-keys of the type-writing machine, a toothed segment pivoted to said lever, a pivoted plate supporting the other end of the lever, a series of registering-wheels beside the segment and means for rocking said plate so as to throw the segment properly into and out of mesh with the regis-



tering-wheels; with means for imparting a step-by-step movement to the series of registering-wheels so as to bring them successively into position to mesh with the segment, substantially as described, and means for resetting the registering-wheels to zero, substantially as described.

25. The combination with a type-writing machine, of a vibrating lever actuated by the numeral-keys of the type-writing machine, a toothed segment pivoted to said lever, a support for the other end of the lever, and means for moving said support so as to throw the segment into and out of mesh with the registering-wheels, a movable frame beside the segment, a series of registering-wheels in the frame, mechanism for moving the frame so as to bring the registering-wheels successively into position to be engaged by the segment, and means for "carrying over" when the frame is depressed, substantially as described.

26. The combination with a type-writing machine, of a vibrating lever actuated by the numeral-keys of the type-writing machine, a toothed segment pivoted to said lever, a pivoted plate supporting the other end of the lever, and mechanism for rocking said plate so as to throw the segment into and out of mesh with the registering-wheels, a movable frame beside the segment, a series of registering-wheels in the frame, mechanism for moving the frame upward step by step so as to bring the registering-wheels successively into position to be engaged by the segment, and means for causing the registering-wheels to "carry over" when the frame is depressed, substantially as described.

27. In combination with a type-writing machine, a movable series of registering-wheels, carry-over levers for actuating one wheel from another, a resetting-shaft provided with arms adapted to engage any displaced carry-over lever mechanism for rotating said shaft, and mechanism, actuated by and from the carriage escapement mechanism for moving said series of registering-wheels during the adding operation, a vibrating lever actuated by and from the numeral-keys of the type-writing machine, a segment pivoted to said lever and adapted to engage the registering-wheels, a movable support for the free end of said lever, and means, actuated by and from the numeral-keys of the type-writing machine for moving said support to throw the segment into mesh, and mechanism for throwing the segment out of mesh at the proper time, substantially as described.

28. In combination with a type-writing machine, a movable frame connected therewith,

a series of registering-wheels mounted in said frame, carry-over levers for actuating one wheel from another, a resetting-shaft provided with arms adapted to engage any displaced carry-over lever, mechanism for rotating said shaft upon the depression of the frame, mechanism, actuated by and from the carriage escapement mechanism for moving said adding-frame step by step during the adding operations, a vibrating lever actuated by and from the numeral-keys of the type-writing machine, a segment pivoted to said lever and adapted to engage the registering-wheels, a vibrating plate supporting the free end of said lever, means actuated by and from the numeral-keys of the type-writing machine for rocking said plate to throw the segment into mesh, and mechanism for throwing the segment out of mesh at the proper time, all substantially as set forth.

29. In combination with a type-writing machine having a vibrating "driver-arm" for actuating its type-shuttle; a series of registering-wheels mounted on a movable support, an actuating device adapted to successively engage the registering-wheels, said device being operated from and by the "driver-arm," and an escapement mechanism controlling the registering movements of said support.

30. The combination of a movable frame carrying registering-wheels, and a vibrating actuating device beside the frame adapted to engage the several registering-wheels successively; with an escapement mechanism for controlling the movement of the frame, composed of a fixed and movable ratchet and a dog mounted on a vibrating support, a key and connections for actuating the escapement mechanism, and numeral-keys and connections for simultaneously operating the actuating device and escapement mechanism, substantially as described.

31. In combination of a "type-shuttle" type-writing machine having a vibrating "driver-arm," a movable frame carrying registering-wheels, and a device actuated by the "driver-arm" adapted to operate the registering-wheels; with an escapement mechanism controlling the movement of the registering-frame and actuated by and from the type-writer escapement, substantially as described.

In testimony that I claim the forgoing as my own I affix my signature in presence of two witnesses.

ALEXANDER C. SCHUMAN.

Witnesses:

JAMES R. MANSFIELD,  
ARTHUR E. DOWELL.