

999,664.

J. MALLMAN.
 ADDING TYPE WRITER.
 APPLICATION FILED AUG. 20, 1910.

Patented Aug. 1, 1911.

2 SHEETS—SHEET 1.

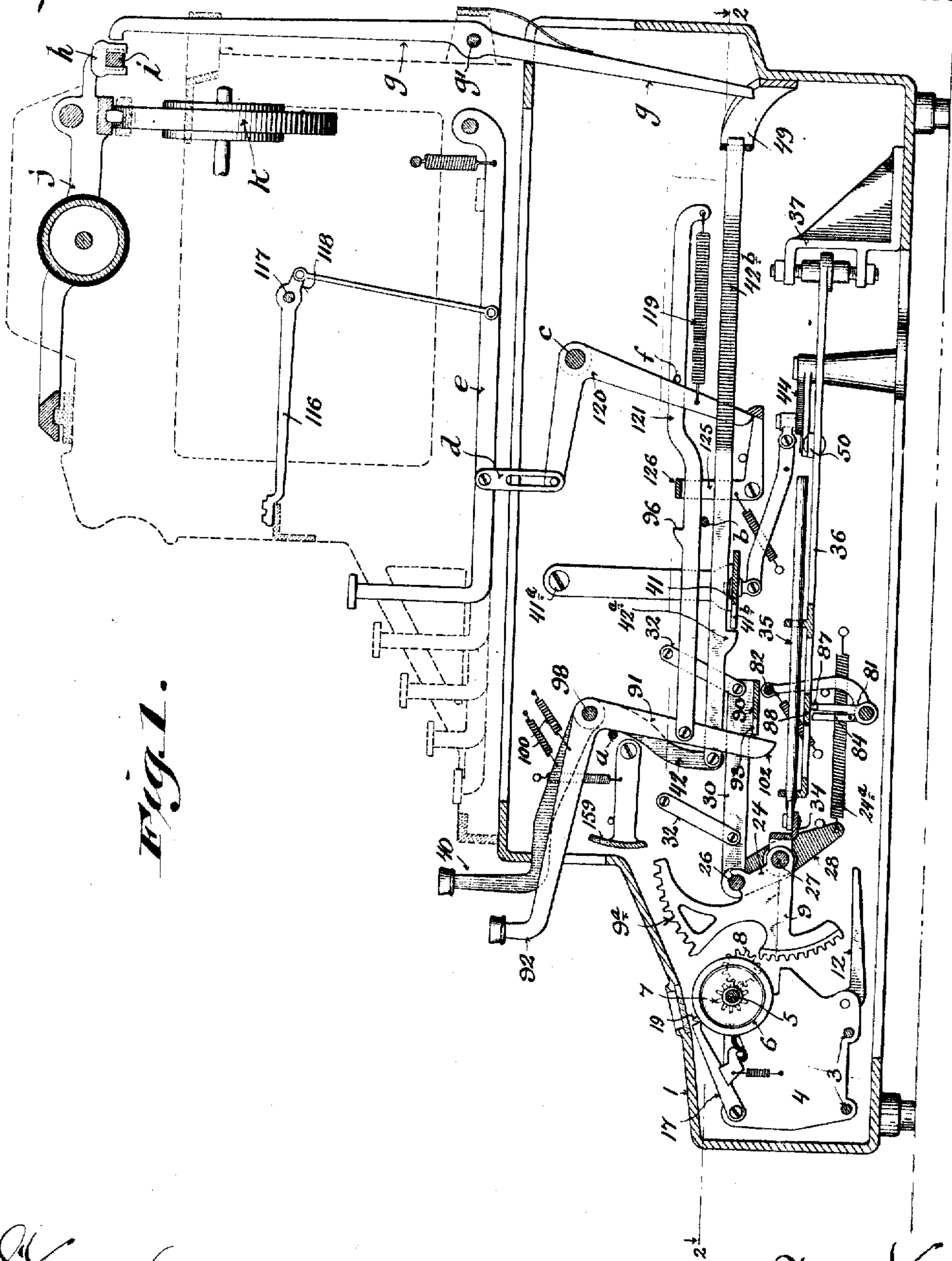


Fig. 1.

Witnesses:
 Casimir Young.
 May Downey.

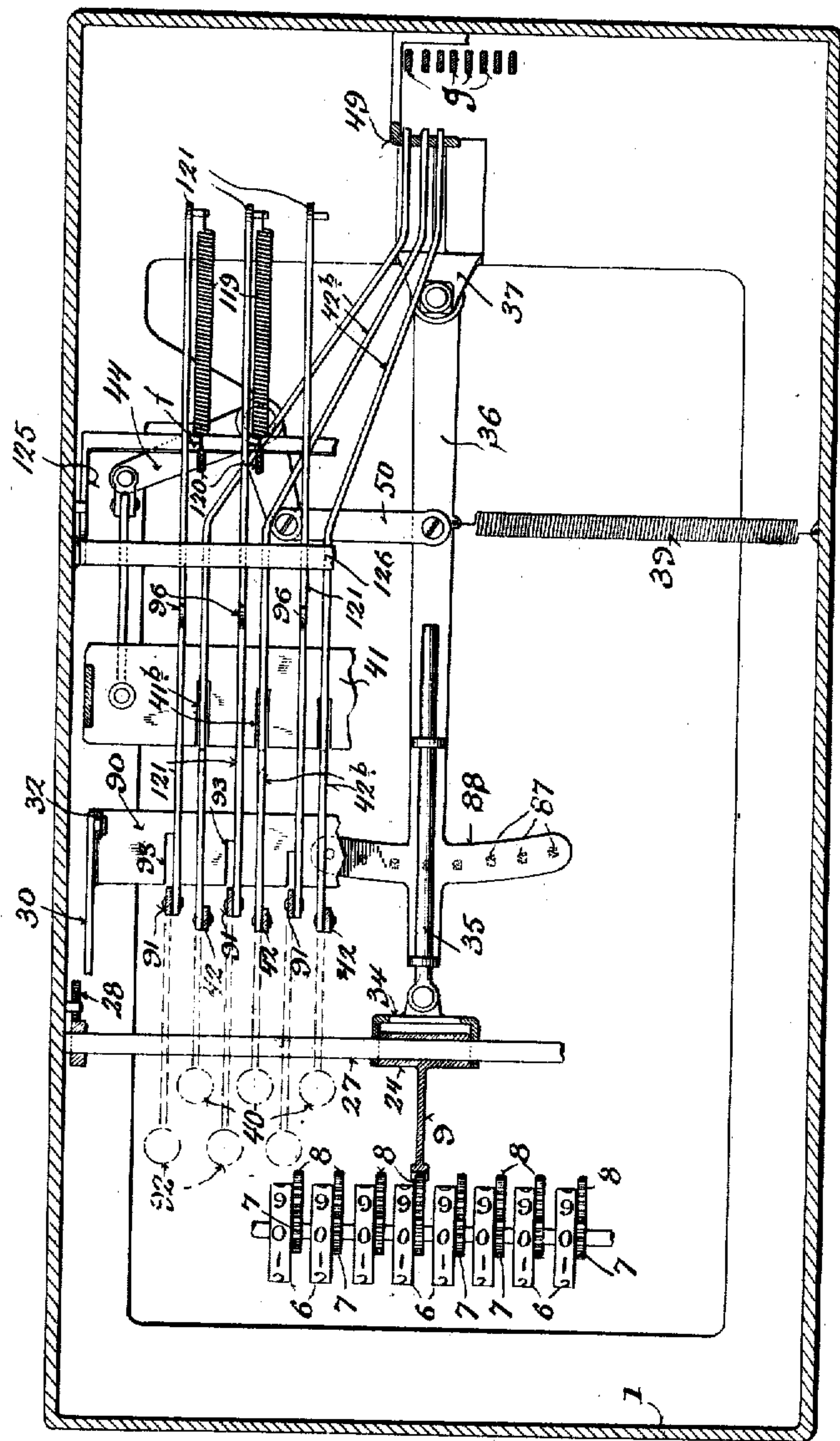
Inventor:
 James Mallman.
 By *Captain Young*
 Attorney.

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 2 SHEETS—SHEET 2.

Fig. 2.



Witnesses:
 Casimir Young,
 May Rowney.

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UNITED STATES PATENT OFFICE.

JAMES MALLMAN, OF SHEBOYGAN, WISCONSIN.

ADDING TYPE-WRITER.

999,664.

Specification of Letters Patent.

Patented Aug. 1, 1911.

Application filed August 20, 1910. Serial No. 578,100.

To all whom it may concern:

Be it known that I, JAMES MALLMAN, a citizen of the United States, and resident of Sheboygan, in the county of Sheboygan and State of Wisconsin, have invented certain new and useful Improvements in Adding Type-Writers; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention refers to adding typewriters, its object being to provide a simple, accurate and economically constructed machine of this character, the mechanical elements and assemblage of the adding mechanism being such that it can readily be attached to any standard design of typewriter having a spring actuated shiftable paper carriage under escapement control, whereby said escapement is capable of being released by a tabulator mechanism.

The adding mechanism employed in carrying out my present invention is in all of its essential features similar to the mechanism of a "recording calculator" for which applications for patents were filed by me July the 22nd, 1909, Ser. No. 508,881, and October 18, 1909, Ser. No. 523,115.

By employing an adding machine having adding mechanism of the above referred to character, its shallow depth, compactness, and alinement of levers renders it possible to place the same under a typewriter and by a simple link connection between the key-levers of the typewriter, controlling the numeral type characters, and key-levers of the adding mechanism, the typewriter is converted into a recording calculator or adding typewriter capable of performing all of the essential operations of both a standard adding machine and a typewriter, while at the same time said typewriter is free to operate independently and when so operated it has the same lightness of touch or key action as heretofore, due to the fact that the adding mechanism remains inert. It should be also understood that the tabulator movement of the typewriter is effected through a series of tabulator keys in connection with the register or adding machine, the said keys being arranged to supplement the usual auxiliary row of tabulator keys employed, when a standard tabulator equipment is attached to a typewriter.

With the above objects in view the invention consists in certain peculiarities of construction and combination of parts as here-

in set forth with reference to the accompanying drawings and subsequently claimed.

In the drawings Figure 1 represents a sectional elevation of an adding typewriter embodying the features of my invention, there being only such mechanism of the typewriter shown in full lines as pertains to the operation of the combined machines, which typewriter is of a standard style, with the frame and key-board indicated in dotted lines, the base of said frame being secured in any suitable manner to the top face of the adding machine casing, and Fig. 2, a fragmentary plan view of the adding mechanism, the view being partly broken away and partly in section upon a plane as indicated by line 2—2 of Fig. 1.

Referring by reference characters to the drawings, 1 represents a casing for an adding machine mechanism, such as shown and described in my application for patent previously referred to.

3 indicates cross rods carried by the casing, upon which are mounted a series of brackets 4 adapted to carry a plurality of adding-sections and their operating mechanism, the essential elements of each section of which consists of an adding wheel 6, all adding wheels being mounted upon a fixed shaft 5. Each adding wheel carries a toothed pinion 7 adapted to engage a twelve-tooth transmission pinion 8. The transmission pinion 8 of each adding-section is so disposed as to be engaged by an oscillatory toothed sector 9, which sector is adapted to have a longitudinal step-by-step movement, whereby each pinion 8 may be successively engaged when the sector is vertically oscillated, said sector being controlled in its transverse movement in one direction, by a motor spring 39, in opposition to an escapement mechanism 81, through a series of connections to be hereinafter mentioned.

The transfer mechanism between the adding-sections forms no part of my present invention and is therefore, only partly shown, each transfer mechanism being carried by a bell-crank lever 12, as indicated in Fig. 1, and is released by a spring-control locking-dog 17, the dog being tripped by means of a tooth 19 that extends from the periphery of the adding-wheel 6.

The toothed sector 9 is so disposed, relative to the transmission pinion as to engage

the same when oscillated, whereby registration of amounts is had. Thus if the sector is rotated three spaces in connection with the tens adding-section, it is apparent that the register wheels will record 30 cents and so on throughout the entire series of register sections, there being, in this instance, eight register wheels shown.

The sector 9 extends from and forms part of a carriage 24, which carriage engages rails 26, 27, respectively of an oscillatory carriage frame, the lower rail 27 of the carriage frame being mounted in bearings of the casing 1, about which said carriage frame oscillates. The carriage frame rails 26 and 27 are connected by side bars 28, to which side bars are secured coiled springs 24^a, whereby the said carriage frame is held in its position of rest, as shown in Fig. 1. Links 30 are connected to the upper rail 26 of the carriage frame and are supported by hangers 32, which hangers are pivoted to the casing 1. The links 30 are connected by a transverse gage-plate 90 that is formed with a series of graduated notches 93, the depth of which notches are successively increased from right to left, whereby said gage-plate is moved horizontally at different fixed distances. This movement is accomplished through arms 91 of adding key-levers 92, there being an arm for engagement with the base of each notch. In this instance the machine is designed to be provided with ten adding key-levers which may be successively numbered from 0 to 9, each key-lever being held in its position of rest, against a universal stop-rod *a*, by a coiled spring 100, and is mounted upon a transverse rod 98 secured to the casing. Each adding key-lever arm 91 has connected thereto a push-bar 121, the free ends of the push-bars being guided by a rod *b*. The outer ends of each push-bar 121 is connected by a coiled spring 119 to one arm of a bell-crank lever 120, the series of these levers being mounted upon a fixed shaft *c*. The other arm of each bell-crank 120 carries a pin that engages the slotted end of a link *d*. The upper end of each link is connected to a spring-controlled key-lever *e* of a typewriter, the connected row of key-levers being those which control the numeral characters of the typewriter.

The printing mechanism shown in connection with the key-levers *e* consists of type-bars 116, which are fulcrumed upon a rod 117, the type-bars being provided with short arms 118 that are in link connection with the key-levers.

From the foregoing description it will be understood that each of the adding key-levers 92 is connected by the described mechanism to a corresponding key-lever of the typewriter by the slotted link *d* and, owing to this loose shackle connection, it

is apparent that the typewriter can be operated without imparting any movement to the adding mechanism while, on the other hand, if an adding key-lever is depressed, it will operate the mechanism of the typewriter to which it is attached in the same manner as if it were actuated directly. This movement is effected through the release of a swinging gate 125 which has a locking-bar that extends across the machine and is arranged to engage the ends of the bell-crank lever 120, there being a universal bar 126 also carried by the locking gate and extending across said machine. The universal bar 126 is adapted to be engaged by spurs 96 that extend from the push-bars.

In order to prevent overthrow of the sector 9 and insure accuracy in registration in connection with the adding-sections, said sector 9 is provided with a supplementary sector 9^a having a series of teeth which, in this instance, correspond in number to the series of operating teeth of said sector. These teeth are so disposed as to be engaged by a universal stop-bar 159, the said bar being provided with feet which are fulcrumed to the casing 1. When an adding key-lever is depressed, just before it reaches the limit of its stroke, it engages the universal stop-bar and causes the same to, in turn, engage the tooth corresponding to movement of this particular adding key-lever, whereby the sector is positively checked against overthrow.

To effect a registration with the mechanism just described, should the sector be alined with the pinion 8 of the tens adding-section, the operator would depress the adding key-lever corresponding to the amount desired to be registered. If, for example, the amount to be registered was 30 cents, the third adding key-lever from left to right of the series would be depressed. This movement would cause arm 91 to engage its notch 93 of the gage-plate and thereby move said gage-plate horizontally the distance of three spaces rearwardly and thus the sector would be oscillated through its carriage and link connections 30, whereby the transmission pinion 8 imparts rotation to the adding wheel, a distance of three spaces. Just prior to the completion of the movement mentioned, spur 96 of push-bar 121 will engage bar 126 of the swinging gate. Owing to the initial movement of the push-bar the coiled spring 119 will, at this time, be distended and exerting its pressure upon the bell-crank lever 120. Hence, when spur 96 acts upon the swinging gate, the same will release all of the bell-crank levers 120, but, owing to the fact that only one of said bell-cranks is under spring-pressure, this particular bell-crank will be oscillated quickly, the power of spring 119 being sufficient to depress the typewriter key-lever *e* to which

it is connected and thus print the numeral 3 in a similar manner to that performed manually by the typist.

From the foregoing described operation, it is apparent that the adding key-lever can be depressed slowly or pushed down as in the case of all standard adding machines, while, at the same time, when a printing operation takes place, the spring imparts a quick movement to the type-bars, whereby the action of manually operated type is simulated, it being understood that at the instant the coiled spring 119 contracts, the printing mechanism of the typewriter is returned to its position of rest by spring control of the levers *e*, the tension of the spring control being comparatively light relative to coiled spring 119, which is manually "loaded" by movement of the adding key-levers. The adding-key-lever mechanism is returned to its position of rest through its coiled spring 100 and to insure the bell-crank lever 120 being brought to its position for reengagement with the swinging gate, its corresponding push-bar may, as shown, be provided with a pin *f*, which pin will engage the lower arm of said bell-crank and positively draw the same back to the position shown. Transverse movement of the sector upon the carriage frame, is obtained, from left to right through motor spring 39, the same being connected to an arm 36 that is pivoted between ears of a standard 37. The arm 36 also carries projecting apertured ears for the reception of a rod 35 that is in telescopic connection therewith, the rod being pivoted to a spanner 34 which has ears that are slidably mounted upon the lower rail 27 of the carriage frame, between which ears the carriage 24 is fitted. The arm 36 is also provided with a shoe 88 having a series of spur-teeth 87 depending therefrom. These spur-teeth are engaged by the escapement mechanism 81, which, as shown, is of the spring-controlled oscillatory anchor type, having a spring finger 84 that normally engages the spur-teeth and a rigid finger offset upon a different plane, whereby release is effected.

The escapement mechanism is also provided with a universal bar 82, which bar is engaged by spur extensions 102 of each adding key-lever, whereby the escapement movement is effected. By utilizing a spring finger escapement mechanism the arm 36 may be manually swung from right to left in opposition to the motor spring 34, said spring finger being capable of yielding in this direction when opposed by the spur teeth 87. Manual shift in opposition to the motor spring is effected through a series of spring-controlled tabulator key-levers 40, which key-levers correspond in number to the adding-sections and are mounted upon the rod 98, being provided with downwardly

extending arms 42, each of which has connected thereto, a horizontally reciprocative plunger-bar 42^b. The rear ends of these plunger-bars are brought together into a nested formation and are guided in slots of a bracket 49, which bracket is secured to the casing 1. Each plunger-bar 42^b has a depending contact lug 42^a that is adapted to operate a swinging gage-plate 41, arms of which plate are mounted upon fulcrum screws 41^a secured to the side-walls of said casing. The gage-plate 41 is similar in construction to the gage-plate 90 previously described, being provided with notches 41^b graduated in depth, the bottoms of which notches are designed to be engaged by the contact lugs 42^a. Fulcrumed to a standard of the casing 1 is a bell-crank lever 44, one arm of which bell-crank lever is linked to the gage-plate 41, the other arm being connected by a link 50 to arm 36, as clearly shown in Fig. 2. The mechanism just described comprises means whereby the sector 9 is manually shifted to the desired adding-section prior to a registration, through depression of the adding key-levers. In the operation of this mechanism, to register an amount upon the second adding-section from right to left, which is the tens adding wheel, the operator would depress the second tabulator key-lever. This movement causes the plunger-bar 42^b connected thereto to move rearwardly and incidental to this movement its contact lug 42^a will engage the corresponding notch of gage-plate 41 and thereby swing the same a predetermined distance, which distance is determined by the depth of said notch. In this case the movement would be sufficient to cause the sector 9 to move transversely upon the carriage frame to a point directly under and aligned with the transmission pinion 8 of the tens adding-section, it being understood that the sector, prior to this movement, was in its extreme position, that is one space to the right of the units adding section. The said movement is accomplished through the bell-crank 44, which is oscillated owing to its link connection with gage-plate 41. The oscillation of the bell-crank, which is also connected by link 50 to arm 36, thereby swings said arm 36 in opposition to the spring. When the arm 36 is swung over, the spur-teeth 87 will pass over the yielding spring finger 84 of the escapement, which escapement will engage the proper spur tooth and hold arm 36 in its adjusted position. Thus the sector is now ready to act upon the adding-section and upon depression of any one of the adding key-levers a registration and printing operation will be effected as previously described. The spur 102 of that adding key-lever which has been depressed will, at the finish of the downward stroke of said lever, engage the uni-

versal bar 82 of the escapement mechanism and thus operate the same, said escapement mechanism thereby permitting arm 36 to swing from left to right the distance of one space and thus this section is automatically positioned under the next adding-section of lower order.

A series of spring controlled tabulator fingers *g* are fulcrumed upon a stud *g'* that is mounted in any suitable manner upon the typewriter frame. The tabulator fingers correspond in number to the plunger-bars 42^b, the lower ends of said fingers being alined with and arranged to be engaged by the ends of said plunger-bars, when the latter are actuated. The upper ends of the tabulator fingers are shown as extending inwardly for engagement with detachable stops *h*, which stops are carried by a notched tabulator bar *i*, the latter being secured to and adapted to travel with a carriage frame *j* of the typewriter, the said carriage being provided with the usual roller platen and is moved from right to left by a spring drum *k* that is connected thereto.

The carriage and tabulator form no part of my invention and may be of any desired construction, the operation of the parts being well known and consists essentially of mechanism for releasing the carriage from its escapement mechanism (not shown), whereby said carriage is moved a predetermined distance and checked by any one of the series of tabulator fingers which may be brought into the path of the stop *h*, whereby the paper carried by the carriage is properly alined with the printing point to effect a tabulating operation.

In the illustration shown the tabulator key-levers 40 are designed to take the place of the ordinary tabulator keys and the plunger-bars 42^b are adapted to actuate the tabulator fingers in a similar manner to that usually employed in tabulator mechanism. Hence, when a tabulator key-lever is depressed, to effect shift of the sector 9, the end of its plunger-bar 42^b actuates a corresponding tabulator finger *g* and the typewriter carriage is brought to the proper position for tabulating.

From the foregoing description it will be seen that a typewriter of any standard style may be placed upon the top of the adding mechanism and by a simple slotted link or shackle connection between one row of the typewriter key-levers and certain lever connections with the tabulator key-levers, an adding typewriter is the result, it being understood that the typewriter is equipped with a tabulator. Heretofore, as far as I am aware, no combined machine of this character has been successfully developed, owing to the fact that the machines, when assembled as a unitary piece of mechanism, have required more or less revision of the me-

chanical construction to accommodate the machines to each other, and even in such cases where it was possible to effect this, the cost of manufacture, together with the overload which was caused by the various connected mechanisms have rendered such devices unmarketable and the amount of power required to operate them, due to the overload, was such that skilled typists found it difficult to accommodate their touch to the various movements. Hence said machines have been considered, up to the present time, impractical.

While I have shown and described the printing operation of the typewriter as being accomplished through a coiled spring 119 whereby uniformity of touch will be assured, it should be understood that, in some instances, I may, without departing from the spirit of my invention, accomplish the result positively by connecting the bell-crank 120 and push-bar 121 by a rigid link, and, while this modification is practical, it is not preferable for the reason that the adding key-levers movement is more of a pushing action, while in typewriting the printing operation is effected by a delicate quick touch. Hence an expert typist will find no objectionable features in utilizing the machine as it is constructed for the reason that in business houses or the like, where an adding machine is used, the typist is accustomed to the adding machine movement, which is distinct from the typewriter movement.

I claim:

1. In an adding typewriter comprising adding mechanism, actuating key-levers for the adding mechanism, and a key-controlled tabulator; the combination of a superimposed key-actuated typewriter having certain of its keys in link connection with the actuating key-levers of said adding mechanism, and an automatic spring-actuating mechanism in connection with the link connected typewriter keys under control of the adding mechanism key-levers.

2. An adding typewriter comprising adding mechanism, actuating levers therefor, a superimposed typewriter having type-bars adapted to be brought to a common printing point, actuating key-levers for the type-bars, other levers in link connection with certain of the key-levers of the typewriter, springs connecting the last named levers and adding mechanism key-levers, a universal gate for the aforesaid levers, and a gate releasing mechanism connected to each actuating key lever of the adding machine.

3. An adding typewriter comprising a series of key-controlled type-bars adapted to be brought to a common printing point, a spring-controlled platen-carrying carriage, a tabulator release mechanism for the carriage, a series of key-controlled adding-sections

tions, a shiftable actuating mechanism common to all adding-sections, means connecting the shiftable actuating mechanism and tabulator release mechanism, whereby movement of the carriage is controlled relative to movement of said shiftable actuating mechanism; and other means connecting the key-controlled adding-sections and certain of the type-bars, whereby the same are actuated incidental to an adding operation.

4. An adding typewriter comprising a spring-controlled paper carriage, type-bars adapted to be brought to a common printing point, actuating mechanism for the type-bars, key-levers connected to the actuating mechanism, a tabulator mechanism for controlling movement of the paper carriage, a series of adding-sections, an oscillatory shiftable actuating mechanism common to all adding-sections, a series of adding key-levers, mechanism controlled by the adding key-levers for imparting movement of different degrees to the actuating mechanism of the adding-sections, means connecting the adding key-levers and actuating mechanism of certain of the type-bars, whereby the latter are brought to the printing point under control of the adding key-levers, a series of tabulator key-levers, actuating means for the tabulator mechanism under control of the tabulator key-levers, and other means under control of said tabulator key-levers for shifting the adding-sections actuating mechanism to a position for engagement with the selected adding-section.

5. An adding typewriter comprising a series of type-bars adapted to be brought to a common printing point, actuating key-levers for the type-bars, a spring-controlled paper carriage, a platen carried by the carriage for receiving impact of the type-bars, stops carried by said carriage, a series of tabulator fingers adapted to engage the stops, a series of gear-actuated adding-sections, a spring-controlled transversely movable and oscillatory toothed sector adapted to be brought into engagement with the actuating gear of each adding-section, an escapement mechanism for the sector, a series of adding key-levers, means controlled by the adding key-levers for imparting oscillatory movement of different degrees to said sector, escapement operating means under

control of each adding key-lever, other means connected to said adding key-levers and certain of the type-bars, whereby the latter are actuated incidental to depression of the adding key-levers, a series of tabulator key-levers, and means controlled by the tabulator key-levers for imparting differential transverse movement to the sector in one direction, whereby the same is brought in alinement with a selected adding-section.

6. An adding typewriter comprising adding mechanism, actuating levers therefor, a superimposed typewriter having type-bars adapted to be brought to a common printing point, actuating key-levers for the type-bars other levers in link connection with certain of the key-levers of the typewriter, springs connecting the last named levers and adding mechanism key-levers, a locking-gate for each of the aforesaid levers, and a releasing mechanism connected to each actuating lever of the adding machine and gate.

7. An adding typewriter comprising adding mechanism, actuating mechanism therefor, a superimposed typewriter having type-bars adapted to be brought to a common printing point, actuating levers for the type-bars, other levers in link connection with certain of the key-levers of the typewriter, springs connecting the last named lever and adding mechanism key-levers, a locking gate for each of the aforesaid levers, and gate releasing means under control of the adding machine actuating levers.

8. In an adding typewriter comprising adding mechanism, actuating levers for the adding mechanism, and a key-controlled tabulator; the combination of a superimposed key-actuated typewriter having type-bars adapted to be brought to a common printing point, levers connecting certain of the type-bars and key-levers of the adding mechanism, and springs for automatically actuating those type-bars which are connected to the adding keys.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

JAMES MALLMAN.

Witnesses:

WILLA ODENBRETT,
GEO. W. YOUNG.