July 9, 1935. H. LANDSIEDEL 2,007,829

DUPLICATING ACCOUNTING MACHINE

Filed Feb. 11, 1928 6 Sheets-Sheet 1

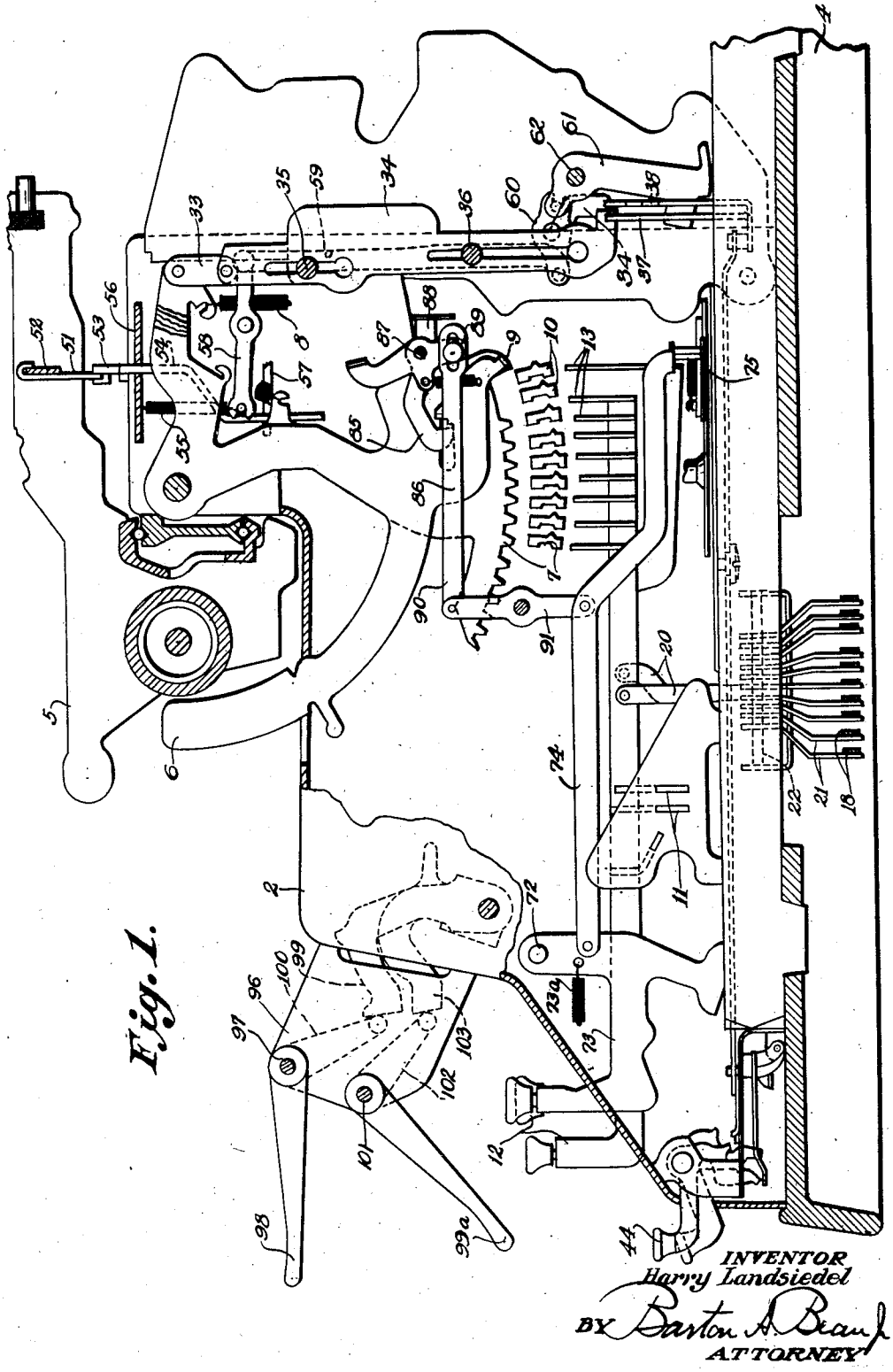


Fig. 1.

INVENTOR
Harry Landsiedel
BY Barton A. Beaul
ATTORNEY

July 9, 1935. H. LANDSIEDEL 2,007,829

DUPLICATING ACCOUNTING MACHINE

Filed Feb. 11, 1928 6 Sheets-Sheet 2

Fig. 2.

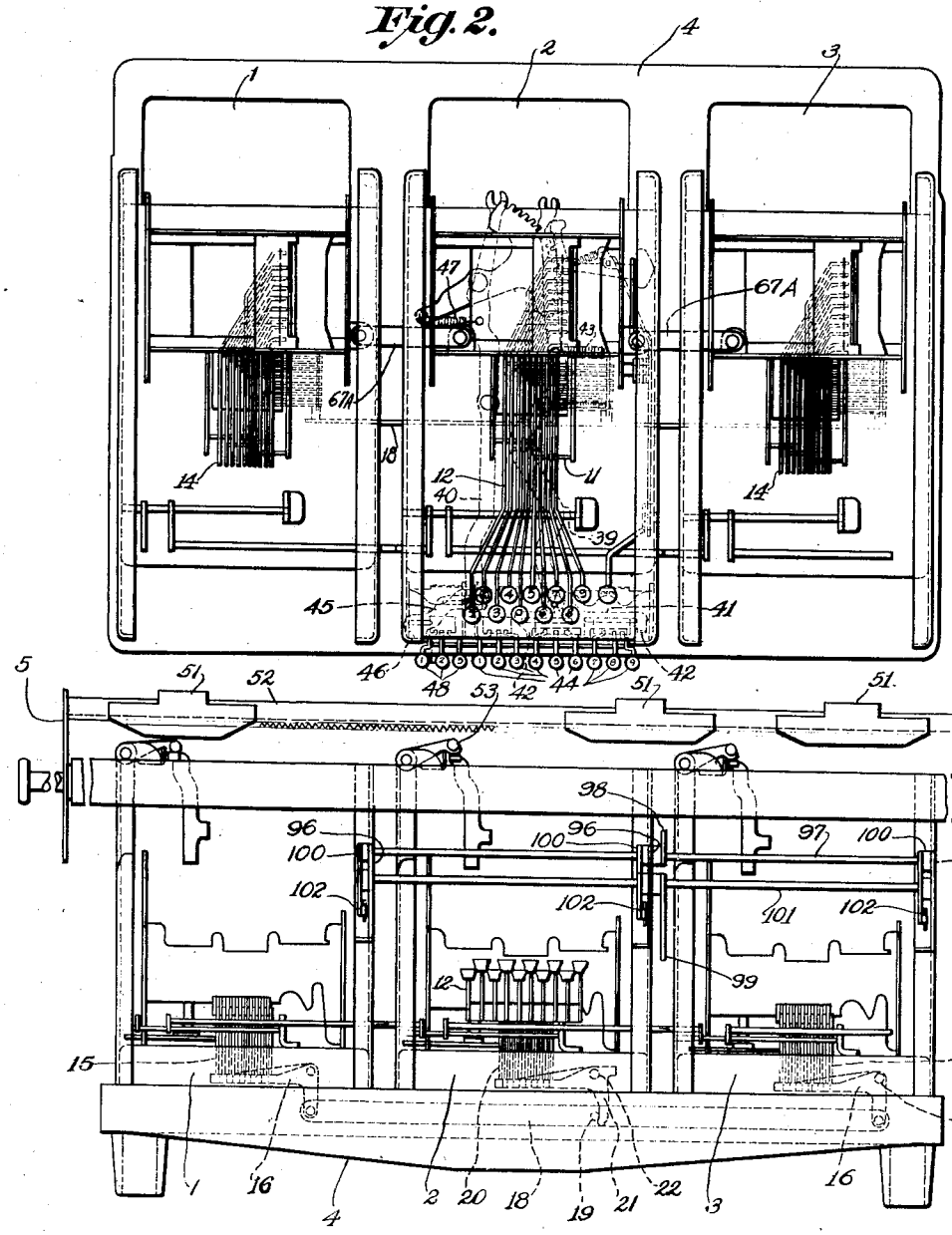


Fig. 3.

INVENTOR
Harry Landsiedel
BY Barton A. Beam Jr
ATTORNEY

July 9, 1935. H. LANDSIEDEL 2,007,829

DUPLICATING ACCOUNTING MACHINE

Filed Feb. 11, 1928 6 Sheets-Sheet 3

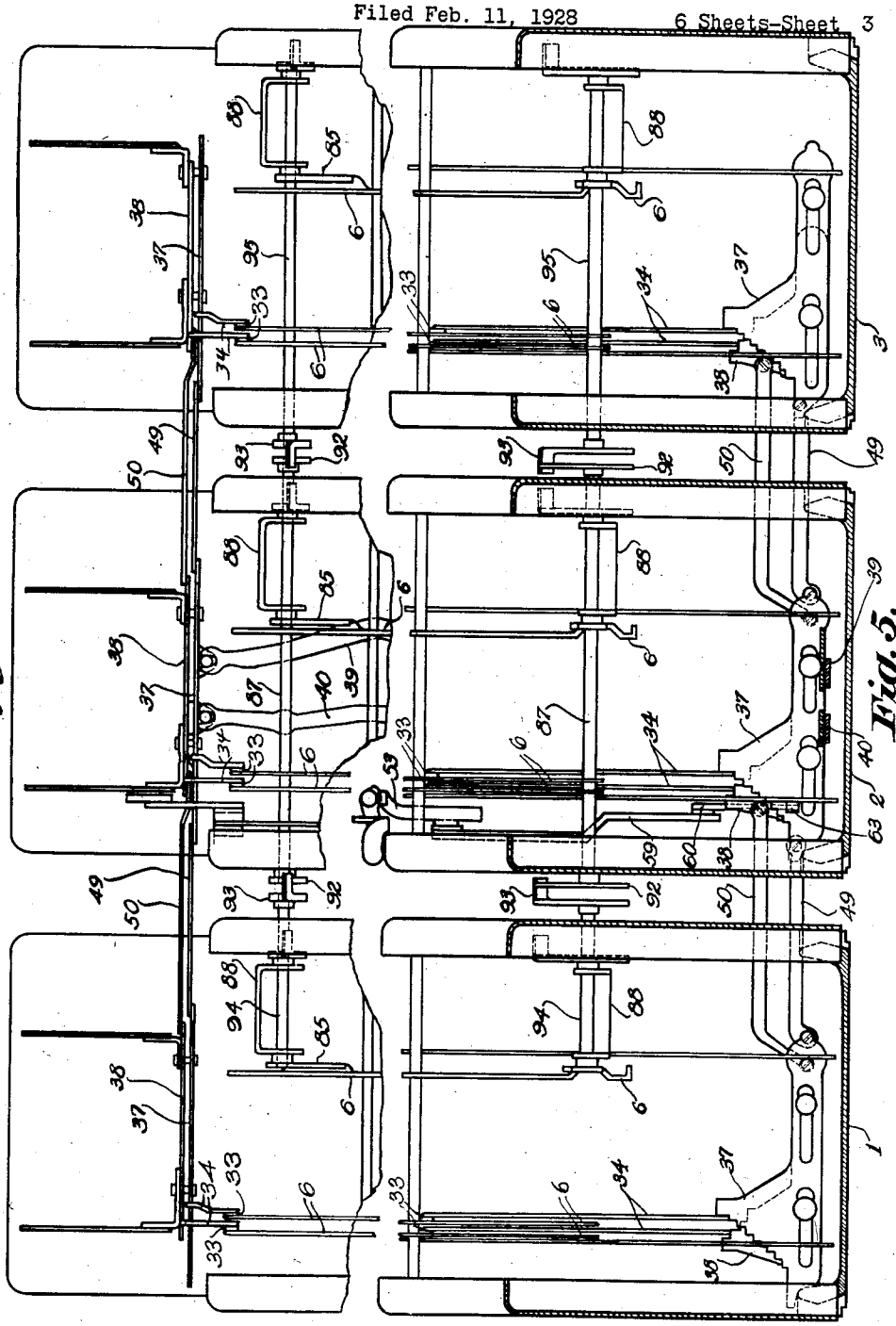


Fig. 4.

Fig. 5.

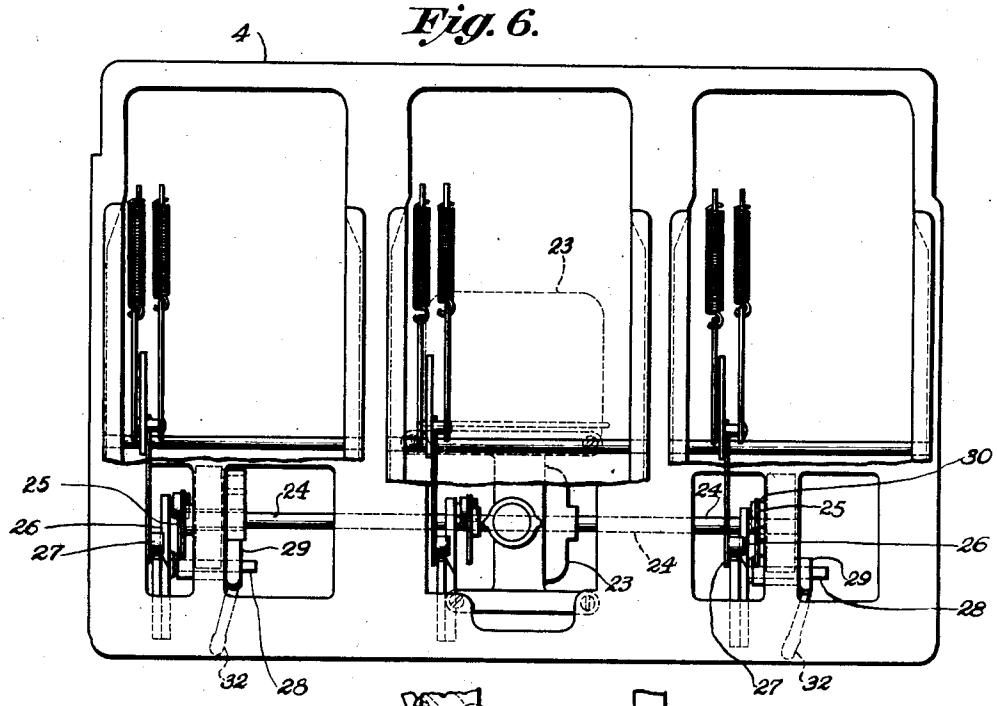
INVENTOR
Harry Landsiedel
BY Barton A. Beaujon
ATTORNEY

July 9, 1935. H. LANDSIEDEL 2,007,829

DUPLICATING ACCOUNTING MACHINE

Filed Feb. 11, 1928 6 Sheets-Sheet 4

Fig. 6.



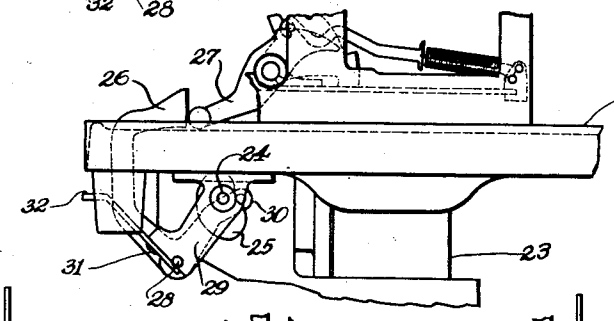


Fig. 7.

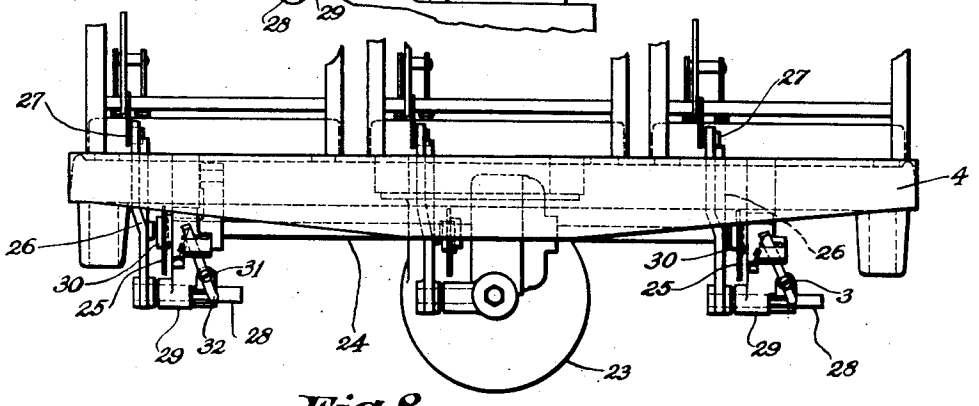


Fig. 8.

INVENTOR
Harry Landsiedel
BY Baxter A Beach
ATTORNEY

July 9, 1935. H. LANDSIEDEL 2,007,829

DUPLICATING ACCOUNTING MACHINE

Filed Feb. 11, 1928 6 Sheets-Sheet 5

Fig. 9.

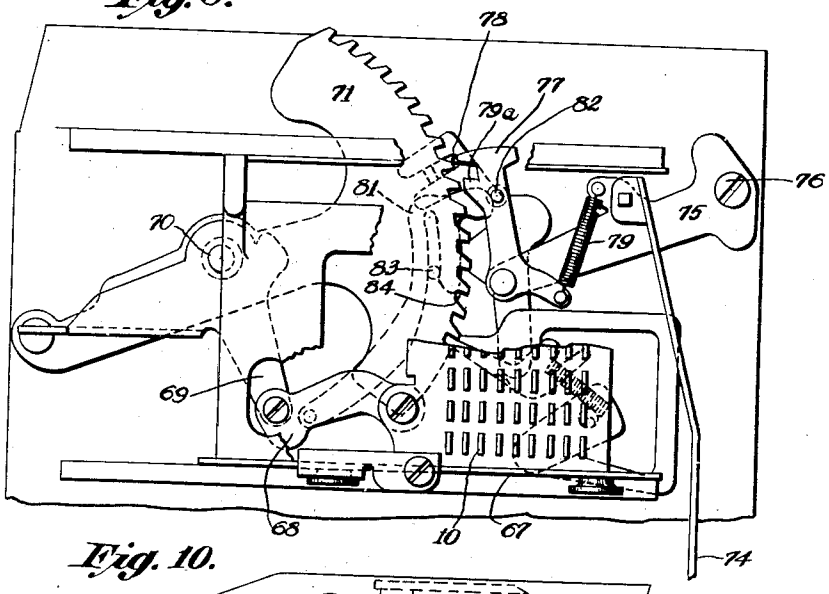


Fig. 10.

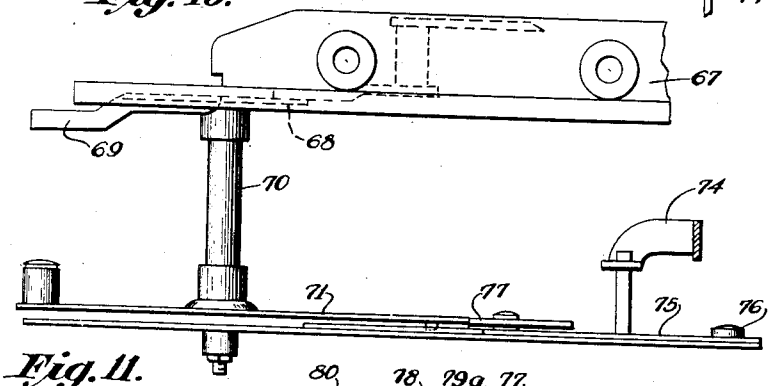
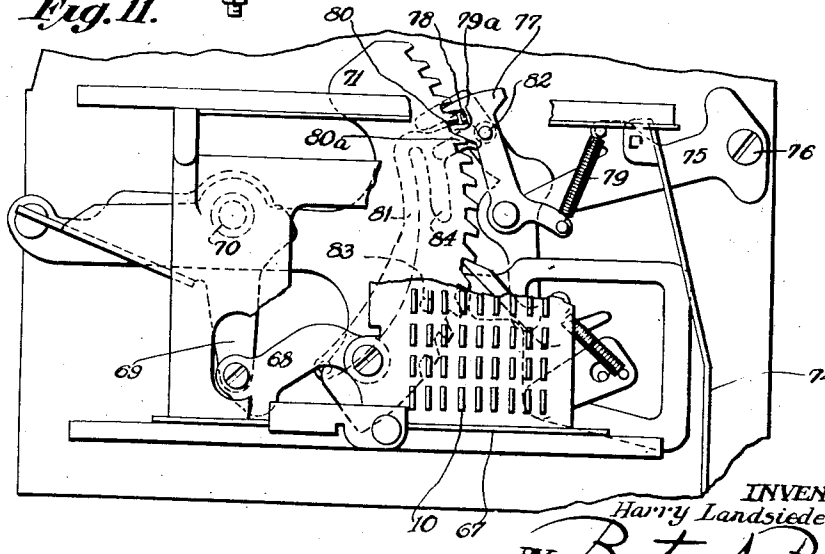


Fig. 11.

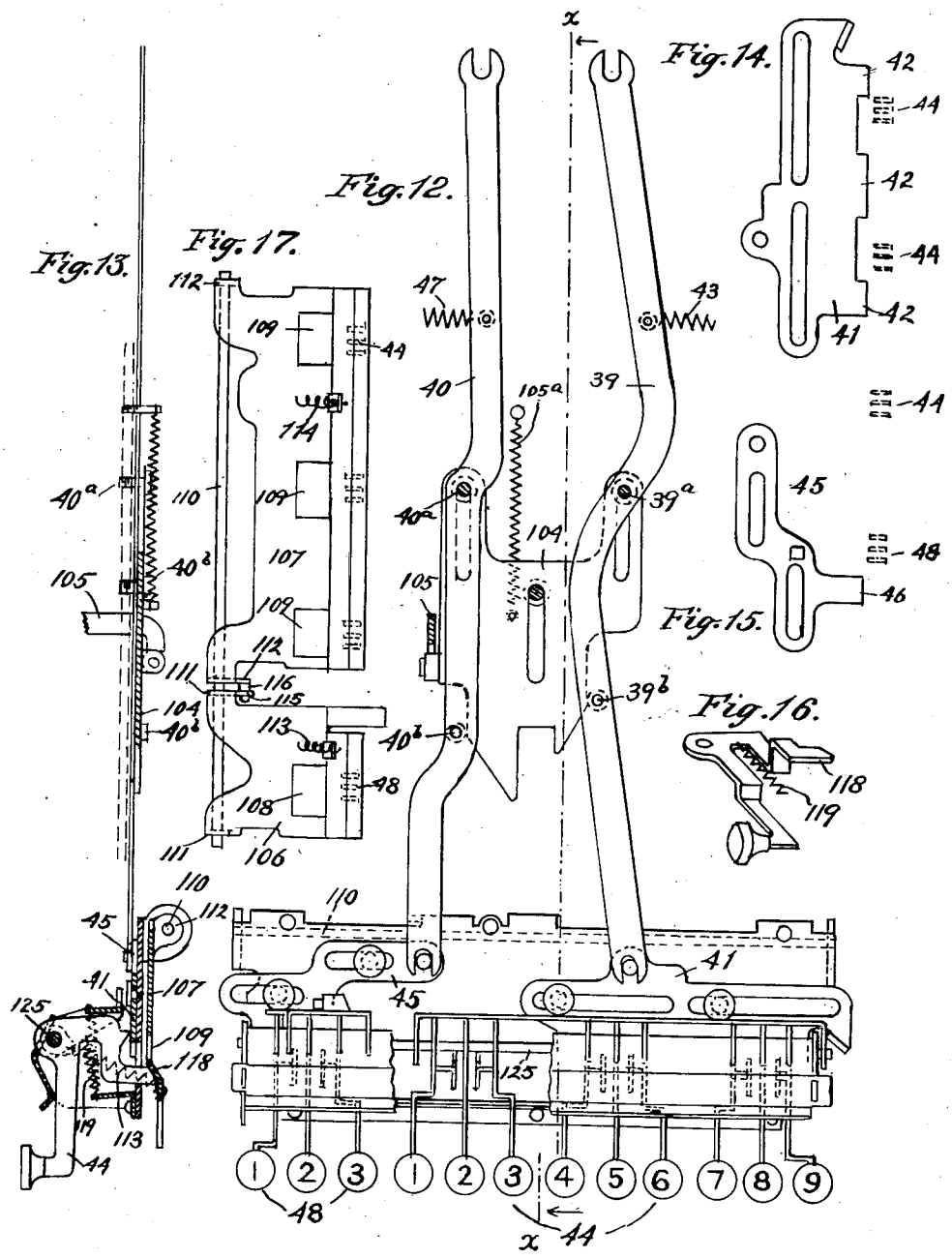


INVENTOR
Harry Landsiedel
BY Barton A. Beau
ATTORNEY

July 9, 1935. H. LANDSIEDEL 2,007,829

DUPLICATING ACCOUNTING MACHINE

Filed Feb. 11, 1923 6 Sheets-Sheet 6



Inventor.
Harry Landsiedel
by Robert H. Strother
Attorney:

Patented July 9, 1935 2,007,829

UNITED STATES PATENT OFFICE

2,007,829

DUPLICATING ACCOUNTING MACHINE

Harry Landsiedel, New York, N. Y., assignor to Remington Rand Inc., New York, N. Y.

Application February 11, 1928, Serial No. 253,687

5 Claims. (Cl. 235—60)

This invention relates to improvements in an adding and recording machine, which may comprise means for posting simultaneously to a number of sheets or forms through the agency of several recording mechanisms, each separate recording mechanism operable under control of separate differential mechanisms, all of which differential mechanisms may be set by operation of a single set of keys.

An object of this invention is to provide a means for setting the several differential mechanisms simultaneously by the operation of a single set of keys.

Another object is to provide, in conjunction with recording mechanism, improved means for printing simultaneously with recorded items the date as set by the operation of a set of keys; together with controlling means a component of which is adjustable to different working positions on and is removable from its support.

Another object is to improve the construction and operation of special differential mechanism comprised in date-printing or character-printing mechanism that includes type-carriers controlled by the special differential mechanism.

In the accompanying drawings and in the description which follows, mechanisms of the character and for purposes mentioned will be explained as applied to a machine embodying the well known principles of the Standard Dalton adding machine. This has been in practice accomplished by the use of Dalton adding machines mounted on a common base, having suitable mechanical connections between them, and equipped with a single tabulating paper carriage of sufficient length to accommodate the sheets, forms or strips of paper involved in the required operation of the machine. Each separate machine, three being shown, closely resembles a Standard Dalton bookkeeping machine in that it is equipped with recording mechanism, accumulating mechanism, and such feature controls, both manual and automatic from the carriage, as may be required in its operation. Only one of the three machines, however, preferably that located in the center, is equipped with the sets of keys for setting the differential mechanisms and the dates.

It is obvious that instead of three units of machines, only two may be employed, or the number may be made to exceed three, in any amount consistent with commercial requirements.

However the invention may be embodied in a machine composed of a single framework and operating mechanism, instead of two or more distinct units mounted on a common base and operatively connected together, and some of the mechanism constituting the invention may be embodied in a machine consisting of a single unit like one of those that together form the machine that is shown and described herein.

The invention consists of improved stop-setting mechanism and improved special printing mechanism and includes herein-described features of construction, combination, and arrangements of parts, and is distinguished in the claims from prior inventions.

In the drawings, which illustrate a machine composed of three machine-units and comprising a driving motor, and in which like reference numerals designate like parts in different views—

Fig. 1 is a sectional elevation, viewed from the right side, of the frame and some of the mechanism of the central machine-unit;

Fig. 2, a modified plan of the machine;

Fig. 3, a modified front elevation thereof;

Fig. 4, a plan of framework and mechanism comprised in a fragment that is next to the back of the machine;

Fig. 5, a front elevation thereof;

Fig. 6, a plan of the machine-base and mechanism associated with the motor, and shifting devices for disabling the two lateral machine-units;

Fig. 7, a view of the right side of a fragment of the base and mechanism supported by it;

Fig. 8, a front elevation of the base and mechanism supported by it;

Fig. 9, a plan of one of the stop-carriages which the machine contains, and some of its escapement;

Fig. 10, a front elevation thereof;

Fig. 11, a view similar to Fig. 9, but showing the mechanism when the designating key is depressed;

Fig. 12 is an enlarged plan of keys and other portions of date printing mechanism; Fig. 13, a section on plane x—x, Fig. 12; Fig. 14, a plan of a differential side; Fig. 15, a plan of another differential slide; Fig. 16, a perspective of a key; and Fig. 17, a plan of two key-locking plates.

The machine that embodies the invention in the form shown comprises the three machine units 1, 2 and 3, (Fig. 2), mounted on a common sub base 4, (Figs. 1, 2 and 3), the machine having slidably mounted thereon in the usual manner, a single paper carriage 5, (Figs. 1 and 3), intended to hold all sheets or forms employed in the operation of the machine. Each machine unit has its individual recording mechanism consisting essentially of type carriers 6, loosely mounted on a shaft (Fig. 1), and associated adding gear racks

7. These type carriers and associated gear racks when released by suitable means are adapted to advance under influence of springs 8 to the printing position. The extent of this movement is determined by a heel 9 which limits on an elevated stop 10 in a differential mechanism comprising a transversely movable stop carriage which moves from right to left from order to order with the regular operation of the machine.

Means for setting stops

Pivoting in guide combs 11 of unit 2, (Figs. 1 and 2), are the differential mechanism control keys and key-levers 12, these levers being tappet bars, having at their extreme rear ends tappets 13, each of which, with depression of the key, attached thereto, is adapted to elevate a cooperating stop 10 in the well known manner. Pivoting in a similar manner and having a duty similar to that of the key levers are the tappet bars 14 located in units 1 and 3, (Fig. 2). The tappet bars of units 1 and 3 may be regarded as key levers with the forward portion of each cut off, as they are not to be operated by the usual means of control from the keyboard. The method of transmitting movement to the tappet bars of units 1 and 3 will now be described. Pivotally connected to the tappet bars in units 1 and 3 are links 15, (Fig. 3), which extend downward and make suitable connection with bell cranks 16 pivoting on shafts 17 having fixed supports. Pivotally connecting the bell cranks 16 of unit 3 with corresponding bell cranks of unit 1 are laterally extending links 18, each provided with a projection 19. Depending from key levers 12 in unit 2, (Figs. 1 and 3), and making pivotal connection therewith are links 20 which make suitable connection with co-operating bell cranks 21, pivoting on shaft 22, each of such bell cranks being adapted to drive an associated link 18 through the projection 19. Through these means, depression of any one of the keys 12 will set up a corresponding stop in each of the three differential mechanisms.

In Patent No. 1,449,009, granted for a prior invention of mine, is shown stop-setting mechanism by which stops may be set in two stop-carriages and in a machine composed of two units, but that stop-setting mechanism is not suitable, or convertible by the mere addition of levers 36 and 40 such as the patent shows into mechanism that would be suitable, to set the stops of a machine composed of three units, and it differs in construction and mode of operation from the stop-setting mechanism that is described herein.

Means for driving and disabling machine units

Attached to the sub base 4, (Figs. 6, 7, and 8), is a motor drive unit 23 similar to the regular Dalton motor drive but with the cam shaft 24 extended laterally at both ends for the purpose of driving units 1 and 3. Those units are driven by means of cams 25 operating drive arms 26 which are adapted to co-operate with standard main shaft member 27. Drive arms 26 are mounted on shafts 28 which are supported and free to pivot in brackets 29, such drive arms being operated by cams 25 by provision of rolls 30 normally in the path of cam movement. Mounted on brackets 29 by pivot screws 31 are shift levers 32, each of which is adapted, when manually operated, to shift its co-operating drive arm shaft 28 laterally, carrying the roll 30 on its arm 26 out of the path of its associated cam 25, thus disabling the driving mechanism of that particular machine unit.

Date printing mechanism

The date printing mechanism includes type carriers located to the left of and similar to the regular type carriers 6, (Fig. 1). These devices, which carry the type for printing the day of the month are two in number and are herein designated as the units and tens date type carriers. Pivotally connected to each of the date type carriers, behind the vertical plane containing the axis of the shaft on which they are mounted, is a link 33 having attached to its lower end a vertical slide 34, (Figs. 1, 4 and 5), such slide being suitably guided on shafts 35 and 36. When released by a suitable means, the type carriers are adapted to advance to the printing line and the associated slides or followers 34 to descend by tension of springs 8. The extent of this movement is limited by stepped index plates 37 and 38 slidably mounted behind said plane under the lower extremity of the followers 34. Index plate 37 co-operates with the units column follower and provides for ten printing positions, zero to nine, while index plate 38, which limits the movement of the tens column follower, provides for three printing positions 1 to 3. The index plates 37 and 38 are operated by levers 39 and 40, (Figs. 2, 4, 5 and 12), respectively. These levers are pivotally connected to the plates 37 and 38 respectively and extend forward therefrom nearly to the front of the machine, lever 39 being pivoted at 39^a and lever 40 at 40^a to a fixed portion of the frame-work (Figs. 2, 12, 1, 4). The lever 39 at its forward extremity makes connection with a differential slide 41 provided with several lugs 42. This part of the mechanism is substantially the same as that disclosed in application Serial No. 703,101, filed March 31, 1924. When released by the suitable means, the lever 39 is caused to move in a clockwise direction by tension of a spring 43 until one of the lugs 42 on slide 41 limits on a depressed key in the units date keyboard 44. Index plate 37, described as being connected to the rear extremity of lever 39, will then be located so as to permit sufficient movement of the units date type carrier to position, for printing a numeral corresponding to the particular units date key depressed. The lever 40 at its forward extremity makes connection with a slide 45 provided with a lug 46. When released by its suitable means, the lever 40 is caused to move in a counter-clockwise direction by tension of spring 47, until lug 46 on slide 45 limits on a depressed key in the tens date keyboard 48. Index plate 38, described as being connected to the rear extremity of lever 40, will then be located so as to permit sufficient movement of the tens date type carrier to position for printing a numeral corresponding to the particular tens date key depressed. The sliding index plates 37 of units 1 and 3 are connected with plate 37 of unit 2 by links 49 while plates 38 have a similar connection in links 50.

As it is not always desirable to print the date with recorded items, a date control cam is provided on the tabulating paper carriage. This cam 51, (Figs. 1 and 3), may be slidably mounted on a toothed bar 52 in such position as to bear on a cam follower 53 only when the movable carriage is in the required date printing position. The cam is or may be adjustable into different working positions on the support 52. The cam follower 53 is adapted, when driven by a cam 51, to force downwardly a slide 54. The slide 54 is normally held in an elevated position by a spring 55 and is provided with suitable guides

in brackets 56 and 57. Through suitable driving means consisting of a rock arm 58, a link 59 and another arm 60, the slide 54 makes connection with a lock arm 61 pivoting at 62 and having a forwardly projecting lug that normally passes through apertures 63, (Fig. 5), in the index plates 37 and 38. It is obvious that this control mechanism or releasing means, would render the date printing mechanism inoperable while the locking device engages the plates, and that only when cam 51 bears on follower 53 to drive the lock arm 61 out of apertures 63, is it possible for the date mechanism to function in printing.

After the levers 39 and 40 are actuated in any operation of the machine, they are restored to their normal positions by any suitable means, such for example as the sliding cam-plate 104 (Fig. 12) acting on studs 39^b and 40^b on the levers 39 and 40 respectively. Said plate may be moved to restore the levers in the last part of a cycle by any suitable means, such as by an arm extending downward from the main rock shaft shown in Figs. 6, 7 and 8; and it may be moved in the opposite direction by a spring 105^a.

The keys of the date-printing mechanism have the forms represented in Figs. 1, 2, 12, 13 and 16, each having an upper arm on which is a key-head, and a lower arm, many of the arms being bent as shown. These keys are loosely mounted on the pivot-rod 125. Underneath the tens keys is the lock-plate 106 and underneath the units keys is the lock-plate 107 (Figs. 1, 2 and 17), these plates having the same shape in cross section (Figs. 1 and 13). Plate 106 has the aperture 108 and plate 107 has the three apertures 109. Both plates are pivotally mounted on the pivot rod 110 passing through ears 111 and 112 formed on plates 106 and 107 respectively. Springs 113 and 114 pull upward on the plates in front of the rod 110. A lug 115 on plate 106 may extend over a projection on lug 116 on plate 107 as shown in my application Ser. No. 703,101, so that when the tens plate 106 is depressed by a tens key, both plates shall turn on rod 110, their front edges swinging downward and the springs 113 and 114 being stretched, but plate 107 can swing without disturbing plate 106. Normally the lower arm 118 of each finger key is in contact with the inclined front margin of the lock-plate below it, as shown in Figs. 1 and 13, and a spring 119 prevents the arm from moving backward unless the spring is stretched. When a key is operated, arm 118 swinging backward and stretching spring 119, forces downward the front of the lock plate, and as the arm reaches the aperture behind it in the lock-plate that plate is drawn to its normal position by its restoring spring and arm 118, passing through the aperture and drawn by its restoring spring against the front edge thereof, is latched in the path of a lug of the differential slide behind it. When keys representing a date are set and locked as described, they may be released by depressing any tens key, which will depress both lock-plates as described above. But if only a units key is depressed, only lock-plate 107 will be depressed and a tens key will not be released. This key-locking mechanism is claimed in my prior application 703,101. The keys and lock plates will be swung back to their normal positions by their restoring springs.

One cam plate 51 may cause the date to be printed on each sheet once in any line and ordinarily that is all that is required. However, several columns are commonly printed on each sheet, and when that is done the carriage stands in different positions during the printing of a single line, and should it be desired to print the date before different entries in one line, two or more cam plates 51 may be employed.

Any cam-plate may be set on its support in a position in which it will not function, or may be removed from the machine. If no cam functions the releasing means of which it is a component does not, and the locking device prevents movement of the stepped plates 37 and 38, the differential slides, and the actuators of those plates and slides, and, of course, the type-carriers to which are connected the followers that act on the stepped plates. But locking of this date-printing or character-printing mechanism does not affect the normal operation of the mechanism that adds and records the items of an account.

As the foregoing description indicates the levers or bars 39 and 40, with the springs by which they are moved, are common actuators of the differential slides that act on the key-controlled stops, and of the index-plates or stepped stop-plates 37 and 38, which stand side by side and close together when they are in their normal positions and each of which is movable from its normal position toward a side of the machine and in one direction only that is opposite to the direction of the other's movement from its normal position. The followers that are connected to the type-carriers and act on the stepped stop-plates are prevented by the latter from advancing to their differential positions when the stop-plates are in their normal positions. If the proper key is actuated either stop-plate may be set to enable the follower that acts on it to function in different positions while the other follower is held in its normal position by the other stop-plate.

In the machine shown in application No. 703,101 each date-printing type-carrier, when it swings forward, is arrested by the action of a differential slide on a key, counteracting force transmitted to it through quite a long train of pointed devices. But sometimes the type-carriers were not arrested in exactly their true printing positions. The trouble was supposed to be incidental to lost motion in the joints of the train and flexibility of some of its components. The defect was remedied by the conception and development of the mechanism that is herein described and that includes the stepped plates 37 and 38 which arrest the type-carriers by limiting the downward movements of the followers 34, connected to the type-carriers merely by the short links 33. By this mechanism not only is the lost motion between the type-carriers and their arresting stops reduced to a negligible amount, but also the levers 39, 40, differential slides 41, 45, and keys 44, 48, are entirely relieved of stress such as that to which the corresponding devices of the older mechanism are subjected in arresting the type-carriers at their printing positions.

Designating word printing mechanism

The extreme right hand member of the group of type carriers 6, which is shown in Fig. 1, holds the type for printing the words or characters required in the work to be performed by the machine. When released by the usual means, this type carrier is adapted to advance, under the tension of spring 8 to the printing position as determined by a heel 9 limiting on an elevated stop 10 in the transversely movable carriage.

Since the designating symbol will be set up with the item, after the item has been introduced into

the stop carriages, the row of stops immediately to the right of the elevated item stops will constitute the row which co-acts with the designating column type carrier, and this row will register with the tappets 13 on the rear ends of key levers 12.

It is evident, however, that when a stop is set on which the heel 9 of the symbol-printing type-carrier is to act, the stop-carriage must be prevented from then moving further, for of course the set stop must be kept in the path of the heel 9 of that type-carrier, and the relation of any previously set stop to the particular type-carrier required to act on it must not be disturbed.

The mechanism for blocking such stop carriage movement will now be described.

The transversely movable stop carriage 67, (Figs. 9, 10 and 11), which holds the stops 10, is adapted to advance from right to left, as previously mentioned, with each depression of a regular numeral key. The mechanism for controlling this escapement consists in part of link 68 connecting the carriage 67 with an arm 69 rigid on a vertical shaft 70, such shaft being free to pivot and having rigidly affixed at its lower extremity an escapement rack 71, which co-acts with the usual escapement pawls and operating mechanism not described. It is obvious in Fig. 9 that the lateral movement of the carriage 67, from right to left will cause a clockwise rotating movement of the rack teeth 71, this movement being the equivalent of one tooth for each operation of the keys.

This mechanism, just described, is located in machine 2 and controls the escapement of all three stop carriages which are connected by links 67A, (Fig. 2), and are adapted to move laterally as one carriage.

Pivoting at 72, (Fig. 1), is the designating control key 73 having pivotally connected thereto a rearwardly extending link 74 which makes suitable connection with an arm 75, (Figs. 9, 10 and 11), pivoting at 76. The arm 75 carries at its extremity a latching pawl 77 normally held in abutment with a projection (from the machine base) 78 by tension of a spring 79. Depression of the key 73 drives the arm 75 rearwardly causing the pawl 77 to latch on projection 78 and a tooth 79A to engage with an adjacent tooth space 80 of the escapement rack 71, (Fig. 11), thus arresting further movement of the stop carriage. The designating key train of mechanism is permitted to be restored by the spring 73A, (Fig. 1), when, as the escapement sector restores with a counter-clockwise movement, a rack tooth 80A, (Fig. 11), adjacent to the above mentioned tooth space 80 drives the pawl tooth 79A out of engagement with the tooth space 80 and the latching pawl 77 off of projection 78.

When the rack 71 is restored, a pin 83 thereon engages a cam surface 84 of the arm 81, thereby restoring and holding the arm 81 against a stud 82 on latching pawl 77, and preventing the same from latching on projection 78 while moving rearwardly on depression of the designating key as described. As the rack 71 moves clockwise out of normal position, when one or more digits are introduced into the stop carriage, the pin 83 moves out of proximity of cam surface 84, permitting arm 81 to float freely and the pawl 77 to latch on projection 78 on depression of the designating key.

The designating type carrier, described as being located on the right of type carriers 6, is normally checked against forward movement and consequent printing by provision of a latch 85, (Fig. 1), engaging with an offset latching shoulder 86 on the type carrying member. The latch 85 is rigid on a shaft 87 which is supported and free to pivot in bracket 88, such shaft having rigid therewith another arm 89 which makes connection to link 74 through another link 90 and a rock lever 91 as shown. Through these means, depression of the designating key results in the raising of latch 85 to permit the forward movement of the type carrier to the printing line when released by the regular means.

The shaft 87 is extended laterally and has rigidly affixed at each end the drive arms 92, (Figs. 4 and 5), which are adapted to operate arms 93, rigid on shafts 94 and 95 of machines 1 and 3 respectively, such shafts serving the same purpose as shaft 87 in machine 2.

Means for depressing total and sub-total keys

Supported and free to pivot in brackets 96, (Figs. 1 and 3), is a laterally extending shaft 97 which has rigidly affixed thereon an operating lever 98. Depending from shaft 97 in alignment with and adapted to operate each of the regular total keys 99 of the three machines is an arm 100. Downward movement imparted to the lever 98 rocks the shaft assembly counter-clockwise with the resultant depression of the total keys. A similar means is employed to depress the sub-total keys, arm 99A serving as the controlling lever, such arm being rigid on shaft 101, supported in brackets 96 and having arms 102 positioned to depress the sub-total keys 103.

While a special embodiment of the invention has been shown and described, it is obvious that certain of the controls and other features could be carried out by other means and in connection with other types of machines.

What is claimed is:—

1. In an adding and recording machine the combination of a pair of separately shiftable stepped stop-plates which normally stand face to face and close together and in which are apertures that register when the stop-plates are in their normal positions, a device including a lug that co-acts with sides of said apertures in locking the stop-plates, and means acting on said device to release both plates simultaneously.

2. In an adding and recording machine the combination of a pair of shiftable stepped stop-plates each movable from its normal position in one direction only that is opposite to the direction of the other's movement from its normal position, a pair of differential slides, a pair of actuators each connected to a stepped plate and to a slide, and a releasable lock that tends constantly to function and normally prevents movement of both of the stepped plates and their actuators and slides.

3. In a machine of the class described and comprising differential devices operating in front-to-rear vertical planes, the combination of a key-controlled differential slide at the front of the machine and movable transversely of the machine, a stepped stop slide at the rear of the machine and movable transversely of the machine, means for connecting the two slides so that the rear slide is settable differentially under the control of the front slide, and a differential device operating in a front-to-rear vertical plane and controlled in its setting by the steps of said rear slide.

4. In a machine of the class described and comprising differentially settable type carriers oper-

ating in front-to-rear vertical planes, the combination of a key-controlled slide at the front of the machine and settable differentially transversely of the machine, a stepped stop slide at the rear of the machine and slidable transversely of the machine, means connecting the two slides in such wise that the rear slide is settable differentially under the control of the front slide, a type carrier operating in a front-to-rear vertical plane, and means whereby said type carrier is differentially arrested by the steps of said rear slide.

5. In a machine of the class described, the combination of a key-controlled slide at the front of the machine settable differentially transversely of the machine, a stepped-stop slide at the rear of the machine and slidable transversely of the machine, a lever device connecting the two slides so that the rear slide is settable differentially under the control of the front slide, and a differential device controlled by the stepped stops of said rear slide.

HARRY LANDSIEDEL.