

Dec. 30, 1941.

W. A. ANDERSON

2,267,885

PRINTING MECHANISM FOR COMPUTING MACHINES

Filed June 25, 1937

5 Sheets-Sheet 1

Fig. 1.

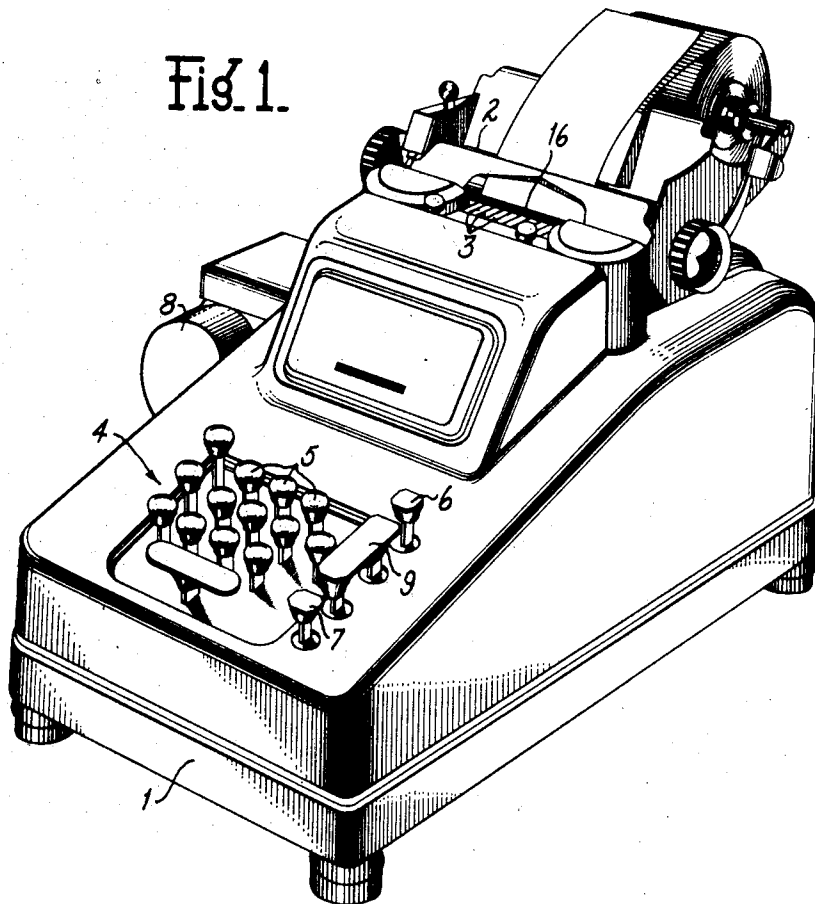


Fig. 2.

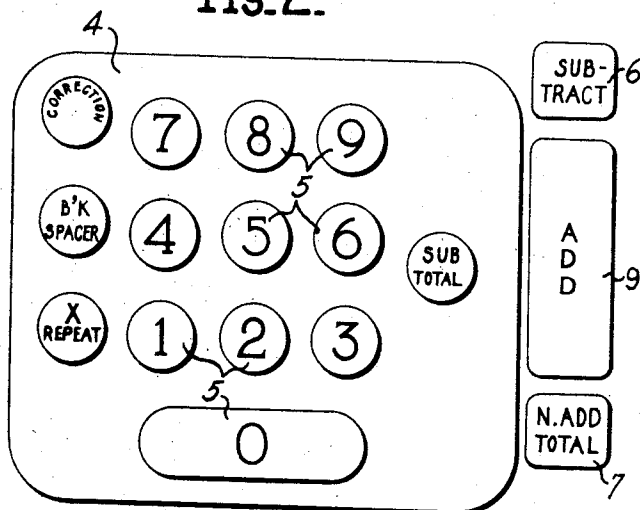


Fig. 3.

135	2.50	
A	3.00	
	5.50	136
	2.25	
	4.75	
	18.00	
137	5.95	
B	3.05	
	4.25	138
	1.75	
	15.00	

INVENTOR
WALTER A. ANDERSON
BY
L. S. Jullien
ATTORNEY

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W. A. ANDERSON

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5 Sheets-Sheet 2

Fig. 4.

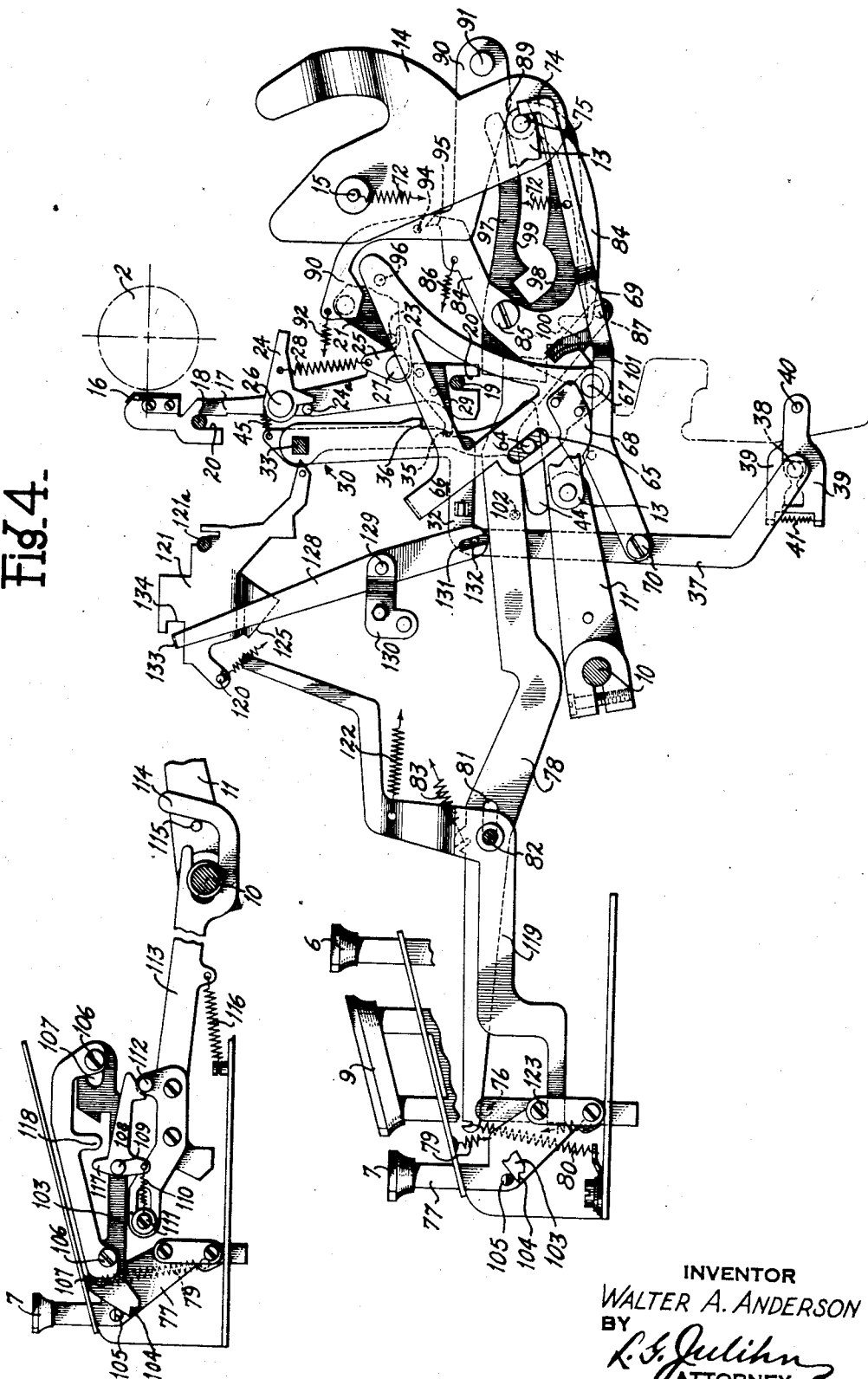


Fig. 5.

INVENTOR
WALTER A. ANDERSON
BY
L. E. Julihn
ATTORNEY

Dec. 30, 1941.

W. A. ANDERSON

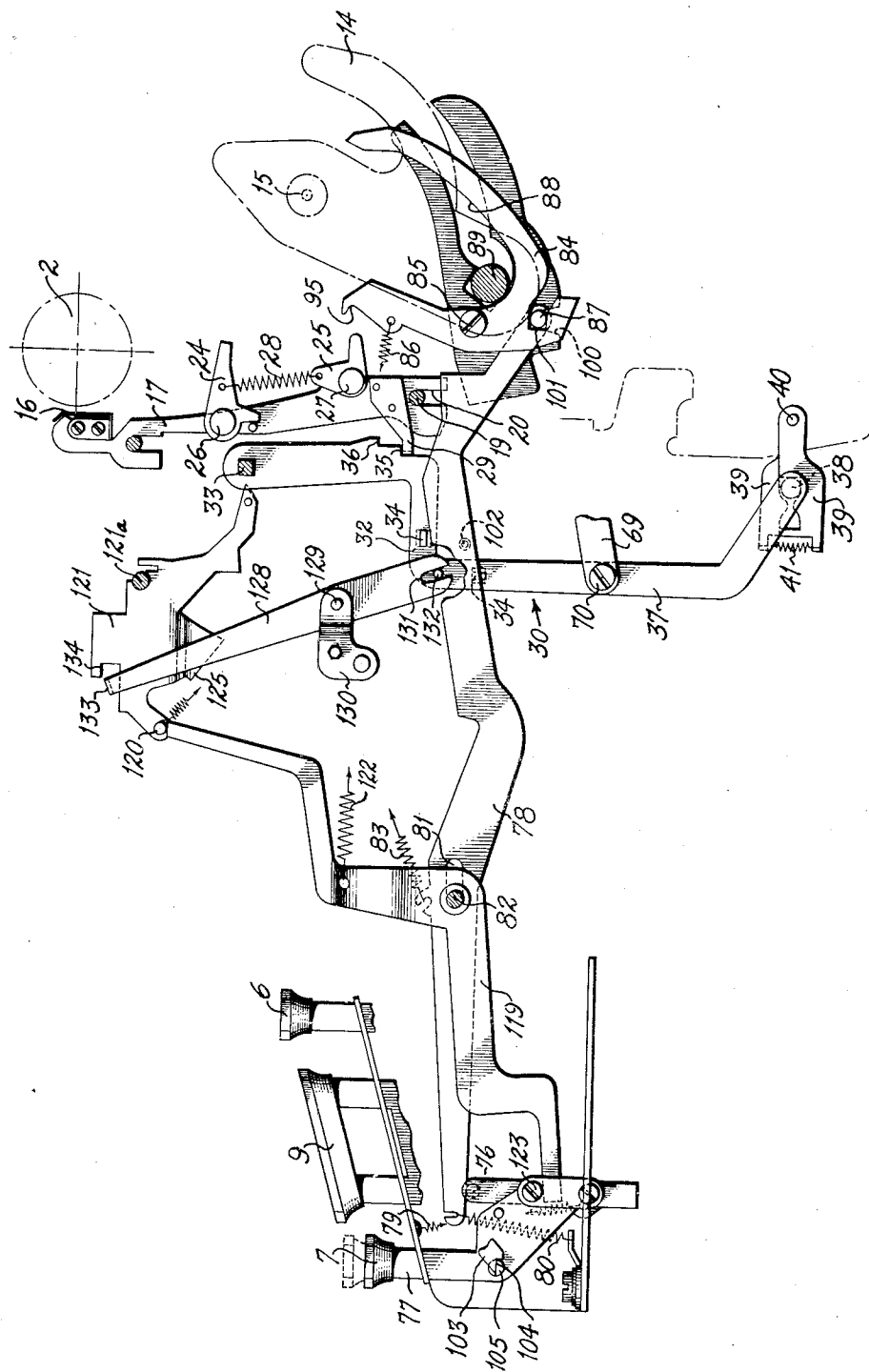
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5 Sheets-Sheet 3

Fig. 6.



INVENTOR
WALTER A. ANDERSON
BY
L. S. Gulik
ATTORNEY

Dec. 30, 1941.

W. A. ANDERSON

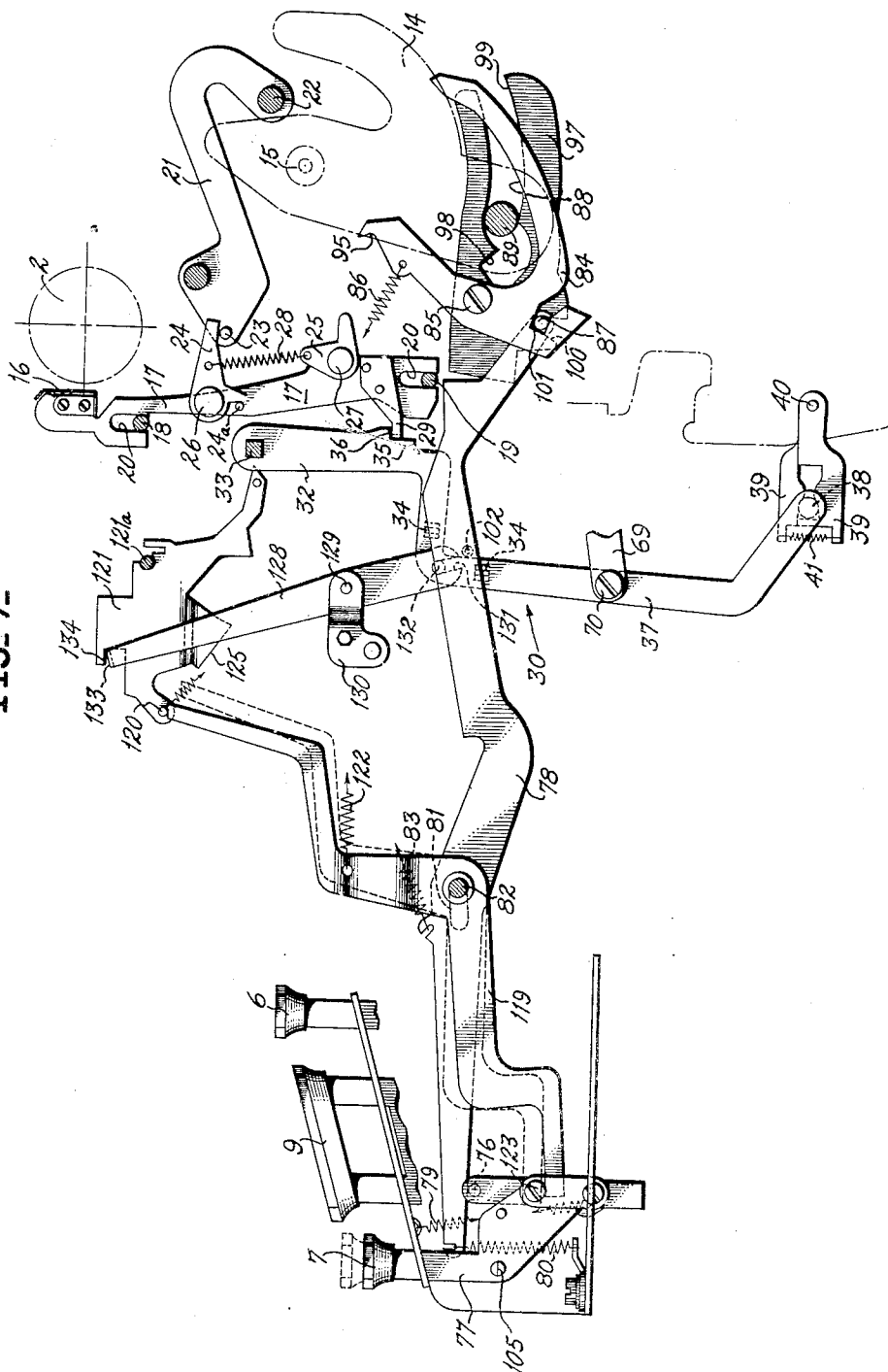
2,267,885

PRINTING MECHANISM FOR COMPUTING MACHINES

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5 Sheets-Sheet 4

Fig. 7



INVENTOR
WALTER A. ANDERSON
BY
L. E. Jullien
ATTORNEY

Dec. 30, 1941.

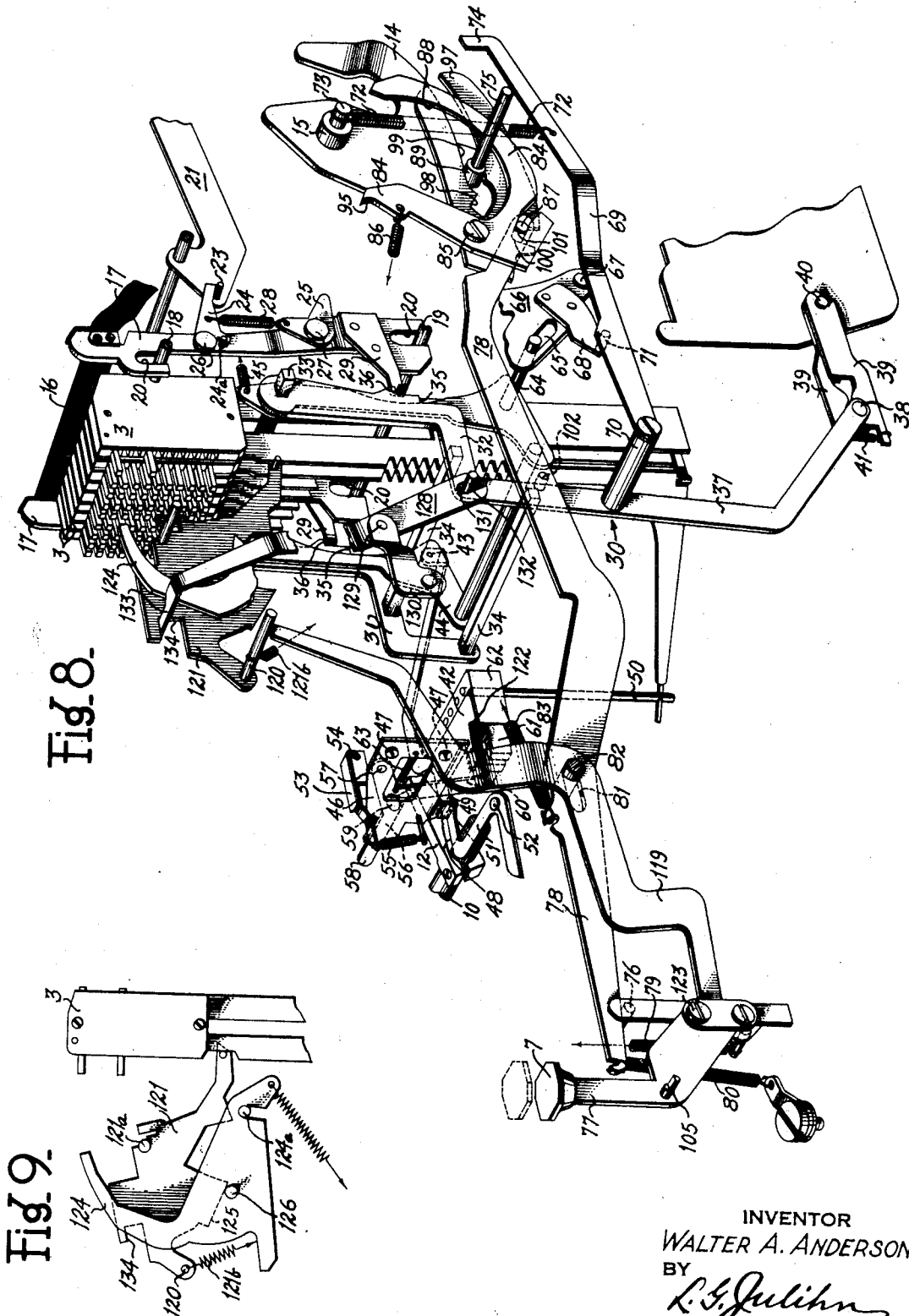
W. A. ANDERSON

2,267,885

PRINTING MECHANISM FOR COMPUTING MACHINES

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5 Sheets-Sheet 5



INVENTOR
WALTER A. ANDERSON
BY
L. S. Juhn
ATTORNEY

UNITED STATES PATENT OFFICE

2,267,885

PRINTING MECHANISM FOR COMPUTING MACHINES

Walter A. Anderson, Bridgeport, Conn., assignor
to Underwood Elliott Fisher Company, New
York, N. Y., a corporation of Delaware

Application June 25, 1937, Serial No. 150,362

12 Claims. (Cl. 235-60)

This invention relates to computing machines, and more particularly to the type of machine used for accumulating and totaling patrons' purchases in retail stores, although the invention is not limited to machines for performing this particular type of work.

In handling sales of the above character, it is customary to list, accumulate and total the prices of the various articles bought, and give to the customer a printed record of the sale. Heretofore, machines of the class used for this work have indicated on the record, by appropriate symbol designation and color of printing, that the machine was cleared when the total was taken. However, the prime concern of the customers is that the machine be clear at the outset of the accumulating operation of their respective purchases. It is accordingly an object of the present invention to provide a device for printing, in a distinctive color and with a suitable symbol, the first item of a group of items, whereby the customer may be assured that the machine was cleared of all previous entries before the computing of the instant transaction.

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

In the drawings:

Figure 1 is a perspective of a computing machine of the type in which my signal printing device may be incorporated,

Figure 2 is a diagrammatic view of the keyboard thereof,

Figure 3 shows two separate sales records and illustrates the type of work accomplished by the machine,

Figure 4 is a right side elevation of the device and the mechanism associated therewith in normal unoperated position,

Figure 5 is a detail view of the total key latch,

Figure 6 is a view similar to Figure 4 but with the parts in mid-cycle position during a total taking cycle, certain of the parts being removed for clearness of illustration,

Figure 7 is a view similar to Figure 5 but with parts shown in the position occupied shortly after the middle of a total taking cycle,

Figure 8 is a perspective view with the parts shown in the same relative position as in Figure 6, and

Figure 9 is a detail side view of the hammer and hammer latch mechanism.

The invention is herein exemplified in connection with mechanism of the general character disclosed in the United States Patents No. 1,198,487 issued to G. D. Sundstrand, Nos. 1,583,102, 1,925,735, 1,934,747 and 1,965,611 issued to Oscar J. Sundstrand, and No. 2,011,310 issued to Walter A. Anderson, to which reference may be had for an understanding of the features not fully illustrated or described herein. It should, however, be understood that the present invention is not limited to machines of this character.

Referring to the drawings (Figures 1 and 2), the reference numeral 1 indicates the machine generally, having the usual platen 2, type bars 3, keyboard 4, including amount keys 5 and subtract and total keys 6 and 7 respectively, motor 8 and motor bar 9.

A main rock shaft 10 (Figure 4) is arranged through suitable connections (not shown) with the drive motor 8 to rock counter-clockwise and then clockwise during each machine cycle. Crank arms 11 and 12 (Figures 4 and 8) rigidly secured to the shaft 10 are connected through links 13 (one of which is shown in Figure 4) to a pair of levers 14 (only one of which is shown) pivoted on an axis 15 in the rear of the machine. Thus, levers 14 are oscillated clockwise about the axis 15 on the initial stroke and counter-clockwise on the return stroke of every cycle.

A bichrome ribbon 16 is arranged to be raised and lowered by means including two members 17 located on opposite sides of the group of type bars 3. The members 17 are guided for vertical movement by any suitable means, as, for example, guide studs 18 and guide rod 19 fixed in the machine frame, and guide slots 20 in the members 17.

The means for raising and lowering the members 17 comprises a pair of actuating levers 21 (Figures 7 and 8) arranged to swing upwardly and downwardly about an axis 22 in timed relation with the forward and return movement of levers 14 by connections not shown but fully disclosed in the above mentioned Patent, No. 1,965,611. Pins 23 carried by the forward ends of the levers 21 ply between upper and lower yieldable projections 24 and 25 pivoted at 26 and 27 respectively to the members 17. A spring 28 yieldingly holds the projections in normal position, the action of the spring being limited by a stop 24a engaging a downwardly extending lug on the upper projection 24.

Forwardly extending lugs 29 secured to the

lower ends of the ribbon carrying members 17 are arranged to engage either of two shoulders 35, 36 provided in the rear edge of a locating frame indicated generally at 30. The locating frame 30 comprises two arms 31 and 32 pivotally mounted at their upper ends upon a transverse rod 33 secured between the side walls of the machine frame. Transverse connecting bars 34 secured between the lower ends of the arms insure uniform parallel movement. The shoulders above referred to are offset vertically in each of the arms 31 and 32; the lower shoulders 35 (when in alignment with the lugs 29) serve to prevent the members 17 from rising to lift the bichrome ribbon 16 beyond the position where it will present a certain field, say, the black field, to the printing mechanism. When the locating frame is swung forwardly so that the upper shoulders 36 are in alignment with the lugs 29, the members 17 are free to be lifted by engagement of the pins 23 of the actuating arms 21 with the projections 24 so as to present the other field, as for example, the red field, to the printing devices.

The arm 32 of the locating frame 30 has a downwardly projecting extension 37 carrying at its lower end a pin 38. A pair of identical detent arms 39 are pivoted on a common stud 40 and each has two opposing notches adapted to embrace the pin 38. A spring 41 holds the detent arms together to retain the locating frame 30 in either of its two (forward or rearward) positions.

In the normal listing of figures of a group and during the totaling of such figures, the locating frame 30 remains in its rearward position, thus preventing the ribbon from rising and thereby causing the figures and total thereof to be printed in black. When, however, the first item of the next group of figures is to be printed, it is desirable to have the locating frame 30 shifted to its forward position to allow the ribbon 16 to be raised just prior to the printing of said first item whereby it will be printed in red, and the locating frame swung back so that subsequent figures and the total thereof print in black.

The means for controlling the movement of locating frame 30 to effect distinctive color printing is actuated through mechanism that enforces a blank cycle before a total can be taken, and the total key and its appurtenant mechanism, which are shown and described in the patents hereinbefore enumerated.

The blank cycle mechanism enforces the taking of a blank cycle of the machine prior to a total taking cycle to insure restoration of the totalizer carrying devices.

This mechanism comprises a detent plate 42 (Figure 8) guided to move forward and rearward in a horizontal plane, said plate being pivotally connected through a rearward extension as at 43 to a frame 44. The frame 44 is mounted for swinging movement (forward and rearward) upon the rod 33 and is normally urged forward by springs 45 (only one of which is shown in the present drawings).

A plate 46 pivoted in the machine frame at 47 is provided with a lug 48. A forwardly projecting lug 49 on the detent 42 is continually held in contact with the lug 48 through the action of springs 45. Whenever any one of the numeral keys 5 is depressed to set up the first digit of an item, the detent plate 42 is pushed back to prevent the upstanding pins 50 carried by the type bars 3 from rising. This result is effected

by means of a lever 51 pivoted in the framework of the machine at 52. The lever 51 corresponds to the lever 304 in Patent No. 1,583,102 and its universal connection to the numeral keys 5 may be substantially the same as disclosed in said patent.

The detent plate 46 is held in its rearward position against the force exerted by the springs 45 by a latch 53 pivoted at 54 and held in contact with the plate 46 through tension of a spring 55.

During the blank or spacing cycle, means for removing the detent plate 42 from above the type bar pins 50 becomes effective. This means comprises a lever 56 pivoted at 57 to the plate 46 and having an extension 58 which lies in the path of a projection 59 fixed to the crank arm 12 of the main rock shaft 10. When the extension 58 is struck by the projection 59, the plate 46 is forced forward and away from the detent plate 42, thus releasing the latter to the action of the springs 45.

In order that the projection 59 shall not release the detent 42 to the action of the springs 45 during the printing of an item, but shall release the detent plate only during the blank cycle, the extension 58 is made movable into and out of the path of movement of the projection 59, under control of the amount keys, by the following parts.

An arm 60 of the lever 56 is arranged to abut a lug 61 formed on a slide 62 through which the upstanding pins 50 of the type bars 3 are guided. A spring 63 tends to move the lever in the direction to lower the extension 58 out of the path of movement of the projection 59. When the slide 62 is in its initial position, the extension 58 is held up in the path of movement of the projection 59. However, when a digit is set up by the depression of a numeral key 5, the resulting movement of the slide 62 allows the extension 58 to be lowered by spring 63 out of the path of movement of projection 59, so that plate 46 is not moved forward during that cycle. When slide 62 is returned to its initial position at the end of the cycle, the extension 58 is raised into the path of the projection 59. If the next cycle is a blank cycle, extension 58 is struck by projection 59 to move plate 46 forward and allow plate 42 also to move forward, as described in the aforementioned Patent No. 1,583,102, thus conditioning the machine for the taking of a total.

The frame 44 carries a stud 64, the outer end of which lies within an elongated opening 65 provided in a total control blank 66 pivoted in the machine frame on the axis 67. The total control blank 66 is, therefore, under the control of the blank cycle enforcing mechanism.

The purpose and function of the blank 66 and its relation to the totalizer (not shown) is fully shown and described in the previously mentioned Sundstrand Patent No. 1,934,747. Suffice it to say here, that when the blank is moved forward, as it is during a blank cycle, the totalizer is conditioned for a total taking operation. When the blank is moved back to its rear position, as it is when the first digit of an item is set up on the keyboard, following a total cycle, the totalizer is conditioned for accumulating operations.

A cam 68 is secured to blank 66 just above its axis 67 and is arranged to force a locating frame restoring arm 69 downwardly when the blank is moved forward during a blank cycle. The arm 69 is pivoted to the locating frame 30 by a stud

70 carried by the extension 37 of the arm 32. A pin 71 fixed in the arm 69 bears against the lower edge of the cam 68 under the tension of a spring 72 secured at one end to the arm 69 and at its opposite end to a stud 73 on the axis 15. An upstanding lug 74 formed on the rear end of the arm 69 lies in the path of a laterally projecting rod 75 secured to one of the levers 14, when the arm is in its normal or raised position, as it is when the blank 66 is in its rear position. In such raised position rod 75 strikes lug 74 on the rearward stroke of lever 14, during the second half of the first item entering cycle after a total taking cycle, and thus pulls locating frame 30 back to its rear position. When the arm 69 is cammed down by the action of cam 68 on the pin 71, the lug 74 lies below the path of the rod 75 and does not restore the locating frame 30.

The means for actuating the locating frame 30 to its forward position and thus permit the ribbon 16 to be raised for distinctive color printing of the first item of the following group is under the control of the total key 7. After the last item of a group is accumulated, the blank cycle is taken and the total key 7 is depressed, as shown in Figures 6 and 7. A pin 76 fixed in the stem 77 of the total key underlies the forward end of a lever 78. A spring 79 secured between the stem 77 and the top of the keyboard normally urges the key 7 upwardly. A spring 80 secured at one end to the forward end of the lever 78 and at its opposite end to the base of the keyboard holds the pin 76 and lever 78 in contact with each other. The lever 78 has an elongated opening 81 through which a pivot rod 82 extends, the lever 78 thus being movable longitudinally to a slight extent. A spring 83 urges the lever 78 rearwardly. During the printing of an item and during the blank cycle, the lever 78 is held against movement by the spring 80 by means comprising a cam plate 84, pivoted at 85 and acted upon by a spring 86. On the rear end of the lever 78 is a laterally projecting pin 87 underlying the cam plate 84. The edge 88 of the cam plate 84 is arranged to be engaged by a stud 89 carried by the adjacent lever 14.

During the printing of an item and during the spacing stroke preceding the printing of a total, the movement of the cam plate 84 under the influence of the spring 86 is restrained by a detent arm 90 (Figure 4) pivoted at 91 in the framework of the machine. A spring 92 normally holds the lower edge of the arm 90 in contact with the stud 89 when the machine is at rest. On the detent arm 90 is a pin 94 adapted to engage a hook 95 on the cam plate 84. When the machine is cycled to print a total, the detent arm 90 is prevented from moving under the influence of spring 92 into position where the pin 94 is in front of the hook 95, by means of a pin 96 on the total control blank 66. When the blank is in its forward position (as it is following a spacing stroke) the pin 96 lies under the front end of the detent arm 90 and holds it elevated.

A detent plate 97 pivoted on the center 85 has a cam slot 98 having a dwell portion 99 in which the stud 89 is arranged to run. That portion of the pin 87 which projects from the inner side of the lever 78 underlies the plate 97. In the lower edge of the plate 97 is a notch 100.

After a blank cycle has been taken, and the movement of the swinging frame 44 and total control blank 66 to forward position effected, as described in the foregoing, the total key is depressed, and the machine is cycled. The cam

plate 84 is free to swing counter-clockwise under tension of spring 86 as the stud 89 on lever 14 moves forward during the initial stroke of the cycle. The pin 87 on the rear end of lever 78 rises under the influence of the spring 80 until the pin is adjacent a locking notch 101 in the cam plate 84. When the movement of the plate 97 under the action of the stud 89 brings the notch 100 into register with the pin 87, the spring 80 moves the pin into notch 100, whereupon spring 86 further rotates plate 84 until notch 101 embraces and locks stud 87 in notch 100, as shown in Figure 6. This occurs at substantially the middle of the cycle.

As the lever 14 starts back on the return stroke of the cycle (shortly after the total is printed), as shown in Figure 7, the stud 89 acting on the walls of the cam slot 98 swings the plate 97 downwardly, thus pushing the pin 87 and lever 78 forwardly. An inwardly projecting pin 102 fixed in the lever 78 is arranged to strike against the extension 37 of the locating frame 30 and thus move the locating frame to its forward position wherein the upper shoulders 36 of the locating frame will be aligned with the lugs 29 of the ribbon supporting members 17.

Hence, when the first item of the next group is indexed in the keyboard and the machine cycled, the rising of the actuating levers 21 during the forward stroke of the cycle causes the pins 23 thereof to abut the projections 24 of the members 17 and raise the ribbon 16, as shown in Figures 7 and 8 to print in red.

To cause the second and subsequent items to be printed in black, the parts operate in the following manner. When the first item is indexed in the keyboard the detent plate 42, swinging frame 44 and total control blank 66 are moved rearwardly simultaneously with the indexing of the first digit of the item, as before described. Hence, the cam 68 moves upwardly as the blank 66 moves rearwardly, and thus permits the locating frame restoring arm 69 to rise under the tension of the spring 72 so that the lug 74 thereof lies in the path of the rod 75. Thus, at the end of the instant cycle, the rod 75 strikes the lug 74 and restores the locating frame to its normal or home position so that subsequent items of the group, and the total thereof, will be printed in black.

Any suitable latch means may be employed to hold the total key 7 depressed until the total cycle is completed. The means herein shown in Figure 5 comprises a slide 103 having a notch 104 arranged to engage a stud 105 fixed in the key stem 77. The slide is mounted for slight longitudinal movement by screws 106 passing through elongated openings 107 in the slide and secured in the side wall of the keyboard housing. A hook 108 is pivoted at 109 to the slide. The hook 108 is tensioned clockwise by a spring 110 secured between a projection of the hook and a stud 111 fixed in the housing, and rests against a stud 112 fixed to a sliding link 113. Thus, the spring 110 tensions slide 103 forwardly. Link 113 is slidably mounted upon screw 111 at its forward end and is bifurcated at its rearward end to slidably embrace rock shaft 10 adjacent crank arm 11. An upstanding lug 114 formed on the extreme rear end of link 113 is arranged to abut against a pin 115 secured in crank arm 11. A spring 116 urges link 113 forwardly and holds lug 114 in contact with pin 115.

When the total key 7 is depressed, stud 105 engages notch 104 of slide 103 as it comes forward

under the tension of spring 110, latching the key down. As the machine cycles, on the forward stroke, crank arm 11 swings upwardly, moving pin 115 away from lug 114, allowing the link 113 to move forward under the tension of spring 116, whereupon stud 112 of the slide is brought into operative engagement with hook 108. On the back stroke of the instant cycle the crank arm 11 swings downwardly, bringing the pin 115 against the lug 114, pulling link 113 and slide 103 (by virtue of its engagement with hook 108) rearwardly, and retracting notch 104 from stud 105, whereupon key 7 rises to normal position under the tension of spring 79. As slide 103 moves farther rearwardly, a projection 117 on hook 108 strikes a stationary lug 118, swinging hook 108 counter-clockwise about its pivot 109, disengaging it from stud 112, whereupon slide 103 restores to its normal position under the influence of spring 110.

Simultaneous with the printing of the first item in a contrasting color, means is provided to print a signal indicia opposite said first item to further positively assure the patron of a true accounting of his purchases. The symbol used for this purpose is the same as that commonly used on the Sundstrand machine for indicating a total. The signal appears in red opposite the first item and in black opposite the total.

The means for printing the "total" symbol in the present invention may be generally similar to that fully shown and described in the before-mentioned Sundstrand Patent No. 1,965,611, and in the present machine is constructed in the following manner.

A stop finger 119 is pivotally mounted upon the rod 82 (Figure 4). The rear end of this finger extends upwardly and normally terminates below and just out of the path of a pin 120 fixed in a hammer latch 121. A spring 122 normally tensions stop finger 119 clockwise about its pivot 82 and thus brings the forward end thereof upwardly against a stud 123 carried by the total key stem 77. Depression of the total key 7 rocks finger 119 counter-clockwise about the pivot 82 and brings the upper end thereof directly under the pin 120, as shown in Figures 6, 7 and 8.

Referring to Figure 9, the hammer latch 121 is pivoted to 121a and is tensioned counter-clockwise by a spring 121b. During the operation of the machine, mechanism disclosed in the above-mentioned patents releases latch 121 to the tension of spring 121b, which rotates the latch counter-clockwise unless stop finger 119 is in a position to prevent such rotation. During item listing operations, after the first item, stop finger 119 is out of the path of pin 120, so that counter-clockwise rotation of latch 121 takes place. This places an edge 125 in the path of pin 126 extending from hammer 124 pivoted at 124a. With the edge 125 in this position, the hammer cannot fire to print the "total" or "clear" symbol.

On the other hand, when the total key is depressed for a total taking operation, stop finger 119 supports latch 121 against counter-clockwise movement, thereby holding edge 125 out of the path of pin 126, allowing the hammer to fire in its customary manner.

The means for detaining the latch in its upper position during the printing of the first item of a group is under the control of the locating frame 30. This means comprises a second stop finger 128 pivoted intermediate its ends at 129 to a bracket 130 secured on the machine frame. The lower end of the finger has an open-end slot 131

embracing a pin 132 fixed in the arm 37 of the locating frame 30, the upper end thereof being bent over to form a lug 133 adapted to engage a notch 134 in the locating frame 121. When the latch 30 is swung forwardly during the total taking cycle, as before described, the finger 128 swings clockwise about the pivot 129, bringing lug 133 into engagement with notch 134.

Remembering now that locating frame 30 remains in its forward position during the remainder of the total taking cycle, and during the subsequent item entering cycle until near the end thereof, it is apparent that stop finger 128 is effective to hold latch 121 ineffective during such first item entering operation. The hammer 124 (Figure 9) is, therefore, permitted to print the "total" or "clear" symbol opposite the first item following a total taking operation.

As above explained, cam 68 (Figure 8) is lowered during a blank cycle preparatory to a total taking operation, and remains in this position during the succeeding total taking cycle. This lowers arm 69 to move lug 74 out of the path of rod 75. This allows locating frame 30 to remain in its forward position at the end of the total taking cycle. It should also be noted that if one or more blank cycles are taken after a total taking operation, cam 68 still remains in its lower position, so that locating frame 30 still remains in its forward position. This permits stop finger 128 to remain engaged with latch 121 during such subsequent blank cycles, and during the greater portion of the next item entering cycle, so that the first item entered after the total taking operation prints the "clear" symbol even though one or more blank cycles were taken between the total taking operation and the first item entering operation.

Toward the end of the first item entering cycle, the locating frame 30 is restored, as described previously, swinging the finger 128 counter-clockwise about the pivot 129, and removing lug 133 from notch 134, whereby latch 121 is permitted to drop during subsequent item entering cycles to restrain the firing of hammer 124.

An illustration of the work done by the present machine appears in Figure 3. Therein, 135 indicates the first item of a group "A," the locating frame 30 having been swung forward during the total taking cycle preceding the indexing of this item "2.50," and the stop finger 128 swung into effective position for retaining the hammer latch in inoperative position. Thus, the symbol and figure are printed in red. Upon the completion of this cycle, the locating frame 30 and finger 128 are restored. Hence, the following items 136 print in blank. After the last item "4.75" is printed a blank cycle is taken, during which the platen advances in the customary manner, leaving a blank space on the slip. The total key 7 is then depressed. This moves the stop finger 119 into position beneath the latch 121, causing the total signal to print opposite the total "18.00" in black, the locating frame 30 being in its normal or rear position. During the latter part of this total cycle the locating frame 30 is again swung forward preparatory to the printing of the first item 137 of the next group "B." Thus, this item "5.95" together with the symbol is printed in red. During the latter portion of this cycle the locating frame 30 is again restored so that the following items 138 are printed in black. After the last item "1.75" of group "B" is printed, a spacing stroke is taken as before.

the total key 7 again depressed to print the total "15.00," together with the symbol in black.

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 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 is:

1. In a machine of the class described, having a keyboard, a printing mechanism, total control means, a bichrome ribbon, and an adjustable carrier for the ribbon, the combination of means for adjusting the carrier, a locating means for arresting the carrier at its adjusted position, said locating means being movable to two positions, means under the control of the total control means for moving the locating means to one position following the printing of a total of a group of items, and means under the control of the keyboard for restoring said locating means to its initial position following the printing of the first item succeeding the total taking operation.

2. In a machine of the class described, having printing means, total control means, a bichrome ribbon, and a carrier for the ribbon, the combination of projections on said carrier, reciprocable actuating means arranged to operate between the projections in every cycle of operation of the machine, a lug on said carrier, a locating means to engage said lug, said locating means being movable to two positions, means controlled by said total control means to move the locating means to one position when a total of a group of items is taken, and means operated during the first item entering operation following the total taking operation for restoring the locating means to its initial position after the item is printed.

3. In a machine of the class described, having a keyboard, a printing mechanism, total control means, means for enforcing a blank cycle prior to the operation of the total control means, a bichrome ribbon, and a movable carrier for said ribbon, the combination of projections on said carrier, reciprocable actuating means arranged to operate between said projections in every cycle of the machine, a lug on said carrier, an adjustable locating means, spaced notches in said locating means arranged to stop said lug, restoring means connected to said locating means, means operated by said blank cycle enforcing means for rendering the restoring means ineffective, means controlled by the total control means for adjusting the locating means when a total of a group of items is taken, and means for rendering the restoring means effective when the first item of a new group is entered in the keyboard.

4. In a machine of a class described, having a keyboard, a printing mechanism, total control means, a signal type bar, a hammer and hammer latch therefor, a bichrome ribbon, and a movable carrier for said ribbon, the combination of a locating means for said carrier movable into either of two positions, means controlled by the total control means for moving the locating means into one position following the printing of a total of a group of items, means under the control of the keyboard for restoring the locating means to its initial position following the setting up of the first item succeeding said total, and

means controlled by said locating means for rendering said hammer latch ineffective while the locating means is in its moved position, whereby a special symbol is printed opposite said first item.

5. In a machine of the class described, the combination of type bars, a ribbon having more than one color field, a carrier for positioning said ribbon, the carrier acting normally to present a certain field of the ribbon for coaction with said type bars, an adjustable locating means for controlling the movement of the carrier, total control means, means, controlled by the total control means after the total is printed, for adjusting the locating means, means for retaining the locating means in its adjusted position, whereby the carriers may present another field of the ribbon for coaction with the type bars during the printing of the first item succeeding said total, and means for thereafter returning the locating means to normal position.

6. In a machine of the class described, the combination of printing means, a bichrome ribbon, adjustable means for positioning the ribbon, a locating means movable to two positions to control adjustment of the adjustable means, total control means having means for moving the locating means, and means, rendered effective by the indexing of an item, to restore said locating means to its initial position following the printing of said item.

7. In a machine of the class described, the combination of type bars, a bichrome ribbon, means for adjusting said type bars for printing therefrom, adjustable means actuated by said last mentioned means for positioning the ribbon, a locating means to restrain said adjustable means, total control means, means controlled by the total control means for moving the locating means into one position, item entering mechanism, and means controlled thereby for restoring said locating means to its initial position following the printing of the first item succeeding a total taking operation.

8. In a machine of the class described, the combination of reciprocable printing type bars, a bichrome ribbon, a member for positioning the ribbon, means to actuate said ribbon positioning member, an adjustable locating means to control the movement of the ribbon positioning member, total control means, means, controlled by the total control means, for adjusting said locating means, a restoring means for the locating means, and blank cycle enforcing mechanism having means for controlling the operation of the restoring means.

9. In a machine of the class described, having a keyboard, total control means, printing mechanism including a signal printing type bar having a total signal type, a signal type hammer and latch therefor, a bichrome ribbon, and a member for positioning the ribbon, the combination of a part reciprocable in every cycle of the machine, means providing a yieldable connection between said member and said part, a locating means to cooperate with said member to define variable extents of movement thereof, means controlled by the total control means for moving said locating means into one of two positions after a total is printed, means under the control of the keyboard for restoring said locating means to its initial position after the first item following the total has been set up and printed, and means controlled by the locating means to

render the hammer latch ineffective while said first item is printed.

10. In a machine of the class described, amount entering means, total taking control means, printing mechanism including a bichrome ribbon, means for supporting the ribbon for printing in one color during a total taking operation, adjusting means for the ribbon, means, controlled by the total taking control mechanism, for enabling the adjusting means to adjust the ribbon for printing in the other color during the first amount entering operation following the total taking operation, and means for thereafter returning the adjusting means and ribbon to normal position.

11. In a machine of the class described, amount entering means, total taking control means, printing mechanism including a bichrome ribbon, means for supporting the ribbon for printing in one color during a total taking operation, adjusting means for the ribbon, means, controlled by the total taking control means, for

enabling the adjusting means to adjust the ribbon for printing in the other color during the first amount entering operation following the total taking operation, and means, controlled by the amount entering means, for restoring the enabling means to its former position following the printing of said first amount.

12. In a machine of the class described, amount entering mechanism, total control means, means to enforce a blank cycle between an amount entering operation and a total taking operation, printing mechanism including an adjustable bichrome ribbon, adjusting means therefor, means, controlled by the total control means, for enabling the adjusting means to adjust the ribbon during the next succeeding amount entering operation after a total taking operation, and means, controlled by the blank cycle enforcing mechanism, for restoring the enabling means to its former position following its said adjustment.

WALTER A. ANDERSON.