Nov. 5, 1935. E. WAGNER 2,019,750

PRINTER CARRIAGE CONTROL FOR CASH REGISTERS

Filed June 21, 1933 3 Sheets-Sheet 1

FIG. 1

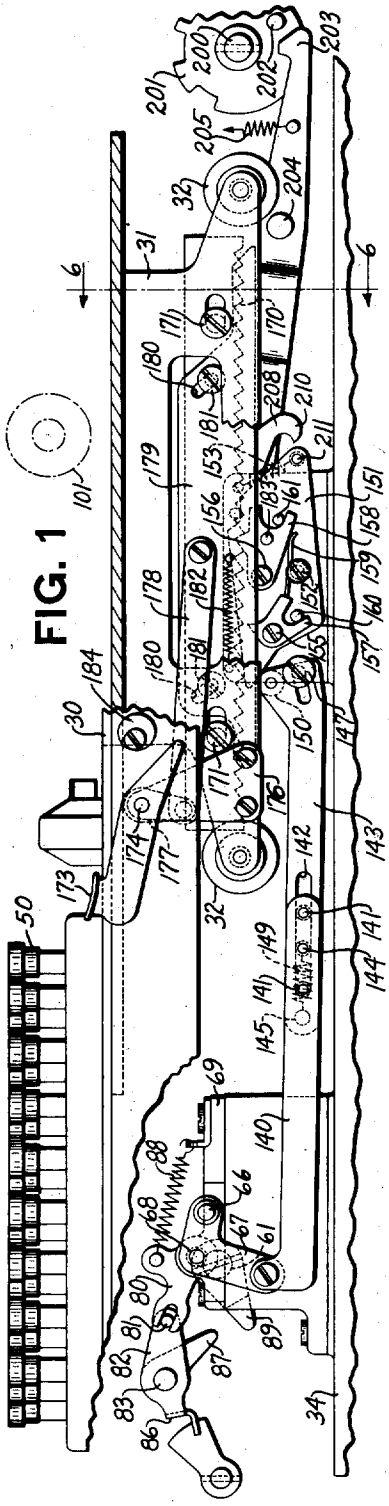
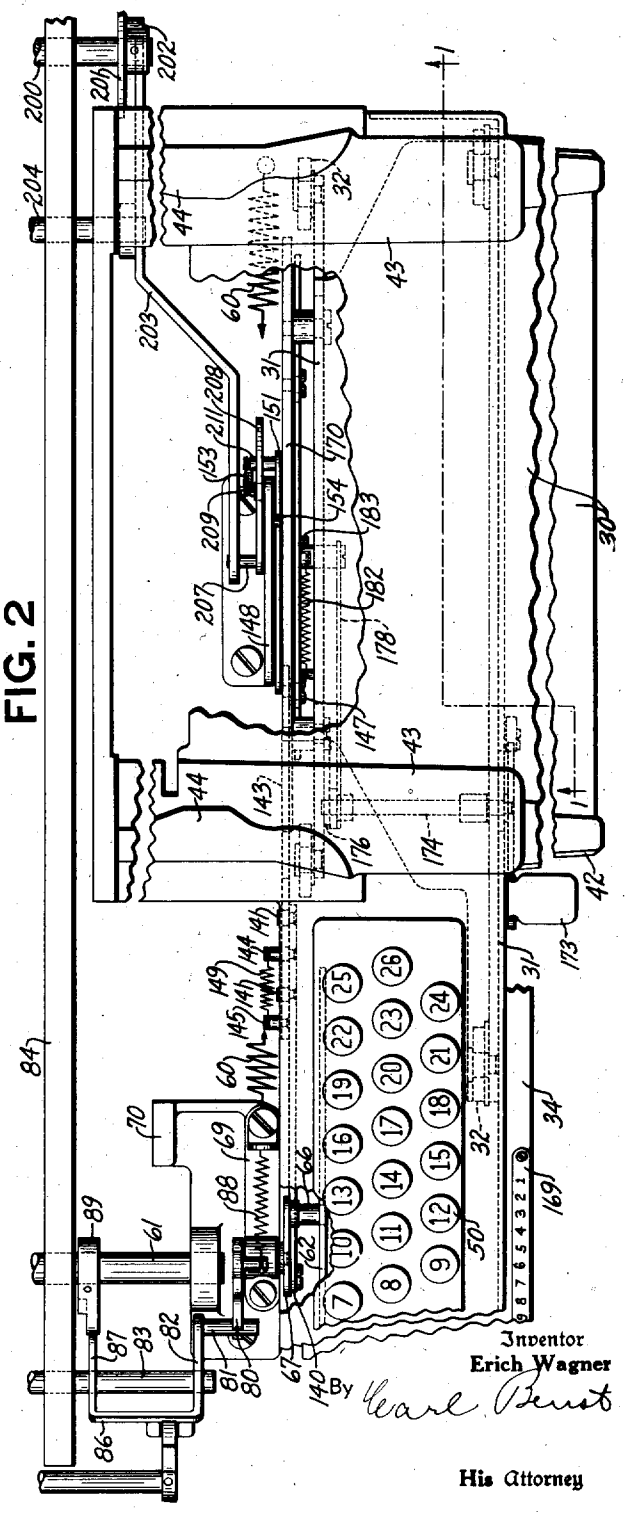


FIG. 2



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PRINTER CARRIAGE CONTROL FOR CASH REGISTERS

Filed June 21, 1933 3 Sheets-Sheet 2

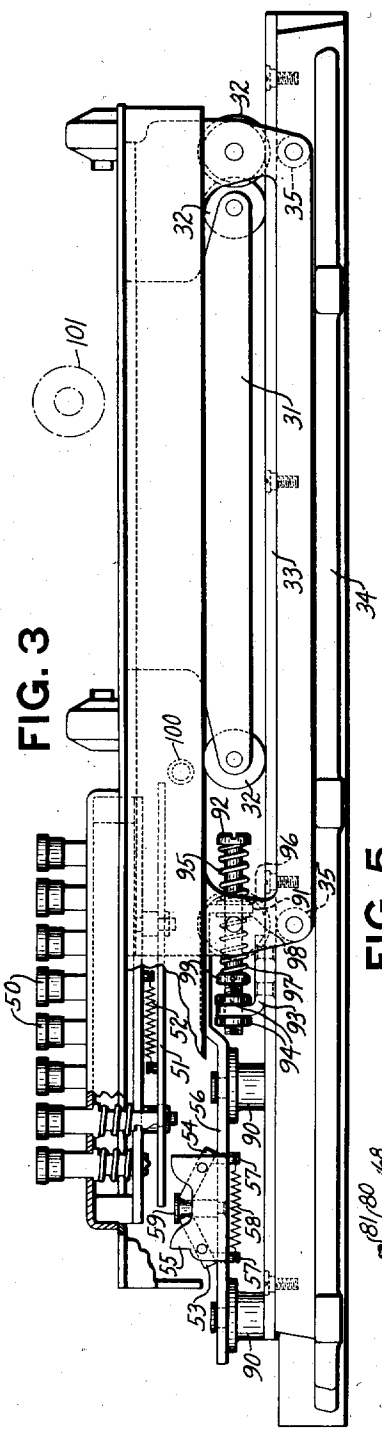


FIG. 3

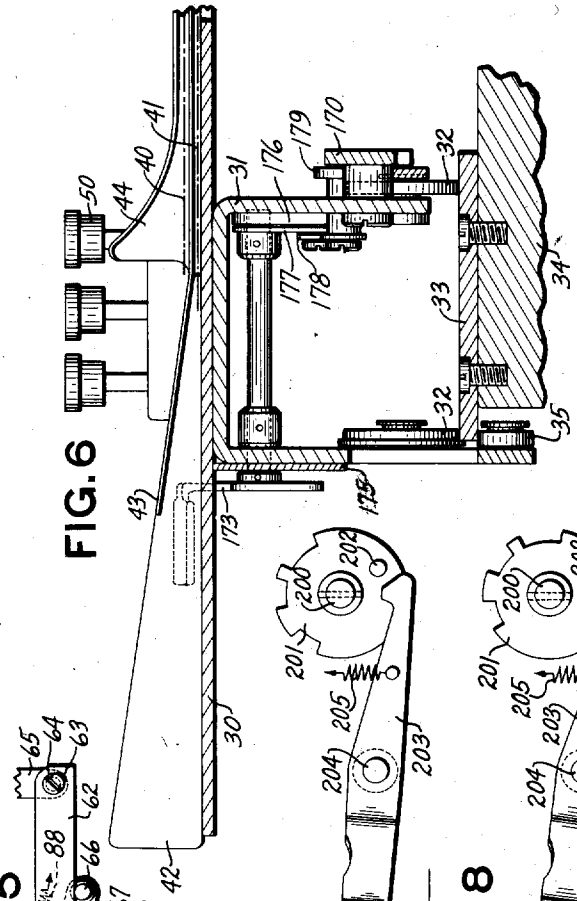


FIG. 6

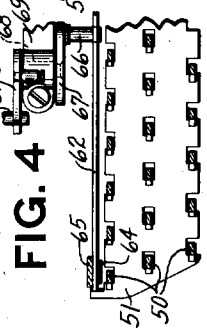


FIG. 4

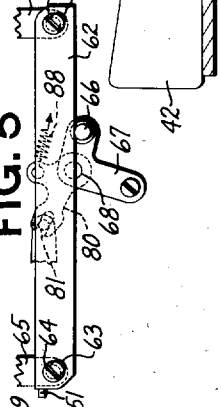


FIG. 5

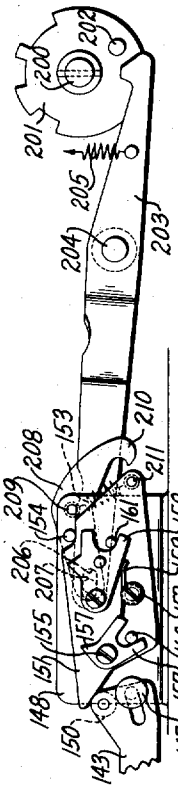


FIG. 7

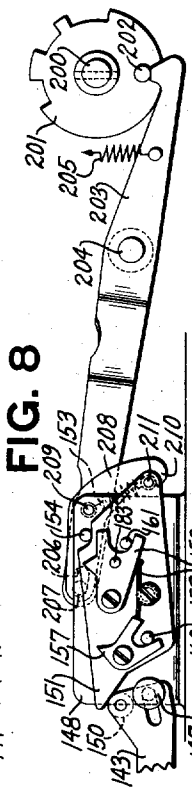


FIG. 8

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PRINTER CARRIAGE CONTROL FOR CASH REGISTERS

Filed June 21, 1933 3 Sheets-Sheet 3

FIG. 9

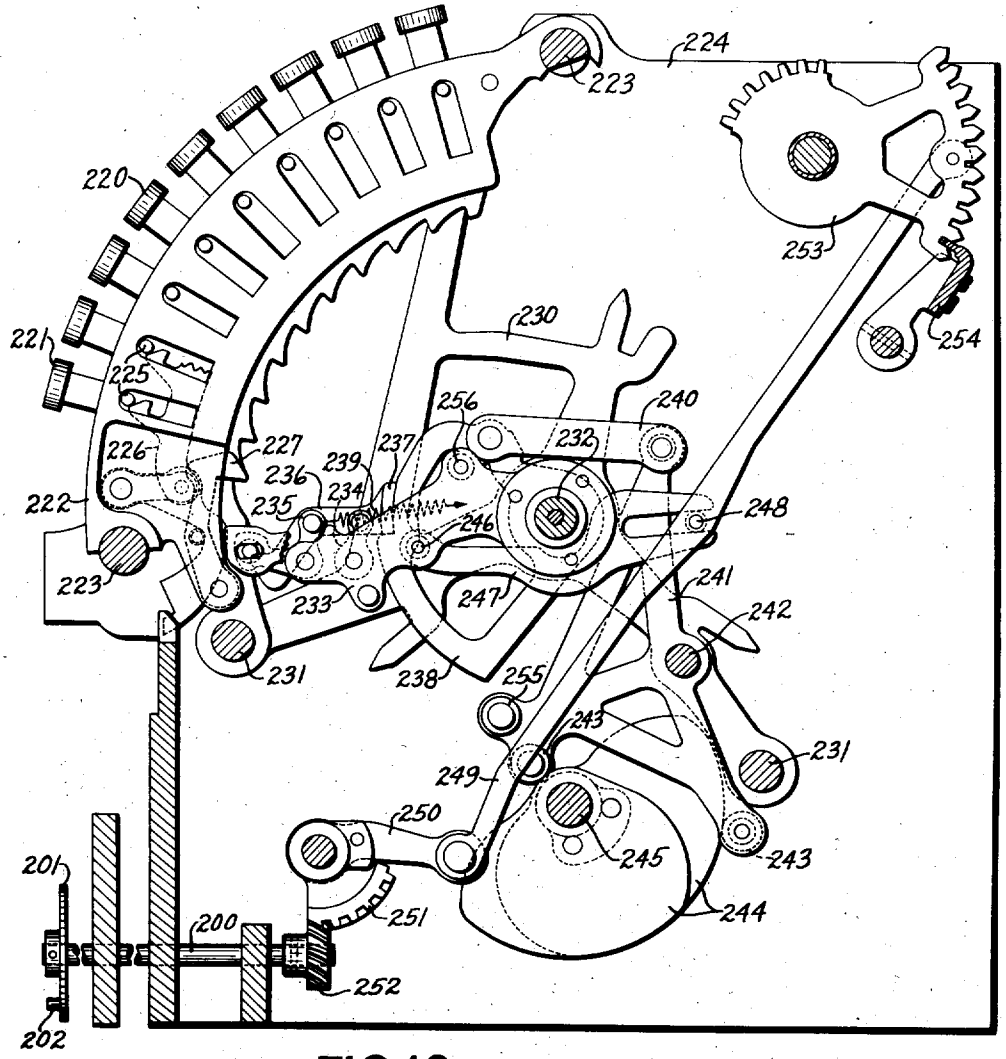


FIG.10

40

	DATE	CREDIT	DEBIT	BALANCE	TRAN.	ACCT. NO.
1	APR 14-33	33.50				132674
2	APR 14-33	9.45				
3	APR 14-33	8.00				
4	APR 14-33	6.75				
5	APR 14-33	3.80		61.50		

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Patented Nov. 5, 1935

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UNITED STATES PATENT OFFICE

2,019,750

PRINTER CARRIAGE CONTROL FOR CASH REGISTERS

Erich Wagner, Berlin, Germany, assignor to The National Cash Register Company, Dayton, Ohio, a corporation of Maryland

Application June 21, 1933, Serial No. 676,813
In Germany October 14, 1932

10 Claims. (Cl. 235—3)

This invention relates to improvements in printing mechanisms of the type generally shown and described in Letters Patent of the United States, granted to B. M. Shipley, Nos. 1,747,397 and 1,761,542, dated February 18, 1930 and June 3, 1930, respectively; and particularly to the carriage mechanism and control of the same to effect or not, as desired, a step-by-step shifting of the same to select the next blank line or lines upon which printing is to be done.

More specifically, the invention is an improvement relating to the mechanism shown and described in an application for Letters Patent of the United States, of Herbert Kaufmann, Serial Number 603,559, filed April 6, 1932.

One object of the present invention is to provide mechanism to control a carriage of the type shown and described in the above mentioned Shipley patents, so that after the first blank line of the printing medium has been selected by the depression of one of the line selecting keys of the carriage, the entire carriage may be shifted automatically step by step toward its normal position whereby printing may be effected in successive lines on the printing medium carried by said carriage under control of a bank of manipulative control devices.

Another object of this invention is to provide a locking device under control of special manipulative devices to render the automatic step-by-step feeding device of the carriage ineffective, thus preventing any feed of the carriage upon operation of certain of said special manipulative devices.

Another object of this invention is to provide means intermediate the above mentioned special manipulative devices and locking device, which means is set under control of said devices to prevent or permit operation of the automatic step-by-step feeding device for the carriage as desired.

With these and incidental objects in view, the invention consists in certain novel features of construction and combinations of parts, the essential elements of which are set forth in the appended claims, and a preferred form of embodiment of which is hereinafter described with reference to the drawings which accompany and form part of this specification.

Of said drawings:

Fig. 1 is a combined front and sectional view of the carriage for carrying record material to be printed upon, the section being taken on line 1—1 of Fig. 2.

Fig. 2 is a top-plan view of the carriage and includes the means for controlling the automatic feeding device.

Fig. 3 is a front view, partly in section, showing how the carriage is supported, and a portion of the line selecting keys and the stop mechanism.

Fig. 4 is a fragmentary sectional view through the line selecting keyboard, showing the detent which maintains an operated key depressed, and also a portion of the means for shifting said detent to release the depressed keys.

Fig. 5 is a detail view of the means for operating the key detent to release the depressed key.

Fig. 6 is an enlarged sectional view on line 4—4 of Fig. 1 and also shows the card and book guides, the controlling means for the automatic shifting of the carriage being omitted.

Fig. 7 is a detail of a portion of the automatic line spacing mechanism and the associated locking mechanism therefor, the latter being shown in its normal position.

Fig. 8 is a detail of the same mechanism of Fig. 7, except that the locking mechanism is shown in its effective or operated position.

Fig. 9 is a sectional view through the machine, taken alongside of a bank of special control keys.

Fig. 10 is a facsimile of a fragment of a card adapted to be printed upon.

General description

The present invention, described in general terms, involves mechanism for automatically line-spacing the record material carriages of accounting and posting machines of the type shown and described in the above mentioned Shipley Patents Nos. 1,747,397 and 1,761,542. It also involves mechanism for controlling such automatic line-spacing mechanism under control of a bank of special manipulative devices or keys.

Machines of the above mentioned Shipley type are at present extensively used in hotels to post the accounts of the guests, and also in banking institutions to post depositors' accounts.

Machines are also in use which do not embody the set of ledger or account keys usually arranged at the right side of the keyboard. Such types of machines are shown in the application for United States Letters Patent of B. M. Shipley, Serial Number 42,458, filed July 9, 1925, allowed December 10, 1932, Patent No. 1,916,535, issued on July 4, 1933.

To give a general idea of how the machine is used at present, a brief explanation of an operation of the machine when posting a depositor's account in a banking institution will be given.

In making a complete posting of such accounts,

the ledger card and book are used. However, in the present case I have illustrated only a ledger card, it being thought that it is sufficient to show how the printing appears when the carriage is shifted automatically step by step on the entry of the several successive amounts of the same account. This card also shows that the first amount is printed on the same line which bears the account number, which account number may be set up by the regular amount keys, as is fully illustrated and described in the last mentioned Shipley application, Serial Number 42,458.

The teller first takes the depositor's ledger card from the filing box and sets up the ledger number or account number on the amount keyboard, at the same time depressing, in the present instance the bottom one of the keys of the special bank of keys illustrated in Fig. 9, which may have the designation "Account No." on the key tip. This operation of printing the account number is a separate operation of the machine. After printing the account number, the amount of the deposit or withdrawal, as the case may be, is set up on the amount keyboard and upon operation of the machine the same is printed, as for example in Fig. 10, on the same line that carries the account number printed in the previous operation.

During the set-up of the items, depending upon whether or not it is a deposit or withdrawal, a corresponding "Deposit" or "Withdrawal" key is depressed which is allotted to the particular teller operating the machine so that such amount is properly added or subtracted to or from the old balance.

After placing the card and book in the machine the operator selects the first blank line on the card by depressing one of the line-selecting keys and moving the record material carriage to the right until it comes to a stop, which of course is controlled by the number of the key depressed. The cards have lines on them which are numbered in accordance with the numbers on the line selecting keys.

After the several deposits have been entered, or a withdrawal subtracted from the old balance, the teller operates the usual total-taking lever to put the machine in a condition to print the new balance. During this operation the new balance is printed upon the ledger card and the depositor's passbook and the computing device is cleared during such operations.

In such machines, however, the carriage remains in that position to which it has been moved by the operator upon the depression of the desired line selecting key until the new balance has been printed.

It may, however, be very desirable to list several deposits of one depositor on successive lines, for instance, currency, checks, and gold; or it may be desirable to list each of the checks being deposited on a separate line.

With the type of machines shown in the Shipley patents and application, it would be necessary, to accomplish such printing, for the operator to depress a line selecting key for the entry of each one of such deposits, which of course requires a great deal of time and is somewhat of an annoyance to the operator, as it slows up his work considerably and also keeps the depositor standing an undue length of time at the window. To avoid all of this time-wasting manipulation which is also very inconvenient for the user, a novel mechanism has been provided in the instant case, which effects an automatic shift of the carriage one step or one line at the end of each operation of the machine so that the next imprint is effected on the following line of the card or book respectively, with the exception of the operation during which the account number is printed.

Usually the account number is printed at the beginning and therefore it is during this operation that mechanism is brought into play which will render the automatic line spacing mechanism ineffective so that it cannot function during the account number printing operation, and therefore, during the next operation of the machine which operation is either the entering of a deposit or withdrawal, that deposit or withdrawal can be printed on the same line which carries the account number.

In the present case provision has been made, through the control of the special bank of keys, to set up a mechanism which in turn controls a locking device to positively lock the automatic line spacing mechanism during the operation in which a certain one of the special control keys, in the present instance the lowermost one, is operated.

Detailed Description

Carriage mechanism in general

Only so much of the carriage will be described as is necessary for a complete understanding of the present invention. If a further detailed description of the carriage is desired, reference may be had to the above mentioned Shipley patents.

The carriage includes a plate or table **30** (Figs. 1, 2, 3 and 6) secured to a U-shaped frame **31** having four rollers **32** running on a rail **33** fastened to a base **34**. To prevent the carriage from tipping over and to retain it in a constant level position one side of the U-shaped frame **31** carries a pair of rollers **35** (Figs. 3 and 6) which engage the rail **33** along the underside thereof.

To guide a ledger card **40** (Fig. 10) (shown in dot and dash lines in Fig. 6) and a passbook **41** (shown only in dot and dash lines in Fig. 6) the carriage is provided with the usual guiding means. The book guide **42** (Figs. 2 and 6) is secured to the table **30** and has inwardly bent flanges **43**. To guide the ledger card **40** a pair of flanges **44** are provided, which flanges are integral with the flanges **43** of the guide **42**. As is usual, the front ends of both guides **44** are flared to facilitate the insertion of the card **40**.

Normally the first blank line on the ledger card, as well as of the passbook, is printed upon. To easily set the card and book so that the printing will fall in the right place, a keyboard consisting of twenty-six keys **50** (Figs. 1, 2, 3 and 6) is arranged directly on the lefthand side of the table **30**. The number of keys **50** correspond to the number of lines which are on the card and passbook, which number may be varied as the occasion demands.

After the key **50**, appropriate to the line on which it is desired to print has been depressed, the carriage is moved bodily by hand to the right, until the lower end of the depressed key comes into contact with a stop.

When a key **50** is depressed to select any one of the lines on the card, it is held in depressed position by a detent **51** (Fig. 3) of the type shown and described in the above mentioned Shipley patents. This detent is normally drawn to the right by a spring **52**.

The above mentioned stop with which the depressed key is adapted to contact to stop the car-

riage in the proper position includes a pair of hinged plates 53 and 54, pivotally supported by flanges 55 (only one of which is shown) extending upwardly from a slidable bar 56. Each plate 53 and 54 has a stud 57 connected by a spring 58. This spring 58 tends to rock the plate 53 counterclockwise and the plate 54 clockwise. The movements of these plates are limited by a pair of studs 59 (only one of which is shown) secured to the slidable bar 56.

In Fig. 3 the carriage 30 is shown in its right-hand position. Assuming that one of the keys 50 is depressed, the operator manually moves the carriage toward the left whereupon the lower end of the depressed key strikes the plate 54, rocking the same counterclockwise until said lower end of the depressed key strikes the plate 53, whereupon the carriage is stopped. Upon the contact by the key with the plate 53, the plate 54 then snaps upwardly under the action of the spring 58, thus locking the key between the two plates, which consequently locks the carriage in the position to which it has been set.

In Figs. 1 and 2 the carriage 30 is shown in position to print on line 11 of the card and book.

The normal position of the carriage table 30 is at the extreme left, just the reverse of the position in which it is shown in Fig. 3. When the carriage is moved by hand from the left to the right to select the first blank line to receive the printing, then the depressed key 50 rides over the plate 53 and comes to a stop against the edge of the plate 54. Then the plate 53 snaps upwardly to its normal position, thus locking the carriage in its selected position.

Key release

As is fully explained in the above mentioned Shipley patents, after the taking of the new balance the detent 51 is moved toward the left (Fig. 3) thus releasing the depressed key whereupon a heavy spring 60 restores the carriage to its normal lefthand position.

Upon the taking of the new balance in the machine of the type with which the present invention is used, it is well known that such machines make two cycles of movement during such balancing operations. It is also well known that the printer shaft, shown at 61 (Figs. 1 and 2) herein is idle during the first of such cycles of movement but receives one counterclockwise rotation during the second cycle thereof.

It is through the medium of this shaft 61 that the depressed line selecting key is released. Such mechanism will be but briefly described herein. For a more detailed description and illustration reference may be had to the previously mentioned Shipley patents.

Cooperating with the key detent 51 (Figs. 3 and 4) is a release bar 62 (Figs. 2 and 5) mounted by means of angular slots 63 on studs 64 carried by lugs 65 extending downwardly from the carriage frame. Contacting the underside of the bar 62 is a pin 66 carried by one arm of a bell crank 67 secured to a short shaft 68 (Figs. 1, 2 and 5) mounted in a bearing 69 supported on a lug 70 of the base 34.

Also secured to the shaft 68 is an arm 80 (Figs. 1 and 2) forked to embrace a stud 81 of an arm 82 slidably and pivotally mounted on a shaft 83 (Fig. 2) supported by the printer front frame 84 and a bracket (not shown) carried thereby. The arm 82 is connected by a bail 86 to an arm 87 also freely mounted on the shaft 83. A spring 88 maintains the parts normally in the positions shown in Fig. 1.

The printer shaft 61 has secured thereto an arm 89 in the path of the arm 87. Therefore, the arm 89 upon the counterclockwise movement of the shaft 61 rocks the arms 87 and 82 clockwise, and the stud 81 rocks the arm 80, shaft 68 and bell crank 67 counterclockwise, whereupon the pin 66 (Fig. 5) raises the bar 62. Due to the angular slots 63 the bar 62 also moves to the left and shifts the detent 51 far enough to release the depressed unlatched key 50. When the arm 89 passes off the arm 87, the spring 88 lowers the pin 66 and the spring 52 restores the detent 51 and bar 62 to normal position. The spring 88 also returns the arms 80, 82 and 87 to their normal positions.

Attention is called to the fact that in the Shipley structure previously referred to the line selecting key 50 is not released during adding or any single cycle operations, since during such operations the arm 87 is out of the path of the arm 89 on the printer shaft as is fully set forth in the patents above mentioned.

Shock absorber

When the carriage is moved either by hand or by the spring 60 to any of its selected positions or to its normal position, respectively, there will be a certain amount of shock when the carriage comes to a certain stop. Therefore, means is provided for absorbing this blow so as to prevent any damage to the mechanism.

The previously mentioned bar 56 (Fig. 3) is slidably mounted on studs 90, carried by the rail 33. The right end of the bar 56 is formed with a downwardly projecting flange 91 to guide and support a screw stud 92, screwed into a bracket 93 secured to the rail 33. A pair of lock nuts 94 holds the screw stud 92 in any position to which it is adjusted. A compression spring 95 is located between a washer 96 and the head of the screw stud 92, and another compression spring 97 surrounds the screw stud 92 between a washer 98 and a collar 99 pinned to the stud.

When the carriage 30 is moved to the right rapidly by the operator when adjusting the same to select a particular line, and the key 50 strikes the plate 54 the shock of such stop will be absorbed by the spring 95.

When the carriage 30 is moved to the left by the spring 60 with no key 50 depressed, a pin 100, carried by the carriage 30 contacts the right end of the flange 55 to stop the carriage in its normal position. At this time the shock is absorbed by the spring 97.

When the carriage is moved to the left with a key 50 depressed, the depressed key stops against the plate 53, then the shock of stopping the carriage is also absorbed by the spring 97.

Printing mechanism

In addition to the printer drive shaft 61, the only part of the printing mechanism which it has been thought necessary to show in this case is the general location of the type wheel line, and therefore in Figs. 1 and 3 is shown in dot and dash lines the general location of the lower set of type wheels 101.

Automatic line-spacing mechanism

As has been previously stated at the outset of this specification, it may be desirable to enter the several items of a single item transaction in lieu of the sum thereof as a single item. For

example, when the machine is being used in a banking institution several separate credits of a single transaction may be entered one after the other, such as illustrated in Fig. 10.

Therefore, in order to do away with the former necessity of manipulating the keyboard by the depression of one of the line selecting keys 50 for the entry of each of such items, the present invention provides mechanism for automatically tabulating or shifting the carriage one line at the end of each item-entry operation of the machine so that the next imprint is effected on the following line of the card or book, respectively, or both, as is desired.

During the first of such item-entry operations the depressed line selecting key 50 will be released and the carriage 30 will be automatically spaced one step by means to be later described, so that on the subsequent item-entry operation the item will be printed on the next line. The carriage is thereafter shifted one space upon the entry of each subsequent item, but there will be no key released since none is depressed for such subsequent items of the same transaction.

It might be well to state here that in connection with this automatic shifting or line-spacing of the carriage, the present invention also contemplates a control over the automatic shifting under certain conditions, which control is effected by certain of the manipulative devices in the special or control bank in the machine of the type with which the present invention is adapted to be used.

Such control over the automatic line-spacing or carriage shifting mechanism will be later described in detail under a separate heading.

The automatic carriage spacing or shifting mechanism per se will now be described. Pivoted to the bell crank 67 (Figs. 1 and 2) is a link 140 carrying two pins 141 projecting through a slot 142 of a link 143. The link 140 also carries a spring stud 144 and the link 143 carries a spring stud 145. A spring 149 normally holds the links in the positions shown in Figs. 1 and 2. The purpose of this flexible connection between the two links will be hereinafter explained. The link 143 is supported at its right end (Figs. 1, 7 and 8) by a stud 147 carried by an L-shaped bracket 148 secured to the base 34. This link 143 also carries a roller 150 adapted to cooperate with the upper left corner of a plate 151 pivoted on a stud 156 carried by the bracket 148. A spring 153 tends to rock the plate 151 counterclockwise, always maintaining it in contact with a stud 154 of the bracket 148.

Pivoted on stud 155 carried by the plate 151 and on stud 156, are pawls 157 and 158, respectively. These pawls are under the action of a spring 159 coiled about the stud 152. The spring 159 always tends to rock the pawls 157 and 158 in counterclockwise direction, which movement of the pawls is limited by the studs 160 and 161, respectively. These pawls 157 and 158 are adapted to cooperate in a manner to be later described, with a notched bar 170 secured by studs 171 (Fig. 1) to the frame 31.

Let it be assumed that the carriage has been moved manually to the positions shown in Figs. 1 and 2 and that there are a plurality of items relating to the transaction to be recorded and that this transaction consists of several credits to be entered in connection with an account numbered 132,674. These credits are to be recorded on the record material but in different lines, the desired line selecting key 50 is depressed and the carriage is shifted by hand until it occupies accurately the selected position shown, in which the first impression is made. The first operation consists of setting up the account number 132,674 on the regular amount keyboard and printing that account number as shown in Fig. 10. During this operation the automatic line-spacing mechanism is rendered ineffective by means to be later described, or in other words controlled so that it will not automatically line-space during the operation in which the account number is set up and printed. Therefore, for the present we will pass over that particular operation of the machine and go to the second operation wherein the operator sets up the first credit, which in the present instance is shown as $33.50.

During the entry of the first credit item or $33.50 the printer shaft 61 is, as has been previously described, located once in a counterclockwise direction. During such movement of the shaft 61 (Figs. 1 and 2) the arm 89 strikes the arm 87, rocking the same clockwise, which through the stud 81 rocks the arm 80, shaft 68 and the bell crank 67 counterclockwise, thus moving the links 140 and 143 toward the right. It will be recalled that these two links are connected by the spring 149 and therefore when the link 140 is moved toward the right the link 143 is, under the influence of the spring 149, moved likewise. Upon such movement the roller 150 by its contact with the upper left corner of the plate 151 rocks the same clockwise about the stud 156. This clockwise movement of the plate 151 through stud 161, effects a disengagement of the pawl 158 from the notched bar 170 and causes the pawl 157 to engage the notched bar 170. The nose of the pawl 157 enters the notch, opposite the same, in the bar 170 before the nose of the pawl 158 is entirely withdrawn from its associated notch. The pawl 157 is located to arrest the carriage 30 after it has moved less than a line space. As soon as the nose of the pawl 158 leaves its notch, the spring 60 draws the carriage 30 toward the left just a portion of one tooth or line space, until the right side of the wall of the notch entered by the nose of the pawl 157 strikes said nose thus preventing further movement of the carriage in this instance. The pawl 157 therefore holds the carriage in the partially line spaced position.

Now, when the arm 89 passes off the arm 87, the springs 88 and 153 restore the arms 87, 80, bell crank 67, links 140 and 143, and plate 151 to their normal positions. Thus, the pawl 158 is again engaged with said notched bar 170 at the same time that the pawl 157 is disengaged therefrom. As the pawl 157 leaves the notched bar 170 the spring 60 shifts the bar and the carriage 30 the remaining part of the line space until the nose of the pawl 158 arrests said bar, at which point the card and book are in position to receive the print on the next line.

From the above it can be clearly seen that the notched bar 170 and the carriage 30 are automatically spaced one step toward the left, thus bringing the subsequent line on the ledger card 40 into printing position opposite the type wheels 100.

The operation set forth above may be repeated until all of the credits to be entered into one account have been printed on the ledger card and in the pass-book, if such is desirable.

After all of the credits and debits if there are any, have been entered as above described, the new balance is taken, which operation is a total

operation, which in the machines of the class to which the present invention is applied, as is well-known, requires two cycles of movement.

It is also well known that the printer shaft 61 does not function during the first of said two cycles; consequently the carriage is not shifted during said first cycle but is shifted during the second cycle after the new balance or the total has been printed.

In order to enable the operator to determine at what line the carriage is setting, said carriage 30 carries a pointer (not shown) which cooperates with a line gage 169 secured to the base 34.

Temporary release for automatic shifting means

If desirable, the operator may release the pawl 158 from the notched bar 170 thus allowing the spring 60 to restore the carriage 30 to its normal lefthand position at any time that it is desired to do so.

To accomplish this result the machine is provided with a handle or lever 173 (Figs. 1, 2 and 6) secured to a shaft 174 carried by the front flange of the frame 31 and a plate 176 secured to the rear flange of the frame 31. Also secured to the shaft 174 is an arm 177 having connected thereto a link 178 which in turn is connected to a slidable bar 179. This bar 179 has diagonal slots 180 into which project studs 181 secured to the notched bar 170. The plate 179 is adapted to be moved toward the left by a spring 182.

Depression of the lever 173 by the operator rocks the same and the shaft 174 and also the arm 177 counter-clockwise, thus moving the link 178 and plate 179 toward the right. Due to the diagonal slots 180 the plate 179 is also lowered, and through its contact with a stud 183 carried by the pawl 158, said pawl is rocked clockwise, thus disengaging it from the bar 170 whereupon the spring 60 (Fig. 2) restores the carriage 30 to its normal lefthand position. The movement of the lever 173 is limited by an adjustable eccentric washer 184 (Fig. 4).

The above lowering of the plate 179 is only sufficient to disengage the nose of the pawl 158 from the notched bar 170 and not sufficient to engage the nose of the pawl 157 with such bar.

As soon as the operator releases the pressure on the lever 173 the spring 182 restores the parts 179, 178, 177, 174 and 173 to their normal positions and at the same time the spring 159 rocks the pawl 158 counter clockwise, thus reengaging the same with the notch in the bar 170 now out of said pawl.

Control of automatic spacing mechanism

As previously stated, it is customary when entering the several debits or credits of a single transaction that the account number be printed first. Such an illustration is shown in Fig. 10 wherein the account number 132,674 is shown printed in the righthand column. This account number, as previously stated, is set up on the regular amount keys. A special key having a designation such as "Account No." is placed in one of the banks of special or control keys, such as shown in the above mentioned Shipley Patent No. 1,916,535.

It is during this operation, that is, the operation which prints the account number, that it is highly desirable to render the automatic feeding or shifting mechanism of the carriage ineffective and maintain the carriage in a position so that the first debit or credit, as the case may be, will be entered on the same line that the account number is printed on.

The mechanism for so disabling the automatic line-feeding mechanism is shown in Figs. 1, 2, 7, 8 and 9 and will now be described.

A shaft 200 adapted to be adjusted by a differential device of a special key bank, to be hereinafter described, has secured thereto a disk 201 carrying a pin 202 adapted to cooperate and control a lever 203 pivotally mounted on the end of a shaft 204 supported near its front end by the printer front frame 84 and near its back end by the printer back frame (not shown). This lever 203 is normally held in the position shown in Figs. 1 and 7 by a spring 205. The left end of the lever 203 has a slot 206 into which projects a pin 207 carried by a pawl 208 pivoted on a stud 209, to which the previously described spring 153 is attached. This stud 209 is carried by the bracket 148. The right end of the pawl 208 has a hook 210 adapted to cooperate with a stud 211, to which the other end of the spring 153 is attached. This stud 211 is carried by the plate 151, which it will be recalled carries the pawls 157 and 158.

When the disk 201 and pin 202 are in the positions shown in Figs. 1 and 7 the automatic line-spacing or carriage shifting mechanism functions in the normal way so that for each successive operation the printing will be effected upon the succeeding line.

However, when the disk 201 and pin 202 have been moved into the position shown in Fig. 8 through the medium of the differential mechanism under control of the special bank of keys to be hereinafter described the movement of the disk 201 from the position shown in Fig. 7 into the position shown in Fig. 8 through the cooperation of the pin 202 with the right end of the lever 203 rocks the lever clockwise whereupon the pin 207 rocks the pawl 208 clockwise and the hook 210 engages the stud 211 as shown in Fig. 8.

With the parts in these positions, when the shaft 61 is rotated counter clockwise in the manner previously described, which shaft rocks the arms 81, 82, lever 80 and bell crank 67 so as to move the links 140 and 143 toward the right, the fact that the hook of the pawl 208 is holding the plate 151, the movement of the link 140 toward the right merely stretches the spring 149 as the link 143 at this time cannot be moved since the plate 151 is prevented, by the pawl 208, from any movement.

Therefore, it can be clearly seen that when the special key in the control bank has been depressed to control the positioning of the disk 201 so that the latter will set in the position as shown in Fig. 8, the automatic line-spacing or carriage shifting mechanism is positively disabled.

It might be well to state here that the spring 149 must of necessity be stronger than the spring 153 so that when the pawl 208 is not in engagement or in cooperation with the stud 211 the movement of the link 140 toward the right will, through the spring 149 move the link 143 likewise, overpowering the spring 153 and rocking the plate 151 to effect the automatic line-spacing of the carriage 30.

During the subsequent operation of the machine, that is, during that operation in which either the first debit or credit, as the case may be, is entered, a different key of the hereinafter described control bank is depressed whereupon the disk 201 during the movement of the differential mechanism will assume a different position

than that shown in Fig. 7, the position assumed being in accordance with the position of the key which has been depressed, and the spring 205 will rock the lever 203 counterclockwise from the position shown in Fig. 8 to that shown in Fig. 7 whereby the pin 207 will immediately rock the pawl 208 counterclockwise, thus disengaging its hook 210 from the stud 211 so that during this operation, upon movement of the links 140 and 143 toward the right as viewed in Fig. 1, the plate 151 will be rocked in the usual manner to effect the automatic line-spacing of the carriage 30.

Control of automatic line-space disabling mechanism

In Fig. 9 there is shown a differential mechanism adapted to be controlled by a bank of keys to determine the positioning of the previously described shaft 200 and disk 201.

Key bank

The special key bank for determining or controlling the positioning of the differential mechanism shown in Fig. 9 is of the usual type shown and described in the above mentioned Shipley patents and application and therefore will be but briefly described in this case. There are eight keys 220 of the usual control type and for the purposes of illustrating this case, one special key 221 bearing the caption "Account No.". This latter key, for the purpose of illustration in this case, is shown in the first position. These keys 220 and 221 are carried by the usual key frame 222 supported on rods 223 which rods are in turn supported by the side frames 224 of the machine (only one side frame being shown). Keys 220 and 221 are each provided with a pin 225 adapted to cooperate with a retaining detent 226 only partially shown in this case. The usual zero stop pawl 227 is shown in a position to stop the differential mechanism, to be hereinafter described, in the zero position. However, when any one of the keys 220 or 221 is depressed the zero stop pawl through the detent 226 is moved into an ineffective position in the usual manner.

Differential mechanism

The differential unit associated with bank of special keys is supported by the usual hanger 230 mounted on rods 231 and guided at its top end by the key frame 222. Pivoted on a hollow stud 232 supported by the hanger 230 is a differentially adjustable arm 233 carrying an arm 234 and a bell crank 235, which in turn supports the usual type of latch 236 having a foot 237 held in contact by a spring 239 with a shoulder on a driving segment 238. This driving segment 238 is pivoted on the stud 232 and is connected by a link 240 with a Y-shaped lever 241 pivoted at 242 to the hanger 230. This lever 241 carries a pair of rollers 243 cooperating with a pair of cams 244 secured to a main drive shaft 245.

Pivoted at 246 to the differentially adjustable arm 233 is the usual beam 247 having its other end slotted to embrace a stud 248 carried by a link 249 the lower end of which is pivoted to an arm 250 secured to a spiral segment 251 meshing with a spiral pinion 252 secured to the previously described shaft 200.

The upper end of the link 249 is connected to the usual alining segment 253 having cooperating therewith the usual aliner 254.

If none of the keys 220 or 221 is depressed, the zero stop pawl 227 will in the usual manner cause the differentially adjusted arm 233 to be stopped and disconnected from the driving segment 238 in the zero position upon movement of the segment 238 by the lever 241 and cams 244.

Let us assume that the account number key 221 is depressed and the machine started through its operation. In this instance the latch 236 by the cooperation of the front end thereof in the usual manner with the inner end of the depressed key 221 will be disengaged from the driving segment 238 as it is being rocked clockwise by the lever 241 and cams 244. As the arm 233 is stopped in the first position the left end of the beam 247 will be likewise stopped in that position and as the lever 241 nears the completion of its clockwise movement a roller 255 carried thereby will contact the underside of the beam and position it in the usual manner, whereby its right end through the stud 248 will lower the link 249 and rock the arm 250 and spiral segment 251 clockwise, which in turn through the spiral pinion 252 will rock the shaft 200 and disk 201 to move said disk from the position shown in Fig. 7 to that shown in Fig. 8. Near the end of the operation of the machine, as the driving segment 238 is being restored to its normal position it will contact a stud 256 carried by the differentially adjustable arm 233 and restore that arm to its normal position shown in Fig. 9. However, the right end of the beam 247 and consequently the link 249 and disk 201 will remain in the positions to which they were set at the end of this operation and until this differential mechanism assumes another position under control of either the zero stop pawl 227 or one of the keys 220.

From the above description it can be clearly seen that the automatic line-spacing or carriage shifting mechanism is directly under control of the keys of the special bank shown in Fig. 9. In other words when, in the case as illustrated, the key 221 is depressed the automatic line-spacing mechanism is disabled but when any of the other keys 220 are depressed, the automatic line-spacing mechanism functions in the usual manner. It might be well to state here that the position of the key 221 may vary in accordance with the position of the pin 202. In other words, if it is desirable to have the upper key 220 control the disabling of the automatic line-spacing mechanism then the pin 202 would be located accordingly on the disk 201.

Since the operations of the various mechanisms have been fully and clearly described under their separate several headings it is thought that it is unnecessary to give any detailed description of a complete operation at this time.

While the forms of mechanisms herein shown and described are admirably adapted to fulfill the objects primarily stated, it is to be understood that it is not intended to confine the invention to the forms of embodiment herein disclosed, for it is susceptible of embodiment in various forms all coming within the scope of the claims which follow.

What is claimed as new, is:

1. In a machine adapted to print upon insertable record material, the combination of a manually movable table carrying record material; a series of manipulative devices for predetermining on what line on said record material the printing is to take place; automatically controlled means for moving the table step by step from any predetermined position at each operation to successively present different lines on the record material to receive the printing; differentially adjustable means for determining the effectivity of

said automatically controlled means; and a bank of manipulative devices for controlling said differentially adjustable means.

2. In a machine adapted to print upon insertable record material, the combination of a manually movable table carrying record material; a series of manipulative devices for predetermining on what line on said record material the printing is to take place; automatically controlled means for moving the table step by step from any predetermined position at each operation to successively present different lines on the record material to receive the printing; a differentially adjustable member; and means intermediate said member and said automatically controlled means for preventing operation of the automatically controlled means when the member is moved to a certain position.

3. In a machine adapted to print upon insertable record material, the combination of a manually movable table carrying record material; movable means for determining on what line on said record material the printing is to take place; a notched member carried by said movable table; automatically controlled means cooperating with said member for controlling the table for step by step movement to any predetermined position at each operation of the machine to successively present different lines on the record material to receive the printing; a pawl cooperating with said automatically controlled means; a lever cooperating with said pawl; and a differentially adjustable member adapted to control the movement of said lever and said pawl to disable said automatically controlled means.

4. In a machine adapted to print upon insertable record material, the combination of a manually movable table carrying record material; a series of manipulative devices for predetermining on what line on said record material the printing is to take place; automatically controlled means for moving the table step by step from any predetermined position at each operation to successively present different lines on the record material to receive the printing; a pivoted member adapted to disable said automatically controlled means; means for operating said pivoted member; a differentially adjustable member; a projection carried thereby and adapted to operate said last mentioned means; and a depressible key to control the differential positioning of said differentially adjustable member and its projection to cause them to be moved into a controlling position relative to said last mentioned means.

5. In a machine adapted to print upon insertable record material, the combination of a manually movable table carrying record material; a plurality of depressible means for predetermining at what point on said record material the printing is to take place; a notched member carried by said movable table; a rockable device carrying a plurality of members for controlling the table for a step by step movement from any position in which it has been previously set; automatically operated means to rock said device on each operation of the machine; and differentially adjustable means adapted when set in a certain position to disable said automatically operated means.

6. In a machine of the class described, the combination of a shiftable table adapted to carry record material; printing means; a plurality of depressible keys for selecting any section of the record material to receive a printed impression; means to return the table to its normal position after the impression has been made on the record material; means, including a member carrying a plurality of pawls, to prevent the return of the carriage to its normal position, and to control the returning means to shift the table one step to present a new section of the record material to the printing line; an automatically operated device to actuate said pawl carrying member; a bank of depressible keys; a differentially adjustable mechanism controlled thereby; and means intermediate said differentially adjustable mechanism and said pawl carrying member to prevent movement of the same to render said automatically operated device ineffective upon operation of a certain one of said keys.

7. In a machine adapted to print upon insertable record material, the combination of a shiftable table adapted to carry record material; printing means; a plurality of depressible keys for selecting any section of the record material to receive a printed impression; automatically operable means for controlling the table for step by step movement from any selected position at each operation of the machine to successively present different sections of the record material to receive the printed impressions; a bank of depressible manipulative means; a member adapted to be differentially adjusted under the control of said depressible manipulative means; and means for locking said automatically operable means when said first mentioned member is set in a certain position under control of one of the manipulative means.

8. In a machine of the class described, the combination of a shiftable table adapted to carry record material; printing means; a plurality of depressible keys for selecting any section of the record material to receive a printed impression; means to return the table to its normal position after the impression has been made on the record material; a member carrying a plurality of pawls, to prevent return of the carriage to its normal position, and to control the returning means to shift the table one step to present a new section of the record material to the printing line; automatically operated means to actuate said member; differentially adjustable means; and a pivoted member operated thereby to lock said member and thus render said automatically operated device ineffective.

9. In a machine adapted to print upon insertable record material, the combination of a manually movable table carrying record material; a series of manipulative devices for predetermining on what line on said record material the printing is to take place; automatically controlled means for moving the table step by step from any predetermined position at each operation to successively present different lines on the record material to receive the printing; a plurality of pivoted members; a rotatable member; a differential mechanism; and a depressible key to control the differential mechanism to set the rotatable member in such a position that the pivoted members will lock the automatically controlled means.

10. In a machine adapted to print upon insertable record material; the combination of a manually movable table carrying record material; a series of manipulative means for predetermining on what line on said record material the printing is to take place; a notched member carried by said movable table; an automatically controlled device carrying a plurality of pawls cooperating with said member for con-

trolling the table for step by step movement from any predetermined position at each operation of the machine to successively present different lines on the record material to receive the printing; a projection on said device; a pivoted member adapted to be moved into cooperative relation with said projection to lock said device to prevent step by step movement of the table; pivoted means for operating said pivoted member; rotatable means for operating said pivoted means; and differential means under control of a bank of depressible keys for controlling said rotatable means.

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