

Oct. 9, 1956

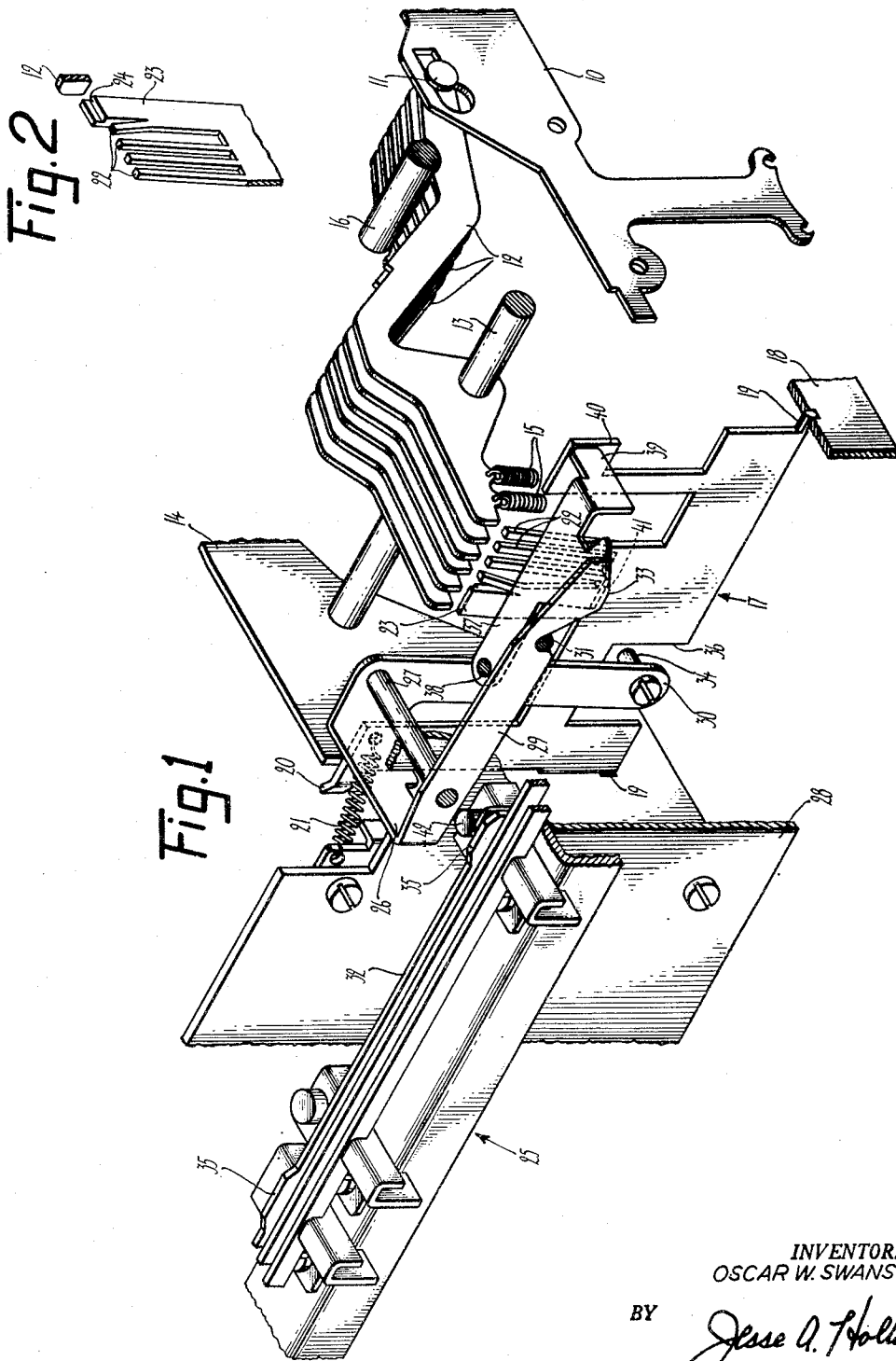
O. W. SWANSON

2,765,736

TYPE BAR CONTROL FOR ACCOUNTING MACHINES

Filed Dec. 22, 1954

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

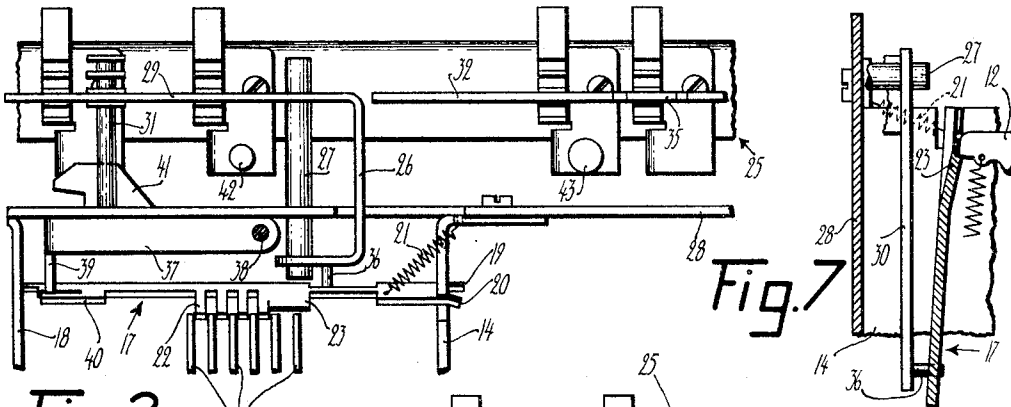


Fig. 3

Fig. 7

Fig. 4

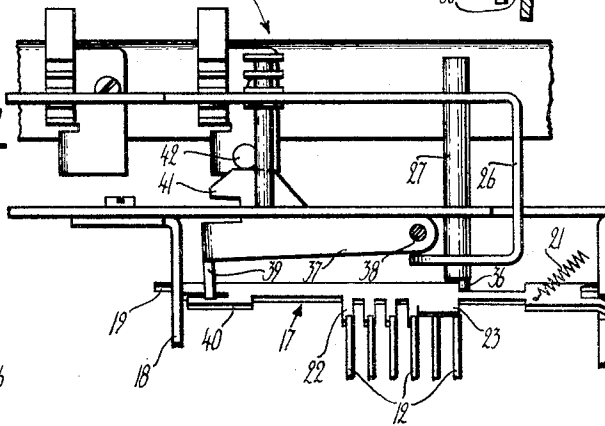


Fig. 5

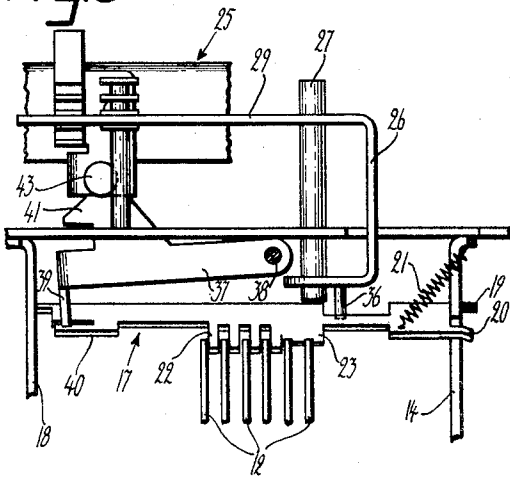


Fig. 6

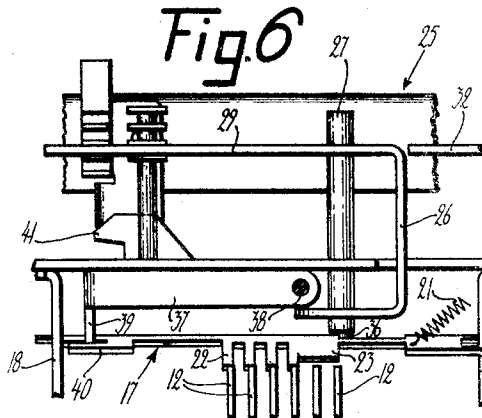
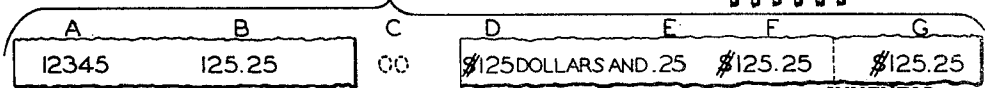


Fig. 8



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2,765,736

TYPE BAR CONTROL FOR ACCOUNTING MACHINES

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5 Claims. (Cl. 101-93)

This invention relates to accounting machines of the type adapted for printing amounts in a plurality of vertical columns and more particularly to mechanism for controlling the operation of the type bars when the machine is operating in different columnar positions. The type of machine in which the invention is particularly useful is exemplified by the well known "Sundstrand" accounting machine.

In the "Sundstrand" machine, as in other machines of that type, the type bars are mounted side by side and are moved during a printing cycle from inactive positions to amount representing positions either under control of amount keys of a keyboard or under control of a register, depending upon whether the amount is being entered or non-added or whether a total is being taken. The present invention does not affect the operation of the type bars during total taking operations but is only concerned with those instances when an amount is being entered or non-added. For example, in making out checks or money orders it is customary to print the amount of the check in such manner that the word "Dollars" separates the cents portion of the amount from the dollars portion and in order to do this with a machine wherein the type bars are mounted side by side it is necessary to provide some means for preventing the operating of the cents type bars during the printing of the dollars portion of the amount and vice versa.

It is the primary object of this invention to provide an improved means automatically operable under control of a movable carriage of an accounting machine for governing the movement of the type bars in a plurality of columnar positions of the carriage.

The means for carrying out the above and other objects, as well as other features and advantages of the invention, will become readily apparent as the description of a preferred embodiment of the invention proceeds.

Referring now to the drawings:

Figure 1 is a perspective view taken from the rear of the machine showing the type bar lifts which normally raise the type bars to amount representing positions and showing the mechanism of the present invention for preventing full operation thereof at certain times,

Figure 2 is a fragmentary perspective view showing a constructional detail of the control mechanism,

Figures 3, 4, 5 and 6 are plan views showing the operation of the mechanism in different columnar positions of the carriage,

Figure 7 is a view partially in side elevation and partially in section showing certain of the parts in the position shown in plan in Figure 4, and

Figure 8 is a diagrammatic showing of the work performed by the machine.

The details of construction and general operation of the machine have not been illustrated because they are not necessary to an understanding of the present invention. However, reference may be had to the patents to Sundstrand, No. 1,965,611 and Swanson, No. 2,650,759 for

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a full disclosure of the machine. In general, as is well known, the operation of the machine involves setting up an amount by means of a ten-key keyboard and depressing a motor bar, whereupon the type bars rise differential amounts from inactive positions and print the set up amount on a work sheet carried by a transversely movable platen.

Referring now to Figure 1, the type bars, not shown, are mounted side by side and are each provided with a rearwardly extending tail portion 10. To the tail portion of each type bar is articulated, by a pin-and-slot connection 11, a type bar lift 12. The type bar lifts are pivotally mounted on a shaft 13 fixed at one end in a stationary plate 14 and at the other end in a stationary member not shown. Springs 15 urge the type bar lifts in a counterclockwise direction about the shaft 13, a bar 16 normally retaining said lifts in the position shown in the drawing in which position the digit types of the type bars are below the printing point. During a cycle of the machine, the bar 16 rises from the position shown in the drawing, thus freeing the type bar lifts 12 to the action of the springs 15 whereupon said springs normally rock the type bar lifts and raise the type bars to positions for printing an amount set up on the keyboard, as described in the above referred to Sundstrand patent. According to the present invention, as will later be described, at times devices are interposed in the path of movement of the type bar lifts to prevent said lifts from moving the type bars or for limiting the extent of movement thereof.

A formed plate 17 is pivotally and slidably mounted between the stationary plate 14 and another stationary member 18 as by means of pintles 19 on said formed plate fitted into openings in the plate 14 and member 18. The upper portion of the formed plate is guided by means of an ear 20 provided thereon cooperating with a cut-away portion of the plate 14, as best shown in Figures 3 to 6. A spring 21 normally holds the formed plate 17 in the position shown in Figures 1, 2 and 3.

A plurality of upstanding fingers 22 and an upstanding portion 23 are provided on the plate 17. In the normal position of the plate the upper ends of the fingers 22 are located between and somewhat below the rearmost ends of certain of the type bar lifts 12 and the portion 23 is located below and rearward of the rearmost ends of two of the type bar lifts, as shown in Figure 3. The two type bar lifts aligned with the portion 23 are the ones which operate the "cents" type bars and the others operate the "dollars" type bars. Particularly in Figure 2 it may be observed that the portion 23 extends higher than the fingers 22 and that it is provided with a step 24 located at the same height as the ends of said fingers. When the upper end of the portion 23 is positioned beneath the two type bars lifts for the "cents" type bars, in a manner presently to be explained, those lifts are not permitted to move and therefore during a cycle the "cents" type bars will be retained in their home positions and will not print. By positioning the portion 23 so that the ends of the type bar lifts contact the step 24 the "cents" type bars will be allowed to rise to "0" position during a cycle. The upper ends of the fingers 22 are sufficiently below the type bar lifts so that when said fingers are positioned in the path of movement of the "dollars" type bar lifts, in a manner to be explained, the "dollars" type bars will rise to their "0" positions.

The printing platen is mounted in a tabulatable paper carriage, not shown, of suitable construction and, as is well known, the carriage moves from one columnar position to another to align various columns of a work sheet with the type bars. A programming means or control plate, generally designated 25 and corresponding to the control carriage 37 of the above referred to patent

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to Swanson, is connected to the carriage for movement therewith as shown in Figure 3 of said patent. As is usual with machines of the type to which this invention relates, the control plate 25 is effective upon a plurality of devices in different columnar positions of the carriage to control the function of the machine, such as addition, subtraction, non-add, etc., the non-add control device being shown in the drawings at 26. In accordance with the present invention, the control plate 25 is also effective to control the operation of the type bars in the different columnar positions of the carriage, as will presently appear.

The non-add control device is in the form of a bail swingably mounted upon a shaft 27 secured in a stationary frame plate 28 and having a generally horizontally extending arm 29 and a vertically extending arm 30. The normal position of the non-add control device is as shown in Figure 1, with the horizontal arm 29 resting upon a pin 31 extending rearwardly from the frame plate 28 and it is operated by an element 32 of the control plate 25 contacting a cam portion 33 provided on the end of said horizontal arm. The particular manner in which non-addition is effected by the control device 26 is not of the essence of the present invention and need not be described.

The lower end of the arm 30 is provided with a pin 34 extending into a cut-out provided in the formed plate 17 and when the cam 33 is contacted by the control element 32 said pin swings freely within said cut-out. However, in certain columnar positions of the carriage a cam 35 is provided on the element 32 and when the cam 35 contacts the cam 33 the control device 26 is swung to such an extent that the pin 34 contacts an edge 36 of the plate 17 and moves said plate laterally far enough to position the fingers 22 beneath the ends of the "dollars" type bar lifts 12, as shown in Figure 6, to thereby restrain the "dollars" type bars from rising above "0" position as aforesaid. The portion 23 of the plate 17, being located rearwardly of the ends of the "cents" type bar lifts, is still ineffective at this time and the "cents" type bars will therefore be free to rise during a cycle to whatever amounts have been entered in those denominations.

It is desirable in other columnar positions of the carriage to prevent the "cents" as well as the "dollars" type bars from rising above "0" and for accomplishing this the following mechanism is provided. A member 37 is mounted upon a stationary pivot 38 and has an arm 39 normally resting lightly against a portion 40 of the formed plate 17. The member 37 is provided with a cam portion 41 extending rearwardly therefrom through a suitable opening in the frame plate 28 into the path of a pin 42 carried by the control plate 25. The pin 42 may be located so as to engage the cam portion 41 in the same columnar position that one of the cams 35 engages the cam 33 of the non-add control device. As shown in Figure 4, when the pin 42 engages the cam portion 41, the member 37 is moved about the pivot 38 so that the arm 39 of said member rocks the formed plate 17 about its pintles 19 to position the step 24 in the path of movement of the "cents" type bar lifts 12 as best seen in Figure 7. As previously mentioned, when the step 24 is in the path of movement of the "cents" type lifts, the "cents" type bars cannot rise above "0." Since the pin 42 is effective in the same column as one on the cams 35, the upper ends of the fingers 22 are beneath the "dollars" type bar lifts and therefore in this column none of the type bars can rise above "0."

It is desirable in some columns to permit the "dollars" type bars to rise above "0" to amount printing positions and to hold the "cents" type bars below "0." This is accomplished by providing a pin 43 on the control plate 25 for that columnar position. The pin 43 is of a larger diameter than the pin 42 and when this pin engages the cam portion 41, the member 37 is swung to a greater extent than it is by the pin 42 with the result that the

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formed plate 17 is swung to a greater extent and the upper end of the portion 23 thereof is positioned beneath the "cents" type bar lifts 12, thereby preventing the "cents" type bars from rising to "0" position, as aforesaid. In this columnar position there is no cam 35 on the control plate and the formed plate 17 will not be moved sideways to position the fingers 22 beneath the "dollars" type bar lifts. This condition is shown in Figure 5.

One example of the usefulness of the above described mechanism may be explained by reference to Figure 8. In this figure the different columns in which the machine operates for making out a money order have been designated by the letters A through G. In column A, the number of the money order is indexed in the machine from the keyboard and printed on a tally during a non-add cycle of the machine. At the end of the cycle, the amount is cleared from the machine by the usual well-known mechanisms. In this column, the control plate has no cam 35 or pins 42 or 43 and the formed plate is therefore in the position shown in Figure 3 and all of the type bars are free to rise to the indexed amount.

After printing the number of the money order, the carriage is tabulated to column B and the amount of the order is indexed by means of the keyboard. In this column the formed plate 17 is also ineffective and the amount is printed as shown in Figure 8 and added into a register in a well-known manner. It is desirable to print this same amount several more times in making out the money order and therefore during the cycle the amount is not cleared from the index mechanism.

As is well known and as is apparent from the above referred to Sundstrand Patent No. 1,956,611, it is necessary in order to reset the carryovers that all type bars be permitted to rise at least as far as "0" during the cycle next following the entry of an amount into a register. In the next printing of the amount the "cents" type bars are going to be held below "0," as will be explained, and therefore provision is made for cycling the machine in a column wherein the type bars are aligned with the bare platen and this column is designated in Figure 8 at C. In this column a cam 35 and a pin 42 are provided on the control plate to move the formed plate 17 to the position shown in Figure 4, thus preventing all type bars from rising above "0" whereas they would otherwise rise to the indexed amount. Only the "cents" type bars print in this column however, the "dollars" being prevented from printing by mechanism explained in the Sundstrand Patent No. 1,965,611.

The money order form has printed on it the words "Dollars and" so that in column D it is desired to print only the dollars portion of the amount. Therefore in this column, the control plate is provided with a large pin 43 but not with a cam 35. The formed plate 17 is thus positioned as shown in Figure 5 and only the dollars portion of the amount will be printed since the "cents" type bars are not permitted to rise even as far as "0" position.

In column E, where the cents position of the amount is to be printed, the control plate is provided with a cam 35 and moves the formed plate 17 to the position shown in Figure 6. In this column, the "dollars" type bars rise to "0" position but the "0's" are prevented from printing by the means described in the Sundstrand Patent No. 1,965,611. The "cents" type bars are of course free to rise to the indexed amount since the portion 23 of the plate 17 does not interfere with the "cents" type bar lifts.

The carriage is then tabulated to column F where the plate 17 is in the Figure 3 position and the amount is printed in a normal manner on the order form. This operation may be repeated in column G so that the amount is printed on the stub of the money order form.

Having thus described a preferred embodiment of the invention, what is claimed is:

1. In a machine of the class described wherein a paper

carriage is movable to a plurality of columnar positions so that amounts may be printed in a plurality of columns and having a set of denominational order type bars mounted side-by-side for movement from inactive positions to digit printing positions; a plurality of spring actuated type bar lifts for moving the type bars to digit printing positions during a cycle of operation of the machine, programming means associated with the paper carriage for controlling the operation of the type bars in different columnar positions of the carriage, a normally inactive device movable to a first position wherein a first portion thereof is interposed in the path of movement of certain of said type bar lifts to prevent any actuation thereof and movable to a second position wherein a second portion thereof is interposed in the path of movement of others of said type bar lifts to limit the actuation thereof, means operable by said programming means in a first column to move said device to said first position, and means operable by said programming means in another column to move said device to said second position.

2. In a machine of the class described wherein a paper carriage is movable to a plurality of columnar positions so that amounts may be printed in a plurality of columns and having a set of denominational order type bars mounted side-by-side for movement from inactive positions to digit printing positions, a plurality of spring actuated type bar lifts for moving the type bars to digit printing positions during a cycle of operation of the machine, a control plate movable with the paper carriage for controlling the operation of the type bars in different columnar positions of the carriage, a normally inactive device movable to a first position wherein a first portion thereof is interposed in the path of movement of certain of said type bar lifts to prevent any actuation thereof and movable to a second position wherein a second portion thereof is interposed in the path of movement of others of said type bar lifts to limit the actuation thereof, a pair of operating means for said device, means on said control plate for engaging one of said operating means in a first columnar position of the carriage to move said device to said first position, and means on said control plate for engaging the other of said operating means in another columnar position of the carriage to move said device to said second position.

3. In a machine of the class described wherein a paper carriage is movable to a plurality of columnar positions so that amounts may be printed in a plurality of columns and having a set of denominational order type bars mounted side-by-side for movement from inactive positions to digit printing positions, a plurality of spring actuated type bar lifts for moving the type bars to digit printing positions during a cycle of operation of the machine, programming means associated with the paper carriage for controlling the operation of the type bars in different columnar positions of the carriage, a normally inactive device movable to a first position wherein a first portion thereof is interposed in the path of movement of certain of said type bar lifts to prevent any actuation thereof and movable to a second position wherein a second portion thereof is interposed in the path of movement of said type bar lifts to limit the actuation thereof, means carried by said programming means operable in a first column to move said device to said first position, means carried by said programming means operable in a second column to move said device to said

second position, and means carried by said programming means operable in a third column to move said device to a third position wherein a third portion thereof is interposed in the path of movement of others of said type bar lifts.

4. In a machine of the class described wherein a paper carriage is movable to a plurality of columnar positions so that amounts may be printed in a plurality of columns and having a plurality of "dollars" and "cents" type bars mounted side-by-side and movable from inactive positions to "0" position and to amount representing positions during a machine cycle, spring actuated "dollars" and "cents" type bar lifts for moving the type bars, a control plate movable with the paper carriage for controlling the operation of the type bars in different columnar positions of the carriage, a pivotally mounted plate adapted to be interposed in the path of movement of said type bar lifts, means on said pivotally mounted plate operable when said plate is in a first position to prevent any movement of the "cents" type bar lifts, means on said pivotally mounted plate operable when said plate is in a second position to limit the movement of said "cents" type bar lifts to an amount sufficient to move the "cents" type bars to "0" position, means operable by said control plate when the carriage is in a first columnar position to move said pivotally mounted plate to its said first position, and said last mentioned means being operable by said control plate when the carriage is in another columnar position to move said pivotally mounted plate to its said second position.

5. In an accounting machine comprising a plurality of "dollars" and "cents" type bars mounted side-by-side for movement from inactive positions to digit printing positions and adapted to print the "cents" portion of an amount at a point substantially removed from the "dollars" portion of the amount and having a traveling carriage for positioning a work sheet in cooperative relation with said type bars; a plurality of spring actuated "dollars" and "cents" type bar lifts for moving the type bars to digit printing positions during a cycle of operation of the machine, a normally inactive device movable to a first position for preventing any movement of the "cents" type bar lifts and to a second position for limiting the movement of the "dollars" type bar lifts to an amount sufficient to raise the "dollars" type bars to their "0" positions, a first operating member for moving said device to said first position, a second operating member for moving said device to said second position, a control plate carried by the traveling carriage of the machine, means on said control plate for engaging said first operating member at the point where the "dollars" portion of an amount is to be printed to thereby move said device to its first position, and means on said control plate for engaging said second operating member at the point where the "cents" portion of the amount is to be printed to thereby move said device to its second position.

References Cited in the file of this patent

UNITED STATES PATENTS

| | | |
|-----------|------------|----------------|
| 1,198,487 | Sundstrand | Sept. 19, 1916 |
| 1,583,102 | Sundstrand | May 4, 1926 |
| 1,747,743 | Sundstrand | Feb. 18, 1930 |
| 1,965,611 | Sundstrand | July 10, 1934 |
| 2,650,759 | Swanson | Sept. 1, 1953 |
| 2,668,659 | Swanson | Feb. 9, 1954 |