

July 8, 1941.

H. P. ELLIOTT

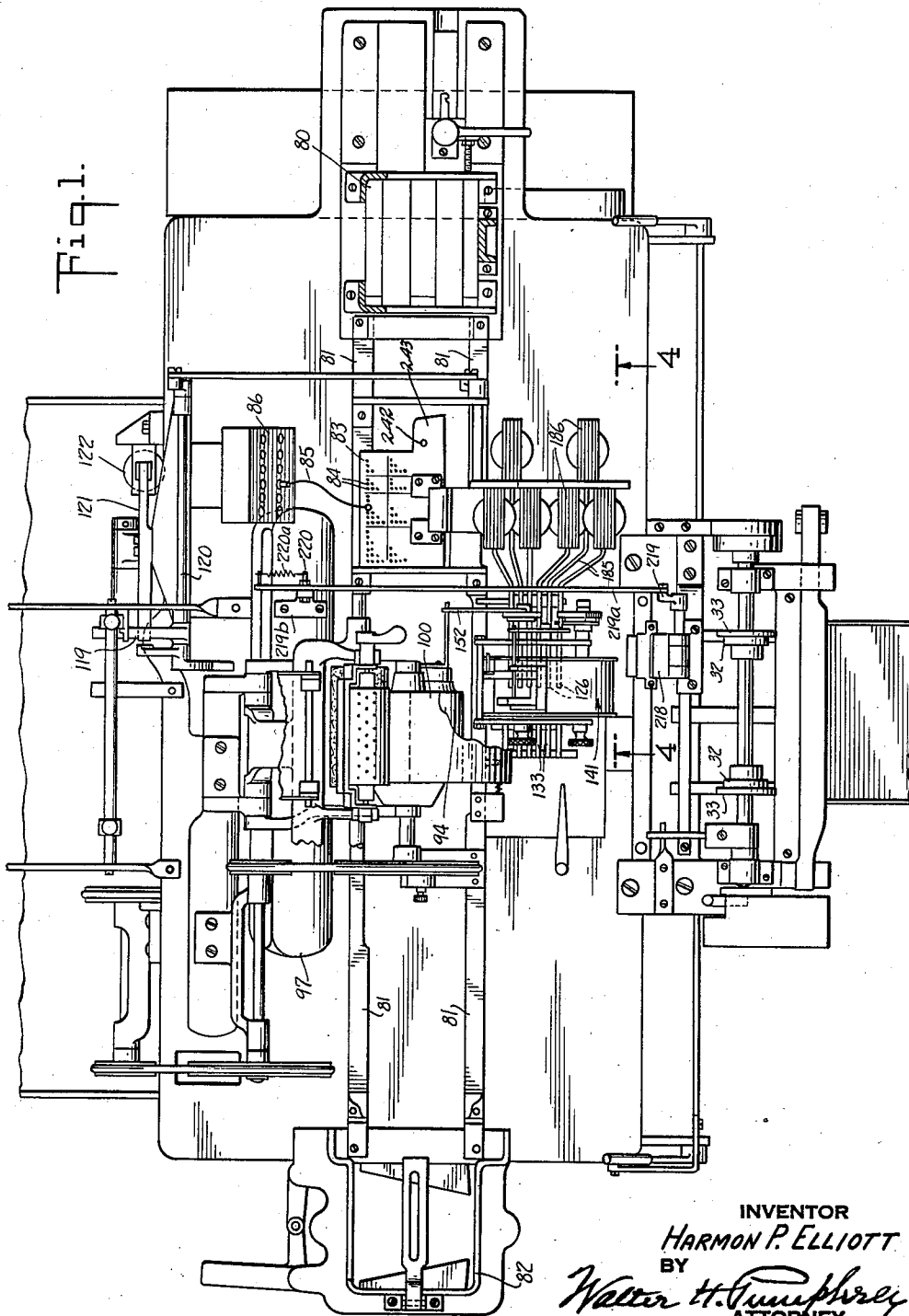
2,248,403

STATEMENT PRINTING MACHINE

Filed June 11, 1940

12 Sheets-Sheet 1

Fig. 1.



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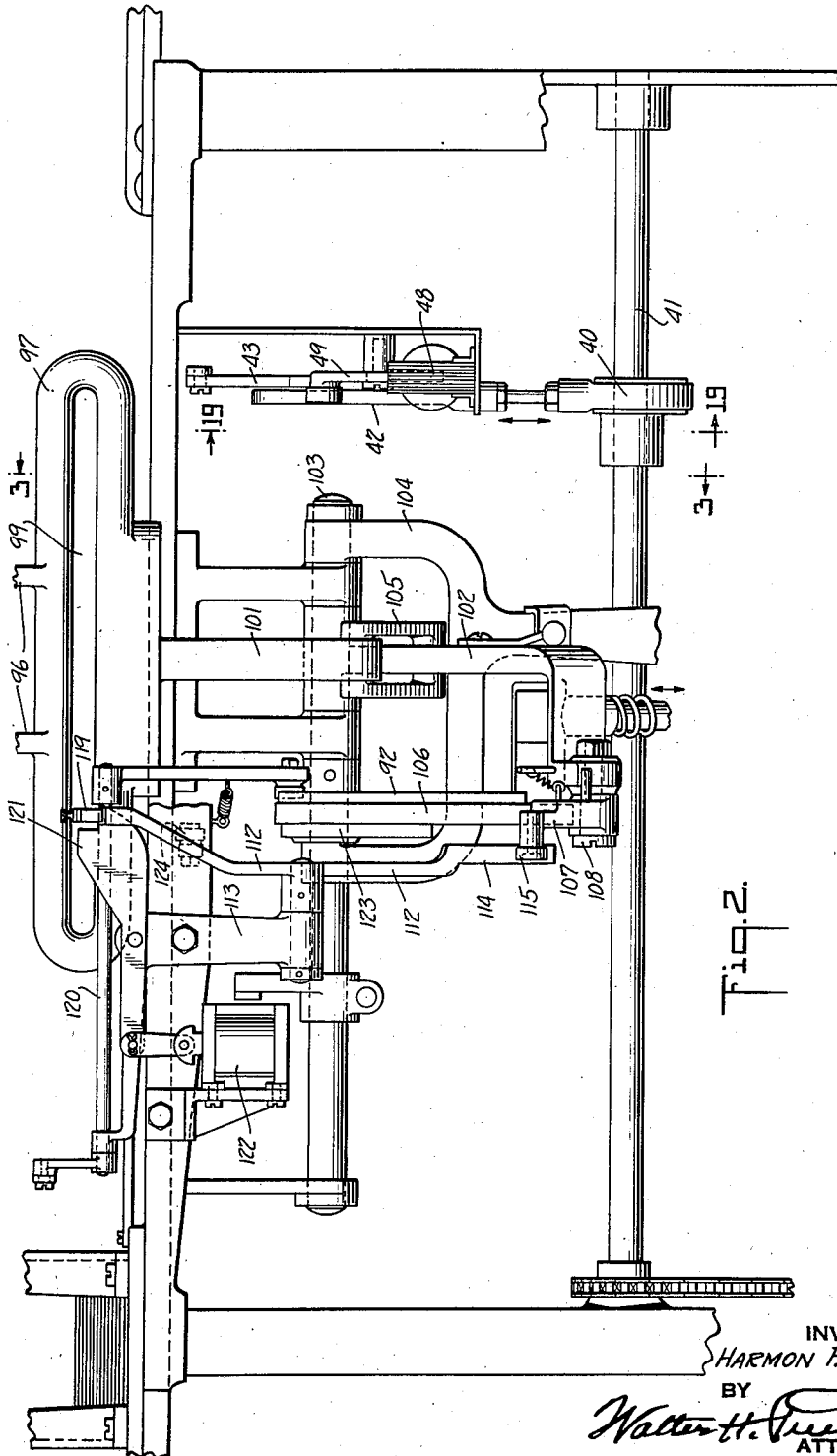


Fig. 2.

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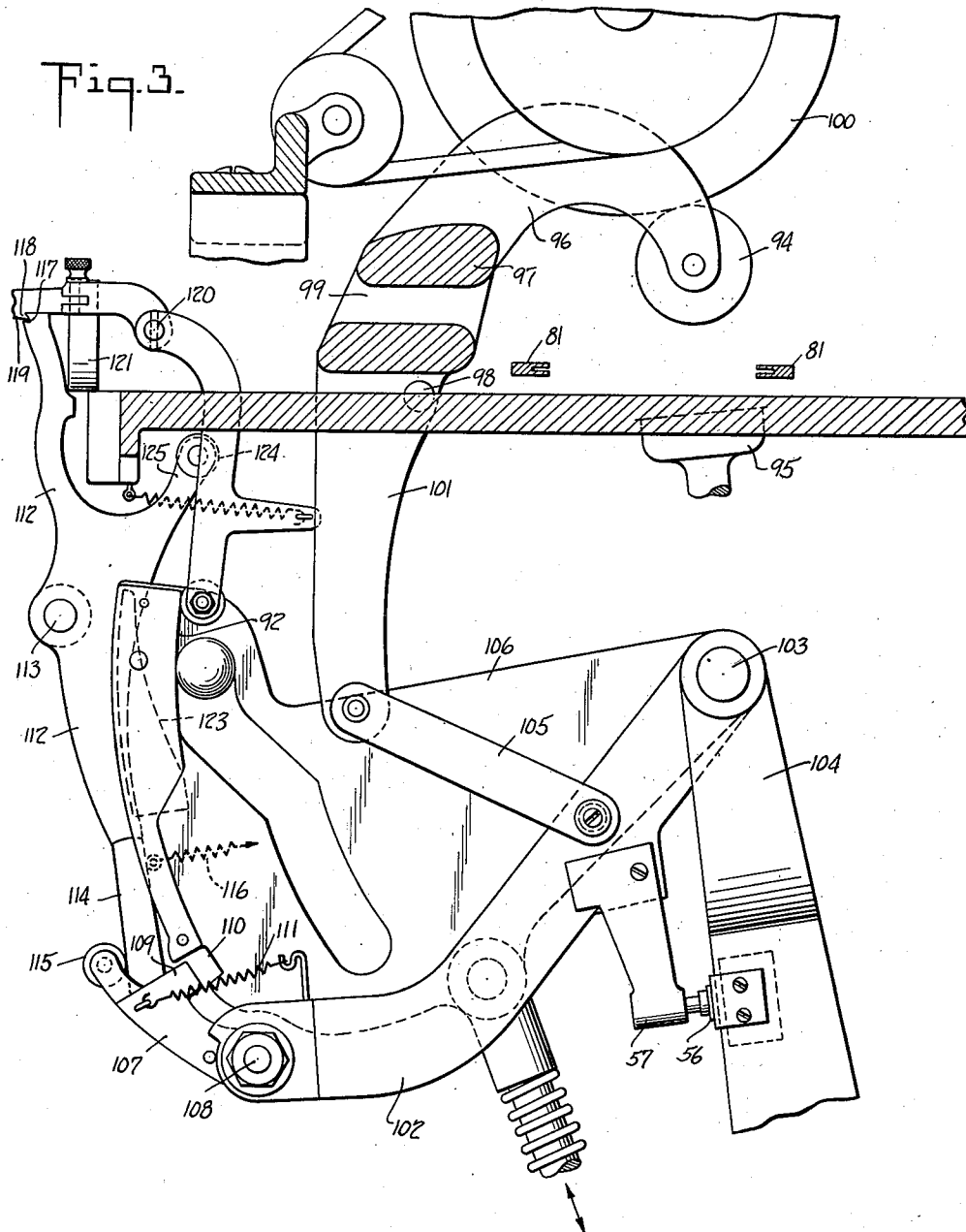
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STATEMENT PRINTING MACHINE

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Fig. 3.



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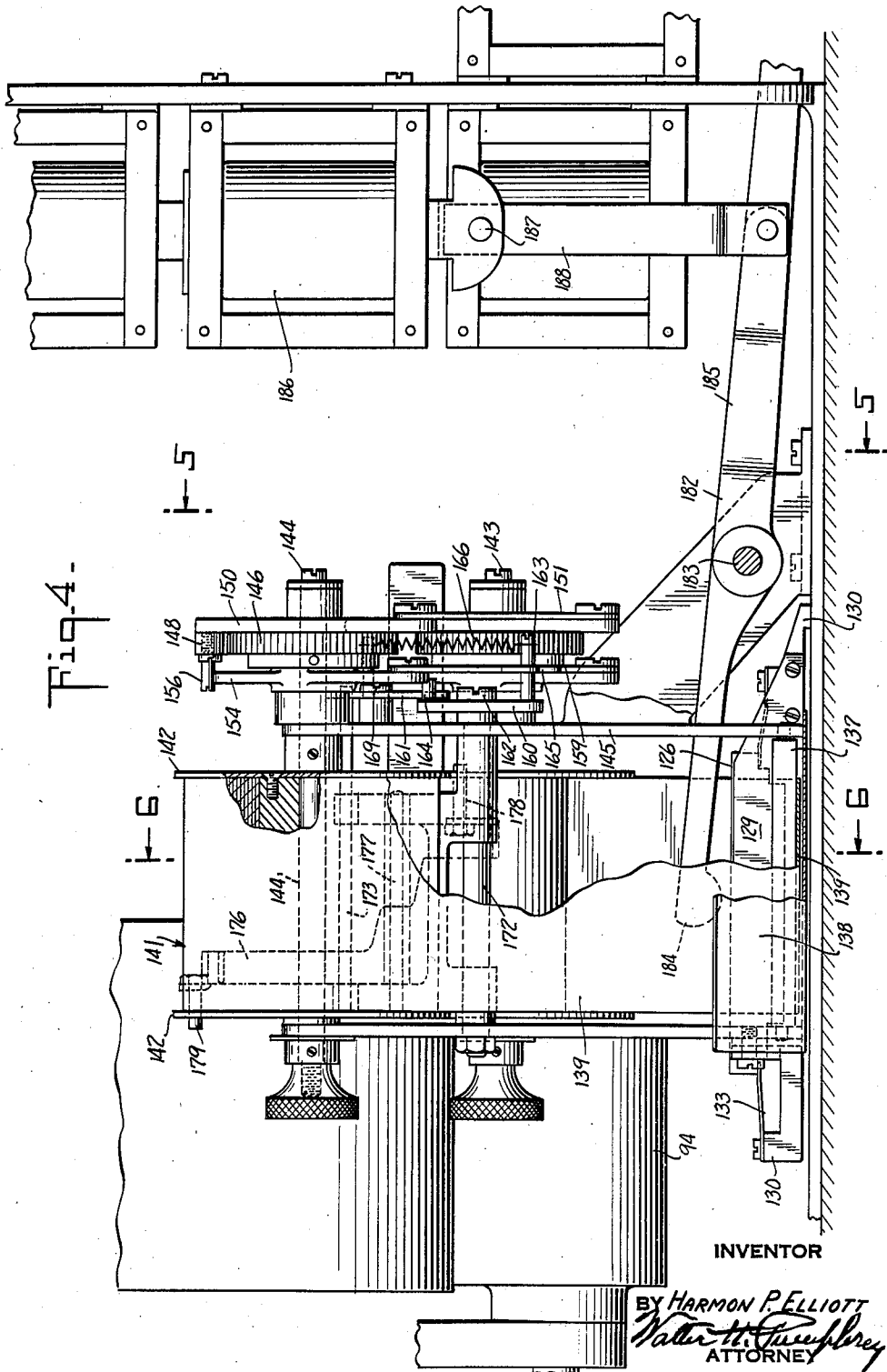
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Fig. 5.

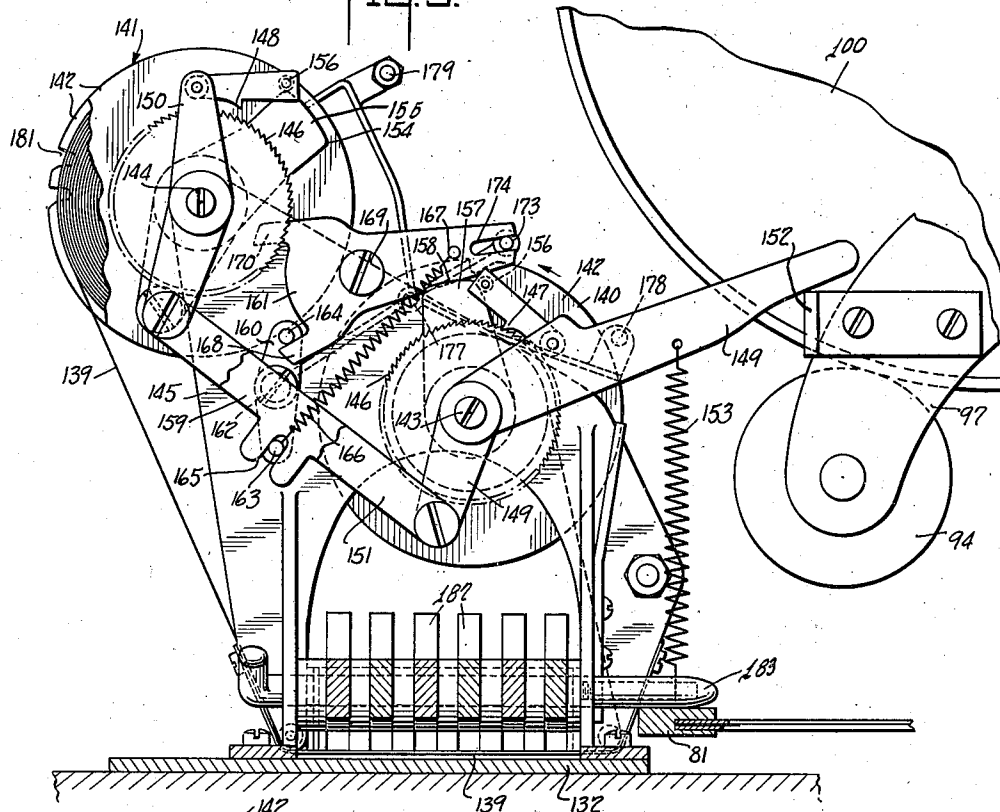
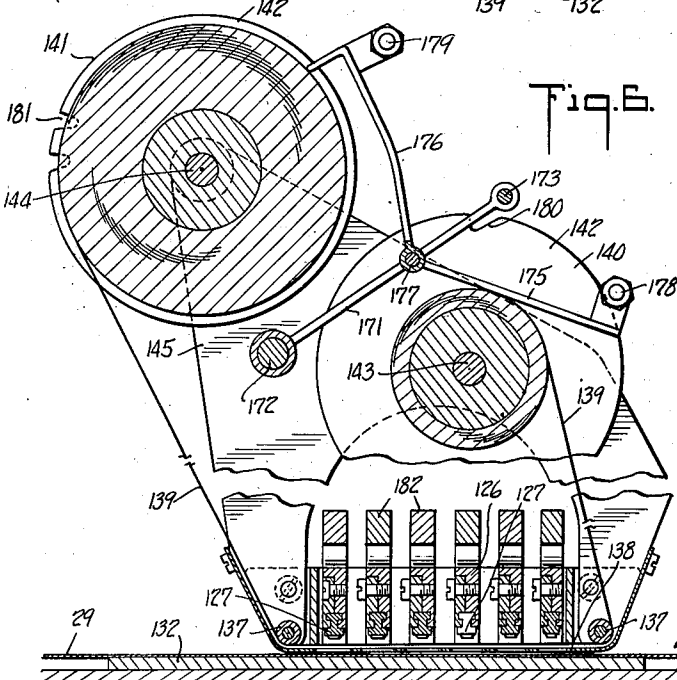


Fig. 6.



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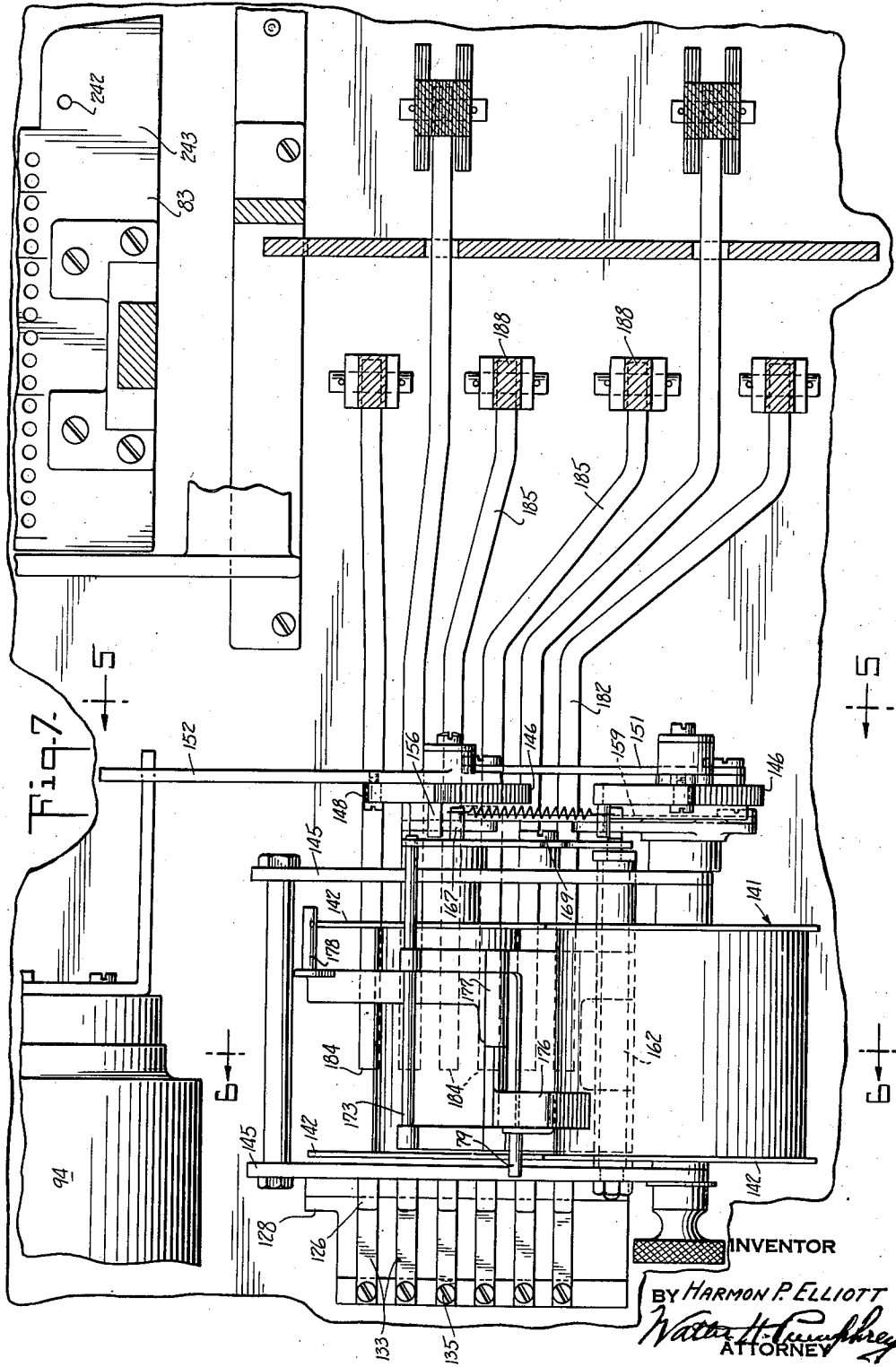
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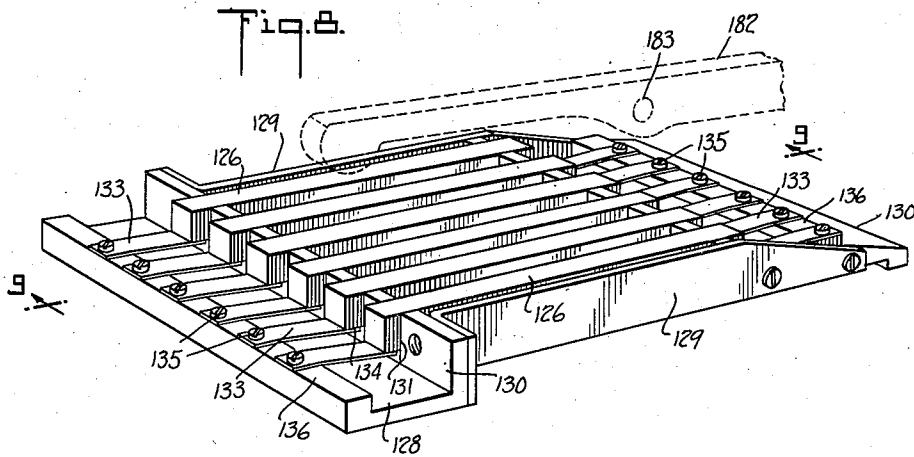
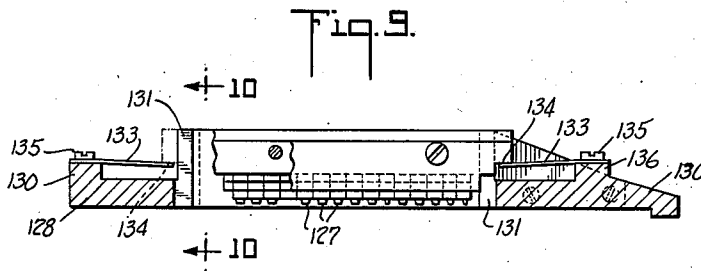
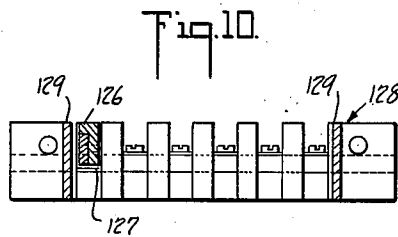
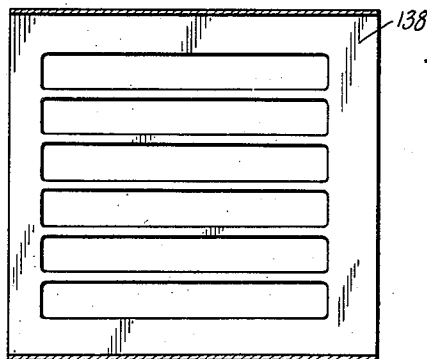
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STATEMENT PRINTING MACHINE

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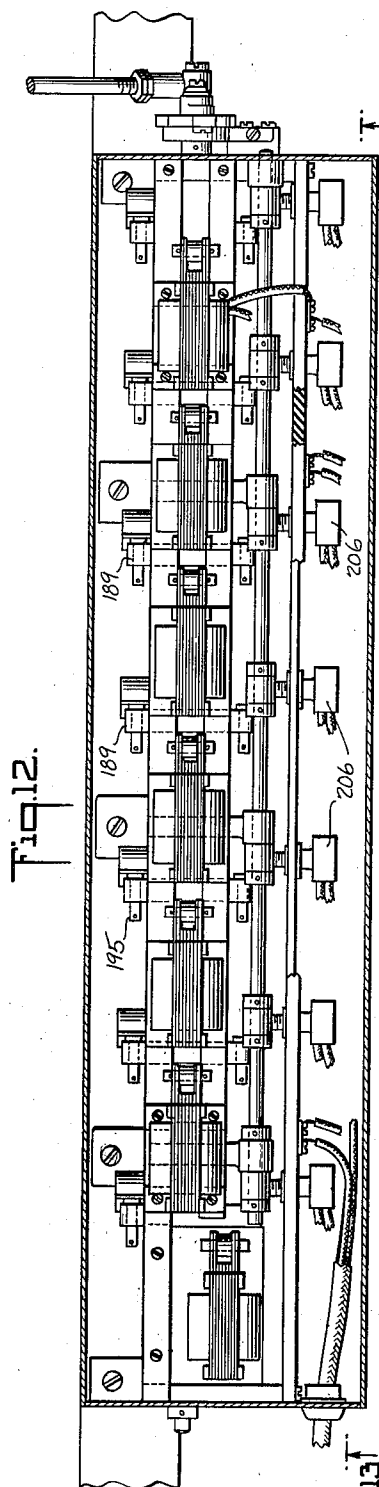
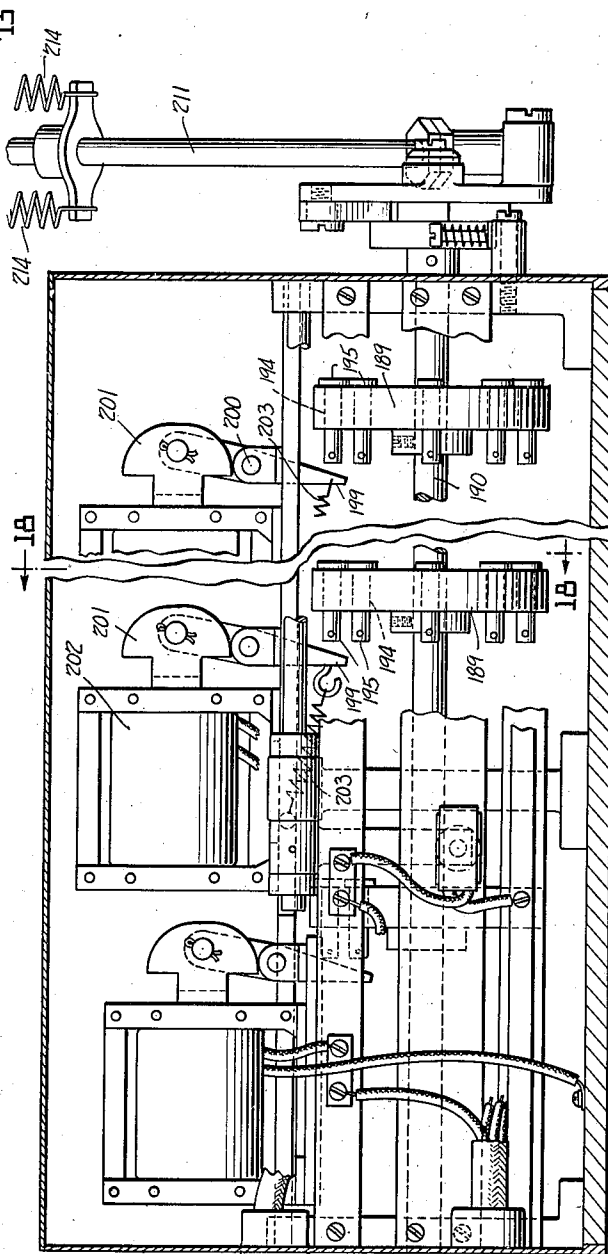
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STATEMENT PRINTING MACHINE

Filed June 11, 1940

12 Sheets-Sheet 8



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STATEMENT PRINTING MACHINE

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Fig. 14.

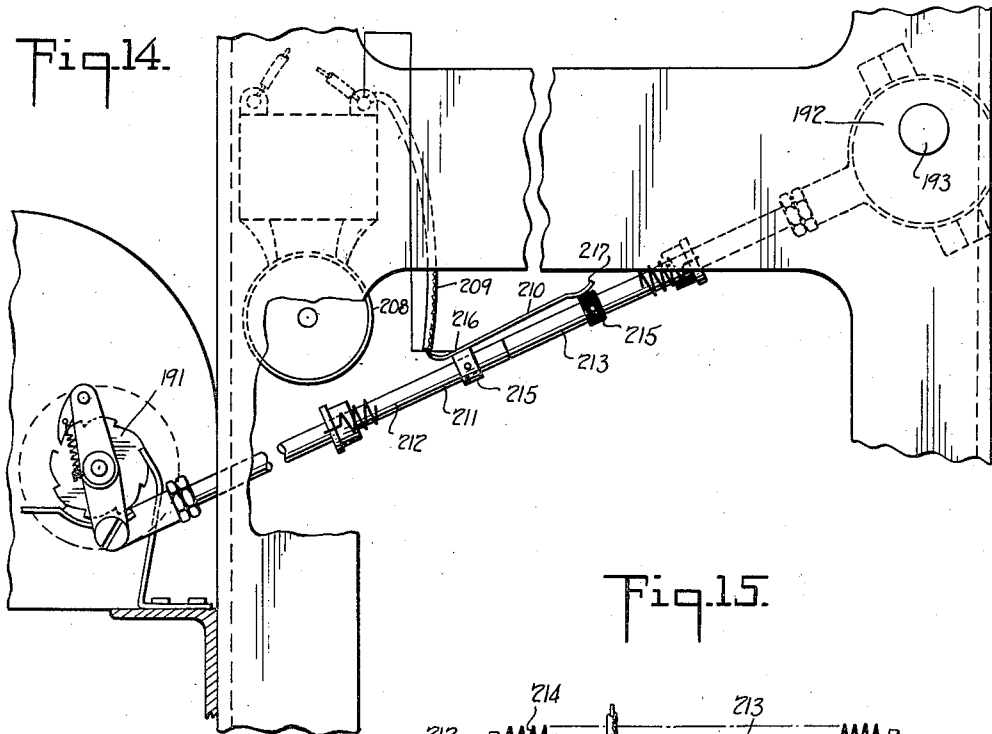


Fig. 15.

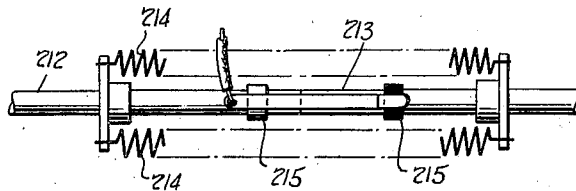


Fig. 18.

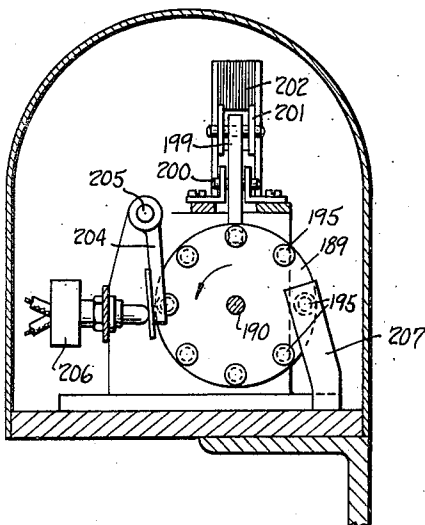


Fig. 16.

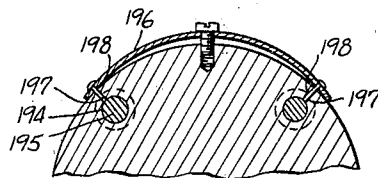
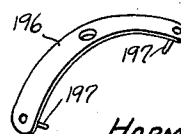


Fig. 17.



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STATEMENT PRINTING MACHINE

Filed June 11, 1940

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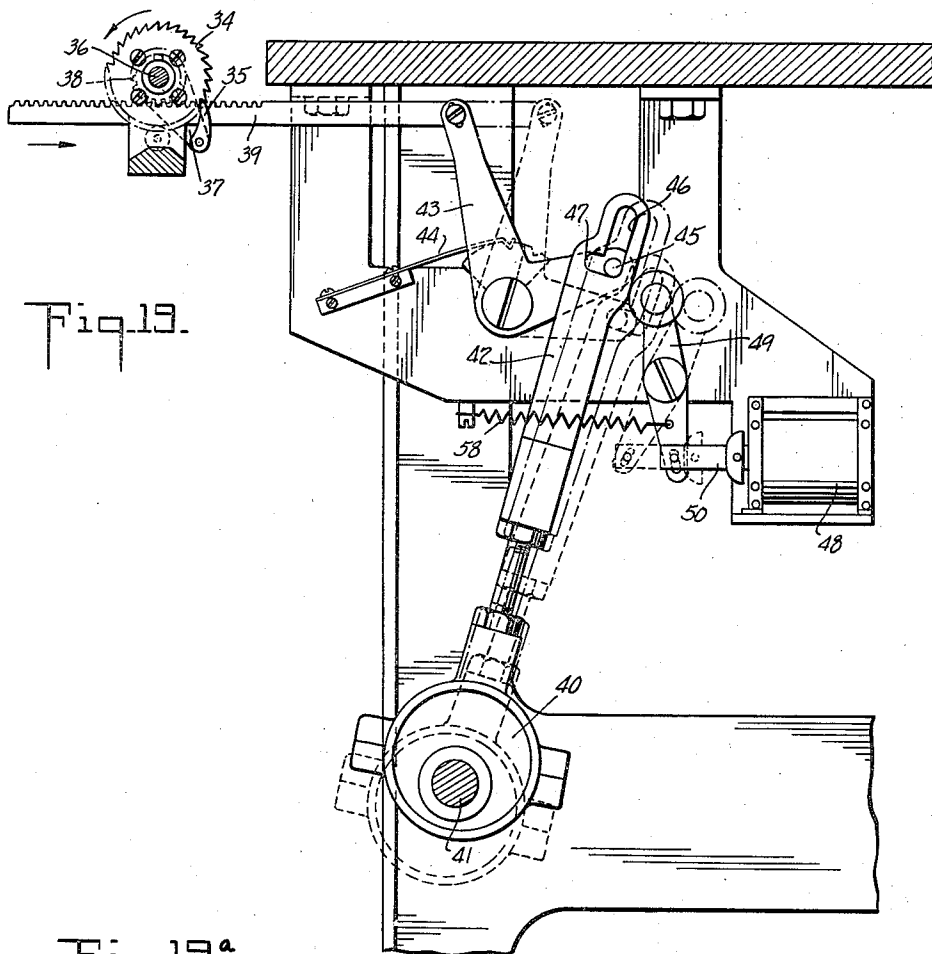
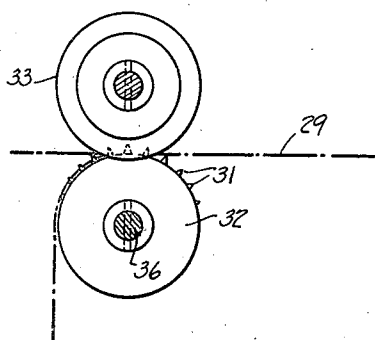


Fig. 13.

Fig. 13^a.



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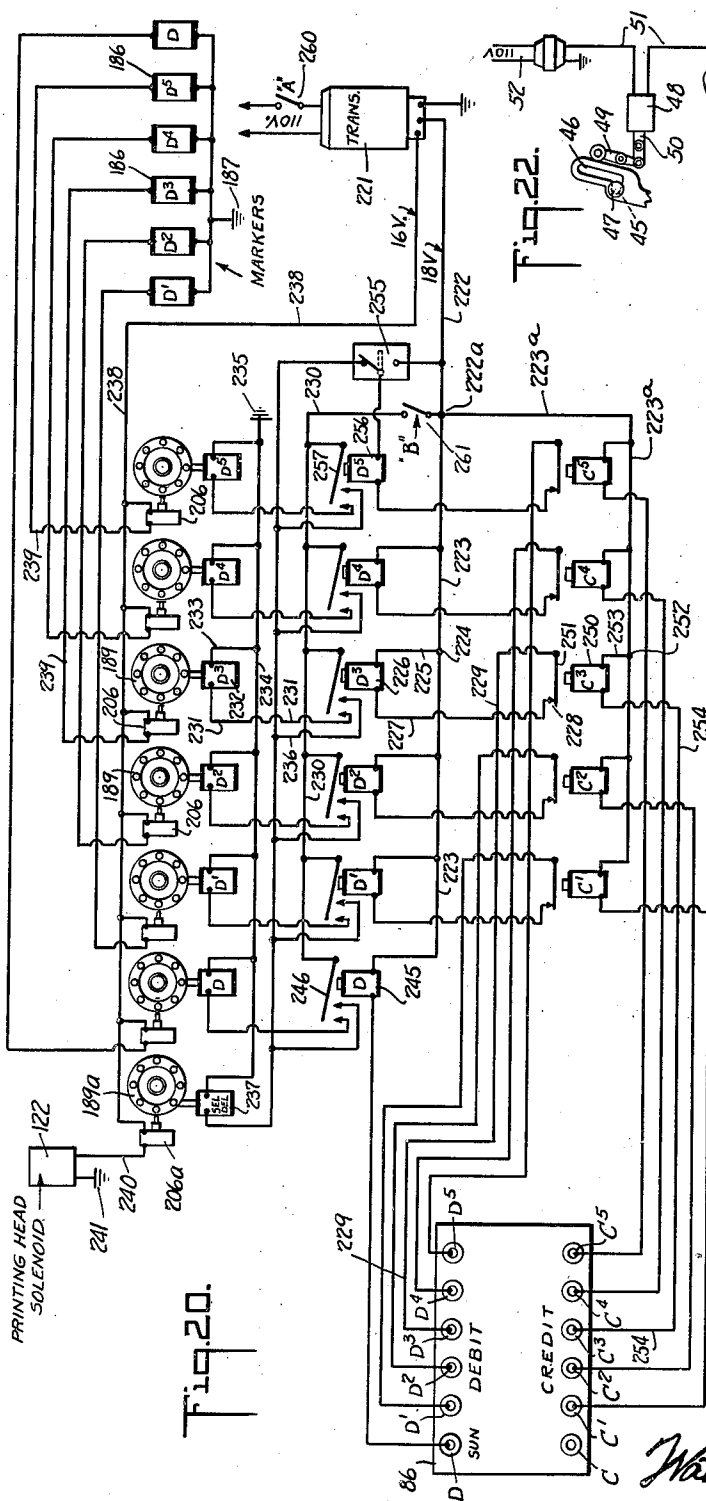
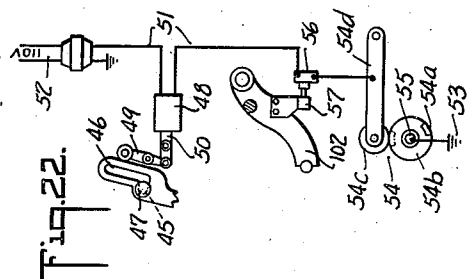
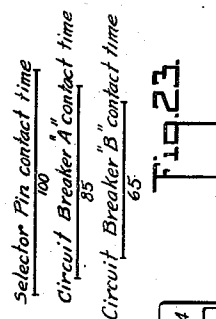
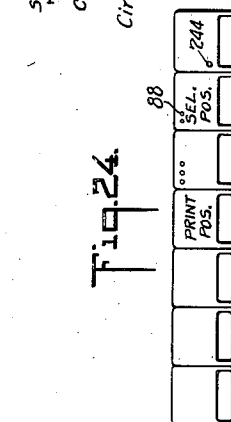
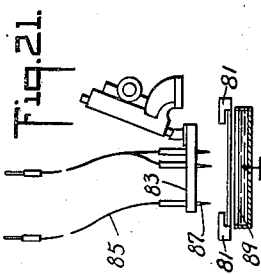
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STATEMENT PRINTING MACHINE

Filed June 11, 1940

12 Sheets--Sheet 11



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2,248,403

STATEMENT PRINTING MACHINE

Filed June 11, 1940

12 Sheets-Sheet 12

Fig. 25.

THE BOOK CLUB

NY 672-15
CHARLES LEE
96 FISK AVE.
NEW YORK CITY

JULY 7, 1939

TERMS: TEN DAYS FR
REMITTANCE SHOULD BE

CLUB SELECTIONS
MAR. THE SER. 2.09
APR. ADVENTURES 2.09
MAY LIFE OF 2.09
JUNE THE HILLS 2.09
SUNDRY 4.18
AMOUNT DUE 10.45

See Reverses ----

Fig. 26.

N.Y. 672-15 CHARLES LEE

FB FB FB

4.18

N.Y. 672-15
CHARLES LEE
96 FISK AVE.
NEW YORK CITY

Fig. 27.

268 269 269a 270 270a

FB FB FB

1.69 1.69

N.Y. 672-15
CHARLES LEE
96 FISK AVE.
NEW YORK CITY

BLACK STENCIL

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UNITED STATES PATENT OFFICE

2,248,403

STATEMENT PRINTING MACHINE

Harmon P. Elliott, Watertown, Mass., assignor to
The Elliott Addressing Machine Company, a
corporation of Massachusetts

Application June 11, 1940, Serial No. 339,893

21 Claims. (Cl. 101—58)

This invention relates to automatic machine production of statements of account from address bearing stencils or printing devices upon which the accounts of the addressees appear in code formation. Such stencils and a machine for producing charge accounts thereon, have been made the subject of a separate application serially numbered 327,425 and filed April 2, 1940. Punched entries are employed in the account formation disclosed in the application referred to, and are preferred for their many important practical advantages over other available formations to which the present machine could be readily adapted to respond, without material change or alteration.

The statements produced, excepting those containing the item "Sundry charges," blank as to the amount, are complete and ready for mailing, being addressed, dated and in itemized amounts of all unpaid charges entered in the stencil accounts against the addressees.

To meet the requirements of the use the present machine is designed to serve, provision is made for limiting the printing of statements to accounts, machine detected, which have exceeded a predetermined limit of credit, based on time and the number of items in arrears.

The test for statement printing to which each stencil account is subjected, is entirely automatic and when the account is found to have exceeded the limit of credit, the overdue debit entries are utilized to preset the machine in accordance with the account showing, for appropriate operation.

The present machine, while adaptable to serve various uses, as will be apparent, is specially designed for printing account statements of members of a literary guild or like organization to whom books or other publications are shipped periodically, usually at monthly intervals and at a uniform charge per book.

Statements are sent out monthly to all members who are indebted to the guild for any amount for a period of two or three months or for two or more books, at the date the statement is rendered and such accounts in arrears are selected by the machine for statement printing, in a run of stencils through the machine, which includes many with accounts that are either paid up or have not exceeded the limit of credit.

Under the guilds system of accounting, if a member is in arrears for more than three months, no further statements are rendered, the shipment of books to him is discontinued and his account is referred to the collection department of the guild for appropriate action, which rule

fixes the indebtedness to be covered by statements to such as is incurred within three months of the date of the statements and as the books are shipped monthly, three or, at times, four charge items serve for all accounts for which statements are rendered.

Under the operation of the rule, statements dated July 1, for example, and limited to indebtedness incurred within the three previous months, would be alike for all new members who had failed to pay for the "First book" sent them and would read:

"First book	2.09"
-------------	-------

For members who have accepted and failed to pay for the current issue for April and have either refused to accept or return the current issues for May and June, the statements would be alike and be limited to the single item:

"April	Adventures of	2.09
--------	---------------	------

For members who have accepted and failed to pay for the current issues for April and May, but have refused to accept, or returned the current issue for June, the statements would read:

"April	Adventures of	2.09
May	Life of	2.09"

And for members who have accepted and failed to pay for the current issues for April, May and June, the statements would read:

"April	Adventures of	2.09
May	Life of	2.09
June	Sojourning in	2.09"

For members who became indebted to the guild for books other than or in addition to the current issues, the statement would cover such indebtedness by the item "Sundry charges" and as there would be no uniformity as to such charges, the amount would be typed in by hand. Such a statement for the three current issues and one or more additional charges would read as follows:

"April	Adventures of	2.09
May	Life of	2.09
June	Sojourning in	2.09
	Sundry charges	1.60"

In printing statements dated a month later—August 1—the April item of the July statements above would be omitted and a July current issue item added, thus:

"May	Life of	2.09
June	Sojourning in	2.09
July	The Mountains of	2.09"

and so on from month to month.

As appears from the foregoing, five items only are required for printing statements of accounts in arrears for three months or less but as the member's indebtedness may be for any one or more of these items, provision must be made for selective item printing. To meet this requirement, a separate type bar is employed for each item and such type bars are arranged, after the "First book" bar, in the order of date appearing thereon. Thus assembled and suitably mounted, the type bars may be separately or collectively selected for statement printing by mechanism responsive to and controlled by the code entries in the account formation of the address stencils.

A machine suitable for carrying my invention into effect is illustrated in the accompanying drawings, but I do not wish to be understood as intending to limit myself to either the form or details shown, as various changes may be made therein without departing from the spirit and scope of the invention as outlined in the appended claims.

In the drawings:

Fig. 1 is a top plan view of the machine;

Fig. 2 is a rear view in elevation of a portion of the machine.

Fig. 3 is a cross section on the line 3—3 of Fig. 2.

Fig. 4 is a partial longitudinal section on the line 4—4 of Fig. 1.

Fig. 5 is a cross section on the line 5—5 of Fig. 4.

Fig. 6 is a like view on the line 6—5 of Fig. 4.

Fig. 7 is a top plan view and partial section of the item printing mechanism shown in Figs. 4 and 5.

Fig. 8 is a perspective view showing the type bar assembly.

Fig. 9 is a sectional view on the line 9—9 of Fig. 8.

Fig. 10 is a cross section on the line 10—10 of Fig. 9.

Fig. 11 is a horizontal sectional view of the slotted guard plate through which the type bars operate.

Fig. 12 is a top plan view of the assembly of the timing devices, with the enclosing casing broken away to expose the same.

Fig. 13 is a sectional view of the assembly shown in Fig. 12, on the line 13—13 of Fig. 12.

Fig. 14 is a view in elevation of an automatic signaling device.

Fig. 15 is a plan view of a portion of the signaling device.

Fig. 16 is a detail cross section of a portion of a timing device disk, showing a spring friction check for the disk pins.

Fig. 17 is a detail perspective view of the spring friction check.

Fig. 18 is a cross section on the line 18—18 of Fig. 13.

Fig. 19 is a sectional view on the line 19—19 of Fig. 2, showing the stop mechanism for the paper feed.

Fig. 19a is a detail section showing the paper feed roll, etc.

Fig. 20 is a diagrammatic view of the machine circuits.

Fig. 21 is a similar view of the selector head and plug-in connections from the switch board shown in operative relation to the stencil.

Fig. 22 is a like view of the paper feed control circuits, etc.

Fig. 23 shows the relative contact periods of the selector pins and the circuit breakers.

Fig. 24 shows the different positions of the stencil in its step by step advance through the machine.

Fig. 25 shows, in full lines, a statement as produced by the machine and, in dotted lines, the perforated edges that are trimmed off before the statement is cut from the web.

Fig. 26 shows one of the address and account bearing stencils or printing devices employed in addressing and itemizing statements.

Fig. 27 shows a similar stencil containing a hand written entry of "Sundry charges" and a companion blank stencil that accompanies it to supply a punched opening to which the machine responds to cover the written entry.

Referring now to the drawings, the product of the machine is the statement of account 20, shown in full lines in Fig. 25. Across the top of the statement at 21, in the form shown, appears the name, etc., of the guild, club or other distributor of the books, publications or other articles for which the statement is rendered. The rectangular area 22 below the distributor's name, which is shown enclosed within a marginal marking, is closely cross lined in light colored ink to provide a safety surface that would be destroyed by and expose any attempted change in the matter printed thereon. In the upper left hand corner of this enclosed area at 23, appears the stenciled name and address of the club member whose account charges appear below, and to the right, at 24 appears the date of the statement. Across the midsection of the enclosed area, at 25, also in the small rectangle 26, below at the left and near the bottom at 27, information is printed for the debtor and in the space at the right, under the heading "Guild selections" appear the various charge items 28, for which the statement is rendered. Excepting the name and address of the debtor, the date of the statement and the charge items, the statement blanks are otherwise prepared complete and ready for use in the machine, by being printed, in suitably spaced relation, upon a web of paper 29 which is then wound in a roll suitably mounted or fan folded in a pile, so that the paper may be freely drawn into the machine as required, to successively advance the statement blanks thereon to the printing mechanism.

As best illustrated in Fig. 25, the web containing the statement blanks is wider than the finished statement, as delivered by the machine, and has a line of perforations 30 along each edge (shown in dotted lines) designed to be engaged by pin-like teeth 31 of a feed roll 32, which serves as a positive feed for the web. In the final operation of the machine, the perforated edges are trimmed off by slit wheels 33, cooperating with the ends of the feed rolls and the statements are cut one by one from the web to reduce them to the form shown in Fig. 25.

The paper feed roll 32 is given step by step rotation to advance the paper in timed relation with the feed of the stencils, by a ratchet 34 and pawl 35 (Figs. 19 and 19a). The ratchet 34 is fast on the shaft 36 of the toothed feed rolls 32 and the pawl 35 is carried by an arm 37 that is made fast to a pinion 38, loosely mounted on the shaft 36, the arrangement being such that as the pawl carrying arm 37 is oscillated, motion is transmitted to the feed rolls 32 to intermittently advance the paper in steps of equal length. Co-operating with the pinion 38 there is a rack bar 39, which is reciprocated by an eccentric drive 40 from a continuously driven shaft 41, acting

through a rod 42 having a pin and slot connection with a bell crank lever 43, pivoted to the rack bar. Cooperating with the bell crank lever, there is a spring latch 44, which yieldingly holds it positioned while the pin 45 idles in the slot 46. The slot is provided at its lower end with a right angular extension 47, in which the pin 45 is normally positioned by the gravitating clockwise tendency of the free end of the slotted rod 42. With the pin in the offset of the slot, motion is transmitted through the bell crank lever 43, rack 39, pinion 38 and ratchet feed 34, 35, to rotate the rolls 32, and advance the paper for each operation of the printing mechanism.

As the address and item printing operation is limited to certain only of the stencils run through the machine, as will be hereinafter explained, provision is made for stopping the feed of the paper during each machine cycle a stencil is passed by the printing mechanism without a statement being printed from it. This is accomplished by the action of a solenoid 48 (Figs. 19, 22) which, when energized, acts through a spring retracted rocker arm 49, linked to the core 50 of the solenoid, to move the upper end of the slotted rod 42 to the left, as viewed in Fig. 19, to position the pin 45 in the slot proper 46, where it idles, as the arm is reciprocated by the eccentric drive, thus cutting off transmission of motion to operate the paper feed.

The circuit of the solenoid 48 (Fig. 22) indicated by leads 51 from a suitable source of supply 52 to ground 53, includes a rotary switch 54, mounted on a continuously driven shaft 55, and a self-opening switch 56, of the push-button type (Figs. 3, 22) which latter is closed by an engaging extension 57 of the operating arm 102, of the address printing mechanism hereinafter described, when the arm is inactive or at rest.

With the switch 56 closed, the circuit is completed when the metal segment 54a of the rotor 54b, turning in a clockwise direction, comes in contact with the roller 54c of an arm 54d and the solenoid thus energized, acts to swing the free end of the rocker arm 49 to the left, to shift the pin 45 from the offset 47, into the slot proper 46 as above described, to cut off transmission of motion to the paper feed rolls.

When the operating arm 102 is swung upwardly to operate the printing mechanism, as hereinafter described, and the extension 57 thereof moves clear of the switch 56, the slotted rod 42 and the contact segment 54a of the rotor 54b are at or near the lower limit of their movement, with the pin 45 idling in the slot 46. After the printing operation is completed and as the operating arm 102, starts to swing downward, the slotted rod 42 reaches the limit of its upward movement, as shown in full lines in Fig. 19, and the solenoid 48, being deenergized, the spring 58 yieldingly holds the free end of the rocker arm 49, clear of the slotted rod 42, permitting the latter to swing to the right and position the pin in the offset of the slot, to reestablish driving relation between the rod and the bell-crank 43, for transmission of motion to the feed roll to advance the paper for the next printing operation.

It will thus be seen that the feed of the paper is controlled by the operating arm 102 of the address printing mechanism, in opening and closing the circuit switch 56 of the solenoid 48. Opening the push-button switch 56, renders the rotary switch 54 ineffective and prevents the solenoid from being energized. Closing the push-button switch enables the rotary switch to com-

plete the circuit and, the solenoid thus energized, acts at the critical moment when the eccentric drive rod 42 is at the limit of its upper stroke, with the pin 45 in the off-set 47 of the slot, to shift the pin into idling position in the slot proper, as previously explained.

As there is no departure here from the prior art in pre-printing blank forms on the web and in mounting the same in roll or other form in the machine or in the mechanism employed for advancing the web step by step through the machine for various machine operations upon it, a further detailed showing and description is not deemed necessary, as the same is well known and in common use.

The address and account bearing stencil from which the statements are printed consists of an enclosing frame 70 of cardboard or other material, for a stencil name and address panel 71. The frame is extended above the panel at 72 and the extended area is charted to serve as an account form 73, here shown, covering a period of two years, in which provision is made for debit, credit and other entries. The numbers 1 to 12, inclusive, printed in the square spaces of the two upper cross rows 74 of each section 75 of the account form, represent the twelve months of the year and the blank spaces 76, under the numbered rows are used for monthly credit entries in the addressee's account. The letters R, S, P, R, at the left of the four cross rows of spaces, are the first letters of "Refused," "Shipped," "Paid," and "Returned" and are to be understood as having the meaning of these words as the following will make clear.

Entries in the upper numbered row marked R indicate that books proposed by the guild to members as current issues for the numbered months punched out, have been refused acceptance.

Entries in the second numbered row marked S, indicate that shipment of books has been made by the guild to members for the numbered months punched out and the account is thus charged for the same.

Entries in the third row marked P, indicate that payments have been made for the monthly shipments punched out and charged for in the row above.

Entries in the fourth row marked R indicate that books shipped for the months punched out have been returned.

Entries in the spaces 77 to the right of the numbered rows, marked FB and B, indicate shipments of books other than current monthly issues, such as "First book" sent to new members, which is charged for and a "Bonus" book, sent free of charge to members whose accounts have been paid up or who have not exceeded the limit of credit for a period of six months.

The spaces 78 further to the right are for hand written entries covering special items or "Sundry charges."

The above described address and account bearing stencils, representing a book club's mailing list of accounts, are stacked one above the other in a magazine or hopper 80 located at the right hand end of the machine, as viewed in Fig. 1, and fed in the usual manner one at a time, from the under side of the stack in the magazine by and on each forward stroke of a reciprocating pusher (not shown) to a grooved track 81. The track extends from the magazine 80 to a hopper 82 into which the stencils are deposited after passing through the machine.

The stencils are advanced intermittently in the track across the machine, in steps of equal length, by the action of the reciprocating pusher, above mentioned, and this step by step feed action is continuous.

In the position taken by the stencil in the first feed step from the magazine, there is no machine action upon it.

The next feed step, the second from the magazine (Fig. 24) brings the stencil into position to be acted upon by a selector 83 (Fig. 1), the general construction and operation of which are known in the art and need not be described at length, except as to detail differences.

The purpose of the selector is to close certain circuits, determined by the punched debit entries in the stencil accounts and thereby pre-set the machine, through the operation of time controls, for subsequently printing on the statement blanks the address and unpaid charges, in itemized amounts.

The selector head is provided with a series of openings 84 corresponding in number and position with the spaces of the charted account form of the stencils. Flexible plug-in connections 85 (Figs. 1 and 21) are employed between the machine panel or board 86 and the selector head openings 84, to enable circuits to be completed by selector action, which control the operation of various devices hereinafter described. The plug terminals 87 of the flexible connections (Fig. 21) project through and below the selector head and are pointed to facilitate entry into the punched account entries 88 of the stencils, through which they pass, when the selector head and are pointed to facilitate entry into the punched account entries 88 of the stencils, through which they pass, when the selector head is lowered, to make contact with a metal plate, pan of mercury or other conductor, serving as a common ground 89 for all selector circuits. The selector head is lowered and raised in time with the step by step feed of the stencils, to test each one as it is advanced two feed steps from the magazine. The pointed ends of the plug terminals telescope, in the usual manner, into the socketed body portion of the plugs and springs within the sockets hold the pointed ends advanced but free to yield when contacting entry spaces of the stencil account form which have not been punched.

The raising and lowering of the selector head is effected by an attached rack and a cooperating toothed sector in the usual manner. The toothed sector is given motion through a series of arms and links, by a cam 92 on a continuously oscillating sector 106, all of which is shown and described in my copending application and as the present invention is not limited to a special mechanism for giving motion to the selector head and may employ any one of several well known forms, it will not be necessary to show and describe the same in further detail.

While the entries in the stencil accounts are shown in the form of punched holes and are preferred, for many reasons, as previously stated, the same result can be obtained by a printed spot of electrically conductive ink or by a thin metal disk stapled or otherwise secured to the stencil. Either of these last mentioned forms would require the use of double contact selector plugs to complete circuits through the marks appearing on one side only of the stencils, but no change other than this would be required

in the construction and operation of the machine as shown and described.

As a stencil is advanced beyond the selector or three feed steps from the magazine, there is no machine operation upon it.

The next feed step, four steps from the magazine, brings the stencil into address and item printing position, above the paper web, with the address panel of the stencil between the printing roll 94 and a platen 95.

The printing roll 94 is rotatably secured in the usual manner between forwardly extending arms 96 of a yoke 97 pivoted at 98 to the frame of the machine and having a horizontally elongated passage 99 therein through which the statement sheet or web is advanced. The printing roll 94 is supplied with ink in the usual manner by inking mechanism 100, not necessary to describe in detail since it may be anything suitable or common in the art. The yoke has a depending arm 101 that is reciprocated by an operating arm 102 to move the printing roll 94 into and out of engagement with the address panels of the stencils in the track. The operating arm 102 is carried by a horizontal shaft 103 journaled in brackets 104 and is connected with the depending arm 101 of the yoke through a link 105. The platen 95 is reciprocated vertically in the usual manner to hold the statement sheet in position under the stencil at the time of printing the address and also to move downwardly away from the stencil, to permit the statement sheet to be advanced. The reciprocatory movements of the platen are in timed relation with the advance of the stencils and effect an address printing operation upon the successive stencils at the time they are stationary in printing position. Since it is desirable to pass selected stencils bearing accounts either paid up or which have not exceeded the limit of credit through the printing position without printing statements from them, the operating arm 102 has a disengagable connection with the continuously oscillating sector 106, which permits the power mechanism to operate and advance successive stencils without operating the printing mechanism. This disengagable connection (see Figs. 2, 3) comprises a latch 107 that is pivotally mounted at 108 on the end of the operating arm 102, and has a detent 109 that is adapted to be located within a notch 110 of the oscillating sector 106, to connect the two for conjoint movement. A spring 111 acts upon the latch 107 to normally urge the latch for interlocking connection with the oscillating sector 106. Selector operating mechanism controlled by the stencils is provided to effect the disconnection of the latch from the sector 106, thereby to disable the printing mechanism when it is not desired to print a statement from a selected stencil. Said mechanism includes a vertically extended lever 112 (see Figs. 2 and 3) that is pivotally mounted at 113 on a bracket fixed to and depending below the rear edge of the machine table. Said lever 112 has an offset cam extension 114 that confronts a cam roller 115 journaled at the end of the latch 107 and so disposed that it can engage said roller and hold the latch detent 109 out of the notch 110 of the oscillating sector 106, in any position in which the latch may be carried by the oscillation of said sector. Said lever 112 is connected with a tension spring 116 that normally urges the lever into a position removed from the latch 107 so that the latch can remain engaged with the

sector during the oscillatory movements thereof. The lever 112, however, can be held normally in a latch disengaging position and thereby in a printing mechanism disabling position. For this purpose the lever 112 at the upper end thereof is provided with a detent 117 which can be arranged to cooperate with a hook 118 releasably carried by a hook holder 119 loosely pivoted on a horizontal shaft 120. In the position of the hook shown in Fig. 3, the hook releasably engages the detent 117 thereby holding the cam projection 114 of the lever 112 in latch engaging position so that the printing mechanism is disabled. The hook 118 can be elevated and thus moved away from engagement with the detent 117 to release the lever and permit the latching of the operating arm 102 and sector 106 and the operation of the printing mechanism. The raising of the hook 118 is effected by a pivoted lever 121 (see Fig. 2) having the core of a solenoid 122 pivoted near the end thereof remote from the hook. When the solenoid is energized, the core is drawn down and the other end of the lever 121 is raised to elevate the hook 118 from engagement with the lever detent 117. The solenoid is momentarily energized by the selector mechanism through the control of the stencils, so that the hook after releasing the lever 112 is free to fall and subsequently engage and again hold the lever when it is reset. The lever is reset at each stroke of the sector 106 by means of a cam block carried by the sector and having a cam face 123 at its upper end that is adapted to engage a cam roller 124 carried by the arm 125 of the lever 112. At each upward stroke of the sector the cam block engages the roller 124 and thereby moves the lever 112 in a clockwise direction and into the reengagement of the hook 118. With the hook as thus described and arranged, a printing operation is effected upon each stencil that permits the circuit to be closed and the solenoid 122 energized.

After the stencil address is printed on a statement blank the stencil is advanced step by step, without further machine operation upon it, until it is deposited in a hopper, at the left hand end of the machine, as viewed in Fig. 1.

As a statement is being addressed, the item printing mechanism operates to print thereon the unpaid charges appearing in the stencil account of the addressee.

These unpaid charges are detected in the account when the stencil from which the address is printed, is acted upon by the selector and, as a result of the selector action, the item printing mechanism is pre-set, through timing devices, hereinafter described, to print one or more selected items of the account, when the stencil comes into printing position.

As previously pointed out, the items printed on the statement are separately listed in single line formation and for such printing, separate single line type bars 126 are employed. As assembled, any one or more of the type bars may be selected for the printing operation as determined by the selector in pre-setting the machine in accordance with the stencil account showing of unpaid charges.

The type bars are slotted or channeled to receive a "set-up" of type 127, which is removably clamped therein, as best shown in Figs. 8, 9 and 10, but, if preferred, the type may be cast in part with the bar or otherwise formed as desired.

The type bars are assembled in a rectangular frame 128, formed of side and cross members

129, 130. The cross members 130 are provided with equi-spaced notches 131, to receive and serve as guides for the type bars when depressed to perform a printing operation. The bars are mounted in floating relation above a platen 132, with which they cooperate, upon supporting springs 133. As shown in Fig. 9, the bars are cut away or shouldered on the under side, at opposite ends as indicated at 134, to enter between and rest upon the free ends of the springs which are of the flat plate type, secured by screws 135, upon raised cross ribs 136 of the frame. As mounted, the type bars yield readily to downward pressure applied to move them into printing relation with the platen. Normally the bars, held against lateral movement in the notches maintain themselves positioned upon the supporting springs by their own weight, and not being otherwise secured, are readily removable for examination, repair or replacement.

Associated with the type bar assembly and extending beneath the same, under guide rollers 137 and a plate or shield 138, slotted for passage of the bars (Figs. 5, 6 and 10) there is an ink ribbon 139, which is carried by two spools 140 and 141. The ribbon is drawn from one spool and wound on the other by the action of a pawl and ratchet feed, with which each spool is provided, the arrangement being such that as the ribbon nears the end on the spool from which it is being drawn, the direction of feed is automatically reversed and the ribbon then moves in the opposite direction and is rewound upon the empty spool.

The ribbon spools 140, 141, provided with the usual end flanges 142, are mounted fast on cross shafts 143, 144, extending between side frames 145, and secured to rotate with each spool, there is a ratchet disk 145. The ratchet disks are oppositely toothed and pawls 147 and 148 cooperating with the disks, give the spools the required motion in opposite directions to draw the ribbon from one and wind it on the other. Arms 149 and 150 loose on shafts 143 and 144, carry the pawls 147 and 148, and are connected by a link 151, to move together. The pawls are of the gravity type, pivoted to the arms to have free movement into and out of engagement with the ratchet disks. The link-connected arms carrying the pawls are given oscillating motion, being moved in one direction by a projection 152, of the yoke 97, of the printing roll 94, coacting with an extension of the arm 149, and in the opposite direction by a spring 153. As arranged, the feed operates to present a new surface of the ink ribbon for each operation of the type bars. This step by step feed of the ink ribbon is effected by one or the other of the pawls, depending upon the direction of the feed, but when one pawl is acting, as for example, the pawl 147 (Fig. 5) the other 148 is disengaged by an arm 154, a cam face 155 of which rides under a stud or projection 156 at the free end of the pawl, moving the latter upward and holding it clear of its ratchet. Until the direction of feed of the ribbon is reversed, the pawl is maintained thus disengaged by the cam continuing to engage the stud, which latter rides back and forth, idling on the cam, as motion is transmitted, through the connections described, to both pawls, causing the active one to feed the ribbon. As shown in Fig. 5, a similar arm 157, with a cam face 158, is provided to coact with a stud or projection 156 at the free end of the pawl 147 and as that pawl is the active one, the cam arm is positioned to permit it to engage its ratchet and feed ribbon.

The two cam arms 154, 157, are connected by a link 159 to be simultaneously shifted in and out of engaging relation with the pawls, by trip mechanism now to be described.

As shown in Figs. 5 and 6, the ribbon is being drawn from the upper spool and wound on the lower one and as the upper spool is full and the lower one nearly empty, the mechanism is in the position it assumes following reversal of the direction of the ribbon feed.

The reversal of the feed is effected by a trip device coacting with the link 159, connecting the cam arms and is controlled by a ribbon gage, which springs the trip when the windings on the spools reach predetermined diameters, causing the trip to shift the link and reposition the cams as required to reverse the pawls.

The trip consists of two members, one a rocker arm 160, and the other a trigger lever 161. The rocker arm is pivoted at 162, and provided with terminal studs 163, 164. The stud 163 engages a notch 165 of the link 159 and has attached to it one end of a spring 166, the other end of which is fastened to a pin 167, of the trigger lever 161, yieldingly holding a lug 168 of the latter in engagement with the stud 164 of the rocker arm. When the trigger lever 161 is moved counterclockwise about its pivot 169, until the pin 167, with its attached spring 166, passes to the left of its turning axis, as viewed in Fig. 5, the spring will then act to throw the lever further to the left, causing a second lug 170 of the lever to engage the stud 164 and rock the arm 160, in a clockwise direction. This movement of the rocker arm, through its connection with the link 159, shifts the latter to the left, causing it to give the required motion to the cam arms to clear the pawl 148 for working engagement with its ratchet and ride under the stud 156 of the other pawl 147 raising the latter clear of its ratchet.

The trigger lever 161 is moved from either of its extreme positions, until thrown by the spring 166, by means of the ribbon gauge 171, which is pivoted at 172, and provided with a terminal stud 173, that engages and is free to move back and forth in an end notch 174 of the trigger lever 161. Gauge fingers 175 and 176 are pivoted at 177 to the gauge to move freely about the pivot and independently of each other. The fingers ride on the ribbon of the two spools and as the ribbon is wound on one and off the other, the fingers rise and fall, following the varying diameters. At their free ends, the fingers are provided with terminal studs or pins 178 and 179, which coact with notches 180 and 181, in the spool flanges, to throw the trigger lever 161 over for action by the spring 166. This happens when the ribbon is so nearly at the end on one spool, that the cooperating gauge finger, following its decreasing diameter, moves downward far enough to permit its terminal stud to engage the notch in the spool flange. On the next feed step of the ribbon, the notch engaged finger will be carried along with the spool, drawing the gauge with it. This movement of the gauge about its pivot is transmitted through the stud and notch connection with the trigger lever, to throw the latter over for action by its spring and reverse the ribbon feed, as above described. This reversal of the feed, giving rotation to the spools in the opposite direction, causes the finger stud engaging the spool flange notch, to ride out of the same, one side of the notch being rounded to permit such disengagement. On each subsequent revolution of the spool, until the ribbon

builds up thereon sufficiently to raise the gauge finger high enough to carry its terminal stud clear of the spool flange, the stud will drop in the notch but ride out again without transmitting motion to the gauge.

To effect a printing operation by the type bars 126 provision is made for separately or collectively depressing them, in opposition to these spring supports, until their type faces, acting through the ink ribbon 139 come into contact relation with the platen-supported statement blank, upon which the impression is made.

To enable any one or more of the type bars to be operated independently of the others, a complete actuating mechanism is provided for each bar. These mechanisms are substantially identical and each consists of a lever 182, pivoted at 183, the free end 184 of which, suitably rounded or headed, is normally held by gravity or the greater weight of its opposite end 185, just above, to clear the type bar with which it cooperates. The lever is actuated or rocked to depress the type bar by a solenoid 186, to the movable core 187 of which the weighted end 185 of the lever is pivotally linked, as indicated at 188. There being a separate solenoid for each type bar operating lever, the selection for item printing is made by the selector in closing circuits, hereinafter described, through entries in the stencil accounts, by which the machine is pre-set to later energize the solenoids of certain type bars thus selected and effect printing in accordance with the requirements of each stencil account.

In pre-setting the machine for item printing, as above described, the circuit arrangement is such as to at the same time include the printing of the address to accompany the items. This operation of printing statements is limited, as previously pointed out, to stencil accounts in which the limit of credit has been exceeded either as to time in arrears or number of items in arrears. If a single item has remained unpaid for two or three months, or payment is due on two or more items, the machine will be pre-set to print statements for such accounts. All other stencils with accounts not thus in arrears will be passed through the printing mechanism without a printing operation upon them.

To meet the requirements of the use served by the present machine, seven separate timing mechanisms are employed, one for stencil printing the address and the others for type printing the items of the statement. As both are printed at the same time, the circuits controlling the operation of the selected printing mechanisms are pre-set by the selector to be closed two stencil feed steps later or when the stencils from which the selections are made have been advanced to printing position.

To thus pre-set the control circuits for delayed closing, automatic switches 189 are employed, which operate in timed relation with the feed of the stencils and as they are substantially identical in construction and operation, a description of one will serve for all.

The preferred form of timed switch is illustrated in Figs. 12 to 18, and consists of a disk 189 mounted fast on a shaft 190, that is given intermittent rotation, eight steps per revolution, by means of a well known pawl and ratchet feed 191 (Fig. 14) operated in the usual manner by an eccentric drive 192, from a continuously driven shaft 193. This rotary feed of the disk operates in timed relation, step by step, with the in-

termittent advance of the stencils and the paper through the machine. In equi-spaced through-cut openings 194 of the disk, eight pins 195 are fitted and are shiftable axially to project from either face thereof. Springs 196 (Figs. 16-17) secured to the periphery of the disk, are provided with terminal studs 197, which enter radially bored openings 198, and engage the pins 195 as a frictional check on their movement in being shifted back and forth.

Normally the pins 195 project from the left face of the disk, as viewed in Figs. 12 and 13, and are shifted, one at a time, to project from the right or opposite face thereof, by a trigger lever 199, pivoted at 200. One end of the lever 199 is pivotally connected to the movable core 201 of a solenoid 202, and its opposite free end projects downward and is held by a spring 203 in cooperating relation with the uppermost pin of the disk. When the solenoid is energized by the action of the selector in closing a circuit through an unpaid punched entry in a stencil account, as hereinafter described, the solenoid core is drawn into the coil, giving the trigger lever counter clockwise motion, which causes its free end to engage the uppermost pin of the disk and shift it to project from the opposite face thereof. Two rotary feed steps of the disk, in a counter clockwise direction, as viewed in Fig. 18, bring the shifted pin into engagement with the free end of a depending lever 204, pivoted at 205, which latter is moved to the left by the pin, closing a pushbutton type of switch 206, and completing a circuit, hereinafter described, that energizes one of the solenoids by which the printing mechanisms are operated. Having performed its above described function, the pin, on continued rotation of the disk, is re-shifted and returned to normal position, projecting from the opposite face of the disk, by a fixed cam 207, against which it rides as it is carried around by the disk.

As shown in Fig. 12, the pin disks of the seven timed switches are mounted fast on the same shaft, to be rotated together, step by step, by the pawl and ratchet feed, above described.

To guard against damage to the timing device assembly, when, for any cause, such as the jamming of one or more parts, the pawl and ratchet feed action meets with resistance in rotating the disk carrying shaft, an automatic signal is employed to sound an alarm that will call the machine attendant to remedy the trouble.

For this purpose an ordinary electric bell or buzzer 208 is employed and the circuit, through which current is supplied from a suitable source, to operate the bell or buzzer, has one side grounded on the machine and the other side, through lead 209, terminates in a flat spring finger 210, which is carried by and insulated from the eccentric drive rod 211 of the pawl and ratchet feed. The drive rod is formed in two sections 212 and 213, which are maintained in operating alignment by connecting springs 214. Adjacent the abutting ends, each section is provided with a collar 215, of insulating material, upon which the spring finger 210 is supported, being secured at 216 to one collar and having its free bent-up end 217, resting on the other collar, clear of contact with the rod. As the eccentric is rotated counter-clockwise from the position shown in Fig. 14, through half a revolution, the pawl will be given forward or positive movement to operate the ratchet feed and if this feed action is resisted by the disk shaft failing

to turn freely, continued rotary movement of the eccentric will separate the drive rod sections, by drawing the upper one away from the lower one, in opposition to the springs 214, connecting the sections, thereby moving the insulation collar 215 from under the free end of the spring circuit terminal 210 and allowing the latter to snap down in contact with the metal rod section and close the signal circuit, causing the bell or buzzer to sound an alarm. This signal circuit will continue to be opened and closed on each revolution of the eccentric, until the machine is shut down and the cause of the trouble ascertained and overcome.

The spring connected sectional form of eccentric drive rod, above described, serves a further important purpose in discontinuing transmission of motion to the pawl and ratchet feed, when the disk shaft is held against rotation by the timing mechanism becoming jammed. Under continued rotation of the eccentric, the upper section of the drive rod will reciprocate idly but no motion will be transmitted to the lower section of the rod and the pawl will remain at rest until the mechanism is put in running order.

The statement blank, after being addressed and itemized, as above described, is advanced a feed step and positioned to have the date stamped or printed thereon.

The construction of the date stamping or printing device is not important and as any well known or suitable form of such a device may be employed, it will not be described in detail.

It is indicated at 218 in Fig. 1, mounted in front of the item printing mechanism and is actuated to perform a printing operation by a crank shaft 219, connected through a rod 219a and bracket 219b to be oscillated by the yoke 97 of the printing roll 94. As the movement of the yoke is greater than is required to oscillate the crank shaft of the dating device, a pin and slot connection 220 is employed between the rod 219a and the bracket 219b and the excess motion of the yoke is taken up by the travel of the pin, idling in the slot. A spring 220a connecting the rod and pin yieldingly maintains the pin operatively positioned in the slot.

In the operation of the machine, the circuits that control the address and item printing of statements, are normally open and can only be effectively closed by the selector in acting on unpaid charge entries of stencil accounts in arrears. Until these circuits are thus closed, there is no printing operation and no feed of the paper. Under these conditions, stencils with accounts not in arrears are advanced through the addressing and item printing position without any machine operation upon them, control circuits closed by the selector through the debit entries thereof being rendered ineffective by the action of other circuits completed through the credit entries in the accounts, which results in preventing operation of the printing mechanism.

The circuit arrangement is substantially the same for each of the six item printing mechanisms here employed and when any one of them is selected for printing by the action of the selector, as above described, an electro magnetic relay switch is energized and closes power circuits through the solenoids of two timing devices, one for pre-setting the selected item printing mechanism for operation and the other for similarly pre-setting the address printing mechanism to accompany it in operation, so the statement

printed will bear the address of the stencil from which the selected item was taken and the same is, of course, true regardless of the number of items selected for printing.

Electric power for operating the various circuits of the machine is obtained from any suitable source of supply, such as a lighting circuit, and is stepped down by a transformer 221, from the usual lighting voltage to lower voltages for which the electrical apparatus employed is designed.

The various machine circuits are illustrated diagrammatically in Figs. 20 and 21.

Flexible plug-in connections 85 are employed, as previously stated, between the machine switch board 86, to which the various control circuits lead, and the selector head and the plugs of such connections, projecting from the under side of the selector head, in entering the punched entries of the stencil accounts, complete the circuits to ground 89.

To avoid the use of a large switch board with complicated wiring and provide the required number of plug-in leads for the selector head, the flexible connections may be branched to provide plug-in connections from any switch board circuit to any two, three or more selector head openings.

As shown in Fig. 20, provision is made for twelve plug-in connections in the switch board, but this number may be varied according to the requirements of the use to which the machine is put.

The circuits of plug-in sockets D, D', D², D³, D⁴, D⁵, in the upper row of the switch board, serve to detect debit entries appearing in the stencil accounts and set the machine to address and print statements in itemized amounts for all accounts in which the limit of credit has been exceeded.

The circuits of plug-in sockets C', C², C³, C⁴, in the lower row of the switch board, serve to detect credit entries in the stencil accounts and oppose and prevent debit circuit action on charges that have been paid, thereby preventing the printing of statements for accounts in which the limit of credit has not been exceeded, as previously stated.

Assuming a circuit to be closed by the selector through a punched debit entry in a stencil account, which would be a charge for either the "First book" or a single current issue; that circuit from the transformer 221 to ground, would be by way of lead 222, to point 222a, thence by lead 223 to point 224, and on by lead 225 to the electro magnet of one of the five relay switches 226, energizing the same and continuing on by lead 227, closed contacts 228, lead 229, back to one of switch board sockets in the upper row and from there to ground 89, through the flexible connection 85, plugged through the selector head 83.

The closing of the energized relay switch 226 connects the solenoids of two timing devices in circuit with the transformer 221, through the common lead 230 from the latter to the switches. One circuit from the switch is by way of lead 231 to the solenoid 232 of one of the timing devices 189, and thence through leads 233 and 234 to ground 235. The other circuit from the switch 226 is by way of lead 236 to the solenoid 237 of the timing device 189a.

The effect of energizing the solenoid 232 of one of the six timing devices, is to set the device to operate a switch 206, two feed steps later or when the stencil assumed to be acted upon by the selector, has been advanced to printing position and

close a circuit from the transformer through lead 238, to the switch 206 and thence by lead 239 to the solenoid 186 of one of the item printing mechanisms and to ground 187. Energizing the solenoid 186 results in an item printing operation by the type bar associated with the solenoid, as previously described.

Energizing the solenoid 237 of the second timing device 189a operates in like manner to set the device to close a similar switch 206a, one feed step later on and complete the same circuit from the transformer through lead 238, back to the switch and thence on by way of lead 240, to the address printing control solenoid 122, and to ground 241. The solenoid 122, acts when energized to release the lever 112, and the latching of the operating arm 102, to the oscillating sector 106, follows and results in the operation of the address printing mechanism, as previously described.

As a result of the foregoing operation, the machine would produce an addressed statement with a charge item for one book, with the date of shipment, title and price indicated in accordance with the account showing of the stencil upon which the machine operated.

If instead of a stencil in arrears for only one item, we assume the account of the stencil acted upon by the selector shows two, three or four unpaid charge items; the only difference in the operation above described would be that two, three or four similar circuits would be completed by the selector through the punched openings in the stencil and instead of producing an addressed statement with a single item, there would be two, three or four items printed on the statement.

Where a stencil account shows unpaid sundry charges, the entry is written in by hand and, as the selector would not respond to such an entry, a punched opening indicating such unpaid charges is supplied by providing the same in an accompanying black marker card that is placed to follow the stencil through the machine. Assuming the stencil to be in position to be acted upon by the selector, the closing of the circuits and their operation would be as above described for addressing and itemizing a statement in accordance with the account showing of punched debit entries in arrears but there would be lacking the unpaid item of sundry charges and in order to have this included in the same selector action, a special opening 242 is provided in an offset extension 243 of the selector head, which registers with the punched opening 244, in the black marker card following the stencil and through a plugged-in connection from the switch board to the offset opening in the selector head, a circuit is completed from the transformer 221, through lead 222, to point 222a, thence by way of lead 223, to the solenoid 245 of relay switch 246, which acts as above described to close the solenoid circuits of two timing devices to pre-set the same to act two feed steps later, to close the solenoid circuits of the sundry item and the address printing mechanism, thereby adding as the last item on the statement "Sundry charges" the amount of which is typed in by hand, as such charges vary in different accounts.

Assuming a stencil to be in selector position in which the account shows punched entry charges for the three last current issues of books and additional punched credit entries for payment of the same, the ground connection of the circuits will be completed by the selector through the debit and credit entries of the stencil account, but the timing devices will not be ener-

gized as the circuit breakers 260 and 261 must first act to close the power circuits and the resulting operation of the credit relay switches will be to break the circuits of the debit relay switches through which power is supplied, rendering them ineffective for pre-setting the machine through the timing devices, as above described, for printing a statement.

The energizing circuits of the electromagnets 250 of the credit relay switches 251, are substantially identical and only one will therefore be described. The circuit from the transformer 221, is by way of lead 222 to point 222a, thence by lead 223a to point 252 and lead 253 to the electro magnet 50 of the switch 251 and from the magnet by lead 254 to the machine switch board 86 and to ground through the flexible connection 85 plugged into the selector head.

When the electromagnet of the switch is energized by a selector pin completing a circuit through a punched credit entry on a stencil account, the switch operates to break the energizing circuit at point 223 of the debit relay switch with which it cooperates, preventing operation of the same, as above described, during the machine cycle the stencil is in selector position.

Five credit relay switches are employed, one for cooperation with each of the five debit relay switches and the number acting depends upon the number of punched credit entries through which energizing circuits are closed by the selector as each stencil comes into selector position.

It will be observed that no credit relay switch is provided to cooperate with the debit relay switch 245 controlling the printing mechanism of the item "Sundry charges." The reason for the omission is that the circuit that energizes the debit relay switch is not completed by the selector through a punched entry of the stencil account but through a punched opening in a card that follows the stencil and such cards are only inserted to follow stencils in which unpaid "Sundry charges" appear in the account and as there are no credit entries, a credit relay switch is not required.

The practice followed in the above described accounting system, as to stencils with accounts paid up to but not including the last current issue for which an unpaid charge entry appears, is to pass them through the machine without printing statements from them. This is accomplished by a switch 255 which makes it possible to connect the power side of debit relay switch 256 so that it will not be energized unless one of the other debit relay switches is also energized. Thus, the stencil with an open debit hole for the last current month will be passed through without printing unless some other debit hole is also open. When switch 255 is thrown to its other position, the above mentioned stencil would be printed even though only the last current month was in arrears; i. e. relay switch 256 would act in the same manner as all of the other debit relay switches.

In order to prevent sparking in the opening and closing of circuits by the pins of the selector and the relay switches, circuit breakers of well known construction are employed in the high voltage line, ahead of the transformer, at 260 and in the low voltage line at 261, between the transformer and the timing devices. The relative contact periods of the selector pins and the circuit breakers are illustrated in Fig. 23.

Assuming the machine is to be operated for a run of statements for July 1st for example, under the system of accounting herein described, the printing of statements will be limited to accounts, machine selected, in which a predetermined limit of credit has been exceeded by being in arrears for a single item for more than one month or for two or more items within the previous three months period. All other accounts pass through the machine without statements being printed from them.

To enable the machine to cover the three months period prior to July, circuit connections are arranged for selector control of five of the item printing mechanisms, one for the First book, three for the April, May and June current issues and the last one for Sundry charges. These connections are plugged in from each of the debit sockets D, D', D², D³ and D⁵ of the switchboard, to selector head openings 84, corresponding to the charge entry spaces 262, 263, 264, 265, 266, of the stencil accounts for April, May and June current issues, First book and Sundry charges.

As there may be either one of two possible off-setting credit entries against each charge entry in a stencil account, by a book being paid for or returned, connections are plugged in from switchboard credit sockets C', C², C³, and C⁵ to selector head openings, corresponding to stencil account credit entry spaces 267-267a, 268-268a, 269-269a, for current issues for April, May and June, and spaces 270-270a for the first book.

With connections plugged in as above described, let us assume an address and account bearing stencil such as is shown in Fig. 27 to be acted upon by the selector. Here we have a paid-up account, excepting special charges, written in by hand. As shown by the punched entries of the account, the April current issue was shipped and paid for; the May issue was refused and the June issue was returned. The action of the circuits closed by the selector through the April and June charge entries, would be to pre-set the April and June item printing mechanism and the address printing mechanism, for operation two feed steps later or when the stencil is advanced from selector position to printing position but, as there are balancing credit entries for these charges and there is no charge for May, the book having been refused, the action of the circuits completed by the selector through such credit entries will be to break the debit entry circuits, as previously described and prevent them from pre-setting the mechanism for a printing operation. Such an account would pass through the machine without a statement being printed from it but for the special charge entry, hand written therein, which is made machine responsive by the accompanying companion card. As previously explained, the companion card is provided with a punched opening 244, through which the selector completes a circuit, when it acts on the address and account bearing stencil the companion card accompanies. The circuit thus completed pre-sets the address printing mechanism and the sundry charge item printing mechanism for operation when the address and account bearing stencil is advanced to printing position and the statement addressed contains the single item "Sundry charges", blank as to amount.

If the account had shown charges for the April, May and June current issues and there were no balancing credits or sundry charges, the

statement printed would have contained three separate items, as follows:

April	Adven. of	2.09
May	Life of	2.09
June	Sojourning in	2.09

After a statement has been addressed and itemized, as above described, it is advanced one feed step and positioned for operation of the dating mechanism by which the date is printed thereon. It is then fed forward to the trimming and chopping mechanism and the perforated edges are trimmed off and the statement is cut from the web and delivered to a receiving tray or hopper at the front of the machine.

The statements from this tray or hopper, excepting those containing the item "Sundry charges" are complete and ready for mailing, but it is customary, though not necessary, to type in the total of the itemized amounts before the statements are sent out. As the item of "Sundry charges" varies in amount for different statements, machine printing of the same is practically impossible and such amounts are accordingly typed or written in from the hand written entries of the stencil accounts in which such special charges appear.

Having described my invention, I claim:

1. In a statement printing machine in which address and coded account bearing devices together with paper to receive address impressions therefrom are fed step by step through address printing mechanism, each of said devices having directly recorded thereon the addressee's account, means controlled by the coded account entries of the aforesaid devices for distinguishing between paid and unpaid entries and effecting itemized printing of the unpaid coded charges of each account for which a statement is addressed.

2. A statement printing machine as defined in claim 1, in which means are employed to date each statement printed.

3. In a statement printing machine in which address and coded account bearing devices and paper to receive address impressions therefrom are advanced step by step to printing position each of said devices having directly recorded thereon the addressee's account, means controlled by the coded account entries of the aforesaid devices for printing the address and the unpaid coded charges in itemized amounts of each account machine selected as having exceeded a predetermined limit of credit.

4. In a statement printing machine in which address and coded account bearing devices and paper to receive address impressions therefrom are advanced step by step to printing position each of said devices having directly recorded thereon the addressee's account, means controlled by the coded account entries of the aforesaid devices for printing the address and the unpaid coded charges in itemized amounts of each account machine selected as having exceeded a predetermined limit of credit and timing means for pre-setting the machine to delay the address and item printing operation during the advance of the address and account bearing devices to printing position.

5. In a statement printing machine in which address and coded account bearing devices together with paper to receive address impressions therefrom are fed step by step through address printing mechanism, each of said devices having directly recorded thereon the addressee's ac-

count, means responsive to coded debit entries in the accounts of the aforesaid devices for adding to each address printed the unpaid coded charges in itemized amounts of the addressee's account.

6. In a statement printing machine in which address and coded account bearing devices together with paper to receive address impressions therefrom are fed step by step through address printing mechanism, each of said devices having directly recorded thereon the addressee's account, means controlled by the aforesaid devices for limiting the printing of statements to the accounts thereof machine-selected as having exceeded a predetermined limit of credit, and means responsive to the coded debit entries in the accounts for adding to each address printed the unpaid coded charges in itemized amounts of the addressee's account.

7. In a statement printing machine in which address and coded account bearing devices together with paper to receive address impressions therefrom are fed step by step through address printing mechanism, each of said devices having directly recorded thereon the addressee's account, means controlled by circuits completed through the entries in the accounts of the aforesaid devices for limiting the printing of statements to accounts machine-selected as having exceeded a predetermined limit of credit, and means responsive to the coded debit entries in the accounts for adding to each address printed the unpaid coded charges in itemized amounts of the addressee's account.

8. In a statement printing machine in which address and coded account bearing devices together with paper to receive address impressions therefrom are fed step by step through address printing mechanism, each of said devices having directly recorded thereon the addressee's account, means responsive to debit entries in the accounts of the aforesaid devices for adding to each address printed the unpaid coded charges in itemized amounts of the addressee's account, and opposing means responsive to the coded credit entries on such accounts for preventing the aforementioned responsive action to any coded debit entries for which there are balancing credits.

9. In a statement printing machine in which address and coded account bearing devices together with paper to receive address impressions therefrom are fed step by step through address printing mechanism, each of said devices having directly recorded thereon the addressee's account, means responsive to coded debit entries in the accounts of the aforesaid devices for printing such debit entries in itemized amounts and means responsive to coded credit entries in the accounts for preventing the aforementioned responsive action to the coded debit entries, thereby limiting item printing to debit entries of accounts in which no balancing credits appear.

10. In a statement printing machine in which address and coded account bearing devices together with paper to receive address impressions therefrom are fed step by step through address printing mechanism, each of said devices having directly recorded thereon the addressee's account, means electrically controlled by circuits completed through the coded account entries of the aforesaid devices for printing in itemized form the unpaid coded charges of each account for which a statement is addressed.

11. In a statement printing machine in which

address and coded account bearing devices together with paper to receive address impressions therefrom are fed step by step through address printing mechanism, each of said devices having directly recorded thereon the addressee's account, means including single item printing mechanisms electrically controlled by circuits completed through the coded entries in the accounts of the aforesaid devices for printing in itemized form the unpaid coded charges of each account for which a statement is addressed.

12. In a statement printing machine in which address and coded account bearing devices together with paper to receive address impressions therefrom are fed step by step through address printing mechanism, each of said devices having directly recorded thereon the addressee's account, means for printing in itemized form the unpaid coded charges of each account for which a statement is addressed, the said means including separate item printing mechanisms and circuits completed through the coded account entries of the aforesaid devices controlling said mechanisms, and a selector co-acting with the devices to complete such circuits and thereby pre-set selected item printing mechanisms for operation when the devices acted upon by the selector are advanced to address printing position.

13. In a statement printing machine in which address and coded account bearing devices together with paper to receive address impressions therefrom are fed step by step through address printing mechanism, each of said devices having directly recorded thereon the addressee's account, means for printing in itemized form the unpaid coded charges for each account for which statement is addressed, the said means including single item printing mechanisms and timing devices for pre-setting the same for delayed operation, the timing devices being controlled by circuits completed through coded entries in the aforesaid account bearing devices, and a selector co-acting with the account bearing devices to complete such circuits and thereby pre-set selected item printing mechanisms for operation when the account bearing devices acted upon by the selector are advanced to address printing position.

14. A statement printing machine, as defined in claim 13, in which a rotating element of each of the timing devices is carried by a common shaft rotated step by step by a pawl and ratchet feed actuated by an eccentric drive rod, the said rod being formed of sections self-separating to discontinue the drive on failure of the common shaft to rotate with normal freedom.

15. In a statement printing machine in which address and coded account bearing devices together with paper to receive address impressions therefrom are fed step by step through address printing mechanisms, each of said devices having directly recorded thereon the addressee's account, means for printing in itemized amounts the unpaid coded charges of each account for which a statement is addressed, the said means including separate item printing mechanisms electrically operated and timed switches for closing the operating circuits, the said timed switches being energized through relay circuits responsive in closing to control circuits completed through coded entries in the aforesaid devices, and a selector coacting with the account bearing devices to complete the control circuits and thereby pre-set selected item printing mechanisms for opera-

tion when the account bearing devices acted upon by the selector are advanced to addressing position.

16. In a statement printing machine in which address and account bearing devices and statement blanks to receive address impressions therefrom are advanced step by step through address printing mechanism, each of said devices having directly recorded thereon the addressee's account, means responsive to and controlled by circuits completed through the entries in the accounts of the aforesaid devices for printing in itemized form the unpaid charges of each account for which a statement is addressed, the said means including a plurality of single item printing mechanisms individually and collectively operable and inking means common to the several mechanisms, the printing element of each item printing mechanism being spring-supported in floating relation above a platen with which it cooperates and depressible against the action of its spring supports to perform a printing operation.

17. A statement machine as defined in claim 16 in which the inking means is in the form of an ink ribbon to which motion is imparted to present a new surface thereof to the printing elements of the item printing mechanisms after each printing operation and self-acting means for periodically reversing the direction of movement of the ribbon.

18. In a statement printing machine, means for advancing a succession of address and account bearing devices and paper to receive address impressions therefrom step by step through printing mechanism, the said devices having directly recorded thereon the addressees' accounts in certain of which special entries appear, means for obtaining machine responsive action from all entries in the accounts of the aforesaid devices by giving the entries code form and providing companion devices as carriers for the coded form of the special entries, such companion devices being interposed to immediately follow the account bearing devices having special entries through the machine, and means controlled by the coded entries of the associated devices for effecting address and itemized printing of the unpaid charges of the addressee's account.

19. In a statement printing machine, means for advancing a succession of address and account bearing devices and paper to receive address impressions therefrom step by step through printing mechanism, the said devices having directly recorded thereon the addressees' accounts in certain of which handwritten entries appear, means for obtaining machine responsive action from all entries in the accounts of the aforesaid devices by giving the entries code form and providing companion devices as carriers for the coded form of the handwritten entries, such companion devices being interposed to immediately follow the devices bearing handwritten entries through the machine, and means controlled by circuits completed through the coded entries of the associated devices for printing the address and unpaid charges of the addressee's account in itemized form.

20. A statement printing machine, as defined in claim 18, in which the coded account entries of the address and account bearing devices and the interposed companion devices are in the form of punched openings through which circuits are completed to effect address and item printing of the unpaid charges of each addressee's account.

21. In a statement printing machine, means for advancing a succession of address and account bearing devices and paper to receive address impressions therefrom step by step through printing mechanism, the entries in the accounts of the aforesaid devices, excepting special charge entries being in code form and such special charge entries, in like coded form, being borne by companion devices interposed to accompany the account bearing devices in which special charges appear in their passage through the machine, and means controlled by circuits simultaneously completed through the coded entries of associated devices for printing the address and the unpaid charges of the addressee's account in itemized form.

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