

April 27, 1926.

1,582,830

H. LANDSIEDEL

SHUTTLE CARRIAGE MECHANISM FOR ADDING MACHINES

Filed Sept. 7, 1922

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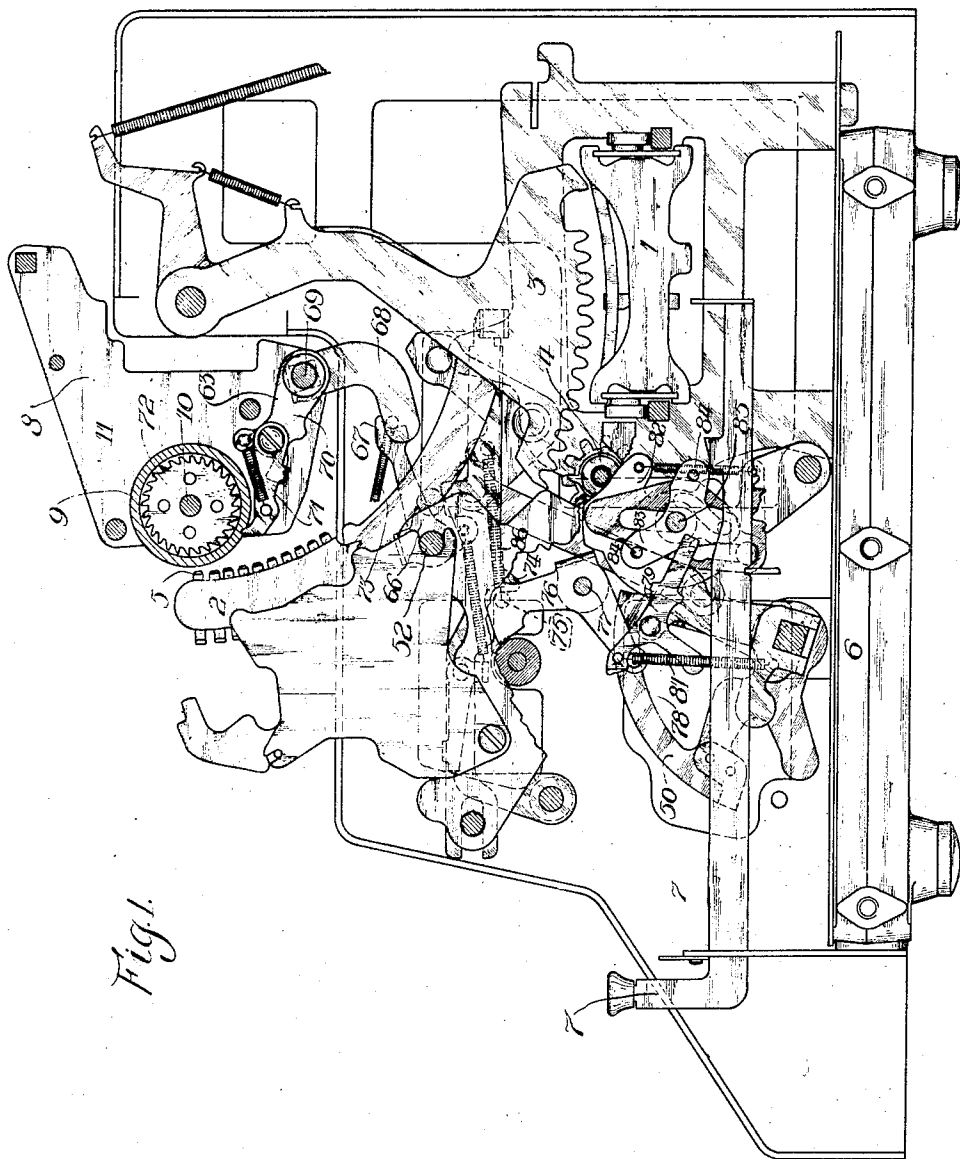


Fig. 1.

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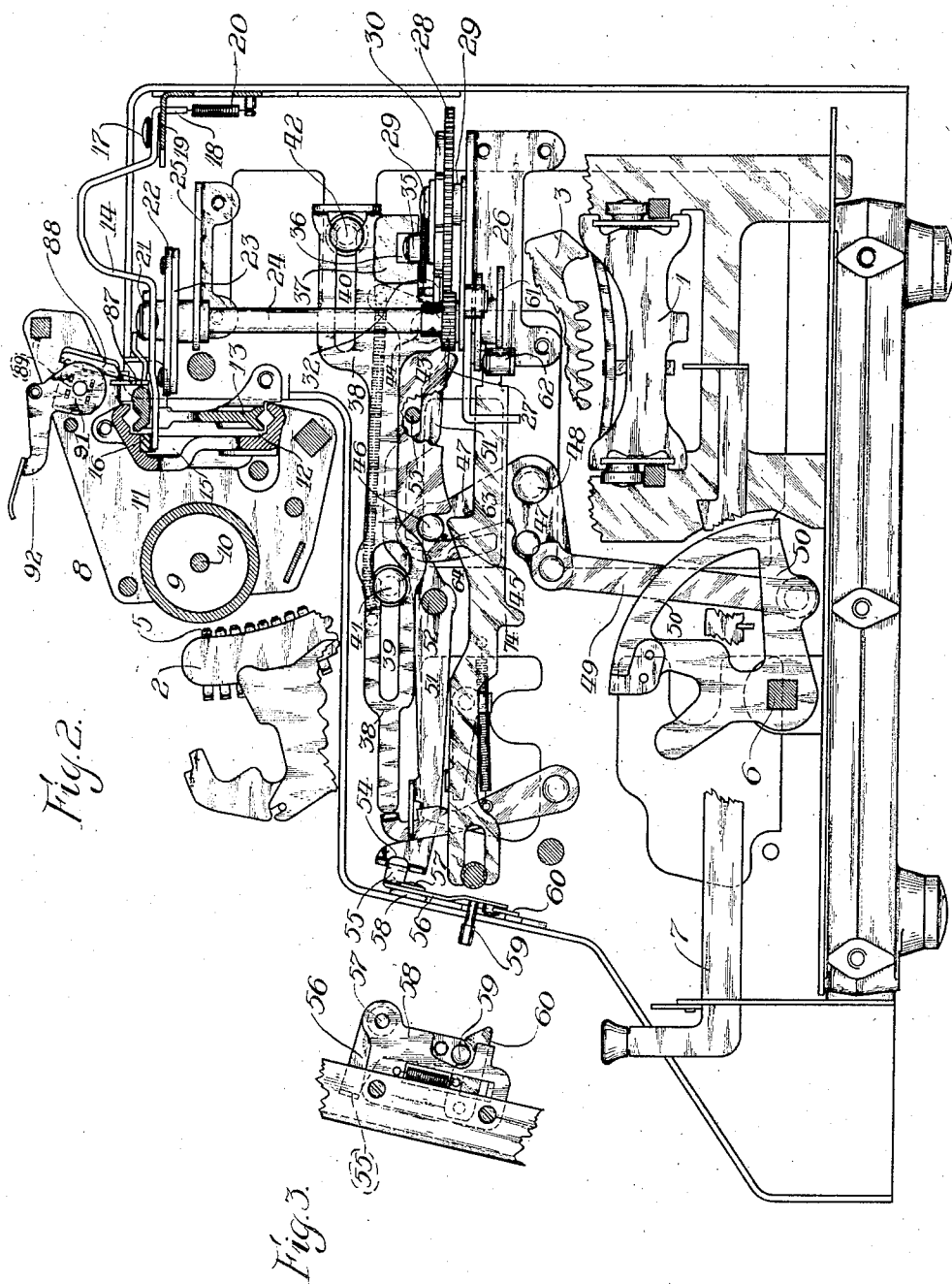
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4 Sheets-Sheet 2



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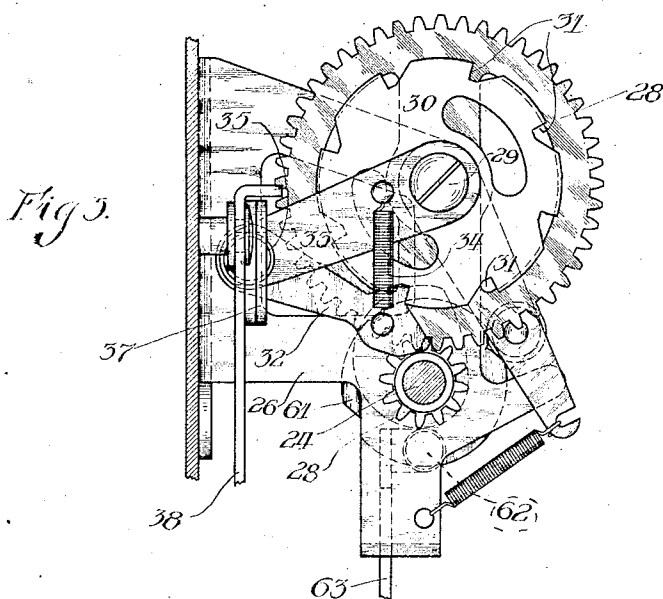
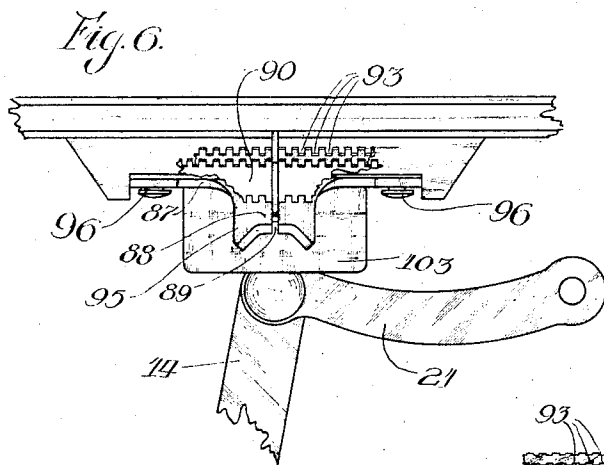
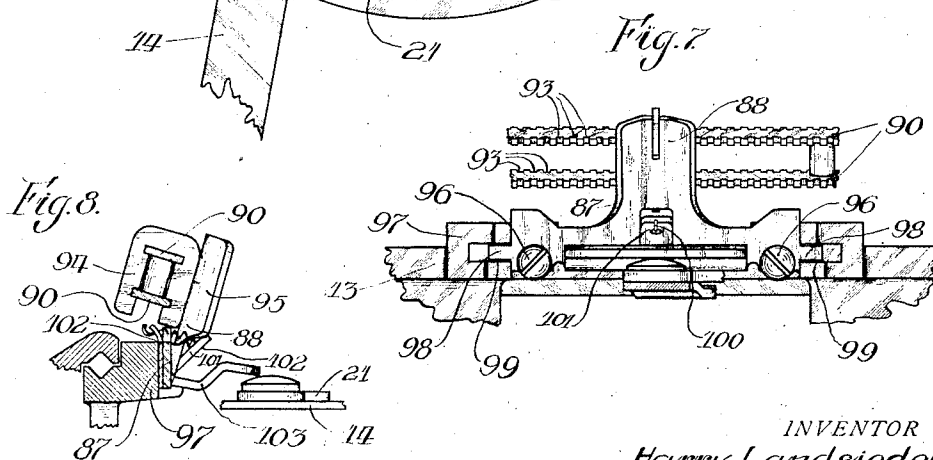
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4 Sheets-Sheet 3



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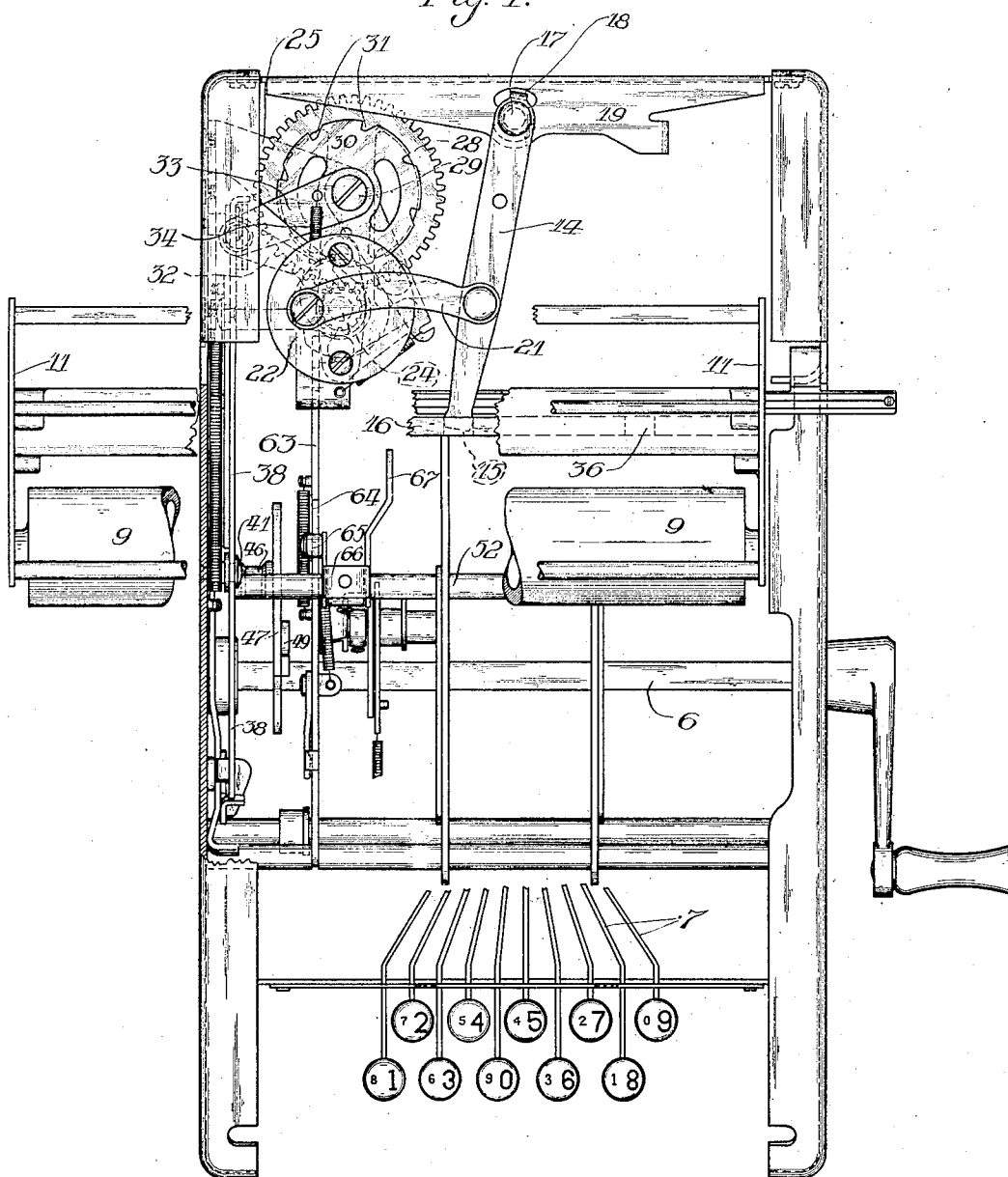
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4 Sheets-Sheet 4

Fig. 4.



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UNITED STATES PATENT OFFICE.

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SHUTTLE CARRIAGE MECHANISM FOR ADDING MACHINES.

Application filed September 7, 1922. Serial No. 586,612.

To all whom it may concern:

Be it known that I, HARRY LANDSIEDEL, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Shuttle Carriage Mechanism for Adding Machines, of which the following is a specification.

The mechanism of the present invention is particularly designed for use in connection with adding machines which are intended to permit the recording of items in parallel vertical columns, one of the columns, as for example the left hand column, containing items which are ordinarily employed as identifying numbers or symbols, and the other column containing corresponding amounts which are intended to be added into the machine. Thus, for example, in using the machine for the purpose of listing and recording the contents of a number of freight cars, the left hand column would be utilized for the purpose of listing the numbers of the cars while the right hand column would be employed for recording the contents of each and adding the items of contents to secure the total result.

In a machine of this character, it is desirable to provide mechanism for automatically shifting the carriage transversely after each designating item has been listed, so that the corresponding amount may be recorded and added in the same horizontal line. This necessitates the use of mechanism, actuated by the handle pull for shifting the carriage to the left after a designating item has been listed, without either adding the item or rotating the platen. With the parts thus positioned to record a numeral item, the mechanism is entrained for the next succeeding handle pull to add in the item last recorded, to feed the platen, and to restore the platen to the right hand position prior to the next operation. It is evident that on the taking of a total or subtotal, only the right hand column items will be included.

The invention further relates to the means provided for disengaging the special shuttle mechanism so as to restore the machine to its normal mode of operation. The invention is an improvement over the one shown and described in the Landsiedel Patent No. 1,321,648. In the patent mentioned, the means for disabling the adding mechanism

are controlled by the lateral movement of the paper carriage, while in the construction of the present invention said means are included as a part of the device for shuttling the paper carriage.

The present invention also includes an improved method for disabling the line spacing mechanism and other improvements which will be apparent from the following description:

In the drawings:

Figure 1 is a sectional view of a Dalton adding machine illustrating the invention mounted therein;

Fig. 2 is a sectional view illustrating the device and connections to the main shaft;

Fig. 3 is a fragmentary front view of the normalizing device;

Fig. 4 is a plan view of the mechanism and the connections to the paper carriage;

Fig. 5 is a view of the gearing and ratchet feeding devices for rotating shaft;

Fig. 6 is a fragmentary view of the tabulator latch, looking at it from the top of the machine;

Fig. 7 is a rear view of the tabulator latch; and

Fig. 8 is an end view of the tabulator latch, illustrating the tabulator stop and its relation to the tabulator latch.

In the drawings, the device has been applied to a Dalton adding machine which includes a lateral stop carriage 1, type carriers 2, adding racks 3, adding mechanism 4, printing mechanism 5, a main handle control shaft 6, numeral key levers 7, a paper carriage 8, and a platen 9. These features, and their general construction and mode of operation as applied to the Dalton adding machine, are well understood in the art and it is not deemed necessary to enter into a detailed description thereof, save in so far as may be needful to a full understanding of the features comprising the shuttling carriage mechanism of the present invention.

The platen 9 is mounted upon a shaft 10 journaled at its ends through end plates 11 which are secured to the ends of a traveling carriage frame 12 which embraces and is guided upon a fixed frame 13 secured between the main side frames of the machine, anti-friction devices being provided to enable the platen carriage as a whole to travel

freely along the fixed ball rail frame 13 as a guide. Back and forth movements of the platen carriage are effected through the oscillations of an arm 14, the forward end of which is adapted to engage with a selected one of a series of notches 15 in a tabulator bar 16, which is secured to and forms a part of the carriage frame 12, as shown in Fig. 2. The swinging arm 14 is pivoted at its rear end to the pivot pin 17, and the rear end 18 of the arm is downturned through the flange 19 which carries the stud and is engaged by a spring 20. Sufficient clearance is afforded between the arm 14 and the head of the stud 17 to permit the forward end of the arm 14 to be depressed against spring tension sufficiently to disengage a selected notch 15 for the purpose of readjusting the platen carriage to a different lateral position. This enables various portions of the paper carried by the platen to be brought to position to have columns of figures imprinted thereon.

It is obvious from the above description that as the arm 14 is swung back and forth within the limits of its operation, it will shift the platen alternately to the right and left. The means provided for controlling the swinging movements of the arm 14, in conformity with the movements of the operating handle will now be described.

The arm 14 has pivoted thereto a link 21, the outer end of which is pivoted eccentrically to a disk 22, which, during the operation of the machine, will be rotated intermittently in the same direction, being moved a half rotation with each return movement of the handle, so that one complete oscillation of the handle will serve to throw the arm, and with it the platen carriage to the left, and the next succeeding operation will throw the parts to the right. The disk 22 is mounted upon a cross arm 23 rigidly mounted upon a vertical shaft 24 journaled at its upper end through a bracket 25, and has its lower end through a bracket 26. The shaft near its lower end is provided with a small pinion 27 which meshes with a large gear 28 rotatably mounted upon a stud 29 upstanding from the bracket 26. The gear 28 carries a ratchet plate 30 provided with notches 31 adapted to co-act with a dog 32 pivoted at its outer end to an arm 33, which latter at its inner end is pivoted upon a stud 29. The dog and arm are connected by means of a spring 34 which serves to hold the dog in spring contact with the edge of the ratchet plate. By swinging the outer end of the arm 33 back and forth, intermittent rotation will be imparted to the gear and parts associated therewith.

The outer end of the arm 33 has mounted thereon a roller 35 which is engaged by a notch 36 in the plate 37, which plate is secured to the inner end of a reciprocating

slide bar 38 provided with guide slots 39 and 40 which engage guide pins 41 and 42 respectively, as indicated in Fig. 2.

Reciprocations are imparted to the slide bar 38 by means of a link 43 which is pivoted at its rear end to the slide bar 38 at the point 44. The link at its forward end terminates in a hook 45 which engages a pin 46 carried by the upper arm of a bell crank lever 47 which is pivoted to the stud 48 upon the side frame of the machine.

The lower arm of the bell crank lever is engaged by a link 49 which at its lower end is pivoted to a segment 50 carried by the main handle control shaft 6, so that with each forward pull of the handle, the slide bar 38 will be moved rearwardly and the dog retracted in position to engage the next succeeding notch on the ratchet plate. With the parts thus adjusted, the return movement of the handle will actuate the gearing and impart a swinging movement to the arm which controls the shuttling of the platen carriage.

When it is desired to normalize the operation of the machine, by disabling the shuttling mechanism, this result is secured by the action of a disabling lever 51 which is fulcrumed upon a cross bar 52. The rear end of the disabling lever lies under a stud 53 inwardly extending from the hooked link 43, and the forward end 54 of the disabling lever is bifurcated to receive the intumed end 55 of a bell crank lever 56 which is pivoted at its elbow to a stud 57 carried by a bracket 58 secured to the front wall of the machine, as shown in Figs. 2 and 3. The bell crank lever 56 is adapted to be swung back and forth by means of an outwardly protruding finger piece 59 which engages a pivoted spring controlled detent 60 configured in its upper edge to hold the bell crank lever in either position of adjustment. By a lateral movement of the finger piece 59, the outer end of the bell crank will be raised and lowered, thereby imparting a like movement to the forward end of the disabling lever. When the forward end of the disabling lever is depressed, its rear end will be elevated and this will serve to unhook the link 43 from the pin 46, so that with the parts in this position, the bell crank 47 will rock idly when the handle is operated and no shuttling movements will be imparted to the carriage.

The mechanism for disabling the line spacing mechanism of the paper carriage will now be described. The lower end of the vertical shaft 24 carries a cam plate 61 having a flat side and an elevated side. Associated with the cam is a roller 62 mounted upon the rear end of a slide bar 63 provided on its upper edge with a cam elevation 64. This cam elevation 64 co-acts with a roller 65 mounted upon a swinging bracket 66

freely pivoted upon the cross bar 52, which bracket carries an arm 67. The forward movements of the slide bar 63 will serve to thus elevate the arm 67, and this arm when elevated will engage with an arm 68 mounted upon a squared line spacing shaft 69, which shaft also carries a finger 70 having a pawl 71 pivoted thereto, which pawl co-acts with the usual ratchet wheel 72. These parts are actuated by a spring 73 when the operating lever is pulled forward and restored to their normal positions by a positive cam action, (not shown) on the return stroke in a manner common in the construction of adding machines. When, however, the arm 67 is lifted, it will be noted that the arm 68 will be blocked against its normal forward movement, so that the line spacing mechanism will be disabled, and since these movements are controlled by means of the cam 61 on the vertical shaft 24, and since this shaft makes a half rotation with each handle reciprocation, it is evident that the line spacing mechanism will be disabled on alternate operations of the handle, and that line spacing will occur only when the platen carriage is in its left hand position, that is to say, after a numerical item has been introduced into the right hand column.

Means for disabling the adding mechanism during the printing of an item in the left hand column will now be described. It is essential that the line spacing mechanism and the adding mechanism be both disabled at the same time, and the slide bar 63 is likewise relied upon to effect a disabling of the adding mechanism as well as the line spacing mechanism. This bar is provided on its under edge with a depending finger 74 which engages a stud 75 on the upper arm of a bell crank lever 76 which is pivoted on a cross rod 77. The lower arm of the bell crank lever is provided with a stud 78 which is adapted to control the movements of a wipe pawl 79 which is pivoted to the usual segment 50 carried by the handle operated main shaft 6, a spring 81 being provided to normally hold the rear or acting end of the wipe pawl in an elevated position. The wipe pawl co-acts with the usual mechanism provided for lifting the bank of adding wheels into mesh with the usual adding racks 3 on the return stroke thereof. This mechanism, is old and comprises a cam 82 and a plate 83 provided with studs 84. The cam 82 is rigid on the shaft 85 and when the latter is rotated by engagement of the rear end of the wipe pawl 79 with one of the studs 84, the cam will be rotated and the adding wheels lifted into mesh with the racks in the usual manner except when the wipe pawl is thrown out of commission by the disabling mechanism herein specially provided.

With the stud 78, in the depressed posi-

tion shown in Fig. 1, the forward end of the wipe pawl, as it is swung forwardly with the forward pull of the handle, will engage and ride over the stud thereby throwing down the rear end of the wipe pawl to an inoperative position, so that upon the return movement of the handle and the segment no actuation of the adding wheel lifting devices will be effected. On the contrary, when the slide bar 63 is moved to its rear position, and the stud 78 is lifted through the pull of the spring 86, the wipe pawl will occupy its normal position and upon its return stroke will engage the stud 84 on the adding wheel actuating series, thereby permitting a movement, upon the back stroke of the handle, which will lift the adding wheels into mesh with the adding racks, to store up the item last listed in the right hand column.

Attention is now directed to the means for disconnecting the shuttle arm 14 from a selected notch 15 in the tabulator bar 16 in order to readjust the platen carriage to a different position laterally for the purpose of recording numbers upon a different lateral section of the paper. Pivoted to the upper section of the fixed ball rail frame 13 on the rear side thereof is a tabulator latch 87 provided with an upstanding tongue 88 which normally extends upwardly and obliquely therefrom in a rearward direction, as indicated in Fig. 2.

The tongue occupies a position in proximate relation to a pair of spaced transversely extending bars 90 which are connected at their ends between a pair of end plates 91 pivotally mounted between the carriage frames 11, one of said end plates being provided with a handle 92, so that the two bars may be rocked or tilted in unison. These bars normally present their edges in parallel relation to the slotted tongue 88, which edges are provided at closely spaced intervals with notches 93. Corresponding notches in the upper and lower plates furnish points of engagement for a plurality of yoke plates 94 (see Fig. 8).

The lateral edges 95 of the tabulator latch tongue 88 are bent back to present a beveled front acting surface, and the latch as a whole is pivotally mounted for a rocking movement on the screw studs 96 which connect the latch with a lug 97 on the rear upper rail of the fixed ball casting. To better maintain the latch in position, a pair of end tongues 98 lying within the slots 99 in the lug are provided and a spring 100 is connected at its outer end to a tongue 101 and at its inner end to a fixed plate 102, thereby serving to normally hold the latch forwardly, in which position the tongue 88 will engage with the edge of one of the yoke plates 94 when brought into register therewith.

Integral with the latch is a rearwardly extending detent 103 which occupies a position immediately above the pivot which connects the link 21 with the shuttling arm 14, which latter, as previously explained, is loosely pivoted on the stud 17, so that its forward end may be slightly depressed. The arrangement is such that when the finger lever 92 is depressed the notched bars 90 are rocked or tilted causing the rear lower corner of the yoke plate 94 to bear against the latch tongue 88 in such a way as to rock the latch and depress the detent 103 which bears down on the shuttling arm and permits a disengagement thereof from the notch in the tabulator bar.

The yokes 94 are so located as to occupy positions at or near the terminal points of movement of the shuttling arm, so that when the latter is brought to rest in either of its terminal positions, it will lie in proximate relation to the detent 103, so that a disengagement of the shuttling bar can be made and a repositioning of the platen carriage effected. The throw of the shuttling arm can be amplified or decreased by radially changing the point of attachment of the link 21 with the disk 22, and the provision of numerous notches in the companion bars 90, permit the yoke plates 94 to be located at positions corresponding to the movements of the shuttling bar.

In operation, after an indicating number has been set up in the usual stop carriage of the machine, with the platen, in its right hand position, and with the paper disposed to receive an impression in the left hand or non-adding column, the handle will be pulled and the figures printed in the usual manner. With the parts adjusted for this operation, the adding mechanism and the line spacing mechanism will both be disabled, so that the only operation, special to the present invention, which takes place on the return movement of the handle will be the shuttling of the carriage to the left to bring the paper into position to receive a numerical item in the right hand column and on the same horizontal line with the designating item last imprinted. After the numerical item has been set up, the handle is again pulled, but on this occasion, the parts are in such position that on the return stroke of the handle the adding wheels will be in mesh with the racks, so that the item will be accumulated, and simultaneously the line spacing mechanism will operate to turn the platen sufficiently to line space the paper in preparation for the imprinting of another designating item in the left hand column.

By adjusting the stud 59, all of the mechanism, special to the present invention, is disentrained from the handle shaft, so that the machine as a whole may readily be restored to operation as a regular adding ma-

chine, in which case, of course, the platen will operate continuously in one position, and the line spacing mechanism will operate with each oscillation of the handle instead of with alternate oscillations as in the case when the shuttling devices are in service.

The shuttling features of this invention are of such a nature that they can be readily applied to adding machines of standard construction without in any way changing or modifying the general structure of the machine as a whole, since these devices are fitted to occupy space not otherwise occupied and are adapted to function without interference with the remaining mechanisms.

I claim:

1. In shuttling mechanism for adding machines, the combination of an oscillating horizontally disposed shuttling arm pivoted to permit a slight movement in a direction at an angle to its plane of oscillation, a platen carriage provided with a plurality of points of engagement for said shuttling arm, and means for moving said arm to effect a disengagement of the shuttling arm with the platen carriage, and a reengagement thereof at a different point, said means comprising a latch member adapted when actuated to bear against the shuttling arm and effect disengagement thereof, substantially as described.

2. In shuttling mechanism for adding machines, the combination of an oscillating shuttling arm pivoted to permit a slight movement in a direction at an angle to its plane of oscillation, a platen carriage provided with a plurality of points of engagement for said shuttling arm, and means for moving said arm to effect a disengagement of the shuttling arm with the platen carriage, and a re-engagement thereof at a different point, said means including a latch pivoted to a fixed portion of the structure in position to bear against and effect disengagement of the shuttling arm, and means carried by the platen carriage for operating said latch, substantially as described.

3. In shuttling mechanism for adding machines, the combination of an oscillating shuttling arm pivoted to permit a slight movement in a direction at an angle to its plane of oscillation, a platen carriage provided with a plurality of points of engagement for said shuttling arm, means for moving said arm to effect a disengagement of the shuttling arm with the platen carriage, and a re-engagement thereof at a different point, said means including a latch pivoted to a fixed portion of the structure in position to bear against and effect engagement of the shuttling arm, and means carried by the platen carriage for operating said latch, when in a predetermined lateral position, substantially as described.

4. In adding machine shuttling mecha-

nism, the combination of a platen carriage, an oscillating arm for alternately shifting the platen carriage to its right and left positions with alternate operations of the handle, a shaft, a crank connection between said shaft and said arm, connections for imparting a half rotation to said shaft with each handle operation, a cam carried by said shaft and adapted to move a half revolution with each handle pull, line spacing devices, and disabling connections between the cam and said line spacing devices for disabling the latter on alternate strokes of the handle, substantially as described.

5. In adding machine shuttling mechanism, the combination of a platen carriage, an oscillating arm for alternately shifting the carriage to its right and left positions with alternate operations of the handle, a shaft, a crank connection between said shaft and said arm, connections for imparting a half rotation to said shaft with each handle operation, a cam carried by said shaft and adapted to move a half revolution with each handle pull, line spacing devices, disabling connections between the cam and said line spacing devices for disabling the latter on alternate strokes of the handle, adding devices, and disabling connections between said cam and said adding devices for disabling the latter on alternate strokes of the handle, substantially as described.

6. In shuttling mechanism for adding machines, the combination of a platen carriage, means operable by the handle stroke for moving the platen carriage first to one columnar position and then to another columnar position, said means including an intermittently rotating shaft, a cam carried by said shaft, line spacing devices, and means actuated by said cam and adapted to permit functioning of the line spacing devices when the cam is moved to one of its positions, and adapted to disable said line spacing devices when the cam is moved to another position, substantially as described.

7. In shuttling mechanism for adding machines, the combination of a platen carriage, means operable by the handle stroke for moving the platen carriage first to one columnar position and then to another columnar position, said means including an intermittently rotating shaft, a cam carried by said shaft, line spacing devices, means actuated by said cam and adapted to permit functioning of the line spacing devices when the cam is moved to one of its positions, and adapted to disable said line spacing devices

when the cam is moved to another position, adding wheels, key controlled means for introducing items into the adding wheels, means for bringing said adding wheels into co-operating engagement with said key controlled means, and connections coacting with and engaged by the cam actuated means for disabling the means for bringing the adding wheels into coacting relation with the key controlled means, the parts being so related as to permit the accumulation of items when the line spacing devices are active and to prevent the accumulation of items when the line spacing devices are disabled, substantially as described.

8. In shuttling mechanism for adding machines, the combination of a platen carriage, an oscillating arm for moving the platen carriage alternately to right and left positions, an operating shaft for actuating said arm, connections for moving said shaft a half revolution with each handle operation, a cam rigid with said shaft, a slide bar engaging said cam and adapted to be moved alternately to different positions with alternate handle operations, line spacing mechanism for the platen, means adapted to block the operation of the said line spacing mechanism when said means are in one position of adjustment, said blocking means being arranged in position to coact with said slide bars for disabling the line spacing mechanism when the bar is moved to one position, and for permitting the functioning of said line spacing mechanism when said bar is in its other position, substantially as described.

9. In shuttling mechanism for adding machines, the combination of a frame, a platen carriage, an oscillating arm for moving the platen carriage alternately to the right and left positions with alternate operations of the handle, a vertical operating shaft for actuating said arm, said shaft being located near the rear of the frame, connections for moving said shaft a half revolution with each handle operation, a cam rigid with said shaft, a forwardly extending slide bar engaging said cam and adapted to be moved alternately to different positions with alternate handle operations, adding devices, and means actuated by the slide bar for disabling said adding devices when the bar is in one of its positions of adjustment and for permitting the functioning of said adding devices when the bar is in its other position of adjustment, substantially as described.

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