Dec. 25, 1934. H. P. ELLIOTT 1,985,245

PRINTING MACHINE AND METHOD

Filed Feb. 4, 1930 6 Sheets-Sheet 1

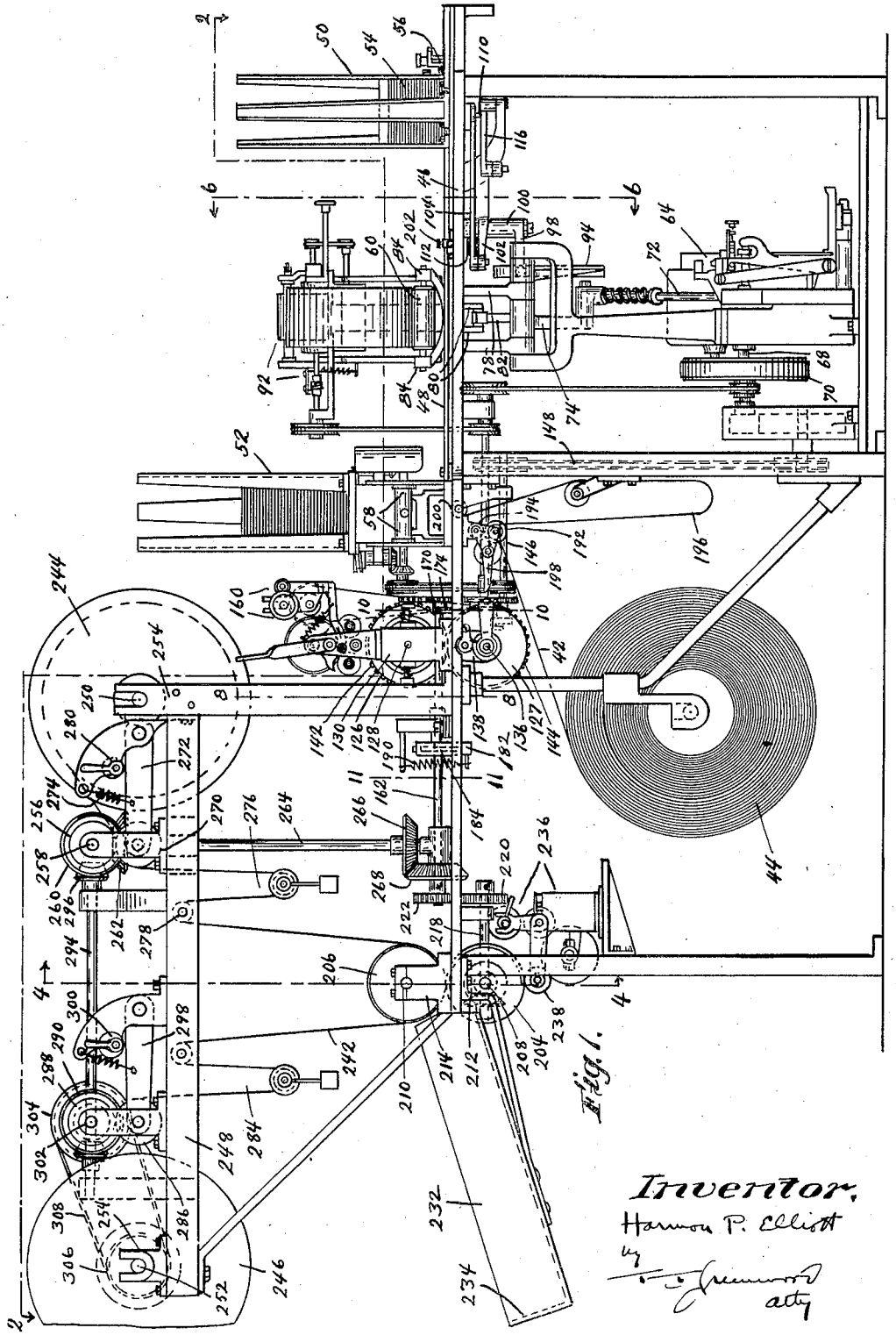


Fig. 1.

Inventor.
Harmon P. Elliott
by
J. Greenwood
atty

Dec. 25, 1934. H. P. ELLIOTT 1,985,245

PRINTING MACHINE AND METHOD

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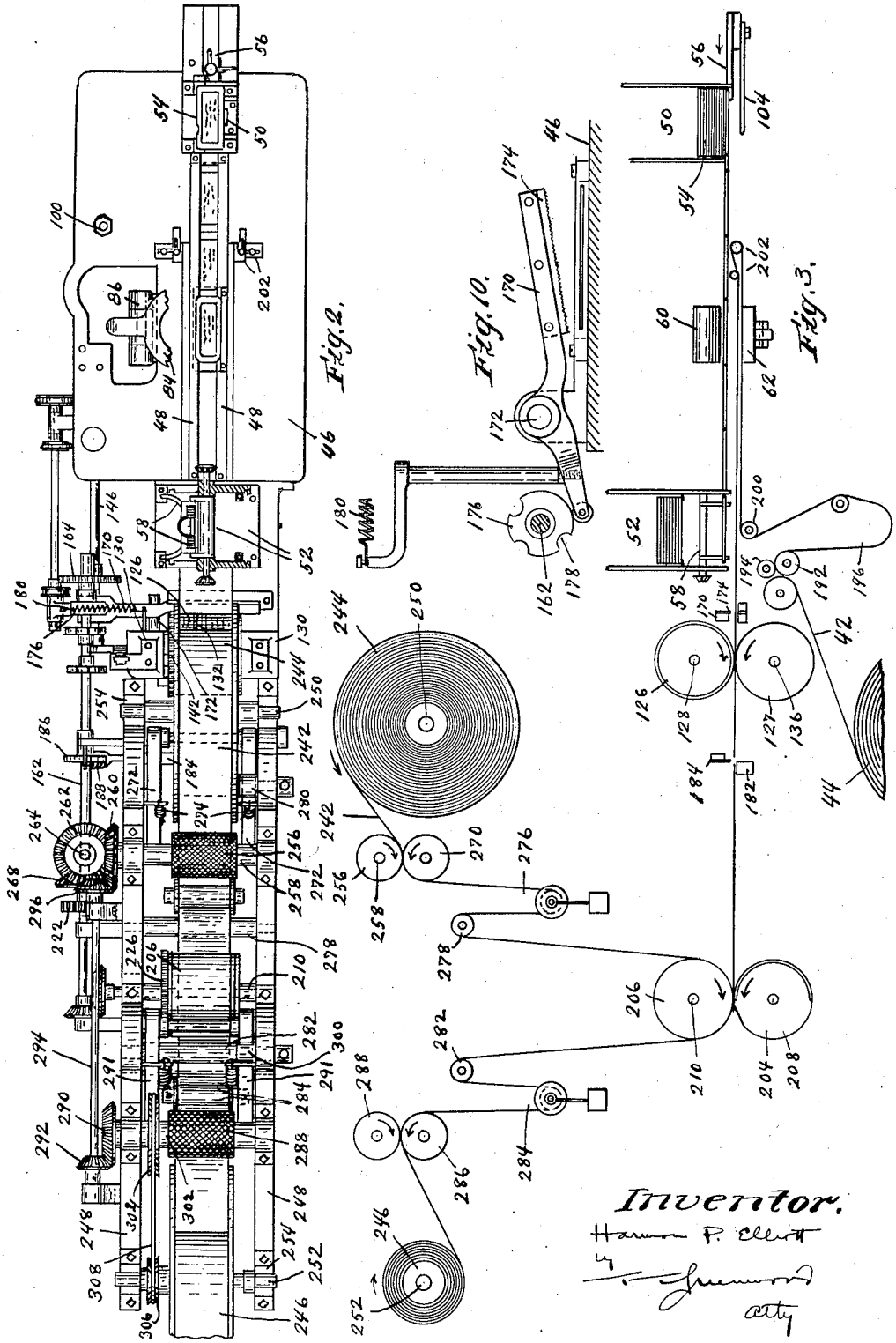


Fig. 2.

Fig. 10.

Fig. 3.

Inventor.
Harmon P. Elliott
by Thurmond
atty

Dec. 25, 1934. H. P. ELLIOTT 1,985,245

PRINTING MACHINE AND METHOD

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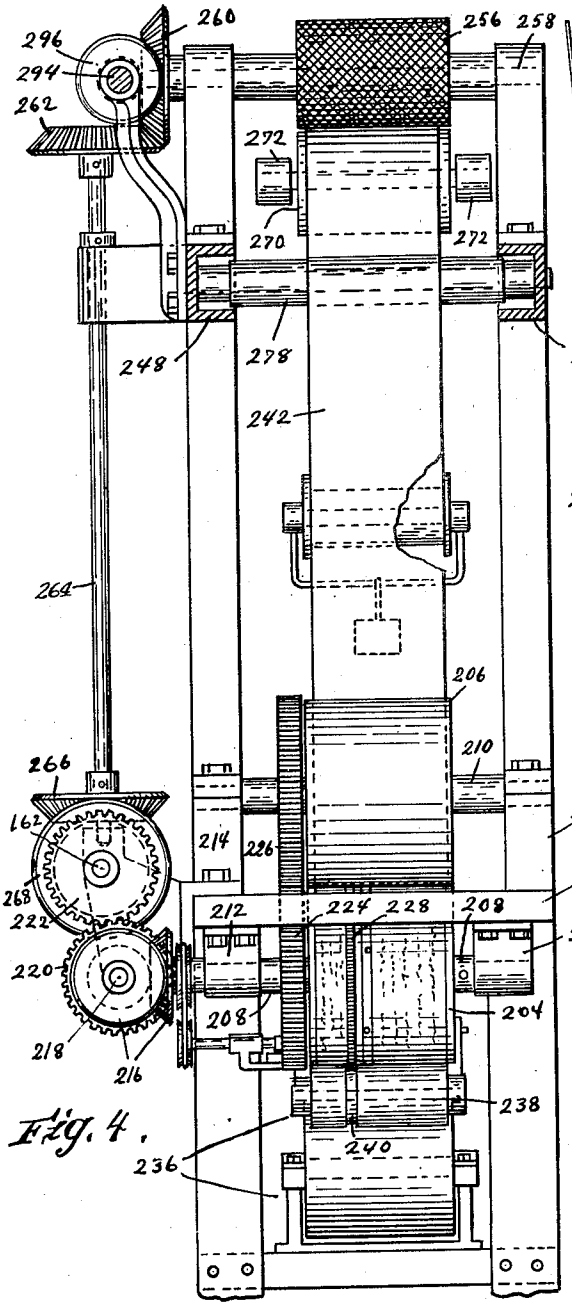


Fig. 4.

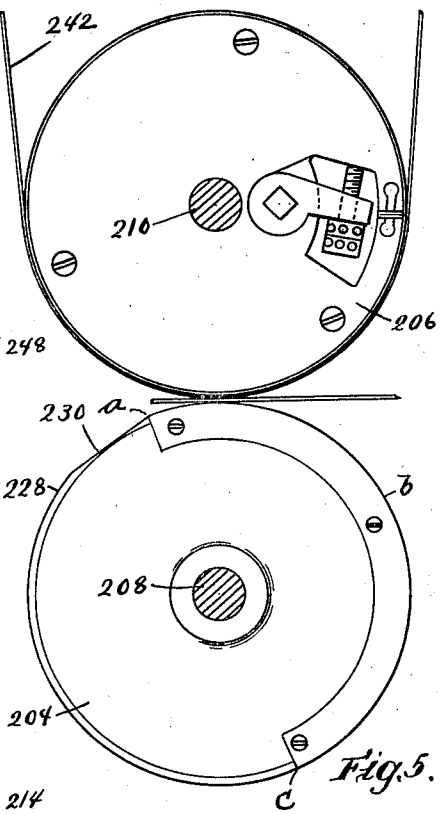


Fig. 5.

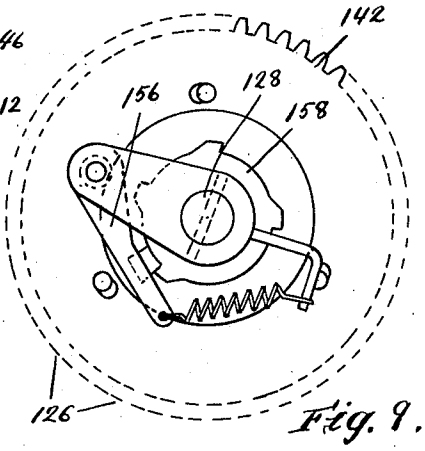


Fig. 9.

Inventor.
Harmon P. Elliott
by
Attorney

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PRINTING MACHINE AND METHOD

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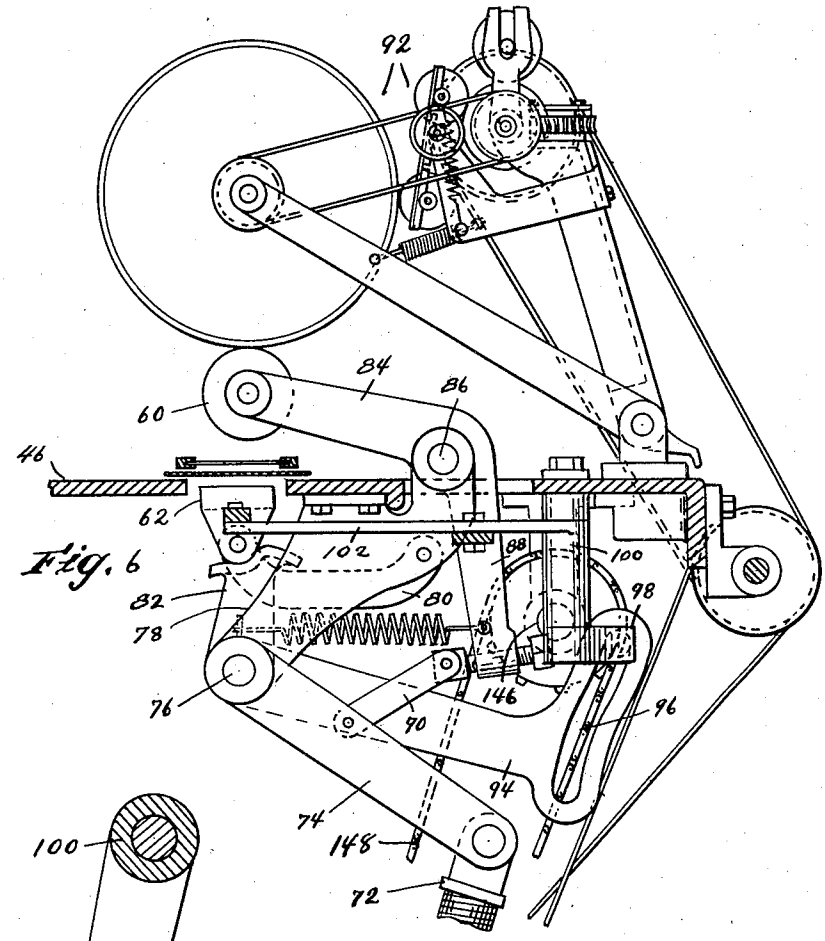


Fig. 6

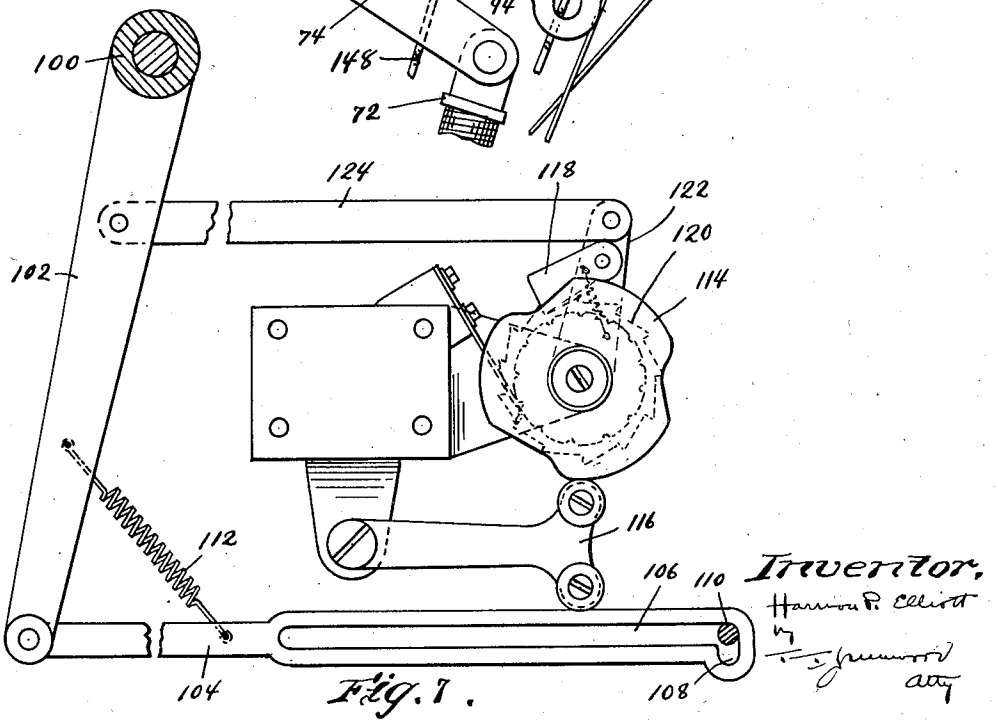


Fig. 7.

Inventor,
Harrison P. Elliott
by
J. Lawrence
atty

Dec. 25, 1934. H. P. ELLIOTT 1,985,245

PRINTING MACHINE AND METHOD

Filed Feb. 4, 1930 6 Sheets-Sheet 5

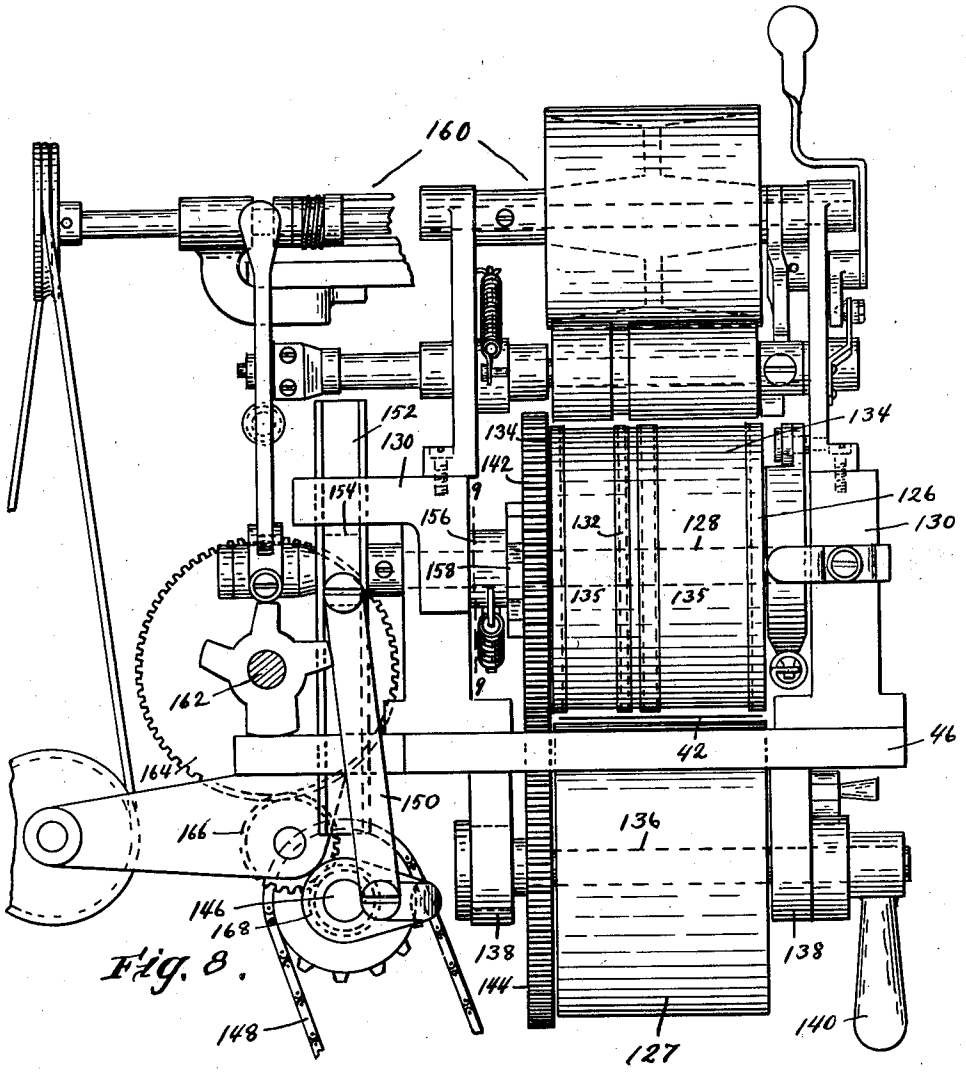


Fig. 8.

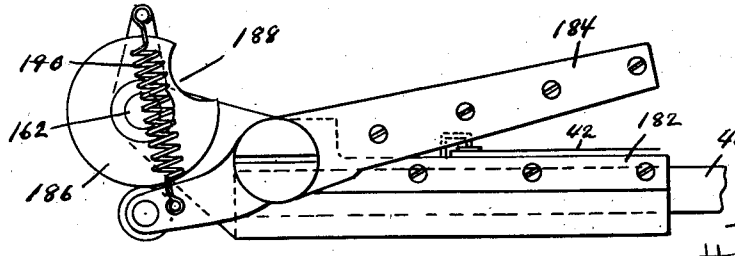


Fig. 11.

Inventor.
Harmon P. Elliott
by
Attorney

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PRINTING MACHINE AND METHOD

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Fig. 12.

Fig. 13.

Inventor.
Harmon P. Elliott
by
Attorney

Patented Dec. 25, 1934 1,985,245

UNITED STATES PATENT OFFICE

1,985,245

PRINTING MACHINE AND METHOD

Harmon P. Elliott, Watertown, Mass.

Application February 4, 1930, Serial No. 425,779

20 Claims. (Cl. 101—57)

This invention relates to printing and addressing machines and methods.

Many large public utilities such, for instance, as a telephone company send out periodical bills for services, which bills consist of several detachable sections some of which are retained by the company for use in their various departments and the remainder of which are forwarded to the customers who detach the remaining sections and present one of the detached sections with the payment of the bill. The various sections of the bills contain printed data and also the address of the customer. The address is located on the various sections in register with the printed data thereon.

A machine for printing such bills from a web or roll of blank paper is described and claimed in my copending application Serial No. 273,364, filed April 27, 1928. The bill made by this machine has the printed data and the addresses all on one face of the bill. It is quite desirable to have printed data appear on the reverse face of the bill, which data can consist of a statement of the rate for the service charged on the obverse face of the bill, for instance, or it can consist of an advertisement of any desired character, which data preferably, although not necessarily, is located only on that portion of the bill that is to be sent to, or is to be retained by the customer. It is an object of the present invention to provide such a bill.

Prior to my invention the only way in which such a bill could be made was to print one face of the bill, as the reverse face, as an operation entirely unrelated to the printing and addressing of the obverse face of the bill and in which the individual bills must be separately manipulated. The entire bill could not be made from a long web of paper. In accordance with the present invention, I have provided a method and a machine for printing both faces of a bill, and applying addresses to the several sections of the bill in register with the printed data on the obverse face thereof and forming successive bills with repeated printed data on both faces and different addresses on one face from a long web of paper; and this constitutes one of the objects of the present invention.

A further object of the present invention is the provision of rotary means for applying printed data to both faces of the bill and reciprocating means to apply addresses to successive portions of one face of the bill.

Another object of the invention is to print and address the obverse face of the bill and to feed the bill into the bite of a second feeding means prior to severing the bill from the web and to impress printed data upon the reverse face of the severed bill while it is in the grip of and is being driven by the second feeding means.

A further object of the invention is in the provision of means for applying printed data to one face of a bill while the ink of the printed data on the opposite face of the bill is still wet and without smudging the ink.

A further object is generally to improve the construction and operation of printing and addressing machines.

Fig. 1 is a side elevation of a printing and addressing machine embodying the present invention.

Fig. 2 is a plan view taken along line 2—2 of Fig. 1.

Fig. 3 is a view illustrating diagrammatically the successive steps of the process.

Fig. 4 is a vertical section taken along line 4—4 of Fig. 1.

Fig. 5 is an enlarged side elevation of the rotary cylinders for impressing type data on the reverse face of the bill.

Fig. 6 is a detailed sectional elevation taken along line 6—6 of Fig. 1.

Fig. 7 is a detailed plan view of the disabling means for the stencil feeding mechanism.

Fig. 8 is a sectional elevation taken along line 8—8 of Fig. 1 and illustrating particularly the first rotary printing rolls.

Fig. 9 is a section taken along line 9—9 of Fig. 8.

Fig. 10 is a section taken along line 10—10 of Fig. 1 and illustrating particularly the perforating mechanism.

Fig. 11 is a section taken along line 11—11 of Fig. 1 and illustrating particularly the reversing mechanism.

Fig. 12 is a plan view of the obverse face of a telephone bill made in accordance with the present invention.

Fig. 13 is a plan view of the reverse face of the bill.

The bill that is a product of the present machine is shown in Figs. 12 and 13 and consists of a long section 20 and several shorter sections 22, 24, and 26, all of which are detachably connected together along lines of perforations 28. The obverse face of the bill shown in Fig. 12 contains printed data 30 at the top and bottom portions of the bill which data may be different in the different sections; and also contains a date 32. The bill also contains stencil-impressed, or address, data 34 which includes the address of

the subscriber; and this last data is duplicated on all of the sections in register with the printed data thereon. The obverse face of the bill also has a longitudinal space 36 which extends throughout the sections and which is free from any printed data and is adapted to be engaged by driving means for the bill sheet.

In accordance with the present invention, the reverse face of the bill illustrated in Fig. 13, also bears printed data 38 which may cover substantially the entire reverse face of the bill or, since the data is intended to be of interest to the subscriber only, it usually will cover only the reverse face of the sections 20 and 22 which sections are presented to the customer. The other sections are retained by the company. It may sometimes be sufficient to have such data 38 appear only on the reverse face of the long section 20. This data may be an explanation of the rates billed on the obverse face of the bill or it may consist of certain service requirements or the like. The portions of the data appearing on the upper and lower portions of the reverse face are separated by a space 40 which corresponds with the space 36 and which is clear and free from printing to provide a surface that is engaged by the driving means of the bill sheet. The data 38 is also at register with the printed data and the address on the obverse face of at least one section of the bill, and usually of the section 20.

Successive bills as above described bearing the same printed data on both faces thereof but different addresses are made from a long sheet or web 42 of paper contained in a roll 44 the web having a width which corresponds with the width of the bill. The web is first passed into and out of a stencil printing position where the same address 34 is impressed in positions corresponding to the several sections of the bill and then is passed through a perforating position where the bill is sectionalized by forming the perforating lines 28 at spaced intervals across the sheet. The bill then passes to a printing position where the printed data 30, 32 is applied to the obverse face of the sheet. The bill thence passes through a severing position where the bill is severed from the web. The severed bill is then run through a section printing position where the data 38 on the obverse face of the bill is applied.

The machine for carrying out the various steps of the process includes a table 46 having elevated stencil tracks 48, see Figs. 1 and 2, extending lengthwise thereof and between a stencil holder 50 and a stencil receiver 52. The stencil holder 50 is adapted to contain a pile of superimposed stencils 54 which bear the addresses and any other desired data associated with the respective customers. Means including a stencil pusher 56 reciprocates beneath the pile of stencils and moves the successive lowermost stencils from the pile into and along the track and into and out of a stencil printing or addressing position intermediate the length of the track and delivers the stencils to a reversing and elevating mechanism 58 which moves the successive stencils upwardly out of the track and deposits them in the bottom of the pile of stencils in the stencil receiver. A printing roll 60 is located above and a platen 62 is located below the line of stencils in the track and the paper web 40 thereunder and both are adapted to be moved toward each other to press the successive stencils against the web and thereby impress on the web the address data borne by the stencils. The operation of the printing roll and platen, the pusher, and the various other parts of the device is effected by a power mechanism 64 which has a shaft 68, the pulley 70 of which is driven by a suitable motor, not herein shown. The power mechanism includes a reciprocating connecting rod 72, the upper end of which, see especially Fig. 6, is pivotally connected to an arm 74 that is fixed to a shaft 76 journalled in brackets 78 that depend below the table 46. The platen 62 is carried by arms 80 pivoted to the aforesaid arms 78 and is raised and lowered by a cam member 82 which is fixed to said shaft 76 and reciprocates therewith. The printing roll 60 is journalled in arms 84 which are supported by the shaft 86. Said arms have a depending extension 88 that is pivotally connected to the arm 74 by means including the link 90. Thus, the reciprocatory movement of said connecting rod 72 actuates both the printing roll and the platen. The printing roll is supplied with ink by means of suitable inking mechanism 92 that need not be described in greater detail. The pusher is reciprocated by means including an arm 94 that is carried by the shaft 76 and is formed with a vertically extended cam slot 96 therein in which is received the end of a horizontally extended arm 98 carried by the lower end of a vertically pivoted hub 100. Thus, the reciprocatory movements of the arm 94 cause said hub to oscillate. Said hub is provided with a forwardly extended arm 102 that is pivoted to one end of a connecting rod 104 having a horizontally extended slot 106 therein terminated in a lateral extension 108. A pin 110 connected with the pusher 56 is located in said slot and the extension thereof. A spring 112 bears on said rod 104 to maintain the pin 110 in the extension 108 so that the pusher and the arm 102 will reciprocate together. Means are provided, however, to operatively disconnect said connecting rod 104 and the pusher so that the same stencil will remain in printing or addressing position until all of the sections of the bill have been addressed whereupon the pusher will be operated to shift stencils or to present a new stencil, bearing a different address, to the addressing position. Said disabling means includes a cam 114 having lobes which actuate a pivoted arm 116 that bears against the connecting rod, thereby to condition the connecting rod for engagement with or disengagement from the pusher, depending upon whether or not a lobe of the cam engages said arm 116. The cam is operated in a step by step manner by a pawl 118 which engages a ratchet wheel 120 that drives the cam. The pawl is carried by a lever 122 reciprocated through a link 124 from the aforesaid arm 102.

The addressed web passes from the printing position to a rotary printing mechanism where the printed data 30 and 32 is applied to the obverse face of the web. Said printing mechanism includes the printing or electrotype roll 126 and the cooperating platen roll 127 located beneath the electrotype roll, the construction of which is best illustrated in Fig. 8. Said electrotype roll is rotatable on the shaft 128 which is journalled in brackets 130, and the periphery of the roll, intermediate its ends, is provided with a continuous annular driving ledge 132 that engages and drives the web in the region 36 of the bill, the grip on the web being continuous and the bill being severed beyond the electrotype roll. The roll is provided with peripheral portions 134 on opposite sides of said ledge that are occupied by electrotypes 135 that bear different printed data that

is applied to the various sections of the bill. The electrotypes are removably secured to the roll in the manner illustrated in my above-named copending application and not herein of particular importance. The peripheral extent of the electrotype roll is equal to the length of the bill.

The platen roll 127 is supported on a shaft 136 journalled in eccentric bushings in a bracket 138 beneath the electrotype roll, which bushings can be rotated by a handle 140 to raise and lower the platen roll with respect to the electrotype roll. Both rolls are caused to rotate at the same peripheral speed by intermeshing gears 142 and 144 of equal pitch diameter which are fixed each to a separate roll.

The electrotype roll is driven in a step by step manner intermittently in one direction, the lengths of certain of the steps being unequal, by mechanism which is operated by a shaft 146 which is geared through a chain 148 with the power mechanism 64 so that it operates in positive timed relation to the operation of the stencil printing mechanism. The shaft 146 reciprocates a connecting rod 150 which actuates a vertically reciprocable rack 152 which is in constant mesh with a gear 154 fixed to the shaft 128. Said shaft carries and reciprocates a pawl 156 which is engageable with any one of the teeth of a ratchet wheel 158 fixed to the electrotype roll 126 so that at each reciprocatory movement of the pawl, the electrotype roll is advanced by an amount equal to the distance between two consecutive teeth. It will be noted that the distance between a certain two consecutive teeth is greater than the distance between the remaining teeth. Thus, the electrotype roll is caused to advance at one time by an amount equal to the length of the first or long section 20 of the bill and at other times is caused to advance by an amount equal to the lengths of the equal sections 22, 24 and 26 of the bill.

Inking mechanism 160 is provided to apply ink to the type characters on the electrotype roll in the manner described in my copending application above-named and thus need not be described in detail here.

Web-perforating and bill-severing mechanisms are located on opposite sides of the printing roll and are operated in timed relation to the movements of the bill sheet from a shaft 162 which is driven through meshed gears 164, 166, 168 from the shaft 146. The perforating or bill-sectionalizing mechanism is located in front of the electrotype roll and the construction thereof is illustrated best in Fig. 12. Said mechanism includes an arm 170 that is pivoted at 172 and carries a toothed knife 174 that is reciprocated into engagement with the stationary paper web to perforate it along the lines 28 between the various sections of the bill. The arm 170 is reciprocated by a cam disc 176 fixed to the shaft 162 and has a series of notches 178 at peripherally spaced intervals in the disc which correspond with the lengths of the bill sections and which notches permit the arm to descend into engagement with the paper web under urge of the tensile spring 180.

The bill-severing mechanism is disposed on the other side of the electrotype bill and consists of a stationary knife 182 over which the paper web passes and a movable knife 183 carried by a pivoted, vertically reciprocating arm 184, the action of which is controlled by a cam disc 186 driven by the aforesaid shaft 162. Said disc has a notch 188 therein which is adapted to permit the knife blade to descend under urge of the spring 190 after a length of web corresponding to the length of the bill has been passed under it, thereby to sever the bill from the web. The perforating and severing mechanisms are timed to operate when the bill is stationary.

The printing and platen rolls constitute the means that moves the paper web through the addressing and printing positions so that the addressed and imprinted characters on the several sections of the bill can not get out of register.

The paper web 42 is drawn from the roll 44 at a rate of speed which is adapted to be substantially equal to or slightly greater than the average speed of movement of the web through the printing and platen rolls by mechanism that includes a driving roll 192 which is geared to the shaft 146, see Fig. 1. An idler roll 194 is spring-urged toward the driving roll 192 whereby to cause said latter roll to grip the web and to feed it into a loose loop 196 from which the web is drawn by the printing roll. The idler roll 194 can be raised from engagement with the paper web by the hand lever 198 whereby momentarily to disable the web-feeding means if the loop becomes too long. The paper web is drawn from the loose loop over an idler roll 200 and in a lower pass through the printing position and over confronting cylindrical surfaces of a mechanism 202 which removes the curl from the web and straightens it. The web then moves in an upper pass toward the left through the printing position and through the perforating mechanism to the engagement of the printing mechanism and is delivered by the printing mechanism to the action of the severing mechanism. The mechanism thus described is essentially the same as described in my above-named application and provides means to address and print the obverse faces of the several sections of the bill.

The printing mechanism advances the web which is completely printed and addressed on one face thereof into the bite of a second printing and driving mechanism which engages the end of the web prior to the separation of the bill from the web and which has means to print suitable data on the obverse face thereof.

Said second printing and bill driving mechanism includes a second and lower printing roll 204 and a cooperating second and upper platen roll 206, said rolls having shafts 208 and 210 respectively which are rotatably supported in suitable brackets 212 and 214. The shaft of the printing roll is driven by meshing bevel gears 216, see especially Figs. 1 and 4, from a shaft 218 that is driven through meshing spur gears 220, 222 by the aforesaid shaft 162. The platen roll 216 has the same peripheral diameter as the diameter of the printing surface of the printing roll and is driven by said printing roll, the printing roll and the platen roll having intermeshing gears 224 and 226, respectively, which gears have equal pitch diameter.

The printing roll is provided with a peripherally disposed annular ledge 228 that engages the obverse face of the bill in the space 40 and grips the bill between it and the platen roll and drives the bill through the rolls. Said annular ledge is continuous except for a flat portion 230 which is adapted to be disposed in confronting relation with the platen roll at the time the end of the web of paper is extended forwardly from the first printing roll, so that the front end of the bill is in position to be gripped between the second printing roll and its platen roll, just after the bill has been severed from the web, which position of the

rolls and the bill is illustrated in Fig. 5. The peripheral length of the driving face of the roll is adapted to be substantally equal to the length of the bill. Since the printed data on the reverse face of the bill is shorter than the length of the bill, the electrotype on the printing roll 204 does not extend entirely around the periphery of the roll and, as herein shown, extends only over the portion *a*, *b*, *c*, of the roll so that the remainder of the peripheral face of the roll, except the ledge 228, is free from contact with the obverse face of the bill.

The second printing and platen rolls make one complete revolution for each bill severed from the web. The end of the web is moved into the space between the printing and platen rolls, provided by the flattened portion 230, and the bill is severed prior to the passage of this flattened portion out from under the platen roll so that the bill is free and clear from the web when it is engaged and moved forwardly by said rolls. The data on the reverse face of the bill is printed simultaneously with the forward movement of the bill and the free and completely printed bill is deposed in the hopper 232. Since both the first and second printing and platen rolls are operated in positively timed relation with each other, the type-printed data impressed by said rolls on the two faces of the bill are caused to be in register with each other, throughout all the bills made by the machine. The speed of movement of the bills from the second printing roll and platen is sufficiently great so that the moving bill is discharged from the rolls and strikes against the front wall 234 of the hopper and then sinks down upon the pile of previously deposited bills without any lateral movement in contact therewith. Thus, there is no danger of smudging the fresh ink on the bottom of, or defacing, the bills.

The printing surface of the platen roll 204 is supplied with ink through a suitable inking mechanism 236 which can be constructed essentially as shown in my Patent No. 1,614,547, dated January 18, 1927. Said mechanism includes an ink transfer roll 238 in contact with which the electrotype section *a*, *b*, *c*, of the printing roll passes. The remaining section of the printing roll is smaller in diameter than the diameter of the electrotype section and so passes over said ink transfer roll without engaging it. Said transfer roll is provided with an annular groove 240 in which the peripheral ledge 228 is located so that said ledge is kept clear of ink.

Since the ink on the top or obverse face of the bill is fresh when it passes between the second printing and platen rolls and thus might possibly transfer ink to the platen roll which might subsequently transfer the deposited ink to a following bill and thereby deface it, means are provided herewith to prevent contact of the inked surface of the bill with a platen roll and the possible defacement of the bills. To this end, a protective web 242 of absorbent or blotting paper is interposed between the obverse face of the bill and the platen roll 206, which web is driven in a continuous manner by the platen roll and thus continuously presents fresh and ink-free surfaces to the obverse faces of the successive bills. The blotting web is contained on a roll 244 from which it is drawn and passed about the platen roll and is then wound on a second roll 246. Said rolls are supported in a suitable frame 248 which is disposed above the second platen and printing rolls and have their shafts 250 and 252, respectively, removably rotatably supported in suitable bearings 254 of said frame. The blotting web is withdrawn in a continuous manner from the roll 244 at a rate which is at least equal to the rate of movement of the web around the platen roll 206 and, preferably, at a slightly greater rate. The web withdrawing means includes the driving roll 256, the shaft 258 of which is driven through bevel gears 260 and 262, see especially Figs. 1 and 2, by a vertical shaft 264 which is driven through bevel gears 266 and 268 by the shaft 162. An idler roll 270 is disposed beneath the driving roll 256 and is rotatably supported in a pivoted bracket 272 having a spring 274 which urges the roll constantly upward toward the driving roll whereby to hold the web in driving engagement with the driving roll. The web is fed by said driving roll into a free loop 276 from which the web is drawn upwardly over an idler roll 278 and thence downwardly onto and around the platen roll. An eccentric cam 280 is provided which can be manually operated to lower the idler roll 270 and thereby stop the feeding of paper into the loop 276 when it is seen that the loop is becoming too long. This arrangement provides a free portion of the web that can be driven through the printing and platen rolls with little opposition and thereby with little tendency to slip into engagement with the bill. The web thence passes upwardly from the platen roll and over an idler pulley 282 and thence downwardly into a second free loop 284 and thence upwardly out of the loop and between a lower idler roll 286 and an upper driving roll 288 from which the paper is fed to the winding roll 246. The driving roll 288 is driven by gears 290, 292 from a shaft 294 which is driven by a gear 296 that meshes with the gear 260 on the roll 256. Said rolls 256 and 288 have the same peripheral diameter and are rotated at the same speed. The idler roll 286 is carried on a pivoted frame 291 in a manner similar to the roll 270 and is provided with an eccentric cam 300 so that the take up of the paper from the loop 284 can be momentarily arrested if the loop becomes unduly shortened. The winding roll 246 is driven from the shaft 302 of the roll 288 by a pulley 304 on said shaft and a second pulley 306 on the shaft of the winding roll. A belt 308 passes about said pulleys and is adapted to slip in engagement therewith so as to take up the paper web from the driving roll 306 only as fast as it is fed by said roll. When the roll 244 becomes empty and the roll 246 becomes full, the rolls are adapted to be removed from their position and replaced by other rolls so that a fresh blotting web can be passed through the printing and platen rolls and thereby prevent the defacement of the freshly printed bills as they pass through the second rotary printing mechanism.

With the arrangement above-described, the bill is completely printed on both faces and is addressed on one face in a progressive manner starting with a long unprinted web of paper. The bills are thus made very rapidly and cheaply since all of the operations are carried out by the successive components of one machine without the necessity for any intervening bill-handling operations.

The standards which rotatably support the second printing roll and platen are adjustable toward and away from the first printing roll and platen so as to operate on bills of various lengths. The peripheral length of the driving ledge 228 of the second printing roll is adapted to be as long as the longest bill to be made and thus also can operate equally well on shorter bills.

I claim:

1. In a printing machine, means for printing unchanging data at different intervals on the one face of successive bill sheets, means for printing changing address data on the same face of the sheets in register with the unchanging data thereon, and means for printing unchanging data, at constant intervals, on the opposite face of the successive separate bill sheets in register with certain of the data on the first-named face of the sheets, said last named printing means having an intermittent driving engagement with the sheets.

2. In a printing machine, means for printing the same address data repeatedly at spaced intervals on a sheet of paper, means for changing the address data after a predetermined number of impressions of any selected address has been made, means for impressing unchanging data on one face of the sheet in register with the addresses thereon, means for advancing the sheet in an intermittent manner through said addressing and one of said unchanging data printing means, means for impressing a second unchanging data on the opposite face of the sheet in register with at least one of the addresses on the sheet, and means for severing the sheet into bills between different addresses and prior to the entrance of the bills to at least one of said unchanging data impressing means.

3. In a printing machine, means for presenting a bill sheet to the action of the machine, separate means for printing unchanging data on both faces of the sheet, means for printing address data repeatedly on separate portions of one face of the sheet in register with the unchanging data thereon, means for changing the address data after a predetermined number of impressions of a selected address data have been made, all of said unchanging data printing means having sheet feeding means associated therewith at least one of which has intermittent driving engagement with the sheet so that constant registration of the unchanging and changing data is maintained throughout successive bills.

4. In a printing machine, a stencil addressing mechanism, two printing mechanisms, and means for presenting a bill sheet in succession to the action of said mechanisms, said stencil addressing mechanism having means to print the same stencil-carried address data on successive portions of the bill sheet and thereafter to shift stencils, and said printing mechanisms having means to print unchanging data in register with each other on both faces of the sheet and with one unchanging data also being in register with the successive addresses on the sheet, both printing mechanisms having means associated therewith to advance the sheet through its respective printing mechanism, and one of said sheet driving means having an intermittent driving engagement with the sheet.

5. In a printing machine, a stencil addressing mechanism, two printing mechanisms, and means for presenting a bill sheet in succession to the action of said mechanisms, said stencil addressing mechanism having means to print the same stencil-carried address data on successive portions of the bill sheet and thereafter to shift stencils, and said printing mechanisms having means to print unchanging data in register with each other on both faces of the sheet and with one unchanging data in register with each other on both faces of the sheet and with one unchanging data also being in register with the successive addresses on the sheet, said two printing mechanisms each having a sheet advancing mechanism associated therewith one of which advancing mechanisms has an intermittent driving engagement with the sheets, and means to sever the sheet between said printing mechanisms at the time said intermittent advancing mechanism is free from driving engagement with the sheet.

6. In a stencil printing machine, means to feed a sheet of paper through the machine, stencil printing mechanism having means to print the same stencil-carried addresses a predetermined number of times on separate portions of the sheet and thereupon to shift stencils, printing mechanism which prints unchanging data on one face of the sheet in register with the addresses thereon and has an intermittent driving engagement with the sheet, other printing mechanism which prints other unchanging data on the opposite face of the sheet in register with the first unchanging data thereon, and means located between said two printing mechanisms to sever the sheet between different addresses thereon.

7. In a stencil printing machine, means to feed a sheet of paper through the machine, stencil printing mechanism having means to print the same stencil-carried addresses a predetermined number of times on separate portions of the sheet and thereupon to shift stencils, printing mechanism which prints unchanging data on one face of the sheet in register with the addresses thereon, other printing mechanism which prints other unchanging data on the opposite face of the sheet in register with the first unchanging data thereon, said printing mechanisms each having sheet advancing means associated therewith, one of which has an intermittent driving engagement with the sheet, and means located between said two printing mechanisms which severs the sheet between different addresses thereon at the time the sheet is within but is free from driving engagement with that advancing means that has an intermittent driving engagement with the sheet.

8. In a printing machine, means for presenting a bill sheet to the action of the machine, reciprocating addressing mechanism having means to impress changeable stencil-contained addresses at different localities on the sheet, and two rotary printing devices which print unchanging data on both faces of the sheet, both printing devices having sheet advancing means associated therewith and at least one of said sheet advancing means having an intermittent driving engagement with the sheet.

9. In a printing machine, means for presenting a bill sheet to the action of the machine, reciprocating addressing mechanism having means to impress changeable stencil-contained address data at different localities on the sheet, two rotary printing devices which print unchanging data on both faces of the sheet, means to advance one device continuously and the other intermittently, and means to sectionalize the sheet between the localities of the successive address data and between the addressing mechanism and the first printing device.

10. A stencil printing machine having means to feed a sheet of paper into the machine, reciprocating stencil printing mechanism having means to print the same stencil-contained address data at predetermined intervals on the sheet and thereupon to shift stencils, intermittently rotating printing mechanism that prints unchanging data on one face of the sheet in register with the address data thereon, other continuously ro-

tating printing mechanism which prints unchanging data on the other face of the sheet in register with the data printed by said first named rotary printing mechanism, and means for severing the sheet into separate bills, said severing means being located in such position that the successive bills are free from connection with each other at the time they are free from driving engagement with at least one of said rotary printing mechanisms.

11. A stencil printing machine having means to feed a sheet of paper through the machine, reciprocating stencil printing mechanism having means to print the same stencil-contained address data at predetermined intervals on the sheet and thereupon to shift stencils, rotating printing mechanism which prints unchanging data on one face of the sheet in register with the address data thereon, other rotary printing mechanism which prints unchanging data on the other face of the sheet in register with the data printed by said first named rotary printing mechanism, and means which is located between said rotary printing devices for severing the sheet into bills between different addresses, said rotary printing mechanisms each having sheet advancing means and one of said advancing means having an intermittent driving engagement with the bills.

12. In a printing machine, type printing mechanism, stencil printing mechanism, means for drawing a sheet of paper from one mechanism to the other which means maintains a permanent grip on the sheet, said stencil printing mechanism having means for printing different addresses on the sheet, said type printing mechanism having means for printing unchanging data on the sheet in register with the addresses thereon, and sheet feeding mechanism which receives the printed sheet from said drawing mechanism.

13. In a printing machine, type printing mechanism, stencil printing mechanism, means for drawing a web of paper from one mechanism to the other which means maintains a permanent grip on the web, said stencil printing mechanism having means for printing different addresses on the web, said type printing mechanism having means for printing unchanging data on the web in register with the addresses thereon, sheet feeding mechanism which receives the web from the drawing mechanism, and a second type printing mechanism which operates on that portion of the web between said drawing and feeding mechanisms.

14. In a printing machine, type printing mechanism, stencil printing mechanism, means for drawing a web of paper from one mechanism to the other which means maintains a permanent grip on the web, said stencil printing mechanism having means for printing different addresses on the web, said type printing mechanism having means for printing unchanging data on the web in register with the addresses thereon, sheet-feeding mechanism which receives the web from said drawing mechanism, and means for severing the web between said feeding and drawing mechanisms.

15. In a printing machine, type printing mechanism, stencil printing mechanism, means for drawing a web of paper from one mechanism to the other which means maintains a permanent grip on the web, said stencil printing mechanism having means for printing different addresses on the web, said type printing mechanism having means for printing unchanging data on the web in register with the addresses thereon, sheet feeding mechanism which receives the web from said drawing mechanism, a second type printing mechanism which operates on that portion of the web between said drawing and feeding mechanisms, and means for severing the web between said two type printing mechanisms.

16. In a printing machine, stencil printing mechanism, type printing mechanism, means for drawing a web of paper between said mechanisms which means maintains a constant grip on the web, said stencil printing mechanism having means to print different stencil-contained addresses along the web, said type printing mechanism having means to print data on the web in register with the addresses thereon, sheet feeding mechanism disposed to receive the web from said drawing mechanism having cooperating sheet feeding elements which have intermittent feeding engagement with the web, said feeding and drawing mechanisms being so arranged that said drawing mechanism delivers the web between the cooperating elements of said feeding mechanism when they are free from driving engagement with the web, and means to sever the web between said feeding and drawing mechanisms.

17. In a printing machine, stencil printing mechanism, type printing mechanism, means for drawing a web of paper between said mechanisms which means maintains a constant grip on the web, said stencil printing mechanism having means to print different stencil-contained addresses along the web, said type printing mechanism having means to print data on the web in register with the addresses thereon, sheet feeding mechanism disposed to receive the web from said drawing mechanism having cooperating sheet feeding elements which have intermittent feeding engagement with the web, said feeding and drawing mechanisms being so arranged that said drawing mechanism delivers the web between the cooperating elements of said feeding mechanism when they are free from driving engagement with the web, and means to sever the web between said feeding and drawing mechanisms prior to the engagement of the severed portion of the web by said cooperating elements.

18. In a printing machine, stencil printing mechanism, type printing mechanism, means for drawing a web of paper between said mechanisms which means maintains a constant grip on the web, said stencil printing mechanism having means to print different stencil-contained addresses along the web, said type printing mechanism having means to print data on the web in register with the addresses thereon, sheet-feeding mechanism disposed to receive the web from said drawing mechanism having cooperating sheet feeding-elements which have intermittent feeding engagement with the web, said feeding and drawing mechanisms being so arranged that said drawing mechanism delivers the web between the cooperating elements of said feeding mechanism when they are free from driving engagement with the web, means to sever the web between said feeding and drawing mechanisms, and a second type printing mechanism which prints data on the opposite face of the severed portion of the sheet.

19. In a printing machine, stencil printing mechanism having means to print different stencil-contained addresses on the obverse face of a web of paper, a rotary type printing mechanism having a type carrying roll which prints data on

the obverse face of the web in register with the addresses thereon, means for drawing a web of paper between said stencil printing and type printing mechanisms, a second rotary printing mechanism having a rotary cylinder for printing data on the reverse face of the web in register with the data on the obverse face of the web, intermittently acting driving means for moving the web from said drawing means to the action of said second type printing mechanism, means for sectionalizing the web between addresses thereon, and means for severing the web between predetermined groups of addresses thereon, which means is located between said web driving and drawing means.

20. A printing machine adapted to make from a paper web a plurality of public service and the like bills which are printed on both sides and have different addresses on one side, comprising addressing mechanism arranged to print repetitions of the same address on the same bill and to shift addresses for a succeeding bill, rotary printing mechanism arranged to print unchanging data on the address-bearing face of all bills and in constant register with the addresses, other rotary printing mechanism arranged to print unchanging data on the opposite face of all bills in the same locality thereon, said rotary printing mechanisms having associated therewith bill-advancing means arranged to pass the bills in succession through their associated printing mechanims, the bill-advancing means associated with one rotary printing mechanism additionally advancing the bills intermittently through said addressing mechanism and the bill advancing means associated with the other rotary printing mechanism having an intermittent driving engagement with the bills, and web severing mechanism arranged to sever the web into separate bill sheets at such times that the successive sheets are separate when they pass through one of said rotary printing mechanisms.

HARMON P. ELLIOTT.