

March 20, 1934.

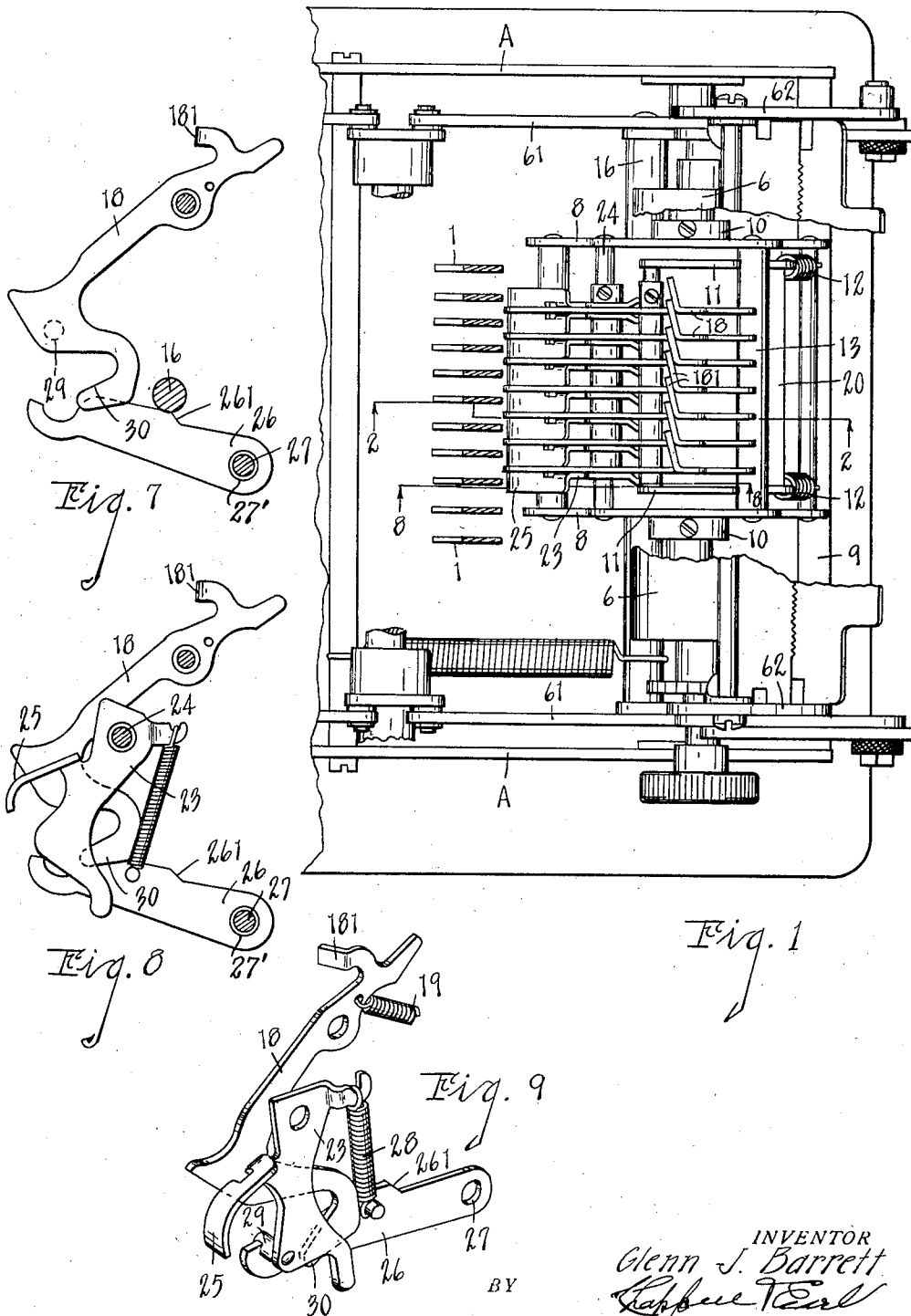
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1,951,592

CIPHER ELIMINATING MECHANISM

Filed April 27, 1931

3 Sheets-Sheet 1



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March 20, 1934.

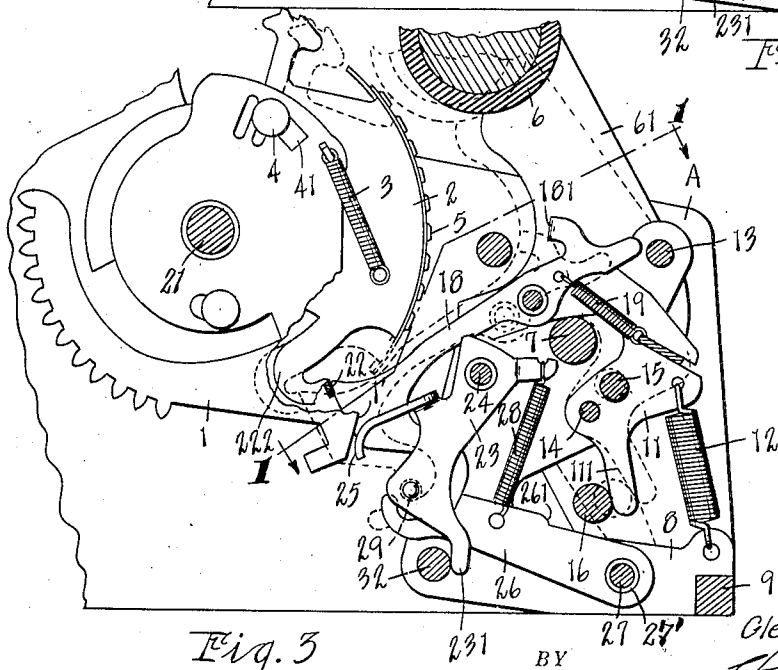
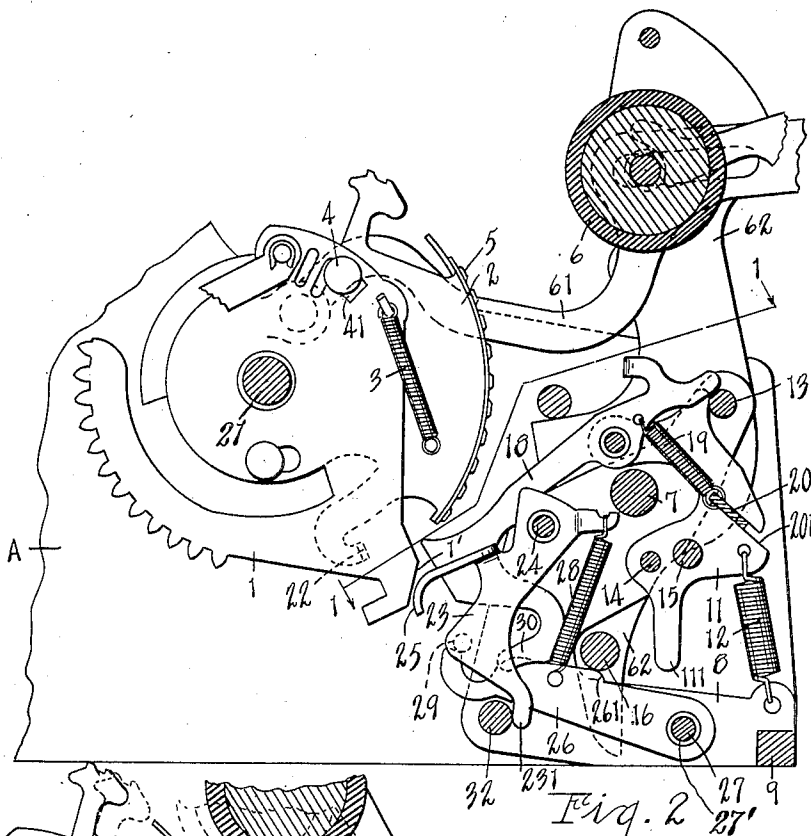
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CIPHER ELIMINATING MECHANISM

Filed April 27, 1931

3 Sheets-Sheet 2



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March 20, 1934.

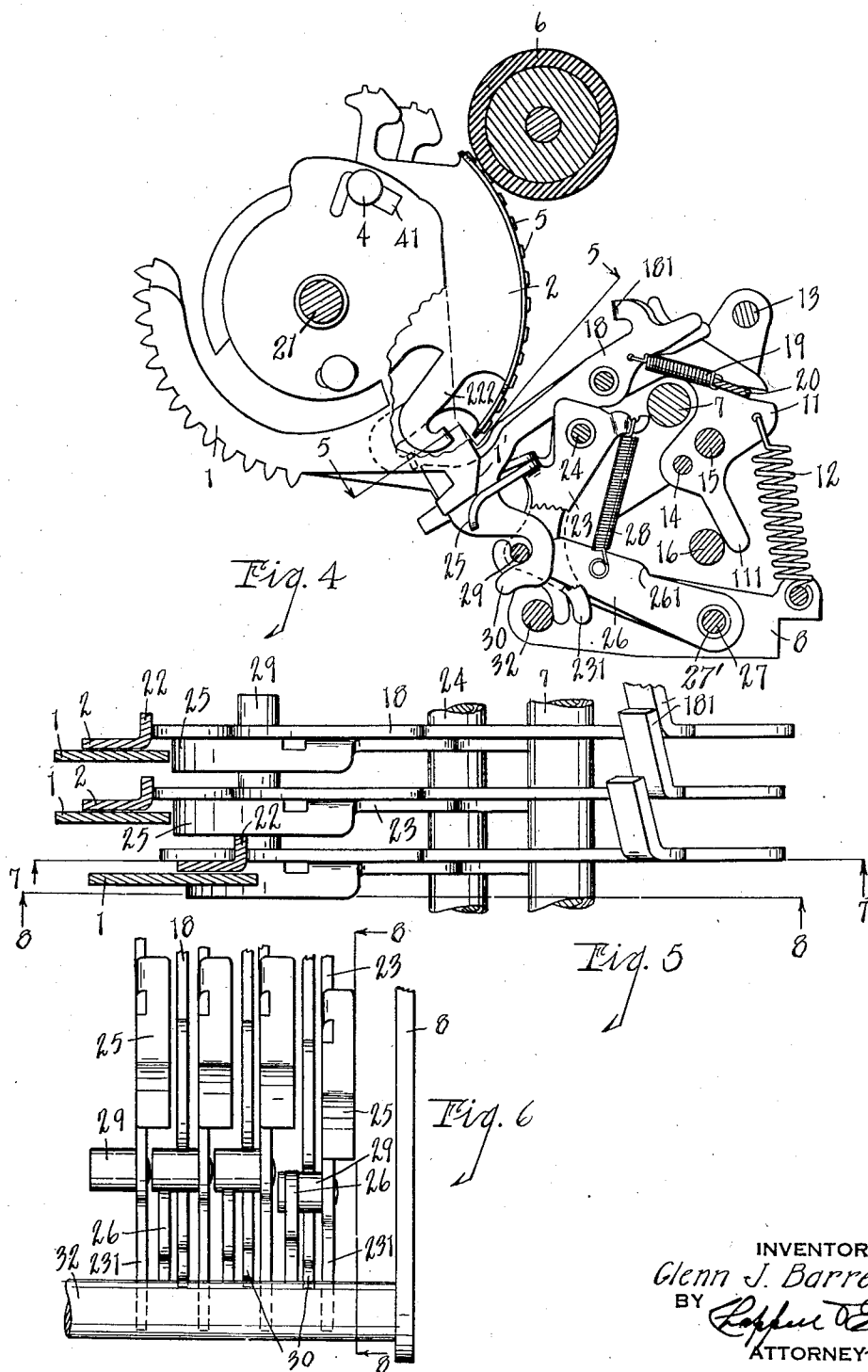
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1,951,592

CIPHER ELIMINATING MECHANISM

Filed April 27, 1931

3 Sheets-Sheet 3



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1,951,592

CIPHER ELIMINATING MECHANISM

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Application April 27, 1931, Serial No. 533,057

12 Claims. (Cl. 101—93)

My invention relates to cipher eliminating mechanism in listing adding machines.

The object of the invention is to provide means for automatically moving all ciphers not required to complete a number printed out of printing position before said printing occurs.

Objects pertaining to details and economies of construction and operation will appear from the description to follow.

My invention is adapted to any standard listing adding machine in which numbers to be added and listed are set up or controlled by keys in a keyboard, and in which during the early operation of the main actuating mechanism, the cipher type are normally positioned in printing position in each denominate column in which no number is to be added.

Standard adding machines of the class described usually are provided with a separate printing means for each individual denominate column, and these printing means are made active or controlled by selective mechanism cooperating with the adding units of each column respectively. That is to say, whenever an adding unit and its cooperating type carrier of any column advances to an adding position beyond the cipher position, the printing mechanism in that particular column and in each column to the right is made active, and by reason of the fact that the ciphers are automatically presented on the printing line prior to the advancing of any adding unit, all ciphers to the right of the digit of highest denomination are caused to leave an impression upon a record paper or tape.

My invention, instead of rendering the printing active to the right of any column in which the adding unit takes an adding position, normally moves the cipher types to the left of the denominationally highest numeral down out of printing range before printing and leaves them in printing position to the right of the said highest numeral, but the printing mechanism is not disturbed in any manner and is left active in all columns.

I have chosen to illustrate my invention as applied to the well known Corona adding machine, and have shown such parts thereof as I deem necessary to clearly show the operation of my invention.

This machine is of the key set class, operated by a main operating mechanism. In it are oscillating adding units for each denominate column in conjunction with which are suitable type carrier segments moving in synchrony therewith when taking an adding position. That is to say,

when the adding unit takes a position to add a 5, the 5 type will be simultaneously positioned at printing point. When there is no adding movement of the adding unit, the cipher is presented at the printing position, the operation of this machine being much like that of any other standard adding machine of its class. In this machine, instead of individual hammers or other means for causing an impression of the number added, the platen bearing the record sheet is brought forward at each operation of the main actuating mechanism and an impression obtained from the type theretofore positioned. The general operation of this style of adding machine is well known and will need no further description than that which the accompanying illustrations and specification give.

A structure embodying the features of my invention is disclosed in the accompanying drawings, in which:

Fig. 1 is a detail plan view of the portions of an adding machine which embodies my improved construction and invention, the same being in section on a line corresponding to line 1—1 of Fig. 3, the central portion of the printing platen being broken away and only fragments of the adding unit mechanism and type carrier segments being shown.

Fig. 2 is an enlarged detail sectional view on line 2—2 of Fig. 1 showing an adding unit and type carrier unit in position, a portion of the type carrier being dotted where it is covered by the adding unit.

Fig. 3 is a similar detail sectional view to Fig. 1 in which the eliminator pawl is shown at the beginning of its action and its final movement with that of the type carrier in position to print a cipher indicated by dotted lines.

Fig. 4 is a similar sectional view showing one of the eliminator dogs in completely depressed position and the relation to the dogs to the left thereof when a numeral is being printed.

Fig. 5 is an enlarged detail plan view of a group of the eliminator dogs and their associated mechanism with one of the dogs depressed.

Fig. 6 is a detail end elevation view of a group of the eliminator dogs, selective trips and actuating means.

Fig. 7 is a detail elevation view of one of the eliminator dogs and the locking latch in relative position.

Fig. 8 is an elevation view of the same parts with the selective trip in place.

Fig. 9 is a perspective view of the eliminator dog and the selective trip and the locking latch

in latched position, the dog being depressed and the locking latch in locked position.

A represents the frame of the machine. 1 is the oscillating actuator of the adding unit. 2 is the type sector associated therewith and carried on the same shaft 21. 3 is the spring which connects the adding unit and associated type carrier segment yielding together. 4 is a stud riveted to the type carrier unit 2 and engaging in slot 41 on the actuator, the slot being of a dimension to admit of the movement of the type sector 2, one space independent of the adding unit.

5 is the cipher type. 6 is the platen and 61 is the connection from the platen for actuating the same.

7 is the cross tie shaft in the main frame A of the machine upon which the platen frame swings. The platen frame 62 swings forward to print in the printing position each time the main operating mechanism is manipulated. Shaft 7 serves as a main support for the main frame of my improved eliminator mechanism. 8, 8 are the side plates of the enclosing frame for the eliminator mechanism. 9 is a square stay rod running across the adding machine, clearly illustrated in Figs. 1 and 3, which serves as a stop to hold the frame of my eliminator mechanism in operative position. 10, 10 are two positioning collars located upon the shaft 7 contacting with the outsides of the said side plates 8 holding the said operating pawls in proper alignment and in cooperating relation with the corresponding adding units and type carrier units.

My eliminator mechanism is made up of a series of eliminator pawls 18 with each of which is associated the necessary trip and lock means. I will describe one of these as the others are identical. Pivotaly mounted within the frame of my mechanism between the side plates 8 are the said eliminating pawls actuating frame composed of side plates 11 which are held in normal position by springs 12.

13 is the stay rod between the side plates 8, 8 which serves also as a rest for the upper ends of the said side plates 11 which are maintained under tension by springs 12. 14 is the pivotal shaft for the eliminator frame. 15 is the main stay rod between said side plates 11. 16 is a stay rod extending between the sides of the pivoted platen supports 62.

In the frame comprising the side plates 11 are the said series of eliminating pawls 18, the rear upper ends of which normally rest against the said tie rod 13. Each pawl 18 is under the tension of its individual spring 19 which is attached at one end to the pawl and at the opposite end to the transverse plate 20. The side pieces 11 are slotted at 201 to receive the said plate 20, so that the same can be very readily assembled. The said frame is actuated by the movement of the shaft 16, there being downwardly projecting fingers 111 on the said plates 11 for that purpose. In Fig. 3 the swinging action is illustrated showing the contact of the shaft 16 with the downwardly projecting arms 111, the dotted lines showing the position and the movement. These parts are so timed that the frame 11 does not start to move until after some adding unit shall have taken an adding position of one or more adding spaces for reasons hereinafter explained. These pawls 18 cooperate with their corresponding type carriers.

Upon each type carrier 2 is disposed an ear 22 at right angles thereto shown in Figs. 3 and

6. Said ear extends towards the left from a gooseneck portion 222 on each type carrier 2. When there has been no number set up in the machine or in the column wherein nothing is set up to be added, when the main operating mechanism is operated, the shaft 16 strikes the arm 111 of the frame 11 and the eliminating pawls 18 are forced forward. The spring 19 tends to keep the forward contact ends of said pawls up in engaging position for the said ears 22 to actuate the type segment 2. The parts are so arranged and timed that this advance of these pawls 18 does not take place until after the adding units that have been set up have had time to start their movement towards an adding position. On those that do not move to an adding position, the contact ends of said pawls 18 strike ears 22 respectively upon their cooperating type carriers and force said type carriers back to a non-printing position, occupied by such parts when the machine is at rest.

Thus it will be clearly seen that in the event an adding unit does not advance to any adding position, its cooperating type carrier will be forced back the distance of one adding space to a non-printing position before printing occurs. This depresses and lowers the cipher type so that it makes no impression on the record sheet or tape, see dotted position in Fig. 3.

My improvement includes means for automatically selecting which ciphers are to be moved automatically out of printing position. 23 are the pivoted selector arms, one arranged in proximity to each cooperating eliminator pawl 18. The selector arms are pivoted upon a shaft 24 and carry a cam face 25 against which a beveled portion 1' on the corresponding adding unit is adapted to contact whenever the said adding unit passes to the "1" adding position or beyond it. 29 are studs or pins carried by and extending towards the left side of each selector arm 23, as clearly seen in Figs. 5, 6 and 9. These studs serve two purposes. One purpose is to act as an engaging means when an adding unit "1" forces its cooperating selector arm 23 back, as illustrated in Figs. 5 and 9.

There are engaging latch pawls corresponding to each pivoted selector arm, a description of one of which will suffice for all. 26 is an engaging latch pawl normally held out of engaging position by the shaft 16, as seen in Fig. 1, which shaft acts upon cams 261 on each latch to depress it. These engaging pawls 26 are pivoted upon a shaft 27 being perforated at 27' therefor and are held in normal up position by springs 28 extending from the selector arms 23 to said engaging pawls 26.

When the shaft 16 passes towards the rear, it releases the engaging latch pawl 26 after the selector arms 23 are moved to the position back of cams 261 shown in Figs. 5, 6 and 9, so that if engaging pawl 26 becomes active it engages its pin 29 and restrains the corresponding selector arm 23.

Each eliminator pawl 18 carries a hooked cam 30 towards its engaging end. When no number is set the cooperating eliminator pawl 18 normally advances, first engages the ear 22 on the type carrier 2 and pushes it back until the cam arm 30, see Fig. 4, passes under the stud 29 and travels along the same. This action allows the forward end of said eliminator pawls to have sufficient contact surface with its respective cooperating ear 22 to move the latter as previously described

and moves the cipher type out of printing position.

If, however, an adding unit in the column has been operated, it cooperates with selector arm 23, causing it to be moved to the position shown in Fig. 9, where it is engaged by the latch pawl 26. The said pin 29 swings into position where it coacts with the cam 30 on the eliminator pawl 18 during the early portion of the movement of said pawl 18 forwardly, as previously described, in which case the forward contact end of the eliminator pawl 18 is down and does not engage and cooperate with the ear 22 on the type carrier 2. This swings the said pawl 18 to inoperative position and permits printing of its cooperating cipher type to occur.

On each eliminator pawl 18 near its upper end is a lateral lug 181 disposed at an oblique angle and projecting to the left, all in close proximity and identical and overlapping. When any pawl 18 is acted upon by reason of contact with its cooperating pins 29, it consequently, through these lugs 181, reacts upon and suppresses all the pawls to the right thereof and insures the printing of the cipher on all of those right hand columns in which numbers have not been depressed.

Thus no printing occurs at the left of any number depressed and all ciphers at the right are automatically printed where needed.

A cross tie rod shaft 32 serves as a rest for the selector arms which are provided with a downwardly projecting finger 231 for that purpose.

That the operation of my machine may be understood I will describe the printing after there has been set up in the machine \$10,204.00.

It will be observed that the two type carriers at the right corresponding to the cents column are not provided with my improved eliminator devices, for the reason that there should be here always printed the ciphers in the event that a number has not been struck up in those columns.

When the machine is actuated, the platen frame of course is drawn forward and because it pivots on the shaft 7 it swings the tie rod or shaft 16 towards the right, as seen in Fig. 2. This releases all the locking latches 26. When the frame is moved back the latches are all cammed down by the shaft 16.

The type actuators in the column of the tens of thousands and of the hundreds and of the units operate upon their respective selector arms 23 which, when they move rearwardly, are at the proper point locked in place by their respective latches holding down the pins 29. As the platen frame continues to rock forward the shaft 16 strikes the arm 111 on the eliminator carrying frame, swinging it forward. The eliminator pawl of the tens of thousands column, of the hundred column, and of the units column, will be depressed so that they will not engage the lugs 22 on the corresponding type carrier segments 2, thus permitting these type carrier segments to be actuated to the appropriate numerals. Because of the lugs 181 on the eliminator pawls 18, all such pawls to the right hand of the tens of thousands column will be actuated and depressed, and if no numbers have been set up in the columns to the right of said tens of thousands column, ciphers will be printed in them. On all numbers to the left of the tens of thousands column, the eliminator pawls 18 will not be depressed and will engage the lugs 22 on the type carriers and carry the printer segments to a non-printing

position, swinging the same in effect one space beyond the cipher point.

When the platen is moved back, the shaft 16 engages the cams 261 on the latches 26, depresses all the latches and releases the eliminators ready for the next actuation.

It will thus be seen that all ciphers to the right of the highest numeral denominationally will be automatically printed unless there is a number positioned in a particular column toward the right and that all type segments to the left will be moved to a non-printing position.

I have described my machine particularly with the movable platen for printing which I desire to claim specifically in this behalf. The type carriers are on the arcs of a circle but they clearly could be of any operable form.

My invention also is adapted for use with the machines which employ hammers as the printing means which I do not deem it necessary to illustrate in this behalf.

With this explanation I would state that it is my desire to claim the invention in the specific form illustrated and also broadly as pointed out in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a listing adding machine having a main operating mechanism, printing mechanism, and sets of positionable type carriers with type from 0 to 9, inclusive, arranged in denominate columns, a cooperating movable platen to take impressions from said type, a control means comprising an oscillating frame supported in the said machine, a series of eliminator pawls carried by the said frame, each pawl connected to move a corresponding type carrier of said printing mechanism to a non-printing position and each pawl having a laterally projecting lug extending to the left above and in close proximity to the adjacent pawl, each eliminator pawl being provided with a cam arm, a selective trip to cooperate with the corresponding type actuator having a cam pin adapted to cooperate with said cam arm, a lock pawl for each selective trip adapted to engage said cam pin to lock the eliminator in operative position to print any set-up number or to automatically print the cipher, each lock pawl having a cam to cooperate with the operating means to release the said lock pawls on the completion of the printing operation.

2. In a listing adding machine having a main operating mechanism, printing mechanism, and sets of positionable type carriers with type from 0 to 9, inclusive, arranged in denominate columns, impression means, a control means comprising an oscillating frame supported in the said machine, a series of eliminator pawls carried by the said frame, each pawl connected to move a corresponding type carrier of said printing mechanism to a non-printing position and each pawl having a laterally projecting lug extending to the left above and in close proximity to the adjacent pawl, each eliminator pawl being provided with a cam arm, a selective trip to cooperate with the corresponding type actuator having a cam pin adapted to cooperate with said cam arm, a lock pawl for each selective trip adapted to engage said cam pin to lock the eliminator in operative position to print any set-up number or to automatically print the cipher, each lock pawl having a cam to cooperate with the operating means to release the said lock pawls on the completion of the printing operation.

3. In a listing adding machine having a main operating mechanism, printing mechanism, and sets of positionable type carriers with type from 0 to 9, inclusive, arranged in denominate columns, a cooperating movable platen to take impressions from said type, a control means comprising an oscillating frame supported in the said machine, a series of eliminator pawls carried by the said frame, each pawl connected to move a corresponding type carrier of said printing mechanism to a non-printing position, and each pawl having a laterally projecting lug extending above and in close proximity to the adjacent pawl, each eliminator pawl being provided with a cam arm, a selective trip to cooperate with the corresponding type actuator having a cam pin adapted to cooperate with said cam arm, and automatic lock means for said selective trips.

4. In a listing adding machine having a main operating mechanism, printing mechanism, and sets of positionable type carriers with type from 0 to 9, inclusive, arranged in denominate columns, impression means, a control means comprising an oscillating frame supported in the said machine, a series of eliminator pawls carried by the said frame, each pawl connected to move a corresponding type carrier of said printing mechanism to a non-printing position and each pawl having a laterally projecting lug extending to the left above and in close proximity to the adjacent pawl, each eliminator pawl being provided with a cam arm, a selective trip to cooperate with the corresponding type actuator having a cam pin adapted to cooperate with said cam arm, and automatic lock means for said selective trips.

5. In a listing adding machine having a main operating mechanism, printing mechanism, and sets of positionable type carriers with types from 0 to 9, inclusive, arranged in denominate columns, a cooperating movable platen to take impressions from said type, a control means comprising an oscillating frame supported in the said machine, a series of eliminator pawls carried by the said frame, each pawl connected to move a corresponding type carrier of said printing mechanism to a non-printing position and each pawl having a laterally projecting lug extending to the left above and in close proximity to the adjacent pawl, each eliminator pawl being provided with a cam arm, and a selective trip to cooperate with the corresponding type actuator having a cam pin adapted to cooperate with said cam arm.

6. In a listing adding machine having a main operating mechanism, printing mechanism, and sets of positionable type carriers with type from 0 to 9, inclusive, arranged in denominate columns, impression means, a control means comprising an oscillating frame supported in the said machine, a series of eliminator pawls carried by the said frame, each pawl connected to move a corresponding type carrier of said printing mechanism to a non-printing position and each pawl having a laterally projecting lug extending to the left above and in close proximity to the adjacent pawl, each eliminator pawl being provided with a cam arm, and a selective trip to cooperate with the corresponding type actuator having a cam pin adapted to cooperate with said cam arm.

7. In an adding machine having a main operating mechanism adapted to reciprocate, oscillating adding actuators, a printing mechanism, sets of type 0 to 9 inclusive mounted upon positionable type carriers and arranged in denominate columns, and having a reciprocating move-

ment normally in synchrony with the movement of said adding actuators for placing numeral type in printing position and for returning to normal cipher printing position during the operation of said main operating mechanism, the combination of means for effecting an excess movement of said oscillating type carriers out of said normal cipher printing position independent of the movement of said adding actuators, comprising contact pawls pivotally mounted in a swinging frame, connections between said swinging frame and said main operating mechanism, a contact means carried by each of said type carriers normally in the path of travel of said contact pawls respectively during the movement of said swinging frame, and a spring for returning said type carriers to normal cipher printing position during the return of said contact pawls to normal position after the operation of said printing mechanism; means for rendering said contact pawls inoperative as to effecting said excess movement of said type carriers, in all columns to the right of any column in which a type carrier is in any numeral printing position from 1 to 9 inclusive, comprising pivoted guide arms for directing the actuating movement of each of said contact pawls, a cam carried by each of said adding actuators adapted to contact with and move the said guide arm for its cooperating type carrier contact pawl when said adding actuators move to position any of said numeral types for printing, a latch to retain said guide arms when positioned by said cams, and a contact guiding means carried by each of said guide arms respectively for deflecting its cooperating contact pawl from its normal operative path of travel during the movement of said swinging frame when said guide arms are retained by said latch; means carried by each of said contact pawls whereby a said deflection of one causes a like deflection of all of said contact pawls to the right thereof; means for resetting said guide arms in normal position after the operation of said printing mechanism; and means for retaining said contact pawls out of contact relation to said type carriers when said reciprocating main operating mechanism is at normal position and until any type carrier shall have been positioned one numeral space higher than normal.

8. In an adding machine having a main operating mechanism adapted to reciprocate, oscillating adding actuators, a printing mechanism, sets of type 0 to 9 inclusive mounted upon positionable carriers and arranged in denominate columns, and having a reciprocating movement normally in synchrony with the movement of said adding actuators for placing said numeral type in printing position and for returning to normal cipher printing position during the operation of said main operating mechanism, the combination of means for effecting an excess movement of said type carriers out of said normal cipher printing position independent of the movement of said adding actuators, comprising contact pawls mounted in a movable frame normally out of the path of travel of said type carriers, contact means carried by said type carriers respectively normally in the operative path of travel of said contact pawls when said type carriers are at normal cipher printing position, means for actuating said movable frame, and means for returning said type carriers after said excess movement thereof to said normal cipher printing position after the operation of said printing mechanism; means for rendering said contact pawls inoperative as to

causing said excess movement of said type carriers comprising a movable guide for directing the operative movement of said contact pawls respectively, means for altering the position of said movable guides controlled by the movement of said type carriers to a numeral printing position, means for retaining said movable guides when moved out of normal position, means carried by said movable guides for deflecting the normal path of travel of said contact pawls respectively, to an inoperative position when said guides are held out of normal position, means for resetting said guides after the operation of said printing mechanism, and means carried by each contact pawl whereby a deflection of any one from normal operative path of travel causes a like deflection of all of said pawls to the right thereof.

9. In an adding machine having a main operating mechanism adapted to reciprocate, oscillating adding actuators, a printing mechanism, sets of type 0 to 9 inclusive mounted upon positionable carriers and arranged in denominate columns, and having a reciprocating movement normally in synchrony with said adding actuators for placing said numeral type in printing position and for returning same to normal cipher position during the operation of said main operating mechanism, the combination of means for producing an excess movement of said type carriers independent of said adding actuators for moving said type carriers out of cipher printing position during the early portion of the movement of said main operating mechanism and prior to the operation of said printing mechanism, comprising contact pawls mounted in a movable frame and normally held out of contact relation to cooperating type carriers, contact means carried by each of said type carriers to cooperate with said contact pawls when said type carriers are in said cipher position, means for moving said contact pawls to cause a movement of cooperating type carriers which shall have remained in said cipher position after a sufficient movement of said main operating mechanism to position a numeral type for printing and before the operation of said printing mechanism; means for returning said type carriers to cipher position after the operation of said printing mechanism; means for rendering said contact pawls inoperative as to causing said excess movement in columns to the right of a column wherein a numeral type shall have been positioned during said portion of said movement of said main operating mechanism, comprising a deflecting means cooperating with said contact pawls respectively for directing contact pawls away from cooperating type carriers, and positionable during the movement of a cooperating type carrier to position a numeral for printing, means for retaining said deflecting means when placed in deflecting position until after the operation of said printing mechanism, and means carried by each of said contact pawls whereby the deflection of one deflects all to the right thereof away from cooperative action with respective type carriers.

10. In an adding machine having a main operating mechanism adapted to reciprocate, oscillating adding actuators, a printing mechanism, sets of type 0 to 9 inclusive mounted upon positionable carriers and arranged in denominate columns, and normally movable in synchrony with said adding actuators for positioning numerals in printing position and for returning same to normal cipher position during the operation of said main operating mechanism, the combination of means for moving said type car-

riers out of printing position during the early movement of said main operating mechanism in columns wherein said type carriers are detained at said cipher printing position, comprising movable contact means for each type carrier normally out of contact relation with said type carriers respectively and means for bringing said contact means into contact with any of said type carriers after same have been detained at cipher printing position and after a sufficient movement of said main operating mechanism to position said type carriers in a numeral printing position; and means for rendering said movable contact means inoperative as to positioning said type carriers out of printing position in all columns to the right of a type carrier which shall have moved to a numeral printing position during said early portion of the movement of said main operating mechanism, comprising a deflecting means for each of said movable contact means positionable during the movement of its cooperating type carrier to a numeral printing position, and means carried by said movable contact means into an inoperative position with reference to its cooperating type carrier to cause a like deflection of all of said movable contact means to the right thereof.

11. In an adding machine having a main operating mechanism adapted to reciprocate, oscillating adding actuators, a printing mechanism, sets of type 0 to 9 inclusive mounted upon positionable type carriers and arranged in denominate columns and normally movable in synchrony with said adding actuators for placing numeral type in printing position and for returning same to normal cipher position during the operation of said main operating mechanism, the combination of movable contact pawls for moving each of said type carriers out of printing position which are detained at said cipher printing position after a movement of said main operating mechanism sufficient for normally positioning said type carriers at a numeral printing position; and means for rendering said movable contact pawls inoperative in columns to the right of any column wherein a type carrier shall have moved to a numeral printing position during said movement of said main operating mechanism, comprising a deflecting means positioned during the movement of said type carrier to a numeral printing position, connections from said deflecting means to said movable contact pawls, and means carried by said movable contact pawls whereby the deflection of any one of them into an inoperative position causes a like deflection in all of said movable contact pawls to the right thereof.

12. In an adding machine having a main operating mechanism adapted to reciprocate, oscillating adding actuators, a printing mechanism, sets of type 0 to 9 inclusive mounted upon positionable carriers and arranged in denominate columns, and normally movable in synchrony with said adding actuators for positioning said type in printing position and for returning same to normal cipher position during the operation of said main operating mechanism, the combination of individual cipher eliminating means cooperating with each of said respective type carriers for moving same out of printing position if not advanced to a numeral printing position during the early portion of the movement of said reciprocating main operating mechanism, said eliminating means being normally out of engaging relation to said type carriers respectively; and means for rendering said cipher eliminating

means inoperative in columns to the right of any column in which a carrier shall have advanced to printing position during said early movement of said main operating mechanism, comprising a
5 deflecting means for said eliminating means for each respective column, means for positioning said deflecting means during the positioning of a type carrier in a numeral printing position, and means carried by said individual eliminating means whereby the deflection of one by the positioning of said deflecting means also deflects all to the right thereof.

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10	85
15	90
20	95
25	100
30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145