

Oct. 28, 1941.

I. L. ELDER

2,260,970

IMPRESSION MECHANISM

Filed June 4, 1938

3 Sheets-Sheet 1

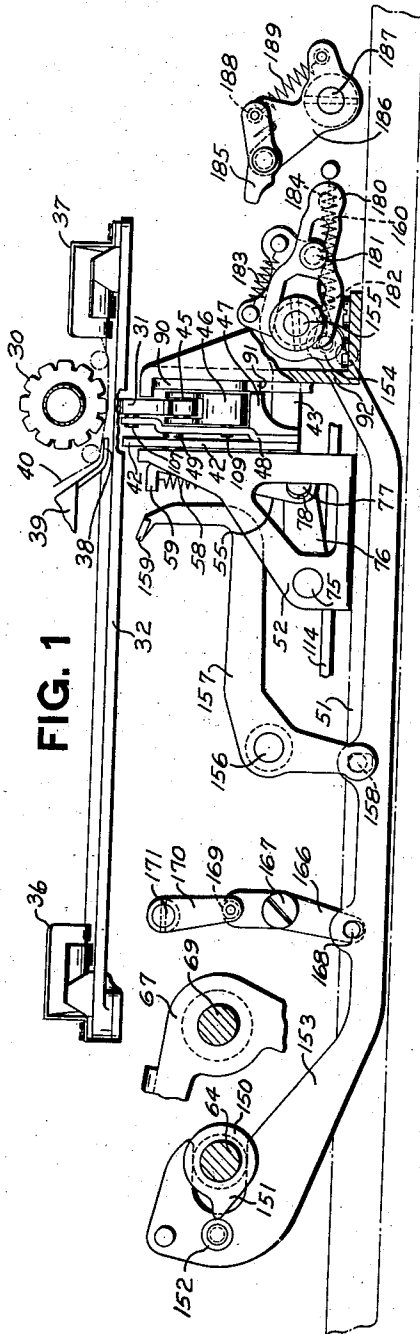


FIG. 3

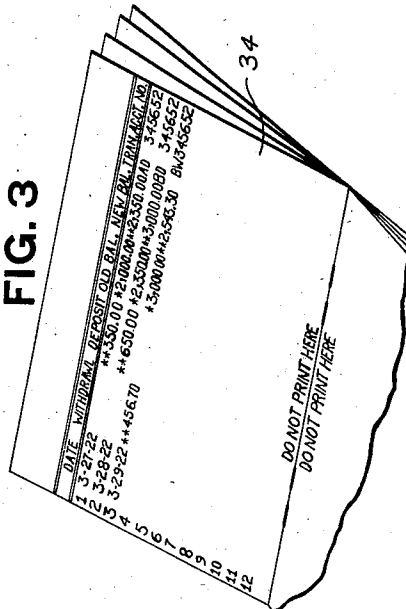


FIG. 2

NAME *John Doe* ACCOUNT NUMBER *345652*
ADDRESS *1122 Main St.*

DATE	WITHDRAWAL	DEPOSIT	OLD BALANCE	NEW BALANCE	TRANSACTION
1 3-27-22					
2 3-28-22					
3 3-29-22					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Inventor
Irvin L. Elder
By *Harold Benoit*
His Attorney

Oct. 28, 1941.

I. L. ELDER
IMPRESSION MECHANISM

Filed June 4, 1938

2,260,970

3 Sheets-Sheet 3

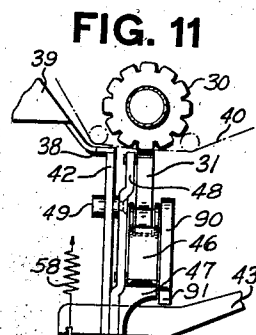
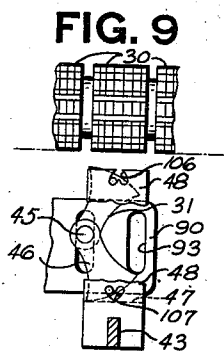
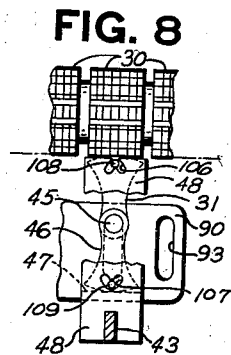
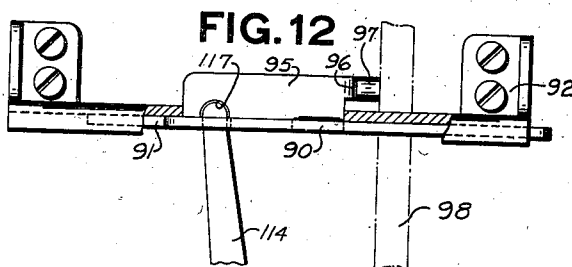
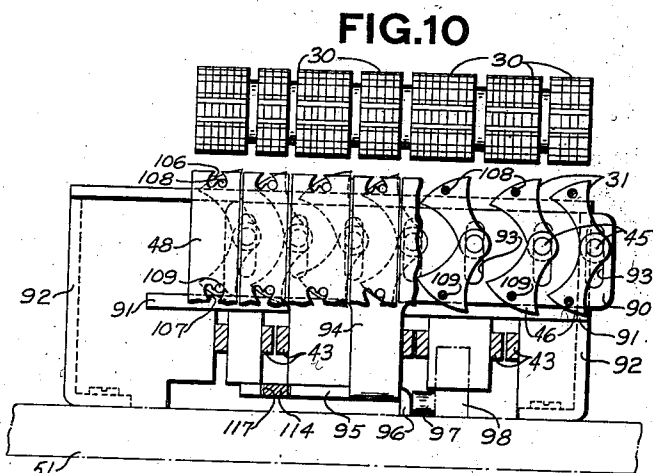
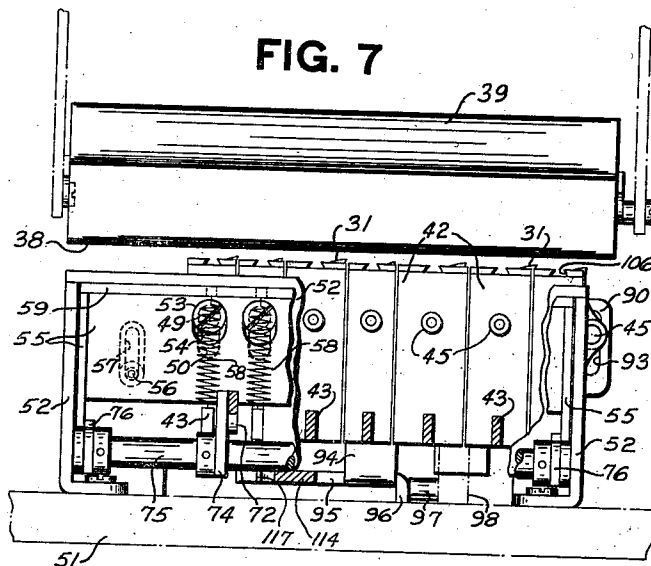
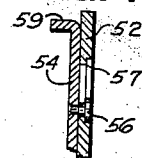


FIG. 13



Inventor
Irvin L. Elder
By
Karl Benet
His Attorney

UNITED STATES PATENT OFFICE

2,260,970

IMPRESSION MECHANISM

Irvin L. Elder, Chicago, Ill., assignor to The National Cash Register Company, Dayton, Ohio, a corporation of Maryland

Application June 4, 1938, Serial No. 211,838

15 Claims. (Cl. 101—212)

This invention relates to cash registers and accounting machines, and more particularly to the printing mechanisms thereof.

The invention is herein shown embodied in a machine of the type illustrated and described in the patents to B. M. Shipley Nos. 1,747,397 and 1,761,542, dated February 18, 1930, and June 3, 1930, respectively, and the application of M. M. Goldberg, Serial No. 559,720, filed August 27, 1931, which issued October 10, 1939, as Patent No. 2,175,346, and to which reference is hereby made for a disclosure of those features of the machine which are not specifically described herein.

In previous machines of this type the printing was accomplished through the sharp impact of printing hammers against type carrying elements. In the present invention the percussion type of printing has been eliminated and in lieu thereof a novel type of impression mechanism is used. Said novel impression mechanism is practically noiseless and includes means which is first automatically adjusted during each operation with relation to the type elements, such adjustment being governed by the thickness of the record material to be printed on. The impression means is then given a rolling movement, instead of the sharp impact movement above referred to, across the type elements to make the proper imprint on the record material. With such arrangement, less wear is produced on the ink ribbon and the parts comprising the printing mechanism.

It is, therefore, an object of the invention to provide automatic means for vertically adjusting the impression means with relation to the type elements before printing, such adjustment being controlled by the thickness of the record material to be printed on.

Another object of the invention is the provision of means for selectively controlling the vertical adjustment of the impression means so that impressions are taken from only certain of said type elements.

Another object of the invention is the provision of means for imparting a rolling motion to the impression means to take impressions from the type elements.

Another object is to provide a novel printing mechanism which will function with a minimum amount of noise.

An additional object is to provide means for taking uniform impressions from the type elements on record materials of different thicknesses.

A further object is the provision of printing mechanism which during its operation will produce less wear on the ink ribbon and the parts comprising said printing mechanism.

A still further object is to provide printing mechanism which during its operation will minimize the shocks and jars to its coordinate parts.

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

Of said drawings:

Fig. 1 is a side elevation of the automatic means for adjusting the impression means with relation to the type elements, as governed by the thickness of the record material to be printed on.

Figs. 2 and 3 are facsimiles of an account card and a pass book, respectively, representing record materials of different thickness, which may be used in the present machine.

Fig. 4 is a detail of a part of the impression operating means and shows a portion of the disabling means therefor.

Fig. 5 is a longitudinal sectional view showing the means for adjusting the impression means with relation to the type elements, and a portion of the means for selectively controlling which of said impression means will be adjusted thereby.

Fig. 6 is a top plan view of the means for selectively controlling the vertical adjustment of the various impression means, together with the means for imparting a rolling motion to the impression means.

Fig. 7 is a front sectional view of the impression means.

Fig. 8 shows a detail front view of the impression means in the act of taking an impression from the type elements.

Fig. 9 is a front view of one of the impression means shown in cocked position, preparatory to taking an impression from the type elements.

Fig. 10 is a front sectional view of the type elements and the impression means, together with a portion of the means for actuating said impression means.

Fig. 11 is a detail side view of the type elements, the impression means, and the means for adjusting the latter with relation to said elements.

Fig. 12 is a top plan view of a portion of the means for actuating the impression means to take impressions from the type elements.

Fig. 13 is a detail sectional view showing the mounting for the impression means lifting plate.

General description

The present machine includes a suitable frame, within which the various instrumentalities thereof are arranged. Inasmuch as the invention relates strictly to the printing mechanism, only such mechanism is shown and described herein.

Briefly, the particular embodiment of the invention illustrated makes use of an adjusting member which, after record material is inserted into the machine, is pressed against the under side of said material to perform the function of a gauge for determining the proper adjustment of impression means with relation to type elements to produce a uniform impression therefrom. If the machine is operated with no record material therein, such adjusting member will cause the impression means to be maintained in a position out of cooperative relation with the type elements, to prevent any unnecessary impression from being made therefrom.

Means is also provided for selectively controlling the adjustment of the impression means to take impressions from only certain of such type elements.

After the impression means has been properly adjusted, as above described, means is provided for imparting rolling motion to said impression means to take a uniform impression from the type elements on the inserted record material, irrespective of the thickness of said material, without jar or shock to the coordinate parts of the printing mechanism. With such an arrangement the noise generally produced by such mechanism is greatly reduced.

Detailed description

For the purpose of columnar printing, the present machine is provided with a plurality of groups of type elements or type wheels 30 (Fig. 10), each group being used to print data in a different column on an inserted record material. The mechanism for adjusting the type wheels to print different data is fully disclosed in the Shipley patents hereinbefore referred to.

Disposed directly beneath each of the groups of type wheels 30 is an impression member 31, which is adapted to coact with its respective group of type wheels to effect a printing operation. Any desired number of groups of type wheels 30 can be provided, and these type wheels are adapted to be set by suitable mechanism so they will impart various kinds of information.

Suitably mounted in the machine and disposed between the type wheels 30 and impression members 31 is a printing table 32 (Figs. 1 and 5) for supporting manually insertable record material such as a card 33 (Fig. 2) and a book 34 (Fig. 3) on which printing is to be performed. The table 32 is provided with an opening 35 (Fig. 5) through which the impression members 31 operate to take impressions from the type wheels 30. A pair of guide members 36 and 37, secured to the table 32, is provided for properly guiding and locating the card 33 and book 34 with relation to the type wheels 30. A laterally extending foot 38, formed integral with a stationary bracket 39 cooperates with adjusting means, to be later described, to properly adjust the impression members 31 with relation to the type wheels 30.

Disposed between the type wheels 30 and the

impression members 31 is an inking ribbon 40 for rendering legible, on the inserted record material, the impressions taken from the type wheels 30. The inking ribbon and the mechanism for actuating the same are old and well known in the art, as shown in the Shipley patents hereinbefore referred to, and therefore are not fully shown or described herein.

Means for adjusting impression means with relation to type elements

In machines of the type herein illustrated, record materials of varying thicknesses, as shown, for example, by the account card 33 (Fig. 2) and the pass book 34 (Fig. 3), are manually inserted into the printing mechanism thereof for the purpose of printing identical data on both kinds of record material during a single operation of the machine. For accomplishing the objects of this invention, means is provided for adjusting the impression members 31 relative to the type wheels 30 during each operation of the machine in accordance with the thickness of the inserted record material.

Such means will now be described.

Associated with each of the impression members 31 is an individual adjusting plate 42 (Figs. 1, 5 and 7) for controlling the vertical adjustment of said members with relation to their respective groups of type wheels 30, such adjustment being governed by the thickness of the record material which has been inserted into the printing position between the impression members and the type wheels. Each of the plates 42 is secured at its lower end to one of a series of bars 43, the upper ends of said plates being located directly beneath the foot 38 on the bracket 39.

Each impression member 31 is pivotally mounted at its lower end on a stud 45 carried by the bifurcated upper portion of a companion member 46. The member 46 is adapted, by means to be hereinafter described, to be rocked to and fro on a block 47 secured to the bar 43.

Associated with each impression member 31 is an individual guide plate 48 (Figs. 9 and 10), for guiding said impression member during the rolling movement which the latter receives when taking an impression from its associated group of type wheels 30, as will be more fully described hereinafter.

Such guide plate 48 is securely mounted at its lower end in its associated bar 43. The guide plate 48 and adjusting plate 42 associated with each impression member 31 are rigidly connected together near their upper ends by a stud 49. The stud 49 extends through a slot 50 (Fig. 7), formed in a cross frame 52 secured to the usual base 51. A large headed screw 53 tapped into the stud 49 acts as a lateral guide for the plates 42 and 48. The head of the screw 53 rides in a slot 54 of a lifter plate 55 and normally bears against the upper wall of said slot 54 to maintain the impression members 31 out of cooperative relation with the type wheels 30. The lifter plate 55 is guided in its vertical movement by studs 56 (Figs. 7 and 13), only one of which is shown, which ride in shouldered slots 57 in the frame 52.

Each bar 43 is connected by a spring 58 to a flange 59 formed on the upper end of the plate 55. From the foregoing it will be seen that each of the bars 43 supports as a single unit an impression member 31, its associate adjusting plate 42 and block 47.

During each operation of the machine, the

lifter plate 55 is given a vertical movement by means to be presently described. When this occurs, the upper walls of the slots 54 are moved away from the screws 53, thereby permitting the springs 58 to move the bars 43, together with the impression members 31, adjusting plates 42 and the blocks 47 carried thereby, upwardly until arrested by the adjusting plate 42 contacting and pressing against the underside of the inserted record material which is held firm by the foot 38 of the bracket 39. The adjusting plates 42 thus properly position the impression members 31 with relation to the type wheels 30 according to the thickness of the inserted record material, preparatory to taking an impression from said type wheels, thereby always insuring a uniform impression, irrespective of the thickness of the record material on which the printing is to be performed.

The means for imparting vertical movement to the lifter plate 55, above described, includes a wide cam 63 (Fig. 5), secured on a printer drive shaft 64, suitably journaled in the frames of the machine. The shaft 64 receives one complete counter-clockwise rotation during each operation of the machine and may be driven by any suitable means, such, for example, as that disclosed in the aforesaid Shipley patents. The cam 63 has formed on the periphery thereof two lobes 65 and 66, which coast with one arm of a bell crank 67, and with one arm of a bell crank 68 to be later described in detail. Both bell cranks are freely mounted on a rod 69. The bell crank 67 effects a vertical movement of the lifter plate 55 twice during each operation of the machine. The other arm of the bell crank 67 carries a stud 70, which extends through an irregularly shaped aperture 71 formed in the left-hand end of a link 72. The stud 70 normally occupies the narrow upper portion of said aperture 71. A spring 73, secured to the stud 70 and to the frame of the machine, normally maintains the upper arm of the bell crank 67 in cooperative relation with the periphery of the cam 63. The right-hand end of the link 72 is pivoted to an arm 74 secured to a shaft 75 journaled at its end in the frame 52. Also secured to the shaft 75 is a pair of arms 76 carrying studs 77 which extend through apertures 78 in flanges formed at both ends of the lifter plate 55.

As previously stated, it is common practice to insert into the printing mechanism two different kinds of record material, such for example, as the account card 33 (Fig. 2) and the pass book 34 (Fig. 3), for the purpose of separately printing identical data on each of said record materials during a single operation of the machine. Means is provided for ejecting each of the record materials from the machine immediately after printing has been performed thereon. Such means is illustrated and described in the before mentioned Shipley Patent 1,761,542, and since it forms no pertinent part of the present invention, it is not shown or described herein. For the purpose of adjusting the impression members 31, with relation to the type wheels 30 before printing on each of the inserted record materials, the lobes 65 and 66 are provided on the cam 63.

After insertion of the account card 33 and pass book 34 between the type wheels 30 and impression members 31, and upon operation of the machine, the cam 63 is rotated counter-clockwise, causing the lobe 65 to rock the bell

crank 68, which by its contact with the under side of a flange 79 on the bell crank 67 rocks said bell crank 67 in a clockwise direction. The bell crank 67, through the stud 70, coacting with the upper small portion of the aperture 71, in the link 72, rocks the arm 74, shaft 75, and arms 76 counter-clockwise, to move the lifter plate 55 upwardly. Such upward movement of the plate 55, through the springs 58, imparts a vertical movement to the adjusting plates 42 to adjust the impression members 31 with relation to the type wheels 30, according to the thickness of the record material which has been inserted into the printing mechanism, preparatory to printing on one of said inserted record materials, namely the card 33 as hereinbefore described.

The bell crank 67 has a toe 81 which rides on the cam 63 and lobe 65 and when the lobe 65 clears the toe 81 the spring 73 rocks said bell crank 67 counter-clockwise to bring the upper arm thereof into contact with the periphery of the cam 63, and thereby return the lifter plate 55 and the adjusting plates 42 downwardly to their normal positions. The lobe 65 passes the end of the bell crank 68 before said lobe releases the bell crank 67 for a purpose to be later described.

The second lobe 66 of the cam 63 operates the bell cranks 67 and 68 in the same manner as the lobe 65 operated them to cause adjusting plates 42 to be elevated to adjust the impression members 31 with relation to the type wheels 30, preparatory to printing on the other one of said inserted record materials, namely the account book 34.

If it should be desired to use the present invention without the means, comprising the plates 42, bracket 39 and foot 38, for controlling the adjustment of the impression members 31 relatively to the type wheels 30 according to the thickness of the inserted record material, such means may be omitted without affecting the remaining functions of the invention.

Impression member actuating means

The means for actuating the impression members 31 to take impressions from the type wheels 30 includes a shiftable actuating plate 90 (Figs. 1, and 7 to 12), slidably mounted on rails 91, formed integral with a frame 92 secured to the base 51. The plate 90 is provided with a series of vertical slots 93 through which extend the studs 45, which form the toggle connection between the impression members 31 and their associated companion members 46. The plate 90 is formed with a downwardly projecting extension 94 (Fig. 10), which terminates in a lateral extending flange 95. A foot 96 on the flange 95 is normally held against a stop stud 97 (Figs. 7, 10 and 12) in a frame 98 secured to the base 51, by means to be later described, thus maintaining the impression actuating plate 90 in its normal position. Each of the guide plates 48 has formed thereon a pair of oppositely faced V-shaped slots 106 and 107, through which extend pins 108 and 109 carried by each impression member 31 and its associated companion member 46, respectively.

The plate 90 is first shifted to the left, by means to be presently described, whereby the slots 93 coacting with the studs 45 move the impression members 31 to cocked position, as shown in Fig. 9, during which time the plate 42 controls the positioning of the impression members 31 with

relation to the type wheels 30, in accordance with the thickness of the record material which has been inserted into the machine. The plate 90 is then shifted to the right, to its normal position, during which movement the slots 93 coact with the studs 45 to impart a rolling movement to the impression members 31, to take an impression from the type wheels 30 upon the inserted record material.

As previously mentioned, the cam 63 herein before described, also coacts with a second bell crank 68 (Figs. 4, 5 and 6) freely mounted on the rod 69, to cause the plate 90 to be shifted in the manner above described. The lobes 65 and 66 on the cam 63 coact with the upper arm of the bell crank 68 to rock it clockwise. The lower arm of the bell crank 68 carries a stud 110 (Fig. 4) which extends through the upper narrow part of an aperture 111, in a link 112 pivoted on a stud 113 on one arm of a lever 114 pivoted on a stud 115 mounted in the base 51. A tension spring 116 constantly tends to rock the lever 114 in a clockwise direction. The right-hand arm of the lever 114 extends into a notch 117 (Figs. 7, 10 and 12) in the flange 95 of the actuating plate 90.

When the bell crank 68 is rocked clockwise the stud 110 moves the link 112 to the left, thereby rocking the lever 114 counter-clockwise against the tension of the spring 116 to shift the plate 90 to the left (Fig. 10), and in so doing cocks the impression members 31, preparatory to taking an impression from the type wheels 30. When the lobe 65 clears the bell crank 68 the spring 116 rocks said bell crank 68 counter-clockwise whereupon the lever 114 moves the plate 90 to its normal position. During such return movement of the plate 90 to its normal position, a rolling movement is thereby imparted to the impression members 31 to take an impression from the type wheels 30. Similarly, when the lobe 66 coacts with the bell crank 68, the impression members 31 will be caused to take a second impression from the type wheels 30, in the manner just above described.

While the operations of the bell cranks 67 and 68 and their associated parts have been separately described to show how impressions are made from the type wheels 30 upon the card 33 and book 34 of Figs. 2 and 3 it is thought that it might be well to set forth an operation of both of these mechanisms to give a clearer understanding of their timing.

While the bell crank 68 (Figs. 4 and 5) is being rocked clockwise by the lobe 65 of the cam 63 to operate the impression actuating plate 90 to cock the impression members 31, in other words to move them from the position shown in Fig. 10 to that shown in Fig. 9, this bell crank 68 by its contact with the underside of a flange 79 of the previously described bell crank 67 rocks said bell crank 67 clockwise so that the lifter plate 55 can be raising the impression members 31 into the proper position for them to be actuated to take an impression from the type wheels during the time the actuating plate 90 is cocking impression members 31.

Now it is necessary to maintain the lifter plate 55 in its raised position during the time the impression members 31 are rolled over the type 30 to take an impression therefrom. Therefore the bell crank 67 is provided with a flange 81 which rides on the cam 63 and its lobe 65 a longer period of time than does the end of the bell crank 68. The result of this construction is 75

that the bell crank 68 is released by the cam lobe 65 before the bell crank 67 is released therefrom to allow the spring 116 to move the actuating plate 90 to the right to its normal position shown in Fig. 10 thus causing the impression members 31 to roll over the type wheels 30 to take an impression therefrom while the lifter plate 55 maintains the impression members in their upper or impression taking positions.

Immediately after this impression the lobe 65 passes the flange 81 of the bell crank 67 whereupon the spring 116 rocks the shaft 75 clockwise to lower the lifter plate 55 and consequently the impression members 31 to their normal positions. After this the card 33 (Fig. 2) which has been printed upon under action of the lobe 65 is ejected from the machine and the lobe 66 then functions to rock the bell crank 68 and through it the bell crank 67 to take a second impression, this time upon the account book 34 (Fig. 3) in the same manner as above described for the impression which was made upon the card 33.

Means for selectively controlling operation of adjusting means

Means is provided for selectively controlling the actuation of the different adjusting plates 42, so that impressions are taken from only certain of said groups of type wheels 30. Associated with the right-hand end of each of the bars 43 is one of a series of bell cranks 125 (Figs. 5 and 6) freely mounted on a rod 126 suitably mounted in the machine. Formed in the right-hand arm of each of the bell crank 125 is a slot 127, through which extends a stud 128, carried by one end of a lever 129 pivotally mounted on a shaft 130 suitably mounted in the machine. The right-hand arm of the lever 129 carries two studs 131 and 132 which are adapted to coact with discs 133 and 134 fast on shafts 135 and 136, respectively. A spring 137 constantly maintains the studs 131 and 132 in cooperative relation with the periphery of the discs 133 and 134, respectively. The studs 131 and 132 are adapted to coact with recesses 138 and 139 in the discs 133 and 134. When this occurs, the levers 129 are rocked clockwise by the spring 137, thus causing the bell cranks 125 to be rocked counter-clockwise to remove the lower arms thereof from the path of movement of the bars 43. This permits the bars 43, together with the adjusting plates 42 and impression members 31 carried thereon, to be moved upwardly by the lifter plate 55 to properly position the impression members 31 relative to the type wheels 30 for taking an impression therefrom.

The lower arm of each of the bell cranks 125 normally overlies the right-hand end of its associated bar 43 and thereby holds said bar, together with the adjusting plate 42 and impression member 31 carried thereon, against vertical movement by the lifter plate 55, thus maintaining those impression members 31, not selected for operation by the recesses 138 and 139, out of cooperative relation with a particular group of type wheels 30. Consequently, when all of the impression members 31 are given a rolling movement by means of the shifting plate 90, only those impression members 31, which were moved into cooperative relation with their respective groups of type wheels 30, under control of the discs 133 and 134, will function to take impressions therefrom.

Secured to the shaft 130 (Figs. 5 and 6) are three arms 140 carrying a ball 141 normally rest-

ing on the levers 129. After the discs 133 and 134 are adjusted to control the selection of the bars 43 and their associated impression mechanisms, the shaft 130 is rocked clockwise to raise the bail 141 to free the levers 129 to the action of their springs 137 so that when notches 138 and 139 are opposite the studs 131 and 132 said lever 129 may be rocked as above described to select their associated bars 43 and impression mechanism for operation.

After the impressions are made on the card 33 and book 34, the shaft 130 is returned counter-clockwise to normal, whereupon the bail 141 restores the levers 129 and bell cranks 125 to their normal positions.

The discs 133 and 134 are differentially settable by means under control of a bank of transaction keys, as disclosed in the previously mentioned Goldberg patent.

Means for preventing actuation of adjusting means and impression means when machine is operated with no record material therein

Means is provided for preventing actuation of the adjusting plates 42 and the impression members 31 when the machine is operated with no record material therein. This means consists of mechanism which is old and well known in the art, as disclosed in the before mentioned Shipley patents, and therefore will be only briefly described herein so as to give an understanding of its novel relation with the printing mechanism. Fast on the shaft 64 (Fig. 1) is a cam 150, which has a node 151 normally engaging a roller 152, carried by a pitman 153. At its opposite end the pitman 153 is pivoted to an arm 154 (Figs. 1 and 5) fast on a shaft 155, supported by the printer frames. Loosely mounted on a stud 156 (Fig. 1) is a bell crank 157, the lower arm of which carries a stud 158, which extends through an aperture formed in the pitman 153. Formed on the upper arm of the bell crank 157 is a feeler finger 159 which is movable upwardly through an aperture formed in the table 32 to ascertain the presence of record material between the type wheels 30 and the impression members 31. A spring 160, constantly tends to move the pitman 153 toward the right, thus tending to move the bell crank 157 counter-clockwise.

The pitman 154 is normally held in its left-hand position by means of the node 151 coacting with the roller 152. However, upon operation of the machine, the node 151 is moved away from the roller 152, thereby permitting the pitman 153 to move toward the right under the influence of the spring 160. Such movement of the pitman 153 causes the bell crank 157 to be rocked counter-clockwise to move the feeler finger 159 upwardly. If there is no record material in the machine, the feeler finger 159 will continue its upward movement until the pitman 153 has been moved toward the right to its full extent. When the pitman 153 is moved its full extent it will, through means to be presently described, cause the studs 70 and 110 (Figs. 4 and 5) to be moved out of the upper narrow portions of the apertures 71 and 111, respectively, and into the lower, wider portions thereof. Thus, when the bell cranks 67 and 68 are actuated by the cam 63, they will have no effect on the links 72 and 112, thereby rendering ineffective the lifter plate 55 and the actuating plate 90. Consequently, the adjusting plate 42 and the impression members 31 will remain in their normal ineffective positions during such

operation of the machine and there will be no impressions made from the type wheels 30.

The means by which the pitman 153 changes the positions of the studs 70 and 110 in the apertures 71 and 111, respectively, as above described, includes a lever 166 (Figs. 1 and 6) pivoted on a stud 167 suitably mounted in the machine. The lever 166 carries a pin 168, which extends through an aperture in the pitman 153, and is bifurcated to engage a pin 169 carried by an arm 170 secured to a shaft 171 mounted in the printer frames. Also secured on the shaft 171 (Figs. 5 and 6) is an arm 172 (Fig. 4) carrying a pin 173 which projects from both sides of said arm 172 and passes through angular shaped slots 174 and 175 in arms 176 and 177 formed integral with the links 72 and 112, respectively.

It will thus be seen from the foregoing that, when the pitman 153 is moved toward the right its full extent, the lever 166 is rocked counter-clockwise and, through the arm 170, rotates the shaft 171 and arm 172, clockwise causing the stud 173 to cam the links 72 and 112 upwardly. There is sufficient clearance under the head of the stud 113 (Fig. 4) for such movement of the link 112. Such upward movement of the links 72 and 112 moves the studs 70 and 110 out of the upper narrow portions of the apertures 71 and 111, respectively, and into the lower wider portions thereof. Thus when the bell cranks 67 and 68 are actuated by the cam 63, the studs 70 and 110 thereon will move idly in the wider portions of the apertures 71 and 111 without moving the links 72 and 112.

Therefore, there will be no raising of the impression members 31 and no rocking thereof.

Near the end of operation of the machine, the node 151 will again coact with the roller 152 to return the pitman toward the left to its normal position. During such return movement the pitman 153 will, through the lever 166 and arm 170, rotate the shaft 171 and arm 172 in a counter-clockwise direction, and the stud 173 will cam the links 72 and 112 downwardly, thereby causing the studs 70 and 110 on the bell cranks 67 and 68, respectively, to again engage the upper narrow portion of the apertures 71 and 111 formed in said links 72 and 112.

On the other hand, when the machine is operated with record material therein, the upward movement of the feeler finger 159 is arrested when the latter comes into contact with the under side of the inserted record material, thereby preventing the feeler finger 159 from moving sufficiently upward to disable the adjusting means and actuating means for the impression members 31, as previously described.

Due to the fact that the node 151 (Fig. 1) does not return the pitman 153 and feeler lever 157 to their normal positions until near the end of the operation, it is necessary, when record material is present to receive printing, to rock the lever 157 counter-clockwise to remove the finger 159 from its contact with the under side of the record material to permit proper printing, feeding and ejecting of the record material.

Therefore means is provided for returning the feeler finger 159 to its normal position before printing on the inserted record material. Such means includes a slide 180 (Figs. 1, 4 and 6) mounted to shift back and forth on a stud 181 on the arm 154 and on a collar 182 on the shaft 155 and normally held in the position shown in Fig. 1 by means of a spring 183. The slide 180 carries a pin 184 which normally lies in the path

of a pawl 185 pivoted on an arm 186 fast to a shaft 187. This pawl cannot rock clockwise due to a pin 188 carried thereby engaging a shoulder on the arm 186. The pawl 185 is free, however, to rock counter-clockwise against the tension of a spring 189 stretched between the pawl 185 and the arm 186. The shaft 187 is rocked counter-clockwise shortly after the beginning of the machine operation by means shown and described in the aforesaid Shipley Patent No. 1,747,397, and if the shaft 155 is rotated only a short distance due to the engagement of the finger 159 with the inserted record material, the pawl 185 contacts the pin 184 and rocks the parts back to their normal positions, where they are held until near the end of the operation, when the node 151 on the cam 150 contacts the roller 152 and retains the parts in their normal positions.

If no record material has been inserted into the machine, the shaft 155 and arm 154 are rocked counterclockwise to such an extent that the pin 184 is moved out of the path of movement of the pawl 185, which is however rocked as usual. The shaft 155 is returned to normal at the same time the shaft 187 is rocked clockwise to normal, and therefore when the pawl 185 moves upwardly it will strike the pin 184, but the pawl 185 is flexibly mounted and when moved in this direction it can wipe by the pin 184 on its way to normal position.

Operation

A brief summary of the operation of the machine will now be given, for a better understanding of the invention. The operator inserts into the machine an account card 33 and a pass book 34 on both of which it is desired to print identical data during a single operation of the machine. Such data is then set up on keys which control the adjustment of the various groups of type wheels for printing the desired data. For the purpose of printing in a particular one of a plurality of columns on said inserted record material, the proper transaction key is depressed for selectively controlling the operation of the adjusting means and impression member associated with the proper group of type wheels for printing in the desired column.

Upon releasing the machine for operation, the feeler finger 159 moves upwardly to control the operation of the adjusting means 42 and the impression members 31, associated with that group of type wheels 30 from which an impression is to be taken. The adjusting means 42 is then moved upwardly to coact with the inserted record material to properly adjust the impression members 31 according to the thickness of said record material, preparatory to taking an impression from the type wheels. Simultaneously with the vertical adjustment of the adjusting means the impression members 31 are moved to cocked position and upon return of the adjusting means to normal position, the impression members are given a rolling movement to take impressions from the type wheels.

While the form of mechanism herein shown and described is admirably adapted to fulfill the objects primarily stated, it is to be understood that it is not intended to confine the invention to the one form or 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 is:

1. In a machine adapted to print on inserted

record materials of different thicknesses; type carriers for printing on said materials; an impression member for taking impressions from said type carriers; a device moved into engagement with the record materials for automatically adjusting said member relatively to the type carriers according to the thickness of the inserted record materials; means for moving said device; and means for preventing the moving means from moving said device to adjust said impression member when the machine is operated without said record materials.

2. In a machine adapted to print on inserted record materials of different thicknesses, the combination of type carriers for printing on said materials; an adjustable impression member for taking impressions from said type carriers; a control element for controlling the adjustment of said member; a bar carrying both the control element and the impression member; means for imparting vertical movement to said bar to cause said control element to coact with the inserted record material to automatically adjust the impression member relatively to the type carriers according to the thickness of said record material; and means for moving the adjusted impression member, while the impression member remains in adjusted position relative to said type carriers, to engage the impression member with the type carriers to cause uniform impressions to be made on said record material regardless of the thickness of the record material.

3. In a machine capable of printing on inserted record materials of varying thicknesses, type carriers for printing on said materials; an adjustable impression member normally out of co-operative relation with said type carriers but adjustable to positions where it can coact with the type carriers for taking impressions from said type carriers; a control element for controlling the adjustment of said impression member; an adjustment control member; and a floating support for said element and said impression member for causing the element to coact with the inserted record material and therethrough with said adjustment control member to automatically adjust the impression member relatively to the type carriers according to the thickness of said record material.

4. In a machine adapted to print on record materials of varying thicknesses, the combination of type carriers for printing on said materials; an impression member cooperable with said type carriers in successive order to take impressions therefrom; means including an element cooperable with the record material during a printing operation for automatically adjusting said member relative to said type carriers according to the thickness of the record material to cause uniform impressions to be taken by said member from the type carriers; and means for thereafter moving the adjusted impression member into engagement with the type carriers in successive order to take impressions therefrom.

5. In a printing device, the combination of a plurality of type carriers; an impression member; a companion member; means joining together the impression member and the companion member to form a toggle arrangement; means for guiding the free ends of the members; and means for operating said toggle to cause the impression member to coact with the type carriers in successive order to take impressions therefrom.

6. In a printing device, the combination of a plurality of type carriers; an impression member; a companion member; a stud serving to join together said members to form a toggle arrangement; means for moving the impression member into coactive relation with the type carriers; and means coacting with said stud for actuating said toggle when the impression member is in coactive relation with the type carriers to cause the impression member to take impressions from the type carriers.

7. In a printing device, the combination of a plurality of type carriers; an arcuate impression member; an arcuate companion member; a stud serving to join together said members to form a toggle arrangement; a block; resiliently operated means carrying said block and maintaining the impression member in coactive relation with the type carriers; and means for actuating said toggle to cause the companion member to coact with said block and to cause the impression member to coact with the type carriers to take an impression therefrom.

8. In a printing device, the combination of a plurality of type carriers; an arcuate impression member having a projection; an arcuate companion member having a projection; a stud serving to join together said members to form a toggle arrangement; means to shift the stud to actuate said toggle to cause the impression member to coact with the type carriers in successive order to take impressions therefrom; and a plate provided with slots through which project the projections carried by said members for properly guiding the movement of the impression member when taking impressions from the type carriers.

9. In a machine adapted to print on record materials of different thicknesses; a plurality of groups of type carriers for printing on said materials; a plurality of impression members one associated with each group of type carriers for taking impressions from said type carriers; separate adjusting means associated with each of said impression members and each adjusting means including an element movable into engagement with the record material to govern the position of said impression members relatively to the different groups of type carriers according to the thickness of the record material to cause uniform impressions to be taken from said type carriers; and settable means for selectively controlling the operation of the different adjusting means to cause impressions to be taken from only certain of said groups of type carriers.

10. In a machine of the class described, the combination of a plurality of groups of type carriers; a plurality of impression members one for each of said groups of type carriers; a support for each of said impression members; means common to all of said members to normally retain them out of cooperation with said type carriers; means to release said retaining means; means adapted to move each member in one direction into cooperative relation with its respective group of type carriers; and means common to all of said members to move the same in another direction to effect printing from all groups of type carriers.

11. In a machine of the class described, the combination of groups of type carriers; an impression member for each group; means adapted to move each member in one direction into cooperative relation with its respective group of

type carriers; means common to all members to move the latter in another direction to effect printing from their associated groups of type carriers; and means for determining which of said members shall be moved in said one direction.

12. In a machine adapted to print on record materials of different thicknesses, type carriers for printing on said materials; an impression member for taking impressions from said type carriers; means for automatically adjusting said member to various positions relative to said type carriers according to the thickness of the record material and including a fixed control block and an element movable into engagement with the record material to move the material into engagement with the block to control the adjustment of the member relative to the type carriers so that uniform impressions may be taken from said type carriers upon subsequent operation of the member; and means to operate the adjusting means during a printing operation.

13. In a machine capable of printing on record materials of varying thicknesses, type carriers for printing on said materials; impression means adjustable relatively to said type carriers; a gauging member; control means normally out of engagement with the record material but coacting with the record material and therethrough with the gauging member during printing operations for controlling the adjustment of the impression means relatively to the type carriers in accordance with the thickness of the record material; and means operable in printing operations to move the control means into coacting relation with the record material.

14. In a machine adapted to print on record materials of different thicknesses, type carriers for printing on said materials; an adjustable impression member settable to a plurality of positions relative to said type carriers for taking impressions from said type carriers; a control element for controlling the positioning of said member during a printing operation; means common to both said element and said member and operable during said printing operation to cause the element to coact with the inserted record material to automatically position the impression member relatively to the type carriers according to the thickness of said record material; and mechanism for thereafter operating the impression member while it is held in adjusted position by the means and the control element, for taking an impression from the type carriers.

15. In a machine capable of printing on record materials of varying thicknesses, the combination of type carriers; impression means cooperable with said type carriers to print data on said material; a floating supporting element for adjustably supporting the impression means relatively to said type carriers; means for positioning the supporting element to move the impression means into printing relation with the type carriers; control means moved into engagement with the record material by the supporting means during a printing operation for controlling the positioning of the floating supporting element; and means for moving the impression means into engagement with the type carriers to take impressions therefrom while the supporting means maintains the impression means in the position to which it was set under control of the control means.

IRVIN L. ELDER.